



Technologies for Primary Health Care

## Field Implementation Aids

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# PRITECH

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PRITECH is pleased to present this series of 12 field implementation aids, which is designed to aid PRITECH field staff and others in providing technical assistance to diarrheal disease control (CDD) programs. The papers cover a wide range of topics that are important to the implementation of CDD programs and efforts. They were written by PRITECH staff and PRITECH consultants who were selected for their knowledge and expertise in the subject areas of the papers. The series includes the following 12 implementation aids:

CASE MANAGEMENT IN DIARRHEAL DISEASE CONTROL PROGRAMS

INCORPORATING DYSENTERY MANAGEMENT INTO DIARRHEAL DISEASE CONTROL PROGRAMS

PREVENTIVE ANTIDIARRHEAL INTERVENTIONS

STRATEGIES FOR TRAINING HEALTH WORKERS IN NATIONAL CDD PROGRAMS

LOCAL PRODUCTION OF ORAL REHYDRATION SALTS

SUPPLY MANAGEMENT AND DISTRIBUTION FOR CDD PROGRAMS

PROMOTING COMMERCIAL SALES OF ORAL REHYDRATION SALTS

CDD ALLIES

COMMUNICATIONS IN SUPPORT OF CDD PROGRAMS

ENSURING THE SUSTAINABILITY OF CDD EFFORTS

PROGRAM PROBLEM-SOLVING STUDIES FOR CDD PROGRAMS

ACUTE RESPIRATORY INFECTIONS: SUMMARY FOR CDD PROGRAMS

Papers on Nutrition in CDD, Persistent Diarrhea, and Monitoring and Evaluation will be available in 1991.

PRITECH hopes that you will find the implementation aids to be informative and useful to field staff. The PRITECH Information Center welcomes requests for additional copies of the papers; requests should be addressed to the PRITECH Information Center at the above address.

**PRITECH FIELD IMPLEMENTATION AID**

**CASE MANAGEMENT  
IN DIARRHEAL DISEASE CONTROL PROGRAMS**

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This paper is one of a series designed to aid PRITECH field staff in providing technical assistance in diarrheal disease control efforts and programs. It was edited by PRITECH primarily to incorporate the comments made by field staff and technical consultants.

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## **CASE MANAGEMENT IN DIARRHEAL DISEASE CONTROL PROGRAMS**

### **A. RATIONALE**

About one in every ten children born in developing countries dies of diarrhea before the age of five - some four million children per year.<sup>1</sup> It is estimated that two-thirds of these deaths are the result of excessive fluid loss - that is, acute dehydration. The remaining deaths are attributed to the nutritional consequences of persistent or recurrent diarrheal episodes, to associated infections (such as measles or pneumonia), and to complications resulting from certain severe types of diarrhea (particularly dysentery). Most deaths can be prevented by the appropriate use of interventions that are accessible and affordable to developing countries. Both diarrheal mortality and diarrheal morbidity can be reduced through appropriate case management at the household and the health facility level.

At the household level, appropriate case management is defined as:

- 1) the early administration (starting at the onset of the episode) of available fluids in amounts that are adequate to replace ongoing fluid losses;
- 2) continued feeding (including breast-feeding) throughout the diarrheal episode, followed by increased feeding during convalescence; and
- 3) prompt referral of severe and complicated cases to trained health care providers.

At the primary health facility level, appropriate case management includes:

- 1) the proper assessment of the child with diarrhea, including the determination of hydration status, identification of relevant risk factors, and detection of associated problems;
- 2) the correct treatment of dehydration with oral rehydration salts (ORS) solution or (in a small percentage of cases) intravenous rehydration solution;
- 3) the appropriate use of antibiotics for specific indications (dysentery or cholera);
- 4) effective communication with the caretaker regarding instructions for home care and recommendations for diarrhea prevention; and
- 5) the referral of complicated cases to the next level of care.

The objective of case management in diarrheal disease control is to directly decrease the morbidity and mortality associated with the illness. While preventive interventions such as the provision of clean water and improved sanitation are appropriate activities that will contribute

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<sup>1</sup> WHO Report of World Health, September 25, 1989.

to reducing morbidity and mortality in the long run, the case management approach permits countries to address the immediate burden of diarrheal diseases in children.

Although the promotion of breast-feeding, continued feeding and the appropriate treatment and referral of complicated cases have always been among the objectives of CDD programs, most programs initially focused predominantly on the oral rehydration therapy (ORT) component of appropriate case management. This was reasonable since acute watery diarrhea accounted for most of the diarrhea cases presenting to health facilities and the majority of diarrheal deaths. As programs achieve their goals of increasing the early use of oral rehydration in the home and decreasing dehydration-associated mortality, the proportion of all diarrheal deaths (and of diarrhea cases presenting to health facilities) attributed to dysentery or to persistent diarrhea appears to have increased. At the same time additional data have become available that document the importance of feeding to the prevention and treatment of diarrhea. Consequently many programs that started out as "ORT programs" are recognizing the need to develop more comprehensive case management strategies.

A comprehensive case management strategy must address all levels of the health care system. At the household level, CDD programs must assure that mothers understand the importance of fluid replacement and feeding and know when to refer a sick child to a health worker. At the community level, health workers must be trained to recognize and treat the different levels of dehydration, to communicate with mothers, and to refer cases requiring additional treatment. At the higher level health facilities, physicians and other health personnel should be capable of correctly treating all cases, including the more severe and complex cases that are referred to them. This ability cannot be assumed, but often requires a major CDD training effort in clinical case management.

### **B. EXPERIENCE AND ISSUES**

Much has been accomplished in CDD worldwide since WHO established the CDD Programme in 1980. USAID, WHO, UNICEF, and other donor organizations have joined forces with ministries of health in developing national CDD programs and strategies to combat diarrheal disease. Through increased access to and effective use of ORT, training of health workers in correct case management, promotion of continued feeding during diarrhea, education of mothers about home management and prevention, and appropriate referral of severe or complicated cases, CDD programs have worked to reduce mortality due to diarrhea.

While it is difficult to measure the impact of CDD programs on diarrhea-associated mortality, the success of CDD programs' efforts in promoting the use of ORT in the home, for example, is perhaps most evident in the reduction in the number and severity of diarrhea cases presenting to health facilities in many areas. Many hospitals with traditionally large caseloads of dehydrated children have closed their diarrhea wards due to lack of patients, who are now being successfully rehydrated in the home. While much progress has been made in CDD, it is useful to analyze critically a number of major issues facing CDD programs.

In order to achieve appropriate case management at the different levels of the health care system, CDD programs must make a series of interrelated programmatic decisions and take specific programmatic actions on a variety of issues. These decisions and actions must focus not only on technical concerns, but also on the resource and personnel costs as well as on the logistical considerations of various options. The following sections summarize some of the main issues related to developing and implementing a comprehensive case management strategy.

### 1. Choice of Fluids for Household Management

The initial household management strategy of most CDD programs focused on assuring that all children suffering from diarrhea would receive either Oral Rehydration Salt (ORS) solution, or a liquid with a sodium and glucose concentration similar to that of ORS (usually sugar-salt solution). However, some CDD programs are reconsidering this initial strategy in light of:

- a) The recognition that standard ORS solution is not needed to prevent dehydration in most diarrhea cases. The electrolyte content of the fluid administered is much less critical than the practice of giving fluids early in the episode and in adequate amounts.
- b) The realization that, for financial and logistical reasons, the availability of ORS packets at the household level cannot be assured and sustained in most developing countries.
- c) The documentation of significant errors in caretaker mixing of sugar-salt solution (SSS) and substantial dropoff in recipe recall over time.

In some countries, CDD programs have made unclear or conflicting recommendations regarding which fluids should be used for initial management (for example, promoting both ORS packets and SSS). This situation has led to difficulties in logistics, training, and communications.

Many countries are considering changing their household management strategies and recommending that all diarrhea episodes be initially managed with fluids that are commonly available in the home (home fluids) and that are traditionally used for the treatment of diarrhea. Recent data documenting a decrease in stool output and in diarrhea duration with the use of cereal-based ORT has increased interest in recommending home-made food-based fluids for initial household management. Commercially manufactured ORS packets would be reserved for more severe cases and/or for cases presenting to health facilities.

Countries considering this basic change in strategy are then faced with the task of identifying safe and appropriate fluids that are likely to be used in adequate volumes during diarrhea. The hope is that these home fluids when given with food, are physiologically adequate to prevent dehydration, while offering advantages of increased availability, acceptability and ease of preparation.

## **2. The Relationship Between the Home and the Health Facility**

When policies for the household management of diarrhea are formulated, they are intended to target caretakers of young children before they present to a health worker. However, many children with no or mild amounts of dehydration are brought to health facilities for consultation. Policies about the management of children who present to health facilities without signs of dehydration are frequently unclear. Should the non-dehydrated child actually be given ORS solution before leaving? Should the mother be given an ORS packet and instructions, or is it preferable to reinforce recommendations about the use of fluids that are available in the home?

## **3. Dysentery and Persistent Diarrhea**

The combination of fluids and feeding is the most important intervention for all types of diarrhea, and the only intervention that is necessary for acute watery (non-cholera) diarrhea. In some countries, bloody diarrhea (dysentery) and persistent diarrhea (of greater than 14 days duration) are significant problems that contribute disproportionately to diarrhea mortality. In addition to correction of any accompanying dehydration, these subtypes of diarrhea require special management and follow-up. Most CDD programs have limited strategies for addressing these more complicated illnesses. (See the papers on dysentery and persistent diarrhea for a comprehensive discussion.)

Another problematic area in the relationship between home management and health facility management is in defining appropriate indicators for referral. Approaches to this topic range from programs that advise mothers to seek help if the child "does not get better", to programs that try to teach mothers to recognize the 12 WHO indicators of dehydration and several additional indicators such as blood in the stool, high fever, and duration greater than a specified number of days. Very few programs have based their referral recommendations on knowledge of the sensitivity and specificity of different indicators when applied by caretakers at the household level.

## **4. Feeding During Diarrhea**

Recent scientific data have demonstrated that feeding during diarrhea not only reduces weight loss and growth faltering, but also enhances the absorption of fluids from the intestine, thereby reducing stool output and shortening the duration of the diarrhea. Unfortunately, efforts to promote feeding during diarrhea have been less successful than efforts to make caretakers aware of and encourage them to try oral rehydration therapy. Most educational materials simply recommend continued feeding during diarrhea, and extra feeding during convalescence. Few programs have undertaken studies to determine which locally consumed foods are currently used in managing diarrhea, and which of these are most culturally acceptable. Little is known about effective methods to encourage caretakers to offer food, and to coax children to accept food during diarrhea. Until these data are available, most programs will be unable to make informed and specific recommendations, and their messages will be incomplete and less convincing to mothers.

Clearly, malnourished children with diarrhea are more likely to be admitted to hospital. Yet, in many facilities, food is not provided to children; feeding is left to the parents, who are often far from home and from convenient sources of food. The result is that these patients are fed inadequately, even in the hospital setting.

#### **5. Communicating With Mothers**

The mother (or other caretaker) is the most important health worker in diarrhea management. It is the mother who gives the sick child fluids and food; it is the mother who must recognize the signs of dehydration or severe disease and bring the child to a trained health worker. Communicating effectively with mothers about appropriate household management is thus critically important to the success of a CDD program.

Unfortunately, many CDD training courses and most medical and nursing school curricula place priority on technical skills and procedures: determining the level of dehydration, prescribing the correct quantity of fluids, inserting a naso-gastric tube, managing complications, etc. Activities to teach personnel how to communicate effectively with mothers receive superficial and limited attention. Supervision of clinical case management usually ignores communication completely. In clinic registers, drug or ORS prescriptions are often recorded, but provision of information to the mother normally goes unnoted.

#### **6. Obstacles to Implementing Appropriate Case Management**

Although the efficacy and advantages of oral rehydration and feeding during diarrhea have been scientifically demonstrated and well documented, reviews of CDD programs indicate that physicians are often obstacles to the implementation of appropriate case management. It is difficult to motivate nurses, paraprofessionals, and other health workers to adopt responsible case management practices when their physician supervisors and teachers continue to prescribe ineffective and dangerous antidiarrheals, multiple antibiotics and unnecessary intravenous solutions. In some places, efforts to set up diarrhea training units (DTUs) have been obstructed by pediatricians who refuse to allocate funds, space, or personnel.

#### **7. Irrational Drug Use**

The overuse of antibiotics and antidiarrheals in diarrhea management, whether they are obtained over-the-counter or prescribed by physicians, is a world-wide problem. Many ministries of health actually supply ineffective antidiarrheals to their treatment facilities. This practice not only results in an unnecessary financial drain on limited budgets, but also undermines ministry efforts to train health workers in appropriate diarrhea management. Many countries have been successful in removing some of these drugs from Ministry procurement lists but it is unclear whether this action has had an impact on the use of these drugs.

The use of antidiarrheal drugs is dangerous as well as wasteful. For example, anti-motility or anti-peristaltic drugs may lead to paralysis of the intestine (paralytic ileus), a potentially fatal complication. The prescription of antibiotics, except in limited well-defined circumstances, is useless, may be harmful, and promotes antibiotic resistance. Furthermore, drug use engenders

the expectation of a "cure by pill," thereby distracting both mothers and health care providers from needed fluid and feeding therapy.

Many health workers say that they must prescribe drugs for children with diarrhea "because the mother demands them." Training courses for health workers could include instruction and practice in the communication skills needed to convince mothers that oral rehydration together with feeding, and not drugs, are the best treatment for diarrhea. Unfortunately, such training is often weak.

In some places, informal relationships between doctors and pharmacists (or the direct sale of drugs by doctors) create economic or political incentives for prescription of expensive pharmaceuticals. Such relationships should be vigorously opposed by ministries, but this is a delicate subject for outsiders to promote and may be difficult to control in the private sector.

## **8. Training of Health Workers**

The numbers of health workers who have completed CDD training courses are far greater than the numbers providing effective case management. Studies show a clear gap between training and performance. Clearly, performance depends not only on receiving training, but on the quality of the training, on the reinforcement of what is learned in training, and on being able to apply and implement what is learned in the trainees' work settings.

A number of countries have established large and well-equipped national diarrhea training units (DTUs), that are the sites of intensive courses for physicians and senior-level workers. Other countries attempt to provide clinical training through smaller, hospital-based ORT units. Courses in both types of facilities include varying amounts of direct experience in managing diarrhea cases.

The training of middle-and lower-level health workers usually takes place in one to three day workshops that consist primarily of didactic sessions. There are often many more participants than patients available for practice; indeed, it is not unusual for such courses to take place in locations where there are no patients at all. Topics other than fluid therapy and drug use may be given inadequate attention. There is often little or no follow-up to reinforce or evaluate the training or to encourage application of what was learned. Health workers who attend these courses are then expected to train their peers as well as the next lower level of health workers.

Not surprisingly, this type of "training" often fails to produce the desired results. The expected "trickle down" of teaching may not occur and information may not reach the ultimate beneficiaries, the mother and child.

## **9. The Limited Reach of the Public Sector**

In many countries, less than 20% of the population receives its health care from the public or government sector. The private sector, including a variety of traditional and allopathic healers, provides care for most acute illnesses. Yet, CDD programs often focus solely on

services provided through the Ministry of Health. Such strategies drastically limit the potential impact of the program on reducing diarrheal morbidity and mortality.

### C. OPTIONS FOR ACTION

A number of options are open to CDD programs for addressing the policy and implementation issues discussed above. The options include specific policy decisions, measures intended to increase access to appropriate treatment for diarrhea, as well as measures to improve the quality of case management.

#### 1. Developing a Strategy to Promote Fluid Replacement

The title of this section is intentionally not "The choice of fluids for home management" because the issue of which fluids to recommend should not be considered in isolation from other aspects of case management. The different aspects of appropriate household management must be coordinated with each other. It is recommended that an individual country's strategy be developed through a careful decision process involving experts in diarrhea case management, communication, cultural issues and nutrition. The first three "options for action" address the major decisions that an "expert panel" of this type must make in designing or clarifying a strategy for the household management of diarrhea.

##### 1a. Promoting Extra Fluids

The first step in developing a comprehensive household management policy is to decide how the program will attempt to communicate the importance of giving increased volumes of liquids together with food during diarrhea, and the idea of balancing fluid losses with fluid intake.

Although many CDD programs have been effective in achieving high levels of awareness and high ever-use rates for either ORS or SSS, they have consistently been much less successful in achieving effective use of ORT. Studies and evaluations that inquire about the volume of ORS or SSS administered indicate that most caretakers administer small, medicinal doses. Health workers who educate caretakers about household management may talk about mixing but rarely emphasize the volume of fluid or the importance of feeding. One of the arguments for promoting fluids that are available in the home (rather than ORS or SSS) for the initial management of diarrhea is that educational messages can then focus on the concept of replacing fluids and on continued feeding rather than on the preparation and promotion of a product.

There is a tendency for programs to "skip over" this step, assuming that the individuals who design the educational materials and the communication materials will work out a way to encourage caretakers to give adequate amounts of fluids. However, the strategy for communicating the critical concept of replacing diarrheal losses by giving extra amounts of fluids with food must be given priority and attention by decision makers.

A number of different communication approaches have been used or may be considered. One of the most commonly used is a direct physiologic explanation: the water lost during diarrhea causes the body to "dry out"; to prevent this drying out, "fluid in" must balance the "fluid out"; giving food along with the fluid will help the diarrhea stop sooner. The problem with this approach is that it often conflicts with existing beliefs about the proper treatment of diarrhea, and with the common perception that giving extra fluids leads to vomiting or increased diarrhea, (and that therefore the only way to prevent the body from drying out is to reduce liquid intake). Programs choosing the strategy of a physiologic explanation must also address these concerns and perceptions.

Other creative strategies which have been used refer to local concepts of maintaining the balance of body fluids or draw the connection between giving an adequate volume of fluids and maintaining strength or appetite. Analogies using familiar objects may also be helpful in communicating the idea of fluid replacement or maintaining fluid balance and of the idea that giving food helps to stop the diarrhea. Some ideas for appropriate analogies might be elicited during training sessions or through contests offering a small prize for the most appropriate entry.

#### **1b. Regional or National Recommendations**

The second step in developing a strategy to promote fluid replacement is to decide whether the selection of specific fluids to be recommended during diarrhea is to be made on a regional or national level. This decision will require a review of available data regarding the variation in beliefs and practices related to diarrhea, access to ORS packets and health facilities, and the availability and use of different ingredients of rehydrating fluids between and within different parts of the country. Where variation is significant, recommendations regarding specific fluids to be used for the initial household management of diarrhea may be made on a regional level.

#### **1c. Choice of Recommended Fluids**

The critical behavior that the CDD program should seek to promote during the initial home management of diarrhea is the administration of increased volumes of fluids. Given that some fluids are likely to be better than others in preventing dehydration, and that mothers and health workers will need some guidance regarding which fluids are best, the program should recommend specific fluids that are good to give during diarrhea. There are four basic options for recommended fluids: ORS packets for all diarrheal episodes, special recipe ("ORS-like") home fluids, home fluids as they are typically prepared, or generic "fluids" at the onset of diarrheal episodes, and either SSS or ORS for more severe cases.

#### Option 1: ORS for Initial Household Management

Some countries have adopted a policy of using ORS for all diarrhea cases, both in homes and in health facilities, both for prevention and treatment of dehydration; Egypt is an example. Prerequisites for considering such a policy include high coverage of the population by health facilities, and/or village health workers, and/or pharmacies or stores, all of which can be reliably supplied with packets throughout the year. Few developing countries have reached

this extent of coverage and level of logistical capability. If the government is to supply the ORS free of charge, the burden of recurrent cost must also be considered.

The advantages of recommending ORS for the household management of diarrhea include:

- Ease of preparation in comparison to SSS and other special recipes (only one ingredient - water - must be measured);
- Efficacy in treating as well as preventing dehydration;
- Possible fulfillment of the perceived need for "a special medicine".

The disadvantages of recommending ORS for the initial management of diarrhea include:

- Limited availability because of financial and logistical requirements;
- Refusal of ORS by children who are not dehydrated;
- Unwillingness of caretakers to use a packet for mild episodes or from the onset of symptoms.

#### Option 2: "ORS-like" Fluids for Initial Household Management

"ORS-like" fluids are prepared from a recipe that is intended to yield a sodium concentration similar to ORS. Sugar-salt solution (SSS) is the most popular "ORS-like" fluid. However, it is also possible to prepare "ORS-like" fluids using carbohydrates or proteins instead of glucose. An example of this would be rice-based ORT. Many countries, including most African countries, have promoted SSS for home use during diarrhea. The use of rice-based ORT is currently being promoted in parts of Bangladesh.

The difficulties that country programs have had with SSS have been mentioned earlier. It is clear that a home fluid policy that relies on the use of an "ORS-like" fluid will require an effective initial communication and education program, and repeated reinforcement of the messages giving mixing instructions. Face-to-face communication between mothers and health workers must reinforce the mass media messages. WHO currently recommends against developing special recipes for ORS-like fluids because of difficulties encountered in implementing this policy. Given the problems seen to date, CDD programs which choose an "ORS-like" fluid strategy should plan to survey mothers periodically to monitor the accuracy of preparation.

The advantages of "ORS-like" fluids for the household management of diarrhea include:

- Some efficacy in correcting dehydration as well as in preventing dehydration;

- Less expensive and more easily available than ORS packets;
- With food-based "ORS-like" fluids, possible reduction in stool output and diarrhea duration, in addition to replacing fluid losses.

The disadvantages of "ORS-like" fluids include:

- Need for intensive educational efforts to teach and sustain knowledge of recipes;
- Varying availability of ingredients from season to season and among different regions of the country;
- Possibility of caretakers mistakenly assuming that food-based ORS is "food", resulting in failure to feed during diarrhea and, consequently, an overall decrease in nutrient intake.

### Option 3: Unmodified Home Fluids for Initial Household Management

The important actions to be taken early in diarrhea are giving plenty of fluids, including breast milk, and continuing to feed. The exact composition of the fluids is not so important at this early stage before dehydration has set in. For that reason, some programs are considering a change in policy to stress the administration of extra fluids during diarrhea. They would choose a few fluids that are commonly available in the home, and acceptable to give to children in large amounts during diarrhea, as examples of fluids that are "good to give". The fluids would be recommended as they are usually prepared. No new or altered recipes would be promoted. Caretakers would be advised to bring children who develop signs of dehydration or severe disease to a provider of ORS.

The procedure for selecting recommended home fluids would be a process of elimination. All fluids known to be commonly available at the household level (including ORS and including water) would be considered as candidate home fluids. Fluids that are known to be culturally unacceptable for use during diarrhea would be eliminated. Similarly, fluids known to contain or be prepared with a high sodium concentration or a high osmolality would also be eliminated. Fluids about which there is concern regarding unknown pharmacological properties (such as local teas and remedies made from plant products) would not be considered. If the remaining list of candidate fluids is long (more than six items) preference would be given to fluids that contain some salt and to food-based fluids.

The advantages of unmodified home fluids for initial household management include:

- Simplified messages, permitting the program to emphasize fluid replacement instead of a rehydration product;
- Elimination of financial and logistical barriers to appropriate initial household management;

- Encouragement of caretakers to begin fluid replacement early in the episode.

The disadvantages of unmodified home fluids include:

- Possibility of decreased efficacy in treating dehydration compared to ORS or "ORS-like" fluids;
- Need for knowledge about which fluids are available and acceptable for use during diarrhea;
- Lack of the appeal of a "special medicine".

Option 4: Home Fluids to Prevent Dehydration  
and ORS or "ORS-like" Fluids to Treat Dehydration

Many programs have developed a multi-level approach to the use of fluids during diarrhea. The typical pattern is to recommend the use of any fluid at the onset of diarrhea, ORS or SSS if mild signs of dehydration develop or if the diarrhea persists beyond a specified number of days, and referral if more severe symptoms develop. This multi-level approach makes sense from a physiologic point of view, but it is a communications "nightmare". The approach requires not only teaching caretakers how to mix and administer ORS or SSS, but it also necessitates assuring that caretakers can distinguish between the three different levels of illness, and that they know which home fluids are "good to give" during diarrhea. This violates a basic principle of public health communications -- to keep the messages as simple and specific as possible.

The advantages of the multi-level approach to home fluid management include:

- Physiological soundness in terms of directing the use of ORS or "ORS-like" solutions for children with symptoms of dehydration;
- Provision of a number of options to caretakers in case one of the recommended fluids is rejected by the child or is unavailable.

The disadvantages of the multi-level approach includes:

- Remaining logistical and financial problems of assuring the availability of ORS or the task of teaching and reinforcing recipes for the preparation of "ORS-like" fluids;
- Need for multiple and complicated communications messages;
- Increased risk of failing to communicate the most important message -- that of administering increased amounts of fluid.

## **2. Coordinating Home Management with Health Facility Management**

The treatment of children who present to health facilities with diarrhea-induced dehydration is usually clear and non-controversial: most children are orally rehydrated with ORS solution and feeding is continued; children who are severely dehydrated are rehydrated intravenously, then switched to ORS.

A question arises when a non-dehydrated child is brought to a health facility and the household management policy recommends the use of "ORS-like" fluids or unmodified home fluids. Considerations include the space and time needed to supervise the administration of ORS to children who are not dehydrated, the cost of using a packet that may not be completely consumed, and the possibility of the child rejecting the ORS because he is not yet dehydrated. These argue against administering ORS in the health facility setting. With this scenario, it would be medically appropriate for health workers to determine if the home management is adequate and, if so, to reassure the mother that she is doing the right thing for her child. The health workers could then send the mother home with advice to "carry on" as she has been doing and to return if the child develops signs of dehydration or other complications of diarrhea. This approach has the advantage of reinforcing the recommended policy for household management.

Some programs argue that this is not an acceptable policy and that every child who is brought to a health facility for an episode of diarrhea should be given some ORS to drink and/or provided with or prescribed a packet of ORS. There are many reasons for this recommendation:

- a) There is a concern that if ORS is not given to the child at the time of the health facility visit, adequate instruction on treating the child at home will not be given to the mother.
- b) In many countries it requires a great deal of effort (including travel time and opportunity costs) for mothers to seek help from a health provider. If mothers are not given something "different" (be it a product or advice on different treatment) they will become dissatisfied and be less likely to return if the child becomes more severely ill.
- c) Children who live a distance from health workers or health facilities may not be able to return in time if they suddenly become more severely ill. Therefore, they should be provided with the "safety net" of an ORS packet.
- d) Health workers feel pressured to "do something" or to prescribe something for the sick child. They will feel uncomfortable if they cannot offer anything different and may feel compelled to prescribe inappropriate antibiotics or antidiarrheal drugs.

Country programs must clarify the policy regarding this issue. The decision will depend on the realities of ORS supplies and demands on staff time. Nevertheless, the provision of ORS packets for home use is not inconsistent with any household management policy, given that the primary importance of the administration of extra fluids is communicated. Health workers can explain that ORS is the best fluid to give during diarrhea, but that other fluids may be given for mild cases and until ORS can be obtained.

The messages focusing on when a child with diarrhea should be brought to a health facility are a second critical aspect of the relationship between household management and health facility management of diarrhea. Developing clear indications for referral is important in any effort to lower diarrhea-associated mortality. The messages must be simple enough that they will not be lost in the myriad of other messages directed at mothers, yet sensitive enough to ensure that children in need are promptly referred, and specific enough that patients who could be adequately managed at home do not flood the health care delivery system.

Participants in the recent UNICEF/WHO/JHU conference on the Household Management of Diarrhea and Acute Respiratory Infections<sup>2</sup> reviewed the published and unpublished data regarding the sensitivity and specificity of different signs, symptoms and risk factors for dehydration. The group concluded that recommendations on when caretakers should take children with diarrhea to a health facility should be developed at the country level according to the following guidelines:

1. Indicators likely to be useful in most countries include:
  - a. frequent or numerous loose stools (possibly with reference to a specific number, e.g. at least six per day, or to watery consistency);
  - b. repeated or frequent vomiting;
  - c. an indicator of general condition that suggests dehydration or serious illness e.g. poor feeding, loss of playfulness; and
  - d. blood in the stool.
2. Additional indicators that may prove useful in some countries include:
  - a. fever;
  - b. any sign or symptom of dehydration that mothers can recognize and tend to be concerned about, e.g. intense thirst, sunken eyes, dry mouth; and
  - c. all infants less than six months of age who are not breast-fed.

### 3. Dysentery and Persistent Diarrhea

The incidence of diarrhea with visible blood (dysentery) and of persistent diarrhea (cases lasting more than 14 days) appears to vary from country to country. General recommendations for managing these complicated types of diarrhea are included in the WHO treatment chart. However, specific recommendations regarding procedures for follow-up and

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<sup>2</sup> Baltimore, Maryland; 4-6 April 1990.

referral should be clarified at the country level. The magnitude of the problem, patterns of antibiotic resistance, and available resources should be considered in formulating specific recommendations.

Available data suggest that Shigella species are the etiologic agent in at least 50% of cases of bloody diarrhea. Treatment with an antibiotic to which the organism is sensitive reduces the severity and duration of illness. Therefore, it is reasonable to treat empirically episodes of bloody diarrhea with an antibiotic that is effective against Shigella.

Unfortunately, no single organism is associated with a significant proportion of persistent diarrhea episodes<sup>3</sup>. The risk factors and pathophysiology of persistent diarrhea are less clearly understood than those of dysentery. The only intervention that has been shown to decrease morbidity from persistent diarrhea is continued feeding with foods of adequate nutritional density. Much research is under way to improve our understanding of persistent diarrhea<sup>4</sup>, but at present, management recommendations are general and tentative.

Guidelines for developing program strategies to address the problem of dysentery are outlined in the PRITECH field implementation aid on the subject.

#### **4. Integrating Feeding into Diarrhea Case Management**

The wealth of data documenting the relationship between malnutrition and diarrheal diseases underlines the importance of incorporating nutritional issues into diarrhea case management strategies. At a minimum, all CDD programs should:

- Promote exclusive breast-feeding until children are between four and six months of age;
- Recommend the continuation and increased frequency of breast feeding during diarrhea and encourage the mother to drink more in order to support the child's need for more fluids;
- Stress the importance of continued feeding during diarrheal episodes, both as a means of decreasing the adverse nutritional consequences of diarrhea and as an intervention to decrease stool output and diarrhea duration;
- Advise caretakers to provide children with extra feedings during convalescence from diarrhea;

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<sup>3</sup> Although Giardia lamblia and Entamoeba histolytica are commonly thought to cause persistent diarrhea, recent research has shown that this is not the case. These organisms are found in equal frequency in children with and without diarrhea.

<sup>4</sup> World Health Organization, 1988 Persistent Diarrhea in Children in Developing Countries: Memorandum from a WHO Meeting. Bulletin of the World Health Organization, 66(6): 709-717 (1988).

- Assess the nutritional status of children presenting with diarrhea, and arrange for referral and follow-up for those at high risk.

In order to maximize the impact of CDD programs on reducing mortality and morbidity from the diarrhea/malnutrition complex, further additional actions should be considered. These actions will require some knowledge about the nutritional status of children of different ages in the country, the process of feeding young children (how much, how often, by whom and whether food is actually put into children's mouths), the type and quality of foods that are most commonly used, and the acceptability of certain foods and food ingredients during diarrhea.

Much of this information may be available from studies conducted by nutritionists in the country's ministry of health or ministry of agriculture, by international agencies such as UNICEF or WHO, by private voluntary organizations (PVOs) such as Care, Save the Children, and OXFAM, or by private consultants (such as the Nutrition Communication Project) in coordination with USAID. All of these sources should be consulted before new studies are planned.

Several resources are available for CDD programs that identify a need for additional information on nutrition and feeding. The A.I.D.-supported Dietary Management of Diarrhea (DMD) Project in Peru and Nigeria has developed methods for examining current feeding practices and for gathering data on the availability, cost and acceptability of different dietary components. PRITECH has collaborated with the DMD project and Manoff International to develop two manuals: "Improving Young Child Feeding During Diarrhea: A Guide for Investigators and Program Managers" and "Improved Nutritional Therapy of Diarrheal Diseases: A Guide for Program Planners and Decision Makers". These documents are currently available.<sup>5,6</sup> A PRITECH field implementation aid on integrating nutritional interventions into CDD programs will be available by the end of 1990.

Some specific nutritional interventions and actions that CDD programs might consider include:

- Training health workers to interview and instruct caretakers about the process of feeding so as to address identified problems of frequency, volume, consistency and feeding method;
- Developing specific messages to improve the caloric and nutrient density of foods. Programs may choose to focus on children of weaning age since in most developing countries, these children have the highest incidence of diarrhea and are also at greatest risk of developing malnutrition;

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<sup>5</sup> Griffiths, Marcia et al., "Improving Young Child Feeding During Diarrhea: A Guide for Investigators and Program Managers." June 1988.

<sup>6</sup> Brown, Kenneth and Bentley, Margaret, "Improved Nutritional Therapy of Diarrheal Diseases: A Guide for Program Planners and Decision Makers". April 1988.

- Assisting hospitals (especially diarrhea training units) to make food available to diarrhea patients. CDD program efforts could include formulating recommendations on which foods to give, and carrying out trials of hospital programs to sell food to mothers or to contract for food preparation services.

## **5. Improved Communications with Mothers**

Mothers must be viewed as the primary target group in CDD education and communication activities. CDD programs sometimes delay activities to educate mothers until last, after diarrhea training units have been established, health workers trained, and ORT units and corners established. These are important activities, yet mothers are the first providers of care when diarrhea occurs. Effective efforts to educate mothers in managing diarrhea with early home fluid administration and feeding can dramatically reduce the number and severity of cases presenting to health facilities.

Countries with community-based health education and growth-monitoring activities, or with high rates of access to mass media have excellent means of communicating with mothers. Thus, efforts to reach mothers can occur concurrently with health worker training and other CDD program activities. Where there is limited access to health facilities or delay in adopting appropriate case management at the health facility level, direct efforts aimed at mothers may move ahead more rapidly. The only prerequisite for educating mothers about dehydration prevention is a clear, practical policy on home diarrhea management.

Actions that can be taken to improve the skill of health workers in communicating with mothers and the likelihood that they will do it include:

- Incorporating modules on communicating with mothers into pre-service medical and nursing training. PRITECH has prepared a module on "Talking With Mothers". This module is appropriate for any level of clinical training and includes practice exercises on the use of simple communication techniques;
- Including a space to document what was taught to the mother on standard clinical forms;
- Introducing supervisory checklists that call for interviews with mothers leaving health facilities after receiving treatment for children with diarrhea (to evaluate whether they have learned the necessary points for home treatment).

## **6. Professional Advocacy**

It is essential to obtain the support of physicians for the case management strategy so that they can assist in convincing other health workers and mothers to adopt it, and in order to ensure that physicians do not delay or obstruct the implementation of CDD program activities.

Physicians' cooperation can be achieved in numerous ways. The best way is to reach them during their pre-service training (this also applies to nurses, other health workers, pharmacists, and so forth). This involves changing existing medical and other professional school curricula

to be consistent with the recent scientific data and current recommendations. It also requires giving soon-to-be physicians practical experience in managing diarrhea cases with oral rehydration and feeding.

Setting the objective of establishing a diarrhea training unit (DTU) in each teaching hospital is one way to ensure this practical experience. These units need to be carefully designed to provide the appropriate type of training. WHO has developed guidelines to assist in establishing DTUs.<sup>7</sup>

PRITECH and WHO have developed medical education teaching materials that are being pretested. The revision and subsequent introduction of these materials into medical school curricula should be instrumental in improving physician knowledge of appropriate case management.

Another way to reach physicians and other health professionals is through professional associations of pediatricians, general practice physicians, nurses, midwives, and pharmacists. The national CDD program, donors, and international agencies can work with these groups to conduct professional seminars or workshops, plan tours through diarrhea treatment units, develop a professional newsletter, and write technical manuals. USAID is currently supporting an activity for professional continuing education in diarrhea management through the Philippine Pediatrics Society. The PRITECH Project in India has collaborated with UNICEF and the Indian Medical Association (IMA) to create a video presentation of actual cases that demonstrates the signs and symptoms of dehydration as well as the response to oral rehydration. The video will be presented to each branch of the IMA, thereby reaching approximately 70,000 private Indian physicians.

## **7. Improving Training and Supervision**

Adequate hands-on experience must be an integral part of ORT training at all levels. Experience for clinicians should include not only the evaluation and management of dehydrated children but also conducting effective face-to-face communication with mothers.

The importance of diarrhea training units (DTUs) in the pre-service training of health providers was discussed in section C.6. DTUs should be strategically located to achieve the most benefit; that is, in teaching hospitals and large medical centers. Depending on the country situation, the CDD program may consider setting up a DTU in each region or district of a country. Two important criteria for choosing a DTU site are that there be sufficient numbers of patients for training purposes and space available for both patient care and teaching activities.

At regional or district levels, DTUs may serve to train a core of individuals who are responsible for training peripheral-level workers. ORT units or corners are ideal settings for

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<sup>7</sup> WHO, Diarrhea Training Unit: Director's Guide. World Health Organization, Geneva, 1988.

training these workers. These corners are special places in outpatient facilities that are used for the management of diarrhea patients. In addition to providing a place for on-the-job training, ORT units or ORT corners offer the following advantages:

- They provide a place where the appropriate management of diarrhea and dehydration is a priority and where treatment can be promptly initiated.
- They are staffed by individuals with practical experience in managing diarrhea cases and with skills in teaching caretakers about the home management of diarrhea.
- The unit provides a place where mothers can actively participate in rehydrating their children and can receive information on diarrhea treatment and prevention.

Setting clear national guidelines for these oral rehydration spaces is critical to effective supervision and should be a top priority for PRITECH action. Such guidelines should include the recommendation that all diarrhea patients, not only those with dehydration, pass through the unit in order to receive effective teaching. Programs that recommend the use of ORS or "ORS-like" fluid should demonstrate preparation of the fluid.

The training must be followed by support to help the trainee put what was learned into practice, an assessment of whether the training adequately prepared health workers to perform well, and supervision to assure that quality case management practices are sustained. The purpose of supervision is to provide feedback, stimulate enthusiasm, and provide continuing education. The results of operations research conducted by the PRICOR project have shown that due to lack of supervision, supervisors are often unaware of the case management practices of the health workers for whom they are responsible. These studies emphasize the importance of supervision of health workers in achieving correct case management of diarrhea.

Checklists with a few key indicators to verify correct practices and to identify problem areas are good supervisory tools. Given the fact that supervisors are usually few, numbers of health workers to supervise large, and transportation limited and unreliable, appropriate use must be made of each supervisory visit. All health workers should be visited periodically to keep interest high, but those workers having problems should be visited more frequently.

Some actions that can assist in improving supervision are:

- Health worker use of a detailed clinical form for recording case histories and treatment for six to 12 months following training. These forms can serve to reinforce what the health worker has learned and are an effective supervisory tool to assess performance;
- Development and use of "mini" teaching modules that address the most common problems encountered in implementing appropriate case management (for example, the management of persistent diarrhea, or talking with mothers about feeding). These modules can help the supervisor shift from evaluating the health worker to the role of teaching and problem solving.

## **8. Promoting the Rational Use of Drugs**

The problem of the inappropriate use of antibiotics and antidiarrheals is a complex and difficult one. Physicians who know that indiscriminate use of these drugs is "bad medicine" defend their behavior by saying that patients and mothers of patients "demand" antibiotics and antidiarrheals. Nurses and auxiliary health workers place the blame on physicians who prescribe multiple drugs and therefore set the standards and expectations in the communities. Others blame pharmacists and the pharmaceutical industry for the aggressive promotion of ineffective and sometimes dangerous products.

The problem will not be solved by any single action or intervention. However, CDD programs can take a number of steps to start reducing the prevalence of inappropriate drug use by:

- Advocating and working toward the adoption of an essential drug list together with legislation to ban the import and manufacture of ineffective and dangerous products;
- Providing tips to health workers on how to properly respond to patient demands for inappropriate drugs (this would be an excellent topic for a mini supervisory/teaching module);
- Counter-detailing health providers and pharmacists about the superiority of oral rehydration and feeding over pharmaceuticals;
- Using the percentage of cases treated with antibiotics as a key indicator of appropriate case management at the health facility level;
- Mobilizing public pressure on pharmaceutical companies to withdraw pediatric preparations of antidiarrheals from the market. (This has recently been achieved with the withdraw of "ADM" from the market in Kenya.)

## **9. Private Sector Involvement**

Widespread use of appropriate case management for diarrhea will depend on efforts in both the public and private sectors. Physicians in the private sector must know about, use, and recommend oral rehydration and feeding to their patients. Drug detailmen from companies producing ORS can play a powerful role in influencing the prescribing and selling habits of physicians and pharmacists. Further details on this approach are included in the implementation aid on commercial sales of ORS.

ORS must be available in pharmacies. Pharmacists must recommend ORS instead of antidiarrheals and antibiotics and be able to educate mothers on proper mixing. Such involvement will require special efforts to train and motivate pharmacists.

In countries in which access to government health facilities is limited, it may be appropriate for the CDD program to concentrate more on private health providers. One option might be to work with well-organized private voluntary organizations (PVOs) or other community

groups. Another approach is to attempt to involve traditional healers in the promotion of appropriate case management at the household level. Further details are included in the implementation aid on CDD allies.

#### **10. Problem-Solving Studies**

The true test of a case management strategy is how effective it is in promoting the desired case management behaviors, and ultimately, how effective those behaviors are in reducing diarrheal morbidity and mortality. It is quite likely that the initial strategies for improving diarrhea management at both the household and the health facility levels will need to be revised based on feedback from the field. Furthermore, many areas of uncertainty remain regarding diarrhea case management and its implementation. Questions regarding areas of uncertainty and the impact of various strategies can be addressed through problem-solving studies.

Some examples of appropriate problem solving studies related to case management include:

- Developing and pilot testing some educational messages regarding feeding during diarrhea with focus groups of the targeted audience;
- Working with health providers who agree to try some recommended messages promoting the idea of fluid replacement in a clinical setting. Follow-up discussions can be conducted with the health workers (to determine whether they perceive the messages to be useful and understood by caretakers) and with caretakers either at the time of exiting the facility (to test understanding), or at home (to determine whether the recommended behavior was tried and adopted);
- Determining the magnitude of the problem of dysentery and persistent diarrhea;
- Evaluating the relationship between indicators of illness severity as defined by mothers (eg. weakness, loss of appetite, "sick eyes", etc.) and physical examination signs of dehydration;
- Comparing health worker responses to different supervision techniques (the use of checklists, mini teaching modules, etc.);
- Evaluating the effectiveness of attempts to influence the behavior of private practitioners;
- Determining the proportion of cases treated by the private sector as a way to stimulate interest in involving the private sector in ORT promotional activities.

## 11. Conclusion

Improving case management of diarrhea at both the household and health facility levels to decrease diarrhea-associated morbidity and mortality is at the heart of CDD program efforts in all countries. It is important that each country have a clear, consistent case management strategy based on the specific resources, opportunities, and constraints within the country. Components of effective case management policies include specific recommendations to mothers on the management of diarrhea at the household level (including which home fluids are appropriate to give children with diarrhea) and to health workers on the treatment of diarrhea in health facilities. Incorporating activities to address feeding during diarrhea and convalescence needs to become a CDD program priority. Program problem-solving studies (PPSS) may be helpful in developing these recommendations and adjusting program strategies.

Training and supervision of health workers in diarrhea case management are essential in ensuring that national case management policies are applied correctly by all health workers treating diarrhea patients. Supervision of health workers following training is the key to ensuring that correct case management techniques learned in training are practiced in health facilities, problems in implementing these practices are resolved, and trainees' questions are answered. Because of its importance to case management of diarrhea, supervision should be a critical CDD program emphasis for the 1990s.

Changing the existing curricula for pre-service training of physicians, nurses, pharmacists, and auxiliary health workers to reflect the national diarrhea case management policy is a major goal of CDD programs and the best way to reach new health personnel before incorrect case management practices begin. Other strategies must be used to reach health personnel already working in health facilities.

Integral components of effective case management training programs include hands-on experience in using ORT to rehydrate dehydrated patients (in a diarrhea training unit, if possible), practice in techniques to communicate messages to mothers, and information to convince health workers that the use of antibiotics and antidiarrheals in "ordinary" cases of diarrhea (even when demanded by mothers) is unnecessary and often dangerous.

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## ANNEX

### TECHNICAL OVERVIEW OF CASE MANAGEMENT

#### 1. The Role of ORS in Treating Dehydration

The discovery of glucose-linked sodium absorption, intact even in the face of significant diarrhea, formed the scientific basis for oral rehydration. The most widely used product for treatment of dehydration is oral rehydration salts (ORS) with the following WHO-approved formula:

- Sodium chloride (3.5 g/l)
- Potassium chloride (1.5 g/l)
- Trisodium citrate (2.9 g/l or sodium bicarbonate, 2.5 g/l),
- Glucose (20 g/l).

This "balanced" or "complete" or "WHO" formula ORS offers the best treatment for those with diarrheal dehydration who are able to take fluids by mouth.

Despite variations in stool electrolyte composition in diarrhea of different etiologies, diarrheal dehydration is usually isotonic. The WHO formula provides just enough sodium to replace extracellular fluid losses rapidly without risking dangerous salt overload or osmotic diarrhea. A lower sodium concentration would not replace the deficit as rapidly. The WHO formula also provides sufficient base to correct the acidosis of diarrheal dehydration, and just the right amount of potassium to replace losses and to balance the shift of potassium back into cells as acidosis is corrected. For use in maintenance of hydration after dehydration has been corrected, ORS should be given with equal amounts of water or breast milk. The ratio of sodium to glucose is carefully balanced to optimize sodium absorption without causing a glucose-induced osmotic diarrhea. Studies in many different countries, in different age groups including neonates, and in diarrheas of differing etiologies with a range of stool electrolyte compositions, have shown that the use of this ORS formula is effective, safe, and inexpensive compared to the alternative of IV therapy.

Whereas there has been relatively little controversy over the formula for treating dehydration, pediatricians, particularly in developed countries, have been concerned about the 90 mMol/l sodium concentration of the standard ORS when used for maintaining hydration after dehydration has been corrected. They argue that this concentration far exceeds the stool sodium associated with most pediatric diarrheas, and therefore is potentially dangerous in maintenance therapy where the object is just to keep up with stool and insensible losses. Despite these concerns, there are data from both developing and developed countries to show that this fear is unfounded. If the WHO recommendations are followed, calling for the use of equal amounts of water or breast milk (which is very low in sodium) along with the standard ORS in maintenance therapy, hyponatremia is not a clinically significant problem. This evidence, plus the practical benefits of using a single ORS formula for both rehydration and maintenance, should encourage CDD managers to advocate a single standard formula whenever ORS is indicated.

It has been shown that ORS can be used alone to rehydrate approximately 90% of patients with diarrheal dehydration. In approximately 10% of dehydrated patients (representing approximately 1% of all diarrhea cases)--those in shock, or where oral intake cannot keep up with stool losses--effective case management requires rapid initial rehydration with appropriate IV fluids, usually within 4 hours, followed by ORS. Appropriate IV fluids contain adequate concentrations of sodium and potassium, plus a base to correct acidosis. Ringer's lactate (Hartmann's solution for injection) is an excellent IV fluid for this purpose. CDD managers should ensure that referral institutions have an adequate stock of appropriate IV fluid for the initial treatment of severe cases.

## 2. Food-Based ORT

Recent evidence that the replacement of the glucose in ORT with certain carbohydrates or proteins may have some effect in reducing diarrhea has raised interest in food-based ORT. Studies in hospitalized patients with severe cholera-like diarrhea clearly show that rice-based ORS is superior to glucose ORS in reducing stool output and in decreasing the duration of the episode. It is less clear whether food-based ORT is efficacious in decreasing either stool output or the duration of the episode in mild to moderate diarrheal episodes (the vast majority of cases). Available data suggest that it probably does, but to a lesser degree.

Another outstanding question is whether the same effect (decreased stool output and shorter duration) can be achieved by administering ORT plus food, as is achieved by food-based ORT. For example, is the administration of glucose ORS plus rice as efficacious in reducing stool output and diarrhea duration as the administration of rice-based ORS? Even if food-based ORT offers advantages over ORT plus food, it would be necessary to assess whether advantages are significant enough to justify the costs of implementing the use of food-based ORT.

Whereas the efficacy (how it works in a controlled setting) of food-based ORT has been demonstrated, many questions remain regarding its effectiveness (how it works in the field under real, uncontrolled conditions). Proponents of food-based ORT suggest that mothers will be more likely to use it because it decreases the diarrhea. However, it has not been demonstrated that mothers will be aware of or satisfied with the 20-50% reduction in stool output associated with use of food-based ORT.

The net nutritional impact of food-based ORT is also difficult to predict. The decrease in stool output and duration of diarrhea may have significant nutritional advantages. However, there is a major concern that providers and mothers might confuse food-based ORT with food, and consequently fail to give additional food during the diarrheal episode. This would be particularly worrisome in situations in which mothers are advised to "water down" the existing weaning food to give during diarrhea. The nutritional effects may be devastating, especially if the diarrhea is prolonged or if mothers continue to give the food-based fluid as a weaning food after the episode. Fortunately, the preliminary results of field trials that introduced home-made food-based ORT to some communities and glucose-based ORT to other communities showed significantly greater weight gain of children with diarrhea in the food-based ORT communities than in the glucose ORT communities. This implies that, at least in these communities, confusion was not a problem.

**PRITECH FIELD IMPLEMENTATION AID**

**INCORPORATING DYSENTERY MANAGEMENT  
INTO DIARRHEAL DISEASE CONTROL PROGRAMS**

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This paper is one of a series designed to aid PRITECH field staff in providing technical assistance in diarrheal disease control efforts and programs. It was edited by PRITECH primarily to incorporate the comments made by field staff and technical consultants.

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## INCORPORATING DYSENTERY MANAGEMENT INTO DIARRHEAL DISEASE CONTROL PROGRAMS

### A. RATIONALE

Dysentery is a clinical syndrome characterized by small, frequent bowel movements accompanied by blood or mucous, pain on defecation, and fever. The syndrome reflects invasion of the mucosa of the colon by bacterial or parasitic pathogens resulting in an inflammatory response, surface ulceration, and the appearance of red and white blood cells in the diarrheal stool.

Dysentery accounts for up to 20 percent of the diarrheal episodes in children under the age of five and up to 25 percent of diarrheal deaths, or 500,000 to 750,000 child deaths annually (2). To date, the primary objective of diarrheal disease control (CDD) programs has been the effective case management of acute watery diarrheas emphasizing early and adequate administration of fluids (oral rehydration therapy - ORT), continued feeding, and medical referral. This programmatic emphasis is appropriate: between approximately 50 percent and 70 percent of all diarrheas can be optimally treated in this manner. The control of dysentery, however, is an important next step that should be taken by most CDD programs. This paper provides the scientific background relevant to the effective incorporation of dysentery management into current CDD programs. To provide guidance to CDD program managers, the operational and programmatic implications of these scientific data also are described.

### B. EXPERIENCE AND ISSUES

#### 1. Key Facts about Dysentery

##### a. Shigella Dysentery

Dysentery is a diarrheal illness transmitted through the fecal-oral route. Shigella is the only dysentery-causing organism consistently associated with clinically severe illness and death in children. Between 30 percent and 60 percent of the identified cases of dysentery in some developing countries are caused by various Shigella species (spp.) (2,9).

Shigella dysentery occurs in both endemic and epidemic forms. The sero group S. flexneri is the most common cause of endemic dysentery in developing countries. S. dysenteriae type 1 ("Shiga" bacillus) causes dysentery in epidemic situations and is associated with high mortality rates.

##### b. Other Causes of Dysentery

In some areas, Campylobacter is an important cause of dysentery, especially in children under one. The illness is usually self-limiting, and antibiotic therapy does not appear to alter the clinical course unless it is given very early.

In many countries, E. histolytica is considered an important cause of bloody diarrhea. Case-control studies, however, have shown that amoebae are present in the stools of healthy

controls nearly as frequently as in the stools of dysentery cases. Young children, both those who have dysentery and those who do not, rarely have amoebae in their stools. Further, it is difficult to distinguish pathogenic amoebae from nonpathogenic amoebae on microscopic examination. These data suggest that amoebae may not be the cause of the diarrhea even when amoebae are identified in the stool of dysentery cases.

#### c. Effects of *Shigella* Dysentery on Children Under Five

Children between the ages of one and five years are the most frequent victims of *Shigella* infections. Children under one suffer from shigellosis somewhat less frequently (one-half to one-third as often as older children) but are more likely to become severely ill as a result. Case fatality rates as high as 3.5 percent have been reported for children under one year of age with shigellosis. The overall case fatality rate of children with shigellosis has been estimated at 0.6 percent (2).

In addition to death, the most significant and dangerous outcome of dysentery on child health is a worsening of the nutritional status. Studies in Bangladesh indicated that of all diarrheas, shigellosis had the greatest effect on the linear growth of young children and was more likely to be associated with persistent diarrhea, which lasts two weeks or more (1). Malnourished children often suffer a more long-lasting illness from diarrhea due to *Shigella* and are more likely to die from it. Clinically evident dehydration is relatively rare in children with shigellosis, but, when it occurs, signals severe illness and greater risk of mortality.

#### d. Diagnosis and Treatment

It is now known that the clinical diagnosis and treatment of dysentery is relatively simple and feasible even within the constraints of developing country health care systems. It has become increasingly clear that the intervention of highly specialized health care personnel -- physicians and laboratory technicians -- should not be necessary for diagnosing and treating dysentery in most instances.

Diagnosis by visual detection of blood in the stool. Recent research indicates that the presence of visible blood in the stool is a specific test for the diagnosis of *Shigella* dysentery. A study comparing a sample of diarrheal patients at the ICDDR hospital in Dhaka, Bangladesh, reported that 85 percent of the patients with visible blood in their stools had *Shigella* dysentery, while 55 percent of those with *Shigella* dysentery had visible blood in their stool (2). While the overall sensitivity of visual blood in the stool for identifying cases infected with *Shigella* may seem low, the test remains clinically useful. This is because severely ill patients (particularly those infected with *S. dysenteriae* type 1) are more likely to have bloody stools than are patients infected with less virulent strains. One study suggests that the test detects 87 percent of cases infected with *S. dysenteriae* type 1.

Another study in Thailand of 200 children with acute mucoid or bloody diarrhea (by history or a stool test for occult blood) reported that blood was observed in the stools of 124 of these children by the nurse and in 85 children by the family. In children with blood seen by the nurse, 60 percent had *Shigella*. In those with blood reported by the family, 62 percent had *Shigella* (9).

These studies also demonstrated that other clinical symptoms and diagnostic tests commonly used to identify patients with shigellosis added little increase in accuracy of diagnosis compared to the method of identification by the simple presence of visible blood. The presence of mucous in the stools or of abdominal cramps are often considered to be clinical signs of Shigella dysentery. In the Dhaka study, however, 56 percent of those with mucoid stool, and 54 percent of those with abdominal cramps did not have Shigella. Neither microscopic examination of the stools for red and white blood cells nor simple chemical tests to detect occult blood greatly increased the ability to correctly identify patients with Shigella. In the Thai study, only 63 of 200 children had greater than ten white blood cells per hpf in the stool. Of these, 79 percent had Shigella, only a slight improvement over the detection of blood by the nurse or the family. Shigella was isolated in only 44 percent with positive chemical tests for occult blood in the stool.

In summary, the detection of blood in the stool by simple visual inspection by parents or nursing personnel, and without complementary laboratory work, is sufficient evidence to make presumptive diagnosis of Shigella dysentery and to determine initial treatment strategy in most countries. In endemic situations, 40 percent to 60 percent of those individuals infected with Shigella have readily visible blood in their stools (9). This percentage can increase dramatically in epidemic situations. Other common symptoms of shigellosis include fever and abdominal cramps, as well as mucoid stools, but these are unsatisfactory diagnostic indicators when considered in isolation and not accompanied by bloody stools.

Case management. A relatively simple, clear, and effective case management strategy for dysentery can be elaborated based on current knowledge and a review of information available at the local level. All acute diarrheas should be assessed for dehydration and treated initially according to standard diarrhea case management guidelines: fluids, feeding, and referral. Treatment with antidiarrheals and antispasmodic agents is not recommended (especially in young children), because these agents can prolong the course of illness and can lead to fatal complications, such as bowel perforation.

Programs should consider the prevalence of dysentery among children under five, as well as the Shigella isolation rate in cases of dysentery and antibiotic resistance patterns of Shigella species, before formulating a policy on the empiric treatment of dysentery. If blood is visible in the stool, shigellosis should be the presumptive diagnosis in most countries. Appropriate antibiotic therapy, in addition to fluids, feeding, and careful follow-up, is the key to effective treatment of Shigella dysentery.

Appropriate and timely antibiotic therapy has been shown to decrease shigellosis case fatality in epidemic situations and to reduce the average duration of endemic Shigella dysentery (5). Antibiotic therapy responds to mothers' concerns by inducing a usually rapid response in the sick child...the child feels better quickly. The initial antibiotic therapy can be effectively prescribed by nurses and, perhaps, other less specialized health personnel. More specialized health professionals may be needed for further diagnosis and treatment of patients who show no improvement within 48 hours, or for those whose illness is complicated by severe

malnutrition or other special circumstances (for example, age less than one year).<sup>1</sup> Once medical attention has been sought, mothers' roles in treating and preventing dysentery include the administration of antibiotic medication, but otherwise differ little from those in acute watery diarrhea.

Stool analysis and specific therapy for E. histolytica should be considered only if initial antibiotic therapy for shigellosis is ineffective. At present, the data do not support the empiric treatment for Campylobacter. Although the organism may be an important cause of dysentery in children under one year of age in some populations, there are reports that antibiotic therapy for Campylobacter may not reduce the duration or severity of symptoms, especially if initiated more than four days after the onset of illness.

#### e. Choice of Antibiotics

The choice of appropriate antibiotics can be complicated by the possibility of antibiotic resistance. Patterns of resistance to specific drugs, including tetracycline and ampicillin, vary from place to place so that choice of therapy depends on local circumstances. It is currently recommended that antibiotic therapy for shigellosis begin with a five-day course of ampicillin or trimethoprim-sulfamethoxazole (TMP-SMX); the choice between these depends on local resistance patterns. If no improvement is observed after 48 hours (for example, less blood in the stool, less diarrhea, increased appetite, or increased activity), then an alternative should be tried (2,8). Nalidixic acid is much more costly, but where resistance to the better drugs is present, it may represent the major alternative therapy. Qualified local physicians should thus be involved in determining the antibiotic of choice for initial therapy in their area. Both an antibiotic of first choice and a back-up antibiotic should be identified.

#### f. Prevention of Secondary Infections

An immediate concern of CDD programs should be the prevention of secondary spread of infection with Shigella organisms. Shigellosis is easily transmitted from person to person because only a small number of organisms are necessary to cause illness. In one study in Dhaka, Bangladesh, 27 percent of case contacts below the age of five developed clinical shigellosis (4). Thus, prevention of secondary cases in family contacts of patients with dysentery is an important objective of dysentery management.

Dirty hands and contaminated foods and beverages are the primary means of transmission. A study in Bangladesh reported a reduction of 84 percent in secondary Shigella cases after a hygiene education activity promoting personal hygiene and the use of soap and water (3). Preventive measures at the household level should thus emphasize good personal hygiene, especially:

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<sup>1</sup> Infants who are not breast-fed are at higher risk for disease. Health workers should be sure to follow those infants carefully and to provide special education regarding weaning foods and warnings against the use of bottles.

1. Hand washing with soap and water after contact with feces and before food preparation
2. Appropriate disposal of infant and child feces, especially in households with a case
3. The continuation of exclusive breast-feeding in children under six months of age
4. Warnings against the use of bottles in infants who are not breast-fed and the promotion of appropriate and sanitary weaning practices.

It is also important that health providers adhere to sound infection control policies to avoid secondary transmission through health facilities. Preventive measures at the health facility should include:

1. Hand washing between patients
2. Enteric isolation of patients with dysentery, with prompt and appropriate disposal of stools
3. The cleaning of examination tables, bed coverings, and medical instruments after use
4. Clear policies against the use of feeding bottles in health facilities.

#### **g. General Preventive Measures**

The long-range goals of CDD programs should include the decreased incidence of dysentery and the reduction of risk factors for severe disease. At the community level, activities that increase access to clean water and to sanitation facilities should decrease the incidence and transmission of infection. Because children who are malnourished, not breast-fed, dehydrated or under one year of age are at increased risk of severe illness and death (8), preventive measures to decrease case fatality should include:

1. The promotion of exclusive breast-feeding through six months of age
2. The encouragement of improved child nutrition and weaning practices
3. The training of mothers regarding the prevention of dehydration during all episodes of diarrhea.

### **C. OPTIONS FOR ACTION**

#### **1. Program Components of a Dysentery Control Activity**

To the extent possible, the treatment and prevention of dysentery should be a completely integrated component of CDD programs. For continuing programs, this approach would

require incorporating the management of dysentery into existing program components in such a way as to reinforce existing activities while adding a limited number of new elements. For new CDD programs, it should be possible to incorporate dysentery into the program strategy from the beginning, because to do so would require relatively slight modifications of the ORT-focused program design.

The primary objectives of dysentery control activities are to:

- Decrease the adverse consequences of infection (case fatality and nutritional losses) through appropriate case management
- Decrease the transmission of infection through preventive measures.

To achieve the foregoing objectives, it is necessary to develop an effective case management strategy, to implement that strategy by logistical support and by its communication to primary caretakers and health care providers, and to monitor the implementation and impact of the strategy. These major components of a dysentery control activity are discussed below.

#### a. Case Management Strategy

A case management strategy defines whether or not dysentery control will be part of CDD activities and, if so, at what level of the health care system, by whom, and how dysentery should be treated.

**Defining the Priority of Dysentery Control.** Prior to planning and undertaking dysentery control activities, the CDD program manager should determine how important dysentery is as a cause of morbidity and mortality among the country's children. It is important to consider the following basic questions:

- Approximately what percentage of diarrheal episodes in children under five are associated with bloody stools?
- Are Shigella spp. responsible for a substantial proportion of bloody diarrheal episodes in the country? Existing data from developing countries indicate that this is probably the case; Shigella spp., however, are not the only organisms associated with bloody stools.

A review of existing information and discussions with health personnel should provide an initial idea of the importance of dysentery compared with other types of diarrheal diseases in the community. Many diarrhea prevalence surveys inquire about the presence of blood in diarrheal stools (or could be designed to do so), thereby providing an estimate of the community prevalence of dysentery. Some health care facilities in the country (particularly sentinel surveillance sites) may have records of the percentage of diarrhea-related admissions and deaths presenting with dysentery. A few countries may have facilities with laboratory records of Shigella isolation rates and antibiotic sensitivities on stool cultures. It will be difficult to determine what proportion of dysentery cases are caused by Shigella spp., because this determination requires the results of stool cultures. Some information (or assistance with

designing appropriate studies) may be available from either organizations or individuals conducting research in diarrheal diseases within the country.

**Defining Appropriate Case Management.** Effective case management of bloody diarrhea consists of four principal components: antibiotic therapy, follow-up, feeding, and fluids (ORT).

Other than the choice of an appropriate antibiotic for local use, three principal policy questions face CDD program managers regarding antibiotic use in treating bloody diarrhea:

- Which categories of health care providers should be provided with antibiotics (or permitted to prescribe them) and receive training to use them appropriately for treating bloody diarrhea? (For example, can paramedical workers be furnished antibiotics for dysentery treatment without misuse for other illnesses?)
- In areas with limited access to health care providers and where antibiotics are available without prescription, should caretakers be encouraged to treat bloody diarrhea with antibiotics purchased from the private sector?
- What should be the content and formulation of specific messages to health personnel and mothers concerning the use of antibiotics for dysentery in order to minimize the risk of encouraging inappropriate use of these drugs for other diarrheas and other illnesses?

The answers to these questions will depend on the structure of the health care system, government access to providers at the community level, and the government's ability to supply antibiotics for use at the community level. Appropriate operations research should provide the basis for some of these decisions. The impact of similar policies to dispense antibiotics at the community level on treatment of other diseases such as acute respiratory illnesses (ARI) should be considered.

**Follow-up and Referral.** Follow-up and possible referral for alternative treatment is an integral component of Shigella dysentery case management. While ideally all children with bloody diarrhea should probably receive a follow-up visit 48 hours after treatment is initiated, it is probably infeasible to do so in many countries because of limitations of MOH resources. Therefore, routine follow-up should be reserved for those at higher risk: children under one year of age (especially infants who are not breast-fed), children who were dehydrated at the time of the first visit, and children with signs of malnutrition. These children, at especially high risk of severe illness and death, should be followed daily, if possible. Children whose condition worsens, or who show no improvement after two days of antibiotic therapy, may need referral to a health facility capable of carrying out microbiological cultures for other pathogens, microscopic examination of the stool for E. histolytica, other diagnostic procedures, or the prescription of alternative antibiotic therapy.

**Feeding.** The third critical aspect of the case management of dysentery is adequate and appropriate feeding during and after the illness. Because anorexia is a common complication of shigellosis, feeding may be problematic during the course of the disease. Nevertheless, the

child should be offered frequent small meals throughout the day. An effort should be made to encourage a child to eat by offering foods he or she especially likes. Breast-feeding should continue. Additional feeding after the return of appetite is vital to the full recovery of these children. They should be given an extra daily meal for as many days as their illness and anorexia lasted. Whenever possible, the weight of the child should be followed to confirm that growth resumes and (if the information is available) the weight lost during illness is regained. Some children may require intensive nutritional rehabilitation in a feeding program or a health facility after initial recovery from their illness.

**Fluids.** As with children with other acute diarrheal illnesses, children with Shigella dysentery must receive sufficient and appropriate liquids during the course of their illness. Those showing signs of dehydration should receive ORT prior to and concurrent with other treatment. Annex 1 furnishes a sample treatment algorithm for dysentery.

#### b. Training

If Shigella dysentery is an important child health problem in either the endemic or epidemic form, CDD programs should give appropriate emphasis to managing and preventing bloody diarrhea in the training of health workers and the education of mothers.

The objectives of health personnel training in dysentery control are to:

- Emphasize the primary role of observation of blood in the stool for the identifying of Shigella dysentery cases needing antibiotic therapy.
- Teach and motivate health care workers to use a treatment protocol for dysentery case management that includes initial treatment, follow-up, and referral (Annex 1).
- Communicate an understanding that antibiotics have a range of mild to serious side-effects, that inappropriate administration of antibiotics can make them useless when they are really needed in the future, and that antibiotics should be prescribed only when clearly indicated and in the recommended dosages.
- To convey an understanding that antidiarrheals and antispasmodics are not recommended in the management of dysentery because they may prolong the course of illness and may lead to serious complications.
- To establish reporting requirements and procedures for "bloody diarrhea."
- To clarify the dysentery-related messages that should be conveyed to caretakers regarding home management and prevention, and to train health care workers in how to communicate these messages effectively.

Current WHO diarrheal disease control courses contain only general recommendations about the management of dysentery in endemic situations, although guidelines are available about epidemic control. Therefore, complementary training materials may need to be developed.

Annex 2 provides an overview of the general and specific content areas related to dysentery that should be incorporated into CDD training for health care providers.

### c. Communication

Other than recognizing the need to seek medical care as soon as blood is observed in the stool, and in administering antibiotics, mothers' roles in the treatment and prevention of dysentery differ little from those for watery acute diarrheas which have been the major focus of CDD educational activities to date. As with acute watery diarrheas, dysentery control messages aimed at mothers should emphasize the following content areas:

- Diarrhea, any diarrhea, is a potentially serious illness for children
- A child who has diarrhea should be given appropriate and sufficient fluids from the onset of the diarrhea
- A child who has diarrhea should receive appropriate and sufficient food while diarrhea persists and should receive extra food after an episode of diarrhea for a period equal to the duration of illness
- The caretakers of a child with diarrhea should observe and monitor the child for danger signs:
  - signs of dehydration (as recognized by mothers, based on local cultural studies)
  - persistence of diarrhea
  - presence of blood in the stool
- Children with danger signs must be taken for appropriate medical treatment as soon as possible
- Once medical attention is sought, the instructions of health care personnel should be followed precisely
- To prevent diarrhea, mothers should practice good personal hygiene, dispose of child stools correctly, breast-feed exclusively for the first six months, practice proper weaning methods, practice good domestic hygiene, and have children vaccinated against measles.

In addition to these basic message content areas, educational activities directed at dysentery control should emphasize the following:

- "Bloody diarrhea" is a special diarrhea that requires special care
- Children with "bloody diarrhea" must be taken to a health care provider who is trained to give special medicine (antibiotics)
- The advice of the health workers should be followed exactly and all the medicine must be used for the treatment to be successful

- Mothers should try hard to get the child to eat extra food when he or she begins to feel better
- Bloody diarrhea is easily transmitted to other children in the family by way of the stools of the sick person. To prevent this transmission mothers should be careful about disposing of the sick child's stools. Further, they should wash their own hands with soap and water, especially after touching the sick child and before preparing food.

If a CDD educational campaign has been initiated with no reference to "bloody diarrhea" and if shigellosis represents a significant percentage of diarrhea cases in a given country (more than 10 percent) or during a particular season, special messages may have to be developed emphasizing the care of this type of diarrhea. Prior to development of any messages concerning dysentery, basic sociocultural research should be carried out to ensure the development of appropriately formulated, effective messages.

As with messages concerning diarrhea in general, messages about dysentery must be transmitted through a variety of channels. The health worker has a substantial role to play in educating the mother of a child with dysentery as to the proper care of her child, especially concerning proper administration of drugs, the importance of extra feeding and the necessity for follow-up visits.

Annex 3 outlines basic sociocultural information that should be collected prior to developing specific messages related to dysentery control. Annex 4 compares message content areas for acute watery diarrhea with additional messages necessary for dysentery control. Annex 5 lists specific skills and attitudes child caretakers must have to manage dysentery appropriately at the household level.

#### d. Logistical Support

The means of providing necessary logistical support should be assured before starting any new dysentery control activities. Three general areas of additional activities should be anticipated:

- Development, reproduction and distribution of training materials related to dysentery control
- Purchasing, distributing and resupplying health care providers with appropriate antibiotics
- Obtaining and maintaining the equipment, supplies, and trained personnel necessary to permit referral centers to provide the services outlined in the treatment protocol. This may include laboratory equipment for culturing the stools of cases that do not respond to the standard protocol and for monitoring local patterns of drug resistance.

Training materials on dysentery control can be integrated with the general training materials on appropriate case management of diarrhea (See the PRITECH implementation aids on training and on communication). This activity should be given high priority in countries

where dysentery is determined to be an important cause of morbidity and mortality.

If a large number of community based workers will be dispensing antibiotics, the cost and logistics of replenishing supplies can become a difficult problem. In most cases, the CDD program must rely on the standard Ministry of Health drug distribution system, which is subject to budgetary shortages and stockouts. In many cases, no reliable mechanism exists for supplying anything to the community level. This set of potential problems must be considered carefully before making the decision to have community workers dispense antibiotics (For additional comments on logistics, see the implementation aid on this subject).

#### e. Surveillance and Monitoring

The objectives of dysentery surveillance are to monitor the prevalence of endemic shigellosis, monitor the patterns of drug resistance among prevalent Shigella species, and recognize and manage Shigella epidemics, if these occur. Monitoring and surveillance of the dysentery component should be incorporated into the overall CDD monitoring plan. Dysentery cases should be distinguished from other types of diarrhea in existing reporting systems at all levels. The antibiotic sensitivities of organisms associated with a small proportion of cases should be determined to assess the appropriateness of recommendations for empiric therapy.

#### f. Program Problem-Solving Studies

Many questions related to the appropriate and effective level of intervention and treatment for dysentery remain to be answered or clarified. Dysentery control activities should include operational studies designed to develop the most appropriate and effective approaches to the management of this form of diarrheal disease in the specific country. Questions to be addressed by such studies could include the following:

##### Questions related to the scope and level of effort of activities for dysentery control

1. How important is dysentery as a (age specific) cause of child morbidity and mortality in various geographic areas?
2. Within the context of current nutrition-related activities in the health system, how can malnutrition best be diagnosed and managed in children with dysentery coming to health facilities? What special diagnostic, curative, and follow-up steps are both feasible and effective?

##### Questions related to effective treatment of dysentery

3. How important are Shigella spp. as a cause of dysentery in the country? Does the situation vary from region to region?
4. What are the patterns of antibiotic resistance of Shigella in each geographic zone?

5. Given the level of sophistication of existing health facilities in the country, what should be the recommendations regarding stool cultures and other stool examinations in dysentery cases? What percentages of cases not responding to presumptive treatment by two or three days have a cause other than Shigella? Can the other causes be diagnosed with technology available in existing health facilities?
6. Given existing cultural dietary practices for children of various ages with and without diarrhea, what specific dietary recommendations for each age group should be made for feeding during and after dysentery?

**Questions related to the effects of dysentery program interventions and recommendations on community behavior and health**

7. What will be the effect on overall antibiotic use (or misuse) of transmitting specific messages to health workers and mothers concerning the use of antibiotics for dysentery?
8. How will education regarding antibiotic use for dysentery influence mothers' perceptions and use of ORT?
9. What is the effect of targeted use of antibiotics for shigellosis on the patterns of resistance of Shigella and other organisms to these drugs?
10. What types of health care providers can be effectively trained to use antibiotics appropriately for dysentery but not for other diarrheas or other inappropriate ends: physicians, nurses, pharmacists, community health workers, traditional health care providers, mothers?
11. To what extent and in what manner does the recommended treatment of dysentery differ from the current care given by mothers and health professionals?

**2. Operational Steps for Integrating Dysentery Control into CDD Programs**

The following list summarizes the essential operational steps for integrating appropriate dysentery control activities into CDD programs.

**Step 1:** Verify the relative importance of dysentery due to Shigella spp. in relation to overall diarrheal mortality and morbidity in under-five children in your country. Consider both epidemic and endemic situations in different ecological regions and seasons of the year.

**Step 2:** Determine patterns of resistance of Shigella spp. to antibiotics available in your country.

**Step 3:** Identify current patterns of antibiotic and antiparasitic use by health workers and mothers. This approach should include information concerning availability, sources, distribution, dosages, duration of treatment, types, price, reasons for choice preference and perceptions

concerning efficacy of specific antibiotics for treating bloody diarrhea.

**Step 4:** Select recommended first choice and alternative antibiotics for treating bloody diarrhea.

**Step 5:** Carry out operations research and establish an appropriate policy concerning the distribution of antibiotics by paramedical personnel.

**Step 6:** Ensure the availability of the selected antibiotics to all who are authorized to treat dysentery cases.

**Step 7:** Identify current knowledge, attitudes, and practices of mothers and health workers regarding bloody diarrhea. Develop appropriate messages for mothers and health professionals based on the foregoing information.

**Step 8:** Develop, test, and produce appropriate IEC materials for educating and training health workers and mothers within the context of the overall CDD program strategy and the CDD communications strategy.

**Step 9:** Implement training of health workers, including review of ORT and additional dysentery-specific content areas during follow-up training and/or supervision activities in the case of continuing CDD programs.

**Step 10:** Implement IEC for mothers and other caretakers, including special-emphasis messages about bloody diarrhea, as appropriate (for example, in continuing programs).

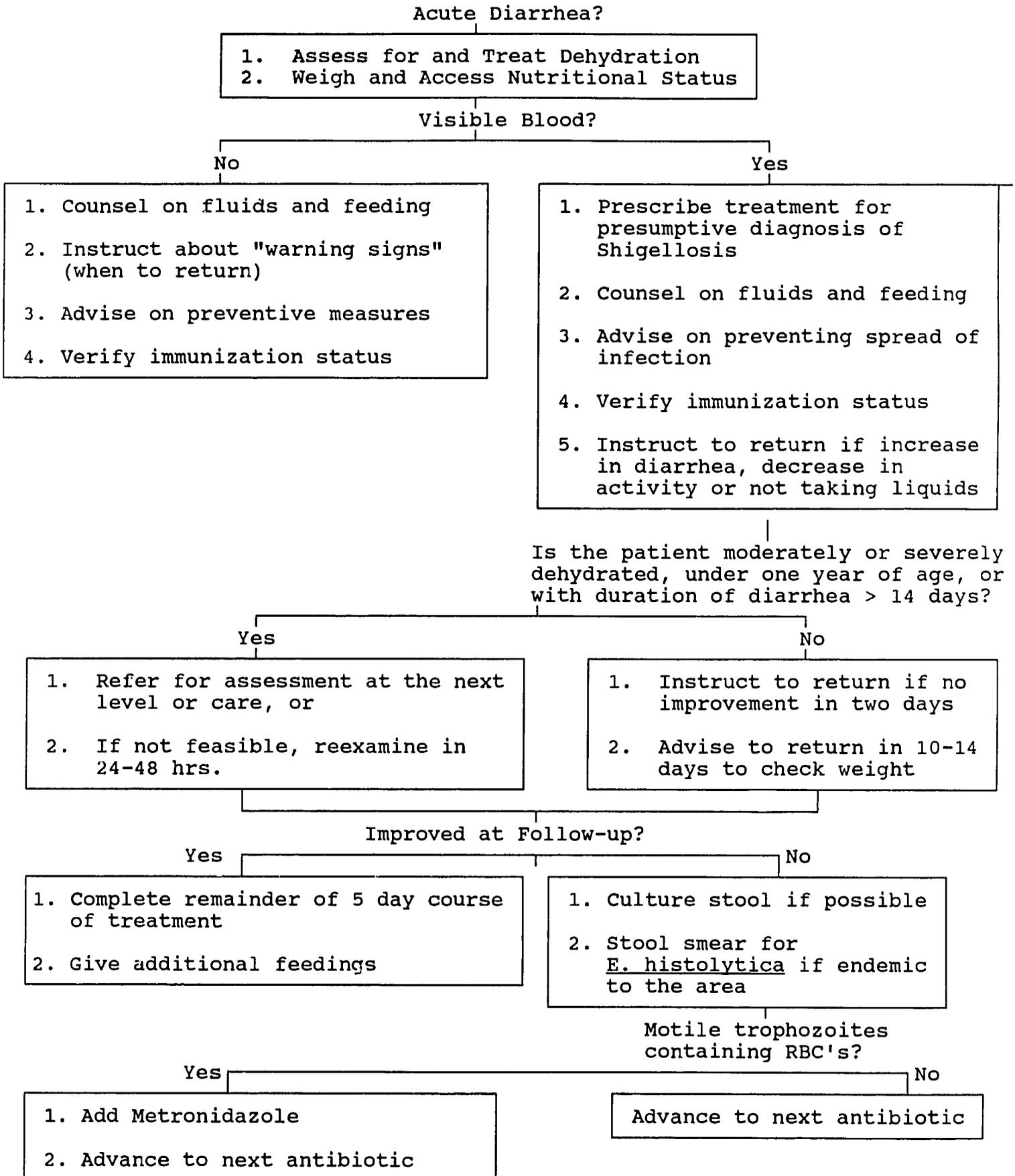
**Step 11:** Design and implement appropriate program problem-solving studies, as necessary and/or feasible.

**Step 12:** Monitor program progress and evaluate impact of education and training activities on response to bloody diarrhea by mothers and health personnel.

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ANNEX 1  
 Sample Algorithm for the Management of Dysentery  
 at the Community Level



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## ANNEX 2

### BEHAVIORAL OBJECTIVES OF DYSENTERY RELATED TRAINING FOR HEALTH WORKERS

#### Level of Health Worker Intervention Special Activities

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- |                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Diagnosis/medical history | <ol style="list-style-type: none"><li>1. Ask mothers specifically if they have observed blood in the stools.</li><li>2. Determine the child's age, nutritional status (by weighing or by arm circumference), breast-feeding status, and the duration of the diarrhea. Has the child already received medication? If so, what type, dosage, source?</li><li>3. Verify the presence or absence of visible blood in stool at the time of physical examination, if possible.</li></ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 2. Treatment                 | <ol style="list-style-type: none"><li>1. If the child has had diarrhea for 14 days or more, refer for the evaluation of persistent diarrhea.</li><li>2. If the duration is less than 14 days and the mother reports no blood, treat diarrhea with appropriate ORT, feeding and follow up as usual. ORT should be initiated immediately if the child is dehydrated, even if blood or persistent diarrhea are present.</li><li>3. If mother reports blood or health worker observes blood, presume <u>Shigella</u> dysentery.</li><li>4. Prescribe five day course of either ampicillin or TMP/SMX depending on local resistance patterns.</li><li>5. Prescribe paracetamol if fever is present.</li><li>6. If health worker cannot provide recommended treatment refer immediately to next level of health care system.</li><li>7. Wash your hands and any objects that have come in contact with the child to avoid spreading the infection to others.</li></ol> |

Level of Health Worker  
Intervention Special Activities

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3. Communicating with the  
Mother

1. Explain that the child has a special kind of diarrhea that needs special care.
2. Explain, in detail, dosage timing and duration of antibiotic treatment (demonstrate visually, if possible and verify comprehension by asking checking questions).  
  
Emphasize the need to continue treatment even after child seems to be getting better - use all the medicine.
3. Explain where mother can obtain the medicine.
4. Explain need for continued feeding and drinking during the illness. Discuss appropriate foods and liquids (including breastmilk!). Discuss quantities and frequency. Obtain mother's agreement that she can do this.
5. Emphasize the need for additional feeding after appetite returns and after diarrhea has stopped.
6. Explain how she will know if the child is improving:
  - less blood
  - less diarrhea
  - increased activity
  - increased appetite
7. Instruct the mother to return if the child becomes less active, will not drink or breast-feed, develops more diarrhea, or does not improve in 2 days.
8. If child has fever, dehydration, is malnourished, or is less than one year old, refer to the next level health facility, or schedule a follow-up visit for the next day. If these risk factors are not present, encourage the mother to return in 2-4 weeks for follow-up weighing and nutritional guidance. If the child is less than 6 months and not breast-fed, warn against the use of bottles and recommend that appropriate weaning foods be prepared hygienically and administered with a cup and spoon.

Level of Health Worker  
Intervention Special Activities

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| 9. Explain hygiene precautions to protect other children.

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4. Follow-up and Referral

1. If child returns for follow-up visit and shows appropriate signs of improvement, continue therapy. Praise mother. Weigh and compare with the previous weight.
  2. If the child's condition is unchanged after 2 days, give the alternative antibiotic. If *E. histolytica* is endemic to the area, perform microscopic examination of the stool and add metronidazole if the smear is positive for erythrocyte-containing trophozoites. Culture the stool if possible.
  3. If child appears sicker after 48 hours (lethargy, continued fever, unwillingness to eat or drink, excessive sleepiness or limpness), refer to the next level of care in the system.
  4. If a high-risk child does not return for follow-up visit, do "active" follow-up (e.g. contact or visit the mother if possible).
- 

5. Record Keeping and Reporting

1. Record and report "bloody" diarrhea specifically to differentiate it from other kinds of acute diarrheas.

## ANNEX 3

### SOCIO-CULTURAL INFORMATION NECESSARY TO DEVELOPMENT OF APPROPRIATE DYSENTERY MESSAGES

Socio-cultural information to be collected prior to dysentery message development should, at a minimum, address the following questions:

- Do mothers recognize "bloody diarrhea" as a health problem distinct and substantially different from other kinds of diarrhea? Does a special local word for this type of diarrhea exist?
- Do mothers recognize that "bloody diarrhea" is particularly dangerous to their child's health?
- What do mothers do now when their children have bloody diarrhea?
  - Withhold foods?
  - Withhold liquids?
  - Seek treatment? Where? From whom? What kind of treatment?
  - Anal purging? Other traditional home therapies?
- Do mothers have access to and use antibiotics from sources other than the official health care system to care for their children with dysentery? If so, which antibiotics are used? How are these recognized, administered etc.? Where are they acquired? What do they cost? How long are they given?
- Do mothers distinguish between antibiotics and other medicines (antidiarrheals)?
- Does the care mothers provide children with bloody diarrhea differ from that provided to children with other diarrheas? If so, in what way? Does care differ for boys and girls, for infants, children and adults? If so, in what way?
- Are there socio-cultural or economic constraints which may prevent mothers from treating their children with appropriate antibiotics, from seeking help from a health care provider, or from using antibiotics appropriately ( e.g. continuing to give pills even after the child has improved)? The same questions should be asked concerning liquids and feeding.
- What are mothers' practices and attitudes concerning follow-up visits? Are there specific constraints which may make follow-up difficult?
- Do mothers recognize that bloody diarrhea can be spread from person to person? What, if anything, do they do now to protect their families?

ANNEX 4

MOTHERS' EDUCATION: GENERAL MESSAGE CONTENT FOR DIARRHEA AND DYSENTERY

DIARRHEA MESSAGES

(ADDITIONAL) MESSAGES  
FOR DYSENTERY

Awareness/Motivation

- |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"><li>• Diarrhea is a serious health problem for young children.</li><li>• Diarrhea is when stools are looser or more frequent than normal.</li><li>• You can do things at home to protect your child with diarrhea from becoming very seriously ill (drink, feeding). You should start doing these things as soon as the diarrhea starts.</li><li>• Sometimes, even if you do these things, your child's illness will become worse. This is because (s)he has a special diarrhea. Special diarrheas can be dangerous. A child with a special diarrhea needs to go to a health care clinic for treatment. If your child does not improve after two days of home treatment or if (s)he has any of these signs (s)he has a special diarrhea and you should take him/her to a health clinic:<ul style="list-style-type: none"><li>- dehydration (specify signs)</li><li>- diarrhea lasting longer than 1 week or more than 10 stools per day.</li><li>- blood in the stools</li></ul></li></ul> | <ul style="list-style-type: none"><li>• "Bloody diarrhea" is a <u>very</u> serious health problem.</li><li>• "Bloody diarrhea" is a special kind of diarrhea which requires special care.</li><li>• If your child has "bloody diarrhea," medical treatment can prevent him/her from becoming very seriously ill. You must take your child to a health worker for treatment right away.</li><li>• You should help the health worker by giving your child enough to drink and to eat from the moment his diarrhea starts.</li><li>• A child with bloody diarrhea often stops growing or loses weight, becoming thin. After the diarrhea has improved it is very important to give him/her a lot to eat so that (s)he starts growing and gets strong again.</li></ul> |
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Specific Instruction

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|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• Preparation of oral rehydration solutions (including ORS)</li> <li>• Proper administration of these solutions             <ul style="list-style-type: none"> <li>- dosage</li> <li>- timing</li> </ul> </li> <li>• Proper feeding during and after diarrhea             <ul style="list-style-type: none"> <li>- breastfeeding</li> <li>- quantities</li> <li>- frequency</li> <li>- duration</li> <li>- special recipes</li> </ul> </li> <li>• Coping with problems             <ul style="list-style-type: none"> <li>- vomiting</li> <li>- refusal to eat</li> <li>- continued diarrhea</li> <li>- crankiness</li> </ul> </li> <li>• Storage of drinks and foods</li> <li>• Where/how to acquire necessary ingredients</li> <li>• Dangers of some sorts of "medicines" often given to children with diarrhea</li> <li>• What to tell the health care worker when you visit the health center and what to ask</li> </ul> | <ul style="list-style-type: none"> <li>• Preparation, administration of appropriate drinks and foods during and after dysentery</li> <li>• Taking medicines             <ul style="list-style-type: none"> <li>- giving the right number of pills/timing</li> <li>- continuing the antibiotics even if the child seems better or doesn't show improvement right away</li> <li>- giving enough to drink</li> <li>- dangers of incorrect dosages and incorrect medicines</li> </ul> </li> <li>• Coping with problems             <ul style="list-style-type: none"> <li>- refusal to eat</li> <li>- fever</li> <li>- vomiting</li> <li>- refusal to swallow medicines</li> </ul> </li> <li>• If the child does not improve (less blood, less fever, more active, hungrier) two days after seeing the health care provider, it is very important to come for a second visit immediately.</li> <li>• Where/how to buy medicines (and where not to). What they cost, and the importance of buying the full course, not just a few pills.</li> </ul> |
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## DIARRHEA MESSAGES

## (ADDITIONAL) MESSAGES FOR DYSENTERY

- 
- Prevention of diarrhea
    - breast-feeding
    - personal hygiene
    - domestic hygiene
    - measles vaccination
- Preventing transmission of "bloody diarrhea." "Bloody diarrhea" is easily transmitted to other children in the family. Stools from children with "bloody diarrhea" are dangerous and should be put into a latrine or otherwise hygienically disposed. Handwashing and careful food handling are also important for protection. Soap should be used to wash hands.

## ANNEX 5

### INDICATORS OF PROGRAM EFFECTIVENESS IN TEACHING MOTHERS TO MANAGE DYSENTERY

In order to behave appropriately when a child has dysentery, mothers and other child caretakers need to acquire the following skills and attitudes:

They need to recognize and accept:

- that "bloody diarrhea" is a special kind of diarrhea
- that "bloody diarrhea" is dangerous and requires special care
- that they can only assure their child's complete recovery if:
  - the child is taken to a health center
  - they accurately and completely follow instructions from health personnel concerning the medications provided
  - they provide good home care as with other diarrheas (liquids, feeding)
- That a child with "bloody diarrhea" often loses a lot of weight and needs a lot of extra food after the diarrhea has improved.

They need to observe and monitor:

- the onset and development (improvement or worsening) of blood in the stools
- the signs of improvement (or lack of improvement) once treatment has started: less blood, less frequent stools, more appetite, more alertness, less irritability
- the signs of dehydration, fever, or other complications.

They need to act and react:

- Having observed blood in the stool, the child caretaker must take the child to a medical center for treatment.
- The instructions of the medical personnel must be precisely followed: antibiotics purchased, if necessary; medicine administered in the prescribed dosage at appropriate times for the prescribed duration.
- The child must be given appropriate foods and drinks in sufficient quantity, both during and after the episode of dysentery. Breast-feeding should be continued.
- The child must be taken back to the health center if there is no improvement after two

days of treatment, if the child's condition worsens during the first two days of treatment or if a follow-up visit was recommended by the medical person consulted.

- Special care must be taken to protect other young children in the family: the sick child's stools must be carefully disposed of; hands, clothes and other objects contaminated with the stools must be carefully cleansed with soap and water.

They need to give and request information:

- The caretaker must accurately transmit the information and instructions received from the health worker to other persons in the household concerned with the care of the child. Their understanding of the messages must be verified.

**PRITECH FIELD IMPLEMENTATION AID**

**PREVENTIVE ANTIDIARRHEAL INTERVENTIONS**

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PRITECH**

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This paper is one of a series designed to aid PRITECH field staff in providing technical assistance in diarrheal disease control efforts and programs. It was edited by PRITECH primarily to incorporate the comments made by field staff and technical consultants.

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## PREVENTIVE ANTIDIARRHEAL INTERVENTIONS

As diarrheal disease control (CDD) programs increasingly succeed in attaining their primary objective - the promotion of effective diarrhea case management (emphasizing fluids, feeding and referral) - it will become more appropriate for CDD program managers to broaden their focus to include selected preventive interventions. WHO has sponsored a series of literature reviews of potential non-clinical antidiarrheal interventions (1, 2, 3, 4, 5, 7, 9, 10, 11, 12, 13, 14, 15, 16) analyzing the potential impact on child diarrheal morbidity and mortality as well as the feasibility and the costs. These studies provide relevant scientific data to facilitate the choice of appropriate interventions for CDD program emphasis. This paper provides operational guidelines to assist CDD program managers in incorporating into their programs those preventive strategies which would best complement their ongoing efforts to improve the treatment of children with diarrhea by health care providers and family child caretakers.

### A. RATIONALE

Most CDD programs focus on treating diarrheal episodes. Given this focus, oral rehydration therapy (ORT) has appropriately become the cornerstone of CDD programs. Yet, while ORT has proven to be highly effective in preventing death from dehydration caused by acute watery episodes of diarrhea, ORT has had little or no impact on diarrhea morbidity rates. In addition, the effectiveness of ORT in reducing mortality from persistent or dysenteric diarrhea is believed to be low. This suggests that CDD programs need to be concerned with preventing morbidity as well as treating it and that ORT should be complemented by other interventions designed to both prevent morbidity and reduce mortality not averted by ORT.

For the CDD program manager, the question is: which preventive strategies are the most effective and the most feasible within the context of a CDD program? For example, although exclusive breast-feeding has been shown to significantly reduce infant diarrhea, breast-feeding promotion does not fit easily into a vertical CDD program from a programmatic perspective: breast-feeding either does or does not happen at birth, and by the time a health worker treats an infant with diarrhea, chances are the mother has already stopped breast-feeding. Therefore, it may be more difficult to design or implement actions which encourage breast-feeding within the context of a CDD program. Other interventions, such as giving mothers lessons in hygiene or providing measles vaccine for children at DTU or ORT corners, might be more easily incorporated into CDD programs. In the long run, the CDD programs which best incorporate preventive interventions will probably have the strongest impact.

## B. OPTIONS FOR ACTION

This paper is organized somewhat differently from other PRITECH implementation aids: this section of the paper provides the overview and synthesis while the annexes provide more detailed guidelines to assist CDD programs. The annexes will be referred to at appropriate points in the text which follows. The reader is encouraged to use these annexes.

### 1. Categories of Preventive Strategies

Potential non-clinical antidiarrheal strategies have been classified into three categories as follows (7):

#### a. **Interventions for Which There is Reasonably Strong Evidence for High Effectiveness and Feasibility**

- promotion of personal and domestic hygiene\*
- promotion of breast-feeding\*
- improvement of weaning practices\*
- improvement of water supply and sanitation facilities\*
- measles immunization\*
- rotavirus immunization (vaccine being developed)\*
- cholera immunization (in certain circumstances; new vaccines being tested)\*

#### b. **Interventions of Uncertain Effectiveness, Feasibility or Cost**

- preventing low-weight births\*
- using growth charts\*
- increasing child spacing
- Vitamin A supplementation\*
- improving food hygiene\*
- control of zoonotic reservoirs
- epidemic control

#### c. **Interventions Which Have Been Found to be Ineffective, of Limited Feasibility or Too Costly**

- enhancing lactation\*
- supplementary feeding programs\*
- chemoprophylaxis\*
- fly control

To date reviews of thirteen of these interventions have been published (starred). The rest are in preparation (see Annex 4 for a list of all possible antidiarrheal interventions).

## **2. Approaches for Incorporating Preventive Strategies into CDD Programs**

Four approaches can be adopted by CDD program managers to incorporate preventive strategies into CDD programs:

- Direct focused preventive CDD training and educational activities at mothers and health personnel within the ongoing CDD program.
- Collaborate with other programs or projects specifically aimed at CDD-related issues: water supply and sanitation (WSS) programs, nutrition and growth monitoring programs, women's education projects, child spacing programs, EPI programs, breast-feeding lactation management workshops, and so forth.
- Advocate policy and strategy changes (at the national level: Ministry of Health, other ministries, donor agencies) which favor more effective control of diarrheal diseases.
- Add on new components to existing CDD programs to develop a comprehensive approach to specific preventive issues, based on appropriate scientific and operations research.

Each of these approaches demands additional program resources: time, personnel, materials, and finances. The first and second approaches demand less of these resources, the third and fourth demand more. Preventive activities should not be undertaken lightly by CDD programs. Preventive activities should be initiated only if their implementation can be accomplished without significantly interfering with necessary efforts to strengthen diarrhea case management (See Annex 1 for concrete examples). This will certainly require specific planning, and may require new funds and manpower.

The four approaches are detailed below.

### **a. Integrating Focused Activities**

The first and most feasible step to be taken toward prevention of diarrhea is adding education about diarrhea prevention to case management related activities. This should occur regularly when a mother brings a child with diarrhea to a health worker for treatment. The health worker can teach the mother both ORT and how to prevent diarrhea. A guideline would be that each clinical encounter should involve as much curative care as is needed and as much preventive care as can be absorbed. To bring this about, sessions on prevention can be added to clinical courses on diarrhea for health workers, and to training for supervisors and CDD program managers. Preventive messages can also be presented along with promotion of ORT or feeding during diarrhea messages in mass media diarrhea campaigns, and in community health education talks.

The major constraint to this approach is the inability of the trainee or mother to absorb more than a few messages at once. If a choice must be made, basic case management messages should get priority over preventive messages and should come first. Nevertheless, the eventual goal should be the integration of selected prevention messages into ongoing CDD education and training activities as an integral part of all CDD programs.

#### **b. Collaboration**

Collaboration with other projects and programs can be highly effective if the approach is well adapted to CDD program resources. CDD program collaboration with other projects can take any one of three basic forms, alone or in combination:

- CDD programs can collaborate actively with other programs by engaging in jointly managed activities: joint strategy development, joint planning, joint execution of pilot or demonstration activities, joint management of overlapping program components or interests, joint evaluation and monitoring of activities in areas of overlapping concern, joint operations or research projects and so forth.
- CDD programs can provide technical assistance to other programs to strengthen those components of other projects which are related to CDD objectives.
- CDD programs can provide financial assistance to other projects to help them carry out CDD-related components, including prevention.

The order in which these three forms of collaboration are listed corresponds to the relative management burden on CDD program staffs of such collaborative activities, with jointly managed activities demanding the most management attention. Choice of the form of collaboration will also necessarily depend on the resources and interests of the collaborating institution.

#### **c. Advocacy**

Advocacy of relevant policy and strategy changes among high level government and donor organization decision makers is an important responsibility of all program managers. Actions include identifying key decision makers, attending planning and strategy meetings (perhaps sponsoring them) as well as pursuing more informal relationships with concerned colleagues.

Please refer to Annex 2 for a list of operational steps program managers must follow to implement each of the proposed mechanisms for incorporation of preventive interventions.

#### **d. Add-on Components**

Of the mechanisms for incorporating preventive strategies listed above, the last - adding on new program components - would usually require the most additional resources, including financial, management, and manpower resources. Should the CDD program take on a national breast-feeding promotion campaign? Should it develop its own clean water supply or

sanitation program? Many CDD programs, even with increased donor support, could not add such components without jeopardizing their efforts in promoting good diarrhea case management. Because of this, the feasibility of such add-on efforts should be weighed carefully, and balanced against the impact which could be expected. If add-on activities are considered, the possibility of obtaining technical, financial and management assistance from appropriate other projects should be explored to reduce the implementation burden on CDD program personnel.

### 3. Criteria for the Selection of Priority Preventive Interventions and Activities

Within the four approaches, a range of types of interventions is possible. Of the eighteen possible non-clinical interventions studied by WHO, five have been shown to be both highly effective and currently feasible and, thus, merit immediate consideration by CDD program managers:

- promotion of personal and domestic hygiene
- promotion of breast-feeding
- improvement of weaning practices
- improvement of water supply and sanitation facilities
- measles vaccination (new cholera and rotavirus vaccines are still in the testing phase).

All of these interventions do not fit equally well into each of the four approaches. Promotion of exclusive breast-feeding, for example, is often impossible in the context of a doctor seeing a diarrhea patient, because the mother has already stopped breast-feeding, or perhaps never started breast-feeding at birth. For effective promotion, efforts to reach mothers during pregnancy and at the time of delivery, usually through a different group of care providers (midwives, obstetricians) as well as mass media, would be more appropriate, either through advocacy, collaboration, or adding a new program activity. On the other hand, the CDD program can remove obstacles to breast-feeding which may be present in its own settings, such as the use of bottles in some ORT corners to administer ORS.

Each CDD program will have to assess local conditions and circumstances to determine which, if any, of these interventions should be included in its program and by using which approach. Key issues and research findings have been adequately detailed in the WHO review series (Feachem, et al) and are outlined in Annex 3.

Annex 1 offers suggestions of possible activities to be undertaken by CDD programs for each of the five currently recommended interventions. The list is not meant to be exhaustive. Only the first three approaches are described - incorporation, advocacy, and collaboration. Description of special programs for these interventions is beyond the scope of this paper.

The choice of CDD interventions to supplement ORT promotion should be governed by criteria which favor the most effective use of limited financial and human resources. Criteria for the assessment and prioritization of preventive interventions to incorporate into ORT programs include the following:

**a. Proven Impact on Diarrheal Disease Mortality and Morbidity**

A preventive CDD intervention which reduces the incidence of diarrhea or, more importantly, the incidence of severe or long-lasting diarrhea would have an indirect impact on mortality as well as reduce the need for extensive treatment of diarrheal cases at health care facilities.

**b. Simplicity**

"Simple" interventions include those:

- for which clear, uncomplicated recommendations can be formulated as messages to families and health care providers,
- which require few additional materials or equipment,
- which can be carried out within existing organizational structures,
- which have a clear relationship to improved health status.

**c. Feasibility**

The implementation of the proposed intervention should be feasible within the existing constraints of families, of the organizations responsible for planning, managing and evaluating CDD programs and of necessary collaborating institutions. "Feasibility" implies existing operational capacity to manage the new intervention in addition to ongoing CDD/ORT activities: time available, trained personnel, materials, logistics support. Even a "simple" coordinating role may over-tax the CDD program personnel in some circumstances.

**d. Affordability**

Preventive interventions to be added on to CDD programs should not unduly tax the financial resources of either donor or host-country primary health care (PHC) budgets. Both one-time start-up costs and recurrent expenditures should be within the limits of current and projected funding availability. Expected health benefits per unit cost should compare favorably with other possible PHC interventions. While the possibility of shifting some costs to other sectors (e.g., rural development, agriculture) and to the public should be considered, the funding limitation of these funding sources should also be carefully assessed.

**e. Synergism with Other Interventions**

Some CDD-related interventions may strengthen or be strengthened by other health-related activities in such a way that the overall impact of the combined activities may be greater than the sum total of each intervention by itself. Such synergisms provide opportunities for more effective use of limited health resources.

**f. Socio-cultural Acceptability**

Any intervention which goes strongly against socio-culturally determined values, beliefs and practices will require more intensive and sustained effort than interventions which are socio-culturally acceptable or neutral.

**g. Strengthening Parental and Community Participation in Health Care**

Effective oral rehydration therapy can empower mothers to become responsible providers of effective health care for their children. Additional CDD activities which reinforce this process should be given priority consideration.

**4. Conclusion**

Incorporating preventive antidiarrheal interventions into CDD programs is an important way of increasing the overall effectiveness of the CDD effort to decrease diarrhea morbidity and mortality. Preventive strategies and approaches for incorporation into CDD programs vary in effectiveness and feasibility, and the expected benefits of interventions should be weighed carefully against expected costs by CDD program managers using the criteria listed above. Costs and benefits of various interventions also vary according to local circumstances; each program manager must consider the local opportunities and constraints before selecting and implementing preventive strategies. The annexes which follow provide more detailed guidelines:

- Annex 1: Mechanisms for Incorporating CDD Preventive Interventions into Ongoing CDD/ORT Programs
- Annex 2: Operational Steps to Incorporating Preventive Activities into CDD Programs
- Annex 3: Key Issues and Desirable Behavioral Outcomes of Diarrheal Disease-Related Preventive Interventions
- Annex 4: Potential Interventions for Reducing Diarrheal Morbidity or Mortality among Children under Five Years of Age
- Annex 5: Technical Resources List

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Mechanisms for Incorporating CDD Preventive Interventions  
into Ongoing CDD/ORT Programs

**A) Promotion of Personal and Domestic Hygiene**

**Integrating into Ongoing  
CDD Education, Training,  
& Case Management  
Activities**

- Emphasize handwashing with soap and proper management of child feces (esp. for children with diarrhea) in "preventive phase" of women's CDD educational activities.
- In health worker training, emphasize how to educate women and proper hygiene practices (handwashing) by health personnel in a clinical setting.
- Include proper hygiene practices on supervisory check list for health personnel.

**Influencing Policy**

- Promote incorporation of hygiene education in official primary school curriculum and budget.
- Promote targeting schools and health care facilities for WSS installations (with appropriate maintenance provisions).

**Collaborating with  
Other Programs**

- Collaborate with water supply & sanitation programs (WSS) by contributing to development of CDD-related water usage, latrine usage, & maint. messages for hygiene education component of WSS programs.
- Collaborate with "women's group" programs to develop community hygiene action strategies to be implemented by local women (e.g., "home hygiene" prizes).
- Promote child-to-child hygiene education activities through any available channel.

**B) Promotion of Breast-feeding and Good Weaning Practices**

**Integrating into Ongoing  
CDD Education, Training,  
& Case Management  
Activities**

- In messages concerning feeding before and after diarrhea, emphasize benefits of breast-feeding, spell out proper feeding practices, propose recipes for "good" food for older infants and children.
- In waiting area, decorate with health education posters appropriate for the audience, demonstrate proper weaning food preparation and if possible, feed the child as part of the treatment provided.
- In "preventive phase" of CDD mothers' education activities, include protective value of breast-feeding, good weaning.

**Influencing Policy**

- Advocate (with MOH) policies concerning:
  - No importation or advertising of breast-feeding substitutes
  - Maternity and hospital practices to favor breast-feeding e.g.,
  - Not separating mothers & infants after birth or during illness
  - No distribution of baby bottles or formula in maternities or MCH clinics
  - Putting infant on breast immediately after birth

**Collaborating with  
Other Programs**

- Collaborate with nutrition/food distribution programs to develop good weaning recipes based on local food stuffs. Assist in developing of breast-feeding and weaning messages with appropriate emphasis on CDD.
- Collaborate with child spacing programs to develop appropriate breast-feeding messages to mothers and health workers.
- Collaborate with "women's group" programs to develop community nutrition action strategies including improved weaning practices.

.62'

**B) Promotion of Breast-feeding and Good Weaning Practices, cont.**

**Integrating into Ongoing  
CDD Education, Training,  
& Case Management  
Activities**

- In health worker training, include specific actions health workers should take to support and encourage breast-feeding mothers.
- Include midwives and traditional birth attendants in CDD related training activities.
- To the extent possible, identify those mothers who are ill, anemic and/or pregnant and refer to appropriate service as soon as possible. Likewise, those needing family planning information and services should be identified and referred. Also, mother's tetanus toxoid status should be identified and corrected if needed.
- Based on criteria agreed upon with established nutrition/growth monitoring services, cases identified at risk should be referred. Where there are no such services available, the need should be documented and a nutrition/growth monitoring program instituted.

**Influencing Policy**

- Active support for breast-feeding during pre- and post-natal care
- Promote policies that make it possible for working mothers to breast-feed.

**Collaborating with  
Other Programs**

- Collaborate with Literacy programs to incorporate breast-feeding and weaning into literacy materials.

**C) Improvement of Water Supply and Sanitation**

**Integrating into Ongoing  
CDD Education, Training,  
& Case Management  
Activities**

- Include "water usage" and "latrine usage/maintenance" messages in preventive phase of CDD education activities to mothers.

**Influencing Policy**

- Advocate appropriate water and sanitation projects, especially in low SES areas with poor access to water (Ministry of Planning).

**Collaborating with  
Other Programs**

**C) Improvement of Water Supply and Sanitation, cont.**

**Integrating into Ongoing  
CDD Education, Training,  
& Case Management  
Activities**

- Include hygiene and sanitation department employees in CDD related training activities (special target group).
- Include proper maintenance of health center and hospital sanitation and water facilities in CDD training for health care professionals as well as patients using the facility.

**Influencing Policy**

- Promote emphasis on sufficient water quantity as opposed to primarily quality in WSS programs.
- Promote adequate programmatic (and budgeting) emphasis on hygiene education components of WSS projects.
- Promote targeting WSS programs to areas with high levels of water-related diseases, including epidemic diarrhea zones.
- Promote establishment of adequate water supply repair and maintenance systems.
- Advocate construction of appropriate latrines for use by small (<30) groups of related individuals.

**Collaborating with  
Other Programs**

- Collaborate with "community development" programs to develop community-based strategies to improve community water supply availability and water resource management as well as improved excreta disposal system.
- Collaborate with "women's group" programs to develop action strategies aimed at improved water transportation and storage practices.
- Collaborate with appropriate community-oriented programs to gather data on CDD related water and sanitation attitudes, knowledge and practices.

**D) Measles Vaccination**

**Integrating into Ongoing  
CDD Education, Training,  
& Case Management  
Activities**

- Include vaccination promotion messages in preventive phase of CDD mother education activities.
- Run pilot studies showing feasibility of same-visit measles vaccination of diarrhea patients.
- Include "checks for measles vaccination status" as point to observe on CDD clinical supervisory checklist.
- Include "measles vaccination status" update: "yes or no" on special diarrhea clinical forms in diarrhea training units and treatment units.

**Influencing Policy**

- Promote sustained immunization (EPI) programs, specifically including measles vaccination.
- Promote adoption of clear policy that patients with acute watery diarrhea can be given measles vaccination on the same clinic visit.

**Collaborating with  
Other Programs**

- Collaborate with EPI programs to develop strategies for assuring measles vaccination of all children not previously vaccinated arriving at health facilities for curative care.

## ANNEX 2

### OPERATIONAL STEPS FOR INCORPORATING PREVENTIVE ACTIVITIES INTO CDD PROGRAMS

#### A. Integrating Selected Preventive Messages

1. Select one or more intervention strategies for program emphasis. Base your selection on prior research to select those strategies most likely to have a significant impact on diarrheal disease mortality and morbidity in your country or region.
2. List the specific behaviors which need to be practiced by each specific target audience (mothers, community leaders, health care providers, etc.) in order to achieve the desired impact.
3. Conduct appropriate research to discover:
  - which of these behaviors are already common practice
  - to what extent and in what way current behaviors deviate from the desired practice
  - what other behaviors are currently practiced
  - why do people do what they do
  - what may prevent or motivate the adoption of the desired behaviors.

#### B. Establishing a Collaborative Relationship

1. Establish the CDD objectives for the activity.
2. Identify the programs or organizations working in the technical area of interest, find out what they are doing, discuss areas of mutual concern, and clarify their degree of interest in CDD related objectives.
3. Verify resource availability (people, time, money, etc.) of potential collaborators.
4. Negotiate mutual agreement in regard to objectives, strategy, work-plan, methods of evaluation and mutual roles and responsibilities for collaborative activities.
5. Monitor and evaluate.

#### C. Advocating Policy and Strategy Changes

1. Identify key policy/strategy issues in CDD-related preventive activities.
2. Find out what is currently being done in each of the relevant intervention areas and by whom.
3. Identify key decision makers in each of these sectors and pursue a supportive professional relationship with them.

4. Attend relevant planning and strategy meetings.
5. Invite appropriate decision makers to attend relevant CDD training activities or planning meetings, if possible.

D. Analyze the Desired Behaviors to Determine Which Are the Most Important, e.g.:

- have the greatest potential impact on the problem
- are the most frequently ignored
- are most consistent with official government priorities or policies.

and which are the most likely to be put into practice as a result of appropriate educational activities, e.g.:

- require the fewest resources
- are the most simple to understand and execute
- require the least frequent and persistent application to achieve success
- have the most immediate and discernable desired positive effect on the problem
- are the most harmonious with local values, beliefs and attitudes.

1. Based on this analysis, prioritize the desirable behaviors and select a few key behaviors to promote.
2. For each retained behavior, list the knowledge, attitudes and skills which both mothers and providers must acquire in order to put it into practice.
3. Design educational/training materials to promote the necessary knowledge, attitudes and skills.
4. Monitor and evaluate the impact of these activities.

ANNEX 3

KEY ISSUES AND DESIRABLE BEHAVIORAL OUTCOMES OF DIARRHEAL DISEASE  
RELATED PREVENTIVE INTERVENTIONS

Intervention	Key Facts & Ideas	Desired Family Behaviors	Desired Health Personnel Behaviors	Desired Community Behaviors
Personal and Domestic Hygiene	<p>*Two key mechanisms to interrupt fecal-oral transmission: -handwashing with soap -effective management of child feces.</p> <p>*Handwashing with soap has been shown to reduce incidence of diarrhea as much as 48%.</p> <p>Changing hand-washing behavior can be difficult: requires sustained education and follow-up resource constraints (time, soap, etc.) may inhibit behavioral changes.</p> <p>*Many people think child feces are "clean."</p> <p>*Messages should be targeted at health care professionals and families of severe diarrhea patients.</p>	<p>*Wash hands with soap and water -after cleaning a child who has defecated and after disposing of child stools -after defecation -before preparing or eating food.</p> <p>*Wash clothes or other objects soiled by child stools as soon as possible.</p> <p>*Dispose of child stools hygienically.</p>	<p>*Remind people of necessity for frequent hand-washing.</p> <p>*Model proper behavior by regularly washing hands with soap and water in clinic setting.</p> <p>*Educate people re the danger of child stools.</p>	<p>*Monitor and insist on proper handwashing behavior by good vendors.</p> <p>*Assure water and soap availability at primary schools (near latrines).</p>
Breast-feeding & Weaning	<p>*Breast-feeding and good weaning practices reduce diarrheal morbidity and mortality by: -Improving nutritional status (and reducing severity and duration of diarrhea) -Inherent protective qualities of breast milk -Reducing transmission by hygienic food preparation, storage &amp; feeding -Elimination of baby bottles.</p>	<p>* Breast-feed exclusively (e.g. with no supplemental feeding) from birth until the age of 4 - 6 months.</p> <p>*Breast-feed on demand.</p> <p>*Give no fluids other than breast-milk during the first week of life (feed the child colostrum).</p>	<p>*Prepare mothers for breast-feeding during prenatal care:</p> <p>*Place baby at the breast immediately after birth.</p> <p>*Allow rooming-in of mothers with young children in clinical settings (e.g., maternities, hospitals).</p>	<p>*Provide positive feedback to breast-feeding mothers.</p> <p>*Facilitate breast-feeding &amp; child care for working mothers.</p> <p>*Assure availability of nutritionally adequate weaning foods (gardens, cooperatives, drying and storage).</p>

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Intervention	Key Facts & Ideas	Desired Family Behaviors	Desired Health Personnel Behaviors	Desired Community Behaviors
Breast-feeding & Weaning (continued)	<p>*Inappropriate feeding behaviors vary between cultures. They may include:</p> <ul style="list-style-type: none"> <li>-No breast-feeding at all</li> <li>-Withholding of colostrum</li> <li>-Supplementation of breast-feeding with other (contaminated) liquids</li> <li>-Abrupt termination of breast-feeding when mother or child are ill, mother becomes pregnant again, father wants to resume sexual relations, etc.</li> <li>-Exclusive breast-feeding after the age of 4-6 months</li> <li>-Mothers may refuse to breast-feed because they believe (inaccurately) that they do not have enough milk</li> <li>-Economic/employment constraints</li> <li>-Status considerations</li> <li>-Aesthetic considerations</li> </ul> <p>*Poor weaning practices may include:</p> <ul style="list-style-type: none"> <li>-Too early or too late introduction of solid foods</li> <li>-Abrupt weaning</li> <li>-Nutritionally inadequate weaning foods</li> <li>-Food contamination during preparation, storage or feeding.</li> <li>-Insufficient quantities of food (poor family food division), seasonal unavailability, etc.</li> </ul> <p>*Educational activities can induce positive changes in child feeding activities.</p>	<p>*If working mothers cannot breast-feed at work, breast-feed prior to leaving home, upon return at night.</p> <p>*Express milk manually to avoid engorgement during periods of separation from baby.</p> <p>*Wean gradually (preferably after age 1 yr.)</p> <p>*Provide supplemental foods in addition to breast milk starting at 4 - 6 months.</p> <p>*Vary nutritional composition of child foods to include energy foods (starches plus oils or sugars) and vitamins (fruits and vegetables).</p> <p>*Offer 4-6 small meals each day.</p> <p>*Wash hands before preparing foods or feeding child.</p> <p>*Prepare food in clean place</p> <p>*Cook or boil food well.</p> <p>*Wash uncooked food.</p> <p>*Cook stored foods. Don't store for more than 2 hours.</p> <p>*Feed child with clean spoon (not with bottle).</p>	<p>*Assist mothers reluctant to breast-feed or experiencing problems by providing counseling aimed at reducing problems and giving adequate emotional support.</p> <p>*Instruct mothers re weaning and infant/child nutrition.</p> <p>*Eliminate advertising of breast milk substitutes in clinics and maternities.</p> <p>*Sensitize fathers and community leaders re breast-feeding and child nutrition.</p>	

Intervention	Key Facts & Ideas	Desired Family Behaviors	Desired Health Personnel Behaviors	Desired Community Behaviors
Improved Water Supply and Sanitation (WSS)	<p>*WSS Programs have been shown to have considerable impact on diarrheal disease mortality and morbidity.</p> <p>*Issues in WSS programs include:</p> <ul style="list-style-type: none"> <li>• <u>Objectives</u> Sufficient water quantity is more important than improved quality.</li> <li>• <u>Site Selection</u> Criteria for site selection should include: <ul style="list-style-type: none"> <li>-Need (e.g. existing sources)</li> <li>-Community interest</li> <li>-Technical feasibility</li> <li>-Water related disease prevalence</li> <li>-Population density (some technologies are more appropriate for low density areas) rather than primarily political consideration.</li> </ul> </li> <li>• <u>Community participation</u>: Communities should be adequately consulted, informed &amp; trained before, during and after installation of facilities. Women and other less powerful or minority groups should be involved.</li> </ul>	<p>*Use cleanest available water for drinking and cooking.</p> <p>*Adopt transportation and storage practices which reduce likelihood of contamination after collection at the source.</p> <p>*Use sufficient water for bathing and household hygiene.</p> <p>*Contribute to maintenance and repair of facilities (labor, money, supplies)</p> <p>*Use latrines when available</p> <p>*Avoid defecation -close to water source -where children play -within living area (except for latrine).</p> <p>*Collect or bury child stools promptly.</p>	<p>*Model proper water usage and storage behaviors.</p> <p>*Educate families re water and sanitation behaviors.</p> <p>*Provide access to latrines at health facilities and ensure proper maintenance of them.</p>	<p>*Contribute to efforts to install and maintain improved WSS systems.</p> <p>*Monitor functioning and maintenance of existing facilities and take steps for necessary repair (implies adapted community organization) and effective communication with outside institutions or organizations (governmental and non-governmental).</p>

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Intervention	Key Facts & Ideas	Desired Family Behaviors	Desired Health Personnel Behaviors	Desired Community Behaviors
Improved Water Supply and Sanitation (continued)	<ul style="list-style-type: none"> <li>• <u>Maintenance and Repair:</u> <ul style="list-style-type: none"> <li>- Communities need both organizational and technical training to manage maintenance &amp; repairs of facilities.</li> <li>-Spare parts should be readily available.</li> <li>-Community level fiscal management must be established.</li> </ul> </li> <li>• <u>Choice of Water Technologies:</u> <ul style="list-style-type: none"> <li>Appropriate choice of technologies varies according to: <ul style="list-style-type: none"> <li>-Technical considerations</li> <li>-Population density</li> <li>-Capacity for community organization</li> <li>-Locally available water sources</li> <li>-Government capacity for maintenance and repair</li> </ul> </li> </ul> </li> <li>• <u>Sanitation Facilities are better used and maintained if:</u> <ul style="list-style-type: none"> <li>-Structures take into account local socio-cultural beliefs and practices</li> <li>-Structures serve a limited, cohesive social group (family, group of related people)</li> <li>-Responsibility for maintenance is clearly assigned and agreed upon</li> <li>-Users are educated re. purpose of use and maintenance.</li> </ul> </li> </ul>			

Intervention	Key Facts & Ideas	Desired Family Behaviors	Desired Health Personnel Behaviors	Desired Community Behaviors
Vaccination	<p>*Measles is frequently associated with diarrhea just before, during and up to 26 weeks after the rash.</p> <p>*Effective measles vaccine is available but coverage is often low.</p> <p>*Constraints to increased coverage may include:</p> <ul style="list-style-type: none"> <li>-Parental misconception schedules/requirements</li> <li>-Inadequate access to health facilities practicing vaccination activities (so that mothers have to make a special trip)</li> <li>-Inadequate cold chain (availability, maintenance).</li> </ul>	<p>*Assure measles vaccination of all children by age 9 months by attending local vaccination clinics.</p>	<p>*Verify vaccination record of all children arriving at dispensaries for curative care for diarrhea and other illnesses &amp; vaccinate those who have been previously vaccinated.</p> <p>*Conduct regular measles vaccination sessions in appropriate locations.</p> <p>*Assure vaccine availability (stock monitoring, ordering).</p> <p>*Maintain cold chain equipment.</p> <p>*Educate parents re vaccination including schedules, care for children who have reactions (sore, fever).</p> <p>*Use sterile needles.</p> <p>*Maintain vaccination records.</p> <p>*Follow-up on unvaccinated children.</p> <p>*Initiate vaccination in clinics more frequently than once per week, daily if possible.</p>	<p>*Assist in organization of special vaccination activities.</p> <p>*Assist in follow-up (get unvaccinated children to the clinic).</p>

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## ANNEX 4

### POTENTIAL INTERVENTIONS FOR REDUCING DIARRHEAL MORBIDITY OR MORTALITY AMONG CHILDREN UNDER FIVE YEARS OF AGE -- ADAPTED FROM FEACHEM, HOGAN AND MERSON (10)--

#### A. By case management

##### 1. Oral rehydration and feeding

- Administration of oral rehydration in the home
- Administration of oral rehydration at a medical facility
- Promoting the appropriate feeding of children during and after diarrheal illness.

##### 2. Non-oral rehydration therapy

- Administration of rehydration by intravenous or other routes at a medical facility

##### 3. Chemotherapy (e.g., antibiotics for "bloody diarrhea")

- Administration of therapeutic agents in the home
- Administration of therapeutic agents at a medical facility.

##### 4. Referral and follow-up, especially for "at risk" children

#### B. By increasing host resistance to infection and/or illness and/or death

##### 1. Maternal nutrition

- Improving prenatal nutrition to reduce the incidence of low birth-weight
- Improving prenatal and postnatal nutrition to improve the quality of breast milk.

##### 2. Child Nutrition

- Promoting exclusive breast-feeding up to age 4 to 6 months and partial breast-feeding thereafter
- Improving weaning practices for children aged 4 to 18 months (introducing non-milk foods not later than the sixth month, continuing breast-feeding for as long as possible, and using nutritious and locally available weaning foods)
- Supplementary feeding to improve the nutritional status of children aged 6 - 59 months

- Promoting the use of growth charts by mothers as an aid to proper child nutrition and child care.
3. Vaccination
    - Rotavirus and/or cholera vaccination (when effective and tested vaccines are available) of the child and/or mother
    - Measles vaccination to reduce measles-associated diarrhea.
  4. Chemoprophylaxis
    - Chemoprophylaxis of children at special risk, such as contacts of known cases, to reduce the incidence and/or severity of diarrhea.
- C. By reducing transmission of the pathogenic agents of diarrheal diseases
1. Water supply and excreta disposal
    - Constructing water supplies that improve the quality and availability of water for domestic purposes, and improved excreta disposal facilities; and providing the necessary educational support to ensure use and maintenance of these new facilities.
  2. Personal and domestic hygiene
    - Promoting specific features of personal and domestic hygiene, such as hand-washing, by appropriate educational campaigns.
  3. Food hygiene
    - Promoting improved practices for the preparation and storage of foods, both commercially and in the home, and especially emphasizing the hygienic preparation of weaning foods.
  4. Control of zoonotic reservoirs
    - Control of infection of domestic and farm animals by pathogens causing diarrhea in man.
  5. Fly control
    - Control of flies, especially flies breeding in association with human or animal feces.
- D. By controlling and/or preventing diarrhea epidemics
1. Epidemic surveillance, investigation and control
    - Improving the ability to identify and investigate an epidemic early in its course and the capacity to implement effective control activities.

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ANNEX 5

TECHNICAL RESOURCES

For assistance with the planning and implementation of CDD related preventive interventions, CDD program managers can draw on the resources of numerous organizations and projects. Key resources in each intervention area are provided here for guidance.

ORGANIZATION NAME AND ADDRESS	RESOURCES AVAILABLE	COMMENTS
<u>PERSONAL AND DOMESTIC HYGIENE</u>		
Save the Children 54 Wilton Road P.O. Box 950 Westport, CT 06881	* training and education materials	Warren Berggren, medical director, is very committed to PHC programs and prevention in particular
<u>BREAST-FEEDING AND WEANING</u>		
Catholic Relief Services 1011 First Avenue New York, NY 10022	* educational materials	
WELLSTART 4062 First Avenue New York, NY 10022	* educational materials	
<u>WATER SUPPLY AND SANITATION</u>		
W.A.S.H. Project 1611 N. Kent St. Suite 1002 Arlington, VA 22209	* technical assistance * numerous technical and operational documents * collaboration in opera- tions research	
World Bank 1818 H St., N.W. Washington, D.C. 20433	* technical documents * project descriptions	

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ORGANIZATION NAME AND ADDRESS	RESOURCES AVAILABLE	COMMENTS
CEFIGRE B.P. 13-06561 Valbonne, Cedex FRANCE	<ul style="list-style-type: none"> <li>* technical assistance</li> <li>* training</li> </ul>	The French "W.A.S.H."
International Reference Center for Community Water Supply and Sanitation P.O. Box 93190 2509 AD The Hague The Netherlands	<ul style="list-style-type: none"> <li>* technical documents</li> </ul>	
PROWWS UNDP 304 E. 45th St. 12th Floor New York, NY 10019	<ul style="list-style-type: none"> <li>* documents/training              materials emphasizing              women in WSS, techni-              cal assistance</li> </ul>	Promotion of the role of women in water and sani- tation
<u>IMMUNIZATIONS</u>		
REACH Project 1100 Wilson Blvd. Arlington, VA 22209	<ul style="list-style-type: none"> <li>* technical assistance</li> <li>* documents</li> </ul>	
WHO EPI Program Avenue Appia 1121 Geneva 27 Switzerland	<ul style="list-style-type: none"> <li>* technical documents</li> <li>* technical assistance</li> </ul>	

**PRITECH FIELD IMPLEMENTATION AID**

**STRATEGIES FOR TRAINING HEALTH WORKERS  
IN NATIONAL CDD PROGRAMS**

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PRITECH**

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**This paper is one of a series designed to aid PRITECH field staff in providing technical assistance in diarrheal disease control efforts and programs. It was edited by PRITECH primarily to incorporate comments made by field staff and technical consultants.**

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## STRATEGIES FOR TRAINING HEALTH WORKERS IN NATIONAL CDD PROGRAMS

This paper examines some of the principal issues related to training in CDD programs and presents options and strategies for achieving and sustaining appropriate case management of diarrhea by health workers. Training, as defined in this paper, is distinct from health education and communications.

### A. RATIONALE

A major objective of national CDD programs is influencing health worker behavior concerning diarrheal disease management. The goal is to ensure that health workers at all levels of the system -- from the university teaching hospital to the village health worker -- have the necessary knowledge and skills to:

- Diagnose and manage diarrhea correctly
- Teach and motivate mothers to practice appropriate home management of diarrhea
- Implement institutional changes necessary to permit and encourage appropriate diarrhea case management.

Training has been the main approach to achieving and sustaining the foregoing goals. Because a top CDD program priority continues to be increasing the number of health workers receiving effective training, hundreds of courses and workshops have been held. Field evaluations, however, indicate that many health workers are not assessing and treating diarrhea cases according to established guidelines, despite having received training. Clearly, training alone does not necessarily result in the desired behavior changes.

This paper focuses on four areas related to health worker performance that are likely to be of particular concern to CDD program managers:

- What are the most effective and efficient strategies for training doctors and nurses regarding diarrhea case management and patient/mother education?
- What are the options for training other categories of health workers?
- What are the most efficient and effective methods of providing follow-up, supervision, and reinforcement following initial training programs?
- What other actions, in addition to training and supervision, should CDD programs take to encourage trained health workers to use their new knowledge and skills?

## **B. EXPERIENCE AND ISSUES**

Nearly all CDD programs have provided some training for health workers. Countries such as Mexico and Nigeria have developed comprehensive national training strategies, have designed or adapted training materials, and have institutionalized "cascade" training from the national to the state and local levels. Some, such as Pakistan and Indonesia, have emphasized in-service training of physicians in hospital diarrhea training units. Others concentrate training efforts on in-service courses for peripheral or community health workers. A few have begun to revise medical school curricula to reflect correct case management of diarrhea. As is apparent, great strides in training health workers have been made in the last decade.

In spite of efforts such as these, however, much remains to be done. The discouraging results of field evaluations of health workers' practices are often attributed to the use of ineffective teaching or training techniques. Other reasons may be equally or more important. They include lack of follow-up and supervision, logistical problems with obtaining supplies and educational materials, and lack of motivation or incentive for changing existing treatment behaviors or establishing a diarrhea treatment area.

This paper first reviews issues that are relevant to the effectiveness of training courses and then presents issues related to actions other than training needed to facilitate behavioral change.

### **1. Case Management Training**

To be effective, training in case management must at least be well planned, have the appropriate content, use the correct teaching methods, be supported by adequate teaching materials, and provide for post-training follow-up.

#### **a. Planning and Preparation**

Training should be integrated into overall program development. Training programs need to ensure linkage between the course and the trainees' work settings; they should not be planned and carried out as discrete one-time activities. Training efforts should be competency-based, focusing on skills that are needed in the work setting. Trainee knowledge and skill levels should be assessed, and courses tailored to meet the needs and expectations of the participants.

In many situations, these features may not be present. Trainees may be informed only a few days before a course that they are to attend. They arrive with a limited idea of what to expect. They seldom have had an opportunity to reflect on diarrhea case management in their own activities, or on problems they might face if they were to set up a diarrhea training unit or an oral rehydration unit or corner.

## b. Content

Case management training traditionally tends to focus on the prevention or correction of dehydration through oral rehydration (see the PRITECH implementation aid on case management). Other subjects crucial to proper case management that must be included are:

Feeding during diarrhea. Recent clinical studies on diarrhea treatment have shown that correct feeding during and after diarrheal episodes is of critical importance, not only because of its role in maintaining nutrition and growth of the child but also because of the role of food in stimulating absorption of fluids, thereby reducing stool output and duration. Unfortunately, this topic is seriously underrepresented in many courses, just as it is in actual practice (see the implementation aid on case management for more details). Trainees may be given little instruction regarding the details of dietary recommendations for children of different ages. In addition, they almost never have had the opportunity to practice techniques for convincing mothers to carry out the prescribed feeding recommendations.

Communication with mothers. The adoption and correct performance of a series of behaviors by the mother are essential to effective prevention and treatment of current and future diarrheal episodes. The WHO supervisory skills course and program managers' courses include techniques for communicating with mothers, but many other course activities or objectives do not include these methods. While health workers routinely talk to mothers of patients, studies show that these clinical encounters rarely include effective teaching of mothers.

Action planning. Trainees may face a range of problems in introducing correct diarrhea case management, establishing a DTU or oral rehydration unit, and training staff in their own facilities. These problems range from obtaining needed materials to obtaining permission from hospital supervisors to use needed space and from scheduling "on-the-job" training to organizing monitoring activities. Including specific activities in health workers' training to prepare them to plan and carry out such tasks is critical to ensuring execution of the tasks. The WHO guide for DTU courses includes an activity to plan how to address these problems.

Only recently have some countries' professional training schools begun to address their case management curriculum content. In many countries, the medical education curriculum either does not include ORT or gives inadequate attention to the scientific basis for ORT and the nutritional component of diarrhea case management. If diarrhea is included, the time allocated to it may be minimal. In fact, many schools teach and promote the use of intravenous therapy and antidiarrheals and antibiotics to treat diarrhea. Students merely copy the practices they see their professors using. In addition, preparing medical personnel to communicate with patients and with communities receives little priority. Physicians are frequently unaware of how to educate mothers and to work with community groups on public health issues. As a result, in-service training must undo what has been done in medical and nursing schools.

To address these concerns WHO, in March 1990, completed a curriculum for treating diarrheal disease to be used in medical schools. WHO is also developing a curriculum for nursing

schools. Several medical schools in the Philippines and Indonesia are testing the pilot versions of these materials, reportedly with much success.

### **c. Methods**

Appropriate training not only includes the correct content but also uses the most effective **training methods**. Trainers are usually health personnel who may not have had adequate preparation themselves in the use of effective techniques. Techniques such as role-playing, hands-on practice, written exercises, question-and-answer sessions and small group work that require active trainee participation and problem solving should be used in course design.

The teacher's viewpoint also affects student learning. Many medical school instructors do not believe in ORT. Those who do believe in and support ORT may not have enough training and confidence to practice it.

Special mention should be made of the need for clinical experience in case management training. Experience in many countries has shown that hands-on, personal experience in managing dehydrated patients is essential for convincing trainees that ORT is effective. To be effective, however, this experience must be structured and supervised, and trainees should receive feedback on their performance.

### **d. Materials**

Printed materials are valuable as training aids and as on-the-job reference documents after training. Handouts should support national policy. Teaching materials for medical schools pose a problem. Many pediatric texts, particularly those coming from the United States and other Western countries, give scant attention to oral rehydration and actually promote intravenous treatment. The availability of the WHO medical school materials should begin to correct this situation. Many developing nations do not have access to the wide array of professional journals available in the Western world. Videos and other audiovisuals, which are instrumental in demonstrating clinical technique, are often unavailable to training programs and medical schools.

### **e. Follow-up and Support**

Trainees are often enthusiastic during courses and seem quite convinced of the benefits of ORT. Without follow-up and material support, however, the trainee may return home and slip back into routine activities, thereby indefinitely postponing tasks that were to be undertaken after the course. Without follow-up and support, trainees also may have difficulty solving problems not addressed during the course. Where creation of DTUs or oral rehydration units is expected, the national program may not provide sufficiently clear directives or support for such reorganization. Hospital administrators often do not participate in training and may present obstacles to proposed reorganizations.

## **2. Training of Trainers**

Many trainees in clinical courses are expected to return home and train others in diarrhea case management. Where possible, training skills should be taught and sufficient time allotted

for trainees to master both technical content and training skills. Support (including time, budget, administrative support, or material to train others) for these "trainers" to carry out training sessions must be provided when they return home.

### **3. Supervision and Management Training**

Follow-up and supervision are essential if training is to achieve its maximum impact. Supervision needs to be more than inspection. It should include support, problem resolution, feedback, and opportunities for information sharing or continuing education. Too often, there is little or no supervision. As a result, detection and resolution of problems suffer. The WHO supervisory skills course has well-tested modules that address these issues.

Few, if any, medical schools provide training to medical students in supervision and management, even though these frequently become important functions of doctors within the Ministry of Health (MOH). This situation may change as more materials such as the WHO program manager's course and PRITECH/WHO Medical Education for Diarrhea Control Package are used.

## **C. OPTIONS FOR ACTION**

### **1. Strategies for Training Physicians and Nurses**

#### **a. In-service Training**

The most successful CDD programs seem to be those that have either converted or convinced a considerable proportion of physicians and nurses about the efficacy of ORT. A number of strategies have been suggested to influence the behavior of upper-level health workers. In-service training is the most widespread and necessary strategy in CDD programs. These courses should be planned as part of a national training strategy.

National training plans should identify the target groups for training as well as the trainers for each target group. Trainers should be selected for their training skills rather than for their status or seniority in the MOH hierarchy. Training plans should specify how training will be carried out: for example, by using the "cascade" approach or by teams of roving trainers who repeat the same training for various groups, by organizing one long course or a series of shorter workshops. (Guidelines for planning training coverage on a national level are presented in the module on **Planning and Monitoring Activities** in the WHO program manager's course).

Establishing diarrhea training units (DTUs) has been the main approach recommended to meet the need for in-service training. These are hospital units that routinely treat many cases of acute childhood diarrhea using correct case management methods and that conduct training in diarrhea management.

Although the training plan may be implemented in stages and the specifics may vary from country to country, there are certain components of sound training that apply at all levels and should be considered for any in-service course. These components are detailed in the paragraphs that follow.

- 1) Task orientation. The first step in planning a training program is to identify the tasks the workers have to accomplish in their jobs. For example, a few of the tasks involved in the appropriate case management of diarrhea are assessing signs of dehydration, determining the degree of dehydration and the appropriate treatment, preparing ORS solution, and teaching mothers to prepare and administer ORT at home. The emphasis in a training course should be primarily on teaching skills rather than knowledge. Communication of knowledge is needed as a support to skills development.
- 2) Appropriate training methods. Skilled trainers use a variety of methods to help trainees learn tasks. Methods such as giving written or oral instructions, assigning reading, or giving lectures are meant to provide basic information, but use of these methods should be limited. Action and participation are much more effective ways of teaching skills. Demonstrations and audio-visual materials give examples of what is to be learned. Role-playing exercises, supervised practice in actual work situations, and written exercises provide opportunities to practice the new tasks and to anticipate problems and solutions. Practice in a situation that is similar to the job is critical to effective training in appropriate case management. Hands-on rehydration of a child, in particular, should be included.
- 3) Careful planning. Training that is well planned will avoid wasting time and imparting confusing messages. Training plans should address exactly what will happen in the training sessions by specifying objectives and procedures, the numbers of participants and trainers, and what equipment, supplies, outside people, or teaching aids will be needed.
- 4) Training materials. Printed materials, such as forms, charts, pamphlets, technical articles or handbooks, and other CDD educational materials used in clinics are especially important and useful as teaching aids. They may be even more valuable on the job as reference documents after training. It is important to ensure that these materials are available to trainees in sufficient number, and are appropriate to the theme and group receiving the training.
- 5) Monitoring and feedback. Effective training gives individual attention to learners and adjusts plans for especially fast or slow learners. Each trainee should be observed to determine whether tasks are being practiced correctly or whether additional help is needed. Feedback on what the trainee has done well and suggestions on how to improve should be given immediately after practice. When the training group is large and trainers are unable to spend time with each person, trainees can observe and prepare critiques of one another's performance using specific forms or checklists to guide them.
- 6) Training of trainers. Most learners attending diarrhea case management training will in turn become trainers themselves -- whether this involves teaching other health workers or mothers of children with diarrhea. Thus, it is essential to ensure that teaching methods are taught in conjunction with case management.

Planners of training programs have several choices. One is to organize separate training-of-trainers (TOT) courses, especially for those health workers with significant

training responsibilities. A drawback may be the additional training costs to the program and the need to find trainers highly skilled in teaching methods.

Another option is to routinely include sessions on teaching methods during case management training. These sessions provide trainers with an opportunity to verify whether trainees can demonstrate ORT skills and give correct information while practicing teaching. If a course combines these two topics, the skills of the training team should be balanced in terms of training of trainer and clinical skills. Training planners should consider using local trainers who may not have a clinical background but who have already participated in TOT. They should also provide trainees with training materials, such as handouts and model session plans, to conduct training when they return to their worksites.

Several other resources are available for training of trainers. The WHO supervisory skills course contains separate modules on the treatment of diarrhea and on training. These modules are designed for first-level supervisors. A module to improve communication skills of physicians called **Talking With Mothers About Diarrhea** has been developed and distributed by PRITECH. PRITECH also has access to training consultants who could assist in developing and carrying out training of trainers.

- 7) Diarrhea training units. The purpose of a diarrhea training unit is to develop the skills and confidence of physicians and nurses so they can give proper therapy to children with diarrhea. When participants attend clinical training, they develop skills in assessing and managing diarrhea. They learn to treat simple and complicated cases and learn how to communicate these skills to mothers and colleagues. They become convinced of the effectiveness of ORT.

Experience indicates that at least a five-day training course is needed to be effective. This approach makes training expensive. Also, some professionals may find it difficult to leave their responsibilities for the required period of time. Because DTUs emphasize individual and practical teaching, only relatively small numbers of professionals can be trained at any one time. The number of participants may range from one to 15. In addition, the need to have a sufficient number of diarrhea cases of various types for each trainee to handle means that some DTUs may be able to run only during certain seasons of the year.

Despite these limitations, diarrhea training units are effective and appropriate settings for the preservice and in-service training of doctors and nurses in the proper management of acute diarrhea. A newly revised and expanded director's guide for establishing a DTU and planning and conducting training is available from the Diarrheal Diseases Control Programme of WHO (see Annex).

#### **b. Preservice Training**

It is often difficult to "reach" physicians and nurses after they have completed their basic training and taken up their service positions. Because of this, an important approach is to focus on the content and quality of undergraduate medical, nursing, and health auxiliary school curricula relating to diarrheal diseases. This strategy is critical to the long-term

sustainment of efforts to improve case management: it ensures that students learn correct diarrhea case management before graduation and that potentially harmful practices (such as the routine use of antibiotics and antidiarrheals) are not perpetuated through professional schools.

PRITECH and WHO have developed materials for use in medical and nursing schools during preclinical training. These teaching materials present state-of-the-art information on standard topics, such as the pathophysiology of diarrhea; the physiologic basis for oral rehydration; the assessment of hydration status; and the management of dehydration, acute watery diarrhea, dysentery, and persistent diarrhea. Topics that are usually neglected in professional school training, such as communicating with mothers, feeding during diarrhea, and supervision of the quality of diarrhea treatment, are presented in innovative ways that require student participation and the practicing of skills.

The nursing school materials are being used in 12 schools in the six Sahelian countries for which they were developed. The medical education materials are currently being field tested and the completed version is now available from WHO. PRITECH has also developed materials for peripheral health workers that are being used in the Sahel.

The clinical training of medical and nursing students can be best accomplished in diarrhea training units. Thus, the first step toward improving preservice training is the establishment of correctly functioning DTUs in teaching hospitals. The reasoning behind this strategy is that the clinical experiences of medical and nursing students in DTUs where ORT and effective case management are being practiced will have a much greater effect on their future diarrhea treatment than preclinical lectures.

The advantage of concentrating on preservice training is that promoting appropriate case management during initial training avoids the problem of having to "undo" incorrect practices later. Another advantage is that students are there to be taught and are already being taught; the CDD program does not have to bring them in for training. The disadvantages are that it is often difficult to gain access to professional school curricula and that teachers sometimes resist the introduction of new materials and new teaching approaches, especially those requiring more active student participation. Participatory methods take longer and are harder to prepare and conduct than giving lectures. Further, because this approach reaches only new professionals, it will require a generation to replace practicing doctors and nurses who have not been trained in appropriate case management.

CDD program managers should realize that curriculum reform is a lengthy enterprise. It can be facilitated by soliciting the participation of instructors in designing, developing, testing, and adapting materials destined for their use and by taking their time constraints and institutional requirements into consideration.

### c. Other Case Management Training Strategies

- 1) Professional conferences. Providers with extensive clinical experience are sometimes reluctant to attend training sessions because they believe they already know how to treat diarrhea or are "too busy". Private practitioners in many countries see the majority of diarrhea patients; therefore, reaching such providers is an important issue in most CDD programs.

One way to address this reluctance is to offer professional conferences or scientific seminars that may feature a particularly renowned and respected speaker. The advantage of professional conferences is that they expand the audience to nurses and doctors who may have neither the time nor motivation to attend clinical training in DTUs. The limitations of this format, however, must be realized. It is usually impossible to incorporate "hands-on" experience into a conference format, and only a portion of physicians attend. Professional conferences are unlikely to achieve much more than stimulating interest in learning more about appropriate diarrhea management and addressing some negative attitudes about ORT and feeding during diarrhea.

- 2) One-on-one discussion. The only way to reach certain providers is to talk with them individually at their place of work. This training approach, often referred to as "detailing," has been effectively used by pharmaceutical companies to market their products. As "counterdetailing", it has been effective in reducing the use of unnecessary and expensive antibiotics and other inappropriate treatment practices. The detailing visit usually includes the distribution of free samples and educational materials. This concept is new within the context of CDD programs. It may be useful in targeting particularly busy practitioners who see a large number of diarrhea cases. Strategies for the organization and funding of detailing efforts have yet to be developed. Trials will be necessary to determine whether this approach can be effective in changing behavior to include ORT.
- 3) Mass media promotion. Such promotion directed at the community will also reach doctors and other health workers, informing them about ORT and the recommendations of the national CDD program to the public. Mothers convinced by such promotion will be more likely to expect and ask for ORT. Newsletters (such as "Dialogue on Diarrhea" and PRITECH's "Technical Literature Update"), journal articles, and other mailings may be alternative ways of informing and interesting professionals in appropriate diarrhea management. The effectiveness of these methods in actually promoting or sustaining behavior change has not been objectively determined, but it is fair to suppose that mass media promotion endorses such change as socially acceptable.

### 2. Strategies for Training Other Health Workers

Doctors and nurses comprise only a small fraction of the health workers in most countries. Indeed, most episodes of diarrhea that are brought for attention will be treated by village and community health workers, pharmacists, and a variety of traditional and informal practitioners. The task of training these varied providers is in many ways more challenging than that of training doctors and nurses. Some, for logistical or cultural reasons, may be unable to travel to training programs outside their local areas. Some may not be literate. Many may hold

beliefs about illness, its causes, and its consequences that differ significantly from the concepts of the biomedical model of disease.

Regardless of these various factors, the elements of effective training, as presented earlier, apply to training other types of health workers. In addition, the training should take into consideration certain characteristics of the trainees, such as languages spoken, reading ability, and ability to understand drawings and symbols. Some health workers may be shy or may think it is rude to excel or display their knowledge in front of others. The degree of comfort with providing and accepting feedback may also vary from culture to culture. If possible, an assessment of trainees' sociocultural characteristics should be made before designing the training program.

Innovative approaches are being considered for training health workers such as pharmacists and medical technicians. Where a sufficient number and range of clinical cases are unavailable, video materials, slides, and photos may provide acceptable alternatives. The effectiveness of self-help learning materials in reaching certain types of health workers might be explored. WHO is in the process of developing case management training modules for a shortened training course, a self-learning course, and a pharmacists' course.

The training of community-level health workers has been a major strategy in providing primary health care services in rural and isolated areas. Some countries, however, have experienced tremendous management and logistical difficulties in providing the training, supervision, and follow-up necessary to support these workers. High rates of turnover in many settings have compounded the problem.

A number of possible solutions have been suggested to this overwhelming management difficulty. Some recommend training established traditional healers to promote continued feeding and administration of home fluids during diarrhea. The expectation is that there will be less turnover in traditional healers and that the use of available fluids, instead of ORS packets, will make the program self-sustaining. Others have advocated abandoning the idea of training community health workers in the use of ORT and instead taking the message directly to the household by means of mass communications campaigns. In the absence of any type of formal health structure, Bolivia's CDD program has successfully trained mothers' club members organized through CARITAS feeding centers to act as community promoters and teachers of diarrhea home management. These issues and options must be addressed in developing a national training strategy.

### **3. Methods of Facilitating the Adoption of Appropriate Case Management**

In numerous country programs, efficient training has not led to proper case management because the rest of the program was not in place. To be effective, training must be combined with other efforts by the CDD program to reinforce and support the desired new behaviors. Training plans and courses alone are not enough: activities and the environment in the workplace to which the trainee returns must support the desired behaviors.

Furnished with information and skills alone, the trainee will often fail to make the changes needed in the daily work environment. The following additional activities may help to promote the adoption of appropriate case management after training.

**a. Provide Adequate Supplies and Materials**

If appropriate health worker behavior is to be sustained, then mechanisms must be in place to ensure the availability of ORS packets and supplies for ORT preparation and administration as well as teaching aids for explaining home management of diarrhea to mothers. Where equipment, supplies, or training materials will be needed by the trainee to carry out expected tasks, they should be ordered well in advance of the course. This includes materials for training fellow health workers upon return home. Delivery to the trainee's work site prior to his or her departure for the course will help to maintain the momentum to institute new practices after completion of the training.

**b. Link Training to the Work Setting**

Training should be conducted using only materials that will be available in the trainee's work setting. Sophisticated equipment and laboratory tests should be avoided. Problems and restrictions that may be specific to the learner's workplace should be anticipated and a specific action plan for coping with them prepared at the time of training. For example, the new WHO training package for diarrhea training units includes guidelines on how to set up an ORT corner in a small facility. Suggestions for approaching a resistant supervisor can be included in the training session and discussed during subsequent follow-up visits.

**c. Decrease Access to and Demand for Antidiarrheals and Antibiotics**

Health worker performance occurs within a social and economic context. The availability of pharmaceuticals and continuing public communications activities may make it either easier or more difficult for health workers to practice appropriate case management. If there is an essential drug policy that limits the manufacture and import of antidiarrheals, use of these agents will not be an option and health workers will be more likely to prescribe ORT. If communications campaigns educate mothers about the efficacy of ORT, the benefits of continued feeding during diarrhea, and the dangers of unnecessary drugs, health workers may find it easier to promote these activities.

**d. Address Potential Points of Resistance**

If issues that will make implementation of appropriate diarrhea management difficult can be anticipated in advance, it may be possible to structure the training to address them. For example, if it is suspected that physicians will resist changes in treatment protocols suggested by nurses, it may be helpful to train the entire team of providers from a given facility at one time. Placing one or two newly trained providers in a community where all other health workers dispense antibiotics and antidiarrheals may put those promoting ORT at an economic disadvantage, and lead to mothers receiving conflicting messages about ORT and drug use from different providers. It may be more effective to train as many health care providers as possible from the same geographic area.

**e. Create Institutional Pressures for Appropriate Case Management**

An indirect way of influencing the behavior of professionals may be through the institutions in which they work. Certain countries in which hospitals are accredited or funded centrally have

enforced policies requiring the establishment of diarrhea training units and adherence to performance standards regarding diarrhea management.

#### **f. Monitor and Reinforce Appropriate Case Management**

Regular follow-up and monitoring (routinely checking the performance of health workers) are determining factors for sustaining desired behavior by health workers. Monitoring is also the best reinforcement for training. Supervisors can fulfill this function more successfully if both training and monitoring are based on the same set of program strategies and task definitions.

Guidelines for effective monitoring of health worker performance are briefly outlined below. Many of these are described in greater detail in the WHO/CDD supervisory skills module on planning and monitoring activities.

- 1) Identify what is expected of health workers. List all routine and special health service activities, including those related to patient care as well as administrative and supervisory tasks. Assign responsibility for the activities to individuals and prepare schedules which show when the activities should be performed.
- 2) Select the specific items to be monitored. Choose items that determine whether health workers are doing a good job in diarrhea case management. Consider which items are most important to the success of the health service, which are most difficult to do, and which are new to the health workers.
- 3) Decide how and when to monitor each item. Possible methods of monitoring include direct observation of health workers, review of forms completed by health workers, or interviews with mothers at the time of or after treatment. Checklists are a particularly helpful way of remembering what to look for when monitoring.

Several countries have experimented with requiring new trainees to use a special clinical form during the six months or so following a course. The form requires documentation of observations and treatment recommendations for patients with diarrhea and is intended to stimulate trainees to use correct case management procedures. The design of the form makes it a reminder as well as a recording form. Analysis of detailed information from the form by a supervisor will help to identify errors or omissions in case management and is useful in providing feedback soon after the training experience.

- 4) Solve problems found when monitoring and give feedback to health workers. The purposes of monitoring are to reinforce appropriate performance, to correct inappropriate behavior, and to resolve problems that present obstacles to appropriate case management of diarrhea. Health workers should be congratulated and praised for tasks that are performed correctly. Whenever possible, they should identify performance problems and suggest corrections themselves. Suggestions should be made for making improvements in remaining deficient areas and if necessary additional information or training provided.

- 5) Plan continuing education activities. "One-shot" training events cannot be expected to produce sustained changes in health worker performance. Plans for reviewing and updating existing knowledge and skills are an essential part of follow-up and reinforcement. Possible continuing education strategies include mailings or self-teaching materials as well as attendance at mini-refresher courses.

Another approach to continuing education might be to develop mini-modules that cover the most common problems in implementing appropriate case management. Such modules could be presented on a one-on-one basis by the supervisor during routine visits. The availability of a structured module would permit a better organized response to problems and would free the supervisor from any embarrassment at having to tell a colleague what to do. Supervisory mini-modules on common performance problems have been developed by PRiTECH's Sahel office and are currently being field-tested.

## ANNEX

### TRAINING RESOURCES

#### 1. Training Guides

**WHO Supervisory Skills Course for Mid-Level Managers.** (WHO CDD Programme, Geneva) Contains the following modules:

- . Introduction
- . Community Involvement
- . Treatment of Diarrhea
- . Targets
- . Training
- . Prevention of Diarrhea
- . Course Director's Guide
- . Facilitator Guide
- . Planning and Monitoring Activities
- . Evaluating Progress and Course Summary

**Talking With Mothers: A Workshop for Physicians.** (PRITECH 1988). Contains a leader's guide and a participant's workbook. Available from PRITECH Information Center.

**DTU Director's Guide and Teaching Materials.** (WHO CDD Programme, 1988)  
Contains lectures and slides.

**Training for the Control of Diarrheal Diseases - Intermediate Level.** (PRITECH Sahel Office, 1987) Contains the following four modules, field training workbook and teacher's guide for preservice training of nurses:

- . Epidemiological Overview and Clinical Concepts
- . Treatment and Prevention of Diarrheal Diseases
- . Application of Health Education Techniques to Diarrheal Disease Control Programs
- . Elements of a National Program to Combat Diarrheal Diseases

**Medical Education for Diarrhea Control.** (PRITECH/WHO 1988 field test version.)  
Contains teaching activity library, student workbook and reader, examination question bank, instructor's manual.

#### 2. Audiovisual Training Material

**Diarrhea Management** (by Jon Rohde, UNICEF 1988.)  
Produced in India. Contains 23 learning modules; 2 hrs. total. Limited availability from PRITECH Information Center.

**Miriam: Uso Exitoso de la Terapia de Rehidratacion Oral** (PAHO/PRITECH 1987).  
Filmed at Children's Hospital in Mexico. Includes post-viewing facilitator's discussion guide. For health professionals in Latin America. In Spanish.

3. Human Resources for Training

**Consultant Bank, PRITECH, 1925 North Lynn Street, Suite 400, Arlington, Virginia 22209.**

**Training Resources Group, 1021 Prince Street, Alexandria, Virginia 22314.**

**Management Sciences for Health (MSH), 165 Allendale Road, Boston, Massachusetts 02130.**

**PRITECH FIELD IMPLEMENTATION AID**

**LOCAL PRODUCTION OF ORAL REHYDRATION SALTS**

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Management Sciences for Health**

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This paper is one of series designed to aid PRITECH field staff in providing technical assistance in diarrheal disease control efforts and programs. It was edited by PRITECH primarily to incorporate comments made by field staff and technical consultants.

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## LOCAL PRODUCTION OF ORAL REHYDRATION SALTS

### A. RATIONALE

The reliable supply of oral rehydration salts (ORS) is a cornerstone of diarrheal disease control (CDD) programs. At the inception of most CDD programs, ORS is usually imported as a donation either from UNICEF or from other international aid agencies. As CDD programs develop, however, interest in ensuring self-sufficiency increases, and with it, the desire for a reliable supply of low-cost, locally produced ORS that is suited to meet specific local needs for size (volume) and label instructions.

While these goals are admirable, certain factors oppose local production. Key among these is low demand that can render local production economically infeasible. Another is the lack of a developed pharmaceutical industry capable of producing ORS of adequate quality and safety.

While specific figures may vary from country to country, approximately \$200,000 is needed to initiate ORS manufacture. More importantly, however, it should be clearly established that local circumstances will support a decision to establish a production facility. This approach demands a careful, deliberate examination of several policy, economic, and technical issues as well as a review of the experience in other countries.

### B. EXPERIENCE

In 1987, 75 percent of the roughly 350 million liters of ORS produced annually in the world were being manufactured in developing countries. The following summary of the status of production in some of these countries highlights some basic considerations in ORS production:

Indonesia. Indonesia has a well-developed pharmaceutical industry; in addition, at least 12 manufacturers, both private and parastatal, have the ability to produce ORS. The current production capacity, however, appears to greatly exceed the market's current capability to absorb the product. With too many producers chasing low demand, usage rates remain low, as do ORS sales. The low revenue from ORS sales acts as a disincentive for continued production by manufacturers, some of which are ranking ORS as a low-priority item and cutting back on production.

Bangladesh. As a result of its large population and the high incidence of diarrheal disease, the annual demand for ORS is estimated to be in excess of 40 million half-liter packets. In accordance with the strict essential drug policies of Bangladesh, local production of ORS is required. Currently, one parastatal and one private company are manufacturing ORS but are incapable of meeting demand. Both companies have encountered obstacles which, while justifiable, have reduced the volume of product on the market. In an effort to meet its own needs, the Social Marketing Program (SMP) studied the feasibility of setting up its own production line for ORS. After reviewing the study, the SMP has decided to continue to procure ORS from other local producers.

Costa Rica. The need for ORS in both the public and commercial sectors is being met by private manufacturers. The Social Security Administration lets tenders for the public-

sector requirements and individual manufacturers compete to market the product, a 240 ml packet, in the private sector. Reach could be improved through more effective and active promotional and marketing efforts.

Tunisia. Until early 1989, when two local private pharmaceutical companies began producing drugs, there was little pharmaceutical production in Tunisia apart from that produced by Pharmacie Centrale de Tunisie (PCT), a parastatal company. PCT, which produces more than 300 preparations under different forms, needs to upgrade its facility and equipment in order to produce ORS according to GMP standards. The demand for ORS, however, is low and competing products, such as antidiarrheals, are better promoted.

Zambia. Although ORS is produced by a private sector company, the government has chosen to procure ORS produced by the government pharmacy. For several months, however, the government pharmacy was reluctant to begin production until assured of both a subsidy and a substantial market. During that period, efforts were made to make the market for ORS more attractive to producers by removing competing products from the national formulary. It was also agreed that UNICEF, USAID, and WHO would underwrite the cost of raw materials during the first few years of production.

Mali. In 1985, a PRITECH team recommended the local production of ORS by a parastatal company. The project was approved, and UNICEF agreed to donate the equipment. On a return visit in late 1987, an ORS production consultant reviewed the installation and identified several additional items required before production could begin. By mid-1989 most of the items were obtained, and an initial trial production run was made. Final production trials were run in early 1990; it is expected that actual production will begin by mid-1990. As a result of inflation during the lag period between the time when the feasibility study was conducted and when production will begin, the product will cost more than initially estimated.

Egypt. A comprehensive CDD program was launched in the mid-1980s with financial and technical support from USAID and other international aid agencies. CID, the governmental pharmaceutical producer, has been able to manufacture an ORS product carefully designed to meet local needs for labels, instructions, and volume size. Production and promotion of ORS, however, have been heavily dependent on donor subsidies, principally from USAID. Without the subsidy, it is unclear to what extent the program would be self-sufficient.

Ghana. Production of ORS by a private company began in February 1988. Production and promotion activities have been closely linked and efforts to launch the product have been marked by extensive cooperation among the government, the company, USAID, and UNICEF. Rather than a direct subsidy in the form of capital, the private company received technical assistance in manufacture and marketing, a one-time supply of raw material, and a small, one-time grant for product promotion. Funding for equipment procurement took the form of loans in hard currency. Repayments will be made in local currency to be used to promote the sale and use of ORS. Particular attention has been given to expanding the distribution of ORS beyond the reach of government health facilities.

These examples suggest conditions that favor local production of ORS and others that discourage it. The need to define the market demand for ORS is evident, as is the need to assess the risk of working with public sector pharmaceutical laboratories. Similarly, a need exists to stress the importance of integrating production and promotion, because production without promotion cannot be sustained.

CDD officials and PRITECH representatives assessing the prospects for initiating the local manufacture of ORS should be conversant with issues in four closely related areas, namely:

- Policies and politics
- Economic considerations
- Production capability
- Marketing and promotion.

The principal issues concerning each of the foregoing areas are discussed in the following section in conjunction with Options for Action.

## C. OPTIONS FOR ACTION

### 1. Policies and Politics

The decision to produce ORS locally should be preceded by an examination of several factors, beginning with an estimate of the potential demand for ORS. This demand is largely dependent on the state of development of the CDD program. An estimate of the under-five population and of the incidence of diarrheal disease episodes is generally not a sufficient basis for demand forecasting. Other factors that must be explored include an analysis of the extent to which diarrheal disease is treated with oral rehydration therapy and the role that ORS packets play compared with other forms of oral rehydration therapy.

It is equally important to assess the government's position on ORS production and distribution. A government decision to restrict production to a public sector manufacturing facility has program implications in terms of timeliness, cost of production, and product distribution. In general, the distribution options of public manufacturing facilities are more limited than those of the private sector.

The local UNICEF office can play a critical role in influencing a course of action for ORS production. Some UNICEF field offices have expressed interest in supporting ORT programs by means other than continued donations of packets. For example, they have supported local production by agreeing to purchase locally made ORS if its unit price is not more than 20 percent higher than that of UNICEF centrally procured ORS delivered in country; some have underwritten capital equipment costs. Thus, the attitude of the local UNICEF office can be important.

**Action:**

**Work with UNICEF, WHO and MOH officials, and others to estimate the demand for ORS in liter-equivalents over the next five years.**

In making the estimate, take into account the special characteristics of the national CDD program and give special attention to estimating how frequently ORS packets are to be used as therapy for diarrheal disease.

**Discuss with the local UNICEF office its plans to supply ORS packets and its interest in promoting local production of ORS.**

If the requirement for ORS is low (fewer than one million packets annually), the most efficient use of financial resources may be to continue procurement through UNICEF, either in the form of donations or by reimbursable procurement. With reimbursable procurement, packets can be purchased at the lowest possible price, that is, UNICEF's cost without markup. For orders of at least one million packets UNICEF can provide packets that address specific local needs in terms of volume size and label instructions for use appropriate to the local culture. Details must be negotiated through the local UNICEF representative.

UNICEF (or USAID) may also be able to help in encouraging the initiation of local production in one country to serve needs of several neighboring countries, for example, a cluster of southern African countries. Awareness of political constraints is important in determining the feasibility of this approach.

**Meet with the chief pharmacist or head of the pharmacy board to determine the regulatory classification of ORS.**

In countries where the intention is to make ORS widely available to the public, WHO/CDD has recommended that ORS be classified in such a way as to ensure proper quality control in manufacturing while permitting its wide distribution. In most cases, this means classification as an over-the-counter drug (OTC), available without prescription. If the pharmacy board is reluctant to allow a classification this lenient, it should be presented with supporting data from the international medical community.

**Ascertain from discussions with officials from both the pharmacy board and the MOH their willingness to support local production of ORS.**

In some instances, government officials are reluctant to support local production of ORS, either because there is a perception that scarce resources should be used for direct health services or because a belief exists that the local pharmaceutical industry could not manufacture a product of acceptable quality. The lack of confidence in the industry may be related to the absence of an enforcement capability by the local food and drug authorities. Should that be the case, the pharmacy board should be told that independent quality

assurance audits can be conducted by international donor agencies, for example, WHO or USAID, upon request.

**Discuss with MOH officials and others their willingness to procure ORS produced by a local private company.**

Government officials are often reluctant to procure a privately manufactured product. Frequently, despite the presence of a capable private company willing to produce ORS, the MOH will refuse to purchase this product or insist on buying a product manufactured by a public sector facility. In such a situation, it is important to help the government understand the cost and programmatic implications of its decision by conducting an analysis that compares the cost of ORS to the government when procured from different sources, that is, private and public vendors. This analysis would review such aspects as extent of plant renovation required, access to foreign exchange, timetable for start-up of production, unit cost, and marketing and distribution capability of the different facilities.

Government officials often believe that prices on products manufactured in the private sector are only enforceable at the wholesale level and that retail prices are frequently beyond the ability of the government to control and of the consumer to pay. For these reasons, governments prefer to subsidize the manufacture and distribution of essential drugs such as ORS. Often, however, governments do not realize that this practice does not necessarily ensure supply -- because governments frequently lack the foreign exchange to maintain production -- and may in fact force consumers to pay a premium for scarce products.

**Select a company for ORS production, considering both technical and nontechnical factors that may affect the success of the undertaking.**

After reviewing the expertise in manufacturing and quality control, assess how many levels of government approval must be obtained for the company to start production. Are several ministries involved (for example, industry, finance, economic planning, commerce)? Is the company of choice locally owned, well-known, and politically acceptable? Can the company's distribution system complement the public sector distribution practices? Is the company willing to expand ORS distribution by directing some of its product to other distributors? Is the company willing to promote its product actively to doctors and pharmacists? To the public?

## **2. Economic Considerations**

Locally produced ORS has a higher unit cost than that which can be purchased by reimbursable procurement through UNICEF. Still, as noted earlier, local production is justifiable on more than purely economic grounds. Every effort should be made, however, to keep the unit cost reasonable in terms of public sector price expectations. As noted earlier, UNICEF has given its local offices permission to purchase locally produced ORS if the product is of quality comparable to international standards and if its unit price does not exceed by more than 20 percent the cost of UNICEF packets delivered in the country.

A common misconception exists that local ORS production frees up scarce foreign exchange previously used to purchase an imported product. The government is often not using foreign exchange because UNICEF is frequently donating ORS. In addition, it should be recognized that some amount of foreign exchange will be required even if ORS is produced locally. Few countries have the raw materials or packaging materials and many nations, especially in Africa, will need access to foreign exchange to import these essential ingredients. Still, the foreign exchange output for individual raw materials is significantly less than the amount required to purchase and import the finished product.

In addition, if an in-country manufacturing facility is able to offer a product for a price acceptable to the government, the government may be able to find a way to avoid any use of foreign exchange for ORS. For example, in two different countries (Ghana and Yemen Arab Republic), UNICEF has agreed to provide raw materials to local producers. In turn, each has agreed to produce and turn over the quantity of ORS previously donated by UNICEF. Because UNICEF has given raw materials equivalent in value to the previously imported finished product, the local producer has access to a supply of ORS that can be marketed in the private sector. In these cases, no funds were passed, and the private sector company does not earn revenue until sales are generated in the private sector.

Finally, experience suggests that subsidies are more frequently found in the public sector than in the private and that the practice should be avoided if self-sufficiency and continuous supply are to be ensured. Rather than subsidizing ORS production, it is advantageous to consider limited, short-term grants that "prime the pump" for ORS sales and allow the market to develop, thereby generating revenue which serves as an incentive to continue production. One approach is to obtain a donation of raw material adequate for one or two years' production on condition that the resultant lowering of production cost be reflected in a price proportionately lower than it would have been had the raw materials been purchased (this is to be done in Niger).

For both technical and financial reasons, ORS should be considered a product to add to an already-existing production line rather than the first product that a company produces. As mentioned, the capital outlay for both production and quality-control equipment is significant, and in general, the revenue from ORS sales is low to moderate. It does not make sound financial sense to establish a pharmaceutical production facility based initially on ORS production; ORS is a "marginal" product that should be added to complement existing capacity.

It remains to be determined how ORS should be priced. As noted above, the government frequently has well-defined policies pertaining to the setting of prices. Often the wholesale and actual prices are fixed percentages of the ex factory cost. Commercial success of the product may, however, be closely related to the pricing practices endorsed by the government and implemented by the producer or distributor. An inexpensively priced product may have no commercial appeal to either the producer or the consumer; and a costly item may not be affordable to the target population. Currently, little information exists that relates the effect of price on consumer acceptance of ORS as well as distributor or shopkeeper willingness to stock and promote it. Price sensitivity studies were conducted in Mali and Honduras. The

studies suggest that mothers were willing to pay for ORS packets when made aware of the benefits of the product.

**Action:**

**Contact UNICEF to learn the landed unit price for the ORS that it imports.**

This activity would serve as a benchmark against which to consider the cost of locally produced ORS.

**Discuss with interested local manufacturers which packaging and raw materials must be imported and which can be obtained in country.**

This information may be used to ascertain how important an issue the need for foreign exchange is, and the type of import duties that can be expected (some countries levy duty on raw materials used to make pharmaceuticals but not on imported pharmaceuticals). It can also be used as a starting point for discussions with government finance officials about the priority of local drug production in terms of allocating foreign exchange, and about the possibility of exemptions to import duty on equipment and raw materials where relevant.

**Obtain assistance from an engineer with expertise in ORS production to conduct a detailed cost analysis for locally produced ORS.**

Such assistance can be arranged upon request through PRITECH, Project SUPPORT (a USAID centrally funded project that works in ORS production and promotion), WHO, or UNICEF.

**Calculate the overall program cost for supporting local production of ORS (technical assistance can usually be obtained if needed).**

In addition to unit cost, the initial outlay to establish the facility and any continuing costs to maintain the process must be considered. Compare this to the overall outcome of local production. Could it increase private sector sales and distribution, thereby expanding overall distribution and reducing the burden on the public sector system? Bear in mind that even if ORS were produced locally, the MCHs in many countries would still be unable to procure packets without donor assistance.

**Consider employing a market research firm to conduct a survey that collects information on competing products on the market.**

It would be useful to know: (a) the total annual US dollar value of these products; (b) sale volumes by socioeconomic level; and (c) ex factory cost and markups for these products. If there is an International Marketing Survey for the country and the PRITECH representative has established contacts in the marketing industry, it should be possible to obtain this information.

**Consider initiating a consumer pricing and marketing survey.**

This survey would collect information on what consumers from different socioeconomic groups are willing to pay for an ORS product. Other data to be collected would include household expenditures for medicines within the last month, and consumers' thoughts on which characteristics of ORS are most valuable, for example, whether the product makes a child more active (positioning the product).

**3. Production Capability**

Although a relatively simple product to manufacture by pharmaceutical standards, ORS nevertheless requires adherence to an internationally recognized code of Good Manufacturing Practices (GMPs). GMPs call for a dual system for controlling the product. First, the manufacturing process itself makes use of numerous specific systems to engineer high quality into the product. Second, the quality control process requires that at least 33 tests be conducted on the product, both while in-process (to allow immediate corrective action in the plant) and on the final product (to determine whether the product can be released).

While adherence to GMPs can be costly, the consequences of disregarding them can be still more costly or even fatal. The latter was demonstrated in the tragedy in Peru, in which four children died as a result of ingesting ORS of poor quality. The ORS, produced in the United States, contained ten times the stated concentration of potassium. In a separate incident, problems with cross-contamination of ORS packets (also produced in the United States) resulted in the need to destroy one million packets in Ecuador. These incidents directly resulted in destruction of human life and material goods; indirectly, however, they may also have had the consequence of undermining the credibility of the ORT programs in those countries.

It has often been said that ORS could be produced in a plant that manufactures similar nonpharmaceutical products, such as packets of soup mix or dried milk. In fact, no experience exists to date (with public funds) with production in this type of facility. While theoretically possible, it must also be emphasized that ORS made in a nonpharmaceutical plant would still need to be made in accordance with strict drug GMPs. Unless separate equipment and a separate part of the plant were dedicated to ORS production, there could be problems with cross-contamination from products not made in accordance with GMPs. The successful manufacture of ORS is not unusual; unfortunately, it is generally only when unsuccessful that attention is given to manufacturing practices.

**Action:**

**With assistance from an ORS production expert, if necessary, examine each potential manufacturer for the following features:**

- Has proven track record in producing other products
- Follows Good Manufacturing Practices

- Is adequately staffed, with at least one trained pharmacist and one expert in quality control
- Has sufficient space for adding ORS to its production line
- Is receptive to accepting assistance specific to ORS production
- Already possesses a broad range of functioning quality control equipment (an indication of how highly it regards quality control).

**If justified, arrange for study tours of local staff to other functioning ORS facilities in the geographic region that are subject to similar constraints in manufacturing.**

For ORS produced with public funding, it is possible to arrange for periodic quality assurance audits by qualified authorities (for example, WHO or Project SUPPORT).

If problems with the quality of the ORS supply are suspected, request technical assistance at the earliest possible time. As a result of the recent problems with ORS in Latin America, USAID can assist in providing technical assistance through centrally-funded projects. On occasion, USAID has also requested assistance from the U.S. Food and Drug Administration.

#### **4. Marketing and Promotion**

ORS promotion and marketing must be integrally associated with ORS production. This is discussed more completely in PRITECH's paper "Promoting Commercial Sales of ORS." The discrepancy between ORS supply and demand is widely known and attests to the fact that merely making large quantities of packets available does not ensure either use -- or sales. If sales are low, then the manufacturer has little incentive to continue production at the levels required.

The link between ORS production and promotion must be established at the outset of project development. As noted above, when selecting a potential manufacturer, it is important to assess the marketing and distribution capability or the firm's willingness to work with other distributors. These elements are as important as production capability.

Market research has proven a useful and often essential tool in deciding a course of action for ORS production. Before equipment and packaging materials are ordered, several promotional and marketing issues must be investigated. The collection of this information necessarily precedes the start-up of manufacture. Objective data based on field surveys and focus group discussions with target populations should be conducted to determine such issues as appropriate package size and mixing instructions.

The decision to work with a private manufacturer should be contingent on the company's agreement to promote ORS in a manner consistent with the CDD program. Critical messages concerning preparation and use should be identical for both the public and private sector

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products; if possible, the same symbols and logo should be displayed. The private manufacturer may also need to understand that ORT is the therapy of choice for diarrheal dehydration and the reasons why that is true. Issues of competing diarrhea products from the same manufacturer should be addressed. The co-positioning of ORS with an antidiarrheal should be discouraged, in order not to "legitimize" a useless drug.

In those countries where ORS packets are already available and where other presentations of drugs are popular, the introduction of ORS in other forms can also be explored. ORS has been manufactured in three principal presentations: a powder for dissolution in a specified volume of water, usually a liter, half-liter or 200 to 250 cc; a premixed beverage, for example, a "Tetrapak" brick of around 250 cc; and a single-dose tablet (from PATH or Ciba-Geigy) to be dissolved in 120 or 150 cc of water. In the case of premixed fluids, it should be noted that electrolyte "sports drinks" are available on many markets. Most of these contain levels of sugar (and other extraneous ingredients) that are potentially dangerous to dehydrated children or infants. Labels of all such products should be checked carefully for conformity with the WHO ORS formula. While the addition of coloring or flavoring has not been formally endorsed by WHO and UNICEF (which will not procure stocks with these additives), such presentations may be favored by the private sector for encouraging consumption of ORS.

**Action:**

**Review the potential producer's record for marketing.**

In particular, the company's routine means of distributing products should be checked as well as its advertising practices. If the company manufactures competing antidiarrheal or antibacterial products, agreement must be reached on promoting ORS as the therapy of choice, at least in children and infants.

Discuss with the pharmacy board the types of advertising and distribution permitted for ORS. If there is resistance to promoting ORS as an over-the-counter drug, work with UNICEF, MOH/CDD and USAID to prompt the board to consider other, more aggressive options for promoting ORS.

**Set up an ORS promotion committee comprised of representatives from USAID, PRITECH, MOH/CDD, MOH/Health Education, UNICEF, the manufacturing company and other prominent players in oral rehydration therapy or primary health care.**

This committee would advise on the design and implementation of promotional activities. It should involve all authorities who could be helpful (or constrain) the widespread promotion and use of ORS.

**In working with the committee, arrange for field research to determine such issues as:**

- Attitudes of infant caretakers and health care workers toward childhood diarrheal disease

- The type of therapy mothers currently use, want, and expect for diarrheal disease and how it compares with effects of ORT and competing antidiarrheal products
- Content of "meaningful" package labeling and instructions for ORS, that is, readily understood and used by caretakers
- The volumes of the most commonly available household containers in which ORS would be mixed
- The most effective ways of advertising and distributing ORS through both public and private sector channels.

As part of the market and pricing surveys noted above, it may be important to estimate the percent of the market held by different pharmaceutical presentations. This study could suggest, for example, the relationship between product presentation and consumer acceptance. When designing the promotional campaign, the committee would be able to use this information to reach specific target groups using different promotional techniques. The committee would also address such issues as how to couple public and private sector efforts in promoting ORS; for example, coordination of the ORS product launch with an ORS/ORT campaign.

**Before offering technical assistance in promotion to a company, consider the extent to which working with a given company can affect ORS use.**

In more limited projects, it may be necessary to work with a company to make its ORS labeling and advertising copy accurate, effective, and consistent with CDD promotional activities. If, however, the company has limited reach, assistance may have little impact on increasing the ORS market. In such a case, resources should be reassessed and invested sparingly to achieve the maximum degree of market penetration.

#### **D. AVAILABLE RESOURCES**

Currently, several different agencies are involved in ORS production and promotion. For U.N.-funded work with public sector manufacturers, technical assistance is available through WHO in Geneva and UNICEF in New York. Occasionally, the United Nations Industrial Development Organization (UNIDO) has assisted in studies of production feasibility.

For projects involving USAID funds, several options are available:

- The central office of PRITECH has frequently provided short-term assistance to explore and assess public and private sector production and marketing.
- If further ORS manufacture and/or marketing potentially involves private producers, then Project SUPPORT, managed by the Program for Appropriate Technology in Health (PATH), provides assistance. The goal of Project SUPPORT is to improve the supply, production and promotion of ORS. Its staff include engineers experienced specifically

in ORS production and quality control, plus specialists in international procurement, loan financing, ORS marketing and communications as well as ORS program specialists. SUPPORT is designed to work on development of comprehensive production-promotion projects and more limited interventions, such as trouble-shooting in quality control, or development of materials.

- The Academy for Educational Development administers HEALTHCOM (Health Communications for Child Survival). This project offers assistance in developing a comprehensive strategy for ORT information, education, and communications. HEALTHCOM technical assistance often involves the development of ORS packet designs and advertising campaigns.
- SOMARC is a social marketing project executed by the Futures Group. While SOMARC has worked mostly in the area of contraceptive social marketing, it has expanded into the area of ORS as well.

For participation by any of the foregoing projects, a request for assistance should be transmitted from the field through the local USAID Mission to the appropriate project monitor at A.I.D./Washington. PRITECH headquarters could help to identify the most suitable project and to contact the appropriate USAID project monitor.

**PRITECH FIELD IMPLEMENTATION AID**

**SUPPLY MANAGEMENT AND DISTRIBUTION  
FOR CDD PROGRAMS**

**Margaret Hume  
Management Sciences For Health**

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This paper is one of series designed to aid PRITECH field staff in providing technical assistance in diarrheal disease control efforts and programs. It was edited by PRITECH primarily to incorporate comments made by field staff and technical consultants.

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## **SUPPLY MANAGEMENT AND DISTRIBUTION FOR CDD PROGRAMS**

### **A. RATIONALE**

Despite major promotional and programmatic efforts by governments and international and bilateral organizations, and despite an annual global output of tens of millions of ORS packets, there is still a large number of infants and children who do not have ready access to ORS or who do not use ORT in any form. Communication, training, promotion, and community mobilization have a central role to play in creating knowledge about the recognition and home treatment of diarrheal disease and in creating an appropriate level of demand for ORS. At the same time, effective supply management and distribution are essential for supporting these efforts.

Unfortunately, supply and distribution issues of ORS and other necessary supplies for CDD programs have not received adequate attention in many CDD programs. In part, this inattention reflects a tendency common to many primary health care programs to undervalue the importance of supply logistics. It also reflects the effect of heavy donor financing for ORS leading to a proliferation of packets and other materials (seen mostly at central storage facilities), which creates the illusion of a well-functioning supply system. As demand for ORS increases, as more programs emphasize ORS in preference to sugar-salt solutions, and as donor-financed supplies taper off, it will be necessary to have supply systems that function effectively. Ineffective systems which appear to function when supply is strong and demand is weak will have to be improved.

Thus, the role of supply management and distribution in CDD programs is to identify, motivate, and make effective any and all supply channels which can put knowledge of ORT, packets of ORS, educational materials, and other necessary supplies in the hands of mothers and health workers. This approach may involve efforts to improve the basic supply system of the public sector -- where most CDD activities are initiated -- and must aim at maximization of ORT/ORS coverage through effective use of all available supply channels.

This paper focuses primarily on the strategic issues related to ORS supply and distribution and on the management issues involved in product selection, procurement, distribution, and use of ORS. Local production is discussed in the PRITECH paper, "Local Production of Oral Rehydration Salts." The same conceptual approach and supply principles, however, are relevant to all supplies -- health education materials and growth charts, intravenous solutions and materials, appropriate antibiotics for dysentery and acute respiratory infections, medical records forms, and other primary health care (PHC) commodities.

### **B. EXPERIENCE AND ISSUES**

Operational experience in ORS supply and distribution is quite varied and includes the utilization of both public sector and private sector distribution networks, though the latter have not yet been fully exploited.

Pakistan. ORS is supplied free through a government program, although there is already concern about how it will be financed over the long run. It is also widely available through private sector pharmacies. Virtually all the ORS is manufactured in Pakistan. UNICEF used to be the major supplier but it was found that local manufacturers could supply ORS to CDD program specifications and at lower cost.

The National Institute of Health (NIH), which directs the CDD program, has its own production facility but can produce only approximately three percent of its needs; therefore, for most of its supply, NIH puts out an annual tender (call for bids) and awards a contract to a local supplier. In a creative use of the private sector, the contract terms and price provide for direct delivery by the manufacturer to the province, division, and in some cases even district level. The latest contract stipulates that the manufacturer will deliver the ORS to all 90+ districts, thereby relieving NIH of a large inventory management and transport burden. Local Ministry of Health (MOH) officials are responsible for delivery from the district to individual health facilities.

To extend beyond this system, ORS is being distributed to households through the nationwide Expanded Program of Immunization (EPI) activities. Vaccinators have been instructed to teach mothers about ORT and to leave two packets in every household where there are young children and no packets already present. Each box of 50 ORS packets provided to vaccinators is packed with 25 fliers explaining the key points in diarrhea treatment and prevention. Resupply issues for this household delivery scheme have yet to be resolved, but the inclusion of educational fliers with ORS has solved the problem of distributing communication and training materials.

To help in limiting ORS demand, and thereby reducing strain on both the ORS distribution system and the government budget, the CDD program has recently begun to emphasize initial use of home fluids rather than ORS when diarrhea starts.

Indonesia. Four public-sector mechanisms exist by which ORS is distributed in Indonesia -- the National CDD program; INPRES, the national essential drug procurement program; ASKES, a health insurance program for government employees; and the Village Nutrition Program. Each of the first three allocates funds to the regency or provincial health office, and the individual decision-makers at those levels then contract with manufacturers in both the public and commercial sectors to deliver the goods directly to health facilities. The Village Nutrition Program, in contrast, procures ORS at the central level and has manufacturers ship it to the provinces for subsequent redistribution.

This pluralism in supply channels has been relatively effective, but there has been a lack of coordination in packet size which has produced confusion; the CDD program switched from 1,000cc to 200cc packets for reasons of convenience and improved compliance, but did so initially without coordinating with INPRES, which is thought to distribute most of the ORS in the country. Another problem is that these mechanisms are not particularly effective in terms of moving ORS beyond the health center level and thus do not support effectively the CDD program strategy and health communications activities that focus on ORS use at the community level.

An exception is the ORT Intensification Campaign in West Java, where health center staff are being trained to set up community-level ORS stocks. They are to be maintained by an individual selected in each village, sometimes associated with the village health committee, sometimes the family planning worker. These community stock keepers are expected to order and receive ORS from the nearest health center, to keep the ORS stocks in accordance with good storage practices, to supply ORS to the community-based ORT workers, and to receive and forward the ORT workers' activity reports. This plan appears to be feasible for movement of ORS to the village level, but its management information system (MIS) component is not yet functioning effectively. One major problem in operationalizing this village level system was that packets were unavailable at the time of village health worker (VHW) training, thereby limiting the effectiveness of the VHWs.

The commercial wholesale/retail network in Indonesia, although geographically extensive and already selling some pharmaceuticals in remote village shops, is as yet underexploited. There seems to be a reticence among Ministry of Health (MOH) staff to get involved with the commercial sector, even though CDD policy encourages it. One effort to promote a private manufacturer in West Java failed due to apparent misunderstandings on both sides. Private-sector potential is increasingly recognized within the Ministry, however, and is expected to be more fully explored with USAID assistance.

A training program, including diarrhea and ORS logistics management, has been carried out aimed at improving overall primary health care drug needs planning, procurement, and stock management, with USAID/PRITECH support.

Niger. Distribution of ORS in Niger began in earnest only in 1985, with donated supplies, and is still not widespread. With the help of a bilateral grant and technical assistance, the ONPPC, a parastatal drug import and production monopoly, installed an ORS production line in 1986. Fully operational since early 1987, ONPPC is now the only source of supply. The MOH and most donors now purchase their packets from ONPPC. ORS distribution takes place in the context of the overall drug distribution system. It is dispensed free through MOH facilities, who order their supplies using credits allocated to them. ORS is sold through ONPPC-run retail outlets and (theoretically, but practically not yet) by village health workers who are to be resupplied through these outlets.

Private drug outlets with a limited authorized product list are beginning to offer ORS, but it has not yet reached the rural pharmacies (with an even more limited list). Problems in maintaining stocks and resupplying these numerous, isolated, and peripherally located small outlets have not been entirely solved yet. Government policy states that retail drug prices must be uniform throughout the country but the rural pharmacies are not covered by this. The MOH told ONPPC to substantially reduce the price of its ORS, using donated raw materials as a subsidy. The objective of such a reduction was to make ORS more affordable to the public. In January 1989, ONPPC accordingly lowered the price of ORS but lowered it to a level that does not allow for any profit margins. Retailers are expected to sell ORS packets at the same price at which they purchased them; therefore no incentive is provided for marketing of ORS by pharmacies.

Guatemala. In Guatemala, ORS supply is managed through a vertical channel, completely independent of other basic medicines and supplies at the central level. The ORT coordinator is responsible for procurement and for distribution to the area level, from which point further distribution is handled locally, with substantial variation. In many areas, ORS delivery below the area level is combined with that of either vaccines or other drugs. Although the Ministry of Health has been eager to reduce its reliance on imported ORS, provided until recently by UNICEF, it has rejected the idea of contracting with one of the several private pharmaceutical companies which are present. It is developing its own parastatal production capability within the Roosevelt University School of Pharmacy, which will be funded by USAID for at least the first few years of manufacture. Financial self-sufficiency may be one of the biggest problems in Guatemala over the long run.

Bolivia. In Bolivia, UNICEF donations of packets ended in 1988. Concern about the Ministry's ability to finance a growing ORT program led to the development of a comprehensive community-based ORT project involving a network of 1,800 mothers' clubs. The mothers' clubs were originally set up by CARITAS, a private, non-profit organization, as development organizations but had come to exist mainly as mechanisms for mothers to collect PL480 food. The distribution system for the food supplements which already existed was perceived as an effective mechanism for distributing ORS at little marginal cost. The ORS packets would be purchased centrally from local suppliers and paid for by the mothers' clubs themselves. The program was begun with free distribution of UNICEF packets to the clubs but only as a marketing technique to reduce initial resistance to the new product. The clubs are free to devise their own pricing policies and fund-raising techniques to ensure reliable resupply.

The foregoing examples illustrate a number of creative mechanisms that have been used to either strengthen or supplement MOH supply systems. Such mechanisms include contracting with local manufacturers for delivery, as well as manufacture, in Pakistan; actively incorporating private pharmacies in the distribution system in Niger; and using PL480 food distribution channels in Bolivia. These experiences confirm that more effective action is possible when central distribution issues are addressed.

At the same time, experiences in these and other countries strongly support the need to directly address supply management and distribution issues if CDD programs are to achieve maximum ORT coverage and a sustainable supply of ORS. An important step in this process is the recognition that for many, possibly most, ministries of health, CDD programs represent an additional burden to already underfunded, inadequately managed, and often understaffed primary health care supply systems.

To meet the objectives of maximizing coverage with appropriate oral rehydration therapy and assuring continuous supply of ORS, CDD programs and PRITECH must focus their efforts on both the strategic issues that affect overall coverage and the management and operational tasks necessary for public and nonprofit distribution.

Key strategic issues include:

- Identification of and selection among alternative delivery channels, including various public-sector channels, such as essential drug programs and EPI programs.
- Establishment of the therapeutic pyramid or policy regarding appropriate case management to determine the levels to which ORS must be distributed and the importance of ORS relative to other therapies.
- Addressing the recurrent cost issue to determine the impact of ORT programs on supply costs and the mechanism(s) for financing any additional costs.
- Assessment of the role for the private sector and the extent to which an ORT/CDD program can and should create and encourage various forms of private sector participation in the promotion, distribution, and sale of ORS.
- Evaluation of local ORS production -- its feasibility; intended or unintended incentives or disincentives for local production; and methods for maintaining dependable supply, high quality, and low cost (discussed in PRITECH's paper on local production).

Essential supply management and operational tasks, particularly for the public and nonprofit sectors, include:

- Selecting the ORS formula and packet size as well as other necessary supplies.
- Establishing procurement practices for estimating needs, arranging supply contracts, identifying sources, and assuring ORS quality.
- Evaluating the adequacy of existing distribution networks, including assessment of information management, inventory control, transport management, and storage.
- Assessing current ORS and other pharmaceutical use patterns as they influence the quantities of ORS required and the cost-effectiveness with which limited resources for essential drugs, including ORS, are used.

## C. OPTIONS FOR ACTION

### 1. Strategic Issues

#### a. Identify Delivery Channel(s)

Because most CDD programs originate in the public sector, they look to MOH channels for distributing ORS. The most common channel appears to be through existing PHC drug supply systems, though these systems are often inadequately stocked and poorly managed. Recognizing this inadequacy, some programs "piggyback" distribution of ORS onto EPI, family

planning, or other vertical programs (as in Pakistan); others establish independent ORS supply systems (as in Guatemala); and still others support decentralized supply through community based programs (as in Bolivia and in scattered areas in the Sahel).

Little comparative information exists to indicate which strategies are most effective in assuring public-sector distribution. One fact remains certain: that most public-sector channels simply do not reach major segments of the population. Programs are increasingly pushing beyond the confines of MOH supply channels to make ORS available to mothers; other options include distribution through nonhealth programs, which are listed in Figure 1 below.

FIGURE 1

SECTOR	HEALTH PROGRAMS	NONHEALTH PROGRAMS
PUBLIC	Primary Health Care Maternal and Child Health Immunization Family Planning	Schools Agricultural Projects Community Councils
NON-PROFIT PRIVATE	Charitable Health Services Religious Organizations Village Drug Cooperatives	Cooperatives Mothers' Clubs Industry, Mines, Plantations
COMMERCIAL PRIVATE	Retail Pharmacists Chemists' Shops Patent Medicine Shops	"Informal" Drug Distribution Networks

Because there are relatively few medical or storage requirements for ORS compared with other pharmaceuticals, and virtually none which either qualify or restrict its widespread distribution, there is no reason program managers should not take advantage of any and all supply channels that are available. Relying on a single channel exposes the entire program to the instability of that channel, when others are almost always available.

Specific Actions:

- Take an inventory of all the channels by which drugs, vaccines, family planning supplies, and commercial products are successfully distributed to rural areas. What are their general functional capabilities? What are the relationships of these channels to each other?
- Study current health behaviors of the ORS target population. Where do mothers turn for remedies for their children? This approach may suggest where to focus interventions, what channels to try to strengthen.
- Identify which of these channels could be made more effective with limited assistance and determine what improvements would be needed.

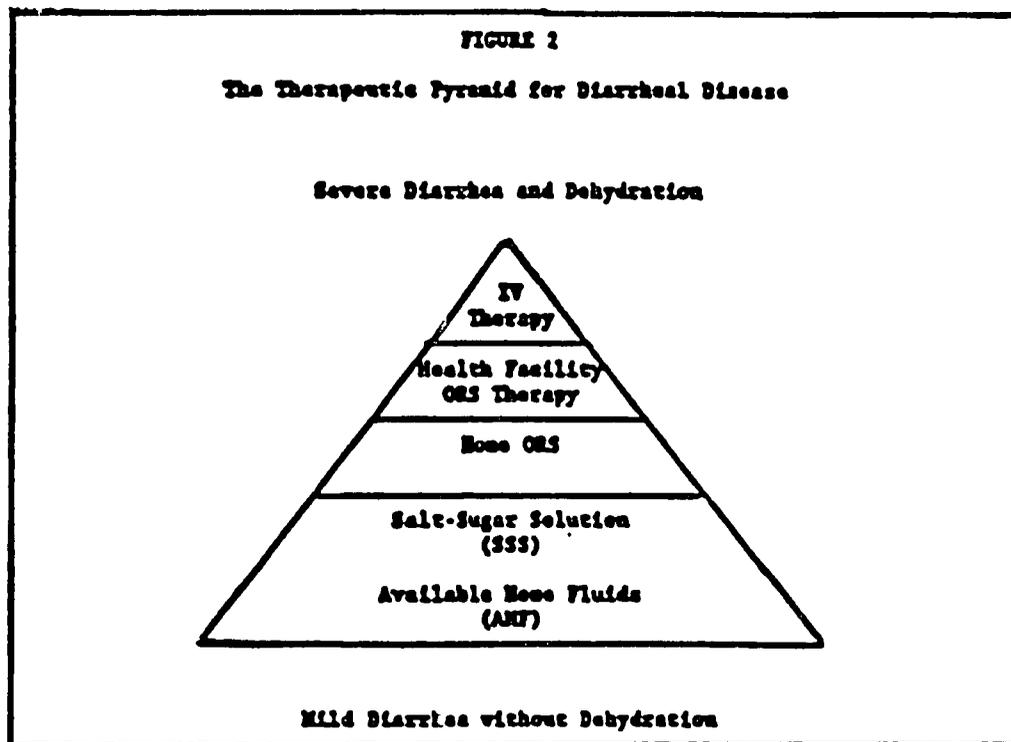
Depending on the country, technical assistance from outside may or may not be needed to resolve this issue. It is often not simply a technical issue. Political and other factors can inhibit consideration of a certain channel which might otherwise be technically appropriate.

Other Options for Action:

- Conduct comparative studies of which delivery channels are used most effectively within and among different countries, and why.
- Study the feasibility of distributing ORS through traditional distribution channels, for example, through traditional herbal medicine shops.

**b. Establish the Therapeutic Pyramid**

Oral rehydration therapy (ORT) can be provided in a variety of forms, including home available home fluids (HAF), specially prepared sugar-salt solutions (SSS), or prepackaged oral rehydration salts (ORS). The therapeutic pyramid, which is depicted in Figure 2, refers to the specific CDD program policy regarding appropriate case management and expectations regarding the level of health care to which ORS will be distributed. Does the program rely exclusively on ORS, as in Egypt, or does it advocate the use of available home fluids and, as in Nigeria or The Gambia, sugar-salt solution? Will ORS be supplied only to health facilities or also to the community level (for example, community ORS depots) or even to individual households as in Pakistan?



These questions not only have implications for communications activities (where such questions are usually first raised) but also have profound implications for the design of the entire distribution network as well as for estimation of program supply costs, ORS requirements, transport requirements, outlook for local production, and similar issues.

Specific Actions:

- Determine both current policies and actual practices for use of ORS vs. HAF vs. SSS. The CDD program manager, or chief technical officer within the Ministry, should be able to define and document the current policies, but these may be incomplete or not operationally stated. A formal KAP study of physicians and other prescribers, as well as of mothers may be needed to determine current practices.
- Determine both current policies and current actual practices regarding the use of anti-diarrheals and antibiotics for diarrheal disease. Current practices that rely heavily on such products are not only poor therapy but also extremely wasteful from a financial perspective.
- Find out how effective or practical the current policy is by analyzing actual treatment patterns at health facilities and in the community. Factors to consider are local feasibility, effectiveness, accuracy of use by mothers, and safety as well as full costs. In Egypt, it was found that it takes nine contacts with the mother to achieve accurate mixing of SSS, thereby incurring high training costs. As a result of this finding, SSS was eliminated entirely from the therapeutic pyramid. In Pakistan, some leading pediatricians feel that the proposed shift in policy toward HAF will not work, because mothers will strongly prefer the convenience and clinical appearance of the ORS packet.
- Hold a workshop if policy change appears warranted. Recognize that people have vested interests and it may take time to change them. Identify who the decision-makers and opinion leaders are and how decisions are made.

**c. Address the Recurrent Cost Issue**

Financing of recurrent health care expenditures continues to be a significant challenge in virtually every environment. It can be particularly difficult to address systematically in CDD programs for two reasons: (1) programs usually begin with donor financing, making the recurrent costs easy to ignore, and (2) programs often experience variability in their rates of growth, making accurate cost projections difficult. Not addressing this issue can seriously limit the full implementation of the CDD program.

Specific actions:

- Estimate the incremental costs of a fully developed CDD program based on the specific program's policy regarding the therapeutic pyramid and the delivery channel(s) used.

- Identify sources of recurrent costs for all PHC or child survival pharmaceuticals. The financing of ORS must be considered within the context of primary health care in general.
- Identify the potential savings -- through improved selection, procurement, distribution, and use of other pharmaceuticals -- that could be redirected to ORS use. In many countries, funds currently expended for unnecessary or harmful treatments for diarrheal disease (most antibiotics used for diarrhea and antidiarrheal preparations) could more than cover the cost of all needed ORS supplies.
- Explore whether the ORT program can or should be the entry point to consider alternative mechanisms for financing recurrent costs, for example, revolving drug funds (RDFs).

The concept of cost recovery and cost sharing through RDFs has gained increasing popularity. For example, UNICEF has been negotiating with WHO and other agencies to operationalize the Bamako Initiative, which it launched in Mali in September 1987. The core idea of the initiative is that drugs provided by international agencies would be sold to communities. The money raised would go to finance primary health care services. Yet, it is all too obvious that there are more ways to make RDFs fail than to make them succeed. In addition to design and implementation issues common to all cost recovery programs, issues of differential pricing and selective exemptions are particularly critical to PRITECH's target groups. It is often the poorest groups in society who have the greatest health care need but who are often the least able to afford out-of-pocket health expenditures. Further, charging for ORS and continuing to supply antibiotics and antidiarrheals free, for example, creates unintended incentives for users.

Other Options for Action: .

- Comparative analysis of the prices charged for ORS in different countries
- Field studies of RDFs that seem to be functioning effectively -- both those that may have been designed centrally and those that have sprung up independently at the community level
- Marketing studies to determine appropriate pricing structures for sales of ORS and considering where incentives/margins are needed along the distribution system, thus determining to what degree the program can realistically be financially self-sufficient. (Ignoring the potential need for incentives for health workers may limit the reach of the distribution system.)

#### **d. Assess the Role for the Private Sector**

In most countries, there is a well-developed private sector, with important experience in promoting, marketing, and selling products through extensive distribution channels. In countries where the population relies heavily on such formal and informal commercial pharmaceutical distribution channels, the full potential for reduction of diarrheal disease mortality will never be realized unless the private sector becomes actively involved in promoting, distributing, and selling ORS. This topic is discussed in more detail in the PRITECH paper on promoting commercial sales of ORS and the paper on CDD allies.

##### Specific Actions:

- Identify current incentives and disincentives to private pharmaceutical sector involvement in ORS supply, including import duties; manufacturing requirements; price controls; profit margin controls; classification of ORS as drug product or food product; restrictions on formulation, coloring, flavoring, or packaging; and promotional support to the private sector through publicly supported promotional activities.
- Define the structure and coverage of potential private sector delivery mechanisms, including formal (legitimate) pharmaceutical distribution channels, informal drug distribution channels, distribution by private health care providers, distribution by traditional healers, and supply (along with soap, matches, and so forth) through other consumer product channels.

#### **e. Evaluate Local ORS Production**

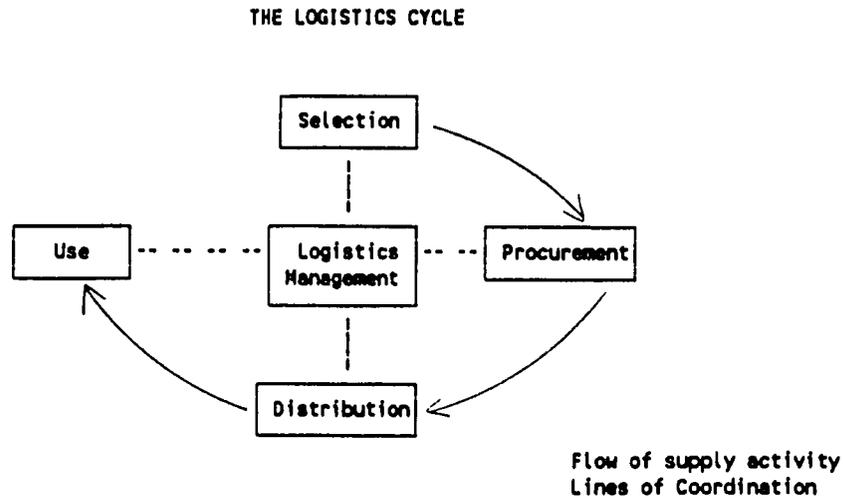
ORS and other CDD program supplies are either imported or manufactured locally. During the early stages of a program, they are usually imported (and donated rather than purchased). Countries are often eager to establish local manufacturing capabilities, however, and the opportunity to do so in ORS is often a useful mechanism for gaining political support for the CDD program. This topic is discussed in more detail in the implementation aid on the local production of ORS.

## **2. Management and Operational Tasks**

The options for action suggested here are focused on public and nonprofit distribution. To a large extent, ministries of health and therefore PRITECH influence private sector ORS supply through policy and regulatory efforts, rather than through direct management interventions. Such options to improve ORS supply through the private sector are considered in detail in the private sector and local production implementation aids.

Within the public and nonprofit sectors, it is important to look at supply and distribution as a system, as indicated in Figure 3 on the following page. Issues of product selection, procurement, distribution, and use are all interrelated -- decisions in one area influence another -- and by perceiving them as parts of a continuous system, it is easier to identify problems.

Figure 3



#### a. Selection

Selection refers both to ORS formula and packet size considerations and to decisions concerning other items to be supplied for diarrheal case management (for example, intravenous solutions, selected antibiotics) and other program activities (for example, growth monitoring, communications, and MIS). These decisions influence program budgeting decisions as well as the overall cost-effectiveness of program activities.

#### Specific Actions:

- Establish ORS formula and packet size.
- Determine what other supplies are needed for appropriate diarrhea case management, including dysentery, outbreaks of cholera, and other epidemic diseases, and for the other common health problems, such as acute respiratory infections, that will use the same procurement and distribution mechanisms (for example, IVs and selected antibiotics).
- Attempt to have antidiarrheals removed from the national drug list.
- Determine what supplies are needed for communications activities (for example, growth cards and posters) and for MIS (clinical recording and reporting forms, consumption reporting forms, stock record cards, requisition forms).

Selection issues can usually be resolved by identifying the principal decision-makers in a country and holding informal discussions or a workshop. An outside clinician (consultant) can

sometimes play an important role in indicating or resolving conflicts of opinion. It is critical, however, not to either ignore or underestimate the potential effects of vested interests.

#### Other Options for Action:

- Operations research to compare the use of two or more different packet labels in different parts of the country
- Field studies into the availability of containers suitable for mixing ORS in rural areas.

#### **b. Procurement**

Procurement requires a specific set of professional skills and involves estimation of quantities of supplies needed, determination of contracting methods, identification of sources of supply, the timing and tracking of orders, and quality assurance. Problems in any of these areas may cause disruptions in supply. How well these activities are carried out also has significant implications for the overall cost-effectiveness of programs.

#### Specific actions:

- Determine who is, or will be, responsible for procuring ORS. Will procurement occur at the national, regional, or individual health facility level? Take into consideration where procurement of other child survival pharmaceuticals takes place and where the procurement capabilities are strongest. What are the advantages of more centralized versus more decentralized procurement?
- Estimate quantities of ORS and other supplies needed. Be aware of consumption-based, service-based, and population-based approaches to estimating ORS requirements, the use of each technique, and the limitations of each technique. Anticipate donations. Anticipate program growth. Anticipate potential gaps in supply when changing suppliers; in particular, making the transition away from donor supplies or to local manufacturers.
- Establish a set of procedures for product and quality assurance. They should include ORS standards, good manufacturing practice (GMP) standards, supplier selection, quality certificates, independent testing, and receipt and inspection procedures.

Technical assistance may be useful in addressing these issues. Managing Drug Supply (MSH, 1981) and specific WHO publications are also useful resources available in several languages (see the annex).

Consider arranging training for individuals responsible for ORS procurement, including estimation techniques, quality assurance procedures, and receipt and inspection procedures.

### Other Options for Action:

- Compare the results of several different quantity estimation methodologies with actual consumption, in order to determine the most appropriate methodology.
- Conduct a comparative study across programs to explore how the procurement function for ORS is most effectively carried out and what factors determine ORS procurement efficiency.

### c. **Distribution**

Distribution involves issues of design of the distribution network, information requirements and inventory management, storage, and transport. All are critical for the appropriate supplies to be available at the right place at the right time and in good condition. The extent of the distribution network also influences shelf life requirements of ORS supplies.

### Specific Actions:

- Analyze the effectiveness of the distribution channel or channels that have been selected for delivery of ORS. Such an analysis involves identifying each storage and dispensing level and visiting at least one facility at each level to determine (1) whether ORS and other key supplies are in stock, (2) whether stock cards and/or a kardex are maintained up to date, and (3) what the storage conditions are as well as the quality of the ORS in stock.
- Design simple-to-use consumption reporting and reordering mechanisms and train staff in their use. This approach can be more complicated when multiple distribution channels are used.
- Develop procedures for good storage of ORS. Facilities should be of adequate size, secure, dry, and well-ventilated.
- Assess shelf life requirements of ORS, considering supply source (locally manufactured ORS often has shorter shelf life), length of procurement/distribution pipeline, and consumption patterns.
- Assess the reliability of current transport systems and the availability of alternative transport sources, considering options in the public and private sectors.

Technical assistance would be useful, perhaps even necessary in some cases. Specific training for managers, storekeepers, and others in good storage practices and inventory management is often critical. Managing Drug Supply (MSH, 1981) would be a useful resource.

#### Other Options for Action:

- Operations research to analyze the feasibility and cost-effectiveness of distributing measuring containers as was done in Pakistan.
- Operations research to design and test alternative management information systems for ORS supply management, including mechanisms for stock control, reordering, and consumption reporting (for example, in Indonesia).

#### d. Use

Use refers to prescribing, dispensing, and consuming behavior and the factors that influence them. These issues are important in a discussion of ORS supply and distribution not only because of their obvious impact on quantities of supplies needed but also because of their influence on the overall availability of resources and thus the cost-effectiveness of the CDD program.

#### Specific Actions:

- Identify current treatment patterns and gaps between current practice and desirable treatment norms. This activity could involve a KAP survey of providers as in Egypt or a workshop on standard treatment norms as in Aceh, Indonesia. In Aceh, physicians compared past drug orders with needs based on current morbidity and standard treatments; the comparison revealed substantial under-ordering of ORS and certain other supplies and considerable over-ordering of other items.
- Analyze ORS consumption patterns: in particular, who is consuming ORS. In both Indonesia and Nepal, it was found that up to two-thirds of the available ORS was consumed by adults, who generally are at less risk of death from dehydration. This finding has important implications for estimating required quantities as well as for influencing prescribing decisions.
- Promote the use of ORS through training of health providers and also of key community members, depending on the CDD strategy being followed. In Egypt, pilot projects gave training in ORS supply mechanisms to 564 community members who established community ORS depots; the result was promising in that there was a tendency for increased visits to health facilities.
- Prepare training materials for pharmacists. WHO and the International Federation of Pharmacists have prepared a booklet for both public and private-sector pharmacists (the French version was recently distributed by the CDD program in Niger). WHO and MSH are preparing training materials for pharmacists which will be available in late 1990. Plans are underway in Nigeria by the Pharmaceutical Society of Nigeria for preparing booklets and posters for pharmacists. Professional societies, when supported, can be extremely helpful.

- Promote the use of ORS through detailing to physicians and pharmacists following the drug company approach. This task may also involve "counter-detailing," that is, efforts to discourage or "counter" the use of unnecessary drugs. An experiment to change U.S. physician prescribing behavior through public health detailing is being undertaken by Harvard Medical Schools. The Program for the Analysis of Clinical Strategies (PACS) succeeded in improving prescribing behavior and in achieving significant savings in drug expenditures.

Many of these activities will require technical assistance. One potentially useful resource is the MSH Drug Management Program. MSH has considerable experience organizing prescriber workshops and training pharmacists and others who handle pharmaceuticals and is currently working with Harvard PACS to apply detailing and "counter-detailing" in developing countries. Another resource is Project SUPPORT of the Program for Appropriate Technologies in Health (PATH).

#### Other Options for Action:

- Examine the factors that influence physician prescribing decisions.
- Analyze the factors that influence patient expectations for drugs.
- Conduct operations research to explore the effect on prescriber behavior of programs of utilization review.

#### D. CONCLUSION

Unfortunately, when CDD program managers and advisers look at supply and distribution through existing primary health care supply channels, they often find inadequately stocked and poorly managed systems leading to frequent ORS stockouts. The choices are few: rely on these systems such as they are, establish a separate ORS distribution network, or, as part of the CDD program, support substantive improvements in the basic primary health care logistics system. Devoting considerable effort to establishing a new system or strengthening existing systems for the sake of distributing one product would seem out of context. On the other hand, for a CDD program to undertake massive training and education activities involving ORS distribution and not take steps to ensure this distribution would seem short-sighted.

Problems of overstocks, understocks, and even misuse of ORS packets will occur whenever promotional and training activities are not coordinated with supply activities. CDD programs and PRITECH must schedule and coordinate interventions, so that expansion of ORS distribution proceeds simultaneously with CDD training. Maximum coordination among all CDD activities may at times require modification of other activities to fit supply constraints, and vice versa. Such coordination is nevertheless necessary to ensure the greatest possible opportunity for actually reducing diarrheal disease morbidity and mortality.

## ANNEX

### RESOURCE MATERIALS FOR TRAINING AND MANAGEMENT

#### USEFUL REFERENCES FOR PRIMARY HEALTH CARE LOGISTICS

##### General References

- Battersby, A.: How to Look After a Health Center Store. London: AHRTAG, 1983.
- Dorner, G., Roepnack, C.G., Burchardt, R., and FIP Industrial Pharmacists Section: Management of Drug Purchasing, Storage, and Distribution: Manual for Developing Countries. (2nd Revised Edition). The Hague: Federation Internationale Pharmaceutique (FIP), 1985.
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WHO/CDD Programme: A Manual for the Planning and Evaluation of National Diarrhoeal Diseases Control Programmes. Geneva: World Health Organization, WHO/CDD/81.5 Rev. 1, 1984.

WHO/CDD Programme: Oral Rehydration Salts: Planning, Establishment and Operation of Production Facilities. Geneva: World Health Organization, WHO/CDD/Ser/85.8, 1985.

WHO: How to Assess Health Services Logistics with Particular Reference to Peripheral Health Facilities (Draft). Geneva: World Health Organization, April, 1985.

#### WHO Training Modules Related to Logistics

Expanded Programme on Immunization Course in Logistics and Cold Chain for Primary Health Care includes the following 24 booklets:

1. How to estimate requirements for an existing store.
2. How to store supplies.
3. How to distribute supplies.
4. How to keep records and calculate wastage.
5. How to control quality of stock.
6. How to estimate requirements for the first time.
7. How to estimate chloroquine requirements for the first time.
8. How to estimate ORS packet requirements for the first time.
9. How to estimate vaccine requirements for the first time.
10. How to estimate contraceptive requirements for the first time.
11. How to estimate essential drug requirements for the first time.
12. The cold chain game.
13. How to improve communication.
14. How to look after a compression refrigerator.
15. User's handbook for compression refrigerators.
16. How to look after a kerosene refrigerator.
17. User's handbook for kerosene refrigerators.
18. How to look after a gas refrigerator.
19. User's handbook for gas refrigerators.
20. How to keep stocks of spare parts.
21. How to look after a cold store.
22. User's handbook for cold stores.
23. Instructors guide.
24. Evaluation questionnaire.

Programme for Control of Diarrhoeal Diseases, Training Course for National CDD Programme Managers includes the following eight booklets:

- Introduction
- National Policy
- National Targets
- Course Director's Guide
- Facilitator Guide
- Myxeria: An Exercise
- Working Toward Prevention
- Planning and Monitoring Activities
- Evaluation

Programme for Control of Diarrhoeal Diseases, Supervisory Skills Course for Mid-Level Managers includes the following seven booklets:

- Introduction
- Community Involvement
- Treatment of Diarrhoea
- Targets
- Training
- Prevention of Diarrhoea
- Course Director's Guide
- Facilitator Guide
- Planning and Monitoring Activities
- Evaluating Progress and Course Summary

**PRITECH FIELD IMPLEMENTATION AID**

**PROMOTING COMMERCIAL SALES OF ORAL  
REHYDRATION SALTS**

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This paper is one of a series designed to aid PRITECH field staff in providing technical assistance in diarrheal disease control efforts and programs. It was edited by PRITECH primarily to incorporate comments made by field staff and technical consultants.

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## PROMOTING COMMERCIAL SALES OF ORAL REHYDRATION SALTS

### A. RATIONALE

One of the elements in A.I.D.'s global diarrheal disease control strategy is to encourage the sale of ORS at appropriate times and opportunities in a country's national program. It is recognized that ORS packets, like essential drugs, are distributed free of charge in the public-sector component of many national programs and should continue to be free for the neediest portion of a country's population. Several facts indicate, however, that access to ORS can be increased greatly by more emphasis on ORS sales:

- Pharmacies are an important point of first-line treatment for illness for a significant percentage of the population in many countries, particularly in urban areas, and pharmacists are important providers of health information.
- Most drug companies, especially in the private sector, employ large sales forces for selling and detailing their products to customers and reach large numbers of physicians, pharmacists, and other health personnel.
- Retail sales systems for basic consumer goods generally extend into the remotest parts of countries in the form of markets and small shops, boutiques, pulperias, and sari-sari stores; they are far more accessible to people in both urban and rural areas than are health facilities.

All of the above are ideal mechanisms for extending the distribution of ORS, but all are businesses operated to make a profit. Sale of ORS is therefore the most viable means of enlisting these private sector actors in a serious effort to rapidly increase the distribution and use of ORS. In addition, keep in mind that sale of ORS in the public sector is a cost-recovery mechanism offering governments a means to move toward self-sustaining health service provision in an era of shrinking public health resources.

### B. EXPERIENCE AND ISSUES

At present, only a handful of countries, primarily in the Asia/Near East region, have embarked on ORS sales programs of any real significance:

- Egypt's successful national CDD program has included an aggressive ORS marketing component; the same packet that the Ministry of Health (MOH) distributes free in its clinics is sold by retail pharmacists, who received training and encouragement from the government to become ORT educators. In practice, 60 percent of the ORS distributed is through the commercial sales channels.
- In Pakistan, the government has established standards for price and formulation of ORS, but not for packaging or for presentation. The Ministry of Health is conducting a generic promotion of ORS through the media, while a number of private manufacturers

are promoting their own specific ORS products through "detailmen," highly trained promoters of pharmaceutical products.

- In India, a private company, Fair Deal, sells more than 50 million packets of an ORS product (Beoral) yearly, with no involvement from government. The company sells the product through pharmacies rather than in the broad consumer market, but recently introduced a new over-the-counter (OTC) product for a different market segment.
- In Indonesia, where a number of private companies are making ORS products, the Ministry of Health (MOH) established a collaborative relationship with one of these companies and in its ORT campaign referred the public to private pharmacies, where this company's product was available. After the campaign was underway, however, the Ministry asked the company to curb its advertising activities, because the MOH felt it risked creating demand for the MOH ORS which exceeded supply and would, therefore, create shortages.
- In Bangladesh, where ORS was added to the product line of a contraceptive marketing program, results showed that the product had considerable sales potential, even at a price perceived as high by the trade and by consumers and without any consumer advertising.

Elsewhere in the world, ORS sales programs are generally much less developed and are hampered by a variety of problems:

- In Ivory Coast, a country with no in-country drug manufacture but a highly regulated pharmaceutical sector, Ciba-Geigy registered the country's first ORS product and is prepared to market it aggressively to pharmacists. The company is waiting for the government to declare its national ORT policy, including the role of ORS, before beginning its campaign. Meanwhile, another company has brought an ORS packet into the country as a food product and is selling it through pharmacies and other retail outlets.
- In Kenya, a handful of private manufacturers have been making and selling ORS of various formulations for the past several years. The Kenyan government at one point banned advertising of one of these products from the national media. Meanwhile, it has only recently been able to formulate national policy on the desired size of an ORS packet, based on data from a national survey that determined which size of container was most available for mixing ORS and water.
- In Niger, a state firm has a monopoly on imports and production and recently began to manufacture ORS. The firm does no advertising or promotion and has no "detailmen;" sales through commercial channels have begun slowly.
- In Tunisia, a parastatal pharmaceutical enterprise manufactures drugs both for free distribution through Ministry of Health facilities and for sale to commercial pharmacies. The company is eager to upgrade and expand its production and sales of ORS. It has

been unable to, however, due to a Ministry of Health policy, supported by UNICEF, that UNICEF-supplied ORS packets be distributed free everywhere, even at commercial pharmacies.

- In Haiti, the national CDD program, from its inception, decided that ORS would be sold, even in the public sector. The Ministry of Health augmented its existing parastatal drug distribution system with hundreds of community ORS sales posts. Despite the existence of both public and private distribution/sales networks, a media promotion campaign, and what was considered to be an affordable price for an ORS packet, even for the poor, sales of packets have been disappointingly low (some of the reasons for this are noted below).

### 1. Government Regulation

The first three examples above illustrate one important problem or cluster of problems that has inhibited ORS sales efforts up until now: poorly defined or overly restrictive government regulatory frameworks. While government has an important and legitimate role to play in regulating a product such as ORS to ensure that its formulation is safe and up to the highest medical and technical standards known, the more the product is regulated, the more one can expect its distribution and sale to be inhibited. Defining ORS as an ethical drug available only through prescription, for example, would effectively preempt widespread ORS sales, especially in a poor country with a limited pharmaceutical distribution system.

### 2. Pricing

The case of Haiti represents another problematic aspect of government regulation. Even when government policy was clear and favorable to widespread retail sale and an effective distribution system was in place, demand for ORS remained low. One reason cited was that the profit margins on ORS, whose price was kept low by government to make it affordable to even the poor, were too small to encourage promotion by the seller.

As a new product, ORS enters a crowded field of high-priced competition. Prices for anti-diarrheals are often five or six times higher than the ORS price, with an equal difference in pharmacists' profits. How can we expect ORS, an inexpensive product which governments are requiring to be sold at low markups, to displace lucrative products that most pharmacists promote and that many mothers have come to expect? What incentives will motivate pharmacists and other retailers to promote ORS? Experience in some countries suggests that increasing the price of ORS may increase its value in the eyes of consumers and stimulate sales and utilization.

### 3. Product Characteristics

A second reason was given for the disappointing demand for ORS in Haiti, which illustrates another whole cluster of problems for ORS sales: the product was not perceived by consumers as addressing their main concern in treating diarrhea.

Conclusions from many surveys show that what mothers want is something to stop diarrhea. Mothers believe that antidiarrheals do this and have been willing to pay a high price for these drugs. The fact is that antidiarrheals have little role in stopping diarrhea, which is usually self-limiting, but they often get credit for stopping it. Many mothers who use ORS expect it to stop diarrhea and, therefore, are disillusioned when it does not.

The long-term challenge here is to improve the product characteristics of ORS to address the desires of consumers. Cereal-based ORS or super-ORS, which reduces stooling as well as rehydrates, promises to be a major step in this direction. In the short term, the challenge is to make the existing formulation more appealing (for example, better-tasting, more attractively packaged) and to position it in a way that responds to some consumer need or value or practice. In Haiti, for example, research has shown that a traditional practice is to give "cooling" preparations called *refraichies* to sick children. Thus, ORS might be effectively positioned as a particular *refraichie* for diarrhea.

#### 4. International Standards

Considering how to improve ORS as a consumer product raises another important regulation issue: international medical standards for ORS. WHO has advocated the use of a single ORS product worldwide, an unflavored standard formulation powder, that has had important implications for ORS marketing and sales. While setting this standard was essential at the start of the international CDD program, rigid adherence to it defies everything we have learned from the field of marketing about how successful introduction of a new product depends on understanding consumer needs and preferences. Most marketing experts favor variety in packaging, a choice among premixed liquid and tablets in addition to powder, and consideration of products with added flavor, color, and effervescence to respond to the range of existing consumer perceptions regarding antidiarrhea products. Although one study suggests that use of flavoring may lead to over-drinking of ORS by children, many clinicians feel that the improved attractiveness of a flavored product for mothers may outweigh the small possibility of displeasure of WHO if they actively promote two varieties of ORS formulations.

### C. OPTIONS FOR ACTION

#### 1. Market Assessment

A necessary first step in promoting ORS sales is to undertake a thorough assessment of the existing market potential and marketing infrastructure for ORS. A CDD program would be well-advised to contract the services of a market research firm to conduct such an assessment, or at least to solicit technical assistance from a research firm in planning it. The assessment should provide information on the following areas:

- Socioeconomic groups and their need and ability to pay for ORS
- Current practices and products for treating diarrhea, including any ORS products already on the market

- Existing distribution networks, both public and private
- Pricing considerations, including prices for competitive products and existing government price controls.

An example from Honduras illustrates how an ORS market assessment may be carried out and how its results may be used. In 1987, a comprehensive ORS marketing feasibility study was conducted by the Ministry of Health in Honduras to help it determine whether and how the government should attempt to stimulate the distribution and use of ORS through a commercialization strategy. The Ministry sought technical assistance in designing and carrying out the study from a Latin American market research firm and from the HEALTHCOM Project. It included the following research components:

- A study of physicians' knowledge, attitudes, and practices: in-depth interviews with 50 physicians
- A retail trade study: interviews in both urban and rural areas at 50 pharmacies, 50 quasi-pharmacies (licensed retail outlets for drugs), and 200 village shops
- A users KAP study: six focus group discussions with both users and nonusers of ORS and a survey of 600 households.

These studies produced extremely useful findings and conclusions in the three broad areas of production, consumers, and distribution, which led the MOH to actively encourage the participation of the private sector.

Regarding ORS production, the research found a capacity to produce the product in both the public and the private sectors, with a cost of production considerably less in the private sector than in the public.

Concerning consumers, the studies found that consumers in lower socioeconomic levels could not afford products available in pharmacies, but that in general consumers were willing to pay for medicines and placed more value on products they pay for than on those that they receive free.

In the area of distribution, the research revealed that:

- Currently only 29 percent of the population was receiving treatment for diarrhea from either public or private medical facilities.
- There are many more retail outlets in the country than Ministry of Health facilities.
- Commercial outlets are resupplied more frequently than MOH facilities.
- Commercial distribution systems are more efficient since each tier of the distribution makes a small profit.

As indicated in the following section, these results not only provided essential baseline information for planning a marketing activity but also set the stage for determining complementary roles and targets for the public and private sector to play.

## 2. Collaboration with the Commercial Sector

While the private sector is a potentially valuable ally of the CDD program, it may be engaged in quite different treatment practices than those prescribed by the Ministry of Health, e.g., the continued promotion of antidiarrheals by the private medical and pharmaceutical sectors. It is vital to establish mechanisms of collaboration which harmonize the interests and activities of the public sector and the private commercial sector to increase the safe and effective use of ORT.

In the foregoing example, Honduras's ORS marketing feasibility studies led the Ministry of Health to propose a collaborative program with the private sector, which would have a pharmaceutical company carry out a social marketing program to reach segments of the population currently not being reached by the national CDD program. The goals of the program would be to:

- Produce and package a quality ORS product using the WHO formula by a local manufacturer
- Distribute ORS sachets through existing commercial distribution systems focusing mainly on retail outlets concentrated in rural areas
- Sell ORS at affordable prices to rural mothers
- Develop a promotion program designed to stimulate and increase demand for ORS.

A useful first step in identifying such collaborative mechanisms is to clearly understand the different goals and concerns that motivate the public and private sectors as well as their perceptions of one another. Public sector goals include improving the quality of life; controlling and reducing public health problems; ensuring access to service, treatment, and education for those who cannot afford to pay for private services; and cost-effectiveness. Private sector goals are more limited: providing a quality product or service and making a profit.

The public sector often views the private sector with mistrust, feeling that it, for example, has different goals, provides services and products that are not essential, serves less needy segments of the population, is interested in making a profit rather than helping people, and receives high salaries and many incentives. With specific regard to ORS sales, government worries that the private sector may aggressively promote sales of ORS without the necessary attention to promotion of correct and safe use.

Similarly, the private sector often views the public sector as lacking staff motivation to get work done, having an abundance of rules and procedures that interfere with efficiency and

progress, having no performance-based incentive system, being influenced too much by politics, and having limited resources.

Articulating and understanding these concerns is the beginning of developing the foundation for new alliances between the public and private sectors. Ignoring them or denying them can lead to growing suspicions and false expectations. Successful collaboration between public and private sectors requires a mutual understanding that each sector can benefit from the strengths of the other.

The strengths of the public sector vis-a-vis ORS promotion are developing policy and programs to meet the health needs of the country, many years of experience with diarrheal disease control programs, knowledge of the complexity of marketing ORS to mothers, and an understanding of the components of an effective demand creation program. The strengths of the private sector are an ability to produce and distribute a quality ORS product, ability to distribute the product to commercial outlets frequently and in a cost-effective manner, an ability to reach an audience not served by the Ministry, and an ability to respond rapidly to changes in the marketplace.

Initially, collaborative mechanisms between the two sectors might include:

- Inclusion of pharmaceutical company representatives and pharmacy associations on national CDD program coordinating committees
- Government-sponsored scientific seminars for pharmacists on ORT and ORS
- Industry-sponsored production of educational materials for physicians and pharmacists (The MOH should review such materials to ensure consistency with its policy and messages.)
- Generic promotion of ORS by government while industry promotes its own specific products
- ORS market research sponsored by government which it makes available to industry (as in the Honduras example)
- Joint market target-setting and program planning.

Other types of collaborative mechanisms are described in Annex 1. To promote collaboration with the private sector and encourage commercial sales activity, there are a number of policy actions that governments may take; these are identified in the following section.

### **3. A Favorable Regulatory Framework**

The following are actions that governments might be urged to take to encourage greater commercial sales of ORS. They are listed from the more simple and easy to enact to the more controversial and difficult to enact.

- Endorsing ORS as an important element of the national CDD program and encouraging commercial sales as well as free public sector distribution
- Facilitating local production and/or import of ORS by making ORS (as with other essential drugs) a priority for import foreign exchange, granting needed import licenses to companies interested in producing or selling ORS, and reducing and removing tariffs
- Allowing the promotion of ORS products in the media
- Defining ORS as an over-the-counter drug and/or food product for distribution regulations in order to expand the network in which it may be distributed outside the pharmacy system
- Subsidizing the production and sale of ORS on an initial basis to stimulate private-sector activity, or on a long-term basis, to keep the price affordable for the poorest population groups
- Developing looser ORS formulation and pricing guidelines to allow the commercial sector to market a range of products appropriate to different market segments at prices that will serve as incentives to wholesalers and retailers
- Eliminating antidiarrheals from MOH essential drug lists and banning their sale commercially.

The PRITECH role in creating a more favorable regulatory framework for ORS sales is one of advocate and facilitator. PRITECH should attempt to persuade MOH policy-makers to loosen regulations on ORS sales in the interest of increasing its distribution and use and facilitate contacts between government and industry to break down mutual negative stereotypes and begin constructive dialogue. WHO can be a valuable partner in these advocacy efforts, and PRITECH should enlist WHO's support in promoting looser ORS formulation guidelines to allow a range of ORS products (for example, with different packaging) targeted at different market segments.

#### **4. ORS Marketing**

Given the widespread recognition of the need to increase consumer use of ORS, we must increasingly seek to leave room for proven marketing strategies when defining government policy, while at the same time ensuring the legitimate role of government in quality control. A greater involvement of professional marketers in diarrheal disease control programs and a greater application of their tools (consumer research, pricing, product positioning, and so forth) will help increase sales, and therefore use of ORS. The following proposes principal action options in each of the four elements of the marketing mix which could be expected to increase ORS sales.

## a. Product

ORS product line. Most marketing experts agree that a line of ORS products designed for different segments of the market should eventually replace the current single-product offering. For urban, middle-class consumers who have reasonably high levels of education and income and who are familiar with the modern medical system, the most appropriate product may be ORS tablets, foil-wrapped, distributed in pharmacies, and priced near or just below the prices of competing antibiotics. For rural, low-income, low-education consumers who are accustomed to taking traditional, herbal medicines, and who do not visit pharmacies but do shop at food and grocery outlets, the most appropriate ORS product may be one that is packaged to resemble traditional products, is distributed through food and grocery stores, and is priced much lower.

CDD program coordinators, with PRITECH support, should advocate an ORS product line in the interest of extending ORS utilization, particularly in those countries with more mature CDD programs and developed marketing infrastructures. In collaboration with WHO, PRITECH should assist efforts to market test safe and effective new presentations of ORS products which promise to be attractive to new groups of consumers.

Positioning. PRITECH and CDD program managers should pay more attention to the way in which ORS is "positioned" in the marketplace. Imaginative planners can find literally dozens of ways to position new products so that they appear attractive and address needs that consumers consider important. ORS has been promoted in different countries based on a wide range of local concerns, for example, as the most modern remedy for diarrhea and as a tonic to restore energy (see Annex 2). A positioning strategy adopted in Egypt and in the Philippines promoted the concept of dehydration resulting from diarrhea, with ORS positioned to prevent or treat dehydration. Negative positioning strategies, such as "ORS will not stop diarrhea, but..." should be avoided. Any given positioning strategy, however, should be based on what careful market research has shown to be consistent with consumer needs and expectations.

## b. Pricing

Objectives. Do the objectives of the program include cost-effectiveness and program self-sufficiency (cost recovery), or are they limited to achieving maximum impact regardless of cost? PRITECH should ensure that discussions between government and industry about ORS pricing include an explicit identification of the goals and objectives of the marketing program.

Subsidies. Considering the low incomes of many target consumers, a need may exist to price the product cheaply to keep it affordable. This approach may be impossible without some type of subsidy. On the other hand, research in several countries has shown that many consumers associate high price with high quality as far as infant products or drugs are concerned, are already paying high prices for competing diarrhea remedies such as antidiarrheals, and may, therefore, also be prepared to pay a higher price for ORS products. This pricing issue is a critical one to explore in the ORS market assessment discussed earlier.

Long-term subsidy of the price of ORS creates a financial burden which is unlikely to be sustainable over time; it should be discouraged. Government can, however, usefully subsidize ORS sales in the short term, for example, by conducting ORS market research and making it available to industry and conducting generic promotion of ORS in the media. Another approach is to arrange donations of raw materials (for example, from UNICEF or a bilateral source) and to use the value of the raw materials as a subsidy; this strategy is soon to be adopted in Niger. If government supports the marketing of ORS product lines to different segments of the population, another option is for industry to offer a modest price to low-income consumers and still create revenues to help pay for program costs by charging a much higher price for a different, more "modern" product aimed at higher-income consumers.

### c. Distribution

Retail outlets. CDD program coordinators and PRITECH should ensure that pharmacists become a priority retail outlet for ORS, because they are in many countries a first-line source of information and treatment for illness. While pharmacists have an economic incentive to keep selling more expensive medicines for diarrhea, experience in a number of countries, including Egypt, Bangladesh and Indonesia, has shown them to be effective and enthusiastic promoters of ORS.

Ultimately, however, ORT programs will extend coverage and reach more of the population by making ORS available through the widest possible retail system, including nonpharmacy outlets such as grocery stores and small village shops, and PRITECH should encourage this in policy discussions.

Profit margins. Commercial distribution channels operate primarily on economic principles of profitability. The total return on investment on any item is the product of the margin per unit multiplied by the number of times per year a unit of that product is sold (stock turnover), divided by the amount of money invested (locked up) in that product at any point in time. For a product such as ORS, this means:

- The program can give the trade a lower margin per unit if the product moves quickly off the shelf.
- ORS trade margins must either match or exceed those for products that have an equivalent stock turnover.
- The trade should not be loaded up with ORS before consumer purchases seem likely; promotion and training should be timed to fit with distribution of ORS.
- The retailer's investment in ORS stocks should be minimized by frequent restocking by the ORS sales force and credit and return arrangements that match or exceed those normal for that distribution channel.

PRITECH's program efforts to boost ORS sales should ensure that these fundamental principles of retail sales are observed in establishing profit margins and stocking procedures.

Other incentives. In addition to credit provisions, retailers should be encouraged with other incentives, both economic (free unit offers or gifts for large purchases and sales) and non-economic (certificates, awards, appeals to social motives); provided with point-of-sale promotional material, featuring ORS mixing and use instructions; and trained in proper ORS mixing and usage so that they in turn can educate consumers.

#### **d. Promotion**

Message content. A major challenge for ORS advertising is to persuade consumers that restoring the child's activity and preventing dehydration is a sufficient reason for using the product. Most communications/promotion efforts have chosen not to deliver negative messages such as "ORT does not stop diarrhea" or "antidiarrheals do not stop diarrhea," even though both are factual (see Annex 2). Rather, programs have chosen to address these issues in other ways such as in scientific seminars for physicians or working to change national drug policies.

A second major challenge is not only to stimulate sales of the product, the traditional goal of advertising, but also to emphasize the correct mixture and utilization of ORS. ORS product advertising should include brand-specific advertising from the beginning for maximum effectiveness, but generic advertising may also be appropriate within the same campaign.

Creative approach. Effective advertising establishes a clear benefit to the consumer, advantages over competing products, and a tone which is appealing and persuasive.

Channels. A number of different media or channels may be used to promote ORS, including drug company sales forces (detailers), broadcast media, point-of-sale promotion (for example, posters and displays in pharmacies), direct mail and conferences. Each channel has different strengths and weaknesses and should be used according to the audiences one desires to reach. See the discussion in the PRITECH paper on communications in support of ORT programs and in the PRITECH ORT Program Assessment Manual.

Implementation. The most effective advertising and promotion work is done by professionals in that business, and PRITECH should encourage the use of commercial advertising agencies to ensure that ORS promotion is as professional and creative as possible. In a number of countries, private advertising firms have donated or discounted their time to assist national CDD program efforts.

As discussed previously, PRITECH has a mediating or facilitating role to play here between public and private sectors. In addition to helping ministries of health appreciate the value of involving advertising professionals, PRITECH can ensure that advertisers thoroughly understand the special technical requirements of ORS messages. This is best done through a comprehensive briefing of the creative people by the technical people on the main technical objectives of the program, supported by the results of market research conducted and other relevant documentation.

## ANNEX 1

### MECHANISMS FOR PUBLIC/PRIVATE SECTOR COLLABORATION

There are a large number of private-sector institutions offering opportunities for marketing ORS and other child survival technologies, either independently or in collaboration with government.

#### A. PRIVATE SECTOR MARKETING MODELS

Commercial Marketing. The marketing systems of pharmaceutical companies and other commercial enterprises are obviously targets of opportunity for promotion of child survival technologies, such as oral rehydration salts. Retail sale of ORS is taking place in a growing number of countries -- Bangladesh, Ecuador, Peru, Pakistan, Indonesia, Thailand, and the Philippines -- but on a relatively limited basis. Pharmaceutical companies often favor the sale of more profitable antibiotics and antidiarrheal medications and remain unconvinced of the marketability of ORS.

Private Health and Delivery Systems. There is a wide and growing range of private health delivery systems in developing countries. These include both private hospitals and physicians and a variety of employment-related benefit plans, such as social security schemes, health maintenance organizations, and health plans run by industries or cooperatives. Typically, these services are financed by contributions of the employer and the employee with governments also sometimes contributing. Because of their growth -- for example, the social security system is the largest provider of health services in Mexico and nearly half the population of Uruguay is covered by HMO services -- these systems represent an important opportunity for child survival marketing. They tend to be highly receptive to child survival technologies because preventive efforts help keep rising curative costs down.

Private Voluntary Organizations. There are a large number of both indigenous and international PVOs such as Caritas, Catholic Relief Services, CARE, Save the Children, and so forth, which are involved in health service delivery programs in developing countries. In many countries these organizations have developed extensive and effective grassroots systems, and in some of the poorer developing countries their coverage may actually exceed that of the public health system. Several A.I.D. programs are already undertaking significant ORT delivery and education projects through PVOs in Africa and Latin America, such as PRITECH's collaboration with Caritas in Bolivia and with Africare in Chad.

#### B. PUBLIC AND PRIVATE SECTOR MIXES

Publicly Subsidized Commercial Marketing. To stimulate commercial marketing for oral rehydration salts, a government may subsidize a pharmaceutical company's sale of ORS so that it is both affordable to target consumers and still attractively profitable to the company. This is a strategy currently under consideration in the Philippines, for example, where the Ministry of Health may subsidize both the production and distribution of an ORS packet by a local

pharmaceutical company by guaranteeing Ministry purchase of x number packets annually from the company.

Product Social Marketing. Similar to the preceding model in that a product is sold at a state subsidized price, social marketing differs in that a new organization is usually established for the sole purpose of marketing a socially desired product. Most international product social marketing has been through A.I.D.'s contraceptive retail sales projects in a number of countries. There are currently several promising efforts underway, in Nepal, Jamaica, and Bangladesh, to add ORS to the product line of successful existing contraceptive social marketing programs.

Public Promotion of Private Products. There are some countries in which socially sought goods or services are available in the private-sector but for which there is inadequate consumer demand. Public resources may be used to stimulate demand, as when a Ministry of Health conducts a generic promotional campaign for family spacing or ORT which increases consumer demand for contraceptives or ORS products available in the private sector. Egypt's "missionary" promotion of family planning of the early 1980s is a good example.

Private Promotion of Public Products. The converse of the foregoing model, here a public-sector program is supported by goods or services donated by or contracted from the private sector. Recent child survival program examples include A.I.D.'s ORT programs in Ecuador and Indonesia, in which private market research and advertising firms are contracted (sometimes at a discounted rate) by the Ministry of Health to do research and design promotional activities. In Brazil, several private broadcast networks donated millions of dollars worth of broadcast time to a UNICEF/Ministry of Health breast-feeding campaign. In Colombia, the networks worked closely with the government's vaccination program.

Joint Marketing. Both public and private sectors are engaged in promoting the same product or products in their respective markets. This model has successfully served a number of national family planning programs, including programs in which the same contraceptive line is being sold commercially and distributed at no cost through public health facilities. It is also currently being followed in ORT programs in Egypt, Peru, and elsewhere where the Ministry of Health is promoting and distributing the same ORS packets through the public health system that the local pharmaceutical companies market commercially.

Complementary Marketing. Public and private sectors market different products to different market segments as part of an overall unified strategy. Such is the case, for example, in Pakistan, where a public health service distributes at little or no cost a product produced locally while the commercial sector sells a more expensive product to a more affluent segment of the market.

Competitive Marketing. Public and private sectors, using different strategies, promote different products to the same market segments. This model runs the danger of promoting conflicting, confusing, and potentially dangerous messages for the audiences, but if the basis can be agreed upon (mixing volume for example), competitive marketing can stimulate market demand of products such as ORS over less effective antibiotics and antidiarrheals.

## ANNEX 2

### POSITIONING ORS

Imaginative planners can find literally dozens of ways to "position" new products so that they appear attractive and address the needs that consumers consider important. ORS, for example, has been promoted in different countries based on a wide range of local concerns.

Communication specialists had to be inventive in Honduras because the target audience did not have a concept of dehydration. Since tonics are widespread and popular, planners decided to position Litrosol, the new product, as a "tonic to restore appetite and energy" during diarrhea.

"Dryness" due to diarrhea proved to be a common concept in The Gambia. Public health officials, however, also wanted to discourage certain practices such as withholding food during diarrheal episodes. The campaign therefore concentrated on nutrition as well as oral rehydration. It promoted these different practices under the theme, "a diet for diarrhea."

In Swaziland, communication specialists launched a similar campaign under the theme "Arm Yourselves Swazis!" encouraging an aggressive attitude toward the killers, diarrhea and malnutrition.

Indonesians have a complex system for describing diarrhea and dehydration, which proved useful as the basis for an economical promotion of ORS. Given the high number of packets required to treat all episodes of diarrhea, planners decided to promote initiation of use at a point in the episode which minimizes both risk to a child and the number of packets required nationally. A three-tier approach was developed: planners are promoting home fluids for "beginning diarrhea," ORS products for "diarrhea plus weakness," and treatment at a health facility for "moderate to severe dehydration."

Among other possible ORS positioning strategies suggested at a recent meeting of public health and marketing experts are the following:

- ORS relieves the symptoms of diarrhea
- ORS is just as effective as antidiarrheals.

Negative positioning strategies, such as "ORS will not stop diarrhea, but...," should be avoided. Any given positioning strategy, however, should be based on what careful market research has shown to be consistent with consumer needs and expectations.

**PRITECH FIELD IMPLEMENTATION AID**

**CDD ALLIES**

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This paper is one of a series designed to aid PRITECH field staff in providing technical assistance in diarrheal disease control efforts and programs. It was edited by PRITECH primarily to incorporate the comments made by field staff and technical consultants.

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## **CDD ALLIES**

This paper presents ideas concerning practical collaboration with organizations and groups other than ministries of health that are involved in delivering health care. It summarizes what has been done, what the constraints are, and how one can initiate such collaboration in order to most effectively reach mothers and other health care providers.

### **A. RATIONALE**

The Ministry of Health (MOH) is usually the largest and most important organization delivering health services. In many developing countries, however, MOH services reach only a minority of the population. Many organizations and individuals outside of the Ministry play an important role in providing health care services to large segments of the population. Health care may be their primary activity or it may be one of several activities in which they are involved. In addition, organizations may exist that have not been directly involved in providing primary health care at all, but whose networks and activities might readily lend themselves to collaboration in health care efforts. Inclusion of these organizations and individuals in CDD programs can provide wider coverage and greater efficiency, thereby increasing the likelihood of long-term gains. Attracting allies outside of the MOH is especially important where MOH coverage of the population or "market share" (relative importance as a provider of health care) is significantly limited. PRITECH field representatives can play an important role in helping ministries of health to profit from the resources or linkages of these other organizations and in helping these organizations profit from the MOH to obtain maximum impact from CDD efforts.

### **B. EXPERIENCE, ISSUES AND OPTIONS FOR ACTION**

Different countries will present varying opportunities for collaboration. In some, the most productive collaboration might be with the private commercial sector. In other countries, the most promising collaborators might be professional organizations of physicians and other private health-care providers. In others, the optimal collaboration might be with private voluntary or other community organizations or groups. As a general rule, CDD program coordinators should seek out existing organizations to build upon rather than try to create new organizations.

#### **1. Commercial Sector**

##### **a. Experience and Issues**

The commercial sector is a potentially powerful ally in CDD efforts. (Refer to PRITECH paper on promoting commercial sales of ORS for a more detailed discussion of this subject.) Privately owned and operated pharmacies are often the points of first-line treatment for illness and are important providers of health information. Most drug companies, especially in the private sector, employ large sales forces for selling their products to customers and reach large numbers of physicians, pharmacists and other health personnel. Retail systems for basic consumer goods generally extend into the remotest parts of the country in the form of markets

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and small shops and boutiques. Often these pharmaceutical outlets and small retail outlets are far more accessible to people in both urban and rural areas than government health facilities. Pharmacies, drug companies and retail merchants could thus be ideal mechanisms for extending the distribution of ORS.

One example of a collaborative effort between the government and private commercial sector is the CDD program in Egypt: the same packet that the MOH distributes free in clinics is sold by retail pharmacists, who received training and encouragement from the government to become ORT educators. In practice, 60 percent of the ORS distributed is through commercial sales channels.

#### **b. Constraints**

Because businesses operate to make a profit, collaboration with the commercial sector is viable only where the sale of ORS is perceived to be profitable. Government overregulation is one of the most commonly experienced constraints in motivating commercial sale of ORS: the more a product is regulated, the more one can expect distribution and sale to be inhibited. In regard to pricing policy, government regulation may keep ORS prices low in order to keep ORS affordable to all. The danger of this approach is that prices are set so low that profit margins are insufficient to encourage promotion by sellers. Another inhibiting factor to successful commercial sales is consumer perception of the product. ORS is not always perceived by consumers as addressing their primary concern in treating diarrhea, that is stopping diarrhea. Therefore, private companies may worry about the lack of demand for ORS.

#### **c. Actions**

##### **Distinguish between Private and Public Sector Talents and Objectives**

A useful first step in identifying collaborative efforts with the private sector is to clearly understand the different goals, concerns and relative strengths of each sector. Concerning ORS, public sector strength lies in its years of experience with CDD programs and its ability to make national policy, while private sector strength lies in its ability to distribute a product (ORS) more efficiently and cost-effectively, to reach audiences not served by the MOH, and to respond to changes in the marketplace rapidly.

##### **Disseminate Information to Private Sector**

For the private commercial sector to be an effective collaborator, its personnel must first be knowledgeable of CDD program goals and strategies. An effective way to disseminate this information might be through government-sponsored scientific seminars for pharmacists on ORT and ORS. To ensure cooperation in implementation efforts, one strategy might be to include pharmaceutical companies and representatives of pharmaceutical associations on national CDD program coordinating committees. To demonstrate the benefits which the private commercial sector itself could derive from its participation in CDD efforts, the government might make its ORS market research available to the industry.

## Advocate Favorable Policy Actions

In the policy arena, PRITECH representatives can act as advocates and facilitators to help create a more favorable regulatory framework for ORS sales. For example, regarding pricing, PRITECH should try to ensure that discussions between government and industry include explicit identification of the goals and objectives of an ORS marketing program. To encourage distribution, CDD program managers should assess whether government and private networks could be operationally complementary to ensure a constant supply of ORS and regular reporting about the demand for ORS. If so, then CDD program managers and PRITECH should promote pharmacists becoming a primary outlet for ORS. To improve marketing, PRITECH should collaborate with WHO and assist efforts to market safe new presentations of ORS products that prove to be attractive to new groups of consumers.

### 2. Private Physicians and Nurses

Governments must recognize the major service provider role of private physicians, pharmacists, and other practitioners. Because private physicians see numerous patients, their endorsements could be instrumental in legitimizing ORT as the most effective diarrhea therapy. Governments must learn how to convince doctors and other private sector practitioners to use and promote ORT and feeding during diarrhea.

#### a. Experience and Constraints

Possible mechanisms for mobilizing private practitioner support include continuing medical education through physician and nursing associations; organizing scientific seminars; changing licensing requirements; arranging for hands-on training or observational visits, preferably by a "critical mass" of health personnel; using detailmen<sup>1</sup> to promote ORT as the treatment of choice for diarrhea; and counter-detailing to discourage the use of antidiarrheals.

Two countries in which private practitioner support has been mobilized through continuing medical education (CME) administered through physician and nursing associations are the Philippines and Pakistan. In these two countries, the national pediatric associations have been instrumental in bringing CME on current diarrhea treatment practices to their memberships. Also in the Philippines, pharmacists are required to participate in a certain number of CME courses to retain their licenses.

In Bolivia, as part of a breast-feeding promotion strategy, a large (17) group of private and government health personnel were invited to participate in a training session which focused on both the clinical aspects of breast-feeding and specific actions hospitals can take to increase breast-feeding practice. Because a large number of health personnel from the capital city had all participated in the training, once they returned to Bolivia they were able to institute the suggested changes (rooming-in, banning distribution of formula in hospitals, and so forth) and reinforce each others' ideas and attitudes.

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<sup>1</sup> Highly trained promoters of pharmaceutical products.

The constraints and limitations to the above approaches are twofold. First, in many countries the majority of local physicians do not belong to or participate in a professional society and do not receive CME or in-service training on a regular basis. The same situation applies to private practitioners in the nursing field. In addition, though medical and nursing practitioners may occasionally receive some form of CME or in-service training, the influence of these sporadic training sessions, which stress the importance of proper ORT case management, are no match for the pressure exerted by highly skilled detailmen. These promoters from drug companies encourage the use of antidiarrheals through regular, sometimes weekly meetings with these same doctors.

In Jordan, Pakistan, and the Philippines, efforts have been made to capitalize on the sales skills of detailmen by using them to promote ORT. Private pharmaceutical companies producing ORS in these countries have hired detailmen to visit physicians regularly and promote the use of their products. These detailmen have been trained in the use of ORS and in selling techniques, and have been provided with polished brochures that publicize the benefits of ORT. The impact of these promotional visits has been an increase in physicians' acceptance of ORS as necessary to correct the imbalance caused by dehydration. Physicians, however, continue to prescribe antidiarrheals along with ORS. This practice suggests that some counter-detailing activities may be necessary to discourage the use of these harmful drugs.

#### **b. Actions**

As noted, an effective strategy is to take advantage of the proven persuasive abilities of detailmen and use them to promote ORT. In addition to detailing, counter-detailing (that is, actively discouraging the use of antidiarrheals) may also be an effective means of improving case management of diarrhea. As with detailing, private pharmaceutical companies can be expected to invest resources in counter-detailing activities only if they can anticipate increasing their profits by such efforts.

In countries where CDD activities are limited to the public sector, CDD program-sponsored workshops involving hands-on training and observational tours for physicians, nurses, and pharmacists can be a first step in creating a supportive atmosphere for national CDD goals. Where possible, the strategy of training a critical mass of carefully selected practitioners may have significantly greater impact over training single representatives from scattered health areas. Although the latter approach seemingly may provide wider coverage, once the training is over, the individual returns to his or her post and must first convince others of the efficacy of what he or she has learned before any attempts are made to actually implement the new ideas. Depending on the amount of resistance encountered, new approaches may never be implemented. On the other hand, successful training of a "critical mass" results in a group of people already committed to the new approach or technique, and energies can be expended on implementation.

In any type of training session or education seminar, it is important to remember that the goal is to disseminate new information or techniques that medical professionals can then implement or incorporate into their daily work activities. Therefore, in-service training sessions or CME

seminars should always include some sort of hands-on training. Where such training is not possible, participants must somehow be provided the opportunity to demonstrate that they not only have understood the material they have been presented but also that they will be able to translate what they have learned into action.

### 3. Linking ORT to Traditional Healers

Strategies can be designed to convince traditional healers to integrate ORT into the traditional healing ceremonies, and to build referral networks that link healers to community-based clinical care for children determined to be at high risk. When properly approached, traditional healers can be interested in ORT or any modern method that works, as long as it can easily be incorporated without destroying their own medical tradition.

#### a. Issues and Experience

The advantages of recognizing traditional healers as potentially useful providers of village-based ORT are significant; among them, the traditional healers:

- Are already there
- Have important status and influence in the community
- Provide good coverage of poor children
- Are sought early in the course of illness
- Are trusted by village mothers
- Speak the same illness language
- Often recognize clinical symptoms associated with diarrhea and dehydration even though they call them by different names
- May follow children's progress during the healing ritual, which may last many days.

In addition, health education efforts cannot have much impact if they are actively or passively opposed by traditional healers.

In Swaziland and in Zambia, traditional healers and modern health personnel are being encouraged to work together to prevent and control diarrhea and other children's diseases. In Swaziland, the MOH has organized regional training workshops for traditional healers, clinic nurses and health inspectors. In Brazil rezadeiras - traditional healers of the local community - receive an initial training to make them competent in identifying the signs of risk and the administration of ORS to children. Because mothers normally bring their children back to the rezadeira for three to nine consecutive days, the rezadeira is able to follow the children's recovery.

## **b. Constraints**

Constraints to this approach include possible opposition of traditional healers to cooperation with the government and to changing their established methods of healing. They may not welcome supervision by the government and outside agencies and may find monitoring and evaluation activities threatening. Second, medical professionals and ministries of health may be skeptical about the ability of traditional healers to provide adequate health care services. Third, promotion of ORT through traditional medicine may strengthen the credibility of traditional healers, some of whose practices are harmful (such as purging in diarrheal disease management) and may increase their utilization as a low-cost alternative to modern, effective medical care. Fourth, in many developing countries, because traditional healers are not organized, working with them may not be practical from a programmatic perspective.

## **c. Actions**

In countries where traditional healers are organized, collaboration with their leaders may be the first step toward gaining their support and trust. A workshop on this topic with government officials, at which traditional healers are also present, may be instrumental in helping to overcome governmental non-acceptance.

Exploration into traditional healing practices may be useful in identifying areas of commonality between traditional and modern treatment of diarrhea. Once identified, similar treatment practices might serve as a useful starting point of discussion between traditional and modern practitioners. Learning about traditional healing practices would also provide valuable baseline information from which to design training programs or communication strategies aimed at reaching traditional healers.

Communications approaches to promote collaborative efforts may include radio, candid discussions with traditional healers, or testimonies of healers who have come to recognize the benefits of oral rehydration. Additional options could include test projects, development of training materials for distribution, and discussions with companies making or distributing medications used by traditional healers.

## **4. The Media**

In some countries, the media may be willing to get involved in CDD activities. Some media owners and operators may have the desire to contribute to the public health status of their country's citizens while others may be willing to participate as a public relations strategy. In either case, because of the ability to reach large numbers of people, the media may be effective allies in CDD activities. (For a more detailed discussion, see the implementation aid on communications).

Another advantage of mass media is that they can be used to reach different groups for different purposes. For example, one type of newspaper article, or radio or television program could be designed to disseminate information to the more educated upper classes, including both politicians and doctors, and another type to disseminate information to mothers and

other (potential) users of ORT. The content of a program aimed at convincing more educated or sophisticated audiences of the efficacy of ORT would need to be scientific in nature and suggest various policy alternatives. Its goal would be to set the political climate for instituting the program desired. The content of programs targeting less educated mothers and other users might be more promotional and user-oriented in nature and use appropriate analogies rather than provide information in scientific terms.

Different countries will offer different opportunities for media involvement. For example, in Pakistan, PRITECH has successfully worked with the media to present documentaries on diarrheal disease control. In addition, a well-known Pakistani puppeteer and radio and television producer has produced radio spots with National Institutes of Health and PRITECH.

In Indonesia, the CDD program has set in place the first tentative building blocks for an aggressive social marketing campaign, which has been largely supported by pro bono assistance from the local media. This CDD initiative will become the first test case for public service announcements to be presented and developed by the newly developed USAID-supported "Indonesian Advertising Council."

In Sri Lanka, the government has launched a series of seminars for journalists in order to stimulate the support of the mass media for the country's program of public information and education for health. Although it is too early to make any assessments of impact, questionnaires from participating journalists indicated that the seminars were useful.

Perhaps the largest constraint to media's involvement in CDD activities is that it is difficult to sustain. A major obstacle is that the media may charge high fees for their participation. Finding a way to spark media interest in promoting CDD activities for motives other than immediate financial gain is thus essential. In those countries where the CDD project is a political one, it might be easier to get the media involved in reporting the openings of DTUs, for example, or other CDD accomplishments. Even in the best situations, media campaigns may be difficult to sustain in the long term because of media's interest in providing new stories and finding new topics on which to report.

##### **5. Other Development Programs**

Development programs of other ministries and community organizations which already successfully reach out into local communities, working in such sectors as agriculture, income generation, and education, are also potential channels for promoting ORT and other aspects of diarrheal disease control. ORT can be taught to agricultural extension agents, vocational trainers, or school teachers, none of whom see themselves as health workers, but all of whom can have direct effect on child nutrition and health.

## **a. Issues and Experience**

### **Educational Institutions**

Educational institutions are some of the most underused resources in CDD. There are primary schools in almost every village of the developing world. While in some countries not all children attend school, the school and its teachers exert a strong influence in disseminating information and are regarded as authoritative sources of new ideas. School children can serve as an entry for the introduction of health issues to the family (child-to-child, child-to-parent).

Introducing ORT into the school curricula has been tried successfully in Indonesia where school children have been taught in five, half-hour sessions why and how to administer ORT. Another example is the village of Ajoya in Mexico, where children conducted a "diarrhea survey," linking the absence of breast-feeding of younger siblings with diarrhea. Disturbed by the results of these findings, some women (with the help of clinic health workers) organized a play to make the entire community aware of the importance of breast-feeding.

### **Private Voluntary Organizations and Community Groups**

In some countries, there are a multitude of nongovernmental organizations (NGOs) with extensive networks reaching into the community. Some private voluntary organizations (PVOs) may already operate in the health field and may have their own networks of clinics, hospitals, and health care workers that could be used as bases for outreach for CDD activities. In addition, just as agents in governmental nonhealth development programs can promote ORT, so, too, can community groups and PVOs in nonhealth sectors. Community organizations can promote ORT instead of, or at least along with, traditional medicines, and can provide social support to young mothers in the use of ORT.

### **Women-to-Women Services**

Given women's critical role in child health, special attention should be paid to incorporating women's groups into CDD activities. For example, they can be a convenient forum in which to train mothers to make ORS from readily available household ingredients. Some projects teach mothers not only to use ORT in their own families but also to serve as local "ORT agents" for wider administration of ORT to other families in their neighborhood. Women may also be selected as depot holders of ORS packets for distribution to other mothers requesting assistance.

One of the largest CDD programs in the world is carried out by women in Bangladesh through a nongovernmental organization, the Bangladesh Rural Advancement Committee (BRAC). In 1980, BRAC launched a ten year, nationwide programme to teach mothers how to make an oral rehydration solution using the household ingredients of salt (lobon) and unrefined cane sugar (gur). Some 1,400 field-workers, mostly young women, moved from house to house teaching mothers to mix a glass of water with a three-finger pinch of lobon and a four-finger scoop of gur. By late 1986, almost seven million mothers had been trained.

Throughout Bolivia, fertile-age women are organized into mothers' clubs. Under the direction of Caritas, a social development agency of the Catholic Church, the clubs distribute PL-480 foods to the mothers and conduct weekly meetings during which children are weighed and measured by Caritas promoters or auxiliary nurses. PRITECH promoted expanding the activities of the mothers' clubs to include the distribution of oral rehydration packets, thereby taking advantage of the clubs' existing infrastructure. The expansion from food distribution into health activities has met with varying degrees of success. In spite of the problems encountered, however, working through the mothers' clubs has proven to be an effective means of reaching large numbers of rural mothers with health messages.

### Religious Institutions

Religious leaders and groups can serve as important channels for ORT education and promotion. Religious institutions are in frequent communication with the community and possess a network of relationships, and therefore have significant influence. In Indonesia, religious leaders participated with the Department of Health in a thorough analysis of Islamic texts showing that the holy works support the concepts of early attention to the sick child, of added food, proper breast-feeding, and intensive mothering during the child's illness. With these practices carefully formulated in a guide to religious leaders, the mosques now play a role in disseminating the messages.

The Catholic missionaries in Ecuador and Colombia supported nationwide EPI programs and other Child Survival strategies by making public announcements after sermons about visiting health teams and encouraging parents to take their children to be vaccinated.

In many countries, missionaries and other religious groups have facilities that deliver health services in areas not served by the MOH system. In some countries they are the most widely used providers of primary health care (PHC). For example, in Zambia approximately 50 percent of health care is delivered by the Church Medical Association of Zambia, primarily in rural areas. Such organizations have the potential to be significant providers of appropriate case management for diarrhea.

### **b. Constraints**

While limited attempts to promote ORT through sectors other than health have shown promise, this approach remains relatively unexploited largely due to the significant constraints involved.

### Different Priorities

NGOs and other organizations rarely have diarrheal disease control among their first priorities. With the already heavy workload of teachers, mothers, extension agents, and others, the introduction of one more task may be perceived as burdensome. ORT may have to be explicitly acknowledged as a national priority before a CDD program can successfully involve other sectors. When CDD is a national priority, school curriculum, training of nationwide workers in other sectors, and coordination with the PVO network can more easily complement health sector activity and greatly increase the impact of the program.

### Limited Reach

PVOs are usually involved in small-scale projects, or operate in remote and dispersed areas. While the advantage of such coverage is that PVOs reach the population not covered by the MOH, the problem from a programmatic standpoint is how to coordinate and organize their various efforts. How can one provide them with technical training, supervision, new information? One idea might be to get PVOs or other small organizations to form coalitions or to pool their resources.

### Different Management and Technical Expertise

The management of PVOs and religious groups may be consensus oriented rather than based on "line" authority. While this approach is desirable within the context of community participation, it may frustrate early achievement of measurable objectives in ORT delivery. In addition, the leaders and policy-makers of PVOs and other elective groups are seldom technicians, and they may require more orientation to technical and administrative aspects of incorporating ORT, such as record-keeping, monitoring, and evaluation, than might be the case with MOH staff.

### Desire to Maintain Autonomy

PVOs and NGOs may be hesitant to work with government programs due to a perceived loss of autonomy and the imposition of often cumbersome bureaucratic procedures. Thus, some degree of program and financial flexibility must exist to successfully merge government and PVO objectives and activities.

#### c. Actions

Make an inventory of all groups and intermediary organizations that work within each country. Special attention should be paid to those that reach populations not easily reached by government infrastructure and those that work with women.

Whenever possible, rely upon existing networks. Many countries have established national coordinating bodies for the regulation and support of nongovernmental agencies. The Non-Governmental Organization Coordinating Council (NGOCC) in Pakistan and the Federation des Associations Feminines (FAFS) in Senegal are just two examples of national agencies that have grassroots-level networks. They could be approached to add CDD components to the agendas of the organizations they oversee, and could be given any needed technical assistance or training.

Religious groups are coordinated at both the international and national levels by the church hierarchy. CDD coordinators can approach national religious leaders through the Council of Churches and Islamic associations. In many countries, it might also be essential to secure the commitment of regional religious leaders; for example, the bishops of each diocese. Leaders at this level cannot be assumed to automatically implement directives from national headquarters and their active support and collaboration should be pursued.

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### C. GENERAL CONSIDERATIONS

For the CDD coordinator or PRITECH representative looking at this array of possible allies, asking the following questions may help in deciding which one may offer the most promising collaboration.

Look at an organization's purpose. Does it relate to health, or could it? Does it relate to children, or could it? Do the organization's purpose and practices converge with the objectives of the CDD program?

Is the organization's staff suitable or adaptable to CDD services delivery? What experience do they have? What training could they handle? Are their numbers adequate? Could the organization manage and afford an increased staff if it was needed? Would technical assistance be needed? Accepted?

Which groups does the organization serve now, and what percentage of the population, approximately? Which areas of the country? What is their service to women with young children? What channels has the organization established to reach these women? What types of networks is the organization plugged into, or what types of networks has the organization created? Does, or could, the organization deliver information or services or commodities now? How could that delivery system be adapted for child survival goals?

Within the normal structure of the national CDD program, where would the organization fit? Health care delivery? Packet production? Promotion? Graphics design? Public education? Logistics? Management? Media services?

Finally, and most importantly, is the organization open to collaboration with those responsible for the CDD program and/or with PRITECH? Why would the organization want to collaborate with the national CDD program or with PRITECH? What benefits would they realize from such an arrangement? How much attention would the organization give to the CDD work in the context of its other interests? Would they see eventual PRITECH financial and technical assistance as beneficial to them? If PRITECH were to provide necessarily temporary, or multiyear assistance, would it leave the organization stronger once PRITECH involvement ended, or would their CDD activity have become dependent on the external assistance and wither away without it? These are the types of questions that a national program coordinator and PRITECH representative need to ask in considering partnership with any organizations.

### D. SUMMARY

In most PRITECH countries, reliance on the MOH to deliver ORT services everywhere is not realistic. Many other agencies currently deliver health services, and it makes sense to try to incorporate these groups into the national CDD effort. Such agencies have many characteristics different from a Ministry of Health, some promising and some that call for caution. Nevertheless, thoughtful integration of their capacities into the national CDD program can greatly increase the chances of achieving program goals. Helping to bring this about may be a particularly lasting contribution that PRITECH can make.

**PRITECH FIELD IMPLEMENTATION AID**

**COMMUNICATIONS IN SUPPORT OF CDD PROGRAMS**

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This paper is one of a series designed to aid PRITECH field staff in providing technical assistance in diarrheal disease control efforts and programs. It was edited by PRITECH primarily to incorporate comments made by field staff and technical consultants.

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## COMMUNICATIONS IN SUPPORT OF CDD PROGRAMS

Public health communication is important to CDD programs because it is a key to getting people to change their behavior.

### A. RATIONALE

Through a communications effort, the CDD program can inform people about ORT--what it is and where it is available; it can teach people how to mix correctly and administer ORS or home solutions; and it can motivate people to try ORT for the first time and to continue to use it. In each program, the communication strategy should be based on careful research to understand the characteristics, concerns, and needs of the audience. A strong consumer orientation is essential to an effective communications strategy.

Mothers and other caretakers of young children are the primary target group for a CDD communications effort. The target behaviors among this group are as follows:

- More effective diarrhea case management in the home
- More effective diarrhea prevention behaviors
- Increased use of ORS.

Health care providers are the most important secondary audience in CDD programs. In this case, communication goals include:

- Physician acceptance of ORT as the best therapy for diarrhea
- Increased practice of ORT by all health providers
- Active promotion and sales of ORS by pharmacists.

A third important audience is the society at large. As noted in PRITECH's implementation aid on sustainable CDD efforts, political will and social support are essential for lasting impact. The media should be used to inform and enlist the public at large, decision makers, and politicians on health issues and strategies. Creating an environment in which health interventions can be effectively implemented is too often forgotten as an important communication objective.

All effective CDD communication strategies will use a combination of communication channels, including mass media for maximum outreach and interpersonal channels for credibility.

## **B. EXPERIENCE AND ISSUES**

To date, most CDD programs with which PRITECH has worked have implemented only one of several elements of the communications strategy outlined in the original PRITECH program assessment and design. Working primarily with health education units in ministries of health, many programs have focused on developing simple graphic instructional materials on ORT for health workers and mothers. A number have organized communication planning and coordination conferences with other organizations. Several have developed radio programs promoting ORT; several others have organized training programs for community health workers emphasizing community outreach.

A number of reasons exist for the modest level of communication activities carried out to date. In some countries, they are the responsibility of another A.I.D. project, such as HEALTHCOM, or another donor agency, such as UNICEF. In most countries, however, communication has been given less attention and resources than other CDD activities, such as clinical training of health personnel. A number of constraints to communication strategy implementation are discussed below.

In no country where PRITECH is working has the communication program created the excessive demand for ORT services or products that was feared several years ago (although in one country authorities asked a commercial firm to stop advertising for fear this was about to happen). Globally, demand and use of ORS lag far behind its availability according to WHO data. A great deal remains to be done to stimulate ORS use by consumers. This task is becoming increasingly important as countries strive to achieve self-sufficiency in ORS production.

We have continued to learn that it is difficult to teach audiences how to prepare sugar-salt solutions. It can be done, and has been done effectively, but teaching a new solution involving careful measurement of several different ingredients, which must then be administered to a child often with no visible effect, has proven to be an intensive, costly endeavor requiring much reinforcement to be sustained. In recognition of this, many countries are shifting their ORT policies away from sugar-salt solution in favor of other home-available solutions more simply prepared as the first response to a case of diarrhea.

This poses two new challenges for communication planners:

- Deciding which home-available solutions to promote and how to promote them, an issue requiring careful thought and investigation, not just by communicators but by CDD program technical staff.
- Determining how ORT communication programs can be planned to allow for major policy changes during a program which will significantly change the messages to be communicated to audiences.

A number of specific issues which CDD program staff face in planning the next stage of CDD communications efforts are discussed here in terms of deficiencies and constraints. The constraints are in large part responsible for program deficiencies.

## 1. Technically Underdeveloped Communication Programs

The communication components of most CDD programs are not yet sufficiently developed from a technical point of view. Among the common technical shortcomings:

- Formative research is inadequate or missing altogether. Critical initial research about audience characteristics, beliefs, and practices is essential to help planners plan the communication effort. Recipes for fluids or foods, or recommended behaviors, must be tried in homes to determine whether they are practical and acceptable before messages are designed.
- Communication planning is piecemeal and isolated from other CDD program components rather than comprehensive and integrated with the program.
- Audiences addressed are limited and undifferentiated, with one set of messages going out to all audiences, often including at least some for which the messages are inappropriate.
- Channels used have been limited and noninteractive. Some programs have used only mass media, others only interpersonal media, to the detriment of overall impact.
- Messages have been imprecise and have not been phased. Vague generic messages are often used, which fail to trap the audience's attention. In many countries messages have been limited to ORT with inadequate attention given to feeding. In other countries, premature attention is being given to preventive messages, overlooking the need to sustain case management efforts and creating too many messages for audience comprehension and impact.
- Training of health personnel in face-to-face health education covers only what to say; inadequate attention is given to how to communicate it effectively, to communication techniques.
- Educational materials, especially essential materials for teaching mothers appropriate case management, are produced in far too small numbers, are poorly distributed, or are simply not created at all. This is particularly true for mothers' pamphlets.
- Monitoring of the process and effects of communication efforts is inadequate.

These technical shortcomings are in large part due to the effects of the following constraints.

## 2. Inadequate Human and Financial Resources

The health education units in ministries of health with which PRITECH is working continue to be understaffed, and existing staff often have no training in public health communication. Ministries continue to make woefully inadequate provision of budget to these units for public health communication activities, including CDD/ORT. At the same time, they are generally reluctant to work with potential partners in the private sector, such as market research or

advertising firms. This resource constraint will obviously have an important bearing on all other aspects of program performance.

### **3. Gaps or Shifts in ORT Policy**

In many countries, essential elements of national CDD/ORT policy relevant to communication planning remain undecided or poorly defined. These include what home solutions to recommend; if and when sugar-salt solutions are to be recommended; what size of ORS packet and mixing container will be used; what foods and feeding approaches should be recommended during and after diarrhea; and what signs should be used to indicate when a diarrheic child should be taken for medical help. In the absence of clear-cut policy, the communicator's messages may be technically incorrect or distressingly without focus, and may eventually lead to confusion when policy is finally made. As noted, shifts in program policy can also pose formidable challenges for communicators. What, for example, should be the messages during a period when a country's policy is shifting away from the promotion of sugar-salt solution in favor of more emphasis on other home available solutions and ORS packets?

### **4. Competing Programs and Messages**

Ministries of health in developing countries have many programs and priorities in addition to diarrheal disease control which compete with CDD programs for the time and energies of Ministry staff. Health education units, in particular, are subject to competing demands to develop supporting educational materials from various project managers who grossly underestimate the time required to properly do so and frequently demand instant action. Moreover, Ministry officials are often unaware of the focus, the intensity, and particularly the duration required for a communication effort to have any effect on its audiences.

### **5. Coordinating Programs and Messages**

Closely related to the problem of competition for resources is that of coordinating what should be mutually supportive messages from various parts of the public health service. The nutrition unit may continue to promote sugar-salt solution after the CDD unit has shifted its policy to ORS packets, or private health care providers may promote one recipe or container size while the government CDD program promotes another.

## **C. OPTIONS FOR ACTION**

The following options for action should be considered by the CDD program and PRITECH consultants:

### **1. Reassessment and Formative Research**

What are the current activities, plans, and priorities of the overall CDD program? How much has been done so far on ORT communication? What do people currently know about diarrhea? What do they do about diarrhea? Are there sizable numbers of people who already

use ORT? What are the current attitudes and practices of doctors and pharmacists? Nurses and local health workers? What needs to be done now? How should those efforts be integrated with an effort aimed at mothers?

To answer the foregoing questions, several types of research studies should be conducted. At a minimum, focus group discussions and in-depth interviews should be conducted with representative samples of target audiences, especially mothers and health workers. It is useful to identify and conduct separate focus groups with users and non-users of ORT to better understand reasons for adoption or rejection and redirect communication efforts accordingly. Observational studies of ORT in clinics are a useful supplement to interviews in determining actual health worker practices and identifying where problems or knowledge gaps exist. These three less-quantitative research approaches are often more useful than the commonplace KAP sample survey. Anthropologists, other behavioral scientists, and market researchers have particular training and skill in designing the appropriate research strategy and specific research activities, and PRITECH should encourage national program counterparts to enlist their help.<sup>1</sup> Local experts in these areas should be identified and used, when appropriate.

## **2. Clarification of National Policies**

Certain aspects of national CDD policy are of particular relevance to communication efforts. These include home treatment recommendations (for example, sugar-salt solution, available home fluids, or ORS), diarrhea prevention priorities and messages, and regulations affecting ORS distribution and sales. PRITECH should seek at every opportunity to help governments clarify these policy issues through technical assistance visits, policy workshops, or problem-solving studies.

## **3. Mobilization of New Resources**

A continuing challenge for PRITECH's country programs is to mobilize additional support and resources for communication efforts both inside and outside the Ministry of Health. The formation of a communication coordinating committee within the Ministry of Health can help to expand the base of support and technical expertise beyond the health education unit. The establishment of an even broader committee with representatives from other ministries and organizations, including the media, may be still more helpful in some countries (these strategies may also assist in the long-term institutionalization of efforts; see item 6 below). CDD coordinators and PRITECH representatives should also profit from opportunities to cooperate with other A.I.D. projects (such as HEALTHCOM, CCCD and SUPPORT) and donor agencies involved in CDD promotion (See also the PRITECH implementation aid on CDD allies beyond the Ministry of Health).

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<sup>1</sup> PRITECH has two manuals which can assist in designing research studies of diarrhea-related feeding practices, and can be adapted to other research objectives. These can be obtained from PRITECH's Information Center.

#### 4. Replanning of the Communications Program

On the basis of assessment of both the status of the overall national program and the results to date of communication activities, the communication strategy may require reformulation. Is the national program just beginning and focusing on case management training for health personnel? The most appropriate communication strategy may then be to concentrate on developing training materials on health education skills which may be added to case management workshops and to emphasize referral and generic treatment messages in communications to the public. If past efforts have included significant ORT communications to the public, have they been technically correct? Were they well understood and acted upon? Is it possible to build on them, or is it necessary to repair earlier deficiencies? Are communications efforts properly phased regarding other activities (for example, promoting use of ORS only when the distribution system is in place)? See the Annex for examples of communication activities and messages appropriate to each phase of a CDD program.

The following section provides a number of recommendations for reformulating communication efforts. In reviewing them, one should keep in mind that all aspects of a communication plan should be consistent. How many and which of the recommendations are appropriate and feasible for a given country program will depend on:

- Previous efforts
- The current phase of the national program
- The resources at hand.

##### a. Audience

Segmentation: Segmentation refers to the development of particular products and/or messages for specific subsets of the audience. Market segments include mothers, fathers, physicians, traditional healers, urban dwellers, rural dwellers, users of ORT, nonusers, and so forth. Messages aimed at one segment may well be overheard by other segments: for example, telling mothers to ask their doctors or pharmacists for ORS may alert doctors and pharmacists to the rising expectations of their clients. But in the interest of maximizing the effect of limited resources, it is essential to focus communication program efforts through audience segmentation. One obvious segmentation is by language, another by subculture, but other characteristics can be equally important. Focus group discussions are a common method used by marketers to identify the characteristics that differentiate market segments so that messages and products can be tailored to fit.

Health opinion leaders: Priority audiences for ORT communications include physicians, pharmacists, and other health personnel. Private physicians are a crucial group to enlist in the ORT cause. In India, special videotapes made for doctors and shown in the regular professional meetings of the Indian Medical Association addressed the special concerns physicians have about ORT.

Reinforcement: Are there sizable numbers of people who already use ORT? A year or two into the program, an important second-phase aspect of a communication program is the reinforcement of ORT users and their enlistment to reach out to others through media

testimonials or community outreach strategies. This information should not be overlooked.

## b. Messages

Diarrhea case management emphasis: Consistent with WHO recommendations, PRITECH country programs during their early years will continue to put their main emphasis on improving diarrhea case management. Thus, communication efforts should focus primarily on reinforcing diarrhea case management, but with a greater emphasis on feeding than has been common in the past. As programs mature and case management improves, preventive messages should be introduced.

Home solutions: Internationally, CDD program policy is increasingly favoring the promotion of available home fluids over a sugar-salt solution as the appropriate first response to diarrhea in the home. Home fluid recommendations should be based on careful research and should emphasize fluids which are easy to prepare and use correctly.

Behavior analysis: Message planning must be based on the recognition that proper diarrhea case management appears simple at face value but is a complex cluster of behaviors which must occur in certain sequences. Appropriate messages must be developed to address each cluster of behaviors. Behavioral scientists can assist communication planners in better analyzing specific behaviors and behavioral sequences to be addressed.

Positioning: On the basis of what research reveals to be local perceptions of diarrhea and expectations of a treatment for it, careful attention should be given to "positioning" ORS and ORT. This concept refers to deciding how best to describe ORS and ORT in a way that will bring them acceptance with a target population. Positioning is described more fully in the PRITECH implementation aid on commercial sales of ORS.

Persuasive appeal: Messages should attempt to maximize the perceived benefit of ORT and reduce any perceived disadvantages or cost. They should stress the relative advantages of ORT over other treatments and use emotional as well as rational appeals.

## c. Channels

Alternative channels: While health workers will continue to be the primary face-to-face channel for teaching mothers ORT, CDD programs should increasingly seek to identify and use other interpersonal channels. Promising existing channels include schools (school teachers and school children), churches and mosques (religious leaders), women's associations, other community groups and popular theater. A first useful step that some countries have taken in this area is to organize a conference of interested community groups to identify roles in the national CDD program and to maintain action through a continuing coordinating committee. A second step might be to conduct training workshops for health workers to improve their community outreach and organization skills.

Improving communications skills: A common problem in many countries is that little health education is done by health workers in clinic settings and that mothers are often treated in an authoritarian and insensitive manner by staff. A great need exists to improve the health

education and human relations skills of health staff. PRITECH can help improve this situation and make health workers more effective teachers of ORT by including instruction and practice of communication skills in as many training settings as possible. A PRITECH module "Talking With Mothers" is available for such training.

A second step in this direction is to develop observational methods and a checklist that supervisors can use to monitor the effectiveness of health education and to teach supervisors to encourage those who do conscientious health education. The HEALTHCOM Project, WHO, PRITECH and CCCD have developed supervision instruments which can be shared with PRITECH program staff.

Strengthening mass media: The mass media, particularly radio, continue to be potentially powerful but underused allies in CDD programs. They can provide three elements better than any other communication channel:

- reach.....the ability to reach a large audience
- frequency.....the ability to repeat messages frequently
- standardization.....key messages may be repeated accurately and consistently.

CDD programs should make greater use of mass media. To encourage this, PRITECH should foster closer collaboration between health and information officials by:

- Holding workshops to expose communication personnel to CDD and other child survival issues
- Seeking free or discounted time from broadcast institutions for CDD messages
- Providing technical assistance to broadcasters in health message development.

ORS commercial sales: In many countries, commercial promotion and sales of ORS is a promising means to both distribute the product and educate mothers (via the pharmacist) about its use. This approach will be a major new emphasis in PRITECH, particularly in those countries with more developed commercial distribution infrastructures.

#### **d. Materials**

Priorities: Priority in developing educational materials should be given to a leaflet or handout for parents on home treatment for diarrhea, particularly mixing and using ORS or home fluids. These materials should be produced in massive quantities, ideally enough for one to be given for each packet (or two packets) distributed and should cover feeding, signs of dehydration, and other indications for referral. Other useful educational materials include ORT teaching aids that health workers can use in clinic and home settings (including discussion/teaching cards for use in one-on-one meetings), educational materials for new interpersonal channels (pharmacists, teachers, traditional healers, and so forth), and radio program series to teach and reinforce proper diarrhea case management practices.

Pretesting: Pretesting materials may seem to be an unnecessary, time-consuming task. The time and resources required, however, are not great when compared with what pretesting can

save by identifying inaccurate, incomprehensible, confusing, and/or ineffective messages in time to correct them before they become the basis of mass campaigns and massive expenditures.

#### **5. Improved Supervision and Monitoring System**

As with other components of the CDD program, health communication must be supervised, both to know its effectiveness and to increase it. Monitoring methods for health communication activities include checklists that supervisors can use to evaluate the process and content of health education as reflected in post-training clinical practice; materials audits which assess how well educational materials are being distributed through the health system; broadcast monitoring to ensure that radio or television programs are being broadcast at the times and with the frequency agreed upon with broadcast officials; and periodic small-sample surveys to determine whether audiences are receiving, understanding and acting upon messages.

#### **6. Strengthening of Institutional Capabilities**

To help sustain CDD and other child survival programs for the long term, steps should be taken to strengthen each country's capacity and commitment to conducting systematic health communication programs. This means the provision of training and experience in key skill areas, such as formative research, message development, communication plan formulation, and pretesting of materials. (This is an area for collaboration with the HEALTHCOM Project, which is developing training materials and activities in these areas). It also means educating senior Ministry officials about health communications, developing their understanding of the time, intensity, and duration of effort required to have an impact and exacting from them a commitment to support health communications on an ongoing basis. PRITECH should thus play an advocacy role to ensure a greater commitment of budget to health education units from ministries of health, a greater commitment to public health broadcasting from ministries of information, and other forms of support for effective health education. A visit by a communications expert to share successful experiences from other countries may be a useful first step in this direction.

## ANNEX

### THE STAGES OF COMMUNICATION ACTIVITIES WITHIN THE CDD PROGRAM

#### Program Activities

#### Communication Activities

1. Commitment to CDD program by government
2. Plan made for program
3. Budget settled
4. ORS supply assured
5. Developmental investigation
  - Qualitative and quantitative research among target audience to understand current diarrhea KAP. Targets include mothers and health-care providers.
6. Design of the communication plan
  - Test recipes and recommendations in homes.
  - Determine channels, their mix and complementarity; determine messages and devise strategy.
  - Assemble production teams.
  - Determine indicators (are you at the awareness state, the behavior stage, the reinforcement stage?) and monitoring channels.
  - Train monitors.
  - Test messages.

7. Set up Diarrhea Training Units
  - Assure that messages to mothers and health workers are consistent with one another.
8. Train health-care providers
  - Design curriculum and teaching materials. Prepare health information systems for health workers' use.
  - Carry out training.
9. Message production
  - Develop, test messages as determined in 6.
  - Use print, TV, radio, other.
  - Test pilots in target audience.
  - Revise after testing, if indicated.
10. Communication begins; monitoring begins. Continuing supervision of health care providers and diarrhea training units.
  - Monitor process as well as results. Revise as indicated.

This last stage should be continuous. Intensity may vary, depending on season, but communication, monitoring, and supervision are to be continuous. Update messages as necessary. Provide additional training as necessary. Review communication plan as you move from awareness to behavior to reinforcement stages.

**PRITECH FIELD IMPLEMENTATION AID**

**ENSURING THE SUSTAINABILITY  
OF CDD EFFORTS**

**Glen Patterson, M.A., M.S.**

**May 1990**

This paper is one of a series designed to aid PRITECH field staff in providing technical assistance in diarrheal disease control efforts and programs. It was edited by PRITECH primarily to incorporate comments made by field staff and technical consultants.

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## ENSURING THE SUSTAINABILITY OF CDD EFFORTS

Any health program may be considered sustainable when the flow of benefits from the program can be maintained or enhanced when donor funding ceases. Thus, sustainability does not refer to each activity undertaken as part of a CDD program, but refers to the lasting impact of the program. Seen in this perspective, the global smallpox eradication program achieved the ultimate in sustainability: the target population continues to receive the health benefits resulting from the eradication of the disease. Ultimately, the goal of any CDD effort is that there be a sustained reduction in morbidity and mortality from diarrhea as a result of the program.

There are various levels at which CDD activities take place and it is important that CDD managers and consultants differentiate between strategies which have shorter or longer term impacts on diarrhea. For example, the installation of a water and sewer system might have a larger impact on diarrhea morbidity and mortality than an advertising campaign promoting ORT use. A more proximate level might be seeking ways to ensure that mothers and health workers maintain appropriate case management practices (ORT use being one of them) after the initial program investment has been made. More proximately yet, one might concentrate on ways to sustain the resource base for program activities such as training, information systems, ORS production and distribution, IEC campaigns, or any other activities designed to reduce the incidence of diarrheal disease.

This paper will focus on strategies for the sustainability of programs aimed at reducing infant morbidity and mortality through the correct use of ORT as the core of standard treatment of diarrheal disease in children. However, many of the observations made in regard to CDD programs can be applied to other programs as well.

### A. RATIONALE

Donors want to invest in development efforts and then have the benefits resulting from their investment carry on without the need for continued outside support. They, as well as developing countries themselves, would prefer to avoid recipient country dependency on donor funding over the long term. This translates into donors trying to avoid paying recurrent costs, such as salaries, routine supervision, and transportation. When these costs are regularly paid by donors, the program is felt to be in jeopardy of being dropped or critically underfunded when the donor project runs out and the program reverts from donor support to the routine government budget. If the government does not have sufficient funds to match the level of donor funding, the program's organization and activities may break down to the point where they are no longer effective. This situation describes what happens to an unsustainable program, one in which insufficient thought has been given to how the host country will be able to support the program in the long run.

## B. ISSUES AND OPTIONS FOR ACTION

Sustainability of ORT and related maternal and child health programs can be usefully looked at and provided for in terms of:

- Demand by mothers
- Essential and timely project interventions
- Overall program viability -- financial, managerial, institutional, technical, and social -- after outside assistance is terminated.

### 1. Sustaining Demand by Mothers

Behavioral change of mothers is a key objective in virtually all CDD programs. ORT and the use of ORS must ideally sell itself to mothers through demonstrated effectiveness. If mothers demand ORS from public health workers, private practitioners, and retailers, the likelihood that the use of ORT will be expanded and sustained is greatly increased. On the other hand, if, even after repeated experience with ORT, mothers remain unenthusiastic, the chances for sustainability are seriously reduced (or conversely, the cost and effort of sustainability greatly increased). ORT must pass the test of the marketplace with mothers to succeed and to fulfill its potential; that fact should guide every element of program design and implementation.

The above discussion suggests some points that require more attention than they have often been given:

- Mothers want diarrhea to stop now, not in three days but now. This is especially true in areas where water is either scarce or difficult to obtain. If ORT cannot satisfy this demand, or if it cannot be supplemented with something that will, the program must address this issue aggressively. The mother must be provided with an explanation that satisfies her. She must understand why her foremost demand cannot be safely met and why ORT fulfills the needs of the child and mother more effectively than other treatments. This is a challenge for all training and education/communication programs; unless this challenge is met and this understanding effectively communicated, demand for the product will be half-hearted, at best.
- Ensuring the proper use of ORT is as important as promoting ORT. It is always easier to stimulate demand for an untried product than for one which has been tried and seen to fail. Promotion, education, and training must be designed to provide maximum assurance of proper usage of ORS from the start. The trial-and-error approach, publicizing ORT and then having health workers teach or apply it inadequately, has a high cost. Credibility is reduced; it is then harder to overcome normal skepticism and to stimulate demand for future use.
- ORT must be viewed at all levels as the remedy of greatest effectiveness, and proper motivation must be given to encourage this, at least until mothers' demand is a strengthened factor in sustaining the intervention. Doctors, nurses, and other medical personnel often continue to use IVs, antibiotics, and antidiarrheals for treatment. Ironi-

cally, even years after the introduction of ORT in a country, it is often found that diarrheal treatment deteriorates as one goes "higher" up the medical ladder with perhaps least use of ORT in teaching hospitals. If mothers perceive that ORT is not the first choice of the health professionals they have come to assume have the most expertise, their uncertainty is increased and their acceptance of and demand for ORT diminished. Therefore, in project design a variety of limited-term incentives (positive and negative) as well as education should almost always be considered for doctors, nurses, and other personnel involved with ORT. Their behavior and choice is far more important than often assumed; it not only affects the children they treat in their facilities but also severely reduces demand of mothers for ORT by increasing uncertainty.

In short, ORT requires a marketing strategy, and mothers are the all-important consumers. Ideally, ORT should sell itself to them if its use is to be sustained over the long term. If, in fact, the demand cannot be self-sustaining, then some consideration must be given to maintaining a resource base for continual promotion efforts. Either way, everything feasible must be done to ensure that it is given a fair chance in the marketplace. This includes:

- Recognizing and addressing mothers' priority concern, stopping diarrhea
- Providing a substitute concern, dehydration, for which ORT is the answer
- Ensuring that ORT is not applied before there is reasonable assurance that it can be applied correctly
- Ensuring that the "prestige" actors in the health field (physicians, hospital personnel, and so forth) use it as a treatment of first choice, or failing this, that widespread publicity and education are given to mothers which explain why the "prestige" treatment is second best to ORT
- Finally, sustainability benefits from constant efforts to make ORT better respond to consumer demand. Among the targets of such efforts are: more convenient packaging, flavoring, combining with other elements to promote attractiveness, and identification of the most effective home mixes. Managers must be sensitized to drawing periodically on technical expertise to improve the marketability and effectiveness of the product.

## **2. Sustaining Essential and Timely Project Interventions**

Over the long term, mothers' continuing demand for ORT is the most important contributor to the sustainability of ORT and CDD efforts, but other conditions are essential too. ORT and related maternal and child health programs, like other development activities, are dynamic. In the earlier stages, particular interventions are needed. Then as those needs are met and the program evolves, other actions become appropriate. This implies careful analysis of needs and planning of interventions, monitoring and evaluation, replanning and repetitions of the cycle. Some of the most important interventions are set forth below.

### **a. ORS Production, Distribution, and Supply**

Obviously, mothers' demand is of little use if it cannot be met. Thus the question of how to guarantee the continuation of adequate ORS production, distribution, and supply is essential to the continued impact of any CDD program. In the early stages of a CDD program ORS may have been donated for a considerable period by an outside donor; local producers, distributors, and retailers may have been subsidized; start-up incentives may have been provided to practitioners and consumers; laws and regulations may have been adequate for existing conditions. However, these factors can and usually do change as the project matures, as donor inputs decline, as the public sector health budget fails to grow, and as other demands appear. As a result, a readily available supply of ORS can easily be jeopardized.

If sustainability is to be defined as an intervention which remains effective and can be carried out without continued major participation of the donors themselves, then donors must be very conscientious in evaluating their inputs and be sure that their strategies have taken into account long term as well as short term goals. By responding to the short term goal of making ORS packets available to everyone and by producing and distributing large quantities of it free of charge, donors jeopardize the continued availability of ORS after donor funding ceases.

From the project's inception, the question of how recurrent costs are to be met must be taken into consideration so that the country itself will be able to take over the distribution and supply of ORS when the donor project ends. Provision must be made for reducing start-up incentives and subsidies to a level that is financially feasible and substituting self-sustaining market forces as much as possible. Among the options:

- Ensure from the beginning of the project that costs of production and distribution are increasingly paid by users; for example, through user fees and/or purchase of ORS in the private sector or in health facilities. This objective is far easier to achieve if demand by mothers grows with experience because evidence shows that even low-income consumers are willing to pay a reasonable cost for a product that they consider to be effective.
- Liberalize laws and regulations to permit maximum and profitable participation in ORS production and safe distribution. This may mean allowing private producers to safely diversify products (for example, through packaging) to provide necessary incentives. It means permitting profitable marketing by the most effective agents which reach village and low-income mothers (for example, traditional practitioners, PVOs, local retailers, even local grocery or household markets).
- Reduce the incentive for using alternative remedies through mass communications, education, and carefully selected financial and administrative "negative incentives" (for example, banning antidiarrheals from ministry or national drug lists makes them available only through purchase in the private sector or not at all in the case of a ban from the national drug list); supervisors can review registers and remind staff of policy when they are prescribing such products.

- Shift subsidies increasingly to lowest income consumers and to areas and regions of least coverage.
- Provide training and education so that every consumer has adequate knowledge of preparing an acceptable domestic substitute for ORS if and when ORS is unavailable.

**b. Personnel: Training and Management**

Independent, ad hoc, and CDD-specific training activities are commonly used to introduce health personnel already on the job to diarrhea case management concepts and practices during the early period of a program. This approach is essential, but only as a start-up activity. Given growth, changing responsibilities, and turnover in health staff, this type of training is seldom sufficient to ensure that the knowledge, attitudes, and practices of medical and paramedical personnel contribute to CDD success. In this context, policy structure and management play important roles in ensuring a steadily increasing number of professionals knowledgeable in CDD.

Possible policy initiatives which might make the training of health care providers and managers have a more lasting impact include:

- Incorporating the policies and practices of the CDD program in pre-service training curricula and examinations for medical, paramedical, and pharmaceutical personnel for the private and public sectors (until this is done, new staff enter service unfamiliar with ORT and the in-service training needs are never-ending)
- Building ORT into regular (as opposed to CDD program-specific) in-service refresher training
- Obtaining and sustaining the results sought from training traditional and village-based practitioners to participate in CDD efforts may require structuring incentives. For example, traditional birth attendants (TBAs), once trained, might be supplied ORS at a subsidized rate and allowed to sell it at the commercial rate. Private village health practitioners, once trained, may be given specific tasks; for example, birth and death recording and referring of difficult pregnancies, for which they would receive a task-related payment. In effect, they would have entered a new profession with the possibility of greater remuneration. This incentive often helps increase the demand for training, its effectiveness, and the sustainability of the behavior sought in giving the training. Often, however, financial incentives are difficult to provide on a recurrent basis in countries with weak economies.

Management can also be improved through ad hoc training early in a program, but program personnel are often transferred out of the CDD program to totally new roles. Sustained improvements are best served by including management training in institutionalized training programs; for example, requiring management training in either medical school or at a management institute or in-service facility prior to assigning medical doctors or others to direct primary and other health care facilities.

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Effective supervision and motivation are important if performance is to be sustained. We have already mentioned institutionalization of training, incentives, and job-entry requirements that favor behavior appropriate to CDD program success. Even harder to achieve than these, but critical to the sustainability of appropriate job performance, are effective supervision and evaluation of personnel. To the extent that rewards and penalties of personnel can be based on accurate and fair assessment of their performance, people can be motivated to use training received and to seek training needed. Sustainability of appropriate knowledge, attitudes, and behavior cannot be divorced from personnel management, supervision, and evaluation.

### c. **Communications and Education**

The principal objective of communications and education activities is changing mothers' behavior (and to a much lesser extent, that of other target groups). The messages, media, and techniques chosen will all change over time as familiarity with ORT is increased with some audiences and others are targeted, and as the program focus shifts, for example, to give increasing emphasis to feeding or preventive measures. Program sustainability implies the capacity to continue a changing mix of appropriate efforts with new and varying audiences and messages and to do so effectively, thereby enabling ORT and related child care practices eventually to become integral parts of mothers' basic knowledge and behavior throughout the society. To accomplish these objectives, it is important to consider the following points:

- With no other program element is careful evaluation and well-planned operational research more important. How else can behavioral change be measured and the educational effort appropriate to the next stage of desired change be developed? How else can one know when it is appropriate to discontinue one set of messages and initiate another? Sustainability requires a built-in capability within the country to evaluate the effectiveness of publicity and to design promotional efforts to achieve new and specific behavioral objectives.
- An opportunity may exist to improve family child care behavior by directing at least some education and communication at fathers. It cannot be assumed that fathers are indifferent to the welfare of their children, and although the role of the mother is predominant in most developing societies, the influence of the father is often underestimated. Greater attention to fathers, perhaps through broader "good parenting" education, can have a valuable effect in sustaining family demand for proper diarrheal treatment.
- Sustainability in the public sector requires a continuing capacity to get materials such as pamphlets, brochures, radio and television messages, and so forth produced and delivered. Given the scarcity of resources available to most MOH's, governments should encourage maximum participation and collaboration from other groups. The potential exists for involvement of private entities (PVOs, medical associations, pharmaceutical firms, private retailers at the village level, and commercial firms with demonstrated outreach) through incorporation of ORT education into their continuing programs. (See paper on CDD Allies).

For example, television, radio and brochures can lose their effectiveness over time. Commercial firms with advertising and promotional experience with target groups may be persuaded to experiment with new forms of promotion such as village baby shows and health fairs, which combine entertainment with maternal and child health instruction (See paper on Communications in Support of CDD for more information on this topic).

- Where ORT has been incorporated into the activities of a variety of influential groups in the society and where scarce public-sector funds are complemented by private financing of education and communications activities, sustainability is likely to be enhanced.

### **3. Sustaining Overall Program Viability**

A national health program is more than its components. It is possible that most, or all, of the project activities could be sustained and yet the overall program lose all dynamism and direction. Project designers and managers must try to make provisions for program sustainability in at least four important respects.

#### **a. Institutional Support**

To be sustained, a CDD program must be viewed as an integral part of an effective maternal and child health program and must be integrated into a viable primary health care system. A dilemma frequently arises when these broader activities are weak and poorly managed: while integration is the ideal, in practice integration at the program's inception may result in a weak CDD effort. Preventing the dilution of CDD efforts then becomes the justification for some initial independence for the diarrheal disease program - independently administered training, alternative sources of equipment and supplies, new information, and management efforts. Even where this independent effort is necessary, its temporary nature should be emphasized. From the beginning, provision should be made for eventual integration of CDD into the broader primary health care system of the country, private as well as public.

Project interventions developed for ORT should be as simple and as economical as possible and, above all, transferable as easily as possible to the primary health care system as a whole:

- Independent training programs should be incorporated into regular training institutions as soon as possible.
- Health information systems developed for diarrheal disease must be simple and easily expandable to include other diseases as capacity grows or able to be integrated into two primary care information systems.
- Managerial improvements (for example, distribution of drugs and supplies) must be compatible with the system as a whole and not just appropriate to ORT. The greater the extent to which regular ministry services are involved in CDD activities, the easier integration will be.

When donor assistance ends, it will take the combined efforts of the public and private sectors to continue the program at the level required to meet its objectives. As noted, this collaboration will require early planning of maximum participation of PVOs, medical associations, private producers and distributors of ORS, and private publicity efforts. If the intensive ORT effort has been gradually shared out over the life of the project, the residual burden placed on the public health establishment when donor assistance ends will be more manageable. Private sector support will enhance the credibility of ORT, and the program will reach the portion of the population often unserved by the public sector.

#### **b. Political and Social Support**

Political will and social support are essential for implementation and continuity of programs and can be sustained through several channels:

- Open and participatory negotiations between donors and host countries are essential since government commitment to the CDD program will most likely be stronger if it has fully participated in negotiations with the donors from the beginning of the program. If government officials feel that the priority, the content, and the design of the program have been imposed, that a project is a donor project, their sense of ownership and responsibility decreases.
- Where possible, a broad children's commission or similar organization responsible for promoting child welfare could be established. This commission should be chaired by someone in the top political leadership of the country, with the participation of a wide variety of community leaders.
- Active partnership with national medical associations, women's groups, and leading community action groups should be sought. Subgrants administered by these organizations for worthwhile CDD activities give them vested interest in sustaining and promoting diarrheal disease control.
- Maximum participation of women in every aspect of the program is essential to ensuring sustained social support and should be complemented by instructing fathers to take a more direct and supportive role in proper child care.
- The media should be used creatively to inform and enlist politicians, decision makers and the public at large on key health issues and interventions. This "political" use of the media is all too often ignored.

#### **c. Economic and Financial Support**

The gradual reduction of subsidies and the transfer of a greater share of project costs to private entities and to the end-user have been discussed earlier. Another key factor in containing costs is extreme caution in increasing permanent employment in the public sector. Every encouragement should be given to contracting for services (for example, certain training activities, promotional efforts, logistics management) rather than hiring large numbers of additional Ministry of Health employees.

Where feasible, the use of the subgrant mechanism should be encouraged. This approach involves having an acceptable intermediary review proposals and administer subgrants to PVOs, groups of private practitioners, and other appropriate groups to carry out parts of the continuing diarrheal disease program. Of course, the question of sustaining CDD efforts in these groups will need to be addressed. The residual role of the Ministry of Health is leadership and management of diverse efforts in the society. Its own funds can then be reserved primarily to subsidize services for the lowest-income beneficiaries and to support promotional and start-up activities in regions inadequately covered.

#### **d. Management Support**

The level of support the program has from Ministry of Health management, as well as the managerial skills applied to it, will play a role in determining program sustainability. It is important that:

- Programs be designed to encourage adequate decentralization and delegation of authority
- Personnel supervision and evaluation provide motivation through both positive and negative incentives at every stage of the program
- Improved management procedures initiated as part of the diarrheal disease control program be incorporated more widely in the primary health care program as rapidly as possible.

#### **C. KEY PROBLEM: WITH A LIMITED PROGRAM, YOU CANNOT DO EVERYTHING**

To ensure adequate distribution of ORS, one cannot remedy every distribution problem of the Ministry of Health and of the often disinterested private sector. To provide effective ORT training to the medical and paramedical personnel immediately related to the target group of mothers, one cannot reorganize training programs throughout the health sector. In short, how does one both keep the project limited in its objectives and ensure sustainability? No easy answer exists. The preceding pages offer several suggestions. They are not all appropriate to any one country, but among them, any program should find several that fit. In all cases, keep in mind that:

- Over the long term, mothers' demand for the product is the best assurance of sustainability. The weaker that demand, the less likely the program is to be sustained.
- Through careful analysis, evaluation, and operational research, project planners can identify the actions and interactions essential to developing sustained demand and supply, and appropriate interventions can be undertaken.
- The building in of incentives and the participation of influential community groups help ensure sustainability.
- Weighing all of these factors and designing an effective and limited, yet sustainable, program is far more a matter of art than science.

**PRITECH FIELD IMPLEMENTATION AID**

**PROGRAM PROBLEM-SOLVING STUDIES  
FOR CDD PROGRAMS**

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This paper is one of a series designed to aid PRITECH field staff in providing technical assistance in diarrheal disease control efforts and programs. It was edited by PRITECH primarily to incorporate comments made by field staff and technical consultants.

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## **PROGRAM PROBLEM-SOLVING STUDIES FOR CDD PROGRAMS**

CDD programs are constantly faced with overcoming implementation problems that cause differences between actual and desired program outcomes. One tool available to assist program managers in this process is research explicitly linked to program needs.

### **A. RATIONALE**

Such research has been called operations research, decision-linked research, or action-based research. The PRITECH Project is using the term "program problem-solving studies" (PPSS) to emphasize the focus of this type of research on CDD program operational problems and issues and on the actions related to their solution.

The PRITECH goal is to promote the use of program problem-solving studies by CDD program managers as a tool to improve the effectiveness of program activities and strategies. An important objective is to increase the proportion of program decisions or choices that are based on objective and reliable information rather than on guesses or subjective impressions.

Research studies which PRITECH is not referring to in this document include large descriptive studies, basic epidemiologic biomedical or clinical studies, or research not designed in collaboration with CDD programs. Research not designed to provide specific information regarding alternative program strategies under active consideration by the program is beyond the scope of this paper.

### **B. EXPERIENCE WITH PROGRAM BASED RESEARCH**

During the last decade, a significant amount of action-linked research has been carried out in the health care field. Perhaps the leader in this area has been family planning where operations research (OR) has led to significant program and policy changes. More recently the Child Survival Initiative has supported a variety of research oriented to program decision-making. Many A.I.D. Child Survival related projects, including many with CDD emphases, have significant research components. The WHO CDD Programme has also sponsored research, much of which is program action oriented. More recently it has redefined its operational research to "implementation research" or the evaluation of the implementation of interventions of known efficacy.

These efforts vary from small-scale studies to much larger research efforts. The results of many have been instrumental in altering program strategies. A number of research and data-gathering efforts, while not titled "OR" or "PPSS," are in fact the very type of activity to which this paper refers.

In the studies which have been conducted, involvement of decision-makers from the outset increased the likelihood of implementing the operational strategies resulting from the research. Following the principles below increased the probability of using the findings:

- Commitment of the relevant managers/decision-makers to modify program strategies as needed.
- A clear idea of what the alternative options or strategies were and the suitability of these options (consistency with existing resources and constraints).
- Availability of support and resources to implement or modify the alternative strategies.

When these conditions have not existed, then the likelihood of using research results has been low.

Many program-related studies are conducted on an ad hoc basis designed to address a specific issue which has arisen. For example, many CDD programs have had to select an appropriate container for measuring water for ORS or sugar-salt solutions (SSS) for teaching and promotional purposes. Small studies have been conducted in a number of countries, including Pakistan, Zambia, Kenya, Ecuador, Honduras, Nigeria and The Gambia, to determine the types of containers mothers normally had in their homes. In some countries, no widely available standardized container was found, while in others the appropriate containers were identified and packet size or SSS recipes adjusted accordingly.

An assessment of voluntary health workers after a two-day ORT training course in Indonesia revealed that the workers' knowledge of correct diarrhea case management was poor and their actual practices even poorer. A brief study of a modified training approach (one-day course followed by one month back home teaching ORT to neighbors, followed by one day review/problem-solving) found that this approach produced much better results.

To promote the use of ORT, Ecuador used a multidimensional approach, including mass distribution of ORS during vaccination campaigns. Facing criticism from WHO, Ecuador's CDD program manager decided to verify whether mothers knew how to mix the ORS solution correctly before proceeding with mass distribution. A KAP survey showed that of 1,700 mothers who claimed knowledge of ORT, 85 percent prepared the solution correctly and only 6 percent used too little water. On the basis of these results, the program manager decided to continue with the mass distribution as planned. While these studies produced useful results, this ad hoc approach is less effective than that of the following examples, which illustrate the use of continued program monitoring linked to problem-solving research and program action.

In Bangladesh, a project implementation committee of a health and family planning extension project met monthly to diagnose problems and propose solutions. One problem that this committee identified was that mothers failed to use field worker services during their children's diarrheal episodes. The committee analyzed four different possible causes: inadequate field worker knowledge, unavailability of ORS packets, poorly motivated field

workers and lack of accessibility of field workers during the time of diarrheal attack. The project used survey data, in-depth interviews and field worker observation to assess these potential causes. It found that field worker knowledge was adequate, but that ORS packet availability and field worker motivation were contributing to the problem. The project then developed and tested different ORS supply strategies and non-monetary ways of motivating field workers.<sup>1</sup>

The Egypt CDD program provides another illustration of the planned and continuing use of research as a tool to improve program performance. Numerous research activities are designed and implemented as the program defines problems and issues for which it needs information to improve its strategies.<sup>2</sup> Annex 7 presents a summary of the research studies and the related program actions supported by the National Control of Diarrheal Diseases Project in Egypt.

The health communications field also has successfully used research results to improve the effectiveness of its efforts. Focus group research, message testing, monitoring of radio station delivery, and so forth are among the problem-solving research activities designed to make communications more effective.

Whether ad hoc or part of a more systematic process, the results of problem-solving research have improved program interventions and activities. The success of the studies cited in leading to useful program changes, however, was dependent on the level of understanding, commitment, and involvement of program staff. The potential in other programs for conducting and using similar studies will be determined by the degree of the program staff's interest and commitment, by staff capabilities, by the resources available for research, and by the time frame of the program.<sup>3</sup> Sometimes "bad" experiences with "prior" research activities also limit program enthusiasm for undertaking such studies. Research done in isolation from the program by researchers interested in a particular topic has not usually led to the program changes in which we are interested.

### C. APPROACHES FOR IMPLEMENTING PPSS

The ideal approach for using PPSS as a management tool for solving implementation problems is for CDD program managers to establish systematic program monitoring, identification of operational or strategic problems, and implementation of relevant research studies to analyze them, leading to new or modified strategies for the program. While any use of PPSS should be helpful to program managers, a more organized approach avoids haphazard analysis and

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<sup>1</sup> Koblinsky, Marjorie A. et al. "Implementing the Bangladesh National Programme for Diarrheal Management at Village Level." Unpublished report, 1985.

<sup>2</sup> Hirschhorn, Norbert. "Keeping Research Relevant: Research and the National Control of Diarrheal Diseases Project."

<sup>3</sup> Koblinsky, M.A. "Operations Research in the Public Sector." Unpublished paper, 1985.

resolution of implementation problems. The steps of such an approach include:

- Establish program monitoring approach
- Define implementation problems
- Analyze causes of the problem/select cause to be studied
- Organize the study
- Carry out the study
- Apply research results to program.

A similar approach is being applied in some countries by the District Team Problem Solving (DTPS), developed by the Family Health Division of the WHO.

It should be noted that this scheme reflects the emphasis of this paper on the steps involved in problem identification and research studies rather than on program monitoring.

## 1. Establish Program Monitoring

### a. Setting the Climate

CDD program managers first must see that problems exist in daily program operations and know that there are gaps between the expected and the actual. Because those in charge of programs are often not oriented toward questioning their implementation strategies, have not been trained in solving problems, and are not rewarded for doing so, this first step is perhaps the most difficult.<sup>4</sup>

PRITECH could assist programs in this process by getting program managers accustomed to monitoring activities, recognizing problems, and realizing that they can do something about many of them. The WHO is supporting this process through its new emphasis on problem solving as an ongoing program activity.

### b. Decide on Monitoring Mechanisms

Most managers are also not accustomed to using studies to provide information for decision-making. Thus, an important step is to sensitize them to areas which could potentially be addressed this way and to encourage them to set up means to monitor progress on a continuous basis. One way is to suggest periodic meetings among staff and between field workers and program managers to discuss day-to-day problems in areas such as:

- Comprehension of health education materials by health workers and mothers
- Status of ORS supplies and stockouts
- Mothers' ORS/SSS mixing and administration practices.

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<sup>4</sup> Koblinsky, M. A. "Operations Research in the Public Sector," p. 3.

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In these and similar areas of program concern, the existing situation is compared with what is desired, or with a locally determined or global standard. Detection of a discrepancy signals the existence of a problem.

Other possible monitoring mechanisms include regular supervisory field visits, reporting requirements on specific concerns such as the ones listed above, report reviews, and regular review of health center records. Programs which are monitored and reviewed frequently on a systematic basis have the intent of defining new program strategies or identifying implementation problems and resolving them. Deciding which issues may need further study and using research to test new strategies to resolve these problems are an integral and continuing part of the effort.

## **2. Define Implementation Problems**

### **a. Identify the Problem**

All health service delivery programs have problems. The question becomes: which of these to pursue? Care must be taken to avoid choosing areas inappropriate for study. The problem should probably be pursued if it meets the following three conditions:

- It is important: priority problem areas of major concern to the program should be studied--not minor issues--because research generally requires important resources of time and money
- There is a question about why the problem exists
- There is more than one plausible answer to this question.

To ensure that research results are used, decision-makers and researchers should be brought together during the initial stages of problem definition to determine precisely what information is needed. While the CDD program manager should initially identify the problem and the actions needed, a number of other key individuals may be influential in determining whether the results will be used or may pose obstacles to modifying program strategies. The CDD program manager should formally identify these individuals and define a strategy for involving them in this phase through activities such as meetings, workshops, invitations to field trips or other mechanisms which will be useful for their future support. While this approach may be difficult and time consuming, any effort made to involve these individuals usually will prove beneficial.

### **b. Describe the Problem**

Determining what is currently known about the problem situation in general terms assists in giving a clearer picture of the issues. Where relevant, this should involve reviewing service statistics, available documents on the topic, and the experience of other programs as well as

obtaining opinions from a variety of knowledgeable or involved individuals.<sup>5</sup> Sometimes these steps are not feasible given limited information or resources. If the problem is believed to be a priority problem for the program, however, it is helpful to:

- estimate how widespread the problem is, or how often it occurs;
- estimate or determine the geographic areas affected;
- determine the population groups affected.

### 3. Analyze Causes of the Problem

#### a. Identify Probable Causes of the Problem

A review of the information available concerning a problem should help identify its possible causes. What is the current thinking on why the problem exists? What are the unanswered questions and the unknowns? Is there consensus regarding the probable causes or are there large discrepancies or conflicting views among the persons involved?

Identifying all of the major factors contributing to the problem, or, in research terms, the independent variables, will assist the CDD program in focusing the research on the most relevant areas. Bringing program staff and the researcher(s) together is an effective way of identifying these factors.

Those reasons or causes of the problem that are program related and within the authority of the program to change or to influence should be considered potential subjects for problem-solving research.<sup>6</sup> The contribution of each "cause" to the problem area should be estimated to determine whether or not a study should be conducted. If the program cannot influence the causes, then it makes little sense to conduct the research from the program's perspective.

For example, if the problem that is identified is the lack of ORT use by mothers, a potential program-related cause could be lack of correct health worker knowledge. Assessing health worker knowledge would then be the topic studied in a PPSS. A non-program-related cause may be the mothers' socioeconomic status. Studying general socioeconomic status probably would not help program decision-making. On the other hand, specific information on socio-cultural factors may be relevant to program strategies. For example, program IEC efforts may be inappropriate for mothers' literacy levels.

The example from the Bangladesh program discussed earlier shows that clarifying issues at the outset helps to narrow the research focus, to identify the principal variables or components to

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<sup>5</sup> Fisher, Andrew, Laing, John, and Stoeckel, John. Handbook of Family Planning Operations Research Design. The Population Council, p. 5

<sup>6</sup> Koblinsky, M.A. "Operations Research in the Public Sector." p. 4

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consider, and to suggest the possible methods to use in studying the problem. It also assists the program manager and researcher to avoid duplicating work already completed or investigating issues that are unimportant from a programmatic perspective. Perhaps most importantly, it identifies areas for program action and change.

**b. Identify Possible Decisions or Actions to Correct the Problem**

Defining possible alternative solutions to the problems identified allows the CDD program to better define the focus of the specific research or other studies needed to test these new strategies. It also prepares other program decision-makers and implementors for modifying program strategies. Therefore, once the program has determined the potential causes of the problem and decided which one(s) to study, it needs to begin to identify strategies to overcome them.

These strategies or actions will be developed in more detail after the research results are available to the program. Nevertheless, at this stage it is useful to think ahead about what the actions might be. Some questions the program might consider briefly at this stage and in more depth later on include:

- Might the potential cause selected for study require several concomitant actions or strategies to resolve it?
- What are the advantages and disadvantages of each possible action?
- Have program actions already been taken to resolve the problem?
- What has already been tried? Has it worked at all? If so, where? Why? If not, where? Why?

Preliminary answers to these questions in the problem analysis phase help to determine more precisely the nature of the studies and to suggest likely interventions.

For example, a program has learned from several sources that mothers are committing significant errors in mixing SSS and decides to study this problem. Possible reasons for the problem are:

- the national SSS recipe is too confusing;
- training of health center workers is inadequate; and/or
- teaching mothers in groups how to mix SSS when they come to health centers is inappropriate.

The range of corrective options might be as follows:

- Revising the SSS recipe and mixing messages
- Abandoning SSS as a national policy

- Trying two new training strategies in different areas to determine whether the errors are corrected by one or the other approach
- Using family planning (or other) outreach workers to teach mothers in their homes.

Identifying these options might lead study designers to include questions on mothers' SSS recipe comprehension, on health worker training effectiveness, and on current functions of and attitudes toward various outreach workers in their study design.

**Note:** The Population Council has developed a useful handbook that provides examples for completing the steps in the problem identification stage. While the manual is detailed and refers to family planning programs, many of the examples are appropriate to other health programs.<sup>7</sup> The handbook suggests preparing a summary of this process. Completing such a summary issues paper addressing these areas helps to ensure that the studies be appropriate and that the results be used. Guidelines are found in Annex 1. PRITECH staff could acquaint CDD staff with this manual and assist them in completing the steps, where appropriate. The manual is available in English, French, and Spanish.

#### **4. Organize the Study**

##### **a. Develop a Draft Proposal**

In many settings, conducting such studies will require management assistance as well as research assistance. Programs will have to develop a research proposal. Depending on the skills available within the program and the nature of the study, this proposal can be a full-blown research design or a more simple version.

If assistance in design is required, a preliminary proposal or abstract, as outlined in Annex 2, could serve as a scope of work for obtaining technical assistance for the detailed research design. A preliminary proposal may be useful in either case to present to potential funders for a "go/no go" decision on developing a more detailed proposal. The detailed proposal can then be used to request assistance from bilateral projects, through other A.I.D. centrally funded projects, or through other donor agencies. Proposal development assistance can be supported as part of the PRITECH country program plan or through PRITECH central S&T/H funds.

##### **b. Identify Local or Outside Resources to Design and/or Conduct Study**

Problem-solving research should aim to achieve results needed by CDD programs as quickly as possible. PPSS may vary in scope from simple data collection activities to sophisticated research depending on the nature of the issues. Nevertheless, it is important that the studies adhere to at least basic research principles and appropriate design and analysis. In other words, the need for a study with quick turnaround should not outweigh the need for using solid methods. Conversely, it is important to seek the input of researchers who are not overly

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<sup>7</sup> Fisher, et al. Handbook for Family Planning Operations Research Design.

theoretical but who have practical and applied research skills in the social sciences. These skills are most needed in design and analysis.

The research skills needed will depend on the data collection or study methods to be used: surveys, observational studies, focus group discussions, in-depth interviews and record reviews (see Annex 3). Research skills may be available within the CDD program, outside the CDD program but within the country, or outside the country.

Within the program: While this sounds ideal, certain risks are involved. The principal ones include less commitment and time to devote to the research task at hand because of program responsibilities, less objectivity, and possibly less skill in research.

Within the country: The major in-country sources to explore are other divisions within the MOH, universities, private commercial or noncommercial groups or other researchers within other public sector institutions. Donor organizations familiar with the availability of research groups or individuals may assist in identifying these resources. The program will have to invest in orienting those unfamiliar with the topical area and ensure that the researcher comprehends the issues. PRITECH staff can assist in this process.

Outside the country: It is critical to ensure that the consultant from outside have not only the appropriate research skills, but also some knowledge of CDD programs and actions if possible, and the appropriate language, cultural, and interpersonal skills needed. PRITECH maintains a roster of consultants with these skills. Other organizations with which PRITECH collaborates in supporting this type of research can provide suggestions for consultants. Whether using locally available or outside consultants, it is important to ensure that the same consultant who assists with the design be available for the analysis phase.

### c. Design the Study

Using the appropriate study approaches and developing the specific protocol(s) help ensure the quality of the studies. The data collection or study approach chosen needs to take into consideration not only research principles but also the timeliness of the results, the insights the studies will provide, and the resources available to conduct the assessments. Whether the methods selected are simple or more rigorous, defining the study protocol to be used makes the study more effective and efficient. The study protocol is a document summarizing the plan for addressing each of the steps involved in conducting the study. It is more or less detailed depending on the methods being used.

In other words, the protocol may be just a simple two or three-page summary of the steps outlined below, an abstract, such as laid out in Annex 2, or a more thorough document. Each of these steps is described in detail in numerous references. The Population Council Handbook mentioned earlier presents a clear and useful guide which could be applied to problem-solving research in CDD programs. Summary guidelines of the steps are found in Annexes 3, 4, 5 and 6. The steps include:

- Definition of study objectives
- Statement of study hypotheses
- Determination of operational definitions of variables
- Selection of study design or approach
- Determination of sampling frame
- Collection of data
- Tabulation and analysis of data
- Study work schedule
- Budget
- Discussion of findings with program
- Preparation of report
- Dissemination of results
- Planning/implementation of suggested program actions.

PRITECH can assist in obtaining technical expertise to design studies, where needed. If necessary, PRITECH staff could also review the protocols developed. The research protocol should be kept simple, so that production of the protocol does not become a barrier to getting the studies started. If outside funding is going to be sought, the protocol will serve as the basis for a proposal for funding. It should include well-defined steps to link the study to the program.

#### **d. Identify Resources to Conduct the Field Work**

Principal field work resources include the materials (questionnaires or other forms), the data gatherers, their supervisors, training, transportation, lodging and logistic arrangements, and related additional quality control measures.

Data collectors: The appropriate mechanism may be to contract out the entire study, including design, field work, and analysis, to an outside group. The choice depends largely on the topic and on the country setting. The advantage is less management time of program staff. In other settings, it may be more appropriate for another group either within the MOH or outside to carry out the field work. Programs may decide to use regular MOH employees to do the field work. As with an in-country research design/management team, the risks involved include less objectivity and commitment to the research activity and a tendency to view the activities as disruptive or intrusive to normal responsibilities.

Other considerations are the level of education or skill needed for the particular type of study and the cultural, ethnic, age, and sex characteristics of the field workers. It is important that supervisors have adequate experience and training and clear objectives, particularly when there are large numbers of field workers involved in the study.

Training: Attention to training of data collectors is of paramount importance. Sufficient training resources must be available from the beginning. Training of data collectors should focus on clarifying the study objectives, research protocol, techniques for interviewing or other methods for obtaining data, and the use of research instruments to record data accurately. If interpreters are needed, they should be trained together with the field researchers in the

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chosen data collection methods. Training should use an active approach, such as role plays between interviewer and interviewee and should also include practice in an actual field setting. It may be possible to field test data collection instruments during the training period.

Logistics: Support for logistics may be sought from the outside. Usually, however, resources exist within the country. In-kind, or financial, support may be sought from UNICEF, WHO, or other interested groups.

## 5. Carry Out the Study

### a. Collect data

Management of the field work will involve providing adequate logistical support for field workers to carry out data collection in a timely fashion, quality control as the work is being carried out, resolution of unforeseen problems as they arise, and generally keeping the effort on track and moving toward its objective. The CDD manager should consider the study a full program activity which will require significant staff time. As such, it is probably best to delegate the management of the field work to an available CDD staff member or, preferably, to the chief researcher.

The CDD program manager and the field activity manager should establish an implementation timetable and agree on periodic check-ins. The program manager should be available during the course of the field work to help resolve unforeseen problems when they arise.

### b. Analyze Data

The research protocol should identify the type of data analysis planned for the study. In small studies, often a hand calculator or manual tabulation of data is adequate. In others, a microcomputer and software may be more appropriate. PRITECH staff can assist the CDD program in determining whether electronic processing of data is required and in ensuring the availability of local resources both for machines and software and of personnel for data entry and cleaning. Many external consultants now use lap top computers on their consulting assignments.

### c. Present Results

If they are to be used for program decision-making, results from any data collection effort should be clearly presented. Because program managers may be inexperienced in using research in their programs, this is especially important. Researchers sometimes have difficulty presenting results in a manner that is understandable to non-researchers. In these situations an integral part of technical assistance and part of the design of any PPSS activity should include teaching program staff how to interpret and use data.

PRITECH field staff may be in a unique position to assist in the interface between researchers and program staff. They can ask questions that may be difficult for program staff to ask. By reviewing initial drafts of tables or text or reviewing planned oral presentations of results,

suggestions for wording, format or content may make the results more understandable to program staff.

Keeping relevant program staff and decision-makers involved or informed throughout the data collection/analysis phase is important. Because research can be a self-contained activity, it is easy to forget to include the principal actors with sufficient frequency during field work and data analysis.

## 6. Apply Research Results to Program

### a. Adjust Strategies

Use of results for altering program strategies deserves special emphasis since it is the main objective for undertaking this type of research. A number of specific actions will help ensure that the results are used:

- Make the hypotheses clear; that is, specify what the alternative decisions are before initiating any research during the problem/decision statement phase.
- Keep program people and decision-makers involved from problem identification through the research activity by way of meetings, workshops, visits, and so forth; review the decision-linked research with the Minister of Health, director general or other appropriate officials in the relevant organization at major points; resources for these activities might be available through central PRITECH PPSS funds.
- Keep a short turnaround for the research results; that is, keep the research brief, focused, and well-designed and choose the appropriate designers, field workers and analysts; "manage" the research activity.
- Conduct workshops to review the findings and plan the modified approaches; for example, a preparatory workshop to orient key decision-makers and researchers and to select and refine implementation options consistent with national resources and constraints.
- Adjust old strategies or develop new strategies on the basis of the results and review of successful experiences in other programs.
- Consider a range of action options and select and adapt those determined to be the most appropriate.
- Develop a plan of action to implement the new strategies and assist specifically in:
  - Getting consultants as needed
  - Sponsoring workshops to share information and to replan strategies

- Seeking resources to support program modification (for example, reprogramming funds, using start-up PRITECH monies, seeking other donor support, and so forth).

#### b. Test Modified or New Strategies

Testing new strategies on a pilot basis with pre-and post-implementation evaluations to help provide answers for their wider application or adoption may be appropriate in many instances.<sup>8</sup> While such testing or trial is a familiar process to researchers, program staff may consider it unnecessary and tedious. Under most circumstances, it may be advisable to conduct limited tests of the strategies to determine their effectiveness before applying them on a national scale. In the Bangladesh example, such a test showed that one strategy, distributing ORS to family planning field workers through the Health Supply Store, was ineffective. Post-implementation evaluation showed that a second strategy, distributing ORS through the normal family planning field worker supply mechanism, seemed to provide them with a continual ORS supply.<sup>9</sup>

#### D. OBTAINING PRITECH AND OTHER ASSISTANCE FOR PPSS

PRITECH has developed general guidelines for obtaining central support for problem-solving studies. Support is available for technical assistance, field work, analysis, and workshops or other related activities mentioned in this document. PRITECH field staff can help interpret these requirements to country programs and assist them in completing the requirements in order to obtain the resources quickly.

In summary, the PRITECH criteria for support of PPSS include:

- The study should be relevant to and desired by the country program
- The study should be clearly linked to action or program decision
- The study method should be relevant to the topic.

Briefly, requirements for a "proposal" for central PRITECH funding will include:

1. A problem statement as outlined in this paper and defined in Annex 1
2. A one to two-page preliminary proposal abstract (or scope of work) (see Annex 2), which summarizes the following information:
  - Definition of study objectives
  - Hypotheses statement
  - Operational definitions of variables

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<sup>8</sup> Koblinsky, M.A. "Operations research in the public sector." p. 6.

<sup>9</sup> Ibid. pp. 6-7.

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- Study design
- Sample
- Data collection approach
- Data analysis approach
- Budget
- Linkage of study to program decision/action.

3. The nature of the support requested from PRITECH/Washington, D.C.

Annex 3 provides definitions and examples of these items.

To begin the process of seeking this support, a telex or fax, including the brief summary problem statement, proposal abstract and support required, should be sent to PRITECH after informally seeking concurrence of the relevant A.I.D. mission. If the PRITECH and S&T/Health reviews determine that it is reasonable to proceed, funding will be approved or a more detailed proposal will be requested where necessary. PRITECH will give preference to shorter studies of under six months duration and can also assist in identifying other funding sources when PRITECH/Washington, D.C., is unable to support specific studies.

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## ANNEX 1

### PROBLEM IDENTIFICATION AND DEFINITION

1. Follow this general procedure in identifying and defining a problem situation:
  - a) Start with a simple statement of the problem situation.
  - b) Add details as you review the literature and investigate the problem in greater depth.
  - c) Move back to simplicity by focusing on the most important aspects of the problem that are researchable.

2. Make a first attempt at identifying the problem situation by using the following format:

**Problem Situation:** (Write a small, simple paragraph that identifies the problem)

**Discrepancy:** (State the discrepancy between what is and what should be)

**Problem Question:** (Write the central problem question)

**Possible Answers:** (Write two or more plausible program-related answers to the problem question)

3. From available research literature, current service statistics, educated opinions, and other sources of information, try to add detail to the problem situation you have just identified. Look for theoretical concepts and operational variables that you may have missed. List these concepts and variables on a piece of paper as you come across them. Try to answer the following questions:

- a. What is the incidence and prevalence of the problem?

An epidemiologic diagnosis should always be made of problems related to health and family planning. In other words, how widespread is the problem? What is its distribution? How often does it occur? An epidemiologic diagnosis will help establish the parameters of the problem.

- b. What geographic areas are affected by the problem?

It is important to know if there are particular geographic areas affected by the problem. Does the problem generally occur in rural areas only? Does it also affect cities? Is the problem restricted to mountain areas, coastal areas, or island areas?

- c. What population groups are affected by the problem?

Are there special population groups affected by the problem such as mothers, children, teenagers, newly married couples or women over age 35?

d. What are the findings of other research studies?

A review of information on a problem should suggest a number of probable reasons that the problem exists. What is the current thinking about the reasons for the problem? Is there general agreement among many people about the reasons, or are there many different, conflicting views? The PRITECH Information Center may be able to assist in obtaining relevant information.

e. What has been done to overcome the problem in the past?

f. How successful were past efforts to overcome the problem?

Many projects and programs may have been directed at the problem in an attempt to overcome it. What types of solutions have been tried in the past? How successful have past efforts been? What approaches seem to work? What approaches seem not to work?

g. What seem to be major unanswered questions about the problem?

From the review of information on the problem, what seem to be the unanswered questions about the problem? What aspects of the problem need to be researched further?

4. With the information you have collected from a literature review and other sources, rewrite your statement identifying and defining the problem. Use the format of Problem Situation, Discrepancy, Problem Question and Possible Answers. Add details that help to define the problem, but organize the information. Try to establish the boundaries of the problem. Focus your attention on the most important, researchable aspects of the problem. Be clear and specific.

5. Have one or more friends read your final statement identifying and defining the problem situation. Have the friend tell you what he or she thinks the problem is. If your friend is unclear about the problem situation, if your friend cannot describe the discrepancy between what is and what should be, then go back to the beginning and start all over again!

## ANNEX 2

### TITLE PAGE AND ABSTRACT OF RESEARCH PROPOSAL

Although they appear as the first section of a research proposal, the title page and abstract are the last to be written. The title page gives the essential information about the proposal. An abstract is a summary of the basic information contained in all the other sections. Do not overload an abstract with unnecessary information. Keep it short (no longer than one or two pages), precise, and to the point. For "quick and clean" studies this abstract is probably all that is needed. The abstract should tell the reader:

1. The problem to be studied
2. The main objectives of the study
3. The major expected implications of the study
4. Who will conduct the study
5. When the study will be conducted
6. Where the study will be conducted
7. What methods will be used to conduct the study
8. What resources are required for the study.

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#### WHAT TO DO--TITLE PAGE AND ABSTRACT

1. From each major section of your completed proposal, write one or two sentences that give the essence of the information in that section.
  2. Arrange the sentences into an abstract.
  3. Attach a title page to the abstract.
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TITLE PAGE

ORT Physician Prescribing Research Proposal

1. Title: Study to Determine Factors which Would Increase Physician Prescribing of ORT
2. Location: yyyyyyyy Province, Northeast Bangladesh
3. Sponsoring institution(s): Ministry of Health, PRITECH
4. Principal investigator(s) (name and address): Mr. Assert  
Director  
IPC  
Dhaka, Bangladesh
5. Starting date: April 1988
6. Completion date: December 1988
7. Total cost: US \$10,500 (this may be difficult to estimate for the unskilled)

Signature \_\_\_\_\_  
Date \_\_\_\_\_

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## EXAMPLE OF ABSTRACT

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- (Problem) There is a wide variation in the rate of ORT prescribing patterns between villages in Bangladesh. Although in theory all MOH physicians receive the same case management training, some health centers have a prescribing pattern of ORT for dehydration as high as 80 percent of dehydration cases, while other health centers have a rate as low as 6 percent.
- (Objective) The immediate objective of this study is to investigate the physician and training factors associated with this variation in ORT prescribing rates. The ultimate objective is to provide program administrators with a better understanding of the reasons the training program is successful in some areas but not in others. This information will be used to develop training strategies and modify existing CDD service delivery approaches so that the rate of ORT prescribing for dehydration is uniformly high in all areas of the country.
- (Implications)
- (When) The study will be conducted between April 1988 and December 1988 by the  
(Who) Institute of Primary Care Research located in Dhaka, Bangladesh. All health  
(Where) centers within two districts will be classified in terms of ORT prescribing rates. Twenty-five health centers will then be selected randomly from within  
(Methods) high, medium, and low prescribing rate strata. All physicians practicing in these centers will be interviewed in each center selected. Information on health center staffing and ORS and training material availability characteristics will also be collected. A team of trained interviewers and supervisors will collect the field data. All coding, editing, and data processing will be done in  
(Resources) Dhaka. The computer facilities of Dhaka University will be used to tabulate the data. A final research report will be completed by December 1988. Funds of US \$10,500 are required for staff salaries, travel, questionnaires, and computer time.

## ANNEX 3

### BASIC STEPS FOR CONDUCTING RESEARCH

#### 1. Definition of study objectives

The definition of the problem in the manner described in the document should lead naturally to the definition of objectives and hypotheses of the research study. The study objectives should be stated in terms of their ultimate purpose. In the case of PPSS this should relate to a program objective, such as:

"the study of alternative training strategies for nurse auxiliaries will provide the CDD program manager useful information for choosing the most appropriate training strategy."

The immediate objectives of the study also should be clearly stated in terms of "who will do how much of what, to whom, when, where, and for what purpose."<sup>11</sup> In other words we want to know who will conduct the study, where, and when as well as what the key dependent and independent variables are. An example of such a statement would be:

#### Evaluation study of different training methods:

"The training division of the MOH Maternal Child Care department in Niger will conduct a KAP study of nurse auxiliaries in 1988 to determine the difference in performance as well as knowledge and attitudes between those workers who received a classroom-based training program and those who received a field-based training program."<sup>12</sup>

#### 2. Hypotheses statement

Hypotheses clarify and specify the expected relationship among variables in such a way that it permits testing. An hypothesis statement guides the research by indicating the major dependent and independent variables of interest, suggesting the data and type of analysis needed. Clear hypotheses statements are important in that they lead researchers and program staff to think about solution testing. As we develop the hypotheses it is important to remember that this is our best estimate of causal relationships; i.e. the independent variable causes, determines or influences the dependent variable.

In CDD operations research, the hypotheses of most importance are those that consider program activities as the independent variable.<sup>13</sup> For example,

"the work performance of nurse auxiliaries who have received a five-week field-based ORT

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<sup>11</sup> Fisher, et al. Handbook for Family Planning Operations Research Design. p. 11.

<sup>12</sup> Fisher et al. Handbook for Family Planning Operations Research Design. p. 11.

<sup>13</sup> Fisher, et al. Handbook for Family Planning Operations Research. p. 12.

course will be higher than the work performance of similar staff who have received a four week, classroom-based training course."

or

"an information and education program using radio, television and printed material will increase mothers' knowledge about ORT and lead to more positive behaviors during a child's episode of diarrhea."

### 3. Operational definitions

The next step necessary is to operationally define these variables and the terms of the study. This process establishes the rules and procedures which will be used to measure the variables and provides unambiguous definitions to terms which can otherwise be interpreted in different ways. For example, to operationally define work performance of health auxiliaries, the study may observe the auxiliary for ten different actions. Every time something is observed or an answer given that does not indicate the performance desired, the researcher may give a score of zero and when the desirable is observed the action would be given a score of one. This example makes it obvious that one has to define what actions of the health auxiliary constitute desirable behavior. The variable thus might be defined operationally as follows:

ORT performance = the number of correct behaviors observed  
compared with 10 desirable case management actions

It is important that the categories determined be mutually exclusive. Thus, an auxiliary cannot be defined both as a low performer and a high performer. Not all variables are this complicated, but research technical assistance may be needed for defining some of the more complex variables.

### 4. Study design

The study design is the plan of action for answering the research questions. The study design selected attempts to minimize mistakes that can be made in validity (accuracy) and the reliability (dependability) of the data. For example, if the investigator asks the mother how old her child is the mother may answer "two years old." The investigator then asks a second question to check the consistency or dependability of the first answer, for example, "in what month and what year was she born?" If the respondent answers January of 1986 (and it is now January 1988), then the investigator calculates that indeed the child is two years old.

Study designs vary from true experimental designs to quasi and non-experimental designs. In most problem-solving type studies it is not practical or feasible to conduct true experimental designs. However, attempts are made to have studies come close to an experimental design in order to have more confidence in the reliability and validity of the results. Details of the advantages and disadvantages or problems of each design can be found in the Population Council Handbook. In brief the more common designs include:

-after only (posttest) design: a program intervention has been introduced and sometime thereafter a measurement observation is made (as in the case of the earlier training example). Many evaluation studies use this design.

-static group comparison: a comparison group which has not received the intervention also receives the measurement observation.

-before/after (pretest/posttest) design: in this design a measurement observation is made before a program intervention is made, time elapses and another measurement is made after the intervention has been introduced.

-time series design: this design is similar to the before/after design, but repeated observations are made over time rather than just two observations.

-nonequivalent control group design: this study design compares the group receiving the intervention with a similar but not necessarily equivalent group over time. For example, when a program intervention, i.e. training strategy, is introduced into one province or state, you could administer a pretest and posttest not only to the group of health workers in the province with the training but in a neighboring province without the training.

## 5. Sampling

The first step involved in sampling is to determine the exact population you want to study; who is the subject? The objectives of the study should have specified this. Next, one must determine whether or not to look at the entire population of concern or just a sample. The answer to this question is largely determined by what you are studying. For example, some studies involve such small populations (the training program has only trained 20 persons), that you can look at the entire population. In most cases, however, your subject population is too large (all mothers of young children in Chad) that a sample must be taken. There are different types of samples and different rules about the size of the sample one needs for a particular study. These decisions are made based on the objectives of the study, whether there is a need for representativeness and whether it is quantitative or qualitative data that you need for the questions you wish to answer. These decisions should be made with assistance from experts in this area as mistakes made here may have negative consequences on the usefulness and validity of your study.

## 6. Data collection

The method chosen to collect data should be determined by the objective of the study as well as the availability of money, time and personnel. The following is a summary partial list of different methods of data collection.

-structured interview: this type of interview employs a standard questionnaire to assure that all respondents are asked exactly the same set of questions in the same sequence. The exact wording of the questions is specified in advance. The structured interview lends itself better to quantitative analysis and reduces problems of data processing. There are a

number of procedures to follow to obtain optimal results from this approach. A useful checklist is found in the Population Council Manual.

-self-administered questionnaires: this approach is relatively inexpensive and is useful in situations where literate respondents are already gathered in a setting such as in a training program. However, difficulties arise if the target group is not sufficiently literate. Even with literate groups, instructions and questions in the self-administered questionnaire may be misunderstood, portions left blank and if mailed out, the response rates are likely to be low thereby affecting the representativeness and validity of the sample.

-service statistics: every MOH collects volumes of service statistics, but these data vary in quality from country to country and sometimes even within a country. Often the data needed for your specific purpose are not collected at all and if they are, their quality and completeness may be poor. However, there are cases where existing service statistics may be useful for some purposes.

-secondary data sources: Many countries have recent censuses, vital statistics, other surveys, etc. which can provide much useful information: sometimes there are other ongoing studies into which one can incorporate questions.

-unstructured interviews: in-depth interviews which probe for details seek to clarify concepts and to permit greater depth of understanding of issues. They are useful prior to developing questionnaires for surveys or to augment quantitative superficial findings from surveys. Their disadvantages include difficulties in quantifying the data, requirements of highly skilled interviewers, and time-consuming analysis.

-focus group discussions: to reduce the time and personnel required in the in-depth interview, respondents are brought together in groups, a facilitator uses a discussion guide and elicits details through probes. Participants are selected purposefully to include the group of interest; for example, mothers who live in highly urbanized areas to test their reaction to radio message developments.

-direct observation: this technique is useful for observing factors for which it may be difficult to get valid answers through interviews. For example, it is more useful to observe a mother mixing ORS or SSS solution than it is to ask her how she does it to get a valid answer to correct preparation techniques. Likewise, observation of clinic operations and activities of field workers may be more valid than asking health personnel what they do. The major disadvantages include the necessity of skilled observers, the time required for observation, difficult analysis of results and a high cost per unit of observation.

## 7. Data analysis

Data can be tabulated by hand, by mechanical sorters or by computer. The choice depends on the personnel and equipment available, the type of data, the sample size, and the costs. Small studies may not require computer tabulation and analysis. For computer analysis the data need to be coded and edited before analysis begins. Preferably an analysis plan with dummy

tables and analytic procedures to be used will have been prepared and specified in the research plan. We cannot emphasize enough the need to keep data analyses for PPSS simple. Complicated analyses are often difficult for program managers to understand and are often unnecessary for program purposes. Simple cross tabulations are often quite adequate to convey results to program staff.

Researchers should ideally discuss study findings and action implications with program staff during the analysis phase, and definitely before presenting a finalized report.

#### 8. Study report

Whether the study is a large or small one, a concise, well-written report is a useful product. It helps to assure use of results and also is useful for reference in other in-country or outside research efforts. Writing a good report is difficult to do well. Following the outline suggested in Annex D and the guidelines for data analysis should help in preparing reports.

#### 9. Dissemination of results and suggested actions

Meetings or workshops which bring together program personnel, decision makers, and researchers should be carried out as an integral part of the research process. A budget item to support such activities should be included in the proposal and its sources defined. The desired outcome of these efforts should be identification of the actions or steps to be taken in response to the research findings, agreement to take those steps, and specification of who will take them, how, and when. In some cases the next step may be further testing of a proposed solution. For example, a study may suggest that a particular food prepared in a certain way should be recommended during diarrhea. The follow up action would be to try out that recommendation with a sample of typical mothers.

## ANNEX 4

### EXAMPLE OF MAJOR HEADINGS FOR A FINAL RESEARCH REPORT

- I. Title Page (title of the report, authors, institutional affiliation, date)
- II. Preface (acknowledgments, source of funding)
- III. Abstract
- IV. Background (location of study, special circumstances of study)
- V. Literature Review
- VI. Study Method (objectives, hypotheses, description of program intervention, study design, analytic procedures, limitations of study)
- VII. Findings
- VIII. Discussion of Possible Applications of Findings
- IX. Conclusions and Recommendations for Modifying CDD Program
- X. References and Bibliography
- XI. Appendixes

## ANNEX 5

### PREPARING THE BUDGET

#### A. AVAILABLE RESOURCES AND FACILITIES

Most reviewers of study proposals will want to know the resources and facilities already available for conducting the research. For example, are experienced interviewers and coders available? Are computer facilities available? Will other institutions or organizations contribute to the cost of the study? How much time will the principal investigator be able to devote to the study--100 percent, 50 percent, 10 percent? These and similar questions relating to the existing availability of resources and facilities should be answered in the proposal.

#### B. STUDY BUDGET

The budget for the research study should be realistic. In general, most funders of research will not provide money for expensive equipment, for building construction, or for vehicles. Also, most funders will not provide salary payments to principal investigators that are above what he or she has received in other jobs. Any large and unusual item in the budget should be explained and justified. Be very clear about each cost item in the budget. Show the components of the item. For example, if you plan to employ interviewers, their salary costs might be shown as:

Field Interviewers (20 at Rs. 500 per day X 20 days)

Arrange the budget under major cost categories. PPSS will be less than a year, but if you assist the program to prepare for longer studies, then separate first-year costs from second-year costs and include a line item to cover expected inflation.

---

#### SUMMARY STEPS: PREPARING THE BUDGET

1. Describe resources and facilities already available for the study:
  - a. Other institutions' or organizations' contributions
  - b. Availability of computers, trained interviewers and coders, secretarial help, vehicles, office space, etc.
2. Arrange the cost items under headings. Major headings should include:
  - a. Salaries and Benefits
  - b. Materials, Supplies, Computer Services
  - c. Travel
  - d. Miscellaneous (reporting workshop, other)
3. At the end of the budget, explain and justify any large or unusual cost items.

EXAMPLE OF A STUDY BUDGET

	<u>Local B</u>	<u>US\$</u>
<b>A. Salaries and benefits</b>		
1. Principal investigator, B2,000/month x 12 months	24,000	1,200
2. Associate investigator, B1,700 x 12 months	20,400	1,020
3. Field interviewers, 20 @ B100 per day x 20 days	40,000	2,000
4. Coders, 20 person-days @ B150/day	3,000	150
5. Secretarial services (not charged to study)	---	---
Subtotal	<u>87,400</u>	<u>4,370</u>
<b>B. Materials, supplies, computer services</b>		
1. Questionnaire printing	3,000	150
2. Administrative supplies	7,600	380
3. IBM card punching/verifying	4,000	200
4. Computer programming	5,000	250
5. Computer time	15,000	750
6. Report printing and mailing (200 copies)	25,000	1,250
Subtotal	<u>59,600</u>	<u>2,980</u>
<b>C. Travel</b>		
1. Field testing of questionnaire	10,000	500
2. Per diem and local travel for field interviewers (20) @ B100 per day	40,000	2,000
Subtotal	<u>50,000</u>	<u>2,500</u>
<b>D. Miscellaneous expenses (including     report dissemination workshops)</b>		
	6,000	300
Total direct costs	<u>203,000</u>	<u>10,150</u>
Total project costs	<u>203,000</u>	<u>10,150</u>

Exchange rate: Baht 20.00 = US \$1.00 as of 1981

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## ANNEX 6

### THE STUDY WORK SCHEDULE

Each research proposal should include a work schedule. The schedule should list the major activities that will be undertaken and the times when they will be undertaken.

Design a work schedule. Consider the realistic timing for each of the following activities (if they apply in your study):

1. Planning phase
2. Pilot studies
3. Drawing of sample
4. Questionnaire preparation
5. Selection and training of interviewers
6. Pretesting of questionnaire
7. Baseline survey
8. Data collection
9. Data processing
10. Data analysis
11. Report writing
12. Discussion of findings with program.

## ANNEX 7

### KEEPING RESEARCH RELEVANT:

#### RESEARCH AND THE NATIONAL CONTROL OF DIARRHEAL DISEASES PROJECT

One of the unique aspects of the Egyptian National Control of Diarrheal Diseases Project (NCDDP) was its regular use of research in order to obtain the information required for policy and management decisions. The NCDDP questioned virtually everything before making important decisions. It questioned through appropriately designed and executed research studies. Although there were many research studies supported by the NCDDP, the emphasis was on low budget, fast turn-around studies. It was not primarily academic research, but was research designed to obtain the information required to implement an effective and efficient national rehydration program.

The types of research supported included double-blind clinical trials, studies of media habits, anthropological investigation of cultural factors in the care of children with diarrhea, market research using small focus groups and national cluster sample mortality surveys. Qualitative research was as important as the collection of statistically reliable data. The emphasis in the NCDDP was on reducing diarrheal related mortality in young children. Research was one tool used to accomplish this objective.

Listed below are many of the research studies supported by the NCDDP. Selected findings are shown, along with the programmatic implications and decisions made as a result.

<u>Research Study</u>	<u>Major Findings</u>	<u>Implications/Decisions</u>
1. Container Study	<ul style="list-style-type: none"><li>-No concept of how much one liter is;</li><li>-No liter measure available</li><li>-200cc cup most common size used for feeding babies;</li><li>-When asked to "fill" the cups, they averaged only 125cc of water;</li></ul>	<ul style="list-style-type: none"><li>-Made ORS sachets in 5.5 gram size (200 cc equivalent);</li><li>-Produced and made available 200 cc plastic cups</li><li>-Used these cups and 200cc soft drink bottle to show mixing in the T.V. commercials.</li></ul>

Research Study

Major Findings

Implications/Decisions

2. Packet Opening Trials

-Found that mothers had difficulty opening the large 27.5 gram (UNICEF)  
-Nurses did not like to demonstrate use because packets were hard to open;  
-Mothers said, "We want something we can open and use quickly";  
-Mothers thought their babies could not drink a liter of fluid.

-Introduced easy-to-open foil packets bonded on one side to polyethylene and on the other to Kraft paper.  
-Reinforced decision to use 5.5 gram (200cc equivalent) packets.

3. Ethnographic Studies

-Identified vocabulary used by mothers regarding diarrhea, dehydration and nutrition;  
-Learned the mothers' knowledge, attitudes and practices regarding diarrhea and dehydration;  
-Identified mothers' system of classification of stages of and types of diarrhea.

-Used to write and prepare the mass media messages;  
-Used to prepare training materials;  
-Used to design the ORS packets and display boxes.

4. Pharmacist/Customer Interaction

-Brand loyalty on part of customers creates brand loyalty on part of pharmacist (pharmacists stock items the customers request);  
-Pharmacists have little time to teach, but do give advice on dosages;  
-Pharmacists rely heavily on doctors' prescriptions and on products requested by the customers, seldom suggesting alternatives.

-Project decided to concentrate on demand creation among doctors and public;  
-Project emphasized correct mixing in training for pharmacists.

<u>Research Study</u>	<u>Major Findings</u>	<u>Implications/Decisions</u>
5. Media Surveys and Focus Groups on Media Preferences	<ul style="list-style-type: none"> <li>-Radio was less influential than T.V.</li> <li>-70% to 90% of mothers watch T.V. regularly;</li> <li>-Preference for specific messages rather than long ones or dramas;</li> <li>-Messages on billboards and posters were not recalled;</li> <li>-Mothers listened to radio in the mornings and watched T.V. in the evenings;</li> <li>-Positive reinforcement for being a good mother was perceived as implying criticism;</li> <li>-Mothers preferred direct information on what to do.</li> </ul>	<ul style="list-style-type: none"> <li>-Emphasized television but used other media for specific target audiences and very specific purposes;</li> <li>-Used preferences to determine length and type of messages;</li> <li>-Kept messages short, explicit and instructive.</li> </ul>
6. Intravenous Fluid: Tested 3 Different Acceptable Solutions	<ul style="list-style-type: none"> <li>-Determined the best one for general use.</li> </ul>	<ul style="list-style-type: none"> <li>-Selected the best I.V. solution and contracted with local pharmaceutical company to begin production. Distributed solution to all hospitals for use with severely dehydrated children who could not be orally rehydrated.</li> </ul>
7. Taxonomy Study: Epidemiology of Diarrheal Diseases	<ul style="list-style-type: none"> <li>-Determined most vulnerable group was &lt;18 month children;</li> <li>-Learned severity of diarrhea in homes: 20% dehydrated 65% watery diarrhea 6.5 days duration</li> <li>-Learned prevalence by month</li> <li>-Found day-point prevalence up to 45% in Summer;</li> </ul>	<ul style="list-style-type: none"> <li>-Made decision to use the &lt;2 year olds as primary target group;</li> <li>-Messages and media images focused on &lt;2 year olds;</li> <li>-Determined ORS production requirements and schedule (June-December highest requirement);</li> <li>-Annual mortality survey designed based on findings from Taxonomy Study.</li> </ul>

<u>Research Study</u>	<u>Major Findings</u>	<u>Implications/Decisions</u>
7. Taxonomy Study: Epidemiology of Diarrheal Diseases (continued)	<ul style="list-style-type: none"> <li>-Found urban/rural differences;</li> <li>-Found male/female differences;</li> <li>-Observed mothers' practices in treatment of diarrhea.</li> <li>-Identified mothers' decision points: what symptoms or signs they used to make various decisions on care and treatment.</li> <li>-Watery diarrhea, inactivity and vomiting are key decision points for mothers;</li> <li>-Found that "starvation" not common as treatment of diarrhea, but feedings were reduced.</li> </ul>	-In mass media campaign, stressed continued and adequate feeding during diarrhea.
8. Follow-up of Clinic Patients to Determine Effective ORS Use	-Learned how much ORS was used per child in the clinics and during 5 days afterwards (i.e., how much ORS is used during one serious episode of diarrhea).	-Production levels based on average daily requirement of 350 cc for 5 days. This gave the maximum production requirement.
9. ORS Use with Low Birth Weight Neonates	-ORS was safe and effective	-Training of physicians included this information.
10. Various In-Hospital Rehydration Studies Using ORS	-Confirmed WHO ORS formula as safe and effective rehydration fluid.	-Policy decision to manufacture and use the WHO formula ORS.

Research Study

Major Findings

Implications/Decisions

11. Depot Holder	<ul style="list-style-type: none"><li>-Found that every community has people they trust for child care advice;</li><li>-Found their involvement could increase ORS use;</li><li>-Depot holder areas had better knowledge of ORS and its use;</li><li>-Depot holder program strengthened primary health care referral system.</li></ul>	<ul style="list-style-type: none"><li>-Began program to establish depot holders in all areas remote from health facilities.</li><li>-Lower child mortality.</li></ul>
12. Focus Group on Disease Concepts	<ul style="list-style-type: none"><li>-Public had no concept of dehydration, but lumped its symptoms with severe diarrhea.</li></ul>	<ul style="list-style-type: none"><li>-Project "invented" the the disease of "gaffef" (dehydration). People needed a label in order to understand the instructions for treatment.</li></ul>
13. Study of Mothers' Use of Foods During Diarrhea	<ul style="list-style-type: none"><li>-Determined electrolyte content of these foods.</li><li>-Breast-fed children had shorter duration of diarrhea.</li></ul>	<ul style="list-style-type: none"><li>-Media messages stressed use of most appropriate commonly used foods, such as rice, potatoes, yogurt and breastmilk.</li><li>-Deemphasized traditional fluids which had no salts.</li></ul>
14. Study of Rice Powder-Based ORS	<ul style="list-style-type: none"><li>-Confirmed that rice powder ORS results in shorter duration of diarrhea.</li></ul>	<ul style="list-style-type: none"><li>-Decision to investigate feasibility of manufacturing pre-cooked rice powder-based ORS.</li></ul>
15. Mothers' Communication Study	<ul style="list-style-type: none"><li>-Neighbors of mothers with intensive ORS training learned about ORS from these mothers.</li></ul>	<ul style="list-style-type: none"><li>-Emphasized quality teaching of mothers in clinics.</li></ul>

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Research Study

Major Findings

Implications/Decisions

16. Hyponatremia  
Tracking and Mixing  
Trials

-Found that mothers  
tended to make many  
mistakes in mixing.  
-Hyponatremia was  
more related to  
mis-mixing than to  
use of ORS, per se.

-Strengthened mixing  
messages on T.V. and  
found that hyponatremia  
incidence and levels  
were reduced.  
-Decided to initiate  
double blind trial of  
WHO formula and ORS  
with lower sodium  
content (results not  
yet in).

17. Double-Blind Trials  
of Antidiarrheals  
and Antiemetics

-Both made diarrhea  
and vomiting worse.

-Began training doctors not  
to use or to reduce use of  
these preparations.

**PRITECH FIELD IMPLEMENTATION AID**

**ACUTE RESPIRATORY INFECTIONS:  
SUMMARY FOR CDD PROGRAMS**

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**May 1990**

This paper is one of a series designed to aid PRITECH field staff in providing technical assistance in diarrheal disease control efforts and programs. It was edited by PRITECH primarily to incorporate comments made by field staff and technical consultants.

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## ACUTE RESPIRATORY INFECTIONS: SUMMARY FOR CDD PROGRAMS

This introductory paper is designed to acquaint PRITECH field representatives with what would be involved in an acute respiratory infections (ARI) program in a developing country. It is quite likely that adding ARI to a diarrheal disease control program would increase the technical and operational problems already facing the CDD program. Therefore, such a step should either be taken cautiously or delayed until CDD operational problems have been solved. If the CDD program is going well and the Ministry of Health has the resources and staff for another program, a technical adviser might explore the interest of the Ministry of Health in starting an ARI program.

### A. RATIONALE

Acute respiratory infections (ARI) are equal to diarrheal diseases as the most important causes of illness and death among children in developing countries. These diseases share a number of characteristics that make close coordination of their interventions advantageous. Although PRITECH's primary concern is the control of diarrheal disease, the potential for a synergistic increase in impact on child survival from closely coordinated or integrated CDD and ARI activities makes it important for PRITECH and other donor representatives to consider carefully the possibility of linking these two efforts.

#### HOW ARE ARI AND CDD RELATED?

- Both programs target mortality reduction in children under five.
- Diarrhea and ARI are often the first and second leading causes of infant and child mortality in developing countries.
- Both emphasize case management, including rationalizing the use of antibiotics. For both dehydration and pneumonia, the health worker is taught to use signs to discriminate degrees of severity of a condition, then to act according to simple management plans.
- Nutritional management during illness and preventive interventions to promote immunization and to improve nutrition (promotion of breast-feeding and proper weaning foods) serve the goals of both programs.
- Both must communicate effectively with mothers and other caretakers of children. To reduce mortality due to pneumonia mothers must recognize the signs of pneumonia, seek care early, then carry out effective case management in the home (supportive care with or without antibiotics) and ensure follow-up if the child's condition worsens.
- Both interventions are often already part of the same primary health care programs, and health workers will often benefit from the efficiency and prior coordination and possibly integration of CDD and ARI training, supervision, guidelines, information needs, logistics, and evaluations.

The collaboration of the CDD and ARI programs is an excellent opportunity to draw upon the CDD experience in improving access to proper case management of one clinical condition, dehydration, to improve that of another, pneumonia. Coordination of the interventions for the two leading causes of death in children makes sense from the perspective of the mother's education and commitment to child survival, from that of the community health workers (CHW) who gain credibility by expanding their ability to cure, from that of the referral hospital clinician responsible for treating children with both pneumonia and diarrhea, and, in some countries, from that of the trainer who can combine instruction on two major causes of mortality for greater efficiency and interest.

This collaboration is actually wider because child immunization is encouraged by both programs, and most messages that are effective in combating malnutrition can be included: good nutritional management during and after illness and the common preventive strategies of promoting breast-feeding and proper weaning foods. Encouraging such collaboration at this level can assist the health worker and the referral health facility in the efficient integrated delivery of interventions. Program materials can be created in such a way that they can be modified and produced expeditiously in-country as guidelines and training materials.

## B. TECHNICAL SUMMARY

### 1. Worldwide ARI Morbidity and Mortality

Acute respiratory infections are important because of their high incidence and mortality in developing countries. Table I summarizes the major acute upper and lower respiratory infections:

TABLE I

ACUTE RESPIRATORY INFECTIONS (ARI): Clinical Syndromes
ACUTE UPPER RESPIRATORY INFECTIONS (AURI)
Common Cold (URI, nasopharyngitis, rhinitis, and coryza)
Pharyngitis and tonsillitis
streptococcal
nonstreptococcal
Suppurative complications of AURI:
Otitis media
Cervical adenitis
Peritonsillar abscess
Retropharyngeal abscess
Sinusitis
ACUTE LOWER RESPIRATORY INFECTIONS (ALRI):
Epiglottitis
Croup (acute obstructive laryngitis or laryngotracheitis)
Tracheobronchitis
Bronchiolitis
Pneumonia

Most acute respiratory infections are not fatal. The majority of upper respiratory infections do not need antibiotic treatment and are benign, self-limited episodes.<sup>1</sup> The main respiratory infections that kill children are acute lower respiratory infections (ALRI): pneumonia, bronchiolitis, and croup (acute obstructive laryngitis). Of the three diseases, pneumonia is by far the most frequent cause of death. Several mortality surveys and calculations from surveillance data indicate acute respiratory infections are responsible for approximately 25 percent of the under-five deaths. This mortality rate is higher in some countries. In general, respiratory infections account for a higher proportionate mortality in countries with higher infant and child mortality rates.<sup>2</sup> Of the 14 million children under five years of age dying annually in the world, approximately four million die as a result of acute respiratory infections, with two-thirds of the total and ARI deaths occurring in infants. More than 90 percent of these deaths are in developing countries.<sup>3</sup>

The incidence of ARI is similar worldwide: five to eight attacks of ARI per child annually in the urban developed or developing world (less in rural areas). In contrast, mortality rates from ARI are 10 to 50 times higher in developing than developed countries. This situation is due both to higher incidence of pneumonia and to higher case-fatality rates. An estimated 20 percent to 40 percent of infants and 5 percent to 7 percent of one to four-year-old children in developing countries develop pneumonia each year.<sup>4</sup> Rates can be considerably higher in populations with a high prevalence of important risk factors such as malnutrition and low birth weight and high infant and child mortality rates. In developing countries, the case-fatality rate of pneumonia is often 5 percent to 10 percent in hospitals in large towns and more than 10 percent in many rural areas.<sup>5</sup> Many children die from pneumonia in their communities without receiving antibiotics from a health worker. The task of providing proper case management with supportive care and appropriate antibiotics early in the course of pneumonia is great.

## 2. Etiologic Agents and Clinical Syndromes

Acute respiratory infections in children are primarily due to viral (respiratory syncytial virus, parainfluenza, adenovirus, and rhinovirus) and bacterial pathogens (Streptococcus pneumoniae, Haemophilus influenzae, Staphylococcus aureus, and so forth); much less so to parasites. These

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<sup>1</sup> Todd, James et al, "Bacteriology and Treatment of Purulent Nasopharyngitis, a Double Blind, Placebo Controlled Evaluation." Pediatric Infectious Disease, Vol. 3, #3, pp 226-232.

<sup>2</sup> Riley, "The Aetiology of Acute Respiratory Infections in Children in Developing Countries."

<sup>3</sup> Leowski, "Mortality from Acute Respiratory Infections in Children under 5 Years of Age: Global Estimates."

<sup>4</sup> Pio, "The Magnitude of the Problem of Acute Respiratory Infections."

<sup>5</sup> WHO: A Programme for Controlling Acute Respiratory Infections in Children.

many etiologic agents cause diverse acute respiratory syndromes: rhinitis, pharyngitis, otitis media, laryngitis, bronchitis, bronchiolitis, and acute pneumonia.<sup>6</sup>

In areas without high immunization coverage, measles, pertussis, and diphtheria can make significant contributions to ARI in young children. All three diseases can initially be present with symptoms resembling the common cold. Measles can cause respiratory death both by obstructive laryngotracheitis and by complicating bacterial pneumonia; diphtheria by airway obstruction (by membrane involving the larynx) or by diphtheria toxin causing cardiorespiratory effects; or pertussis by complicating bacterial pneumonia or acutely during cyanotic or apneic spells after paroxysms of coughing. ARI case management can improve survival from bacterial pneumonia complicating measles or pertussis, but this has not been adequately substantiated.

Physicians learn to differentiate these ARI diagnostic entities and the spectrum of specific etiologic agents and treatment. Most pneumonia case management, however, remains empiric even in developed countries because bacteriological diagnosis cannot usually be obtained without undue risk. In developing countries, case management can be simplified further by concentrating on pneumonia and teaching health workers to discriminate severity of disease, rather than trying to establish the anatomic diagnosis and likely etiologic agent.

In developing countries, most serious pneumonia is caused by bacteria. Studies using lung puncture in children hospitalized with pneumonia have yielded bacteria in 60 percent, a rate significantly higher than that found among children with pneumonia of similar severity in developed countries, where most cases of pneumonia are caused by viruses.<sup>7</sup> Streptococcus pneumoniae and Haemophilus influenzae are the most common bacterial isolates from community-acquired pneumonia without prior antibiotic therapy.<sup>8</sup> Respiratory viruses are also highly prevalent in developing countries and cause the initial infection in some children who go on to develop bacterial pneumonia. Children in tropical developing countries are much more likely to carry Streptococcus pneumoniae and H. influenzae in their nasopharynx than children in developed countries, which may contribute to the higher rate of bacterial involvement in pneumonia.

### C. OBJECTIVES OF AN ARI PROGRAM

The overall goal of an ARI program is to reduce mortality and morbidity from acute respiratory infections. The major objectives of an ARI program include:

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<sup>6</sup> Berman, S. and McIntosh, K., "Selective Primary Health Care: Strategies for Control of Disease in the Developing World."

<sup>7</sup> Pio, A. "The Magnitude of the Problem of Acute Respiratory Infections."

<sup>8</sup> Shann, "Etiology of Severe Pneumonia in Children in Developing Countries."

- Providing effective case management of pneumonia
- Preventing ARI
- Carrying out other interventions (besides case management) to reduce pneumonia.

### 1. Providing Effective Case Management of Pneumonia

Effective case management of pneumonia addresses two principal areas: 1) diagnosis and treatment of pneumonia and 2) appropriate referral.

#### a. Diagnosing and Treating Pneumonia

The principal element in an ARI program is correct case management of pneumonia. Proper case management requires simple, clear protocols which allow health workers to provide timely and appropriate treatment of pneumonia which can be adequately supervised. By using two signs, fast breathing and chest indrawing, the health worker can discriminate between the child with no pneumonia (no antibiotics needed), pneumonia (that can be treated with antimicrobials as an outpatient) and severe pneumonia (requiring emergency referral to a supervisor or hospital). Refer to Table 2, below and Annex 1.

TABLE 2  
EXAMPLE OF DECISION CHART FOR FIRST LEVEL  
FACILITY (HEALTH CLINIC)

DOES THE CHILD WITH COUGH HAVE PNEUMONIA OR OTHER SIGNS OF SEVERE DISEASE?

Does the child have clinical signs of pneumonia?	Chest indrawing	Fast breathing: MORE than 50 breaths per minute	No fast breathing or chest in-drawing FEWER than 50 breaths per minute
DECIDE	SEVERE PNEUMONIA	PNEUMONIA	NO PNEUMONIA
TREATMENT	REFER URGENTLY TO HOSPITAL  After First Dose of Antibiotic  If referral is not possible, treat with antibiotic and follow closely. (Also give antimalarial if the child has had convulsions or is abnormally sleepy or difficult to wake in malarious area.)	ANTIBIOTIC PLUS HOME CARE  Return immediately if breathing becomes more difficult or more rapid or if there are problems with feeding. Return in 2 days for reassessment.	Teach the mother how to give HOME CARE Watch For Signs Of Pneumonia: return if breathing is fast or difficult or if child is unable to drink. FEED the child and increase feeding after illness. Clear the nose if it interferes with feeding. GIVE FLUIDS: continue breast-feeding and give the child more than normal to drink. SOOTHE the throat and cough with safe remedies.

<p>Other signs of severe disease:</p> <p>Unable to drink</p> <p>Convulsions</p> <p>Abnormally sleepy or difficult to wake</p> <p>Stridor in a calm child</p>
--------------------------------------------------------------------------------------------------------------------------------------------------------------

Effective, supportive care at home and at the referral level is important both in ensuring survival from this episode and in minimizing the negative nutritional effects. Most mothers seeking care for children with an upper respiratory infection are not provided antibiotics for their children. Nevertheless, it is still important that they provide special care and nutrition to their children and that they monitor the illness for progression to pneumonia or other life-threatening complications. Principal elements of supportive care are nutritional and fluid support: continued breast-feeding and small frequent meals, appropriate fluid management, and increased convalescent feeding. The child can also be supported by the control of fever and malaria in many locations, clearing the nose, and the maintenance of an appropriate thermal environment, as noted in Table 3.

TABLE 3  
CASE MANAGEMENT OF ARI  
SUPPORTIVE CARE FOR HOME AND REFERRAL LOCATIONS

**NUTRITIONAL SUPPORT:** Recommendations for nutritional management during pneumonia can be identical to those for diarrhea: continue breast-feeding and feed frequent small meals during pneumonia. Increase feeding during convalescence with normal weaning foods.

**FLUID MANAGEMENT:** The mother should encourage the child to drink. If dehydrated and unwilling to drink, cautious nasogastric (NG) hydration can be used in the hospital. It should only be performed by staff trained in inserting NG tubes. IV hydration should be avoided except in shock (WHO/RSD/86.26). Fluid overload precipitating respiratory failure is a serious danger. Health workers at the referral levels must appreciate the difference in the principles of fluid management in the dehydrated child with diarrhea and with pneumonia.

**CONTROL OF FEVER:** Paracetamol can be given for high fever or discomfort.

**ANTIMALARIALS** should be given to children with fever when falciparum malaria transmission is occurring in the community.

**CLEARING THE NOSE:** Mothers should be taught how to clear the nose, particularly in infants who may have difficulty mouth breathing and cannot breast-feed if the nose is blocked.

**THERMAL ENVIRONMENT:** Avoid overheating or chilling a child with pneumonia.

**CHRONIC SUPPURATIVE OTTIS MEDIA:** daily aural toilet.

**SOOTHE THE THROAT AND COUGH WITH SAFE REMEDIES.**

**ADDITIONAL SUPPORTIVE CARE IN HOSPITAL:**

- Control bronchospasm
- Oxygen, if feasible
- Treatment of complications
- Suction secretions from the nose

Advice on nutritional and fluid management should be included in all programs. The suitability of the other recommended therapies must be determined by the physical setting of maternal care and by hospital conditions.

A key element to home care is watching for signs of pneumonia or, if the child is receiving an antibiotic for pneumonia, for signs the child is worsening. If these signs are observed, the child must be returned to the health worker immediately.

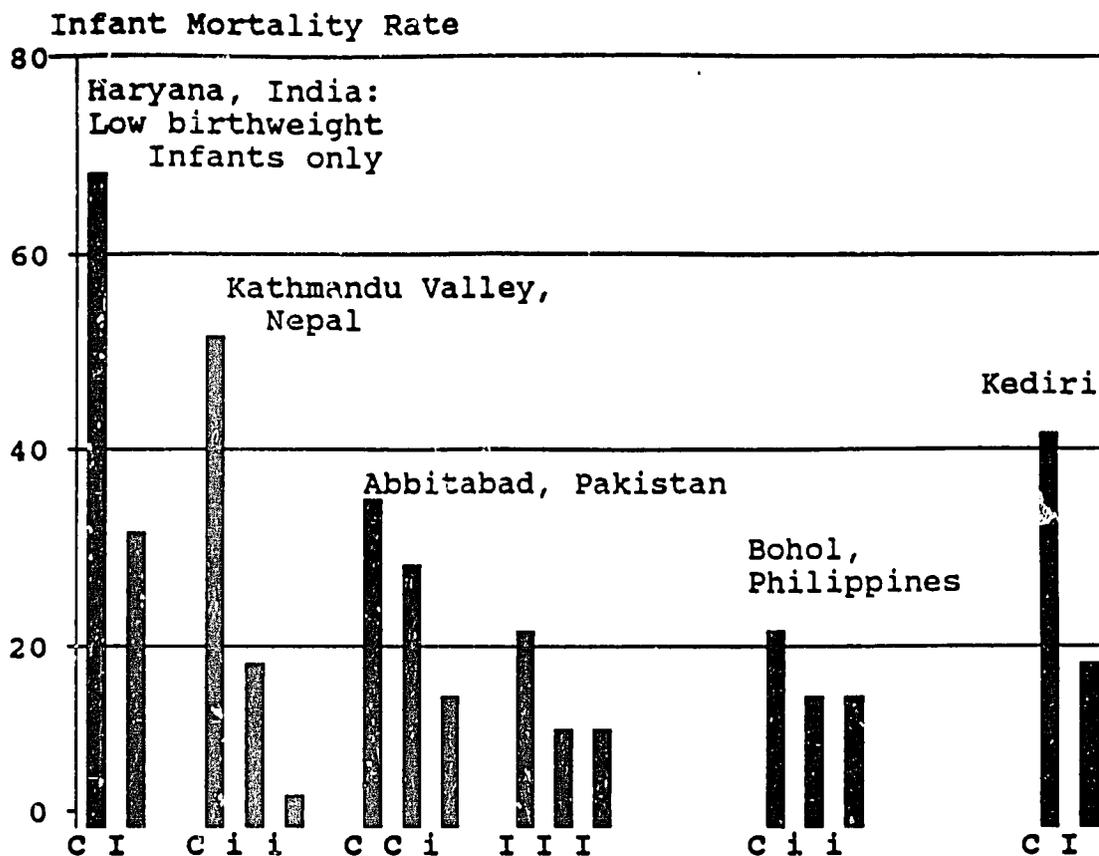
Procaine penicillin or oral amoxicillin, ampicillin or cotrimoxazole (trimethoprim-sulfamethoxazole) are adequate treatments for most cases of community-acquired pneumonia. When feasible, the development of simplified empiric protocols for the rational use of antimicrobials should be guided by information on the sensitivity of pathogenic organisms (samples can be obtained from the nasopharynx of healthy children). However, protocols for case management can be developed without in-country information on antimicrobial sensitivity of Hemophilus influenzae and Streptococcus pneumoniae if this cannot be obtained.

It is unnecessary to perform studies in each country to determine the etiology of pneumonia. Clinical experience and ARI intervention studies indicate that early treatment with antibiotics directed at Streptococcus pneumoniae and Hemophilus influenzae will reduce pneumonia mortality in developing countries (Figure 1).

Early treatment and follow-up are essential for effective case management, which indicates the importance of family recognition of pneumonia and its access to and use of adequate case management. This includes compliance with a full course of antibiotics, provision of supportive care, and follow-up. Training and supporting health workers (including forgoing the use of antibiotics when the respiratory rate is lower than 50 breaths per minute) and educating mothers to participate in the proper case management of pneumonia are difficult but essential elements of a program trying to extend the availability of antibiotics for pneumonia. The mother must not expect immediate cure from the antibiotic and must know when to return if her child does not improve or worsens. Investigating maternal recognition of signs of severity, attitudes toward antibiotics (expectations, color preference, the plausibility of more than twice daily dosing, and so forth) and traditional treatments for ARI may be advisable before beginning a program. Proper case management with supportive care and, if pneumonia is present, with antibiotics must replace or coordinate with traditional remedies for ARI, some of which are expensive. Some traditional therapies are harmful either by damaging the child or, more commonly, by delaying antibiotic therapy for pneumonia.

Common causes for stridor and the incidence of wheezing vary greatly by geographic location. More experience in how to manage these conditions at the peripheral and first-referral level is needed. Life-threatening complications of ARI, such as meningitis, tight bronchospasm, and serious croup, should be referred by the peripheral health worker. He or she must also be able to detect pneumonia treatment failure and refer the child to a supervisor, health center, or hospital for more expert clinical assessment and second line antibiotics, oxygen, or bronchodilators as needed.

Figure I: ACUTE LOWER RESPIRATORY INFECTION  
SPECIFIC INFANT MORTALITY RATES



Year

C= control area (or period)

I= intervention area (or period)

i= intervention in prior control area

ALRI - specific infant mortality rates summarized from six studies. See report for full description

"Case Management of Acute Respiratory Infections in Children: Intervention Studies" Report of a Meeting, WHO, Geneva, April 1988 (WHO/ARI 88.2).

Provision of antibiotics through peripheral health workers is controversial in some countries but must be considered in the context of the widespread availability and lay misuse of antibiotics in much of the developing world. Thus, the total tonnage of antibiotics need not increase if their use can be rationalized. More rational use of antibiotics could also preserve the effectiveness of antibiotics by retarding antibiotic resistance although this is largely speculative. Program effects on antibiotic resistance of enteric and respiratory bacterial pathogens need to be monitored in countries where this is feasible. Parenteral antibiotics should be avoided unless correct use of disposable syringes and needles or adequate sterilization can be guaranteed; this situation is particularly true where HIV and hepatitis B infection are prevalent.

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Other acute respiratory infections, such as ear, nose and throat infections, are rarely fatal. Protocols for their treatment should avoid unnecessary use of antibiotics and should be targeted at the appropriate age group and with appropriate drugs for averting serious sequelae of these infections. Serious sequelae of pharyngitis, i.e. acute rheumatic fever and chronic rheumatic heart disease, are greater problems in five- to fifteen-year-old children than in under-five children. Streptococcal pharyngitis in children under five uncommonly leads to rheumatic fever.<sup>9 10</sup> Otitis media is the leading cause of deafness in developing countries. Chronic suppurative otitis media is best managed with daily aural toilet.<sup>11</sup> Many programs will want to provide antibiotics only for pneumonia case management at the peripheral level.

#### b. Referral care

At least one second-line antibiotic, often chloramphenicol, should be available for the management of severe pneumonia and meningitis or moderate pneumonia not responding to the first-line antibiotic. At this point, it is difficult to say whether provision of oxygen at referral locations is cost-effective compared to other pneumonia mortality reduction strategies. The relative value of a clinician knowledgeable in the use of bronchodilators and second-line antibiotics for treatment failures and of good nursing at referral locations is also unknown but is probably less than early treatment and improved access.

In some rural locations, no referral is feasible within a time frame relevant to preventing death from pneumonia. Provision of drugs for the treatment of severe pneumonia and meningitis and training in the treatment of bronchospasm with salbutamol should then be considered for the health worker or his supervisor.

## 2. Prevention of ARI

Most risk factors identified for ARI do not increase the incidence of total ARI; they increase only the incidence and severity of pneumonia, which is often bacterial in the developing world, and may increase the duration of illness. The exceptions to this are lack of immunization against pertussis, diphtheria, and measles. Although many risk factors have been identified, there are few interventions that have been proven to reduce mortality in the short term.

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<sup>9</sup> Markowitz, "Observations on the Epidemiology and Preventability of Rheumatic Fever in Developing Countries."

<sup>10</sup> Sanyal, et al., "The Initial Attack of Acute Rheumatic Fever During Childhood in North India."

<sup>11</sup> Eason et al., "Chronic Suppurative Otitis Media in the Solomon Islands: A Prospective Microbiological, Audiometric and Therapeutic Survey."

### 3. Other Interventions for Reducing Pneumonia Incidence and Mortality

a. Strategies that overlap with preventive strategies of CDD are as follows:

- 1) Promotion of immunization with EPI vaccines. Measles pneumonia in malnourished children and pertussis both cause many deaths which can otherwise only be partially reduced by good pneumonia case management.
- 2) Promotion of breast-feeding and improved weaning practices. Although elements of the weaning food recommendation have some specificity for diarrhea prevention (avoidance of contamination) and possibly for pneumonia prevention, the message can be singular but applicable to both.

b. Other preventive strategies for other risk factors for increased pneumonia incidence, severity, or mortality: effective preventive strategies to reduce these risk factors need further development. Possible strategies include:

- 1) Reducing the incidence of low birth weight infants. Prevention of low birth weight (LBW) would have a substantial impact on pneumonia mortality. Simple and efficacious interventions which can be implemented through primary health care need further development. Nutrition education to promote adequate prepregnancy weight and caloric intake during pregnancy, iron/folate supplements to prevent anemia, malaria control, child spacing, and reduction of maternal drug (including alcohol) and tobacco use should be explored as interventions for reduction of low birth weight. It is not plausible to effectively promote improved fetal growth through an ARI program in the absence of an effective antenatal program. In some locations, specific adverse health practices or conditions stand out such as deliberate limitation of food during pregnancy in order to have a small baby or a high prevalence of severe anemia in women.

The difficulty in reducing low birth weight is particularly discouraging because it limits the success achievable by the curative interventions of the ARI program. Datta and others<sup>12</sup> found an ARI case-fatality rate of 25 percent in LBW infants and 3 percent in normal birth weight children in their control area; in the intervention area, limited to LBW children, the program achieved a case fatality rate of 8.7 percent. In addition, low birth weight is a recurring problem. If low birth weight girls survive to reproduce, they are more likely to have low birth weight children. This situation contributes to the chronicity of ill health in developing countries.

While it may be difficult to reduce low birth weight in the short run, it may be possible in some settings to target extra education on prevention and early treatment - and active casefinding/surveillance where TBAs or other health workers are in close contact with infants - of low birth weight infants.

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<sup>12</sup> Datta et al., "Application of Case Management to the Control of Acute Respiratory Infections in Low-Birth-Weight Infants: A Feasibility Study."

- 2) Improvement of socioeconomic status. Improvement of socioeconomic status and female education are other measures expected to reduce pneumonia mortality but are beyond the realm of a health program.
- 3) Prevention of chilling. Prevention of chilling through assistance in finding shelter and clothing may be a relevant preventive strategy for special groups, such as refugees or disaster victims.
- 4) Domestic air pollution. Domestic air pollution from use of biomass fuels probably contributes to the incidence and severity of pneumonia in certain settings. Research needs to be done to develop feasible interventions to reduce domestic air pollution which are cheap, sustainable, and do not increase the woman's work. The efficacy of such interventions in reducing pneumonia incidence or mortality needs to be demonstrated. Designs for effective stoves for heating and cooking have been published.<sup>13</sup>
- 5) Malnutrition. Other possible risk factors for increased pneumonia incidence and mortality which have been inadequately explored include: effects of severe iron deficiency, mixed nutritional anemia, and Vitamin A deficiency. Vitamin A should be given to all children with measles in areas in which vitamin A deficiency is a recognized problem or where the case-fatality rate of measles is high.<sup>14</sup> Broader use to reduce the incidence or severity of pneumonia needs further research.

#### D. OPTIONS FOR ACTION

##### 1. Promote Better Immunization Coverage

An ARI program should be considered within the context of existing primary health care programs. If immunization coverage rates are low, promotion of immunization usually should receive higher priority than initiation of ARI control through improved case management. Promoting effective pneumonia case management with continuing high case rates for measles or pertussis would seem misdirected, except: 1) on an emergency basis, or 2) in a setting where EPI has adequate resources but is only slowly able to expand coverage due to constraints. An ARI program does not detract from the expansion of EPI coverage; the Ministry of Health must be able to absorb additional inputs, peripheral workers and supervisors must be able to handle additional intervention, drug logistics cannot compete with cold chain resources, and so forth.

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<sup>13</sup> K. Darrow and R. Pam, Appropriate Technology Sourcebook.

<sup>14</sup> "Joint WHO/UNICEF statement on Vitamin A for measles."

## **2. Assure the Capacity of the CDD Program to Support a New Intervention**

PRITECH should not encourage the development of ARI activities unless the CDD case management strategy is being well implemented and is secure enough within the Ministry of Health to take on additional duties. Although the logic of incorporating ARI and CDD is strong, it will entail additional training of health workers both centrally and in the field and new educational messages for mothers.

In countries where the ARI program is developing in conjunction with the CDD program, it has been found that there is a need for a technical director for each program. The capacity of the Ministry to provide such is a major consideration in the decision making process.

## **3. Collect Information**

A number of activities must be carried out early in the planning of an ARI program to collect the information needed to develop rational treatment protocols and a plan of action. There will be no single protocol that will be appropriate for every country. Of the activities listed below as essential, the last three are key and will necessitate developing new knowledge bases, not just using existing data. The WHO ARI Programme has indicated that it is receptive to requests from Ministries for consultation in developing the information needed to plan a program. The essential information gathering activities that need to be undertaken are:

- Review empiric treatment protocols in current guidelines for peripheral health workers and at the referral levels.
- Examine existing ARI-related infant and child mortality data and rates and distribution of low birth weight infants and other malnourished children.
- Collect information on antibiotic use, availability, logistics and bacterial sensitivity if feasible.
- Investigate maternal KAP concerning ARI and conduct antibiotics focus groups as a start, then rapid KAP studies, rather than involved formal operational research.
- Investigate attitudes of the medical profession toward indications for antibiotic treatment in ARI and the extension of antibiotics to peripheral health workers.

## **4. Make a Decision**

Only after the preceding steps have been taken (EPI, CDD, information gathering) should the Ministry make a decision. If the Ministry believes that there is a problem warranting further attention, and has sufficient information on the problem and adequate resources (either in hand or identifiable from a donor) then it should make a decision to initiate an ARI Program. It must identify the leader, and develop, promulgate and gain acceptance of a policy on the management of ARI. This policy can be designed after the elements of a CDD policy and will need the endorsement of not just the government, but also political and medical leaders. The assurance of cooperation from WHO and UNICEF are essential if the program is to remain vital.

## **5. Plan the Introduction of Appropriate Case Management**

Improved access to timely and appropriate case management of pneumonia is the work of an ARI program. Programs will differ as to the source of care for severe pneumonia, depending on whether it is within the community by a supervised health worker, at a health center, or at a hospital. Adequate care for mild, moderate, and severe disease must be developed as well as maternal education to ensure early disease recognition and care.

An ARI program can be started in one region or district. The staged introduction of a MOH national ARI program, carried out with resources comparable to what could eventually be available on a national basis, would be a better test of feasibility than a well-endowed operations research project. The staged introduction of proper case management in one area can be used to develop and test materials and explore logistic problems of antibiotic supply. The context of this paper assumes that the strain of adding a new set of interventions will be considerably reduced by integration in teaching, supervision, surveys, logistics, and so forth with diarrheal disease control activities.

## **6. Train and Provide Logistics Support to Peripheral Health Workers**

The new training of peripheral health workers and the provision of antimicrobials to them is a major undertaking requiring careful planning, training of supervisors in both managerial and technical skills, adequate supplies, and logistics. If, within the context of a primary health care program, antibiotics are already being given for pneumonia, improving case management may require less input but would still dictate careful retraining of health workers and their supervisors, effective communication with mothers, careful monitoring, and the assurance of regular supplies.

## **7. Assess Pneumonia Care in Hospitals**

Deciding whether to direct input into hospitals will depend on the state of pneumonia case management at present and the potential for sustained, proper case management. Some hospital systems are so lacking in structure, staff, drug supply and logistic support that it is infeasible to improve them to establish referral care for pneumonia.

As an initial step in this assessment of case management, estimate the case fatality rate of severe and very severe pneumonia (with cyanosis or inability to drink) by age and facility. This would require collecting data on admissions sorted by the criteria for severe and very severe pneumonia; if this requires active data collection for several months, it would also be useful to quantify time since onset of disease, whether diarrhea is also present, whether other care has been sought first, and so forth.

If the case fatality rate is already low and cases are not being turned away due to a lack of antibiotics, this referral level may not need assistance early in an ARI program. Then estimate the reduction in pneumonia deaths annually that would be achieved by improved case management at existing facilities. As mentioned earlier, the cost-effectiveness of oxygen should be considered before embarking on its provision because oxygen by cylinder is

expensive and technologically appropriate oxygen extractors have not yet been developed which can withstand field conditions.

#### **8. Direct Information, Education, and Communication Efforts Toward Mothers**

At a later stage, mothers in communities with access to peripheral health workers, health units or hospitals with trained personnel and supplies should be actively educated about disease recognition and care seeking as the program develops. In some areas, adequate care may already be available in health centers or hospitals and maternal recognition and referral deserve early attention. Maternal education before proper case management is available could be counterproductive and further promote inappropriate use of antibiotics.

#### **9. Direct Information, Education, and Communication Efforts Toward Health Professionals**

Other possible ARI program activities that will produce more long-term benefits include gaining the support of health professionals for improved access to proper case management through a national ARI workshop or other teaching activities. Many physicians need to be convinced that pneumonia can be diagnosed without stethoscope or chest X-ray and treated by minimally trained health workers with good results. Improved medical school teaching and nurse and paramedical curricula are needed. Some nursing schools continue to provide classic training in hospital nursing without any instruction on diagnosis and treatment for nurses who later deliver clinical care or supervise its delivery by minimally trained health workers.

### **E. AVAILABLE RESOURCES**

The WHO ARI control program is currently revising training modules for first-level supervisory staff on managing the child with cough and other acute respiratory infections in order to simplify decision processes in ARI case management for basic level and referral staff. Work is proceeding on identifying measurable program indicators with an epidemiologic relationship to pneumonia mortality reduction, which will allow effective program monitoring and evaluation. These indicators will be incorporated into newly developed training modules for ARI program managers. Material to promote joint CDD/ARI training, supervision, program evaluation, and surveys are also being developed. WHO has identified research priorities for ALRI and can also be contacted for recommendations regarding short-term technical advisers.

BOSTID (Board on Science and Technology for International Development, U.S. National Research Council, Washington, DC) sponsors international research on the epidemiology and etiology of ARI in children. BOSTID should soon provide further information on the etiology of pneumonia in developing countries. This is a resource for basic research, however, and not for program development.

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## ANNEX

### CONSIDERATIONS IN DEVELOPING SIMPLIFIED CASE MANAGEMENT PROTOCOLS FOR SELECTIVE ANTIBIOTIC USE AND REFERRAL IN PNEUMONIA

The primary symptom which should initiate consideration of pneumonia is the presence of cough although cough is often not present in the neonate with pneumonia. Fever is not required. Some malnourished children are unable to mount a fever and several studies show that fever is not an adequate indicator of the presence of pneumonia (Shann 1984a; Leventhal).

Increased respiratory rate (>50 per minute) or chest indrawing are the basic diagnostic criteria for pneumonia. Tachypnea has been shown to be as reliable a sign as crepitations, which are difficult to hear in young children and require a skilled practitioner. The sensitivity of a respiratory rate over 50 for pneumonia by CXR or crepitations is 72% to 85% and the specificity 60% to 94% in hospital/health center settings in two developing countries (Shann 1984; WHO data) and a developed country (Leventhal) where only tachypnea was specified. The specificity is likely to be considerably lower in the hands of minimally trained health workers. The percent of children diagnosed as having an ALRI by a clinical algorithm can be as much as four times higher than diagnosis by CXR.<sup>15</sup> The frequency of misdiagnosis of pneumonia in frightened children, in neonates, or in those ill with another disease needs close attention. Miscounting of the respiratory rate or health worker preference to report a higher rate in order to give antibiotics must be monitored. The contributions of bronchospasm, high fever, acidosis and severe anemia to an elevated respiratory rate need further exploration. Protocols need to be developed to identify neonates ill from pneumonia and other serious bacterial infections.

The measurement of respiratory rate requires a calm child with shirt removed, adequate lighting and a timepiece; for example, a watch, timer or sandglass.

Chest indrawing occurs when an increasingly severe pneumonia reduces lung elasticity and the skin between the ribs or at the base of the neck is drawn in with inspiration. Neonates occasionally have minor chest indrawing due to an elastic chest wall but this can be differentiated from chest indrawing in pneumonia by the absence of increased respiratory rate or cough.<sup>16</sup>

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<sup>15</sup> Riley et al., "The Status of Research on Acute Respiratory Infections in Children in Papua New Guinea."

<sup>16</sup> Riley, "The Aetiology of Acute Respiratory Infections in Children in Developing Countries."

The same pneumonia treatment protocol can be used to treat the secondary bacterial pneumonia which commonly complicates bronchiolitis.

The recognition of cyanosis is difficult to teach to peripheral health workers but should be used at the referral level as the criterion for giving oxygen, when available.<sup>17</sup> In Papua New Guinea, the case fatality rate of children with pneumonia and cyanosis or inability to drink was 20% even with treatment of very severe pneumonia compared to 5% in children with only chest indrawing.

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<sup>17</sup> WHO, "The Case Management of Acute Respiratory Infections in Children in Developing Countries."