

Oral Rehydration Therapy in Asia
Report of a Workshop
Dhaka, Bangladesh
March 17-21, 1985

Technologies for Primary Health Care

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ORAL REHYDRATION THERAPY IN ASIA

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PREFACE

The Asia Regional Workshop on Oral Rehydration Therapy (ORT) was held as a follow up to the International Conference on Oral Rehydration Therapy (ICORT) held in Washington, D.C. in 1983. It was felt that such a meeting was particularly appropriate in Asia given that Asian countries have taken the lead in establishing and implementing diarrheal disease control and ORT programs. With more than ten years of program experience, much information about implementation issues could be usefully shared among the countries of the region. The workshop was planned to help continue the momentum towards rapid expansion of effective ORT programs by focussing attention on ORT implementation successes and problems and through the dissemination of information based on experience to date.

The workshop, funded by AID, was coordinated by the PRITECH Project. It was planned in collaboration with the International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B) and in consultation with WHO, UNICEF, and the Ford Foundation.

Participants were invited from 13 countries in the Asia region as well as representatives from donor agencies, private voluntary organizations, USAID missions, and other interested organizations.

The meeting was organized around plenary presentations and panel discussion by several ORT experts followed by working group discussions. The working group discussions provided the opportunity for participants, resource people, and panel members to share experiences and exchange information. Field trips were made to the ICDDR,B hospital and facilities, the Bangladesh National Oral Rehydration Program (NORP) packet production factory, the Bangladesh Rural Advancement Committee (BRAC) headquarters (including a presentation on their ORT extension program), and the Population Services International (PSI) social marketing program.

FOREWORD

Welcoming Message of AID Administrator M. Peter McPherson

"It is my pleasure to welcome you, distinguished guests, to this regional workshop on oral rehydration therapy. We are pleased that so many of you were able to attend, and we look forward to your comments and suggestions at this meeting. Two years ago AID hosted a similar meeting in Washington, D.C. known as ICORT. My participation in that conference and my subsequent discussions with scientists and leaders from around the world have convinced me that AID can and shall increase significantly its support for oral rehydration therapy. This technology can be administered in hospitals, clinics, communities, and households, and it is safe, effective, and inexpensive. Most importantly, it can save millions of lives.

"In the two years since ICORT, we have worked together to expand the use of ORT. AID has doubled its support for ORT programs from 1983 to 1984. In Asia, where AID helped support research on the development of oral rehydration therapy, we are now assisting a number of countries in the expansion of ORT services. In Africa, where infant mortality rates remain the highest in the world, we are supporting several countries' efforts to initiate ORT programs.

"The U.S. Congress has also recognized the importance of ORT in child survival and has doubled the resources available to the agency to undertake programs that will contribute directly and dramatically to improvement in the health and well-being of children in developing countries. This regional workshop can be the springboard for action. It is an opportunity to redouble our efforts. It is an opportunity to share our successes, our problems and our solutions. It is an opportunity to examine approaches to integrating the therapy into a broader primary health care package which includes breastfeeding, growth monitoring, immunization, family planning, and basic sanitation.

"Programs will differ among countries and communities. Some of you present are working with governments which are not yet convinced of the need to expand availability of oral rehydration therapy. Many of you are dealing with the difficult problems of planning, implementation, and evaluation. Nonetheless, by sharing our experiences, we can help each other towards our common goal of improving the lives and survival chances of children.

"In closing, let me thank you for this opportunity to welcome you and wish you a successful meeting over the next two days."

I. INTRODUCTION: ORAL REHYDRATION THERAPY AND THE PROMISE OF HEALTH FOR ALL*

There has been a great deal of progress in the last 25 years or so in the joint development of Oral Rehydration Therapy (ORT). Formerly diarrheal diseases were not even recognized for the tremendous toll on lives that they claimed. Cholera incited an exotic fear in the public mind. Diarrhea, as then perceived, was little more than a bother, a troublesome symptom hardly worthy of scientific research. The founders and early workers of the Cholera Research Laboratory, today the ICDDR,B, were deeply convinced that relevant answers could only be found by the application of science in the very setting where the problem was found. The first staff of the Cholera Research Laboratory initiated the comprehensive studies of cholera and eventually all diarrheal diseases that continue today to elucidate the transmission, pathogenesis, and mechanisms for clinical management of diarrhea and its related condition, malnutrition.

While the outstanding discoveries made by Bengali and international scientists in the ensuing two decades have ranked among the important biomedical advances of this century, it is necessary once again to turn to the wisdom of the founders of the laboratory. It was they who recognized the critical importance of understanding the sociocultural context of the disease. An anthropological and social approach is once again claiming an important role in ICDDR,B research.

There have been from the onset the doubters, those who recognizing the complexity of the factors leading to diarrhea, despaired of any meaningful progress with such a simple solution. ORS was called, disparagingly, a magic bullet, a technical fix. Nothing could be that simple. But the enthusiasts added up the percentages, seeing what enormous impact application of ORT could have on a large population. They counted the five million deaths, fully one-third of the global fatality in childhood and said "let's go for it."

Many at this conference have carried the message far and wide, who have taken the promise of ORT and--often against severe doubt, skepticism, opposition, and indeed, even ridicule--have incorporated ORT into health systems where it has become a basic pillar of primary health care.

Great progress has been made. Not only do all Asian countries have operative diarrheal disease programs with major activities in ORT, but they also rank highest in the world for the important measures used in WHO assessments. Access to ORS in this region is 43 percent, 22 percent worldwide; and the use rate of ten percent, although not very high, is substantial when compared with four percent estimated for the rest of the world.

* Keynote Address by Jon Rohde, Management Sciences for Health.

The following is a review of the progress that has been made and the issues, problems, and prospects in a number of key areas that must be tackled in the ambitious challenge that has been set to reduce the diarrhea mortality rate by 25 percent by 1989.

The Technology

The first effective demonstration that ORS was an effective rehydrant or could maintain heavily purging cholera patients occurred in 1968. Seventeen years later the use rate is only four percent. In spite of the best efforts, these things take time. It was more than five years before WHO recognized ORS as an acceptable technology for dealing with cholera and another five before its Control of Diarrheal Diseases (CDD) program was established.

The WHO oral rehydration formula is a remarkably resilient technology, and the present formula has proven effective in children and adults in mild and severe diarrheas. It is effective in all etiologies. There is probably no other treatment modality for a major life-threatening disease which is so kind in its physiologic flexibility and allows so much flexibility in adjustments to deal with both medical and cultural realities.

It seems strange, in fact, to worry about the precise composition of packets when it is known that effective use of this formula has been demonstrated in a range of sodium concentrations--for instance, from 50 up to 120 millequivalents. Or, to worry that when the mothers make it, it is not precisely the solution that is printed on a package. ORT is indeed a very flexible technology, and that, perhaps, is its greatest strength.

Researchers in Costa Rica have demonstrated dramatically that this is a definite technological improvement over intravenous solution. The treatment of hypernatremia, probably the most severe complication of diarrhea and the most life-threatening, is more effective with WHO formula ORS than with any intravenous regime that has yet been published.

Citrate can now replace bicarbonate. It is marginally more costly, but it increases packet life by years and reduces packet cost by allowing cheaper materials within which to package the product. In addition, citrate appears to enhance absorption. So again a technological breakthrough in a very small area has made it more available and perhaps, more effective. Investigators at ICDDR,B have violated the instructions on the packet and actually boiled the solution, without disastrous results--one or two millequivalents per liter change in the bicarbonate, perhaps, but there is really no reason not to boil the solution. Many cultures do not like to drink unboiled water. So again, one can be less rigid in prescriptions. The cleanest water possible should be the rule of thumb. It has even been demonstrated that water purification occurs in sunlight. Water in large polyethylene containers exposed to the sun for relatively short periods of time actually exhibits a dramatic fall in contaminating bacteria.

The most exciting technological breakthrough is the development of what is being called "Super ORS," the combinations of nutrients, starch and proteins, or the cereal-based rehydrating fluids. Starch molecules string long chains of glucose together to make them less osmotically active overcoming the need not to exceed two percent glucose or four percent sucrose in a solution because of its osmotic effect. But the intestine's ability to absorb carbohydrate is almost completely intact in all diarrhea studied, and starch molecules are an excellent way of delivering it. Furthermore, starch is generally available in every human diet from tubers to cereals while sometimes sugar is considered a luxury and not so widely available. Proteins that occur in cereals and perhaps in legumes also offer the prospect for improving the absorption. Researchers at ICDDR,B have demonstrated in the field, following careful hospital studies, the dramatic improvement in diarrheal management with rice-based cereal ORS.

They have shown that stool losses decreased by one half and the duration of diarrhea by one third or more. Most important, nutritional status of children using this over a period of time increased substantially compared to those receiving no ORS or the standard glucose or sucrose-based ORS. Finally, they found less relapsing or chronic diarrhea among these children, a very promising finding given that most deaths cluster in this small but important group of persistent illnesses.

But one must not assume that nutrients found in ORS, such as the cereal powders, are a replacement for the other half of oral therapy. One must be careful of the "ORT" catch word, because in fact the term that was used in the early days was "oral therapy," and oral therapy has two integral parts, neither of which stands alone: rehydration and feeding. Many programs are leaving out the feeding element. A major recent breakthrough in research on diarrhea patients shows that feeding during and after diarrhea is an important part of therapy. In fact, anorexia (loss of appetite) decreases intake only 20 to 30 percent, and in some studies, none at all. Giving ORS appears to renew appetite and that's a sign of recovery to which mothers respond.

Handwashing has been shown, both here and in Calcutta, to reduce significantly the transmission of shigella and thereby cholera. Measles vaccine has been shown to reduce effectively the disease which accounts for a significant part of diarrheal deaths in many parts of the world. Breastfeeding reduces the risk of diarrhea by four to six times in most populations. These are other technologies which we must incorporate into programs. Technologies are dynamic and always advancing, and one must not wait for a new technology as an excuse not to use those which are available today.

The Epidemiology of Diarrhea

Another area of advance is that of epidemiology. Cholera affects all ages but it is the youngest who die. While one used to talk about the pre-school child, in fact the highest death rates are almost invariably among those under age one, usually those in the second half of the first year. Programs must be appropriately oriented to the very earliest age groups. That is also where malnutrition will be interrupted. The epidemiologic understanding of chronic diarrhea is necessary to overcome this problem. Proper treatment and management promise to ameliorate the chronic diarrhea which accounts for a substantial portion of deaths.

Malnutrition is a critical element in death from diarrhea, and in fact malnutrition can be caused by diarrhea. Malnutrition must be addressed in any discussion of diarrheal deaths--whether as a contributor to diarrheal deaths or as a result of diarrhea. Weaning foods themselves are often the source of the organisms which lead to diarrhea. Weaned early, children get lots of diarrhea; weaned late, they get marasmus for lack of adequate nutrients.

A rotavirus vaccine is already being tested and may be available within a few years for wider testing. WHO has pursued this vigorously in a number of laboratories and it is one of the major outcomes of the CDD program. A cholera vaccine being tested in Bangladesh at present offers 70 percent protection in volunteers and 100 percent protection from severe disease.

For 50 percent of all diarrheas seen in the field, there is no etiologic agent identified. There is some evidence from ICDDR,B that these diarrheas have even worse effects on nutrition status with greater nutrient losses during illness.

The Social Dimensions of Diarrhea

The third area, the sociology of diarrhea, should also be examined. ORT is criticized for addressing only a symptom while a spectrum of social and environmental factors together lead to morbidity and mortality from diarrhea. Poverty, illiteracy, crowding, environmental pollution, and malnutrition all combine in what is called a "social synergy" leading to illness and death. ORT addresses only the final symptoms. Programs must be infused with an element of comprehensiveness that addresses these valid concerns. An effective ORT program strategy is in fact a consumer-oriented, behavioral change strategy that must penetrate the very beliefs and practices of each family. The correct knowledge by mothers leads to scientific action on her part. The knowledge of when and where to seek further help and the confidence to ask for help is crucial. Studies in Kerala, one of the poorest states of India, notable for having an infant mortality rate half that of the rest of India, have shown the importance of literacy among mothers in demanding health services. I would contend that it is their

knowledge, their self-confidence, and their understanding that have made them effective mothers and with it this remarkable difference in mortality in a poor area.

Health-seeking behavior follows education. The true use of oral therapy includes ORT, feeding, hygiene, breastfeeding, and referral and is itself liberating and empowering. It is revolutionary in a true sense. It can only lead to a demand for more information and services on the part of mothers, a demand that might outstrip availability.

Communication Strategy

There must be a radical change in communication strategy. It must be recognized that the most oppressive ignorance is that of program implementers. They must better understand and appreciate the perceptions, concerns, and practices of the client. It is not the clients job to understand the program. Traditionally, such programs have taken a supply side approach. There is a real need for a consumer orientation and demand creation. The skills of anthropologists and marketing specialists are needed. There must be a dialogue with clients, and the product, particularly its presentation, must be adapted to their perceived needs, whether it is called social marketing, a people-oriented approach, or given any other label. Whatever it is, ORT programs need more of it.

Organizational Structure

Finally, there is the organizational challenge. All Asian governments have committed themselves to the grand goal of Health for All by the Year 2000. A strategy of primary health care has been formulated to this end, but time and again nations are unable to develop the framework to realize such an ambitious and all-encompassing goal. Too many people work in too many directions, tackling too many problems all at once.

A national ORT program offers an ideal paradigm for a national primary health care strategy. It is most certainly not a vertical approach as it calls upon the entire existing system to participate fully. It is categorical, focused, and important. It is "doable". It fulfills admirably all the criteria enunciated at Alma Ata for primary health care: appropriate scientific technology, affordable, dependent largely on paramedical personnel, based soundly in the community and indeed in homes, socially relevant, and based on traditional practices suitably modified to complement the gains in scientific knowledge. Promotion of ORT profits by the mobilization of other social and commercial sectors. All these are the basic tenets of primary health care.

To do this, it is necessary to adopt a sound plan with clear, defined, and precise intermediate objectives by which to evaluate progress. The plan must spell out in detail the role of

those at every level of the health system, the responsibility of each worker. From this follows an appropriate training plan based on clear tasks, competence, and expectation of each individual from the university hospital specialist all the way to the community health workers and mothers. The job of each person is defined, and each one knows what is expected of him/her.

The Future

New approaches to health care in general and ORT in particular should mobilize all health care resources and measure, or at least estimate, the coverage or outreach of government systems. They should recognize the role played by private practitioners, by traditional healers, by drugstores, and other providers of care and reach out to them to extend program coverage. Strategies should be developed to mobilize the commercial sector. Villages should be reached as in Indonesia where 120,000 mothers groups weigh their children each month, and 30,000 villages have mobilized themselves to teach each other oral rehydration.

ORS production capacity and fairly wide distribution systems can be developed, but often there will be encounters with private doctors and others demanding useless antidiarrheals. Some countries may follow Bangladesh's lead and literally ban these products from the marketplace or find other means to control them. Some countries may adopt the bold and frontal approach of New Guinea in banning entirely the baby bottle which has resulted in the halving of diarrheal rates and the dramatic fall in hospital mortality from diarrhea. The marketing through village retail outlets, now occurring in Nepal and starting in Bangladesh, will make ORS more widely available in places where previously only popular anti-diarrheal drugs could be found.

Improved information systems must also be designed with which to monitor packet use, diarrhea deaths, hospital admissions, and supervisory visits. They must be used to make adjustments in programs. Periodic surveys will be used to verify and further refine data. A recent joint Thai/WHO survey revealed that diarrhea-related mortality was near zero, remarkable confirmation of that program's success. India is at present carrying out large sample surveys as a baseline which will precede a major national push to carry ORT nationwide into its half-million or more villages. With a sensitive and reliable information system, one can measure what has been done and what remains. What's more, such information will demonstrate what can be done, and how effective such programs can be.

This is the promise of oral therapy. Not only the relief from needless deaths and malnutrition and diarrhea, but more so the empowering of the entire health system by tackling an important health job and winning. Success in one program can become infectious. Oral therapy may not itself be "Health for All," but it is a very good start.

II. PROGRAM IMPLEMENTATION ISSUES*

Worldwide, most countries have plans, on paper, for ORT programs and are in the early stages of implementation. Most ORT programs have taken the approach of traditional public health programs with strategies that tend to be public sector oriented, ministry of health dominated, facility based, provider centered, packet-oriented, and demand dependent. These programs continue to concentrate on improving service delivery systems in the public sector, training an existing workforce in ORT, and improving supply systems. Although these are important activities, a broader approach is necessary to effectively meet ORT implementation goals and targets such as 50 percent effective use. Further examination of existing ORT programs and focussing on new program areas will identify the key factors necessary for an expanded, broader approach essential to ORT strategies.

Awareness of ORT vs. Use

There are bottlenecks in existing programs which point up the need to reorient and refocus ORT programs. First, is the fact that awareness of ORT is much higher than its actual use. As a result, one needs to ask, what are the key obstacles to continuous ORS usage that are being overlooked? Is ORT being regarded as a low-tech intervention and thus not actively encouraged?

Data Bases

Secondly, most systems are based on a relatively weak data base. For instance, usage is estimated at approximately two packets per episode per year. Yet, this was calculated without really having such major data as the diarrhea associated mortality rates, diarrhea incidence rates, case fatality rates, or access to ORS. Thus, programs must be based on field research. Epidemiological studies must be used to assess the magnitude of diarrhea, the nature of diarrhea (acute versus chronic), and distribution of diarrhea by region or country. As will be noted, without accurate monitoring and evaluation, the effective use of ORT is seldom known.

Role of Ministries of Health

Third, is the issue of ministry of health domination of ORT programs. Should government be provider, stimulator, coordinator, or serve another function in ORT programs? Noting that often governments only provide 25 percent of health services, it is evident that the remaining 75 percent are performed by others. Yet, do the governments truly utilize their resources in a manner

* Panel Presentation by Jack LeSar, Management Sciences for Health; Jon Rohde, Management Sciences for Health, and Mr. Sudahkar, Planning Commission, Government of India.

that will motivate and incorporate traditional practitioners and other health care providers, or do they aspire to control all aspects of program implementation? Many societies have more faith in traditional practitioners than government administered systems.

Keys to Successful Programs

On the other hand, successful programs recognize and incorporate primary concerns. These programs share three key characteristics. They provide wide coverage, they provide services that are immediately available to those with diarrhea, and they promote a credible message. Another key component, and one that cannot be overemphasized, is an assessment of the needs of the client population for the purpose of ensuring that their knowledge, attitudes, and practices will be taken into consideration in program implementation. In other words, the notions, fears, and practices surrounding diarrhea must be discovered in order for ORT messages to effectively communicate and reinforce positive concepts in an understandable and acceptable manner.

Further, as diarrhea is becoming more recognized as a family problem, approaches must be developed in which the family is perceived to be the service delivery unit. This involves another major component of education. Emphasis should be on how to get the ORT message across through mass media and planned communication programs. For an illiterate society, education in the broad sense may focus on the socialization processes within a community. Indeed, it is often less the classroom education and more the socialization process which teaches most effectively. For instance, children want to behave very much like each other. If washing hands is a good thing, then they will all wash their hands. If keeping clean is a good thing, then they will all keep clean. They will bring these ideas and behavior back to the house and to the community, and in this manner appropriate ideologies and practices are reinforced.

Attention should be given to local and indigenous organizations in implementing ORT strategies. PVOs, private cooperatives, and medical practitioners must be viewed not as adversaries but as allies. A shift in orientation to include others in ORT promotion and practice is critical.

Management Systems

All this reinforces the need for the establishment and maintenance of clear, precise administrative and management systems. First, an adequately detailed and focussed plan is crucial. It should be clear and spell out the various components including numbers, time frames, and instructional objectives at each level of implementation. It should have realistic goals and expectations. Such plans should clearly consider what can and cannot be accomplished.

Management Information Systems

The second essential instrument in effective management is an information system. Massive data collections should be reorganized to develop precise indicators that allow managers to know if the system is or is not working, according to plan. If the information system is developed in a sensitive fashion it will have a self-evaluation and self-motivation component built into it.

Both of these tools, when used effectively, allow key indicators to progress. These well-conceived, timely, accessible, and agile sets of data constitute indicators for project management and evaluation without major demands on personnel time. They prove invaluable in the very necessary yet often overlooked planning, implementing, evaluating, and re-planning process. Plans must be flexible! They must be monitored and reviewed at least once every year, preferably every six months, to understand what is and what is not succeeding.

Financial Management

In addition, effective administrative systems will coordinate the essential release of program funds on a timely basis, coordinate donor accounting systems to ensure the above and monitor procurement and financial procedures, and ease the administrative burden on technical personnel.

Where Will Services be Provided?

Another look at strategy involves the who, what and where of intervention. Where will interventions take place? Hospitals, clinics, pharmacies, community, in the home? Again, these answer must take into consideration the target society. Each client group's or population's needs are somewhat different depending upon access to health care. For instance, where hill populations are quite scattered, a home-based program is called for. In urban areas, where there may be greater access to care, the use of packets may have greater appeal.

What form will the strategy take? Packet program, center based program, home based program, or a mix of several are all options. Each society will have a somewhat different mix depending on access to health care.

Who Will Provide Services

Who will implement the strategies? Health personnel, physicians, nurses, pharmacists, teachers? Key considerations in this arena involve the types and numbers of providers as well as answers to such questions as (a) how much dependence does this society have on health professionals? Or (b) considering the hesitancy of governments to release control of health care, how much responsibility will be allotted to others? Again, there is a

critical need to recognize the participants' sense of involvement, discovery, and contribution in the ORT effort. Yet, in many instances, if we are asking others to assist us, we may, in turn, need to assist them. The notion of offering something to new outlets that will encourage participation in ORT efforts is not unrealistic. For instance, if we are going to involve the schools, perhaps we may provide attractive education materials for science or reading classes that can be used by a school teacher in the context in which he or she knows how to teach. This will both facilitate the job of the teacher as well as spread the ORT message.

III. MONITORING AND EVALUATION OF ORT PROGRAMS*

Monitoring implies examining the day-to-day progress made in implementing a program to ensure that the operators are proceeding according to a plan. It implies that corrective measures are possible. Evaluation, on the other hand, is the comparison of what was achieved to what was the baseline, or what is expected to be achieved. It is less of the day-to-day procedures. Objectives are a general statement and targets are a quantified statement of what one plans to achieve. Subtargets break it down even further.

There are a number of steps in the preparation of a plan, such as policy review, health planning and budget review, demographic and social data collection, an examination of the health services, a look at the diarrheal disease problem, and so on. These lead to developing objectives and targets, then laying out strategies, setting up the delivery system, looking at activities, and finally, looking at evaluation. Monitoring provides health management with tools to measure progress towards these objectives. Monitoring does not indicate that the best approach is being used. This is important to understand. Rather, it informs you that you are progressing along the path you had established or decided to follow earlier. Monitoring does indicate whether you are staying on target as defined by measuring the progress towards a set of objectives. Monitoring should be action oriented and should form part of an integrated health information system. It must be developed within the context of national policies, goals, and priorities.

There are two elements to setting up objectives, one expressed in quantitative terms and one in temporal terms. That is, how much will be done in what period of time. Objectives need to be understandable, quantitative, and time limited. Very careful consideration must be given to objectives and targets because on the basis of this, everything else follows. Selected indicators and data collection should be kept to a minimum so that reliability is increased and the quantity of data is decreased.

The problem of collecting only information that is important and that will allow one to make decisions is very critical. Part of good indicator selection is picking indicators that have a natural feedback mechanism whereby the information collected is important for those actually implementing the program. If it is not important for the people in the field, then real thought should be given as to how effective it is at the decision making level.

* Presented by Richard Cash, Harvard University.

Data should reveal the intensity as well as the shortfalls of the objectives. It should reveal, if possible, different effectiveness among different groups. Indicator selection is an evolutionary process. One may decide to change things over time. For example, in the initial smallpox eradication program, concern focused on how many people were immunized, vaccinated against smallpox. When the approach was changed to the control of smallpox, concern first moved to the number of cases, and then to the actual number of new outbreaks. As understanding of the condition changed and as the epidemiology became more understood, the kind of indicators used also changed. The same thing may be relevant for ORT programs. For each indicator, it is necessary to know:

- what will be measured,
- who will collect the data, where and how,
- how often,
- who will use it, and
- how will the data affect performance.

What should be measured?

What indicators should be chosen? They should be output oriented, simple, readily understandable, and comprehensive.

There are four basic strategies within the CCCD program: case management, epidemic control, MCH practices, and environmental health practices. Within any of these four areas there are activities and scheduling for which data could be collected. They are production and development, distribution, training, education and promotion, and evaluation. Under the area of production and development, such things as the number of ORS packets produced, the number of facilities established, and the amount of promotional materials that are developed would be looked at. Under distribution, one might be interested in the number of sites where these activities are being carried out or the number of packets distributed. Under training, one looks at the number of people trained at various levels and the effectiveness of that training. Under education and promotion, one would look at such things as the number of mothers that are educated, while under evaluation of the case management activity, the quality of ORS produced and the number of facilities receiving adequate amounts of ORS would be looked at. Under each of these strategies, there are a number of things that can be evaluated and that can be monitored.

Who should collect these data and where and how?

There are many different levels, such as the village health worker, the individual, even the nurse auxiliary, the nurse moving up the chain, the physician, the epidemiologist, the trained monitor. Most data, however, will be collected at the local level. Therefore, it must be kept simple, as simple as possible.

Where and how can these data be collected? There are essentially three different ways that this can be done. One way is through the standard data collection system and another through the use of sentinel sites. The use of sentinel sites may become a more common way of data collection since it is less expensive. In picking sentinel sites, one must consider whether the community is willing to report the information clearly. Are they capable of reporting it? Is that sentinel site representative of a fairly large sector of the population?

How often?

How often depends upon the acute or chronic nature of the condition or the program that is being measured. Some data need to be collected on a weekly basis, some every four months, some yearly.

Who Will Use the Data?

After the data have been collected, the analysis takes place at all levels. It is at all levels also that action is taken in response to the evaluation. This last point cannot be stressed enough. Data collection that takes place in a vacuum done through a small cadre of individuals will have very little impact on the system. Eventually, those individuals in the field who collect the data will begin to lose interest. That is why the choice of what is monitored is very, very important. That data must continue to feed back rapidly into the system. If it does not, the system will break down.

Problems in Data Collection

There are a number of impediments to data collection. In looking at mortality and morbidity surveys there is an enormous problem of the misclassification of deaths by age. Much of the information on cause of death is often taken by marginally trained individuals or those trained only once, and this same information is used for data collection over the next 20 years. The non-reporting of deaths, particularly in the neonatal period is quite difficult. The difficulty lies in attributing cause of death--a great deal more work needs to be done in the area of the oral autopsy.

The definition of terms is a problem when collecting data on certain activities. What do you mean by use? What do you mean by appropriate use? What do you mean by diarrhea? In a recent study in a rural area it was found that there are at least four types of diarrhea recognized by the population. Mothers know that you don't treat diarrhea of a child that is teething. If everyone in the community recognizes this condition as a non-treatable type of diarrhea, maybe it shouldn't be part of the denominator. Perhaps you should look at only those conditions that people and the medical profession recognize as treatable illness, and this should be the denominator. This in turn will clearly affect use rates.

The issues of monitoring and evaluation are fascinating and complex. It is very important that we define our objectives, targets, and terms very clearly. Unless these are precise, unless definitions are clear, there will be very different results with regard to monitoring and evaluation. Clarity is critical to every evaluation for planning and particularly for those who are implementing a program, be it CDD, EPI, or primary health care.

In the following sections brief summaries are given of present ORT monitoring systems within Thailand, Indonesia, and the Philippines.

Thailand*

Information collection and monitoring in Thailand are carried out on four levels. The first is ORS production and procurement, the second is ORS delivery, the third is ORS use, and the fourth is actual reduction of diarrhea-related morbidity and mortality. The objective is to reduce both mortality and morbidity through the promotion of ORT. Accessibility and coverage targets for ORS have been established as well as attempts to relate operational targets to expected reductions in mortality and hospital admissions. At the beginning of the program in 1981 there was no routine reporting system for the Control of Diarrheal Diseases (CDD) program. Today three items of information on the CDD program have been incorporated into the routine reporting system.

Even so, there is still not enough information collected about CDD, and what data are available are often incomplete. Data provided by health workers at the periphery are often inaccurate and late in coming. Delays of three months are not unusual and yearly reports have to wait for those data. A primary source of data are deaths reported through the routine epidemiological surveillance system. In addition, access and use of ORS are monitored. This is done by special surveys of morbidity/mortality and ORT coverage. Cross sectional studies are used to detect geographic and seasonal variations. Using several surveys in the same year, a more accurate picture of ORT coverage and diarrheal morbidity can be developed.

The third data source is sentinel surveillance. The sentinel system is needed to supplement these other two data sources because the routine system is not providing sufficiently reliable data.

* Presented by Sawat Ramaboot, Ministry of Public Health, Thailand.

Indonesia*

In Indonesia the CDD monitoring system is integrated in the health information systems. There are about 5,300 health centers throughout the country reporting about 10 million cases of diarrheal disease every year. Of course not all 5,300 report regularly; usually only one third do so. Following are some recent findings. In 1983 figures, accessibility to ORT was about 50 percent and real usage about 23 percent. Around 600 hospitals reported diarrheal diseases estimating approximately 150,000 cases every year. ORS usage is reported to be about seven million liters every year (five million sold in one liter packages and 10 million in 200cc containers).

Besides monitoring routinely, special surveys are conducted on specific activities such as household surveys, cost effectiveness surveys, and audience and service provider surveys. In 1983 a comprehensive program review was conducted by WHO, UNICEF, USAID, and the Indonesian government.

Because of the geographic complexity of the country, data collection is focused on the 10 or 11 provinces which contain 90 percent of the whole population. A community survey found that diarrheal disease incidence is between 15 to 43 per 100. Under-five children suffer about two episodes per year. Diarrheal disease is number two among all causes of death at all ages and accounts for about one-fourth of the infant mortality and about one-third of under five mortality.

Philippines**

The review findings of the Philippine CCCD program, begun in 1980, are summarized below. There is still significant diarrhea morbidity in children under five; nearly three episodes of diarrhea per child per year were observed (probably higher if adjusted to the seasonal incidence). Mortality in children under five years showed a wide range. In the north, mortality was 2.9 per 1,000, in the central area it was 4.6 per 1000, and in the south it was 18 per 1,000. The review found that in the three provinces surveyed, there was an average of 33 percent of all diarrhea episodes using ORS. All government health facilities use ORS for diarrhea and promote national awareness of Orasol. Of mothers with good access to government health facilities, 86 percent knew about ORS and 76 were actually using it. Promotion of continued feeding during diarrhea has been very successful.

* Presented by Bambang Winardo, Control of Diarrheal Diseases Program, Indonesia.

** Presented by Enriqueta Sullesta, Task Force on Diarrheal Disease, Philippines.

Extensive training relating to ORS has been carried out. Nearly all government health workers have received some sort of exposure or training in diarrheal disease control, although the quality of training is not known.

Based on a review of the findings, it is believed that the mortality reduction target (a reduction of up to 85 percent by 1987) could be achieved if the effective use of ORT continues to be expanded and improved. The main problems were ineffective use or lack of acceptance by some health workers, especially doctors and hospitals, and some parents. This is due to the inadequate training and promotion in the clinical use of ORT and inadequate promotion of ORT messages to the public.

Several recommendations were made in the review. Clinical training in ORT for health workers should be further strengthened and diarrheal disease control should be integrated into the training curricula. Promotional and educational activities for public health workers should be intensified and should include private practitioners. Complementary strategies (such as hand-washing, breastfeeding, weaning and child care practices, and good hygiene and waste disposal) at home should be intensified in order to reduce diarrhea morbidity. ORS production should be increased to meet future needs. This could be done by encouraging commercial manufacturers to produce and market oral rehydration salts. The review also recommended that the CDD office be strengthened.

IV. PROGRAM IMPLEMENTATION: THE DONORS' PERSPECTIVE

The World Health Organization (WHO)*

The following seven points explain WHO's role in ORT.

1. WHO does not carry out its own programs but participates with ministries of health to help them execute their own programs. The emphasis now is on strengthening national capabilities.

2. WHO is a technical agency and not a donor agency. Seventy percent of the WHO budget is allocated to country program activities, while 30 percent is allocated for headquarters in Geneva.

3. Some WHO programs can attract extra funds in addition to the regular budget. CDD activities are an example of such a program.

4. Policies regarding technical assistance and support for WHO are set by the World Health Assembly which is a collective of countries.

5. CDD at both the regional and country level aims to work with other agencies in a collaborative manner emphasizing joint technical policies and coordination.

6. WHO (and all other donors) are accountable for the funds they disburse. In an annual meeting attended by 26 donors, WHO is required to report in detail on all its activities.

7. The main areas in which CDD is interested in developing collaborative efforts are:

- planning and reprogramming
- training, especially management training and clinical training
- evaluation, surveys, and MIS
- research, both operational and biomedical
- information and publications.

In all of these areas the CDD emphasis is on program management and supervision. A new initiative being undertaken by WHO is in the area of social marketing and communication, with the intention of adding a technical perspective to an activity that is important for ORT. There is a need to bring the health sector and the communication sector together so that each can learn from the other.

* Presented by Michael Merson, WHO.

UNICEF*

UNICEF is not a technical agency but rather a funding agency which relies on WHO to provide technical assistance. UNICEF provides funding for supplies, training, and other in-country program expenses. In collaboration with host governments, UNICEF develops a five-year plan for programming its assistance. This assistance is not constrained by sectoral boundaries and can include support for nongovernmental organizations as well as government agencies.

UNICEF has a deep concern for the problem of diarrheal disease, and thus with ORT. In fact, ORT forms part of a critical package of interventions designed to save children's lives. These interventions are generally seen in the context of a primary health care program and the provision of basic services.

In countries throughout the world UNICEF has provided assistance with ORS production, training, communication and information dissemination. It believes that governments are the logical focus for coordination of ORT activities and for UNICEF assistance. UNICEF has a ceiling for its support of country level funds but also has access to special funds for diarrheal disease programs and activities.

The U.S. Agency for International Development (AID)**

AID bilateral funds are programmed through in-country USAID missions, although some AID activities are centrally funded as well. Like WHO, AID does not carry out its own programs but assists governments with their programs. By legislation, AID funding is channeled toward the goal of reducing infant and young child mortality. Traditionally, this has been through primary health care programs, and in recent years has become increasingly focused on key interventions which have the greatest impact on mortality reduction. Certain technologies are shown to have the greatest impact: family planning, ORT, nutrition and growth monitoring, immunization and malaria control.

In 1983 the AID Administrator made a major commitment to ORT. ORT has been emphasized through a variety of special activities such as international meetings focussed on ORT and the PRITECH project (which since its inception in the fall of 1983 has worked in more than 50 countries), through already existing programs such as the Project for Combatting Communicable Childhood Diseases (CCCCD) and the Mass Media and Health Practices Project, through country programs, and other activities. Close to \$70 million will have been spent from Fiscal Year 1983 to Fiscal Year

* Presented by Anthony Kennedy, UNICEF.

** Presented by Anne Tinker, William Goldman, and Robert Clay, U.S. Agency for International Development.

1985 for ORT activities around the world. AID plans to devote an additional \$35 million to ORT in 1986.

In 1983 a review in Asia showed that all governments had policies and programs for diarrheal disease control and most were producing ORS packets in-country. The assessment also revealed major problems with distribution and demand creation, with utilization less than 10 percent. Special projects were developed to support government programs already under way in the following areas:

- education for mothers about the benefits of ORT
- information and education to service providers as to the "why, how, and when" of ORS
- the use of alternative delivery systems for ORS including traditional, commercial, and social marketing
- efforts to obtain support of medical professions
- research, monitoring, and evaluation

Within the Asia Region, AID assistance for diarrheal disease control has increased from \$500,000 in 1983 to \$5,000,000 annually in 1984 and 1985.

V. DIARRHEAL DISEASE CONTROL: POTENTIAL INTERVENTIONS*

If one looks at potential interventions for controlling diarrheal disease other than the traditional ORT, two areas are prominent: super ORS and non-ORT interventions. There are three major reasons for development of super ORS. They are (a) to reduce the volume and duration of diarrhea; (b) minimize treatment failure by correcting dehydration and maintaining hydration more effectively; and (c) to provide nutritional benefit.

Super ORS

At present, five formulas of more efficient oral rehydration solutions (ORS) are being examined around the world (see table below). These fall into two categories. Formulas 1-4 are categories that contain a starch, a peptide and a dipeptide in different concentrations. Formula 5 is cereal-based.**

Both categories are being explored for several reasons. One, both types of formulas (chemical and cereal) have already proven their effectiveness. They have been shown in clinical studies to reduce diarrhea considerably--as much as 50 percent. The cereals or the legumes probably have a maximum effect of around 40 to 50 percent reduction in diarrhea. With further research, it is possible that the right combination of proteins and dipeptides may increase that percentage to 70.

A second reason relates to packaging technologies. At the present time it is unknown which of the two types will be easier to package. Third, concern about use of cereals within the first three months of life necessitates further investigation. A number of physicians have expressed reluctance to use cereal within the first three months of life due to allergic, immunological, and digestive factors which are significant in very young infants. A fourth concern is that rice is not available everywhere, and other cereals may not be as effective as rice. Maize does not turn out to be nearly as effective a rehydrating solution as rice.

For home use, obviously the cereal-based or the legume-based approach is the only possibility. Even though glycine and diglycine cannot be produced in the home and are not part of the cereal-based formulas, this approach is very appealing. However, there are constraints and critical issues that must be addressed. For instance, the rate of fermentation is crucial. If the mix ferments in as little as four to six hours, is it practical to ask the mother to make up the solution every twelve hours? Can

* Presented by Michael Merson, WHO.

** There is also a legume-based formula. The mung bean is now being tried in New Delhi.

COMPOSITION OF SUPER ORS FORMULAS

	Ingredients	Grams
<u>Formula 1</u>	Glucose Glycine Trisodium citrate, dihydrate Sodium chloride Potassium chloride	20.0 8.0 2.9 3.5 1.5
<u>Formula 2</u>	Glucose Glycine Glycyl-glycine Salts	20.0 4.0 4.0 As in Formula 1
<u>Formula 3</u>	Glucose Glycyl-glycine Salts	20.0 13.5 As in Formula 1
<u>Formula 4</u>	Maltodextrin Glycine Glycyl-glycine Salts	20.0 4.0 4.0 As in Formula 1
<u>Formula 5</u>	Cereal (e.g., rice powder) and legume (e.g., mung bean) Salts	50.0, 60.0 As in Formula 1

Source: WHO

she afford this constant preparation process? Will fuel be readily available? Another issue is how easy is it for her to prepare the mix using rice powder? (Note that this is not rice water, but powder. It might need to be precooked and ground and then put into solution).

What ramifications does this have on those packets commercially available? If you can purchase a Super ORS formula in the market that cuts down diarrhea losses by 50, 60, or 70 percent it would seem reasonable that every mother would want to use it. At this point, she may be told that she can make it at home. This might appear quite welcome. In addition, its presence and reliability may further rid the marketplace of numerous, alternative, commercial antidiarrheal drugs. Indeed, the option of home preparation may even affect those people that continually depend on the commercial sector for health care.

Non-ORT Interventions

Certain constraints are associated with ORT and other interventions. First, ORT has the same operational constraints that any intervention has and cannot reduce mortality all by itself. Secondly, ORT doesn't treat dysentery and doesn't treat chronic diarrhea. Third, ORT doesn't affect morbidity (used here as incidence). There is no doubt that ORT alone is not going to control diarrheal disease.

At present 18 interventions are being investigated by WHO and other organizations(see Appendix C). These approaches have been looked at for their efficacy and, if found to be potentially effective, have been priced. They have been grouped into four categories. The first group are interventions thought or known to be feasible and affordable yet which require immediate implementation and operational research. These are breastfeeding promotion, measles immunization, water supply and sanitation, and promotion of personal and domestic hygiene.

The second group, improving weaning practices and rotavirus immunization, are interventions likely to prove cost effective but which require some research before operational recommendations can be made. For instance, questions still remain about when to introduce weaning food, what the weaning food should be, how it should be approached in rural areas versus urban areas, etc.

WHO believes that any successful rotavirus vaccine must be incorporated into existing EPI programs. To ask any developing country to provide a vaccine that requires an additional visit by the mother in the first year of her child's life is unacceptable and impractical. At present, mothers are being asked to bring their children for their first vaccine at birth. DPT starts at six weeks and is followed up at ten weeks and 14 weeks. EPI has just changed its schedule to recommend that BCG and polio be given at birth, so mothers are now being asked to come at birth and three more times thereafter. To ask them to come once again is unrealistic.

Conclusion

Effective implementation of these strategies demands hard work. Planning and evaluation, manual revisions, surveys and comprehensive program reviews, training courses, and operational research funding are all examples of necessary, preliminary steps. The challenge that lies ahead is how to begin strategy implementation or how to support existing programs which may incorporate ORT. In this effort, case management should not be viewed as a low priority. ORT not only saves lives and helps nutritional status, but it is cost effective. It should remain the top priority while other interventions are continually studied and explored.

VI. ETHNOGRAPHIC RESEARCH AND DIARRHEAL DISEASE*

The ethnographic approach to research on diarrheal disease and ORT can be applied anywhere. However, ethnographic data on knowledge, attitudes and practice related to diarrheal disease tend to focus on the aspects of a culture which government officials may find embarrassing to acknowledge such as supernatural beliefs relating to magic and sorcery and practices such as purges and the use of herbal medicines. These do not fit into the western oriented medical training of many government officials, particularly physicians. In addition, anthropological research methods (ethnography) are often not credible to this same group since they do not involve statistical techniques, computers and standard evaluation procedures. However, although ethnographic research methods are qualitative and not quantitative they can prove of real value to diarrheal disease control efforts.

An ethnographic approach is needed to design culturally specific and culturally sensitive ORT and diarrheal disease control programs. If ethnographic data are available in the planning stages of a program it should be used. However, generally such data are not available and programs must then plan for this type of focussed research. A major obstacle to performing such research is the lack of qualified researchers to carry it out. Because medical anthropologists are seldom available in developing countries anthropologists are often brought in thereby lessening the probability that ethnographic procedures will become institutionalized as part of project design.

The research methods used in developing an ethnography of diarrheal disease in Swaziland (and applicable elsewhere as well) were the following:

- A survey methodology using unstructured or open ended questions;
- Interviews with key informants (such as traditional healers or traditional birth attendants); and
- Direct and participant observation in homes or other key locations.

An ethnography involves the study of behavior, beliefs, attitudes, and perceptions underlying a particular type of behavior through in-depth original study and through unstructured interviews between the researcher and the clients. Ethnographers are always trying to learn rather than trying to teach.

* Presentations by Najma Rizvi, ICDDR,B, and Edward Green, Consulting Anthropologist.

How should one promote ORT? Anthropologists have been involved in the study of food behavior for a long time and even longer in disease management programs. Precisely for that reason, there is a good deal more ethnographic information on disease management than on food behavior. However, it is only recently that anthropologists have been called upon to provide some kind of insight into health promotion.

For the promotion of ORT and other interventions related to the treatment or prevention of diarrhea, the first question to ask is how diarrhea is perceived. Do those promoting this technology understand how diarrhea is perceived by the people for whom the technology is planned? The perception of any disease, and that is true of diarrhea, can be examined at three different levels. First, whether diarrhea is recognized as a major health problem by the people. Bangladesh data show that villagers know that their children are suffering from diarrhea and many of them are dying from it. They do consider it a major health problem.

At the second level are the perceived causative factors of diarrhea. In Bangladesh and throughout the Subcontinent diarrhea is believed to be caused by overheating of the body. This overheating could be due to eating "hot" foods ("hot" does not refer to temperature or other observable characteristics). The heating can come from supernatural causes, such as something bad in the air. Breastfed children with diarrhea are believed to be affected by supernatural causes because breastmilk in Bangladesh is still considered the ideal food for a baby, free from any kind of disease. Breastmilk is a disease free food which keeps the stomach in a cool state. A mother may use magico/religious rites to neutralize the bad spell which causes her breastmilk to give an infant diarrhea.

Often the concept of dehydration and rehydration is a little too abstract or not understood in a community. It is much better to stay with concepts already understood locally and use them to program advantage. Programs should build on what is already available rather than teaching communities something which is totally alien or using an alien concept.

VII. PROFESSIONAL RESISTANCE TO ORT

Philippines*

Following is a review of recent data on attitudes concerning ORT among private physicians in rural organizations in the Philippines. There are several commercial brands of oral rehydration salts or solutions available in the Philippines: Pedialyte, a premixed solution in a plastic bottle; Glucolyte, a commercial powder for 250 ml. solution; Isolyte, a premixed solution in an IV bottle; Crystallite, a 500 ml. solution; and Diorlyte, a 200 ml. solution.

In the Philippines there are 8,000 government physicians and 25,000 private sector physicians. The objective of the study was to determine knowledge, attitudes, and prescription practices among 100 rural private physicians in the Luzon area with regard to oral rehydration products. The following questions were asked: What commercial brands are available? What brands of ORS are known? What is prescribed?

Doctors were asked to name brands they knew or had heard about. Pedialyte was the most well known with 57 percent of the physicians mentioning it. Orasol, the WHO solution, surprisingly, was mentioned by 40 percent in spite of the fact that it is not directly promoted among private practitioners. Pedialyte is even better known among paramedics who only knew three brands: Crystallite, Isolyte and Pedialyte.

"Total awareness" and preference for various ORS brands was also investigated. "Total awareness" is defined as a positive response to questions such as "do you know Brand A, B, and C?" Surprisingly Orasol was found to be at 92 percent total awareness among physicians, almost on a par with Pedialyte which is highly promoted. However, when prescription practices were studied, Pedialyte was found to be prescribed 65 percent while Orasol is prescribed by only 2 percent.

Physicians were asked what factors they consider in choosing an oral rehydration product for a patient. Most important was affordability. Physicians said cost is the first thing they tried to evaluate (can this patient afford the product?) followed by availability. Can he get it from the commercial drugstore? Is it convenient to administer? In its favor is the fact that Pedialyte is the largest selling brand and is convenient to administer. The mother will not make a mistake in preparation. Taste and flavor are also important factors.

* Presentation by Cecilia Versoza, Kabalikat ng Pamilyang Filipino, Philippines.

Physicians were also questioned about oral rehydration in comparison with antidiarrheal medications. Antidiarrheal medications meant anything besides oral rehydration salts. Ninety-seven percent recognized that there is a difference. When asked about indications for use of ORS, most respondents said it was for replacement of lost body fluids and correction of electrolyte imbalance and useful primarily for mild or slight dehydration or mild diarrhea.

Convenience of administration, the replacement of lost body fluids, and affordability were listed as the advantages of oral rehydration. The main disadvantage is that it is not applicable when there is vomiting. It has an unpleasant taste, and it is only for mild cases of dehydration. Earlier studies have shown that private physicians complain that children brought to them already had moderate dehydration. In most cases, they felt more comfortable giving an intravenous solution rather than oral therapy.

Of those doctors prescribing Pedialyte, 43 percent felt that Orasol (the WHO formulation) was not applicable for private practice because it is used mainly in public sector health programs. It cannot be prescribed because it is not available in the commercial sector. Fourteen said Orasol is just as good as Pedialyte. The main reason Orasol is not prescribed is that it is not well promoted. The second reason is that it is not available. The third reason is that it is not convenient to administer.

Pakistan*

In 1975 UNICEF sponsored an "acceptability" study in Pakistan which first introduced ORS packets into the country. The Government's approach started out with sensitization of the leaders of the medical profession, the people who were likely to create obstacles to the use of ORT. This was done through training seminars.

From this core of trained and committed pediatricians all over the country there emerged as well 10 or 12 centers for diarrheal disease control. Other pediatricians became involved through exposure to the centers. By 1982 almost all pediatricians were trained in oral rehydration therapy.

The second stage began in 1982 when WHO conducted a senior managers training course in Lahore and brought together another 30 decision makers from government ministries and directories and others administering health services. At this point, the professionals were very well motivated, and the administrators and people in the ministries knew what was going on. Distribution

* Presentation by Mushtaq Khan, Jinnah Post-graduate Medical Centre, Pakistan.

was the main problem. The country was producing only about one million half liter packets in one year. Most lay unused in ministry offices and were never sent through the system.

Gradually over time acceptance of ORT increased and there were more seminars and workshops. The Pakistan Pediatric Association and the Pakistan Medical Association became actively involved in the promotion of ORS. This was crucial. Every time that there was a meeting of the Pakistan Pediatric Association a special session was held on diarrhea and ORT. The end result was that any physician who had not heard about ORS came up and asked for information. After this, general practitioners and others both in the cities and rural areas became involved. From the Pakistan experience, it seems that if there appears to be apathy among physicians and professionals it is usually because of a lack of information.*

Pakistan is also attempting to limit availability of certain drugs often prescribed for diarrhea. A drug review was conducted and an official of the drug registration board was informed of its findings. The registration board agreed that all the anti-diarrheal drugs which contain streptomycin, or neomycin as well as the antimotility drugs should be dropped from the national pharmacy.

VIII. CREATING CONSUMER DEMAND*

How do we get more people to use, use correctly, and continue to use oral rehydration therapy? What should be the overall goal of a communication component in an ORT program that addresses these questions? This section will examine various areas of consumer needs and their effect on marketing strategies.

Correct usage of ORT has been identified as one of the key indicators of program success. For communication planners, this must be an ultimate goal as well. It is not enough to think only in terms of increasing consumer demand for services. Due to the fact that effective practice of ORT constantly lags behind knowledge and awareness of it, it is essential that energy and effort be directed at continual and correct usage.

Communications

Because of the emphasis now being placed on communications, its role, functions, and key components must be addressed. In the most general sense, the role of communication should be one of advocacy. Most importantly, advocacy on behalf of audiences--the consumer. Using mothers as the example, communication programs must learn about and then appropriately address existing practices among mothers, existing beliefs, perceptions about disease causation, and attitudes towards treatment. Another important audience is the provider of services, i.e., physicians and other health professionals whose support we have to win, particularly in the early stages of an ORT program. Also, advocacy is important in the interest of senior officials, for example, heads of state. This strategy may attempt to get heads of state to endorse ORT in a very visible manner. This will allow them to both endorse and take credit for program success.

In general, there are three functions that communication can play in ORT: publicizing, teaching, and motivating. A communications program should not only publicize but provide enough information about ORT to enable an audience to learn how to mix and administer an oral rehydration solution. Motivation is needed to encourage people to participate in a program, as well as to try a new product or continually use a new service.

Among the reasons for the increasingly important role of communications is the development of new tools and techniques available in implementing goals. Behavioral science, for instance, has provided new insights into the way that people learn and the way that individuals comprehend and grasp a new idea or a new way of

* A panel discussion among Mark Rasmuson, PRITECH; Terry Louis and William Schellstede Population Services International; and Euriqueta Sullesta, Task Force on Diarrheal Disease, the Philippines.

doing things. Such insights yield pertinent information regarding ways to increase consumer utilization and the process of consumer learning by stages. This in turn leads to more effective designs in training strategies for health workers and public education as a whole.

Social Marketing

A second and popular mechanism is that of social marketing, marketing that is directed at a social benefit rather than a specific product and not necessarily for profit. Not unlike commercial marketing, efforts are directed towards implementing the correct marketing mix that will have the right product, at the right price, in the right place, with the right promotion (the four "Ps" of commercial as well as social marketing). Within social marketing, there is an effort to "sell" without emphasis on the transfer of money but rather on the transfer of knowledge to consumers within a context which the consumer understands. The products involved in this process are usually subsidized to insure that the cost is low enough to reach those unable to pay commercial prices. However, sale of the product is considered essential because it contributes to marketing effectiveness. It helps to motivate the consumer to use the product. If hard earned money is paid for a product the person really wants it and will use it. Marketing also increases program efficiency. Since product sales are simple and clear-cut measures of program progress, they also stimulate managers and provide an added stimulus for program success.

However, due to the broad goals of social marketing, certain constraints exist. For instance, social products are more complex than commercial ones. It is one thing to choose between Coca-Cola and Pepsi-Cola, but quite another matter for a rural women to learn a new formula for making a diarrheal medicine, remembering how much salt and sugar to use and giving enough of the solution to the sick child.

Social products are less immediately satisfying to the consumer. It is not easy to motivate a mother to walk a great distance to have a child vaccinated when she sees no immediate benefit. On the other hand, drinking Coca-Cola immediately provides a sweet, pleasant taste and provides instant gratification to the consumer.

Social marketing audiences have fewer resources than most consumers. The poorest of the poor are not the target for commercial marketers but they are for social marketers--those who are less literate, more isolated, and very often ill.

Social programs frequently also call for spectacular results. When planning a program, for instance, an administrator may demand a 30 to 40 percent reduction in infant mortality. Changes

of two to three percent would be insignificant and not acceptable. A major manufacturer of soap or detergent, however, would be delighted with such an increase in sales.

A brief review of the four "Ps" will further highlight the influence of consumer demand in marketing strategies. "Product", as already discussed, can be either an object or concept. The important factor is that the product be presented in a way that consumers will accept and use. If for example, effervescent salts are more acceptable, attractive and useful to certain rural women, then the ORS should be presented as effervescent tablets. If mothers don't understand the concept of dehydration then it may be best to furnish ORS as a tonic to strengthen the baby during diarrhea or as a prevention for "dryness".

"Price" or cost of the product to the consumer takes on hidden meaning when social marketers promote, for example, a home mix salt solution. The "price" of ORS to the consumer then is not the only cost of the salt and sugar, but includes also the time taken by the mother to mix and give the solution to her child.

"Place" relates to where the product is available and symbolizes the importance of an adequate distribution and supply system to insure that the product is easily available to the consumer--in a place which maximizes contact, often outside the health delivery system. The health system, as we know, is tied to health centers as the primary distribution system. The market, in perspective, may lead to the discovery of other existing alternatives.

"Promotion" includes communication channels: press, radio, cinema, TV, posters, etc. It is essential that the consumers know what the product is, what it is for, what benefit it has, how it is to be used, where it is available, and anything else that might motivate them to seek it out and use it properly. This last issue of proper use is especially important with ORS. It is not enough to have ORS in every home. Unlike other products the consequence of improper mixing and administration of ORS is potentially life-threatening.

Finally, the implicit "P" in marketing is people: the consumer, the target audience, the potential user, etc. Marketing, more than any other delivery strategy, places emphasis on the consumer's needs, attitudes, constraints, and opportunities. It is practical, comprehensive, and integrated.

Problems In Creating Demand

Yet when all of these factors have been taken into consideration, constraints to effective utilization remain. Continual and reliable availability and accessibility are essential. Mothers may know about ORS but if it is not available and accessible to them, they will not be able to use it effectively. A second

barrier is a cultural one. A young mother may know and may want to use Orasol, but if her mother-in-law thinks it is not good medicine then it may be ignored. Another barrier may be taste. If you ask a group of mothers why they are not giving ORS to their children or if you ask some health providers why ORS is not so acceptable they may very likely say it is due to its taste. Yet, if ORS is sold by a health worker or a midwife who is accepted in a village this obstacle may be overcome. Frequently those who are not really using ORS are the ones who complain about the taste; those who are using it do not have such reactions.

Another strike against ORS is that it may be viewed as a government issued medicine. A drug given free by the government may not be viewed as being effective. On the other hand, the more expensive the medicine, the more it is perceived as effective. Indeed, in one particular culture, the more painful the injection the more acceptable the intervention.

As already noted, the lack of immediate relief from diarrhea is another barrier. It must be fully explained to the mothers that ORS is not to stop the diarrhea, but to replace the lost fluid. Unless she understands this crucial concept, she may administer ORS once and only once. If the diarrhea doesn't stop she will then perhaps turn to other medicines. This emphasizes the key concept of effective communication!

Also noted has been the issue of incorrect administration. Obviously lack of knowledge of how to give ORS correctly leads to reluctance in its implementation or its usage. If a doctor or nurse does not know how to use it correctly he/she will not be able to give the right amount within the right time. Therefore, the expected results will not be achieved and dissatisfaction will occur.

These examples point up the critical need for both training and education for both the service providers as well as for the consumers or the mothers.

In summary, successful communication programs have common characteristics including a well planned, systematic strategy and the utilization of various channels of communication. Usually, radio provides the widest coverage and a large number of people can be reached very quickly with a single message. Next in effectiveness is interpersonal face-to-face communication, largely through health workers but also through community leaders and community volunteers. This channel usually makes the message credible because it consists of people the target audiences know and trust. The third part of a commercial campaign is some key print or graphic materials. In one ORT program this was a very simple flyer providing graphic instructions for mothers which they could refer to at the time they needed it--when their child was sick. It was something that reminded them of ORT's effectiveness and even showed them how to mix a rehydration solution.

Also important is the careful selection and development of a few "actionable" messages--actionable in the sense that they have to be things that people can do. We can't promote, for example, a sugar/salt solution if people don't have access to sugar and salt. These messages involve repetition, selecting a few messages and staying with them over time, and repeating them time and time again until people have learned them.

Another crucial concept is that all of these elements must be part of a comprehensive ORT program. A communication strategy cannot exist in a vacuum. WHO and others in recent months have expressed a concern that communication can go too far ahead of an ORT program, generating demand for services that the health delivery systems are unable to supply. Therefore, all strategies must pay a great deal of attention to supply systems for oral rehydration salts, distribution systems, management systems, and so forth. It is only in this manner that well-designed marketing and communication strategies will further our program goals.

IX. WORKING GROUP SUMMARY AND CONCLUSIONS*

This meeting has reiterated the principles enunciated at the International Conference on Oral Rehydration Therapy (ICORT) held almost two years ago in Washington, D.C. First, there is agreement on the importance of diarrhea not only in its contribution to mortality but also its high cost to the health system and the toll in nutritional health that it claims from almost every child. Second, the validity of ORT has been underscored as a scientific and appropriate technology that can be applied effectively at all levels of the health system extending from university hospitals to the home. Advances continue to occur in this scientific area and one looks forward with great interest to the improvements which are heralded in the new oral rehydration technologies, particularly "Super ORS." Thirdly, there is unanimous agreement that the time to act is now and that implementation of wide-scale programs is the major challenge to all. Science must be taken to where diarrhea is.

Some key issues mentioned two years ago in concluding remarks at ICORT seem already resolved:

- The policy is there; commitment is strong in almost every country in the world; ORT is the accepted strategy for meeting the diarrhea problem.
- Once controversial, the critical central role of mothers in diarrhea management is now generally agreed upon by all. There is no question that therapy must begin at home.
- Once thought a second rate medicine to be used only where intravenous feeding was not available, it is now universally recognized that ORS is appropriate and desirable at all levels of the health system from the home to the hospital and that it provides improved clinical care as well as considerable cost savings.
- ORT far from standing by itself, has been shown to have a synergy with other programs. There is a oneness with primary health care and no longer the question of vertical versus horizontal programming.
- Finally, there is agreement that multiple pathways are essential to promote the ORS/ORT message. No single route is the correct or desirable one. We must mobilize networks of communications and distribution extending far beyond those of the fixed and formal health facilities if we are to extend this technology into every home in developing countries.

* Prepared by Jon Rohde, Management Sciences for Health.

But other vexing problems remain:

- The interactions of malnutrition and diarrhea are complex and the relationship a difficult one to break. Nutritional status is an important determinant of outcome in diarrheal disease and adequate attention to feeding is far from accepted among professionals and lay people alike.
- Strong professional and public resistance to simplified treatment for diarrhea is seen as a major impediment to its acceptance in countries throughout the world.
- While a few experimental efforts have shown the power and outreach of modern communications media, effective use of marketing approaches to ORT are yet to be widely implemented in most countries.
- In spite of efforts to measure acceptance and use, they have been largely unsuccessful in measuring the impact of efforts to promote ORT. Improved information systems are required both as a tool for management and self-improvement as well as to justify the resources allocated to established programs.

Throughout this meeting discussions centered on several major areas:

Implementation of Programs

ORT is an integral part of primary health care. In fact, ORT can become the leading edge of a primary health care strategy, perhaps the best and most practical of all, as it requires reaching into each and every home to change behavior. It uses and respects traditional practices, and it reinforces the entire system of referral which must be intact and function properly for an effective rehydration program. An ORT program leads to self-reliance at each level of the health system and dramatically demonstrates many of the principles of primary health care.

ORT can in no way be the monopoly of the health ministries, nor even of the health sector, but must borrow from the approaches used in other development sectors. The success of the Green Revolution has been largely attributed to the "training and visit" scheme, a focussed approach of supervisory and educational visits to villagers to introduce and assure proper use of modern agricultural techniques. Primary education and literacy programs have shown how to mobilize community leaders to promote mass education. In some countries literacy has reached remarkably high levels far exceeding the coverage of the health sector. ORT programs have mobilized mass media to reinforce the messages and change habits using radio and posters.

The private sector can produce, distribute and promote ORS. Vast numbers of outlets are possible through mobilization of existing private and commercial networks. Market segmentation (a range of prices for products which appeals to different levels of society) is a phenomenon well recognized by commercial firms and needs to be appreciated and adopted in ORT programs.

ORT needs an integrated strategy of implementation extending from the household solution to the use of ORS in university hospitals. There must be clear, prescriptive and solid pragmatic messages for home ORT. Not only the materials available to make home solutions must be considered but also the measurement of volume, equally important to the final composition. Volumes and measuring devices must be standardized and there must be single and unequivocal messages that will not compete with one another in the minds of the public. These messages should be reinforced in a consistent way at clinics and hospitals, all of whom should use ORS as a preferred treatment for diarrhea.

The present use of antidiarrheals and other inappropriate medications for the treatment of diarrhea is viewed as a major impediment to wide program acceptance. Where it has not been done already, restrictive controls on ORS should be removed, making it an over-the-counter drug. Meanwhile, efforts should be made to ban or restrict the use of antidiarrheals and other inappropriate medications.

Monitoring and Evaluation

Program monitoring is the "nervous system" by which managers correct themselves as they navigate towards an elusive goal. Monitoring and evaluation are not separate activities, but integral parts of program implementation. The top leaders and bureaucrats should develop a taste for solid data and be willing to pay the costs of that newly developed taste. Certain incentives are useful. Some countries will provide a paycheck at the end of the month in exchange for a monthly report form.

The data that are collected must be useful and visible. Targets must be set at each level and displayed in a visible way like graphs so that people can understand where they are going and how close they are coming to meeting those targets. Feedback is essential. It challenges the worker and provides clear goals and a measure of his/her own accomplishment and self-esteem. One group said, "Monitoring is a linkage of the worker to the system, and it makes him feel a part of the organic whole of that system."

Monitoring must be simple, based only on key indicators, which may change over time. It may start with hospital data and some sentinel area data at the outset accepting all the weakness that implies. Sales of packets offer a crude indicator of use,

probably a better one than free packets that are more often allowed to decay without use. But if people are buying ORS they are probably using it. As home ORT increases, ORS sales may actually go down.

Effective use is of particular concern. The proper balance of fluid input must replace the output in the diarrhea case. Thirst is a good measure for replacement needs, and the output of urine is a sign of adequate hydration of the child. But how does one measure this in a monitoring system? Can we measure quantity used? Can we measure percent of people dehydrated appearing at the clinics? Can we measure deaths?

To the extent possible information gathered should be integrated. It should be selective and limited. Supervisory systems verify data and check in homes as well as clinics to see how progress is going. The cluster sample survey is a good technology that really deserves more use.

Other Interventions

Interventions other than ORT are an important strategy that must be integrated into ORT programs. All these interventions require behavioral change; all of them depend on the quality of interaction with the people to be served. It is no longer possible to eradicate disease simply by good epidemiology or by delivering injections. The consumers have to be involved.

Beliefs and Practices Among Clients and Health Professionals

This meeting has shown a remarkable respect for traditional beliefs and behavior, one not often seen at conferences of a scientific nature. It is important to build upon what people know, to avoid ridicule, and to enhance people's self esteem. There is a particularly strong respect for the role of women and a recognition that they are critical to the success of any health effort such as ORT.

There is commitment to build on what is best, drawing on local wisdom in attempts to introduce improved ORS made at home from cereal and encourage the use of other home fluids. There is tolerance for what is harmless, letting people find in ritual the solace and humanitarian sympathy so often lacking in scientific medicine. At the same time there is a realization that even harmful practices can change with careful explanation and reassurance. Taking science to the people can be done with patient understanding of what they know, accepting their concerns, an appropriate tailoring of messages, and demonstration that it works. The proof is in the drinking and when they have seen and experienced for themselves they'll tell each other. Good news, contrary to popular proverbs, often travels fast.

Traditional healers, the alternative providers of care, who, in many societies are sought earlier and more frequently in response to illness, play an important role. They are accessible, affordable, acceptable, and available and generally their advice is applicable and practical. They or their ways are no longer denigrated or overly criticized but attempts have been made to recruit them to support ORT technology. By entering into a sympathetic dialogue with their leaders, traditional healers will convince each other that they can adopt ORT in their own practice. They too will see that it works and use it. The rising tide of enthusiasm will carry them along as well.

The health professionals are at once both the critical factor and the most problematic when it comes to traditional attitudes and practices. Difficult as it may seem, they must be involved, for where ORS has gone well, health professionals have led the way and where ORT programs have not been accepted or are weak, it has often been because of attempts to circumvent the medical profession.

Professional Resistance

Much more attention is needed to the medical curriculum where basic habits in health care are formed. While acute diarrhea may be viewed as a "messy disease", medical educators can be convinced to use diarrhea as an important teaching example illustrating the spectrum of human physiology, infectious disease, microbiology, and the application of modern science to perplexing problems of society. In short, the prestige of ORT must be built within the medical curriculum. Overall, ORT can extend from the basic sciences in the medical curriculum to the social and community sciences.

Students must be involved, responsible and experienced in the field implementation of ORT. Most importantly, they should be examined on ORT, for unfortunately, it is the final exam which often determines what students will study and retain. Hopefully, future medical students will leave their formal education feeling the truth of the Lancet accolade that this is "potentially the most important medical advance this century."

Medicine is a lifelong education process and the importance of "continuing education" for practitioners through meetings and literature must be underscored, with special attention by professional societies to upgrading their colleagues' skills and knowledge with selected medical literature. The major source of continuing education for doctors is the detail man, the representatives of drug companies promoting products. ORS needs to be actively and aggressively promoted with a message that is understood and accepted by professionals around the world.

Government administrators and other lay decision makers need an in-depth understanding of the potential impact of ORT. They must be helped to realize the implications for achieving national goals in infant mortality reduction and the great political advantage of a successful and widespread ORT program. ORT is an egalitarian and politically attractive program which can be promoted by nonhealth personnel for a wide variety of reasons.

Creating Consumer Demand

A consumer oriented communication support strategy is an integral part of the most successful programs existing in the world today. With demand creation at the periphery, there must be a parallel development of a distribution system adequate to meet the demand. The particular value of home solutions is in their increased availability and affordability and the integration of a home solution strategy as part of an overall ORT message. Appeals to consumers should be multichannel, comprehensive, consistent, and mutually reinforcing through the different message delivery routes.

Social marketing is a new approach to advancing socially desirable behavioral change and consumer strategies. Unlike some marketing efforts, ORS marketing requires far deeper behavioral change which will take more complex, more controversial, and more difficult marketing efforts than simply the choice of a brand of soap or toothpaste. The prime audiences are the poor and disadvantaged who are most difficult to reach. It is important to focus on activities where results are predictable. For example, the diarrhea accompanying measles is among the most fatal and harmful to nutritional status and yet this disease can be eliminated with a single vaccine. The most important determinant of diarrhea in the first year of life is breast-feeding which can be encouraged through rooming in, enforcement of the infant formula code, and banning the presence of bottles in clinics and other health facilities. Breastfeeding saves lives. Handwashing, particularly with the use of soap, can be encouraged even where piped water is not available. A reduction in cholera and shigella has been shown with this simple intervention alone.

"Super ORS" is anxiously awaited. Cereal companies will be encouraged to turn away from infant formula and prepare infant cereal ORS, a nutritious electrolyte replacement drink effective in all cases of diarrhea which shortens the duration of diarrhea and offsets the nutritional effect. Homemade "super-ORS", already available in Bangladesh, will be developed for each country with an appropriate nutrient mix.

The ultimate goal of ORS planners is that everybody should use ORT for every episode of diarrhea. Whether ORS is necessary is another question. Until the drinking of fluids for diarrhea is a culturally acceptable practice around the world, it will be necessary to promote the concept of drinking during diarrhea.

The commercial principles are important for marketing ORS/ORT. Price does make a difference, and it can make a product attractive. Competition is good for promotion; a different products mix is useful. There are multiple product for multiple economic levels. A diversification of price and product does seem to be appropriate. Incentives are helpful when sales are at stake.

Summary

In summary, the meeting was notable in several ways. First, was the realization that all Asian governments represented at the meeting are already committed to ORT programs. No longer is it necessary in Asia to discuss the "what" or "whether" of ORT but rather it is necessary to concentrate on the "how to" of implementation. Second, was the consensus that the goal of universal coverage with ORS presents a complexity of problems, which must be met with a multiplicity of solutions. There is a need for both government and private sector activities, as well as contributions from disciplines as diverse as anthropology, economics, marketing, and medicine. Last, the view of the future holds promising developments in ORS to expand availability and utilization. The Asian countries represented at the meeting rank highest in the world in availability and use of ORS. With this momentum, the Asia region will be able to achieve the goal of doubling the use of ORS each year for the next five years and near universal availability before the target date of 1993.

AGENDA

Asia ORT Meeting

Sunday, March 17, 1985

4:00 - 5:00 pm REGISTRATION

5:00 - 7:30 pm INAUGURATION AND RECEPTION

Monday, March 18, 1985

8:30 - 10:30 pm PLENARY SESSION: Anne Tinker, Agency
for International Development, Conference
Moderator

- ° Introductions, Jack LeSar, PRITECH
- ° Presentation: New Directions in Oral
Rehydration Therapy
Jon Rohde, MSH
- ° Panel Discussion: Program
Implementation Issues
Jack LeSar, PRITECH, Overview, Strategic
Planning
Jon Rohde, MSH, Administration and
Management
Richard Cash, Harvard University, Program
Options: ORS Packets or Home Mix
Mr. Sudahkar, Planning Commission, India

10:30 - 11:00 am BREAK and Per Diem Payments

11:00 - 12:15 pm SMALL GROUP DISCUSSION ON IMPLEMENTATION

12:15 - 1:30 pm LUNCH

1:30 - 3:00 pm PLENARY SESSION

- ° Presentation: Monitoring and Evalu-
ation of ORT Programs
Richard Cash, Harvard University
Sawat Ramaboot, Ministry of Public
Health, Thailand
Bambang Winardo, CDD, Indonesia
Enriqueta Sullesta, Task Force on
Diarrheal Disease, Philippines

3:30 - 3:15 pm BREAK

3:15 - 5:00 pm SMALL GROUP DISCUSSION ON MONITORING
AND EVALUATION

Asia ORT Meeting

Tuesday, March 19, 1985

- 9:00 - 9:45 am PLENARY SESSION
- Panel Discussion: Implementation - The Donors' Perspective, Anne Tinker, AID, Moderator
- Michael Merson, WHO
William Goldman, AID
Robert Clay, AID
Anthony Kennedy, UNICEF, Dhaka
- 9:45 - 10:15 am Presentation: Diarrhea Disease Control: Potential Interventions
Michael Merson, WHO
- 10:15 - 10:30 am BREAK
- 10:30 - 12:00 pm SMALL GROUP DISCUSSIONS ON POTENTIAL INTERVENTIONS FOR DIARRHEAL DISEASE CONTROL
- 12:00 - 1:00 pm LUNCH
- Afternoon Field Trips to the Following:
- 1:00 - 4:00 pm
- Bangladesh National ORT Rehydration Program
 - ICDDR,B
 - BRAC
 - PSI Social Marketing Program, Bangladesh

Asia ORT Meeting

Wednesday, March 20, 1985

9:00 - 12:00 am PLENARY SESSION

- Overview, Urban Volunteers Program
Bonnie Stanton, ICDDR,B
- Field trip to Urban Volunteers Program

12:00 - 1:30 pm LUNCH

1:30 - 3:00 pm PLENARY SESSION

- Presentation: Ethnographic Findings
Regarding Treatment of Diarrhea
Najma Rizvi, ICDDR,B
Edward Green, Washington, D.C.
- Presentation: Professional Resistance
to ORT
Cecilia Versoza, Kabalikat ng Pamilyang
Philipino, Philippines
Mushtaq Khan, Jinnah Postgraduate
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3:00 - 3:15 pm BREAK

3:15 - 5:00 pm SMALL GROUP DISCUSSIONS ON ETHNOGRAPHIC
RESEARCH AND PROFESSIONAL RESISTANCE;
REVIEW OF ANY OUTSTANDING ISSUES FROM
PREVIOUS DISCUSSIONS

EVENING

7:00 - 9:00 pm Dinner Program

Asia ORT Meeting

Thursday, March 21, 1985

- 8:30 - 10:00 am PLENARY SESSION
- ° Panel Discussion: Creating Consumer Demand
Mark Rasmuson, PRITECH Public Education & Communication
Terry Louis, PSI, Social Marketing
William Schellstede, PSI, Social Marketing
Enriqueta Sullesta, Task Force on Diarrheal Disease, Philippines
- 10:00 - 10:15 am BREAK
- 10:15 - 11:30 am SMALL GROUP DISCUSSION ON CREATING CONSUMER DEMAND
- 11:30 - 1:00 pm CLOSING SUMMARY SESSION
- ° Reports from Groups I - IV
 - ° Summary, Jon Rohde, MSH
- 1:00 - 2:30 pm Buffet lunch sponsored by PRITECH

Asia ORT Workshop
March 17-21, 1985 Dhaka, Bangladesh

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March 17-21, 1985, Dhaka, Bangladesh

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POTENTIAL INTERVENTIONS*

The major conclusions regarding 15 interventions are summarized in this table. Broadly speaking, the interventions may be divided into 4 groups:

Group 1	Promotion of breast-feeding Measles immunization Water supply and sanitation Promotion of personal and domestic hygiene	Effective interventions (which are thought or known to be feasible and affordable) requiring implementation and supporting research
Group 2	Improving weaning practices Rotavirus Immunization	Interventions likely to prove cost-effective, but requiring further research before operational recommendations can be made
Group 3	Prevention of low birth-weight Use of growth charts Cholera immunization Food hygiene Control of zoonoses Epidemic control	Interventions of uncertain effectiveness requiring more research
Group 4	Enhancing lactation Supplementary feeding programmes Chemoprophylaxis Fly control	Ineffective or excessively costly interventions that are not priorities for diarrheal diseases control

Analyses of child spacing and vitamin A supplementation are not sufficiently advanced to indicate to which of the above groups they will be assigned.

* For more detailed discussions of these interventions please see R. G. Feachem, R. C. Hogan and M. H. Merson, "Diarrhoeal Disease Control: Reviews of Potential Interventions", Bulletin of the World Health Organization, Vol. 61, Issue 4, 1983 and subsequent volumes.