

ORAL REHYDRATION THERAPY: THE BEHAVIORAL ISSUES



BEHAVIORAL ISSUES IN CHILD SURVIVAL PROGRAMS:
Monograph Number One

Prepared for
**THE OFFICE OF HEALTH
U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT**

By Soheir Sukkary-Stolba, Ph.D.

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**BEHAVIORAL ISSUES IN CHILD SURVIVAL PROGRAMS:
A Synthesis of the Literature
with Recommendations for Project Design & Implementation**

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Oral Rehydration Therapy: The Behavioral Issues
Monograph Number One

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**Behavioral Issues in Child Survival Programs;
A Synthesis of the Literature with Recommendations for Project
Design & Implementation (six monograph series)**

*also available from: International Health and Development
Associates. 18133 Coastline Drive, Suite 4A, Malibu, CA 90265

Diarrhea remains the number one threat to the health and well-being of children in developing countries. Each year the dehydration that often results from diarrhea exacts a tremendous toll: the lives of more than five million infants and children. The simple and effective technology known as ORT (for oral rehydration therapy) provides a means to cut dramatically the number of diarrhea-related deaths. Although it is easy to use, teaching mothers and other child caretakers to prepare and administer ORT correctly has not been easy, however, many cultural, environmental and socio-economic factors influence local perceptions of diarrhea and the use of ORT. This monograph: (1) identifies the major behavioral issues reflected in the qualitative literature about the use of ORT in different cultures; (2) provides valuable synthesis of the literature, summarizing findings and "lessons learned", which can be used by project designers and implementors; and (3) identifies major recommendations and conclusions emerging from the studies and research reviewed.

This monograph is the first in the series which analyzes and synthesizes research and program experience concerning behavioral issues in the following child survival interventions: Oral Rehydration Therapy; Immunization; Breastfeeding, Weaning and Nutrition; and, Growth Monitoring and Promotion. Monograph Two, Oral Rehydration Therapy: An Expanded Bibliography, a companion to this monograph, presents a more comprehensive bibliography on behavioral factors related to oral rehydration therapy.

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PREFACE

This monograph is the first in the series **Behavioral Issues in Child Survival Programs: A Synthesis of the Literature with Recommendations for Project Design & Implementation**. The series covers the major child survival interventions with the exception of birth spacing. It thus includes the following: Oral Rehydration Therapy; Immunization; Breastfeeding, Weaning and Nutrition; and Growth Monitoring and Promotion.

This monograph, like others in the series, sets forth the major behavioral issues related to the intervention, summarizes research findings on each issue, presents recommendations, and includes a bibliography. Monograph Two, Oral Rehydration Therapy: An Expanded Bibliography, a companion to this monograph, presents a more comprehensive bibliography on behavioral factors related to oral rehydration therapy.

Behavioral Factors in Child Survival

Success in child survival projects and programs depends not only on technical interventions themselves but on their being accepted and used by the millions of mothers and other child caretakers who determine in developing countries whether a child lives or dies. This requires that project designers and implementors understand not only the technical but also the behavioral factors that influence child survival in developing countries.

An enormous volume of research has been carried out during the 1980s on topics related to child survival. In addition to basic biomedical research, much of this has been qualitative research designed to provide answers on how to adapt technology, delivery systems, and promotional approaches to individual countries and cultures. Much of this research has been funded by the Agency for International Development (AID/Washington as well as by USAID bilateral projects). Additional research has been supported by UNICEF, WHO, and other organizations, public and private. Many social scientists have also conducted independent research that provides further valuable descriptive material about beliefs and practices of mothers and others that influence child survival.

The findings and conclusions of this large body of qualitative research can be extremely valuable for improving the design, implementation, impact, and sustainability of donor-funded projects and host-country programs.

These research results are not easily available, however, to either AID/Washington or mission personnel outside the countries where individual studies were initiated. Many of the studies have not been published. Some of the reports are still in rough form or in languages other than English. There is no central repository of

these studies. Nor, prior to this series, was there any comprehensive bibliography of research on behavioral aspects of child survival programs. It was for this reason that AID's Office of Health initiated the "Behavioral Issues in Child Survival: Literature Review and Consultations Project" which produced this series of monographs and bibliographies.

Purpose and Audience of This Series

The immediate purpose of this series is to bring together the major findings, conclusions, and recommendations of this far-flung body of qualitative research on behavioral issues in child survival projects and programs. The ultimate purpose of this series is to help project and program personnel:

- o First, to understand better the behavioral factors that influence whether and how well parents and other child caretakers utilize child survival services; and
- o Second, to design and implement projects and programs that achieve higher levels of participation, more effective adoption of the new behaviors being promoted, and more sustainable impacts.

The monographs are to be used in AID/Washington, distributed to USAID missions, and made available to host-country counterparts, AID contractors, researchers, and others engaged in child survival activities.

Methodology

These monographs were prepared in two stages. First was the task of bringing together the published and unpublished literature. This was done by: interviewing and consulting with researchers and research sponsors in the U.S. and various developing countries; sending cables to all USAID missions and letters to researchers in other countries asking for relevant materials; conducting computerized and other searches of the published and unpublished reports; and, finally, acquiring copies of reports and publications that appeared germane. Computerized searches were performed by or accessed collections of the following organizations: AID, UNICEF, Popline, the APHA Clearinghouse on Infant Feeding and Maternal Nutrition, and the International Development Research Centre (IDRC). The second stage was analysis and synthesis of the materials collected. The materials examined for the series include well over a thousand published and unpublished reports of research and studies conducted using qualitative, behavioral science methodologies.

Criteria for Selecting Materials Reviewed

In deciding what to include from the voluminous literature relating to behavioral aspects of child survival, the following criteria were adopted:

1. **Child survival interventions:** Concerning ORT and immunization, the goal was to be as comprehensive as possible. Concerning the area of nutrition improvement, on which an enormous amount of research has been conducted, it was decided to concentrate on two areas: (1) breastfeeding, weaning, and nutrition, with the greatest emphasis on breastfeeding; and (2) growth monitoring and promotion. Birth spacing was initially included in the series. Here, given the enormity of the family planning literature, the decision was made to focus on materials that explicitly discussed the use of family planning to increase birth intervals for purposes of maternal and child health. A copy of the initial report, Behavioral Aspects of Child Survival: Birth Spacing, by Soheir Sukkary-Stolba, is available from International Health and Development Associates.

2. **Research methodologies:** Research and studies included are those characterized as behavioral or behavioral science research, in contrast to biomedical research. Priority was placed on qualitative, as opposed to quantitative, studies. The dividing line is thin, however, as many quantitative studies (e.g. KAP surveys) seek to understand the same types of behavior as do the more clearly qualitative studies. **The goal was to seek studies that researched people's motivations and behavior in an in-depth manner;** some research on socio-economic characteristics has been included, but only when it appears to look in depth at related behavior. Priority was placed on project-related studies and studies of intervention-related behavior (in contrast to research focused more exclusively on traditional behavior--e.g., on mothers' knowledge of ORT as opposed to traditional means of treating childhood diarrhea).

Methodologies examined included those identified as:

- * ethnographic research,
- * anthropological research,
- * in-depth interviewing,
- * key-informant interviewing,
- * observation,
- * participant observation,
- * detailed activity studies,
- * focus group studies,
- * household studies,
- * community studies,
- * community diagnoses,
- * participatory research/evaluation,
- * social marketing research,
- * formative research,
- * motivational research,

- * practice studies,
- * audience research studies, and
- * action research.

Also included, especially when they attempted an in-depth examination of beneficiary behavior, were:

- * KAP (knowledge, attitudes and practice) studies,
- * baseline studies,
- * household surveys,
- * case studies,
- * situation analyses,
- * feasibility studies,
- * operations research,
- * pilot studies and surveys,
- * message testing and product preference trials, and
- * evaluation research based on longitudinal or other in-depth studies.

Project evaluations are also a rich source of information about behavior. Evaluations of the "rapid appraisal" type that are most commonly conducted on AID projects have generally not been included in this review, however, as they are the subject of other ongoing AID-sponsored activities (e.g., at Johns Hopkins University).

3. **Behavior:** Whose behavior is included? The focus is primarily on the behavior of mothers and other child caretakers, secondarily on service providers in relationship to the mothers and other child caretakers and, third, some organizational factors that directly affect mothers' behavior (e.g., hospital policies on rooming in as they influence breastfeeding mothers). Other research on organizational behavior and systems has not been included (e.g., no research on management information systems, health care financing arrangements, or Ministry of Health re-organizations).

4. **Research sponsor:** Priority was given to studies funded by AID, especially in AID's 22 child-survival "target countries." Efforts were made to be as comprehensive as possible in finding studies funded by AID. Unfortunately, some were undoubtedly still missed, given the fact that many USAID mission-funded studies never find their way back to Washington. (The same is true of UNICEF-funded field studies which likewise are not all available at headquarters.)

5. **Time frame:** A time frame of 1980-to-present was adopted at the time the initial draft report was completed in April 1988. Research conducted before 1980 but reported on after 1980 is also included. Some earlier exceptions have been included as judged important for the particular intervention. With a few exceptions, materials produced since April 1988 have not been included.

6. **Other:** A small number of more general items have also been included. Among these are: literature reviews, policy statements, topical overviews, and methodological materials.

General Conclusions and Recommendations

1. Further research should build on the findings and cumulative experience to date. Much has been learned during the last few years that can be applied to project design and implementation problems cross-nationally. Issues have been identified and general answers are available. The need is for project and program personnel to use these as a guide and point of departure (rather than reinventing the proverbial old wheel) and only then decide what precise questions remain on a country-specific basis.

2. The findings presented in this series should be further developed to assist AID personnel in designing and implementing more effective, sustainable projects. Other valuable information in the documents collected for this report but not presented here should also be utilized. Further work should focus on:

- o **Developing explicit procedural guidelines for project personnel to use in design, implementation, and evaluation.** Partial guidance is presented in this report, but recommendations need to be streamlined and more tightly linked to decisions in the project process. This was not possible within the scope of work for this activity.
- o **Synthesizing the lessons and recommendations about methodologies for learning about behavioral factors in child survival.** Mission personnel who are not behavioral scientists need to know, for example, what types of methodologies are appropriate for investigating priority issues, what research can easily be organized in-house, when to call in behavioral researchers, and what sort of guidance to give them. Again, far more has been written than is regularly being used by most USAID missions. Such information is contained or suggested throughout the literature collected for this project. This is a wealth of instructive information that should be summarized.
- o **Analysis of "cross-cutting topics."** Important cross-cutting variables (e.g., socioeconomic status, maternal education, and so on) affect acceptance and use of the child survival interventions. A synthesis of information on these cross-cutting variables can also assist project planning and implementation. These variables are discussed in each monograph as they relate to the particular intervention, but far more is included in the literature collected than could be included here.

About the Bibliographies

As noted above, a selective bibliography accompanies each monograph. For those interventions for which the behavioral literature is voluminous--namely oral rehydration therapy and breastfeeding, weaning, and nutrition--separate volumes, "expanded bibliographies," have been prepared. Copies of the key documents cited are held in the libraries of International Health and Development Associates. Bibliographies are in Wordperfect 5.0 on floppy discs that could be shared with others. In some of the bibliographies an asterisk (*) is used to indicate work funded, partially or in full, by AID (although it has not been possible to identify all AID-funded reports).

Acknowledgements for Assistance with the Series

Dr. Pamela Johnson of AID's Office of Health, and Manager of AID's Child Survival Program, is to be credited for initiating this activity and for her insight into the critical importance for project success of understanding the behavioral issues in child survival.

This series has been a mammoth undertaking. It would not have been possible without the interest and generous cooperation from professionals in many organizations: AID, UNICEF, the World Health Organization, the Centers for Disease Control, the APHA Clearinghouse on Infant Feeding and Maternal Nutrition, Wellstart, the Academy for Educational Development, Management Sciences for Health, Manoff International, John Snow, Inc., Applied Communications Technology, Education Development Center, the Center for Population and Family Health at Columbia University, Water and Sanitation for Health, the International Science and Technology Institute, Johns Hopkins University, the Population Council, the Primary Health Care Operations Research Project, the Carolina Population Center, Pragma Corporation, and the International Development Research Center. The authors are grateful for the interest shown by colleagues and others in these institutions as well as for the contributions and stimulating input from many individual researchers. Finally, the authors are grateful to Linda Vogel and Terry Gay of the Office of International Health, U.S. Department of Health and Human Services, and to Vivian Sellars of the LTS Corporation for their support of this project.

Barbara Pillsbury,
International Health &
Development Associates

EXECUTIVE SUMMARY

The main goals of this monograph are to (1) identify the major behavioral issues reflected in the qualitative literature about the use of oral rehydration therapy in different cultures, (2) provide a useful synthesis of the literature which can be used by project designers and implementors and (3) identify major recommendations and conclusions emerging from this review. There is an extensive body of literature which deals with the various ways oral rehydration therapy has been accepted or rejected by mothers and care takers. This monograph concentrates on identifying beliefs, values, practices, and other important factors affecting the use of oral rehydration therapy in developing countries. It attempts to clarify the cultural constraints and opportunities associated with ORT use in various cultural settings.

It is estimated that about five million infant deaths in developing nations today are due to diarrhea-related problems (USAID 1989). Diarrheal disease remains the number one threat to the health and well-being of children of developing nations. The discovery of Oral Rehydration Therapy (ORT) offers hope to many families. Oral rehydration therapy has two main components: "(1) the use of fluid and electrolytes (oral rehydration solution) to correct the dehydration and replace the continuing fluid loss of acute watery diarrhea; and (2) nutritional therapy to minimize weight loss and even shorten the duration of illness" (Cash 1987:10). ORT education emphasizes feeding/breastfeeding during and after diarrheal episodes to reduce the incidence of malnutrition. Prevention messages associated with ORT, such as hand washing, personal hygiene, and sanitation are sometimes considered part of the general prevention/control of diarrheal disease.

The transfer of ORT's technology has not been easy. Various cultural, environmental, and socio-economic factors influence local perceptions of diarrhea and the use of ORT. There is an enormous body of literature which describes the various ways individuals learn and administer ORT. A basic theme that runs through almost all qualitative studies is that successful experiences in one cultural setting cannot readily be transplanted and necessarily have the same degree of success in another cultural environment; however, the qualitative literature is rich with useful lessons which can be learned.

MAJOR CONCLUSIONS AND RECOMMENDATIONS

1. **Integration of local beliefs and practices in project design/implementation.** Local perceptions, definitions, and classifications of diarrhea are numerous and often very complex. **In project design, one should identify local perceptions, as well as existing health behaviors related to diarrhea and its treatment in order to plan activities that fit within the cultural context and therefore facilitate acceptability of ORT.**

2. **Feeding practices during and after diarrhea.** Cross-culturally, there are numerous beliefs about feeding during and after diarrhea. Many harmful behaviors, such as withholding or restricting foods or fluids, cessation of breastfeeding, and purging (inducing evacuation of the bowels for the purpose of "cleansing" the body), are practiced. **Feeding practices and behaviors should be identified, as well as the principles underlying the cultural classifications of foods, and addressed in either ORT training sessions or media messages.**

3. **Local beliefs and acceptability of the medical product.** Local beliefs often affect the perceived effectiveness and acceptability of medical products. Field based studies might be carried out to ascertain local preferences for flavor, color, name, and form of ORS. **Researchers should identify local beliefs which might affect the perceived effectiveness or acceptability of ORS.**

4. **Identification of target groups.** Mothers are the principle care takers of young children, and therefore are an obvious target for ORT messages; however, other family members such as older siblings, grandmothers, and fathers also play an important part in child care and decisions about the treatment of sick children. **Researchers should identify individuals besides mothers who are responsible for the well being of young children and consider them as part of the target group for ORT messages.**

5. **Clarity of mixing instructions.** One key to effective oral rehydration therapy is correct mixing of the ingredients. Several studies have shown that mothers can learn to properly mix and administer ORS. Without proper education, however, many mothers often mix and administer ORS incorrectly. ORS packets should be accompanied with clear, easy to understand instructions. Mothers generally cannot prepare ORS from the packet directions alone, however. **Clear, careful, consistent instructions are essential components of an ORT intervention program and should accompany the introduction of ORT in any area. Extensive and sustained education efforts are necessary for mothers to be able to effectively use ORT.**

6. **Household containers/measuring devices.** Many households lack appropriate containers for measuring and mixing ORS. **The amount of rehydration ingredients in each packet should conform to a common household container. If no such container can be identified, measuring devices, such as cups or even cheap plastic bags, can be distributed with the ORS packets. Where ORS are prepared from home ingredients, measuring devices can be distributed through sources such as local health volunteers or traditional health workers.**

7. **Medical health care professionals' support of ORT activities.** Support from the medical community, both public and private, is vital to the success of ORT activities, however, many medical professionals, such as physicians and pharmacists, in developed as well as developing countries are often reluctant to promote ORT. **ORT promotion, education, and training should be extended to include health care professionals.**

8. **Traditional health practitioners and promotion of ORT.** Traditional health practitioners (e.g., midwives, healers, health barbers) are in some cultures often the first source of medical care for children suffering from diarrhea. They are accessible, affordable, acceptable, and available. The literature states many examples of traditional health practitioners who have successfully administered and distributed ORT supplies and information. **In many countries, it is important in many countries to include traditional health practitioners in promoting ORT.**

9. **Clinic/community-based distribution.** Clinic-based distribution of ORS may not be sufficient because of clinic distance, short supplies, busy medical staff, or lack of positive attitude on the part of the service providers. **Community health workers, as well as teachers, community leaders, family members, and mothers who have ORT experience, can be used to promote ORT and teach others how to mix the solution.**

10. **Communication channels and ORT interventions.** The success of ORT interventions depends on reaching the greatest number of mothers possible with ORT messages. While radio is often the most popular channel for the spread of ORT information, other media should be explored. Only one channel of information is generally not enough. **ORT information campaigns should include a combination of media--radio, television, printed flyers and posters, and/or face-to-face contact with trained health workers--to be effective. Local research is necessary to determine the best media strategy for ORT messages.**

11. **Knowledge vs. use.** Use of ORT often lags far behind knowledge. In addition, some mothers do not use ORS under certain circumstances. For example, mothers sometimes do not give ORS to children of a particular age or sex or if the diarrhea is perceived to be only a "mild" episode. Often, mothers discontinue ORS because they do not clearly understand that their purpose is to prevent their child from dying from dehydration, not to alleviate the symptoms of diarrhea. When mothers perceive that ORS are not curing their child of diarrhea, they become dissatisfied with it and discontinue its use. **Research is necessary to determine why mothers are not using ORS so that the necessary steps can be taken to ensure continued and consistent use.**

12. **Sustainability of ORT activities.** Several studies demonstrate that ORT promotion and education campaigns can be successful. In addition, it has been demonstrated that ORT knowledge and use can fall off unless a concerted effort is made to sustain ORT activities. **It is important that project implementors plan carefully, and commit to long term involvements. Once an ORT intervention is in place, care must be taken to sustain the activities. This means continued promotion, education and follow-up, as well as a consistent supply of ORS packets, measuring implements, and other necessary items.**

ORAL REHYDRATION THERAPY

INTRODUCTION

It is estimated that about five million infant deaths in developing nations today are due to diarrhea-related problems (USAID 1989). Today, diarrheal disease remains the number one threat to the health and well-being of children in developing countries. It is not unusual for a child to suffer from several episodes of diarrhea every year. Now Oral Rehydration Therapy (ORT) provides a means to dramatically cut the number of diarrhea related deaths.

Since its discovery in the 1960's, ORT has offered hope to millions of families. A WHO/UNICEF report defines ORT as the administration of fluid by mouth to prevent or correct the dehydration that is a consequence of watery diarrhea (WHO/UNICEF 1983:5). The purpose of ORT is to prevent deaths due to dehydration by replenishing the water and salts lost during episodes of diarrhea. A mainstay of ORT is Oral Rehydration Salts (ORS) which produce a glucose-electrolyte fluid that, if used properly, can save the lives of many children. ORT also includes support for feeding and/or breastfeeding during and after bouts of diarrhea to reduce the malnutritional consequences of diarrhea.

ORT can greatly reduce infant and child deaths due to diarrhea. ORT has two main components: " 1) the use of fluid and electrolytes (oral rehydration solution) to correct the dehydration and replace the continuing fluid loss of acute watery diarrhea; and 2) nutritional therapy to minimize weight loss and even shorten the duration of illness" (Cash 1987:10). ORT education emphasizes feeding/breastfeeding during and after diarrheal episodes to reduce the incidence of malnutrition. Prevention messages associated with ORT, such as hand washing, personal hygiene, and sanitation are sometimes considered part of the general prevention/control of diarrheal diseases.

The transfer of ORT's technology has not been easy. Various cultural, environmental, and socio-economic factors influence local perceptions of diarrhea and the use of ORT. It is almost axiomatic that successful experiences in one cultural setting cannot be transplanted and have the same degree of success in another culture. Certainly lessons learned in one setting can be useful in promoting ORT elsewhere, but solutions must be tailored to each local culture. The information in this report is generally representative of the rural and urban poor populations in the countries indicated; however, internal variations also exist within countries due to social, economic, religious, educational and other cultural differences.

The transfer of ORT technology has proven to be complex in situations where different cultural, environmental, and socio-economic factors interface with a modern bio-medical product. At first glance, the mixing and administering of ORS might seem like a simple procedure; however, in reality, complications often occur because of lack

of product acceptability, environmental problems of access to clean sources of water, price constraints, limited time of care takers, or inability to learn the proper way to mix ORS.

As the child survival initiative is implemented in different cultures, it becomes evident that there is a great deal of variation in the ways individuals learn and administer ORT. Ethnographic studies provide a wealth of data about these diverse experiences in developing countries where ORT has been introduced to the public. Ethnographic findings are most useful in the following areas:

1. Identifying the cultural setting in which diarrheal diseases occur, as well as current treatment practices;
2. Clarifying the cultural constraints and opportunities associated with ORT use in a particular cultural context;
3. Providing guidance to develop and test communication messages via the news media; and
4. Understanding behavioral changes which result from health educational campaigns and use of the media.

A basic theme that runs through almost all qualitative studies is that successful experiences in one cultural setting cannot readily be transplanted and necessarily have the same degree of success in another cultural environment. **The ORT experience is unique, complex, and is not directly replicable from one country or culture to another.**

Issues in ORT

ORS have been hailed as a "simple technology." It was declared by many health professionals as the "simple solution" to the complex problems caused by diarrheal diseases. After several years of research and hundreds of programs specially designed to promote ORT, the introduction of the "simple solution" in different cultural settings has proven to be an extremely challenging task. There are a number of important technical issues still being debated and discussed in the scientific community. In developing guidance on these technical matters, it is essential to consider the behavioral dimensions, that is, how guidance will be interpreted and communicated by lower-level health workers and acted upon by mothers and other child care takers. These issues include the following:

1. Should a mother or other care taker give a child ORS as a first action when diarrhea occurs or should she do other things first? Messages to mothers have changed a number of times, often leading to confusing and incorrect use of ORT. For example, the literature reviewed, technical guidance as well as behavioral studies, repeatedly state that mothers

should give ORS at the onset of diarrhea. Today, in the late 1980's, this guidance is again changing. At the same time, many health care professionals in developing countries are still telling mothers to consult a physician prior to using ORT because of the complexity and dangers of diarrheal diseases. No wonder mothers have difficulty using ORT correctly! Mothers need to know when to start treatments in terms they can understand. It is important that messages such as this have a sound technical basis and be consistent over time.

2. Should ORS be flavored? Are we encouraging children to seek flavored medical products for their sweetness alone, leading to over consumption of ORS? The behavioral literature indicates that mothers often add something, such as lemon juice or guava to ORS to improve the taste. Physicians often object to the idea of accepting a medical product on the basis of taste. Also, there is a concern that improving the taste might lead to consuming larger amounts than an individual needs.

3. Should mothers and other care takers be told to boil water before using it to prepare ORS? In many places, this is the guidance they receive. Many technical experts, however, currently believe that water boiling is not necessary but rather that mothers should be directed simply to use the cleanest water available. How clean does water need to be? And can poor mothers afford the time and fuel to attain this standard? Would the time and fuel constraints to achieve an unnecessarily high standard of cleanliness impede the use of ORS?

4. Is there a short but effective ORT message which can be used universally? Should a mother be told about dehydration in the message? Should a mother be told to use ORS immediately after observing that a child suffers from diarrhea? Would feeding during and after diarrhea be included? Can a mother remember all these instructions? If we included all the information necessary for appropriate administration of ORT, the message will never be short.

5. Should diarrheal disease control projects give more attention to the prevention of diarrheal disease? If so, should water supply and sanitation be included or should the prevention component be limited to hygiene education alone? Is it realistic to expect diarrheal disease control projects to include all these components? Some behavioral scientists indicate that preventive health issues are very important in educating the public about possible causes of diarrhea which can be easily avoided (Kendall 1985b:44-45).

The Organization of the Report

This report presents some of the contributions of behavioral scientists to this complex topic. The report focuses mainly on a selected number of major behavioral topics discussed in the qualitative literature in relationship to the treatment and prevention of childhood diarrhea. The data presented are based on a detailed, thorough examination of the ORT literature and interviews with many researchers.

The ORT literature is vast and ever-growing. This tremendous growth reflects the complex processes associated with introducing ORT technology in different cultural settings. The ever-changing and evolving nature of ORT technology, makes it hard for any one report to cover all topics. Thus, this report does not claim to be all comprehensive. For example, new issues related to the use of cereal-based formulas are not dealt with in this report. No attempt is made here to include all relevant institutional or logistical issues; however, a serious effort has been made to identify the most significant behavioral issues relevant to the implementation of glucose-based ORT in many different cultural settings.

Thirteen issues are presented here along with a very brief discussion of some of the methodological issues. **The issues presented are not meant to be mutually exclusive nor exhaustive in their treatment of the subject. In fact, there is a fair amount of unavoidable overlap because of the interrelated nature of the issues discussed.**

This review identifies some of the cultural settings in which diarrheal diseases occur. However, the primary focus is on local perceptions and practices in relation to diarrhea and the treatment of diarrhea and dehydration in children. Product positioning, identification of target groups, distribution channels, the nature of ORT messages, communication, and dissemination of ORT knowledge via health care professionals and traditional practitioners are also discussed in detail. Most of the bibliographic materials reviewed for this report were written or published prior to 1987, the time the first draft of this report was completed and sent to reviewers. Very few publications which were produced after this date appear here.

BEHAVIORAL ISSUES AND SIGNIFICANT FINDINGS

I. Local Perceptions About Diarrhea, Rehydration, and Traditional Treatments

Issues for Project Design and Implementation

How is diarrhea as a disease perceived by mothers? How are the symptoms recognized? What are the personalistic/naturalistic local explanations for diarrhea? Are behaviors such as purging, withholding of foods, or using traditional medicine known or practiced in the community? What words do mothers and health care workers use to refer to or describe diarrhea and dehydration? Is diarrhea perceived to be a severe health problem? What are the different types of folk diagnoses of diarrhea?

Local Perceptions vs. the Medical Definition of Diarrhea

Local perceptions and beliefs about diarrhea influence both traditional and modern treatment. Health professionals view diarrhea as a deviation from normal function. They may quantify the severity of the diarrhea by such techniques as noting the number of abnormally loose or watery stools or the degree of dehydration. Physicians classify diarrhea according to the infectious pathogens involved (e.g., rotavirus, shigella, E. coli) (De Zoysa 1984:727). Local perceptions of diarrhea, however, often deviate greatly from scientific definitions. The uneducated rural poor often view diarrhea as a normal condition and not as a stimulus for action or alarm.

There are numerous studies that deal with the cultural context of diarrhea. A cross-cultural health survey carried out by Axel Kroeger provides an excellent source of information about people's perceived disease causation, their use of different kinds of health services (including traditional sources), and their perceived need for health care (Kroeger 1983). This baseline data helps project implementors design culturally appropriate programs/projects.

Diarrhea is perceived by some as dangerous and life threatening, yet accepted as a normal part of life by others. Ability to recognize diarrhea and dehydration varies greatly. Each locality has its own set of beliefs and practices, and it is clear that what works in one area may not work in another. This can be seen in the case of the hot/cold dichotomy. In **Peru**, diarrhea is seen as a cold disease, while in **Haiti** it is considered a hot disease.

In **Honduras**, project implementors were able to take advantage of the understanding the country people had about diarrhea and its treatment. Rather than viewing

rural people as lacking knowledge of diarrheal diseases, they designed a "context-sensitive" intervention which allowed them to integrate ORT into the local treatment complex (Kendall 1985). Thorough ethnographic investigations can provide the baseline data crucial to the development and implementation of effective ORT activities.

Local Perceptions of the Types of Diarrhea

Ethnographic studies reveal that local perceptions of diarrhea are varied and numerous, and classifications are often complex. In **Guatemala**, for example, 41 different local terms for diarrhea have been identified (Enge and Harrison:1978:35). In one **Costa Rican** community, local people use eight different categories and several sub-categories for diarrheal disease (Scrimshaw and Hurtado 1987). Although mothers offer such reasons as food contamination, lack of hygiene, and other physical explanations for diarrhea, they describe a rich variety of folk etiologies as well.

Within indigenous belief systems, diarrhea is not always seen as a distinct clinical entity with a single set of causes. Perceptions about diarrhea influence the type of treatment that is sought. In **Swaziland**, traditional healers and patients tend to classify illnesses as either African/traditional or modern/European illnesses. "Modern illnesses" include cholera, tuberculosis, heart disease, etc., while "African illnesses" involve supernatural agents which are thought to be more important and dangerous (Booth, et al. 1985).

Causes and Treatment of Diarrhea

Folk beliefs differ from one country and region to another, but the definitions and etiologies remain as complex. The following example from **Swaziland** demonstrates the complexity of folk definitions and etiologies of diarrhea. In **Swaziland** the people divide infant diarrhea into three types: simple or natural diarrhea and the more dangerous kuhabula and umphezulu. They believe simple diarrhea is caused by food or changes in season, diet, or location or by teething. Simple diarrhea is thought to be the result of a hot/cold imbalance (referring to the intrinsic property of food or other substances, not their actual temperatures). Teething, for example, causes heat which in turn causes diarrhea. Simple diarrhea is usually treated with a number of oral decoctions, some of which actually promote diarrhea, followed by herbal enemas intended to "clean out the baby's stomach." If the diarrhea does not respond, one of the more serious illnesses, kuhabula or umphezulu, is suspected.

According to **Swazi** belief, babies become ill with kuhabula when they inhale fumes from tinyamatane, a therapeutic preparation that is burned as a fumigant or used as a traditional vaccination. Each clan has its own special tinyamatane that are used to protect clan members against illness. Babies become ill when they inhale fumes from the tinyamatane of another clan. The affected child is taken to a

traditional healer who, after a complex process of diagnosis, will fumigate the child by making him or her breathe a medicinal smoke. In addition, babies are sometimes given herbal enemas in order to purify or "drain bad air out of" the stomach. Sometimes babies are given herbal decoctions to drink.

Umphezulu, on the other hand, is thought to be contracted in the womb. It is caused by the pregnant woman passing through an area where lightning has recently struck or where enemies have spread harmful medicine. If a pregnant woman fails to keep her head covered at all times, the baby will be born with umphezulu. A child with umphezulu is taken by the traditional healer to a place where lightning has recently struck. A hole is dug and a fire is built in it. The baby is held over the hole and given an herbal enema, and the feces are buried in the hole. The child may also be given herbal decoctions or traditional vaccinations. Hospital or clinic treatment of this illness is considered dangerous and ineffective (Booth, Green, and Huntington 1985:114-116).

Natural causes: Hot/Cold Imbalance

A recurring perception of diarrheal diseases relates to hot/cold imbalance. In **Haiti**, diarrhea is usually defined as a "hot" illness. Correspondingly, traditional remedies there involve cooling the body with refreshing teas (Coreil 1985:27). In **Peru**, however, mothers most often described diarrhea as a "cold" disease (Escobar, et al. 1983). When asked, "What causes diarrhea?", mothers responded with such answers as: the baby being left in the cold, eating cold foods, the baby wearing a piece of clothing that had been allowed to stay in the cold, or breastfeeding under cold conditions. In several regions of **South Asia**, people believe that "heat" is transferred through breastmilk (Green 1986:357-366; Nichter 1988b:7; Nichter and Nichter 1983:235-246).

In **Nepal**, if the perceived cause belongs to a "natural" category, such as hot/cold imbalance, eating wrong foods or lack of nutritious foods, the children are treated with medicine and home remedies. If, however, the cause is due to a spirit possession, called lagan, the child is treated with a mantra (magic hymn) by a traditional faith healer. Common diarrhea, disha pakhala, is not treated for four or five days (Shrestha 1968:14).

Ingestion of Certain Foods

Many beliefs about the cause of diarrhea are related to the ingestion of certain foods. The list of specific foods is long and varies from region to region. This includes poorly washed or dirty foods, spoiled foods and certain classifications of foods, as well as those that fall into folk categories, such as hot or cold. About 30 percent of the mothers in **Goa** believe that diarrhea is related to the child's or mother's foods (Srinivasa and Afonso 1983:860). **Egyptian** mothers gave the following reasons as directly related to the cause of diarrhea: 1) drinking large amounts of cold water or other beverages; 2) eating large quantities of sweets and drinking water afterwards; 3)

eating rich foods and lots of fat and grease; 4) catching cold, especially at night if not well covered; 5) drinking cow's milk without boiling it or removing the cream from it; and 6) drinking hot and then cold beverages (El Katsha, et al. 1986:139).

Local perceptions about diarrhea and its etiology can be very complex. While mothers generally recognize that diarrhea is a serious and potentially deadly disease, some kinds of diarrhea are viewed as more serious than others. For example, the following explanation was given by a **Costa Rican** mother:

"My children get pega when they eat something, like ripe bananas, and having their stomachs empty it sticks to them... In these cases small balls form on their elbows and they get diarrhea and bloated stomachs. Then one has to rub them hard to loosen the pega (stuck food) and afterwards I give them bicarbonate with lemon juice to help the pega get out... There is a big difference between pega and empacho, because empacho is a sad thing...much stronger than the pega because empacho is produced by a pega. The person with empacho may even die" (Scrimshaw and Hurtado 1987:11).

Worms

In some localities diarrhea is believed to be caused by worms. In **Honduras**, for example, mothers believe that everyone is born with a sack (bolsa) which is located in the gut just below the stomach. This sack contains worms which, during the first year of life, are underdeveloped and cannot digest dense, compact foods. Certain foods or activities cause the worms to become agitated, therefore bringing about diarrhea. If the worms are properly fed, however, they are believed to be beneficial. According to **Honduran** belief, a child or an adult "who loses his or her worms will certainly die" (Kendall 1985b:50-52). Worm-caused diarrhea is often considered normal, and parents do not usually treat it, at least during the first three days. Similarly, **Rwandan** mothers believe children are born with intestinal worms. They believe these worms are the carriers of a child's ancestral lineage. To kill the worms would be to kill the child's familial heritage; therefore, intestinal worms are seen as an accepted part of living (Glik, et al. n.d.:17).

Supernatural Forces

Numerous supernatural and psychological etiologies of diarrhea have been recorded. They include such explanations as the will of God, evil spirits, "evil eye", sunken fontanel, indigestion (empacho) and "fright disease." Some types of diarrhea are thought to involve the behavior of the mother before the child is born or while breastfeeding. In **India**, for example, dosham, a form of diarrhea, might occur when a mother has fed her child after exposure to a woman who has had a miscarriage (Lozoff, et al. 1975:358).

The concept of the "evil eye" occurs widely throughout the world and is perceived as an important factor which causes illness, including diarrhea. In **Honduras**, as in many other parts of the world, evil eye, or ojo, is caused by the envious glance of a person who is defined as "strong" (e.g., a sweating man or woman, or a pregnant woman). It usually attacks a weak infant or baby less than one year old (Kendall, et al. 1983:355).

Sunken or fallen fontanel called (caida de mollera) in **Honduras** is thought to be due to parents' neglect. Caida may be caused by a fall or a near fall. It is treated by rubbing the fontanel, pushing up with the index finger on the roof of the mouth, sucking on the fontanel and sometimes turning the child upside-down and slapping the soles of the feet (Kendall 1985b:53-54).

Another folk illness which has a wide distribution is empacho. People in **Honduras**, for example, routinely claim that empacho is a cause of diarrhea. Empacho is an illness accompanied by flatulence, a feeling of fullness (especially on the right side of the abdomen), a "peculiar" skin quality, and during evacuation a sensation of pushing accompanied by stools broken into short, watery bursts. It is believed to be caused by eating too little, eating too much, eating hot foods, cold foods, heavy foods, skipping a meal, or eating at the wrong time. In **Honduras**, empacho is treated by administration of a purgative and by massage (Kendall, et al. 1983:356).

Purging and Diarrhea

Purging (cleansing the body by inducing evacuation of the bowels), and withholding of foods during episodes of diarrhea are common. A great number of substances are used to induce bowel movements. The use of these substances creates the impression of cleaning or purging (Kendall, et al. 1983). Young infants in **Sri Lanka** are given an herbal medicine, Sinhala, to "clean the stomach of impurities acquired in utero. These medicines, which are given to the child periodically for the first one to three years of life, are sometimes responsible for causing diarrhea (Nichter 1988b:9-10). In **Goa**, 83 percent of the mothers interviewed believed that food should be restricted not only during episodes of diarrhea but for two to three days after (Srinivasa 1983:863).

Relationship Between Folk Beliefs and Formal Health Systems

Formal health systems and folk beliefs may overlap, blend, or even conflict with one another. A **Costa Rican** mother, for example, followed her doctor's recommendation by giving her child liquids and an analgesic to reduce her fever. However, the mother also gave the child a starch gruel with lemon. The mother stated, "This is good because it makes a kind of glue in the intestine that helps coagulate food and doesn't let it come right out" (Scrimshaw and Hurtado 1987).

Costa Rican mothers rely most often on the national health system or the social security medical system, but medical facilities are most likely to be utilized only for three of the eight types of diarrhea that they recognize. According to one mother, "Doctors don't understand about pega, instead they always diagnose children with pega as having an 'intestinal infection.' Even if the children take the medicine the doctor orders, they do not get well until they get a massage." Doctors are often mentioned as a source of treatment, but so are herbal remedies, purges (which are intended to "clean out" the child, but actually aggravate diarrhea), and massage. In **Honduras**, mothers believe that although cosmopolitan medical staff can cure diarrhea and dysentery, they would be unsuccessful in treating either empacho or ojo (Scrimshaw and Hurtado 1985).

Local Perceptions of Dehydration and Disease Severity

The ability of mothers to recognize diarrhea and dehydration also varies from location to location. Researchers found that **Rwandese** mothers generally possessed "a good deal of knowledge" of the signs and names of illnesses. Some were aware of the possible consequences of untreated illness in young children. Researchers also found, however, that there is a great deal of misinformation and confusion regarding the cause of diarrhea (Glik, et al. n.d.:16-17). In **Peru**, mothers view diarrhea as a dangerous illness, but not necessarily as an emergency. The consequences of diarrhea are known but not necessarily understood. Only 16.5 percent of the mothers could show that they could recognize dehydration (Escobar, et al. 1983). In southern **India**, dehydration symptoms, called dosham, were seen as life-threatening, but for the most part were not associated with diarrhea (Lozoff et al. 1975:358). During a 1980 study in **Honduras** none of the mothers interviewed knew about dehydration (Kendall 1985b:57). A 1986 pre-intervention KAP survey in both rural and urban **Egypt** revealed that almost all mothers had heard of the concept of dehydration (gaffaf) but did not associate it with the effects of diarrhea (S.P.A.A.C. 1987:16-18). Based on this information, the National Diarrheal Disease Control Program launched a campaign which taught mothers about the dangers of gaffaf and the importance of preventing it.

Diarrhea is so common that mothers often consider it a normal part of growing up. Sixty-seven percent of the mothers in **Karachi** felt that diarrhea is a serious disease; however, because diarrhea is so common among children in the slums, many mothers considered diarrhea an unavoidable hazard of childhood. One-fourth of the mothers regarded diarrhea as a normal childhood occurrence. Nearly one-third did not know what caused diarrhea (Mirza 1987:15). In a rural community in **Sri Lanka**, mild or intermittent diarrhea is considered a normal, if not an expected, response during transitional times such as teething, weaning, and learning to walk (Nichter 1988).

The perceived severity of the disease is often linked to its etiology. **Honduran** mothers, for example, consider ojo and empacho to be very serious, even fatal if not treated. On the other hand, **Hondurans** do not consider diarrheas such as those

caused by teething or la bolsa (worms) to be serious. Some diarrheas may even be thought beneficial (Kendall 1985b:50-52).

Conclusions and Recommendations

Local perceptions about diarrhea are numerous and often very complex. There is a rich variety of folk diagnoses and etiologies. Folk medicines and traditional healers play an important role in the recognition and treatment of diarrheal diseases. Behaviors such as purging, withholding of food, and other folk remedies are widely practiced. Sometimes traditional practices conflict with formal medical systems. The fact that women in **Honduras** would not seek help from a physician for diarrhea caused by empacho or ojo demonstrates that **it is important to consider local perceptions when designing ORT activities.**

Clear communication is essential for successful ORT interventions. Local terminology for diarrhea and folk illnesses associated with diarrhea should be identified. The causes, effects, and symptoms of diarrhea must be described in ways the people can understand. Often the technical concepts of dehydration and rehydration are too abstract or not understood in a community. Concepts that are understood locally should be identified so that project implementors can use them in ORT education and promotion.

1. **Local names, and categories of diarrhea.** Mothers often perceive diarrhea as having several different causes, or etiologies, each with its own name. **Project implementors should identify the local names and categories for diarrhea so that media messages can be developed and tested in culture specific contexts.**
2. **Folk treatments for diarrhea.** Indigenous beliefs include many supernatural causes and folk treatments for diarrhea, and faith healers play an important role in diarrhea treatment. Even though project personnel may not consider certain folk treatments to be useful, these and other innocuous behaviors can be overlooked so long as they do not conflict with ORT. **Harmless treatments may even be integrated into the ORT messages to make them more culturally relevant, and thus accepted. Harmful treatments should be identified so they can be discouraged.**
3. **When to start treatment?** Mothers often do not perceive diarrhea to be dangerous. Many believe it is a natural part of life and growing up. Symptoms of dehydration are often unrecognized. In many instances this perception leads to delayed treatment. **Mothers need to know when to start treatment in terms that they can understand. It is important that messages such as this have a sound technical basis and be consistent over time.**

II. Feeding Practices During and After Diarrhea

Issues for Project Design and Implementation

How do mothers feed their children during bouts of diarrhea? Do mothers stop breastfeeding when they notice that their infants are suffering from diarrhea? What liquids or solids are given to infants/children suffering from diarrhea? What liquids or solids are culturally perceived as dangerous for children with diarrhea? How long do mothers withhold food? What are the culturally appropriate foods for sick children? Is breastmilk considered dangerous for an infant with diarrhea?

Diarrhea and Malnutrition

Malnutrition is a severe problem in developing countries. Children in developing nations have on the average three to six bouts of diarrhea per year with each bout lasting an average of three to five days (Van Zijl 1966). During diarrhea, feeding practices vary greatly. In some areas mothers recognize the need for adequate nutrition during episodes of diarrhea; however, some mothers alter the child's diet when he or she suffers from diarrhea. This may include withholding foods and/or liquids or discontinuing breastfeeding or even giving foods or remedies that aggravate diarrhea.

Frequently diarrhea and malnutrition interact negatively. Infants and children with diarrhea are at risk of suffering from malnutrition. Food is often withheld during episodes of diarrhea, and breastfeeding is frequently discontinued. Mothers sometimes restrict certain foods and emphasize others. In some instances, mothers withhold all fluids. Promotion of appropriate feeding, particularly breastfeeding, during episodes of diarrhea is an important component of ORT activities.

Feeding Patterns During Diarrhea

Numerous beliefs exist about feeding during diarrhea. Qualitative research provides useful insights about feeding practices during and after bouts of diarrhea. Perceptions about the cause and/or type of diarrhea may influence a mother's feeding practices. For example, in **Sri Lanka**, Sinhalese distinguish four forms of diarrhea, each of which has its own remedy. For "mild diarrhea" solid food is withheld and liquid consumption is reduced. Children are commonly given weak coffee (believed to be "heaty") sometimes mixed with lemon juice, coriander water (a cooling agent), a kenda

(soup) made of fried rice patty in water, or a decoction of beli root and irewerilya. Mothers reduce liquids because they feel too much liquid will induce vomiting and cause more diarrhea (Nichter 1988b:23).

In contrast, when Sinhalese children experience "blood and mucus diarrhea," coffee is generally not given. Cooling medicines such as Sinhala, and ayurvedic herbal medicines, as well as coconut water, rice water, and beli root decoctions, are given instead. The Sinhalese fear of vomiting affects health behavior appreciably. Some mothers reduce liquids given to a child because the child had vomited or because the woman fears the child will vomit. In one case liquids had been withheld for two days after the child vomited (Nichter 1988b:26).

Thomas Cook found in **Nicaragua**, for example, that mothers were worried that a "cold" food (the oral rehydration solution) would be harmful to a child with diarrhea. When mothers were told that they could cook the rehydration solution (thereby making it a "hot" food), the ORS became an acceptable remedy (1977:38).

In many countries, mothers stop feeding and/or breastfeeding their children during bouts of diarrhea, often on the advice of medical practitioners. In **Bangladesh**, for example, many mothers typically withhold foods and fluids, including breastmilk. Seventy percent of the mothers interviewed in the **Bangladesh** study mentioned that all or most solid foods are restricted when a child has diarrhea (Green 1985b). Eight percent of the respondents said breastfeeding is discontinued during diarrhea. (Subsequent research by Rivisi, 1985, however, indicates a somewhat lower percentage.) When asked what foods were given during diarrhea, mothers in **Bangladesh** mentioned barley water, a sago-based drink, glucose water, sugar water, sugar-salt solution, ORS, lemon water or juice, and such foods as wheat porridge, soft rice, breastmilk, and coriander gruel. In addition, sugar and salt is added to flavor most drinks, gruels, and porridges (Green 1985b:15).

In contrast, almost all of the mothers in **Haiti** said that children with diarrhea should be given food and liquids, including breastmilk; however, one-third of the mothers stated that the usual diet should be modified somewhat (Coreil 1985:46).

Many liquids and solids are perceived by mothers to be either harmful or beneficial to children during bouts of diarrhea. In **Haiti**, the foods considered harmful during diarrhea were the same ones believed to cause diarrhea -- ground corn, grease, cow's milk, and certain grains, vegetables and fruits (Coreil 1985:Table 22). No special "diarrhea foods" were noted; however, some beverages--lime juice, carrot juice, and Seven-up--appeared to be given more often during diarrhea than in the usual diet. Herbal teas had been given to 38 percent of the infants and children who had diarrhea, and 24 percent of the respondents had administered ORS (Coreil 1985: Table 29). Traditional Huli remedies in **Papua New Guinea** are intended to dry the stool, so dry and firm foods are given and fluids are restricted (Frankel and Lehmann 1985:272).

In **Egypt**, mothers reported adding specific items to the child's diet during diarrhea; these were most often sweetened boiled water, with or without the addition of local flavoring agents, and several varieties of starch-based puddings (Galal, et al. 1987:6).

Herb teas and decoctions are frequently given to children suffering from diarrhea. In **Peru**, for instance, almost 95 percent of the mothers said they would give panetela to a child with diarrhea. Panetela is a broth which is made from rice, toasted bread, cinnamon or anise, and sugar. An anise or manzanilla (local herb) infusion or strong tea is also frequently mentioned (Escobar, et al. 1983:1262). Some **Swazi** mothers give their children herbal decoctions that actually promote diarrhea, followed by herbal enemas to "clean out the baby's stomach." (Booth, et al. 1985:116).

Foods given during diarrhea often include those that have a purgative effect. In **Honduras**, for example, mothers say foods which are eaten during diarrhea are intended to "clean out" the child's gut. This diet/purgative regimen consists chiefly of cooking oils, some commercial preparations (i.e., Laxol, Magnesia) and some absorbents such as Bismuto (which probably acts to firm the stool bolus and, upon defecation, create the impression of cleaning or purging (Kendall, et al. 1983:356).

Breastfeeding During Diarrhea

Breastmilk is sometimes viewed as being dangerous for a child who is ill. A study in **Peru** disclosed that breastmilk is seen by some as potentially harmful to the child or to the mother. Nearly half of the mothers studied stated that breastfeeding should be stopped if the mother or child had diarrhea or a fever (Escobar, et al. 1983:1263). Rural mothers in **Egypt** often consider breastmilk dangerous for infants when they are sick (Stolba 1987).

In some regions it is the practice for breastfeeding mothers to discard the colostrum which provides the child with important nutrients and antibodies. Most mothers in **Karachi**, for example, express and discard the colostrum until "white and clean milk comes" before they begin breastfeeding (Mirza 1987:11). For a more detailed discussion of breastfeeding see the companion monograph entitled Breastfeeding, Weaning and Nutrition by Ann Brownlee.

Feeding Following Bouts of Diarrhea

In many cultures, a normal diet is not resumed until several days after the diarrhea has stopped. Eighty-three percent of the mothers studied in **Goa** restricted feeding not only during the episode but also two to three days thereafter. Most believed that a normal diet would increase the diarrhea (Srinivasa and Afonso 1983:863). While 81 percent of the mothers in a **Bangladesh** study resumed normal feeding in less than three days, 12 percent said a normal diet was not resumed for six days to over two weeks (Green 1986:362).

Conclusions and Recommendations

Many traditional and established practices conflict directly with optimal treatment of diarrhea and prevention of dehydration and nutritional loss. Breastfeeding during bouts of diarrhea is important; yet, many mothers discontinue breastfeeding just when it is the most needed (Hoyle, Yunus, and Chen 1980:2370). Withdrawal of food during diarrhea is a major contributor to malnutrition in children (Kahn and Kamal 1986). Purgatives worsen diarrhea and dehydration (WHO 1980:13). Behaviors such as withholding fluids are outright dangerous. Documentation of local practices provides information for development and refinement of the social marketing messages.

1. **Diarrhea and discontinuation of breastfeeding.** Many mothers discontinue breastfeeding, sometimes on the advice of medical practitioners. Breastfeeding is sometimes thought by mothers to be dangerous for infants during bouts of diarrhea. Continued breastfeeding during diarrhea is a crucial part of oral rehydration therapy. Some mothers withhold liquids and foods. **Breastfeeding and nutrition information should be an integral part of ORT promotion.**
2. **Traditional practices of feeding children special foods during diarrhea.** Some traditional foods and liquids may be beneficial and can work in harmony with oral rehydration therapy. Other remedies and beliefs (such as purging) may be quite dangerous. **Researchers should identify which foods and liquids are given to sick children so that appropriate behavior can be encouraged, and dangerous behavior discouraged. Allowing mothers to continue giving beneficial or harmless items to their children may help to make ORT more acceptable.**
4. **Reasons for giving or withholding foods during diarrhea and ORT messages.** Some traditional remedies seem perfectly logical within a particular belief system--for example, in **Papua New Guinea**, the Huli practice of giving their children dry foods in order to dry the stool. **An effort should be made to determine the mother's reason for administering or withholding certain foods or liquids so that relevant explanations can be made a part of ORT training.**
5. **Purging and ORT messages.** Purging, administering foods or liquids which induce vomiting or elimination, is practiced in many areas. **These practices should be identified and appropriate information regarding the dangers of such behaviors should be included when teaching mothers about ORT.**

III. Cultural Acceptability of ORS

Issues for Project Design and Implementation

How can programs promote mothers' acceptance and knowledge of ORT? Are some flavors, colors or packaging techniques more culturally acceptable than others? Do mothers believe that certain kinds of medications are harmful to their children? If so, which ones? Are some medications believed to be more effective? Would mothers doubt the effectiveness of ORT? Why? How should ORS be introduced to mothers? In what form (e.g., liquid/powder)? What containers should be used for home mixing of ORS? What are the constraints on pricing ORS packages? What size can be easily used and stored by mothers? Are there culturally acceptable logos which will make use of the product more attractive to mothers? What name should be given to ORS to make them more appealing? What are the advantages/disadvantages of pre-packaged ORS compared to home prepared?

A number of factors affect the acceptability and use of ORS:

Taste

While ORS experts are concerned that flavoring ORS may lead to over use, in a number of countries, taste is a factor in the acceptability of ORS by mothers.

Some mothers report that their children do not like the taste of the unflavored product. YEDCO (Yemen Drug Company), for example, found that in **Yemen** initial acceptance of ORS was slower than anticipated due in part to its taste (Fabricant 1986a:17). When asked if ORS had any bad effects, several mothers in a study in **Bangladesh** complained of poor taste (Green 1985b:21; Baker, et al. 1985:32). Researchers in **Turkey** observed that the consumption of ORS increased when their taste was improved (WHO 1979:132). Mothers in **Mexico** complained that ORS lacked flavor which "all modern medicines for children now have" (HealthCom 1986:6).

Some research indicates that children prefer and readily accept rice-based ORS over glucose-based ORS (Molla 1985, personal communication cited in Mata 1986:58). According to Green and Louis, mothers state that rice-based ORS are good tasting and that, in severe cases of diarrhea, some children reject ORS but will accept the rice solution (Green and Louis 1985:8).

Cost

Poor families in some areas cannot afford ORS packages or even the sugar and salt for home made solutions. During a study of several villages in **Malawi**, several households reported that they did not have or could not afford sugar (HealthCom 1987:5). Furthermore, the time expended by the mother to mix and give the solution to her child or to travel to the health center to get packets may be considerable, especially for poor women. This is an opportunity cost which should be considered both by researchers and program implementers (Baker, et al. 1985:31).

Mothers are sometimes skeptical of free or inexpensive medicines. Mothers frequently ask, "If ORS are free, does it really work as well as a medicine I have to pay dearly for?" and, "Is this really medicine or just salty water that the doctor is giving me because he ran out of real medicine?" (W. Smith, et al. 1985). HealthCom researchers found that mothers in **Mexico** display a general distrust of government services and "give away" medicines (HealthCom 1986:6). In a workshop on oral rehydration therapy in **Asia**, mothers indicated that they perceived more expensive medications as being more effective (Baker, et al. 1985:32).

ORS Form: Liquid, Powder, Tablet

ORS can be manufactured in several different forms. Some are more practical than others. In 1986, HealthCom experimented with some of the most common presentations. Researchers found that pre-bottled liquid ORS were easy to use, but expensive to market and distribute. Powdered ORS were found to be both convenient and inexpensive. ORS in tablet form were more convenient and easier to use than the powder, but more costly to produce (HealthCom 1986:3; PRICOR 1986:Study Abstract). While the addition of flavor, color, and even effervescence may (or may not) contribute to the acceptability of the product, these inclusions add to the expense of production (Ahmed, et al. 1986). Since the greatest portion of the target households are rural poor, it is important to keep the cost of ORS as low as possible--powdered ORS being the least costly.

Packet Size and Mixing of ORS

Powdered ORS must be mixed with water. It can be distributed in pre-measured packets which, when reconstituted, yield enough rehydrating solution for one day's use. Larger packages require that the mother measure accurately the appropriate amount of water. If ORS are presented in packages larger than necessary for one day's use then correct measuring and mixing become more difficult. ORS must be mixed fresh every day. Mothers tend to dislike mixing large quantities of ORS because they do not like to throw away the unused portion (HealthCom 1986:3).

Mixing and Measuring Utensils

Some ORS projects have tried to tailor the packet size to a commonly used household container so that mothers can more easily mix the proper amounts of ORS and water. Researchers in **Egypt** identified 13 containers most frequently used for drinking. All containers were measured for volume capacity. Glasses used to serve tea were selected as the most appropriate containers for mixing ORS (Hassouna and Taylor 1984). In **Honduras**, researchers found that the majority of households had one liter soft drink bottles. Their ORS solution, Litroso!, is packaged so that one packet can be added to one liter of water (hence the name Litroso!) (Kendall 1985).

Many households do not have a standard measuring device for mixing ORS. In a study in **Karachi** slums, for instance, researchers could not find a single utensil which measured exactly one liter, and no universally used measuring utensil could be identified in any of the four areas surveyed (Mirza 1987:15). One solution to this problem is to distribute measuring devices with the ORS. In **Egypt**, a cup for mixing and a spoon for administering ORS are provided free with every 10 packets of rehydration salts (USAID/UNICEF/WHO 1986:35). Not all projects can provide containers free of charge, however. David Nalin suggested that a cheap plastic bag with the one liter level indicated by a black line could be distributed with pre-measured ORS packets. These "sandwich" type bags would insure that water volume is accurately measured, yet would add little to the total cost (Nalin 1978:264). Researchers in **Ecuador** found the one litre plastic bag had the extra benefit that it could be used for other household needs (Salvador and Salizar 1984:10). This may make ORS even more attractive to mothers since people with limited resources have learned to make every product, every plastic bag or bottle, do multiple service (Kendall 1985b:40). However, one might add that logistic problems can complicate the process of distributing plastic bags to a large population.

In **Honduras**, the only one liter container available had a very narrow opening. This would make it difficult to pour in the rehydration salts as rural women in **Honduras** do not usually have a funneling device. The problem was solved by designing the ORS packets in the shape of a funnel (Smith and Pareja 1981:3).

Dissatisfaction With Failure to stop Diarrhea

Several researchers have found that mothers mistakenly believed ORS should stop diarrhea. When their children's diarrhea does not stop, the mothers become displeased with the result and discontinue using ORS (Daulaire, et al. 1987:29; Kendall, et al. 1983). A recent KAP survey shows that a significant number of mothers discontinue ORS after one or two days because they think they have no effect on the sick child (NCDDP 1987, Evaluation of NCDDP National Campaign: KAP of Mothers, 1986, Final Report, p. 29). The Huli of **Papua New Guinea** express doubt about ORT because it does not rapidly reduce the flow of diarrhea (Frankel and Lehmann 1985:273).

ORS and Other Medicines

Some forms of medication are believed by mothers to be stronger or more prestigious than others. In **Bangladesh**, researchers discovered that ORS, especially Labon-Gur are regarded by mothers to be relatively low-prestige, "even a second class medicine" because of their simplicity and low cost. The preference there appears to be for modern medicines; as elsewhere, I.V. solutions seem to be particularly prestigious in treating diarrhea (Green and Louis 1985:14). In some regions of **India**, mothers prefer injections or tablets over powdered ORS (Kumar 1983:123). Mothers in a **Honduran** study favored "sophisticated" modern medicine over a home remedy (Smith, et al. 1984:61). In **Nepal**, mothers believed pre-packaged ORS, Jeevan Jal, were more effective than a mixture that they would make at home (Daulaire, et al. 1987:29). Health practitioners in **Sri Lanka** complain that people are never satisfied if only ORS were offered. Sinhalese people expect pills and "mixtures" when visiting a doctor. One practitioner commented, "If I give only ORS, patients will go someplace else. I have to give at least some tablets even if it is panadol or people will not be satisfied" (Nichter 1988b:38).

In some instances mothers themselves have attempted to make ORS more appealing. For example, some mothers reported adding their own ingredients to the ORS mixture. A substantial number of mothers in **Haiti** indicated they added guava (a "cooling" agent) to the rehydration solution (Coreil 1985:32-33).

Conflict With Traditional Beliefs

Traditional beliefs sometimes conflict directly with the use of ORS. Certain named folk illnesses associated with diarrhea are not treated with ORS. Mothers in **Haiti**, for example, believe that ORS are inappropriate for supernaturally caused diarrhea (Coreil 1985:60). In a **south India** study, researchers report that mothers believed "continuous green diarrhea" was related to pollution (in the Hindu sense) and should be treated ritually rather than with modern medicines (Lozoff, et al. 1975). Mothers in **Honduras** do not believe that ORS are effective for all types of diarrhea, especially "empacho" (Scrimshaw and Hurtado 1987:4). ORS are sometimes thought to be inappropriate for the treatment of "hot" or "cold" illnesses. According to research in rural **Bangladesh**, rice-based ORS are preferred over the standard solution because rice is regarded as a "cool" food, appropriate for treating diarrhea which mothers believe is a "hot" disease (Green and Lewis 1985:9).

In **Malawi**, HealthCom researchers found that a remedy made in the household is not considered by mothers to be real medicine. Responses from mothers indicate they believe SSS (salt, sugar solution) is just water. Only treatment from traditional healers, or remedies from a store or clinic are considered mankhwala, medicine (HealthCom 1987:4).

Mothers may hesitate to use ORS because they conflict with traditional diarrhea remedies. In **Nepal**, for example, most people believe that if modern/western medicine is taken their traditional remedies will no longer work. Because of this belief, mothers in **Nepal** tend to turn to traditional remedies before ORT (Shrestha 1986:7). In addition, pre-intervention research in **Honduras** indicates that acceptance of Litrosol (ORS) was made more difficult because it is so different from traditional diarrhea remedies (Applied Communications Technology 1985c:66). The case in **China**, however, was just the opposite. In the late 1950's ORS were more readily accepted because the promotion of ORS accidentally coincided with the traditional practice of sweetening medicines which are to be given to children (Taylor and Yu 1986:188).

Packaging Shape and Color

Packaging color may influence mothers' opinions regarding the effectiveness of ORS. In **Honduras**, for example, red is identified with healing in traditional rural medicines (Smith and Pareja 1981:3). Color of the liquid itself may influence its perceived effectiveness and its acceptability. Mothers in **Mexico**, for example, expressed doubt that a clear liquid could be effective (HealthCom 1986:6). Health personnel in **Bahrain** complained that clients create health problems for themselves when they insist on choosing medicines by color (Hassouna, et al. 1981:21).

In some regions, packaging shape and material may not have much cultural significance. However, ORS packaging may be more attractive to rural people if the container can be made to serve some useful purpose after the rehydration salts are used up. This finding came to light during an investigation in **Honduras**. As noted above, rural women in **Honduras** do not usually have a funneling device, so packets for the ORS were made in the shape of a funnel. This design has proven successful in increasing the acceptability of packaged ORS (Smith and Pareja 1981:3).

Product Name

Some names make ORS more appealing. Field research in **Egypt** revealed that mothers preferred simple names that either convey a warm feeling or describe the purpose of the solution. Medical practitioners, however, did not like the name preferred by the public. The name chosen translates into "the solution for the treatment of dehydration" known commonly as "the solution" (Hirschhorn 1985:13). In **Nepal**, packaged ORS are called Jeevan Jal which means "life fluid" (Oral Rehydration Therapy for Childhood Diarrhea, Population Reports 1985:L41). Researchers in **Mexico** found the name "Electroitos Orales" hard for the people to pronounce and incomprehensible, especially for people with little or no education (HealthCom 1986:4).

Logos and Graphics

Interpretations of graphics and logos may vary from locality to locality and individual to individual. Once a logo has been developed it should be tested thoroughly to make sure it conveys the message intended. During a pilot project in **Ecuador**, researchers found that mothers had difficulty understanding what the original logo--a child seated on a potty--represented. Rather than a child suffering from diarrhea, mothers perceived the child as smiling and "playing with a ball." Only after several revisions and months of testing was an appropriate logo created (Salvador and Salazar 1984:4-7).

Graphics and instructions can be misinterpreted. In a study in **Honduras**, even when mothers were handed ORS packets with the visual instructions facing up, none of the mothers perceived the illustrations as instructions (Smith and Pareja 1981:4). Also in **Honduras**, a graphic message was printed on the ORS packet to indicate that mothers should not give purges to their children with diarrhea. A large, dramatic "X" was used to cross out an illustration of common traditional purges. Mothers did not perceive an X as a "do not" symbol (Smith and Pareja 1981:5).

Conclusions and Recommendations

ORS are not introduced into a vacuum. They must compete not only with traditional remedies but with "modern" medicines as well. In some country localities mothers believe traditional remedies are stronger, while in other areas mothers may prefer more modern and "sophisticated" medicines. Project designers and implementors should take the following factors into consideration:

1. **Taste**. While ORS have enjoyed fairly wide acceptance, some mothers have reported they, or their children, do not care for the taste of ORS, and therefore do not give them to their children. Although the issue of accepting a medical product on the basis of taste is controversial, many behavioral scientists indicate that dissatisfaction with taste might lead mothers to discontinue the use of ORS. Studies have shown that some mothers add their own ingredients, such as guava, to the rehydrating solution. If the added ingredients are harmless, allowing mothers to include these items may improve the acceptability of the ORS. **Continued research is needed to determine if the addition of flavoring might improve the acceptance of ORS without encouraging over use. Cereal-based formulas have a great potential in this area.**
2. **Cost**. Some mothers are skeptical of free or very inexpensive medicines. Some believe that more expensive medicines must be more powerful. While it is advisable to keep the cost of ORS down so that everyone can afford it, research is needed to determine what price might be appropriate. **Project designers must determine the most appropriate form within the pricing, manufacturing, and distribution constraints for each country.**

3. **Should ORS look like modern medicine or a traditional remedy?** Opinions about treatments and medicines vary. Local preference for certain flavors, colors, and forms of ORS affect the marketability of the medical product. **Researchers should determine whether ORS should be marketed as a modern medicine or if they should be made to look more like traditional remedies or teas.**
4. **Mixing and measuring containers.** ORS packets are most convenient for mothers when the amount of dry ingredients is tailored to the size of a commonly used household container. **Project designers should determine the most common container available to mothers in order to develop the appropriate amount of dry ingredients to place in the packets. Where no standard container can be identified, measuring cups and spoons, or even cheap plastic bags, can be distributed with ORS.**
5. **Failure to stop diarrhea.** Researchers have found that some mothers mistakenly believe that ORT stops diarrhea. When the rehydration therapy does not stop the flow of diarrhea many mothers discontinue giving ORS to their children. **ORT messages should make clear to mothers what ORS do and do not do.**

IV. Cultural Research and the Identification of the Target Audience

Issues for Project Design and Implementation

Who should be targeted for communication messages/health programs promoting ORT? Besides mothers, are there other care takers of children or decision-makers who determine their care who should know how to administer ORT?

Mothers

Successful communication and marketing of health concepts depends primarily on correct targeting of groups or individuals. In the case of ORT, the target group consists of care givers rather than the actual recipients of the product. Extensive research has been done in countries such as **Honduras** and **The Gambia** to identify potential target audiences.

In most developing countries, mothers are the principal care takers of young children; therefore, they are an obvious primary target for ORT messages. Mothers are not the only people involved in caring for sick children, however. In **Honduras**, the primary audience was identified as rural mothers and grandmothers as well as primary health care workers called guardians. The secondary audience included physicians, nurses, auxiliary nurses, midwives, fathers, rural school teachers and school children, and regional health promoters (HealthCom 1985:8). In **The Gambia**, the primary audience was rural mothers, grandmothers, and older female siblings. The secondary audience included rural health inspectors, community health nurses, Peace Corps volunteers, leprosy inspectors, maternal child health teams, and primary health care workers. A tertiary audience consisted of physicians, dresser/dispensers, local leaders (alkalos), and rural fathers of children under five (HealthCom 1985:12).

Fathers and Other Male Family Members

The majority of existing ORT messages are aimed at women; however, fathers and other male family members should not be overlooked. In the majority of households in **Yemen** the husband was identified as the treatment seeking decision-maker. This was true for a large percentage of **Egyptian** households as well (Hassouna, et al. 1981:25). Research showed that in Dhaka, **Bangladesh**, women were nearly as likely as men to purchase ORS, but outside Dhaka men almost always were the purchasers of ORS (Green and Louis 1985:11). A number of women in a study in **Bangladesh** stated that they would never make a decision on their own

without guidance from their husbands and perhaps their husband's parents as well (Green 1986:362).

Other Family Members

In addition to mothers, the family as a whole is a logical target because of shared responsibility within the household (Furst 1985:16). Other members of the nuclear and extended family often influence child care decisions and actions. In **Egypt**, for example, the oldest member of the family is usually the acknowledged decision-maker and all the family members are involved in decisions affecting the welfare of a child (Galal, et al. 1987:2). Mothers in **Malawi** identified grandmothers, mothers, neighbors, and grandfathers as people who make decisions about treatment of children with diarrhea (HealthCom 1987:8).

Mothers are often caught between conflicting advice from trusted traditional family members and "modern" health professionals (Galal, et al. 1987:2). In five percent of the **Yemen** households and 10 percent of the **Egyptian** households the mother-in-law was influential in making treatment-seeking decisions (Hassouna, et al. 1981:25). According to research in **Asia**, a young mother may know about and may want to use ORS, but if the mother-in-law thinks they are not good they may be ignored (PRITECH 1985:32).

Community Leaders

In some community projects community leaders--local politicians, village chiefs, wise men, etc.--have been recruited to participate in promoting ORT. Experiences with such community leaders have been less successful than with community health volunteers. In **Haiti**, for example, community leaders apparently had little time to follow through on what they had agreed to do. Community leaders may be more effective in giving public sanction for ORT than in conducting training (Newman, Reyes, Johnson 1987:37).

Teachers

Four studies conducted by PRICOR demonstrated that teachers can successfully train school children and adolescents to prepare and use ORS. Researchers observed that school children were able to master ORT knowledge and skills apparently more easily than adults (Newman, et al. 1987:24). In **Indonesia**, school children were successfully taught how and why to give oral rehydration. The result of this effort was that three-quarters of the families recognized the need for ORT and knew how to prepare ORS, compared to only zero to three percent before (Rohde and Sadimin 1980).

Conclusions and Recommendations

A target audience should be segmented into smaller homogenous groups of people who view the problem in similar ways (Clay and Fouladi 1987). Moreover, the appropriate target audience in one locality may not be fitting in another region. Each ORT activity will need to identify its own target audience through research.

1. **Mothers and fathers as primary target groups.** In developing countries mothers are the principal care providers for children under the age of five. **Mothers should be the primary target for ORT messages; however, fathers should not be overlooked as in many cultures they are the decision-makers and often the ones who accompany a child to physicians.**
2. **Target other care takers of children.** The selection of key target audience(s) should consider everyone involved in caring for children and making decisions about child care. Older siblings, grandmothers, mothers-in-law, and neighbors play important roles in child care.
3. **Target community leaders and teachers.** ORT activities need the support of the professional community as well as community leaders and other local care givers. **Key figures should be identified as a secondary audience for ORT messages.**

V. Preparation of SSS and Mixing Instructions for ORS

Issues for Project Design and Implementation

What are some of the problems encountered in teaching mothers how to mix ORS? What are the requirements for successful mixing and administering of ORS? What are some of the effective teaching methods? Are ORT corners effective in teaching mothers how to mix ORS or prepare SSS?

Correct Instructions For Mixing of ORS and SSS

A key to the success of ORT is to provide ways for teaching the correct preparation and administration of ORS. Mothers must be taught how to mix the ingredients in exact proportions to avoid dangerous concentrations of salt. The type of household solution to be used and its methods of preparation may need to vary from one country region to another depending on acceptability, resources, literacy, and so on. As noted above, ORT education may also include information on feeding sick children and warnings about the use of harmful remedies and behaviors such as purging.

In some regions, correct mixing of ORS is a problem. For example, several mothers in **Karachi** described the method of ORS preparation as follows: "add 1/2 teaspoon of salt to 1/2 packet of ORS, mix with one glass of water and administer two teaspoons three to four times a day" (Mirza 1987:14). Although two-thirds of the mothers interviewed in **Nepal** recognized a packet of Jeevan Jal (ORS) as treatment for diarrhea, only 20 percent could correctly prepare the mixture (WHO 1986:15). Sixty-five percent of the mothers interviewed in **Malawi** narrated the wrong formula for ORS (HealthCom 1987:5). Mothers in **Haiti** knew the main ingredients but only a minority specified the correct quantities (Coreil 1985:60-61).

As with packaged ORS, the problem of correct mixing of the home-made solution becomes more difficult when mothers do not have appropriate measuring or storage container (see Section III above). In **Indonesia**, many rural households do not have containers large enough to hold a liter of water. Almost every home has a fairly standard sized drinking glass but no appropriate device for measuring the dry ORT ingredients. A cheap plastic measuring spoon has been developed which conforms to the drinking glass size. The double ended spoon is used to measure the correct amount of salt at one end and sugar at the other. Clear, simple directions are printed on the spoon in the local language (Population Reports 1985:L-50). Another solution

to the problem of measuring devices is the development of the "pinch-and-scoop" method of measuring the dry ingredients. With this method, the fingers are used to measure a pinch of salt and a scoop of sugar (Population Reports 1985:L-50).

In some countries, both ORS packets and home-made SSS have been introduced. Sometimes this leads to confusion regarding correct methods of preparation. For example, some mothers in **Haiti** who had heard of both methods were adding sugar, salt, and lime juice along with the package contents to a liter of water (Coreil 1985a:60).

ORS Packets vs Home-Made Solution (SSS)

The advantage of pre-packaged ORS is that it is simple and relatively easy to use. Although pre-packaged ORS are easier to mix at home, they may be harder to adopt because they require a visit to the village health worker or health center to pick up the packets (Applied Communications Technology 1985c:50). Packets must be manufactured and require a distribution system which makes ORS available to all, especially rural households. Once a distribution system for pre-packaged ORS is in place, care must be taken to insure a consistent source of ORS packets.

Pre-mixed ORS are convenient and easy to use; however, some people cannot afford to purchase them. As mentioned earlier, ORS packets require a distribution system. Parents often have to travel long distances to a health center or other distribution point to obtain ORS packets. There are cases when packaged ORS are unavailable or not affordable, an alternative is for mothers to prepare a rehydration solution from home ingredients. Some researchers have found that rice-water or coconut water may be a suitable substitute in these cases also (Booth and Harries 1982:120; Taylor and Yu 1986:187; Cooper 1986:281).

Mothers Can Learn to Correctly Mix and Administer ORS and SSS

Mothers can learn to correctly prepare and administer ORS and SSS. This was demonstrated during an ORS campaign in **The Gambia** where radio programs were used to teach mothers and other family care givers how to mix the ORS formula. The intervention in **Honduras** and **The Gambia** utilized an extensive and an integrated program. The radio programs helped to explain printed mixing instructions and pictures to mothers. The measuring units--a Julpearl soft drink bottle with the bottle cap--were available in nearly every home. Mothers were taught to mix one Julpearl cap of salt, eight Julpearl caps of sugar, and three Julpearl bottles of water. Fliers reinforced and augmented the radio messages, and a "happy baby lottery" tested mothers' ability to correctly mix the ORS. The happy baby lottery also served as an incentive for the mothers to learn the ORT information (Oldfield 1983:73-76).

Conclusions and Recommendations

1. **Clarity of mixing instructions.** Where both packaged and home-made ORS have been introduced, mothers sometimes confuse mixing instructions (i.e., mothers add sugar). **Mixing instructions should be made very clear and specific.**
2. **Communication, education and ORT.** Mothers can learn to correctly prepare ORS at home, either from pre-mixed ORS packets or from home ingredients, and administer it to their infants and children. Researchers have found that without adequate education and reinforcement mothers frequently mix the ingredients incorrectly, sometimes in dangerous proportions. Distribution of packets, therefore, is not enough. Careful instructions are essential. **ORS Packets should be accompanied by clear instructions, in the local language where possible. In areas with a low literacy rate, graphic or pictorial instructions should be tested to make sure they convey the intended message. Education is an essential part of any ORT activities.**
3. **Identifying a common household container for mixing and measuring.** Proper measurement is difficult if appropriate containers are not available. Home-made ORS require that mothers not only correctly measure the water, they must also measure the salt and sugar. **This problem can be overcome by identifying a common household container and conforming the proportions of sugar and salt to that container.**
4. **Availability of SSS ingredients.** Home-made ORS have the advantage that it is made of common household ingredients that in all but a few instances are readily available. Mothers or other family members do not have to make long trips to health centers to obtain packets as with the pre-mixed ORS. In a few localities, families cannot afford ingredients, especially sugar; or ingredients may not be available in some areas. **It may be necessary to distribute pre-mixed ORS in these cases.**

VI. Health Care Professionals and ORT

Issues for Project Design and Implementation

Do doctors support the use of ORT? If not, why? Which health professionals should be trained to mix, administer, sell or distribute ORS? Is ORT taught in medical school curricula? Do Western doctors fully-support ORT?

Medical Professionals' Attitudes About ORT

In many countries, physicians and other health care professionals resist recommending ORT. Without their support, the effectiveness of an ORT intervention is severely limited. There are several reasons for this negative attitude. They may not have been trained to use ORT, either in medical school or in continuing education courses. Many specialists now believe that one of the main reasons for the low acceptance rates of ORT by the public in developing countries is the negative attitude of some physicians in the U.S. (Carpenter et al 1987:1) Physicians in developing countries often rely on Western medical journals for up-dating their information. In the medical literature, intravenous therapy and non-rehydrating remedies are often mentioned as the recognized treatments for diarrheal disease. Increased use of ORT by U.S. doctors might improve the acceptability of ORT by developing country physicians (Carpenter et al 1987:1).

Medical professionals in developing countries often give technical reasons for their reluctance to promote ORT. Some have expressed concern over the safety of incorrectly mixed solutions (Newman, et al. 1987:13). Researchers in **Honduras** noted that the professional medical community knew about ORT, but did not widely promote it. Also, physicians were skeptical about the effectiveness of ORT and often perceived it as a second-class medicine. Because each mother must be instructed on how to mix and use ORS, medical professionals see ORT as additional work (Smith, et al. 1984:61-62). One major problem is that teaching physicians and doctors in influential positions often do not realize the value of oral rehydration therapy (Bennett 1983). In one study, physicians expressed the following reservations about ORT:

- Babies will be given too concentrated a solution and develop hypernatraemia;
- Lay people cannot make up a solution correctly;
- Only pre-measured ORS packets are useful and all home prepared fluids are liable to gross error;

- The doctor's job is to treat severe cases and these will only respond to intravenous therapy;
- Infectious diarrheas need antibiotics and other drugs and it is wrong to rely just on rehydration;
- There is no standard measure in rural houses and many do not even have salt, sugar or water;
- Diarrhea cases should not have their usual foods as this will delay recovery (Bennett 1983:730-731).

Doctors can be convinced that ORT works, especially when they can see the effects for themselves. Once a core of convinced doctors is established in a country, ORT education can become a part of ongoing professional medical training. Including ORT in medical school curricula gives it legitimacy in the eyes of medical practitioners. ORT education must be extended to include other health care professionals such as nurses and pharmacists (Bennett 1983:371). Health service personnel training and participation in ORT projects can help increase the use of oral rehydration.

Despite informational campaigns, some health professionals remain reluctant to recommend ORT. In **Grenada**, for example, health professionals continued to be reluctant to support community-based distribution of ORT despite special ORT seminars (Bennett 1983). Without understanding and support from the medical professional community, implementation of ORT activities may be very difficult.

ORT messages in **Egypt** were designed as much for physicians, pharmacists, and nurses as for mothers. When everyone receives the same message, this gives medical professionals the opportunity to know what the general population knows. It "provides them with a base upon which to continue educating their patients/customers" (Hirschhorn 1985:14).

Role of Health Professionals in the Distribution of ORS Packets and Information

In some regions, physicians may be a preferred source of ORT information. Focus group interviews in **Nepal** revealed that mothers could best be approached through pharmacists, doctors, nurses and other health workers, "provided they like to teach and are friendly." Mothers stated that the place where treatment is given is the most important channel for communication. Mothers said that people learn faster at the time when they are in need "and their problems are solved" (Shrestha 1986:19).

Private physicians are frequently cited as an appropriate source of help when a child is sick with diarrhea (Scrimshaw and Hurtado 1987:13). Doctors, however, are not trained communicators (Furst 1985:11).

Private pharmacists are a good source for distribution of ORS and can be a source of information as well as supplies. In **Guatemala**, the health post was an important part of the intended system for distributing ORS and disseminating rehydration information. The drugstore, however, was found to be a more common source of medications and home remedies (Scrimshaw and Hurtado 1987:12). Edward Green concluded that pharmacists appear able to educate customers about the correct preparation and use of ORS, as well as other ORT information such as continued feeding and breastfeeding (Green 1985b:10). Pharmacists and especially physicians may be more open to the idea of oral rehydration therapy if they can participate in ORT activities as supervisors or trainers of the trainers (Newman, et al. 1987:13).

While pharmacists may be able to inform customers about using ORT, there may be some drawbacks. Researchers in **Egypt** and **Mexico** found a problem in the amount of information that pharmacists were prepared to give to mothers. When information was given, it was sometimes inadequate (Newman, et al. 1987:13).

Physicians and pharmacists have limited time to spend teaching mothers to mix and administer ORS. Community health workers are a possible resource for ORS distribution and ORT education. A study in two rural **Indian** villages demonstrated that community health volunteers (CHVs) can be trained to mix, administer, and distribute ORS. Knowledge about ORS improved with repeated training. Success, however, was limited. CHVs were found to share the same deep-rooted beliefs as the villagers. The study found that forty-seven percent of the CHVs continued to restrict food during diarrhea. Twenty-nine believed in restricting breastfeeding, even after one year of training. In spite of repeated training, CHVs could not enumerate signs of severe dehydration and malnutrition (Kumar, et al. 1986:215-216).

A study was carried out in India (Kumar, Monga, and Walia 1986) that evaluates the knowledge of community health workers and suggests ways to improve future training. Training for community health care workers must be extensive and should include repeated reinforcement.

Conclusions and Recommendations

Support from the medical community for the product gives it the necessary legitimacy for acceptance by the public. Recommendations from health professionals provide credibility for new technologies.

1. **Support from Health care professionals for ORT activities.** In many countries, physicians and other health care professionals continue to resist community based ORT activities. Without their support the effectiveness of an ORT intervention is seriously limited. **ORT education and promotion should extend to all health professionals. Physicians should be educated about ORT so that they can recommend its use to their patients and refer them to the appropriate health educators for training.**

2. **Cooperation between physicians and other health care workers in promoting ORT.** Few doctors are trained communicators. Physicians and other clinic staff often lack the time or the willingness to teach mothers about ORT. Mothers may prefer advice from local practitioners. **While physicians may not be the most appropriate health care professionals to train mothers about ORT, they can refer mothers to nurses, community health workers or traditional practitioners who can give them the needed ORT information. Project implementors may be able to change negative opinions about ORT if its effectiveness can be demonstrated to health professionals.**
3. **Incentives for pharmacists.** Pharmacists are a possible source of information and distribution for ORS. If this is to be the case, an extensive education program will be necessary. **Project designers must remember that private pharmacists are in business to make a profit and may need an incentive to recommend ORS to their customers.**
4. **Community health care workers and ORT education.** The use of community health workers including volunteers (CHVs) may be a partial solution to the problem of ORT education and ORS distribution. Community Health Workers often share the same deep-rooted beliefs as villagers. Traditional belief systems are hard to change. **CHVs can be trained to mix, administer, and distribute ORS; however, an intense, repeated education effort is necessary if they are to achieve an adequate and sustained level of proficiency.**

VII. Traditional Health Practitioners and ORT

Issues for Project Design and Implementation

Can traditional health practitioners (e.g., midwives, healers, health barbers, etc.) be utilized to distribute ORT products? Can traditional health practitioners train mothers in the procedures of mixing and administering ORS?

Traditional Health Practitioners and ORT Distribution and Education

In many developing countries, traditional practitioners are an important source of medical care for children suffering from diarrhea and other illnesses. A number of projects which utilize these practitioners, have shown that traditional health practitioners can promote and distribute ORS and provide mothers with ORT training.

Traditional practitioners such as midwives, injectionists, herbalists, health barbers, and shamans already provide a large portion of health care to villagers. Buddhist monks in **Thailand** were chosen to be trained as health care workers because they are "the most respected, disciplined, and unselfish community leaders." In addition, Buddhist temples are scattered throughout **Thailand** allowing even the most rural poor accessibility to health care (Hathirat 1983). Village traditional health practitioners in **Bangladesh** were chosen to be given ORT training because they are approached first in most instances by villagers when a child is ill. Their services are readily available and relatively inexpensive. In many instances they are the only service available to villagers (Rahaman 1981:1).

A PRICOR study in northeast **Brazil** demonstrates that traditional healers can be effective in preventing and treating dehydration and in reversing mothers' harmful health practices. During the study, traditional healers showed that they were capable of preparing safe rehydration solutions and could effectively convey ORT information to mothers. The healers formulated their own strategy for incorporating ORT into their healing rituals. Investigators concluded that the introduction of ORT in this way did not change villagers' beliefs about the causes of diarrhea, but rather strengthened the healers' role in the community by the incorporation of ORT skills (PRICOR 1986).

The experiment in **Brazil** resulted in large numbers of children being given ORT. The effort was not without its difficulties, however. Researchers concluded it was "not an easy thing to involve healers." Getting healers to work with each other and to accept ORT required much time and patience. Project implementors have successfully trained traditional birth attendants in ORT technology, but with "a fraction of the time

involvement and interpersonal intensity" of that necessary for training traditional healers (Newman, et al. 1987:24-25).

Community Acceptance of Advice from Traditional Healers

Traditional health practitioners understand local folk beliefs and folk etiologies of diarrhea and therefore may be more able to communicate with villagers. Physicians often do not share definitions or of diarrhea with their patients. For example, people at Manshiet Nasser in **Egypt** believe doctors speak a secret language which nobody outside the medical profession can understand. The local term for diarrhea is "ishaal", but doctors refer to it as "nezla mawiya" (Oldham 1984:19).

Traditional health practitioners, in most instances already enjoy considerable status in their communities. Traditional "daktars" in **Bangladesh**, for example, are significant opinion leaders in health matters (Green 1985b:4). Furthermore, many illnesses (e.g., evil eye, empacho, worms, etc.) are considered by mothers to be treatable only by indigenous practitioners (Kendall, et al. 1983). The "rezadeira" in **Brazil** has great prestige in the community and enjoys much credibility (De Souza 1987:108-109).

Health practitioners' knowledge about ORT varies. In **Haiti**, knowledge about ORT was lower among herbalists and shamans interviewed than in the general population (Coreil 1985b:55). **Haitian** midwives and injectionists, however, were significantly more knowledgeable about ORT. One injectionist from the **Haitian** village of Montrouis stated he had used Serum Oral packets a number of times. He said he kept a supply of packets on hand which he bought at the grocery store. When a parent brings in a child with diarrhea, he demonstrates how to mix and use the ORS (Coreil 1985b:56). A study in **Bangladesh** revealed that knowledge about diarrhea and rehydration was poor among village practitioners, and abuse of drugs for diarrhea was very common (Rahaman 1981:2).

Willingness of Traditional Health Practitioners to Promote ORT

For the most part, traditional health workers are willing to accept ORT technology and promote it in their own practice. Some traditional health practitioners express interest in receiving ORS packets for distribution to their patients. Virtually all of the healers in the **Haitian** study by Coreil were in favor of working with public health officials to control diarrheal diseases in their community (Coreil 1985b:57). Researchers in **Bangladesh** found village practitioners to be a naturally motivated group most of whom need little persuasion to undertake a medical training such as learning proper methods to mix oral rehydration and practice it on their own (Rahaman 1981). Researchers found that traditional healers in **Nepal** are interested in participating in primary health care delivery (Oswald 1983).

The Role of Traditional Healers in ORT Promotion

Ultimately, the success of an ORT project depends on the mother's ability to mix ORS and her willingness to administer oral rehydration therapy. The issue of convincing mothers of the seriousness and potential deadliness of diarrhea, while at the same time encouraging them to treat their sick children at home, is an important one. Mothers are asked to set aside some of their traditional beliefs and remedies--that is, to abandon what is familiar and "safe" and to risk adopting the new and unfamiliar. Newman asks, "Can we expect her to assume that risk alone?" The traditional healer (or midwife, or health barber, etc.) by playing an active role in oral rehydration therapy may help mothers by assuming some of that risk for her (Newman, et al. 1987:33).

Conclusions and Recommendations

Traditional healers are a valued and trusted health resource in most communities. It is important that ORT project designers do not ignore the role of traditional healers in the community.

1. **Including traditional health practitioners in ORT promotion.** In some societies traditional health professionals are the first health resource. They tend to be accessible, affordable, acceptable, and available. **With proper training and incentives, traditional health practitioners can successfully administer and distribute ORT supplies.**
2. **Traditional health practitioners' continued support of ORT.** Many traditional healers have expressed interest in participating in ORT activities. Others are more resistant and must be convinced of the value of ORT. **The degree to which healers have and will continue to adopt ORT should be studied.**

VIII. Distribution Channels: Community-Based Distribution Systems vs. Clinically-Based Distribution Systems

Issues for Project Design and Implementation

Which outlets should distribute ORS and give ORT training--clinics, community health workers, depot-holders, flag-holders? Should pharmacists sell ORS and be involved in training clients how to mix the rehydration salts?

Community health workers play a crucial role in disseminating knowledge and skills for the use of ORT. Trusted community leaders, experienced mothers and grandmothers can all promote ORS and teach others how to mix the solution.

Clinic-based distribution may not be sufficient because of clinic distance, short supplies, busy medical staff, or lack of positive attitude on the part of some service providers. Poor quality or inappropriate service can be a deterrent to ORT use (Buvinic, et al. 1987).

Hospitals and Clinics

An important consideration in the distribution of ORT supplies and ORT education is accessibility. Hospitals and clinics may not always be appropriate for ORS distribution because they are often located far away from small hamlets. Parents must travel long distances to obtain ORS packets. Often they have many other competing demands for their time, and so do not make the trip to the health unit or hospital (Coreil 1983:709). A study of 23 villages in Etimesgut district near Ankara, **Turkey**, showed that mothers often do not utilize hospitals because treatment there is expensive or inaccessible (Egemen and Bertan 1980). Where distances to health facilities are great, it will be important to supplement them with other distribution points.

Health Professionals

Physicians and other hospital personnel often do not have the time to give individual ORT instructions to each mother. In addition, physicians may be unwilling to accept the role of educator or may not be willing to promote ORT, preferring I.V. therapy or antidiarrheal medications instead (Bennett 1983:730-731). Mothers may prefer the advice of traditional healers or older family members.

Pharmacists may be a suitable source for ORT packets and information, but they may lack the willingness to promote ORT and provide mothers with ORT training. Pharmacists appear able to educate customers about preparation and administration of ORS, as well other pertinent ORT information such as continuing feeding and breastfeeding when a child has diarrhea; however, not all pharmacists are willing to take the time to provide mothers with ORT training. For example in **Egypt** and **Mexico**, researchers found a problem with the amount of information pharmacists were prepared to give mothers since ORS have a low profit margin and therefore low priority. Researchers also found that the information given by pharmacists was sometimes inadequate. It should be noted, however, that none of the pharmacists studied had been given ORT training (Newman, et al. 1987:13). For more details on the role of pharmacists in promoting ORT see Section VI.

Depot Holders, Flag Holders, Guardians

One of the main advantages of ORT is the ability to use it at home. This advantage is maintained only if supplies are readily available. Traveling to a hospital or clinic is often difficult and so time consuming that initiation of treatment is delayed. ORS have been successfully distributed by a number of different village or peripheral health workers. In **Bangladesh** and the **Philippines**, volunteer village or urban women who have had one or two days of training serve primarily as depot holders for supplies (Rahaman, et al. 1979; International Study Group 1977). A similar project utilizing depot holders was successfully implemented in **Egypt**. Researchers there found that every community has people who are trusted for child care advice. They concluded that these people can be trained in ORT, and that their involvement could increase the use of ORS. (USAID 1987:54; Annex 12, p. 3).

In **Honduras**, mothers indicated that guardians were an important source of Litrosol (ORS). Researchers there observed that hospitals were never an important source of ORS packets (Applied Communication Technology 1985g:146). In **The Gambia**, health services are brought to rural villagers through "trekking teams" who conduct periodic clinics. During 1983 a drought and periodic fuel shortages disrupted the trekking teams' schedules and some clinics were stopped (Applied Communication Technology 1985c:61). Interruption of service is a major detriment to successful ORT promotion. A more successful approach in **The Gambia** trained mothers whose homes were marked with "happy baby" flags. These "flag holders" served as resource persons to other mothers needing further instructions. Radio announcers informed mothers that they could go to "happy baby" homes for ORT information and diarrhea medicine (Shimp and DeLozier 1986:576).

Community Health Workers

When deciding who should distribute ORS and ORT information, project designers should ask who is the first person mothers turn to when a child is ill? (Furst 1985:19). Community health workers (CHWs) or volunteers (CHVs) have been trained to educate mothers in ORT with considerable success (Population Reports 1985).

Midwives in Ankara, **Turkey**, were trained to mix and administer packaged ORS and in turn trained mothers to mix and give the solution to their children (Egemen and Bertan 1980:333-335). Community health workers bear the responsibility for instructing, supplying, advising, and supporting families in the use of ORT. Because they are located in the village, near the people they serve, they are in the best position to ensure that mothers receive ORS packets and see that mothers understand ORT instructions. Mothers in **Nepal** suggested that village health workers would serve best if they could be mobilized for home visits (Shrestha 1986:19).

Some obstacles encountered when employing CHVs is that they often hold the same traditional beliefs as villagers. Forty-seven percent of the CHVs studied in **India** continued to believe in withholding foods and restricting breastfeeding (Kumar, Monga, Walia 1986). Intensive CHV training is crucial to the success of ORT activities where they are used.

Other Distribution Points for ORS and ORT Education

Local markets or grocery stores may be suitable distribution points for ORS packets, but some sort of additional community education or training program must be in place in order to ensure proper use. Researchers in **Haiti** found the market place to be an ideal location for ORS distribution, especially for rural people. Even the most isolated mountain communities have several weekly markets within walking distance (Coreil 1985b:62). In Anadaban, **Nepal**, researchers observed that many people were selling herbs and other kinds of home made medicines in the weekly hatbazar (market). Their advertising attracted many people, and the people were buying their products. Local health practitioners there suggested that the hatbazar could be used as a "prominent and effective communication source" (Shrestha 1986:19). At the conclusion of their study in **Turkey**, Bertan and Egemen suggested that ORT utilization would be increased if ORS packets were distributed through grocery stores in addition to the health services (1979:132).

Conclusions and Recommendations

Accessibility is extremely important for successful ORT. Hospitals and clinics are often too far for rural families to travel in order to obtain ORT packets. Community leaders are sometimes too busy with their other duties to distribute ORS or train mothers; however, they can help by recommending and promoting the use of ORT. It has been demonstrated that community health workers or volunteers can successfully teach mothers about ORT. Community health workers, however, often share with villagers deeply ingrained traditional beliefs which may work against ORT. Intensive repeated training of these community volunteers is a necessary part of ORT activities.

1. **Trusted sources for dissemination of ORT messages.** Oral rehydration therapy often calls on a mother to change deep seated traditional behaviors. **ORT messages are more acceptable to**

mothers if they come from a known and trusted source such as a doctor or knowledgeable village woman. Project planners should determine which authority figures have the most influence and credibility.

2. **An integrated approach for distribution of ORS.** In most cases, no single source is best for ORT distribution or training. A typical integrated program might be as follows: Physicians and clinic staff recommend ORT. They are supported by community leaders. Community health workers train mothers and distribute ORS. Pharmacists sell ORS and reinforce ORT instructions. ORS packets are distributed through grocery stores, markets, etc., to ensure a constant reliable supply. Other scenarios might involve traditional healers or other health professionals. **An integrated approach involving all health workers would do much to ensure an effective intervention.**
3. **Community outlets for the distribution of ORS.** Grocery stores, markets, or other community gathering place are a potential point of ORS distribution. **If these outlets are used, however, additional provisions must be made to teach mothers how to mix and use ORS.**
4. **The importance of training the trainers.** No matter what means is chosen to distribute ORS and educate mothers, a key to successful ORT intervention is for the trainers themselves to be well-trained and have ORS supplies on hand.

IX. Alternative Communication Channels and Approaches

Issues for Project Design and Implementation

Which media channel reaches the largest segment of the target group?
Are people influenced by what they watch on T.V. or hear on the radio?
Can fliers be used to explain mixing procedures to mothers?

Access and Attention to Radio and Television

The success of an ORT intervention depends on reaching the greatest number of mothers possible with ORT messages. There are principally three media channels which may be used, singly or in combination: radio or T.V. broadcasts, print materials, and person-to-person communication. Several studies have demonstrated that these media can be used successfully to promote ORT and communicate ORT skills to mothers.

In developing countries, access and attention to broadcast media--radio and television--ranges from high to nearly non-existent. In **Ecuador**, researchers found that the majority of households had a radio. Data were also collected on programs, listening times, preferred music, and stations most listened to. Investigators found that the literacy rate in **Ecuador** and the need to develop graphic materials was not a problem since there is almost always someone in the household who can read (Salvador, et al. 1984:3).

The National Control of Diarrheal Disease Program (NCDDP) research determined that over 90 percent of **Egyptians** have access to radio, and over two-thirds to television (over 90 percent in urban areas) (Hirschhorn 1985:13). Exposure to T.V. messages, however, was found to be much higher than for radio (NCDDP 1987:Table 17). After careful development and testing, T.V. ads using a famous actress to deliver the ORT message were aired. Post-tests showed that these ads were the most remembered of any public or commercial ad in that country (Hirschhorn 1985:14).

Research in the slums of **Karachi** disclosed that 41 percent of the families studied owned radio/cassette recorders; however, 68 percent of the mothers in these households did not listen to the radio. They preferred listening to cassettes of music in their own language. A much higher percentage (64 percent) owned T.V. sets. Women were especially interested in "Urdu" plays and stage shows. Messages in their local language were found to have special appeal. Television therefore was judged a useful media in that region for child health publicity (Mirza 1987:18).

Of 34 mothers interviewed in **Malawi**, only eight stated there was a radio in the household, and only a few of these were in working order (HealthCom 1987:3). Results of a HealthCom study in **Swaziland** indicate that radio was able to reach 62 percent of the population, while outreach workers reached only 16 percent (Hornik, et al. 1986:vi).

According to a recent evaluation by the International Center for the Prevention and Treatment of Major Childhood Diseases, radio is by far the most common source of awareness of Nun Chini Pani (ORS) in **Nepal**. Radio contact was found to be particularly good in urban and bazaar areas (Daulaire, et al. 1987:14). Focus group discussions with mothers in **Nepal** disclosed that most of the respondents had heard of radio mass education, and many of the mothers said radio could be one of the best media sources for diarrhea education. Several mothers complained, however, that they have trouble understanding radio announcers because they speak so quickly. People whose first language is not Nepali have even more trouble understanding. Mothers recommended that the announcers speak slowly and in the language that the majority of illiterate mothers speak, which is village Nepali, rather than standard Nepali (Shrestha 1986:19).

Researchers in **Zimbabwe** tracked the impact of an ORT media campaign. The project in **Zimbabwe** covered about one-third of the country. An extensive education and media campaign was launched which promoted the use of home-mixed ORS. Of the children brought 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 second month of the campaign about 52 percent of the children had been treated, and by the third month 60 percent had been treated with either home-mixed or packaged ORS (Hornik, et al. 1986).

Value of Face-to Face Contact

Mass media is effective in promoting ORT messages but some information is better conveyed in person-to-person contact. Correct measurement of the ORS ingredients is essential. Radio can be a first contact with ORT and a regular reminder of key mixing and administration techniques. Fliers provide readily available instructions when a mother needs them. However, according to a WHO/UNICEF joint statement, "mothers require individual instruction and often need to observe a practical demonstration and practice mixing a number of times in order to prepare ORS or water-sugar-salt solutions correctly" (WHO 1983:19).

Without face-to-face instructions many mothers know about but can not correctly demonstrate how to properly mix the rehydration solution. For example, in **Indonesia**, most women who had heard of ORS but had not received personal instructions did not know how to mix solutions correctly from packets. Few of the mothers who said they understood the directions on the packet could in fact mix the solution correctly. Only a few could mix sugar and salt solutions accurately by

following pictures on a flier. After the technique was demonstrated by a health worker, however, nearly all of them mixed the OR solution correctly (Population Reports 1985:L51).

Other Useful Media Channels

In addition to mass media, local media such as drama, skits, and entertainment can be utilized to convey ORT messages to mothers. These activities often take place on market days and other community occasions. School children trained in PRICOR-funded studies have performed promotional skits. In **Haiti**, RaRa bands have been used in ORT promotion (Newman, Reyes, Johnson 1987:16).

In **Nepal**, many medicinal products are sold and vigorously advertised in the weekly hatbazar. At festival fairs such as Teej (women's festival) in **Nepal**, women celebrate by singing and dancing. New political, social, national, and international issues are brought into their songs. A test was done in 1986 in which eight girls were hired to make songs about diarrhea and treatment with Jeevan Jal (ORS) and sing them at the fair. Interviews with persons who attended the fair revealed that the songs were one of the "new important and interesting issues of the fair" that year. The people believed women at the fair learned the songs and hopefully could use the message when needed (Shrestha 1986:20).

Integrated Media Approach

A project in **The Gambia** used radio, graphics, and face-to-face contact with trained village health workers to teach mothers how to treat and prevent diarrheal dehydration in their children. Preliminary research determined that most mothers had access to a radio. Pictorial instructions for the preparation of ORS were distributed; however, researchers found that few mothers could "read" the pictures due to lack of familiarity with printed material of any kind. Radio messages were used to interpret the pictorial messages in the flyer, and a "happy baby" contest was held in which mothers could win prizes (a bar of soap or a plastic one liter container) by demonstrating to a health worker how to correctly mix the ORT solution. Weekly community prizes (bags of sugar and rice) were given to the community turning out the most mothers for the contest. Additional grand prizes (radios) were awarded in a drawing and announced in a special one-hour radio broadcast. (Applied Communications Technology 1985f; Booth 1984:100-105; Meyer, et al. 1983; Rasmuson 1983:39-45).

In **Honduras**, radio was used to provide widespread coverage. It served as a regular reminder to mothers of critical mixing, administration and feeding advice. Printed materials were used to carry more detailed instructions which the mother could have on hand when she needed to know how to mix and give Litrosol to her sick child. Face-to-face contact with physicians, health workers, and community health volunteers "provided overall credibility for the new health technology" (Smith, et al. 1984:66-67).

ORT promotion in **The Gambia** relied on a high impact radio lottery targeted at rural women, with print and health worker support. In contrast, the campaign in **Honduras** utilized multiple, intensively repeated short radio messages, broad print materials and health worker focus. Researchers in **Honduras** reported that the single most useful source of information for learning about how to mix and administer LitroSol was the packet itself, but face-to-face instructions and radio messages were also significant sources of information (HealthCom 1985:28). Environments in **Honduras** and **The Gambia** are quite different which necessitated somewhat different approaches in each locality. The studies in **Honduras** and **The Gambia** demonstrate that an integrated media campaign can be successful in reaching mothers with ORT messages.

Conclusions and Recommendations

The most appropriate medium of communication may vary from region to region. Radio, television, and face to face communication methods have been used successfully to promote ORT and teach mothers how to mix and administer the rehydrating solution.

1. **The importance of using an integrated approach.** Effective ORT interventions are not limited to one or even two media. An integrated approach, using mass media, print, and face-to-face instructions, can be very effective in getting the ORT message to mothers. **In planning ORT messages, programs should consider the use of multiple media--a combination of radio, television, printed flyers and posters, and/or face-to-face contact with trained health workers. Research is necessary to determine the best medium or combination of media for each area. Unique local media such as fairs, songs, and skits should be explored as possible communication channels.**
2. **Face to face communication.** Face-to-face communication is an effective medium of instruction, but should be combined with pictorial teaching aids.

X. ORT Messages

Issues for Project Design and Implementation

What is a minimum effective message? What messages should be relayed? What messages should be used to emphasize continuity of use of ORS? Why do mothers discontinue using the solution? Are ORS given to children suffering from diarrhea at all ages? Do mothers give ORS to both male and female children?

What language should be used with urban/rural women? Is the message culturally appropriate? Is the message effective? Which media channel is more effective in explaining water volume, quantity of salt/sugar, etc? Do the messages achieve their educational objectives? How can a media message effectively overcome a cultural barrier?

What should ORT messages say?

The number of messages which can be communicated effectively to mothers is limited, especially in a single session or over media channels. Therefore, it is important that communications efforts concentrate on the information that mothers need to know. The literature reviewed suggests that ORT messages should consist of two basic elements: administer ORT correctly and promptly, and seek help if child gets worse. Given how common it is for mothers to be disappointed when ORS do not stop the diarrhea, it is probably important in most programs to also tell mothers what to expect. They need to know that ORS may not stop diarrhea, but that they will prevent their children from dying of dehydration.

There are many other messages that may also be important to include, for example, those pertaining to:

- The preparation and administration of ORS (e.g. frequency of administration, quantity).
- Recognition of dehydration and symptoms that should prompt additional action.
- Feeding during and after diarrhea.
- Harmful behaviors (such as purging or withholding food).
- Supportive and preventive behaviors (e.g. the importance of colostrum, home hygiene, handwashing and breastfeeding).

An article by Smith, Pareja, Booth and Touchette (1981) contains a complete list of behaviors that might be addressed through media messages (1981: Appendix A). Needless to say, project planners have to consider the ability of mothers to absorb and act on multiple messages. Knowledgeable health professionals and community health workers need to give priority to the most important information. There are a number of factors to be considered in developing communications activities.

Use of ORS and Severity of the Diarrheal Episode

More serious cases of diarrhea are more likely to be treated. This was found to be the case in **Honduras** (Applied Communication Technology 1985c:iii). In **Sri Lanka**, as in many other countries diarrhea is considered to be a natural part of growing up. Diarrhea is perceived as a trouble, not an illness. Mothers do not become alarmed unless the child has a fever or is vomiting. In such cases mothers do not seek help unless the child gets worse (Nichter 1988b:6). During a survey in **Egypt**, one of the main reasons mothers offered for not giving ORS to children was that the diarrhea was mild (Loza 1987:29).

Use of ORS and Children's Age

The age of the child often influences a mother's decision on whether to administer ORS. Some mothers tend not to give ORS to their older children as often as they do younger children. In one study in **Honduras**, 33.6 percent of diarrheal episodes in children under 12 months are treated with Litrosol (ORS); only 23 percent of diarrheal episodes for children older than 48 months receive ORS (Applied Communication Technology 1985g:v-vi). In **Egypt**, mothers told interviewers the reason they did not give ORS was that the child was too old and ORS are only for infants (Loza 1987:29).

On the other hand, some mothers avoid giving ORS to very young children. Other mothers in **Egypt** stated that they did not give ORS to an infant because they were afraid ORS would harm the child (Loza 1987:29). Two parents in a survey in **Bangladesh** stated that ORS are not appropriate for small children (Green 1986:361).

Use of ORS and Children's Sex

In some countries, male children may be more likely to be treated with ORT than female children. Many developing country societies value sons more than daughters and exhibit "son preference," or preference for the male child (Ravindran n.d.:2). Preferential treatment of male children is especially pronounced in South Asia. In Pakistan and Bangladesh, for instance, researchers have found that girls are much less cared for during sickness than boys (Miller 1984).

Other Beliefs Affecting ORS Use

Some mothers do not use ORS for diarrhea which is associated with certain illnesses or folk etiologies--that is, perceived causes. For example, a 1983 study in **Bangladesh** found that some mothers were not using ORS for diarrhea accompanying measles. Many mothers in **Bangladesh** believe that ORS stops diarrhea, but in the case of measles, diarrhea was believed to purge the body of harmful waste (Green 1986:357; Shahid, et al. 1983:). Mothers in **Haiti** maintained that ORS were not effective for diarrhea caused by "heat", worms, measles, evil eye, or a congenital predisposition (Coreil 1985b:33).

Language for Media Messages

Media messages are most effective when they can be clearly understood by the target audience. This generally means messages should be in the local language. For example, mothers interviewed in **Nepal** pointed out that the majority of illiterate mothers speak village Nepali. For them, standard Nepali is a second language. The mothers suggested that radio announcers speak slowly and in their native language (Shrestha 1986:19). Researchers in **Karachi** also found that messages in the local language have a greater appeal (Mirza 1987:18).

Cultural Appropriateness of Messages

It is important that ORT messages be culturally appropriate. The following example from an ORT campaign in **Honduras** illustrates how researchers can use baseline cultural data to formulate culturally relevant promotion of ORT: Radio spots in **Honduras** were developed around the local belief that everyone has a sack (*la bolsa*) in their gut which contains worms. When the worms are content, they stay put. Improper food, filth, and other disruptions cause the worms to wander, resulting in digestive problems including diarrhea. The radio spots featured two worms (*lombrices*), named Lombricio and Lombrolfo, conversing in their sack in the stomach of an infant. In the ad, Lombricio and Lombrolfo discuss their adventures of wandering due to improper child care (Meyer, Block and Ferguson 1983:18). The ad used local beliefs to convey ORT health messages about food and hygiene.

Overcoming Cultural Barriers

Sometimes project implementors are faced with cultural barriers which must be overcome. In many countries it is common practice during episodes of diarrhea to discontinue breastfeeding, withhold foods, administer home-made medicines, and give purges which worsen the diarrhea. In order to change these traditional practices ORT messages should come from an authority figure--someone mothers recognize and trust. This may be a doctor, an older village woman, a grandmother, etc. Field research in **Nicaragua** illustrates how authority figures were used to bring ORT information to mothers.

Doctors are held in high esteem in rural **Nicaragua**; therefore, a doctor was the first choice as spokesperson for the new way to care for sick children. Secondly, young mothers in **Nicaragua** also turn to their mothers and neighbors for advice about how to care for their children. Although midwives are thought to be experts in delivering babies, they are not always sources of information about child care. The second choice for conveying information about Super Limonada (ORS) therefore was Doña Carmen, an older women, wise in the ways of taking care of sick babies and comforting worried mothers. The third figure, a popular radio personality, was used to introduce the spots featuring Doña Carmen. After 10 months of broadcasting, message recall was good, and substantial progress was made in converting rural mothers to new practices in caring for their children with diarrhea (Cooke and Romweber 1977:44).

Effectiveness of Media Messages

Even though media messages are successful in reaching a great number of households, these messages are not always effective. For example, an evaluation of the promotional efforts in **Nepal** reports that nearly all of the respondents to their survey had heard the NCP (Nun-chini-pani, ORS) radio ads. The song was quite popular although many people in rural areas reported they did not pay attention to the words. Because of language differences, many respondents could not understand the ads. The research team reported that overall, the impression was that people were aware of NCP but most did not understand the details of the radio ads. A similar problem existed with the ORT posters. Most respondents understood the pictures but continued to be confused about the amounts of sugar and water needed. (Dauliare, et al. 1987:30) In the final analysis, this effort failed to achieve the educational objectives of the campaign.

Conclusions and Recommendations

ORT messages should be culturally appropriate. Messages can be made effective if they are written in the local language and are field tested prior to use.

1. **Clarity of ORT messages.** Mothers should be told what ORS will and will not do for their children. **The message should educate mothers about the dangers of dehydration and tell them how to recognize the symptoms.**
2. **Availability of ORS supplies.** Parents sometimes discontinue ORS because ORS packets are not consistently available. Although this is primarily an institutional problem, it does have a profound effect on the behavior of mothers. Mothers are not going to rely on ORT for their children if the supply is not consistent. **Project implementors should ensure the availability of ORS supplies. Operational research is necessary to determine the most**

appropriate means of delivery so that a constant supply is available to mothers.

3. **Reinforcing ORT messages.** Without continuous education and reinforcement, knowledge and use of ORS drops off. **ORT messages should be reinforced through continuing media campaigns and follow-up by health workers at the community level.**
4. **Sustainability of ORT.** The issue of sustainability of ORT activities is a complex one that needs more study. The fact remains that mothers often discontinue using ORS after one or two trials. **Further research is needed to determine why mothers do not continue to administer ORT to their children, and what steps can be taken to sustain the use of oral rehydration therapy.**
5. **ORT and the age and sex of the child.** The age and sex of a child often influences a mother's decision on whether to administer ORS. **Educational campaigns should inform mothers that ORS are appropriate for children of all ages and both sexes.**
6. **Use of local language.** Rural mothers often complain that they did not understand media messages because of language differences. **ORT messages should be in the local language. Media messages should also use local terms and be sensitive to local beliefs about diarrhea to be culturally acceptable.**
7. **Pre-testing of all messages.** Mothers sometimes report that they have heard the ORT ads but do not understand what the ads are trying to tell them. It is not enough just to reach the greatest number of people with ORT messages. The ultimate goal of most media messages is to promote the use of ORT. **Program messages should be tested to find out if they are achieving their educational objectives. Printed material should first be tested and in either face-to-face instructions or via television or radio**

XI. Knowledge vs. Use of ORS

Issues for Project Design and Implementation

How many mothers know about ORS? How many mothers use ORS for their children after they have learned about it from media campaigns or health education programs? Have utilization rates been raised by media campaigns?

Why do Some Mothers Discontinue the Use of ORT?

In many countries actual use of ORT lags far behind knowledge. Mothers frequently report knowing about ORT but do not use ORS when their children suffer from diarrhea. Several studies have demonstrated that mothers' knowledge of ORT is increased by media campaigns and/or health education programs. Utilization rates, however, usually lag behind knowledge levels. Reasons for non-use vary from one country to another. The following describes some of the most common reasons behind low utilization rates.

Lack of Availability of ORS Packets

One reason for non-use of oral rehydration is when ORS packets are not available or can be easily procured. As already noted, consistent availability of ORS packets is necessary to sustain ORT where it has been introduced. In **Egypt**, early in the diarrheal disease control program, uneven distribution and local shortages of packets were of major obstacles to the effective use of ORT by mothers (Galal, et al 1987).

Confusion About Mixing or Measuring Instructions

Many mothers are confused about methods of preparing ORS. This is illustrated by the mothers in **Karachi** who described the method of ORS preparation as follows: "Add one-half teaspoon of salt to one half packet of ORS; mix with one glass of water and administer two teaspoons three to four times a day" (Mirza 1987:14). Although two thirds of the mothers interviewed in **Nepal** recognized a packet of Jeevan Jal (ORS) as a treatment for diarrhea, only 20 percent could correctly prepare the mixture (WHO 1986:15).

Incompatibility With Traditional Beliefs Or Perceived Ideas About the Proper Treatment For Diarrhea

Mothers are often reluctant to abandon traditional practices such as withholding foods. Traditional beliefs are difficult to change. An assessment of knowledge and attitude of Community Health Volunteers (CHVs) in India showed that, in spite of repeated training, CHVs could not enumerate the signs of severe dehydration and malnutrition. Forty-seven percent continued to restrict food intake during diarrhea and 29 percent believed breastfeeding should be restricted (Kumar, Monga and Walia 1986:216).

An extensive two year, five phase study in **Honduras** and **The Gambia** examined the level of learning and behavior changes in response to a multi-media campaign. A packet-based oral rehydration solution, Litrosol, was introduced to mothers in Honduras, while a home-made sugar-salt solution was introduced in **The Gambia**. Research revealed that in both countries mothers' knowledge of ORT increased steeply during the campaign. Eighty percent of **Honduran** mothers knew about Litrosol, and between 60 and 89 percent of **Gambian** mothers were aware of the sugar-salt solution. Use of oral rehydration therapy, however, trailed behind knowledge. In **Honduras**, use of litrosol rose from zero to 62 percent. In comparison, use of ORS in **The Gambia** rose from 48 percent to 76 percent by the end of the campaign (Applied Communication Technology 1985). The study concluded that different levels of adoption may be due to variations in cultural perceptions about diarrhea and treatment.

It should be stated that although use of ORS remained below the knowledge rates, the ORT campaigns in **Honduras** and **The Gambia** had significant effects on the child mortality rates. In Honduras, child deaths due to diarrhea dropped significantly. The mortality rate for 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. Because **Gambian** mothers are unwilling to discuss their children's deaths with outside researchers, mortality statistics could not be accurately reported (Applied Communications Technology 1985d:41-46).

A study of child health related practices in the **Karachi** slums showed that 84 percent of mothers had heard of ORS but only 38 percent claimed to have used them during the last six to seven months. When asked how diarrhea should be treated, almost all of the mothers responded that antidiarrheal medicine should be obtained from a private doctor. None of the mothers thought that ORS could work without antidiarrheal medicine. Many mothers stated they tried ORS once or twice but discontinued their use after deciding they were useless because they did not cure diarrhea (Mirza 1987:15).

Lack of Support From Medical Health Professionals

In **Egypt**, an ORT campaign was launched in 1983 by the National Control of Diarrheal Diseases Project (NCDDP). Baseline data showed that 73 percent of

mothers reported someone had told them about ORT, but fewer than half reported having used ORS in the current diarrheal episode (Galal, et al. 1987:144). Having heard about ORT was significantly related to the type of health center the mothers visited. The centers with specialized programs, Nutritional Education, and Strengthening Rural Health Delivery, had 57-80 percent of the mothers aware of ORT compared to 67 percent who attended a primary health care center without such special programs. A follow-up survey showed that a significantly greater percentage of mothers reported both knowledge and use of ORT; 93 percent reported having been told about ORT, and 70.5 percent had used ORS for the current illness. In addition, there was a marked decrease between the first and second surveys in the number of mothers who stopped breast-feeding during diarrhea, from almost 15 percent to fewer than five percent. The proportion of mothers who reported withholding all food dropped from 10 percent to five percent (Galal, et al. 1987:144).

Dissatisfaction With Results

In **Malawi** shows that of 34 mothers interviewed, 33 stated they had heard about ORT. Only 11 gave the right formula for mixing from home ingredients, but just 10 mixed the solution correctly. A mere three individuals reported they actually used ORS for children with diarrhea. Researchers suggest that the low usage rate is due to previous negative experiences (HealthCom 1987:7).

Researchers in the Southern Highlands Province of **Papua New Guinea** discovered a decline in ORT usage. The education campaign did not make clear that ORT is slow to work and does not cure diarrhea. Mothers who expected quick results became dissatisfied and discontinued giving ORS to their children. Some mothers opt not to use or discontinue using ORT because the results are not immediately obvious to them. Mothers often do not understand the purpose of ORT. They think ORS are a diarrhea medicine, and when it does not alleviate diarrhea symptoms, mothers become dissatisfied and quit giving them to their children. Mothers in the southern highlands of **Papua New Guinea**, for example, expected quick results from oral rehydration therapy. When they saw that their children still had diarrhea, even after administering ORS, the mothers became dissatisfied and discontinued their use (Frankel and Lehmann 1985:272).

It is difficult to convince mothers to use a diarrhea medicine that does not stop diarrhea. Many mothers prefer diarrhea medications that they obtain from physicians or clinics. Project implementors in **Honduras** solved this problem by portraying litrosol (ORS packets) as the latest advance in science, rather than a simple home remedy. litrosol was marketed as an aid to restore appetite and activity and not as a cure for diarrhea. Researchers decided on this approach after field data showed that mothers were most concerned about appetite loss and inactivity associated with diarrhea (Applied Communication Technology 1985).

Lack of Knowledge

Not all regions enjoy a high rate of either use or knowledge. A survey conducted in north-east Calcutta, **India**, shows that only 29 percent of the families contacted knew the proper use of ORS packets; six percent knew how to correctly prepare the home-made solution. Sixteen percent had heard of ORS but did not know how to use them. Four percent used a commercial ORS preparation as a delicious drink for their children. A little over half of the families did not know anything about oral rehydration therapy in childhood diarrhea (Datta 1985:929). Newman, Reyes, and Johnson (1987) suggest there is a strong relationship between ORT competence and use (1987:31).

Lack of Continued Reinforcement

Another reason for discontinuation of use is the lack of reinforcement of the ORT messages. Without continued reinforcement, mothers forget the ORT messages and discontinue the use of ORS. Prigor-funded studies demonstrated that after projects have ended, knowledge and use of ORS drop off (Newman, Reyes, Johnson 1987:37). Research in **Honduras** shows evidence that mothers begin to forget information as soon as the messages are discontinued (Applied Communication Technology 1985f: iv). Sustained media efforts and continued education and reinforcement at the community level are necessary to maintain high levels of ORT use. In some areas community health workers or volunteers have taken on the task of continuing ORT education and reinforcement; however, volunteer workers may themselves need incentives to remain interested and enthusiastic (Newman, Reyes, Johnson 1987:38).

Conclusions and Recommendations

1. **Knowledge vs. use.** Several ORT activities have been successful in increasing knowledge of ORT. ORT promotion and training can disseminate information and enable mothers to use ORT correctly. However, actual use of ORT comes more slowly. There are numerous cultural and other barriers to the use of ORS. **Research is necessary to determine why mothers are not using ORS so that the necessary steps can be taken to ensure use.**
2. **The importance of ORT education.** In order for mothers to adopt ORT they must believe it will work and have the self-confidence to put ORT into practice. **ORT education should provide mothers with good training and an opportunity to see ORS in action so that they have confidence in both oral rehydration therapy and their own abilities.**

3. **Continued Reinforcement through training.** It is clear that informing mothers about ORT is not enough. Mothers often continue traditional practices after hearing about the effect of ORT. **Training courses and community outreach activities can promote the proper use of ORT. Continued reinforcement of the ORT messages is necessary to ensure that mothers understand the severity of diarrhea and dehydration and that correct treatment is important.**

XII. Prevention of Diarrheal Disease: Water, Sanitation and Hygiene

Issues for Project Design and Implementation

What is the environmental context of diarrhea? What personal hygiene measures relate to diarrhea and ORT use? Is contaminated water a problem in the implementation of ORT activities? What are the traditional methods of refuse and human waste disposal which contribute to the spread of diarrheal disease? Should diarrheal disease control projects give more attention to the prevention of diarrheal disease? If so, should activities to improve water supply and sanitation be included or should the prevention component be limited to hygiene education alone? Is it realistic to expect diarrheal disease control projects to include all these components?

Some behavioral scientists indicate that preventive health issues are very important in educating the public about possible causes of diarrhea (Kendall 1985b: 44-5). To be effective, these activities must take into account the cultural and environmental context of diarrheal disease. However, preventive practices of hygiene and cleanliness show considerable cultural variation. Many of the observations summarized in this report about the difficulty of achieving behavioral changes in the treatment of diarrheal disease also apply to its prevention.

Lack of Sanitation

In developing countries, the lack of clean water, adequate sanitation and appropriate hygiene constitute a major health problem. Unsanitary living conditions and contaminated or polluted water contribute to the spread of diarrhea and other diseases.

Poor sanitation continues to be a major problem in developing countries. Levels of sanitation vary among communities and also among individual households within a community. Waste disposal facilities are often inadequate or nonexistent, especially in rural areas. Sewers and appropriate means of water disposal are often lacking (Van Zijl 1966:251). In rural **Honduras**, as in many other countries, dwelling floors are usually made of dirt and have no drain. Few people think cement floors are practical because they have to be mopped again and again when people spit, water spills, or when animals or children urinate or defecate. The dirt floor is preferred because it absorbs the spills, urine, and other contaminants (Kendall 1985b:41).

Women in a poor **Egyptian** community stated that disposal of grey waste water is a problem, especially on laundry days when large amounts must be disposed of in public streets. Indiscriminate water disposal would quickly produce mud holes; therefore, stringent rules call for a woman to scatter the water over a wide area or to dispose of it gradually so that the first portion has a chance to dry before more is thrown (Oldham 1984). In rural **Baluchistan** grey water is simply thrown on the ground in a corner of the rural compound, which often creates standing pools of water. Garbage is usually thrown in one corner of the compound and later taken outside, or immediately thrown outside in a ditch (Hunte and Sultana 1984:20).

Disposal of Human Waste

Practices involving defecation and disposal of human waste vary from community to community. In rural communities, sewer systems and indoor toilet facilities are rare, and fecal-oral contamination is extremely common and dangerous (Feachem 1984; Iseley, et al. 1982; Elmendorf 1981). For example, only about 11 percent of the households in rural **Bangladesh** have latrines. In households where there are no latrines, feces are left where first deposited, among the bushes in the case of adults or in the courtyard in the case of children (Rahaman 1985:28-29).

Mere installation of latrines does not necessarily mean better sanitation. Even where latrines are present, they are often not used. In **Honduras**, rural people do not like latrines because, according to a study by Carl Kendall, they dislike the smell (1985b:47). The general practice in rural **Baluchistan** is for women and children to defecate inside the living compounds while men do so outside their households in nearby fields (Hunte and Sultana 1984:20). In many cultures, people prefer to defecate away from their households. This is one reason, according to research in **Kenya** by Karen Shelley and David Omambia, that many people still do not accept latrines as appropriate or convenient for waste disposal (Pillsbury and Yacoob 1987). In one area in the **Sudan** researchers reported the incidence of diarrhea was lower where there were no toilet facilities than in an area where an unsanitary privy was used (Van Zijl 1966:255-256). Climate (hot-arid vs. hot-humid) is a major factor in this regard.

Some traditions conflict with the use of latrines. For example, in **Swaziland** informal interviews revealed that older people see no need, or even found it distasteful, to defecate "in a house." Some people feared sorcery, believing that they can be victimized by spells involving their feces or urine or by "poisons" placed by enemies or sorcerers on toilet seats or entrances to latrines. Some people expressed fear that the pit would cave in or that their children will fall into the pit through the floor or the seat hole (Green 1984:81).

In many cultures children's feces are viewed as relatively benign and treated casually, in contrast to adult feces, thus constituting an unrecognized mode of disease transmission (Pillsbury and Yacoob 1987; Nichter 1988b:15). Even in households where adults use latrines, children may defecate anywhere. A study in Calcutta, **India**, showed that despite the provision of latrines in the Calcutta Metropolitan Development

Authority buildings, young children defecated in the rooms and passages, "thus making the home environment as insanitary as in [a] slum" (Moore, et al. 1965).

Kitchens and food preparation areas are often located in close proximity to toilet facilities. Uncovered refuse is present in the living quarters in many communities. Uncovered garbage inside the home was found in about half of the rural **Egyptian** homes studied by Hassouna and Taylor (1984:7). In **Baluchistan**, kitchen refuse and garbage are thrown into the latrine area which is located in a corner of the living compound, often adjacent to the area where food is prepared. The latrine/garbage area is most often cleaned by periodically allowing donkeys to eat the excreta. In some cases women collect the human waste and throw it on the fields as fertilizer (Hunte and Sultana 1984:21). Use of human excrement as fertilizer ("night soil") is common in many countries.

Presence of Farm Animals in Living Space

Farm animals frequently are kept inside living areas. In many **Egyptian** villages, for example, livestock and poultry are routinely raised and housed within the living compound. A special room for cattle, the zareeba, has no separate entrance; therefore, these animals must use the same entrance as the human residents (El Katsha, et al. 1986:90-91). In their study in the **Yemen Arab Republic** Ansell and Burrowes state, "One is struck by the number of animals that share the open living space with the human inhabitants." Cows, sheep and goats have their own enclosure; however, young lambs and kids stay in and around the house. Chickens, cats, pigeons, and older sheep kept in for fattening also share the living space (1981:15).

Personal Hygiene

Personal hygiene practices may be a major source of disease transmission. Bathing and handwashing practices vary considerably between communities and between individuals. Besides being one of the requisites for good hygiene, bathing and ablution are religious rites in Islam. Assuming a regular water supply, rural **Egyptians** bathe twice a week in the summer and once a week in the winter at the minimum. Research in two study villages in **Egypt** revealed that handwashing before cooking or eating was not performed by most women as a regular practice in everyday life (El Katsha, et al. 1986:108-109).

In most developing countries, the lack of handwashing by mothers before preparing food significantly increases the rates of childhood diarrhea. Research in **Bangladesh** confirmed the correlation between lack of handwashing and diarrheal disease (Clemens and Stanton 1987). Handwashing takes many forms, however. Often it consists of only a quick splash of water over the hands from a bowl used communally by a number of people (Stolba and Huxley 1989:79).

In the rural areas of many countries, soap is used infrequently. Mothers in **Egypt** stated that washing of hands with soap is essential (1) after handling things with

a strong odor, e.g., fish or kerosene; (2) before dairy chores or preparing dough for baking; (3) after cleaning the zareeba, and after defecation; and (5) after eating greasy foods. Washing the hands with soap before breastfeeding was reportedly not a common practice (El Katsha, et al. 1986:108-109). The adults of Wadi Ayyan, **Yemen Arab Republic**, bathe at least once every two weeks with water and a locally made powder or washing powder such as Tide; the use of bar soap is rare (Ansell and Burrowes 1981:11).

In many regions, soap is expensive and often unavailable. Where it is available, it is often of very poor quality. Some people, however, prefer not to use soap. Rural **Hondurans**, for example, say soap tends to leave a perfumed odor on the hands which would "contaminate" food or other objects (Kendall 1985b:46-47).

Limited Access to Clean Water

Many rural areas lack access to safe drinking water. Data from **Swaziland**, for example, indicate that less than one-third of the homesteads surveyed have access to drinking water that is protected in some way. Water is procured from several different sources: rivers or streams, springs, standpipes or taps, boreholes or wells, stagnant pools or dams, and collected rainwater. Even when water sources are protected in some way it cannot be assumed that the source yields safe water. A 1981 study by the Rural Water Supply Board in **Swaziland** showed that even boreholes and protected springs become fecally contaminated (Green n.d.:31)

Contamination of Food and Water During Storage

Water supplies are generally limited and often are contaminated or polluted. Many communities do not have piped water and must rely on wells or open ditches which sometimes serve multiple functions. For example, irrigation canals surrounding the community of Babil, **Egypt**, are intended mainly for crop irrigation; however, women use the canals for cleaning and waste disposal. The canals are also used for disposal of solid waste and sillage. The Ministry of Works has installed concrete steps in eight different areas along the canal, evidently to facilitate access to water for village women. Young boys swim in the canal water during the summer months (El Katsha, et al. 1986:23).

Existence of a safe water source does not guarantee freedom from contamination. In one area in **Bangladesh** where sanitary wells have been installed, families use several other, polluted sources in addition to the sanitary supply. All available sources, including even puddled low-tide canal water, are used. Surface-water sources are used for urination and defecation, bathing, washing food and utensils, drinking, fishing, and playing (Levine, et al. 1976:87). In addition, community water systems are often poorly maintained. Public standpipes are often littered with garbage and mud from the used water as in the case of the **Egyptian** community of Babil (El Katsha, et al. 1986:16).

People in the rural community of Teknaf in **Bangladesh** obtain their water from ditches, wells (ring-wells), or tube-wells equipped with hand-pumps. The uncovered ditch water is invariably contaminated. Well water is also heavily contaminated. The deeper tube wells are somewhat safer but the quality of water consumed depends on handling practices during collection and storage which often contaminate the once cleaner water. Large community ponds used for bathing and laundry are the same ones in which cattle wallow and drink. The banks are used as human defecation grounds (Rahman, et al. 1985:29).

Local perceptions typically affect water usage. For example, villagers in **Sri Lanka** place great importance on knowing the source of their water. They feel that a limited amount of sunlight is necessary for keeping water fresh. To drink water from an unknown source is considered a hardship. A villager expressed to a friend the hardship of having to remain in Colombo city for a period of time is to exclaim "Ayyo! pipe water--you have to drink and bathe in it!" (Nichter 1985:667).

Even when clean water can be obtained, it frequently becomes contaminated during storage. Food and water are often stored in open containers. In **Wadi Ayyan**, water for drinking is stored in round clay containers with narrow necks. Water intended for other purposes is stored in a variety of pans which are often left uncovered. Chickens often perch on the rims of water pans, and goats and sheep that wander into the living compound also drink from the pans (Ansell and Burrowes 1981:15). Carl Kendall reports that in rural **Honduras** little or no purification of water takes place in the home. Visible contaminants such as insects are removed, but the water is not boiled. Food, especially bean soup, is prepared and then eaten over a period of days. The soup is rarely heated to a temperature that is likely to destroy bacteria (1985b:44-45).

Flies

Flies abound during the summer months, especially where solid waste collects. Flies can easily contaminate food which is kept in open containers. Van Zijl's study of seven countries has demonstrated a correlation between high fly count and the spread of diarrheal disease. However, Van Zijl asserts that the high fly count is an indicator of a low level of sanitation, and that reduced rates for diarrhea were due to improved sanitary conditions rather than to the reduction of the fly population (1966:253).

Conclusions and Recommendations

Lack of safe water, inadequate sanitation, and poor hygiene are major contributors to the spread of disease, especially diarrheal disease in developing countries. Environmental conditions and sanitation and hygiene practices vary greatly from community to community and from individual to individual. Project implementors might want to take these variables into account when designing health or hygiene education programs.

1. **Use of clean water and ORS.** Many communities lack a clean source of water. In many areas people bathe, wash their clothes and utensils, water their animals, and drink from the same, often polluted, water source. **According to current thinking, mothers should be encouraged to use the cleanest water available to prepare ORS.**
2. **Education and prevention of diarrheal disease.** In the literature reviewed, preventive health education is stressed as being important in the general improvement of quality of life which may lead to the reduction of diarrheal disease incidence. However, there is little consensus about the relative priorities and issues to be addressed. Nor is there evidence that it is easy to change these behaviors. **There is agreement, that to be effective, education on the prevention of diarrheal disease must take into account cultural and environmental factors.**
3. **Attitudes toward children's feces.** Many mothers consider the feces of children to be harmless. Children are often allowed to defecate in living areas. **Mothers need to know that all excrement is a source of contamination which contributes to the spread of diarrheal disease.**
4. **Flies and solid waste.** Flies are abundant, especially where solid waste collects. Flies are a source of disease transmission; however, a high fly count is generally an indication of a poor level of sanitation. **Emphasis therefore should be on improving sanitation practices rather than on reducing the number of flies.**
5. **Long term commitment to community education on sanitation and hygiene.** Sanitary conditions cannot be improved over night. **Long term community-based programs are needed to improve the general level of sanitation.**
6. **Establishing and using a safe water supply.** The problem of establishing, maintaining and using a safe water supply is not a simple one. This issue needs to be dealt with at both the individual (home and behavioral) level as well as at the community level. As important as it is, this problem is probably beyond the capacity of many ORT programs to address. **However, most ORT programs can and should contribute to an understanding of the importance of prevention of diarrheal disease.**

XIII. Methods Used In Researching/Promoting ORT

Issues for Project design and Implementation

What are the main qualitative research methods used in ORT programs? Which methods are more successful than others in revealing relevant ethnographic details? What social marketing techniques have been used in promoting ORT? Are certain media channels more effective than others? Can one easily compare qualitative research methods and generate clear generalizations about their effectiveness?

Qualitative research studies have used a multitude of research methods in collecting data on ORT topics. Some of the main methodologies are focus groups, surveys, case-studies, in-depth interviews, product preference trials, behavioral observations, process evaluation techniques and questionnaires. Each method has its strengths and weaknesses, and most (ethnographic) studies use more than one technique. Usually, methodologies are selected on the basis of information known about budgetary constraints, transport, availability of trained personnel, the research period, and the subject matter under investigation.

Intervention methodologies also vary according to the circumstances. Several successful ORT activities have had considerable impact on the knowledge and use of ORT in developing countries. Printed materials, T.V. and radio programs, posters and other media have had varying effect on the acceptance and use of ORT. Motivating media programs such as the successful radio "Happy Baby" contest in the case of **The Gambia** have demonstrated the ability of ORT activities to change behaviors related to the care of children suffering from diarrhea and dehydration.

This part of the review focuses on a few successful experiences in researching and promoting ORT. The purpose is not to be comprehensive, but rather to highlight methods and strategies that have brought positive results. In reviewing the literature it is difficult to compare methodologies or even assess their utility because due to a lack of consistency in reporting the details of methods used and outcomes. Seldom do researchers report failures or provide a rationale as to why a certain method was favored over another method.

There are strengths and weaknesses, advantages and trade-offs for each of the research methods commonly used to gather information for the development of social marketing programs (Booth and O'Hara 1984). For example, questionnaires allow researchers to poll a large number of people. However, they lack the detailed information often necessary to develop social marketing strategies. On the other hand,

focus group interviews--structured discussion groups--have the advantage of eliciting more detailed information and comments not anticipated in questionnaires or formal interviews. Other approaches, such as product preference trials, are associated with product development and marketing strategy.

Although some methods of data collection can be used alone, they are most effective when used in combination. Mark Nichter's article entitled "Diarrhea and Dysentery: Using Social Science Research to Develop Appropriate Health Care Messages" (Nichter 1988b:13) outlines a useful step-by-step method in an integrated approach for generating an appropriate health care message. He employs traditional ethnographic techniques like key informant interviews, surveys, and case studies in strategic ways to arrive at appropriate health care messages.

The reader should be warned that successful experiences in one cultural setting may not necessarily have the same degree of success in another cultural environment. The following are some brief examples of methodologies used in association with oral rehydration interventions.

Use of Focus Groups, Interviews and Surveys: The Case Of Egypt's Diarrheal Disease Project

A variety of social science research studies played an important role in the planning and implementation of Egypt's highly successful National Control of Diarrheal Diseases Program (NCDDP).

One of the project studies, carried out in 1984 by Social Planning, Analysis, and Administration Consultants (S.P.A.A.C.), serves as an excellent model for ethnographic research on diarrheal disease in children. The study stresses the importance of identifying the environment, beliefs, concepts, traditions, language and perceptions, and current practices related to diarrhea so ORT messages and instructions are "believed, relevant, feasible, and accepted" (1984:1).

The study began with a set of pertinent research questions designed to yield information important to the design of training, mass education, and marketing. The list was expanded and organized according to the target audiences: parents, physicians, pharmacists, nurses, lay care takers, and traditional care takers. The areas of research included diagnosis and theories of cause, treatment and feeding, seeking help, prevention, and channels of communication. Important characteristics of the home environment were identified within each of these topics. A review of the relevant literature was undertaken with the help of researchers in several disciplines (1984:2-3). Key concepts were explored in focus groups, in-depth interviews, direct observations, and structured surveys. Samples were drawn from "all parts" of **Egypt** and encompassed "all social classes" (1984:3).

The study reported that mothers had no difficulty in recognizing diarrhea. They also recognized the varying degrees of severity of diarrheal attacks or episodes. Mothers were aware of the signs and symptoms of severe diarrheal illness; however,

few connected these signs with dehydration. The S.P.A.A.C. study found that the term gfeff (meaning aridity or drought in an agricultural context) used by physicians, was "readily accepted by mothers, after education on the point, to cover the collection of signs and symptoms they already know" (1984:7). The concept of fluidity was found to be an important one. Mothers commonly thought that giving fluids may worsen diarrhea ("fluid in is fluid out"). This led to the decision that education messages should reinforce the connection between commonly-known signs and symptoms to gfeff (i.e., "fluid in is fluid replaced").

Researchers have found that "ascribing a cause is as much an attempt to define what has happened or is going on (labelling) as to decide what to do" (1984:8). Acute, short-lived attacks of diarrhea are more likely to be considered to be a "modern disease." When diarrhea becomes more chronic and associated with debilitation, more magical explanations are used. Egyptian mothers generally believe that the body should "avoid extremes" (for example, large injections, or drinking a liter of fluid in a few hours). It is thought that a good treatment is one that restores a natural balance. It was concluded that ORT "should be stressed as a natural restorative, a strengthener, a means to return a natural fluid balance" (1984:9).

The study found that mothers recognized the link between poor hygiene and diarrhea. Other causes of diarrhea identified by mothers were teething, weaning, heavy foods, changes in weather, and an upset mother who communicates her upset in the breast milk.

According to the report, "it is necessary to recognize the varied and shifting theories of diagnosis and causation, and the ability of Egyptian mothers to accept a new explanation, if understandable and satisfactory. She also will accept new, if satisfactory, explanations of a cure" (1984:10).

Strategies of treatment were found to correlate generally with the severity of the illness as modern medicine would classify it (1984:10). Traditional treatments and religious interventions are not unusual. With mild diarrhea mothers often cut back on solids, and stop or dilute the child's formula, although they tend to continue breast-feeding. A wide array of home prepared remedies or drugs from the pharmacy are used (1984:10).

The study indicated that concentrated, colored or chalky liquids are preferred. This creates a problem in convincing mothers to administer the clear ORS solution in high volume. ORT instructions that direct the mother to give a child as much as he or she will take are often misinterpreted as meaning to give only small amounts. Therefore, it is suggested that a large average volume of ORS should be specified (1984:12). In addition, mothers are more likely to mix ORS in the proper proportions if they are given a standard measuring cup (1984:13).

The study found that some mothers view ORS as a dietary treatment to be used like an herbal tea. Others saw it as a medicine to stop diarrhea. In both instances it was found that ORS are "likely to be mixed and administered incorrectly and to have

had either no effect or an adverse one." Mothers were "far more likely" to use ORS correctly if they learned their use in a rehydration center (1984:14).

If diarrhea continues for two to three days, if the child becomes dehydrated, or if the illness is severe from the outset, mothers will often seek outside help, usually from a physician (1984:14). There is a tendency for physicians to prescribe several drugs on the first visit. There is much competition for patients and doctors feel they are under pressure to "provide more and more" (1984:17). Ministry of Health hospitals were found to be often considered only as a last resort, but some have gained the reputation as "the place to get life-saving rehydration with intravenous fluids" (1984:17). Rehydration centers should promote themselves as "places that treat serious diarrhea and dehydration and save lives" (1984:17).

In some instances, the pharmacist was found to play an increasing role as a "first-line" health worker. The pharmacist is available for consultation, may provide services without charge, and will sell drugs without prescription if asked. In the city, however, the pharmacist is often "too busy to do more than ring up a sale" (1984:18).

Researchers found that there are fewer traditional healers now than in the past. There are some exceptions, however, such as older women who give warm oil massages and advice on herbal fluids. In some cases, with the increasing number of government physicians, traditional practitioners have gone "underground" (1984:18).

Older female relatives are still consulted in about half to one-third of the cases (1984:18). Fathers are usually involved only when major expenditures or travel is needed, believing that child care is the mother's business (1984:19). Formal religious persons or "quasi-religious diviners" are rarely consulted about diarrhea (1984:19).

In trying to identify the most appropriate media for the ORT message in **Egypt**, the study found evidence that mass media--particularly television--had the "greatest potential to introduce new ideas and information (1984:21). Surveys and evaluations of radio and television programs conducted in 1983 and 1984 showed that ORT messages in the form of dramas and songs were "the most likely formats to convey memorable messages." Furthermore, a physician's statement added a "stamp of authority" (1984:22).

The study revealed that physicians generally treat diarrhea with antibiotics, antiemetics, constipatives, and antimotility agents. "They believe the diarrhea must be stopped and all treatment is directed to this end" (1984:24). Mothers are advised to stop breast-feeding and to withhold food for 24 to 48 hours or more. Dehydration is treated intravenously and ORT is considered "a supportive measure used only if there is no dehydration" (1984:24). Only a small percentage of children receive ORT. Many doctors do not know how to properly mix ORS and give mothers little or no instructions on their use. Physicians trained in ORT centers were more likely to follow the recognized ORT procedures (1984:24).

Physicians were found to have a "universal disregard for mothers' intelligence and capacity to know about diarrhea, or ability to follow directions" (1984:15).

Physicians felt, however, that it was their role to promote ORS (and not that of a popular entertainer). The report mentions that it would be a "serious error" to reach mothers with the ORS message before the physician does (1984:26).

Pharmacists shared the physicians' belief that diarrhea should be stopped and that breast milk and food should be stopped during diarrhea. The pharmacist follows prescriptions, but if asked, he or she will suggest products that are currently "popular" and "likely to give the mother confidence in the advice" (1984:26-27). Two-thirds of the pharmacists in Cairo knew "the essentials" about ORS, but on-spot surveys around **Egypt** found the majority did not know the proper mixing of ORS (1984:27). When Rehydran (packaged ORS) is in short supply, some pharmacists made up their own ORS in "varying amounts of differing potencies: some disastrously over-strength (1984:27).

Surveys showed pharmacists as the first source of care in 1-20 percent of the cases; however, anecdotal evidence suggests the percentage may be higher. In researching possible channels of communication, the report states that there is no data available on the media habits of pharmacists. Further study is needed in this area to determine how best to communicate the ORT message to pharmacists (1984:28).

The S.P.A.A.C. study found that nurses in **Egypt** are in short supply; however, "they are not considered very highly and their profession is not respected. Further, many nurses share with mothers the same ideas of diarrhea classification and cause. With adequate training, however, their knowledge of ORT is "substantial." Nurses are not allowed to disagree with doctors, so if their supervising doctors disagree with the ORT approach, the nurses are in a quandary about treatment (1984:29). In addition, doctors object to being trained in ORT together with their nurses. It is suggested that training of new graduates of secondary schools may be a good long-term solution to providing nurses with basic information, supplemented by the NCDDP self-instructional manual (1984:30).

Several, rather specialized, categories of practitioners were identified along with their roles, or lack thereof in treating diarrhea:

- The attar sells herbs such as yansoun, caraway, anise, etc., many of which are used in the treatment of diarrhea. The attar does not give advice, but is simply an "herbal grocer" (1984:30).
- The traditional birth attendant, the daya, has no role in treating diarrhea (1983:31).
- The bonesetter, the megabar, is "a vanishing professional" as is, to a some degree, the health barber, the halaa seha (1984:31).
- Religious diviners, the sheikh (male) or sheikha (female), may provide amulets or hold courts to protect children with long-standing disease. Some charge high prices. They are also called on to provide charms to protect against illness (1984:31).

- An older woman, a massager, treats matoumad.
- The custodian of a health center often administers first aid, dispenses shots or cold remedies, or diarrhea remedies. The custodians have "gained a certain aura in many villages" (1984:31).
- There is a whole group of people--farmers, housewives, clerks, teachers--who serve as first-aid practitioners to neighbors and relatives, usually without charge (1984:31).

It is mentioned in the report that "the closer one is to a physician, the more the practitioner shares more scientific concepts about diarrhea; the closer to lay people, the more they share lay ideas" (1984:32). While some of the traditional practitioners believe trying to save a life is presumptuous "as only God can do this," curing or preventing dehydration may be a more acceptable concept (1984:32). At the time fieldwork for this study was being conducted, another NCDDP sponsored study was underway to determine the most likely deliverer for ORS in a village. The choice at that time was the tomarqi or tomarqiyya. Television, pharmacists, and physicians were all thought to be credible sources of information for practitioners (1984:32).

Direct Observations, Questionnaires, and Testing ORT Messages in Focus Groups: The Case Of Ecuador

HEALTHCOM has carried out a one-and-a-half year investigation and methodology development in **Ecuador** which is described by Ligia Salvador, et al. in "Communications and Community Participation in the Control of Diarrheal Diseases in Ecuador" (1984). The fundamental elements are village participation in the design, production, and processing of educational material, and interaction among the different levels of the Ministry of Public Health, the Office of the Secretary of Integrated Rural Development (IDR), and the rural communities themselves.

An important part of this methodology is the participation of rural organizations in the development process not only in the various project stages (diagnostic, task implementation, and evaluation), but also "as a continuing process on the part of the rural people themselves and in recognition of their rights as an integral part of society" (Salvador, et al. 1984:1). The focus is shifted away from the stereotype of the villager as incapable of understanding or contributing to the development of adequate solutions to their own problems. This approach recognizes villagers' capabilities in dealing with problems and supports training activities which are determined jointly by technical experts and villagers.

The objective of the research in **Ecuador** was to identify local beliefs and practices in the treatment of infant diarrhea, and to use this information to design and implement the educational component within the existing Ministry of Public Health Program for the Control and Prevention of Diarrheal Diseases. Methodologies used in this research were group discussion, individual interviews, and direct observation. The

individual interviews were used to quantitatively confirm the results of the group discussions and identify radio listening patterns. Direct observation of mothers mixing oral rehydration salts in their homes revealed some of the problems which had to be overcome for effective use of the ORS.

Analysis of the results showed that rural mothers first chose to use home remedies combined with medicines purchased locally. Many mothers were able to identify most of the signs of moderate to mild diarrhea but did not associate the signs with dangerous loss of liquids from diarrhea.

In regard to the need to develop graphic materials, researchers found there was almost always someone in the house who could read. Radio listening patterns indicated that the majority of households had a radio. Listening times, preferred music, and stations most listened to were determined. The decision to use radio to deliver the ORT message, as well as which materials to use was made on the basis of this investigation.

Based on research information, the project team decided to use the following methods to communicate the ORT message: (1) personal communication through training; (2) group communication through the use of printed plastic bag, label, poster, flipchart, and training manual; and (3) mass communication via radio. These media were used to transmit information about: (1) identification of the envelopes of Suero-Oral (ORS)--what it is for and when to give it; (2) preparation and administration of Suero-Oral; (3) the problem of dehydration; (4) the feeding regimen, and (5) the prevention of diarrhea.

As the components of the campaign were developed, each was tested to ensure that its goal/s were accomplished. In some instances materials or activities had to be revised many times. Logos, graphics, and packet design, for example, were developed through numerous revisions using comments and criticisms from local mothers.

As a result of this research, a clear, recognizable logo is now found on bags, flipcharts, and on the Suero-Oral label. The logo is mentioned in radio spots and programs which tell mothers to obtain Suero-Oral where they can see "the mothers in the red circles." Because interviews and observations revealed a problem with the availability of measuring devices, one liter plastic bags are now distributed with Suero-Oral, accompanied by simple graphic instructions which coincide with audio-visual educational aids.

Radio messages were developed to be presented in two phases. Phase one message contents were: 1) elements of the overall problem of diarrhea--its causes, dehydration, and oral rehydration, 2) identification of the Suero-Oral packet, 3) where to get Suero-Oral 4) when to administer Suero-Oral, and 5) how to prepare and administer Suero-Oral. Phase two emphasized diarrhea prevention behavior, signs of recovery (testimonials), and correction of errors in preparation and administration found in the training evaluation.

Radio spots and graphics were pretested in order to define the degree of understanding of the material in terms of vocabulary, concepts, regional differences, symbols, and illustrations. Pretesting also allowed researchers to define the degree of acceptability of the material to determine what factors in the message could cause problems with acceptance or rejection. It was also necessary to determine the ability of the messages to induce desired behaviors in the target audience. Pretest of the radio spots contributed valuable information on what should and should not be used, and which characters and dramatic situations had the widest acceptance among mothers.

In order to strengthen ORT knowledge and attitudes and to achieve positive behavior in the rural community, simultaneous training programs were carried out for doctors, nurses, health educators, nursing aides, health inspectors, educators, and community representatives. The training program for health workers emphasized practical mixing trials and practice sessions on teaching mothers how to use Suero-Oral. Group dynamic techniques combined with sociodramas allowed providers to practice new skills in teaching the use of ORT using new educational aids--flipcharts, flyers, and plastic bags (Salvador 1984).

After 12 months of broadcasting, 93 percent of the mothers knew of Suero-Oral. Thirty percent reported using Suero-Oral to treat their child's last diarrheal episode. Eighty percent of the mothers tested in observation trials could properly mix ORS. During in-depth interviews, mothers could list all the correct ORT behaviors (HealthCom 1985:44).

This project strategy in Ecuador highlights the importance of involving beneficiaries in the design and implementation of ORT projects to the extent that this is possible. A more detailed description of this intervention in **Ecuador** can be found in the report by Ligia Salvador, et al, (1984).

ORT And Media Campaigns: The Cases Of Honduras and The Gambia

In **Honduras** and **The Gambia**, a methodology was developed that combined the use of mass media and health providers. ORT messages were aired on radios. Graphics were developed for training village health workers to teach mothers how to treat and prevent dehydration resulting from diarrhea. In **The Gambia**, ORS prepared from home ingredients (water, sugar, salt) were promoted. In **Honduras**, pre-packaged ORS were used. (In each case, proper mixing and administering of ORS were essential).

Graphics and pictures can be important teaching devices; however, in **The Gambia** researchers found that few people can "read" pictures due to their lack of familiarity with print material of any kind. Preliminary research revealed that mothers could understand and remember the pictures if they were interpreted. In order to solve this problem, a national "happy baby" contest was held in which mixing instruction flyers were distributed to nearly 2,000 **Gambian** villages. Repeated radio announcements told mothers to gather and listen to contest instructions. The radio

announcer led listeners through each panel of the color-coded flyer. Thus, mothers learned to "read" the mixing instructions.

The most common container in **Gambian** households suitable for measuring ORS ingredients was found to be a Julpearl soda bottle. Mothers were told to mix eight Julpearl bottle caps of sugar, one Julpearl bottle cap of salt, and three Julpearl bottles of water "as clean as you can find." In addition to mixing instructions, mothers were told how to administer ORS, how to determine if their child was improving, and to seek help if the child did not get better. Experienced mothers who had been trained in ORT techniques flew "happy baby" flags over their homes. Mothers were told that they could go to the flag holders for help with ORT.

Mothers participated in "happy baby" contests in which they could win a prize--a plastic one liter measuring cup or a bar of soap--for correctly mixing the ORT solution. Winning mothers' names were entered in a grand prize drawing for 15 radios. The village turning out the most mothers for the contest each week received a 50 kilo bag of sugar and a 100 kilo bag of rice. Grand prize winners' names were drawn and announced during a special one-hour radio broadcast.

After eight months of promotion and training in **The Gambia**, the number of mothers reporting using ORT climbed from three percent to 48 percent. The number of mothers who could repeat the formula rose from one percent to 64 percent.

In both **Honduras** and **The Gambia**, several behaviors and beliefs that contributed to dehydration (i.e., purging, withholding foods and liquids, and the belief that breastmilk causes diarrhea) were singled out for modification. Behavioral changes were promoted through positive concepts and images and concentration on reinforcing established behaviors that approximated the new actions being advocated. For example, the concept of dehydration is unknown in **Honduras**, but in **The Gambia** the term lappa--dryness or wasting due to diarrhea or undernutrition--is well known. Promotion of ORT in **The Gambia**, therefore, was presented as a remedy for lappa.

In **Honduras**, focus group discussions explored the aspects of diarrhea, food preparation, infant feeding and treatment of sick children. In-depth interviews were held with health professionals, as well as direct observation of mothers in their homes during episodes of infant diarrhea. The research linked 109 behaviors to the treatment and prevention of diarrhea. Target behaviors for the ORT campaigns were selected on the basis of importance, feasibility, cultural readiness (or resistance), and the extent to which the behavior had observable effects that could reinforce its performance. On the basis of these criteria, different objectives were selected for **Honduras** and **The Gambia**.

In **The Gambia**, exposure to human and animal waste significantly contributes to diarrhea. However, the country's Moslem beliefs emphasize cleanliness. Hence, the radio campaign there featured a religious leader who told the listeners to view the floor of their living compound as a place of prayer, to be treated with respect and to be kept clean.

People in **Honduras** believe everyone has a sack (la bolsa) in his or her gut which contain worms (lombrices). When these worms become agitated, they wander from their sack and cause digestive problems such as diarrhea. A humorous radio spot featured two worms discussing the effects of filth and poor food preparation on the child they inhabited. Mothers were told to practice good personal hygiene and food preparation so they would "keep the worms in their sack." Thus, ORT messages were linked to familiar local beliefs.

In both **Honduras** and **The Gambia**, primary health care workers were given four to eight hour training. Training focused on performance--mixing and administering ORS and teaching the skills to village assistants. Instructional posters, used in training, could be used later as a refresher or reference in teaching others. Radio spots reinforced the instructions and encouraged mothers to seek out "happy baby" flag homes for further instructions. Complementary radio, print, and face-to-face instructions interacted to obtain maximum impact and evoke the desired behaviors.

One of the major features of the campaign in **Honduras** and **The Gambia** was pretesting of the ORT messages as they were developed, and monitoring radio station performance and audience reaction. For example, radio programming in **Honduras** was originally intended to emphasize mixing and administration of litrosol (ORS). However, interviews with mothers revealed several obstacles. Mothers wanted to know if litrosol could be used with other medicines, and if litrosol was appropriate for severe cases of diarrhea or for adults as well as children. Radio became the most practical channel to address these concerns. Monitoring of radio frequencies led to improved frequency and timing of ORT promotional spots.

Results from the campaigns in **Honduras** and **The Gambia** are encouraging. After one year of broadcasting in **Honduras**, 49 percent of the mothers interviewed reported having used litrosol, and 94 percent could correctly mix ORS. The interventions in **Honduras** and **The Gambia** illustrate how a culturally sensitive methodology can be designed and implemented to bring about positive behavior changes in the adoption of ORT technologies.

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