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FOR SUPPLY AND

# IMPROVED NUTRITIONAL THERAPY OF DIARRHEA

A GUIDE FOR  
PROGRAM PLANNERS  
AND DECISION MAKERS



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# IMPROVED NUTRITIONAL THERAPY OF DIARRHEA:

Guide for Health Workers and Decision Makers

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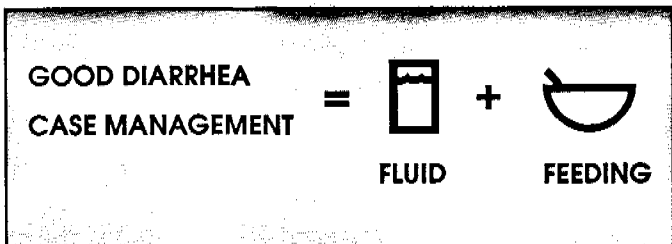
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## INTRODUCTION

The primary focus of Diarrheal Disease Control (CDD) program efforts has been on improved case management through the promotion of oral rehydration therapy (ORT). Although ORT is generally recognized to include two components — fluid therapy *and* adequate diet — most programs have emphasized hydration and neglected diet, even though it is known that food enhances fluid absorption during diarrhea and that repeated diarrheal episodes produce adverse nutritional consequences for young children. In order to achieve optimal clinical and nutritional results, serious attention must be devoted to incorporating improved dietary management of diarrhea into CDD programmatic efforts.

Malnutrition and diarrhea interact in several ways detrimental to children's health. First, diarrhea produces serious nutritional deficits. Second, malnourished children suffer diarrheal episodes of longer duration and of increased severity. Even more importantly, diarrheal case-fatality rates are substantially elevated among malnourished children, and most diarrhea-associated deaths occur among this group of patients. Thus, successful efforts to improve nutritional status should also result in fewer deaths from diarrhea.

Fortunately, it is possible to minimize the effects of diarrhea upon nutritional status. This can be done by: 1) increasing nutrient intakes during and after diarrheal episodes, and 2) improving the general feeding practices of children.

Worldwide studies of infant and child nutrition have demonstrated that poor infant feeding and weaning practices along with frequent infections are the major determinants of growth faltering and malnutrition, even where food availability at the household level is adequate. Therefore, an important long-term programmatic goal should be to improve feeding practices in general. This strategy, however, requires a significant effort to achieve successful outcomes. The first option — improving the dietary management of diarrhea (DMD) — is probably the most feasible for most CDD programs. It is important, however, not to lose sight of the larger nutrition problem of infants and young children, and of possible opportunities to improve general feeding practices.

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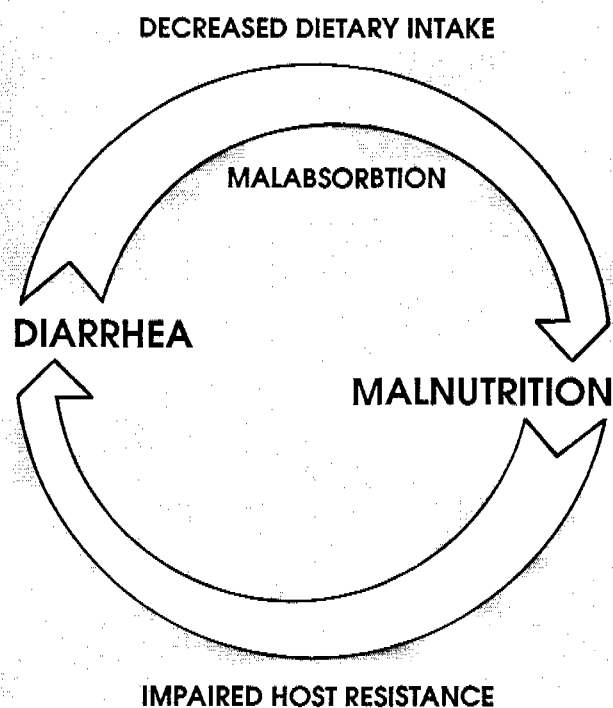
Improving dietary patterns during and after diarrhea may require bringing about changes in beliefs and behavior among caretakers at the household level, as well as among health care providers and professionals and program managers and policy makers. Currently, many programs do have generic messages about "continued feeding during diarrhea," but the messages are not specific enough to lead to actual changes in behavior. It is difficult for caregivers to respond to vague advice such as "feed more after recovery." Program messages must be expressed in *specific terms* so that children's caregivers and health professionals can act on them. More precise messages on types and amounts of foods that should be offered to children of different ages and stages of illness are necessary. These messages must be expressed in terms that are understandable by children's caregivers, and reasons must be provided to justify the extra effort or expense that may be implied by these new practices.

Apart from a few universal guidelines on the timing and amounts of food to be provided, recommendations on the specific types of foods and optimal preparation techniques should be strongly determined by *local food availability patterns* and *cultural beliefs*. Thus, programmatic recommendations must be based on firm knowledge of the local culture and actual feeding practices. Applied research will be required not only to prepare specific recommendations, but also to ascertain that the program's messages communicate these ideas effectively.

To formulate both the program *strategy* and the *messages* that will lead to positive change, several preliminary activities are necessary.

Figure 1

### THE VICIOUS CYCLE OF DIARRHEA AND MALNUTRITION



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## PURPOSE OF THE MANUAL

The purpose of this manual is to guide the program manager through the steps that are required to supervise the integration of improved dietary management into CDD intervention efforts. The major activities will be:

- to generate and sustain the political commitment necessary to initiate program activities and achieve successful outcomes;
- to gather available background information specific to the local area;
- to assemble a "team" of local experts from diverse disciplines to guide the process of information collection and application;
- to collect, as necessary, additional primary data selected from a range of appropriate methods and relevant disciplines;
- to define the problem through interdisciplinary effort;
- to design and pretest messages and materials;
- to disseminate the messages through multiple channels; and
- to establish simple monitoring and evaluation procedures that will allow a fine-tuning and/or scaling-up of program efforts.

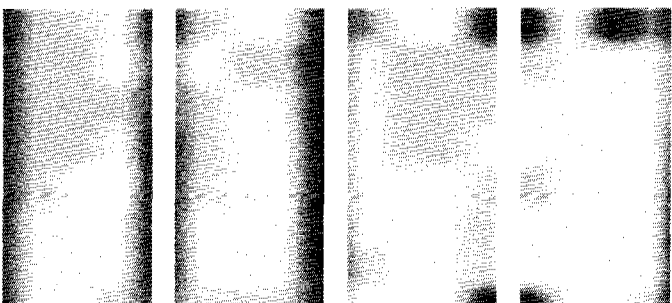
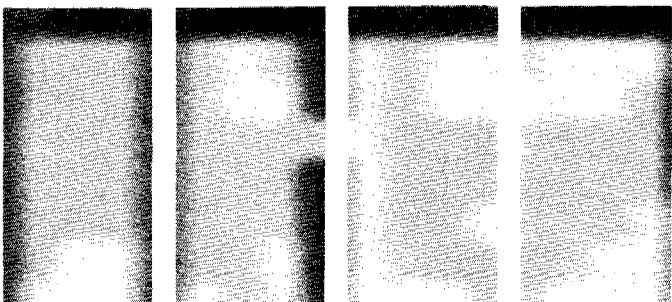
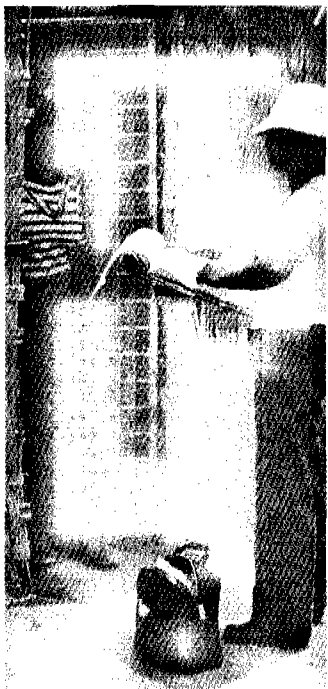
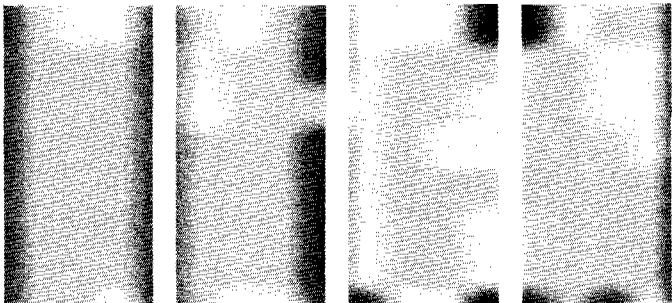
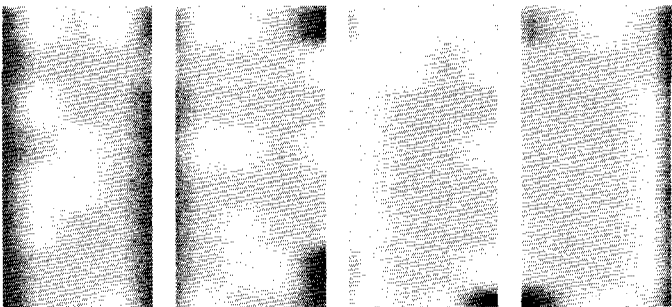
There is a large body of technical material that should be read and understood as a companion to this manual. Appendix I provides some detailed information on the nutritional and clinical background that is needed to proceed with program activities; minimal technical information is provided in this manual. *It is essential that the nutritional guidelines described in Appendix I are followed.* Much of the intervention strategy and message development depends on proper nutrition concepts. Unless the program manager has the necessary technical expertise in this area, program activities should be supported by a



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nutritionist/clinician, to assist with the analysis of the nutrition issues that underpin any intervention efforts.

This manual is divided into two parts. Part I provides background information that must be digested before specific program activities are undertaken. Part II details specific steps that will guide the program manager through the generation of political commitment to the monitoring and evaluation of program implementation. The central activities outlined initially in these first steps are the collection, analysis, and interpretation of information for problem definition and program action. These activities logically lead to the design, testing, and implementation of messages and materials.



# **PART ONE**

## **BACKGROUND INFORMATION FOR INTEGRATING DIETARY MANAGEMENT OF DIARRHEA INTO CDD PROGRAM ACTIVITIES**

This section of the manual provides a brief overview of information that must be understood before program activities are undertaken. It includes a discussion of the nutritional impact of diarrhea, possible program strategies to alleviate the problem, the process of gathering information to make program strategy decisions, and the categories of information that are required in order to make program choices.

## HOW DIARRHEA AFFECTS NUTRITIONAL STATUS

Every child, healthy or ill, has specific requirements for energy ("calories") and other nutrients for metabolism, growth, and physical activity. Although physical activity may be curtailed during illness, metabolic processes must obviously continue. Fever and other "normal" responses to infection may even raise metabolic requirements for specific nutrients. If insufficient amounts of nutrients are consumed during illness, the body must rely on tissue reserves to meet the demands of metabolism. This means that a child will stop growing or even lose weight during a diarrheal episode. This effect of repeated diarrheal infections is shown in a growth chart of a typical Guatemalan child (See figure 2).

The impact of diarrhea on nutrition, then, can be explained through two basic mechanisms: 1) reduced *intake* of food in relation to requirements (which may be elevated by the infection); and 2) reduced *utilization* of the food that is consumed. These two mechanisms are discussed briefly below:

### REDUCED INTAKE IN RELATION TO REQUIREMENTS

The level of nutrient consumption may be reduced for a number of reasons during diarrhea. First, some children, especially those with fever, nausea, or abdominal pain, may simply not want to eat. This loss of appetite, or anorexia, is temporary and generally does not interfere completely with food consumption. It has been commonly observed, for example, that breastfed children continue to nurse, and that dehydrated children are eager to drink fluids. Thus, a general recommendation or message is that *children should continue to be offered food*. Mothers should be reassured that if there is appetite loss, it is only a temporary phenomenon.

Possibly more important as an explanation for reduced nutrient consumption are alterations in the type or amount of food that is offered to children by caretakers. For example, if a child normally consumes two bowls of rice every day, mothers may prepare the rice as a more dilute gruel or even substitute a less nutrient-rich food during diarrhea. When mothers offer foods that are "softer" or more liquid during diarrhea, they are unknowingly reducing the nutritional content of the diet.

In more technical terms, there may be reductions in the "nutrient density" of foods offered during diarrhea. Nutrient density is defined as the *amount of nutrients per unit of weight of food*. Peanut butter, for example, is very dense in calories, and carrots or green leafy vegetables are dense in vitamin A precursors. Soups and dilute porridges are generally of low nutrient density.

In many settings, one of the major causes of malnutrition among weaning-age children is that the diet offered is not sufficiently nutrient dense, even during non-illness times. In other settings, the weaning diet may be adequate in nutrient density when the child is healthy, but shifts in diet that are introduced during diarrhea or other illness, may result in a diet that does not meet caloric and other nutrient requirements, which (as stated above) are increased during illness.

The cumulative effect of changes in the type and nutrient density of foods during illness may be minimal for the *well-nourished* child, who experiences a small number of infections each year and who has sufficient reserves of energy in the form of subcutaneous fat stores. Indeed, most adults who grew up in the western world can remember the dry toast and tea mothers offered during sickness in place of the usual diet. However, changes in the types and quantity of food during diarrheal illness can have devastating consequences for malnourished children in the developing world. These children experience a greater number of infections and have limited tissue nutrient reserves upon which to draw during illness.

### REDUCED FOOD UTILIZATION DURING DIARRHEA

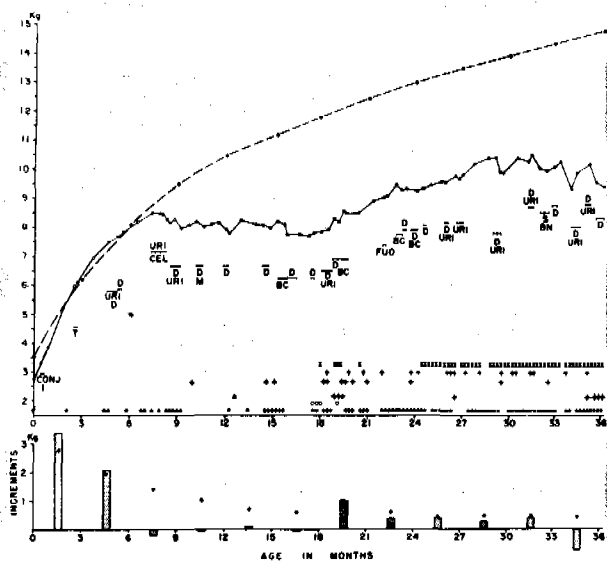
Absorption of nutrients is reduced during diarrhea, because of the changes in gastrointestinal function produced by the infection. Even though a substantial proportion of that which is ingested is still absorbed during diarrhea, minor reductions in intestinal absorption, such as a mean absorption of 70 percent of dietary fat instead of the usual 90 percent, may represent a sizable reduction in the amount of energy available for metabolism.

Despite the known derangements of intestinal function during diarrhea, the net absorption of nutrients can be positively influenced by increasing the *amounts and quality* of foods provided. Thus, children who receive a nutritionally complete diet in adequate or even increased quantities will more nearly satisfy their nutrient requirements during diarrhea. This may be accomplished by: 1) changing the nature of the diet during diarrhea (more nutrient dense, better

tasting); and 2) increasing the number of feedings per day, or increasing the volume (quantity) of the diet, through increased amounts at each meal.

Figure 2

### WEIGHT, INFECTIONS AND GROWTH OF A GUATEMALAN CHILD



**KEY**  
 BC • BRONCHITIS  
 BN • BRONCHOPNEUMONIA  
 CEL • CELLULITIS  
 CONJ • CONJUNCTIVITIS  
 D • DIARRHEA  
 FUG • FEVER UNKNOWN ORIGIN  
 I • IMPETIGO  
 M • MEASLES  
 S • STOMATITIS  
 T • ORAL THRUSH  
 URI • UPPER RESP ILLNESS

**KEY**  
 † ASCARIS  
 † E. HISTOLYTICA  
 † GIARDIA  
 † SHIGELLA  
 † ENTEROPATH. E. COLI  
 † ADENOVIRUS  
 † ENTEROVIRUS

## PROGRAM STRATEGIES TO REDUCE THE NUTRITIONAL IMPACT OF DIARRHEA

Until cost-effective interventions to reduce the incidence of diarrhea are widely available, the major strategies to prevent nutritional complications will depend on improved case management and better child feeding in general. Case management strategies include: 1) continued feeding with nutritionally adequate diets during illness; and 2) increased feeding during convalescence to promote "catch-up" growth from any deficit imposed by the illness. Newly available information further suggests that children who are provided with better diets on a daily basis when free from illness, may be less susceptible to diarrhea-induced growth failure. Thus, general improvement in the feeding of infants and young children presents a complementary approach to the treatment of the nutritional complications of diarrhea, although these interventions may be more complex and difficult to sustain. The advantages and disadvantages of each feeding strategy are summarized briefly in Table 1. The specific feeding recommendations for each strategic approach are presented in Appendix I.

In summary, the following strategic issues need to be resolved in addition to more specific questions related to the dietary regimens to be promoted:

- Should the program promote feeding during diarrhea, convalescence, or both?
- Should program messages be linked to diarrheal episodes only, or should they promote better feeding during non-illness periods also?

The choice of program strategy depends upon adequate information regarding the nutritional "problem" of infants and young children, the sociocultural context of child feeding and child care patterns, and availability of sufficient program resources. Decisions should be made only after relevant information is available. This process of moving from an information data base to programmatic decision-making is called "decision-linked" research.

Source: Urrutia JJ and Gordon JE (1978) Diseases and Disabilities. In Mata LJ, The Children of Santa Maria Cauque: A Prospective Field Study of Health and Growth. Cambridge, MA: The MIT Press.

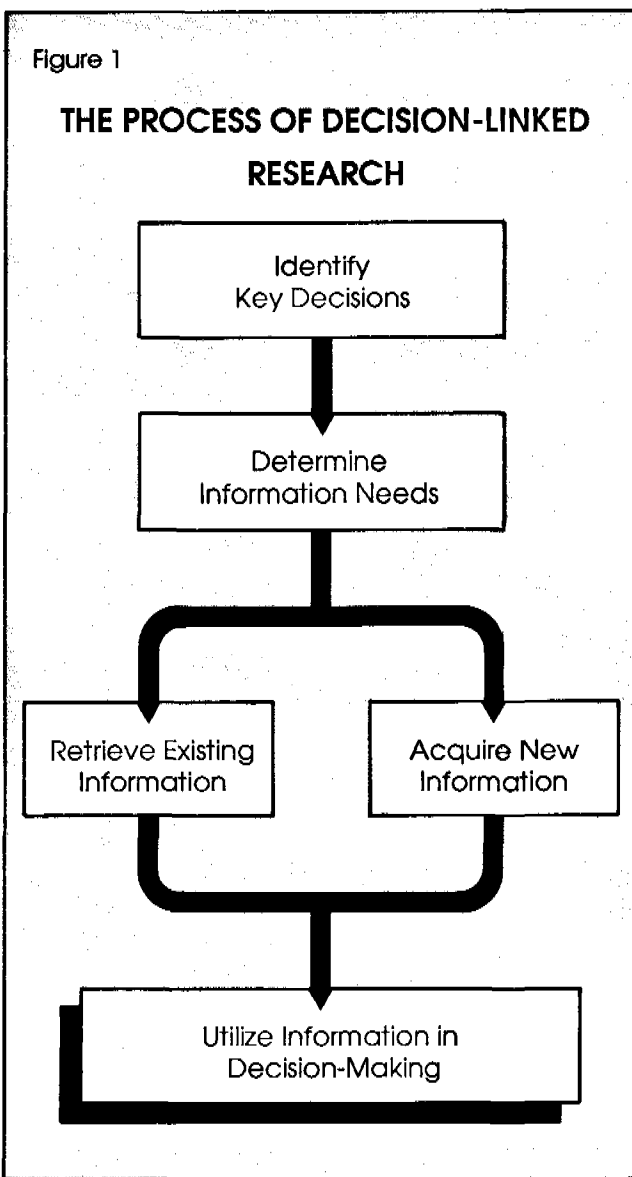
Table 1

**ADVANTAGES AND DISADVANTAGES OF DIFFERENT STRATEGIC APPROACHES TO REDUCE THE NUTRITIONAL COMPLICATIONS OF DIARRHEA**

| STRATEGY   | ADVANTAGES   | DISADVANTAGES  |
|--|--|--|
| Continued feeding  | <p>Caretaker may be eager to comply because of concern about illness</p> <p>Short duration compliance required (involving temporary behavior change)</p>   | <p>Child may be unwilling to eat</p> <p>Possible cultural constraints exist</p> <p>Possible resistance from medical community exists</p> <p>Special dietary formulation may be required</p>  |
| <p>Increased feeding during convalescence</p> <p>Medium duration</p> | <p>Child appetite should be normal (or increased)</p> <p>Caretaker compliance may be enhanced by perception that this is specific treatment of illness</p> | <p>Limited caretaker time may constrain achievement of adequate levels of intake</p> <p>Cultural perception of nutritional impact of diarrhea is needed to justify message</p> <p>Limited scientific knowledge of optimal levels of intake is available</p> <p>Special dietary formulation may be required</p> |
| Improved general dietary practices                                   | There is greater probable impact on nutritional status   | <p>Long duration compliance requires permanent behavior change</p> <p>Numerous economic, cultural, and time constraints exist</p> <p>Special dietary formulation may be required</p>   |

# DECISION-LINKED RESEARCH TO DEFINE PROGRAM STRATEGY

The process of developing a program strategy for DMD should be guided by "decision-linked" research. The program planner should clearly delineate alternative program strategies and the information that is necessary to choose among them. The figure below outlines the process involved:



\* Adapted from World Health Organization, 1986, "Improving Health Care through Decision-Linked Research"

The first step, identifying key decisions, will generate a list of program alternatives similar to those listed above. The second step, determining information needs, falls to the program planner and his or her interdisciplinary planning team. Actions taken in this step lead to the acquisition of existing information from various sources, and to the collection of new information from primary data collection. When all the information is collected, compiled, and summarized, decision-making regarding the program's activities is possible.

## WHAT INFORMATION IS REQUIRED, AND WHY?

There are several categories of information required for program planning purposes. The key categories are listed in Table 2. The depth with which this information is collected will depend on the scale and direction of the intervention strategy. Much of the information will already be available and the critical findings may simply be summarized. Other types of information will be unknown or of questionable value, and primary data collection will be required. The program planner must decide when there is sufficient information to move ahead, and when more detailed information is required.

The major purposes of the information gathering and interpretation phase should be:

- to assess the nutritional status of the target population, including specific nutrient deficiencies;
- to describe infant and child feeding and weaning practices, including specific information on the children's food and nutrient intakes, as well as the factors that influence them;
- to describe current beliefs and practices regarding feeding and caring of young children during and after diarrhea.

A brief discussion of the categories of information that may need to be collected follows the outline provided in Table 2 (page 6).

Table 2

## CATEGORIES OF INFORMATION USEFUL FOR PROGRAM PLANNING

### Nutritional status of target group children

- Anthropometric data
- Biochemical data (if available)

### General infant feeding patterns (by age of child)

- Cultural beliefs about infant feeding
- Breastfeeding patterns
  - Exclusive vs. mixed breastfeeding
  - Duration of breastfeeding
- Weaning food patterns
  - Age of introduction of solids and types of foods introduced
  - Preparation of specific weaning diets, including food processing and cooking techniques
  - Feeding mode and identification of primary "feeder"
  - Number of feeding episodes/day; number of meals prepared
- Dietary intake data
  - Dietary patterns
  - List and frequency of foods normally consumed
  - Quantitative estimates of food and nutrient intake

### Available foods and common food processing/cooking techniques

- Seasonal availability
- Local versus external availability
- Nutrient content and bioavailability
- Costs to household
- Amount of time spent on food processing/cooking
- Technology of processing/cooking

### Cultural beliefs and practices regarding diarrhea and feeding during diarrhea

- Cultural definitions/taxonomies of diarrhea
- Perceptions of the causes/consequences of diarrhea
- Identification of negative and positive outcomes of diarrhea
- Cultural beliefs about feeding during/after diarrhea and about special foods to be offered or avoided
- Actual feeding patterns during diarrhea

### Cultural beliefs regarding child health and development

- Concepts of a "healthy" or "unhealthy" child
- Beliefs about how to produce a "healthy" child or to avoid having a child become "sick"

### Maternal work roles and child care practices

- Patterns of work/time allocation
- Maternal time available for food preparation and for child feeding
- Child care patterns when child is healthy or ill
- Seasonality of maternal work

### Current health care provider recommendations/practices

(same as noted for "cultural beliefs and practices," above)

### Communication

- Cultural perceptions of positive and negative outcomes of diarrhea
- Ownership of radios, TV
- Literacy of population
- Effective "channels"
- Credible sources of information

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## **NUTRITIONAL STATUS OF TARGET GROUP**

A description of the nutritional status of the target population is necessary both to define suboptimal patterns of growth as well as to identify specific nutritional deficiencies. Moreover, this information can be used to indicate which geographic, age, and sociocultural subgroups of the population are at greatest risk of undernutrition. These results are often crucial to justify the need for a nutritional intervention, and they are certainly useful to direct the programmatic activities to those in greatest need. In most countries, anthropometric and often biochemical data are available from previous nutrition surveys. If such data are not available, it may be necessary to conduct some limited studies to provide this information.

## **GENERAL INFANT FEEDING PATTERNS AND DIETARY INTAKE**

To understand beliefs and practices related to feeding during and immediately after diarrhea and to interpret the nutritional status data, it is necessary to understand *general* infant and child feeding patterns during non-illness periods. This includes information about breastfeeding and feeding of non-human milks, ingredients and forms of preparation of the major weaning food mixtures, the ages at which the foods are offered, and the factors that influence these practices. In addition, information is needed on the methods and frequency of feeding and on the person responsible for performing this task. In most countries, some data may be available, but they may be too superficial or otherwise inadequate for programmatic purposes.

It is difficult, if not impossible, to determine a program strategy without knowledge of *what* (types and composition of foods) and *how much* children eat, and of the nutritional outcomes of these consumption patterns. In some countries, quantitative information may exist on children's food and nutrient intakes by age and the nutrient composition of key weaning foods. To obtain the dietary/nutrient intake data in settings where the information does not exist, two options are possible: 1) 24-hour dietary recalls; or 2) quantitative dietary intake studies, weighing foods prepared and consumed. A cross-sectional study of a representative sample of children, stratified by age group, is required to provide adequate information. Because there may be significant seasonal variability as well as important differences in urban and rural

dietary consumption patterns, these factors should be considered when planning and conducting the studies.

Both the 24-hour recall and the observational methods require regional or national food composition tables (tables that convert specific food items and amounts to nutrients, such as energy, protein, iron, vitamin A, etc.) These food composition tables should be available within departments of nutrition or within the ministries that oversee child health and nutrition. In some cases, reliable data on nutrient composition of key weaning foods will not be available. In these cases, a decision must be made about whether the information is important enough to arrange for laboratory analyses or whether information can be extrapolated from international food composition tables for similar foods.

## **AVAILABLE FOODS AND FOOD PREPARATION TECHNIQUES**

A list of commonly consumed foods and their seasonal availability and prices should be compiled, and matched against the consumption patterns of the target group of children. This information will be useful to plan improved weaning diets, when necessary.

Information about local food processing and cooking techniques is required to ensure that programmatic recommendations are compatible with the local practices and available technology. If the intervention is not aimed at altering the current diet of children or promoting new or revised recipes, then this information will be less important.

## **BELIEFS AND PRACTICES REGARDING DIARRHEA**

Numerous studies worldwide have shown that in most settings there is an "explanatory model" of diarrhea — a body of cultural knowledge that influences how diarrhea is managed within the household, including guidelines on how children should be fed during diarrheal illness. In order to design messages to influence behavior during diarrheal episodes, it is first necessary to ascertain how people define, categorize, and perceive diarrhea; what specific treatments they use, and why; and whether there are any foods that are perceived to be especially beneficial or harmful for use during diarrhea.



## CULTURAL BELIEFS ABOUT CHILD HEALTH AND DEVELOPMENT

Mothers in diverse settings cite two common concerns regarding diarrhea: children's loss of appetite and weakness. The symptoms that cause concern in a particular culture are very often useful for development of messages to promote specific changes in behavior. For example, if "weakness" is perceived as a negative consequence of diarrhea, a message might be "if you feed your child extra food during diarrhea, this will help to keep the child strong and active."

There has been a common misconception within the public health and medical community that mothers in nearly all cultures withhold food (or even starve their children) during diarrhea. Recent studies have shown, however, that what occurs more commonly is a *shift in the types or consistencies of food*. Such shifts are based upon the caretaker's desire to avoid "harmful" foods or to provide "helpful" foods, rather than to withdraw all food. It is also clear that in many cultures the diet is maintained as normal, but the quantities are reduced for several reasons, including maternal responses to child anorexia or alarm at the volume or frequency of stool output.

In North India, where diarrhea is perceived to be a "hot" illness, some mothers (for some diarrheal episodes) prepare a special rice and lentil dish, *kichuri*, because it is felt to be "light" and "cool"; they also believe yogurt and bananas are "helpful." *Chapati*, the staple food of North India, is believed by about half of mothers to be "heavy" and "harmful," and milk is also considered to be a food to avoid. During actual diarrheal episodes, mothers do offer the special foods to some extent, and do withdraw milk to some extent. For the *majority* of diarrheal episodes, however, mothers continue to feed the normal diet. It is not until the episode is perceived to be severe (defined by mothers as an increase in stool volume or duration, or the presence of blood or fever) that the shift in diet routinely occurs.

It is important to document cultural beliefs about feeding during diarrhea (including the quantity and types of food to be given) so that foods that are perceived as "harmful" are not encouraged, and foods that are perceived as "helpful" may possibly be promoted. Although most mothers do not withdraw *chapati* in North India, despite their cultural beliefs about its negative effect during diarrhea, it would not be wise to promote *chapati* actively in an educational campaign.

Whatever the intervention strategy, behaviors that are promoted will have a perceived or real "cost" to the target group (such as expenditure of time or money). These "costs" must be justifiable to the mother in terms of some desirable outcome that will be produced. The identification of these "positive reinforcers" is necessary in order to "sell" the intervention messages. For this reason, cultural norms about a "healthy" and "developing" child — and how to produce one — is valuable information.

Nearly every culture has a set of beliefs about what is a "healthy" child, and a set of cultural guidelines for producing one. It is easy to assume that nearly everyone, in nearly every culture, wants a "fat and chubby baby," but this is not necessarily the case. It is true that a chubby baby is the "ideal" or desired type of baby in many settings. Even so, mothers may not make the connection between a chubby baby and proper food intake. Moreover, in some settings, such as Yorubaland in Nigeria, chubby babies may even be a cause for concern. The "ideal" baby in parts of Yorubaland is "light" — a baby who is light in weight to pick up, one who is active, and who is not lethargic or sick. Fat babies can be considered dangerous, as they may become "heavy" — heavy to pick up, inactive, irritable, and sick.

How can such information be used for program purposes? Continuing with the Nigerian example, messages to mothers to "feed your children during diarrhea to produce a fat and chubby baby" would likely produce an intervention failure. A culturally appropriate message might be, "feed your children during diarrhea to keep them 'light' and active."

## MATERNAL WORK ROLES AND CHILD CARE PRACTICES

It is well documented that mothers in the developing world have multiple and labor-intensive work roles. Child care activities often compete with agricultural work responsibilities or other income-generating activities. In order to promote program messages that are compatible with a mother's ability to act upon them, it is necessary to understand maternal work roles, time allocation, and child care practices.

Some of this information may be available through university departments of anthropology or

sociology, or from the Ministries of Labor, Child Health and Welfare, Agriculture, or Finance. It is likely, however, that specific information will need to be collected as part of the information-gathering activities.

## HEALTH CARE PROVIDER BELIEFS AND PRACTICES

It has been widely documented that health care providers influence household diarrhea management, child feeding, and child health care practices in general. Therefore, their current beliefs, practices, and professional recommendations must be considered during the design of the intervention program. The pluralistic nature of most health care systems implies that there are several groups of health care providers who must be reached. These groups must at the very least cooperate with the objectives of the intervention; better yet, they should be actively involved in the promotion of program messages.

The choice of which providers to focus on depends on the degree to which they are influential with the target group. For example, in many parts of the world allopathic physicians are preferred for the treatment of diarrhea, and traditional practitioners and healers are becoming less and less important. Unfortunately, because of inappropriate previous medical training, some practitioners do counsel against continued breastfeeding and/or feeding solid foods during diarrhea. If their knowledge and practices are not modified, interventions that promote continued or "special" feeding during diarrhea will conflict with the practitioners' recommendations and could be undermined.

## COMMUNICATIONS RESEARCH

Information must be collected on available "channels" to communicate program messages. The manual, "Communication for Child Survival" provides a detailed description of each "channel," and the advantages and disadvantages of each. The sort of data that must be compiled to assist in the choice of appropriate "channels" includes information on whether people own a working radio and which radio programs and time slots they prefer; whether television or film are viable options, given the high cost and urban bias of these media; whether enough people are literate and able to rely on printed messages; whether face-to-face interaction is possible; and so on. This information can often be compiled from

secondary sources, particularly for the mass media channels.

## TARGET GROUPS FOR WHOM INFORMATION IS REQUIRED

In nearly every setting, the two major target groups for which the information should be collected are:

### ◦ THE PRIMARY CHILD CAREGIVERS

Mothers, as well as other household members (older siblings, grandmothers, mothers-in-law, and fathers) who feed and care for children

### ◦ HEALTH CARE PROVIDERS

Medical doctors and health care personnel, pharmacists, healers, and other influential persons involved in illness management

The relative importance of these different groups for household decision-making related to feeding and caring of children will vary by setting. Part of the objective is to define *which* groups need to be reached with program messages. Information should be gathered for *each* target group, as specific messages should be developed and disseminated to each.

## DOCUMENT BOTH POSITIVE AND NEGATIVE PRACTICES

Both positive and negative practices should be documented as part of the information gathering exercise. Assumptions should not be made that mothers, other child caretakers, and health care providers do everything wrong, nor that they intuitively always do things right.

The goals of the information gathering should be to:

- identify positive beliefs and practices that can be reinforced; and
- identify negative beliefs and practices that must be changed.

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## UNDERSTANDING THE "WHAT" AND THE "WHY"

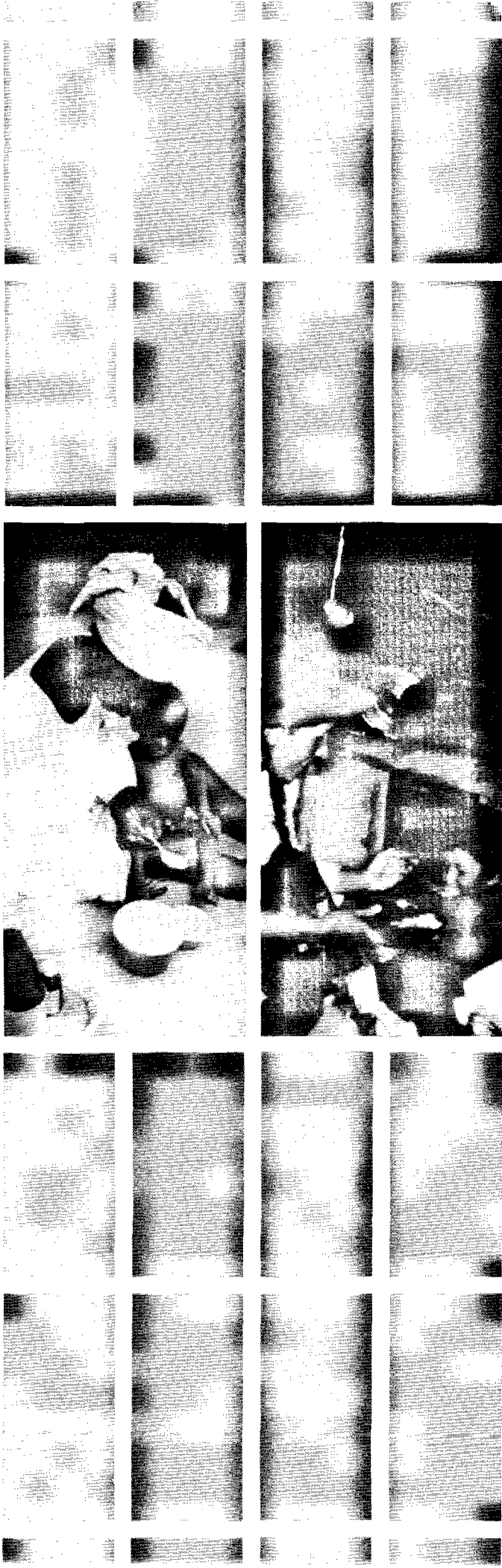
To some extent, it is necessary to understand both the "what" (what people do) and the "why" (why they do what they do) in relation to child feeding. "Determinants" (influential factors) include food availability, seasonality, food preparation techniques and technology, household social structure, socioeconomic factors, maternal work roles and child care patterns, and cultural beliefs regarding appropriate infant feeding and child care.

Why is it necessary, in some cases, to go beyond a description of practices or patterns of behavior and attempt to understand the factors that influence behavior? Because until the *problem* is correctly understood, the *solution* cannot be formulated. The following example (drawn from work done in Nigeria as part of the Dietary Management of Diarrhea Program) makes the point:

In some parts of rural West Africa the traditional way of feeding is to "pour" a dilute cereal pap into the child's mouth with the caretaker using her hand as a funnel. Semi-solid or solid foods are usually not offered until the child has reached at least 12 months of age. Strong cultural beliefs condemn offering solid foods before a child is "developmentally ready," and mothers cite ease of feeding, time constraints, and tradition ("we were all fed this way") as reasons for preferring handfeeding. In this setting, the optimal nutrition intervention might be to encourage spoonfeeding of a more "nutrient dense" semi-solid or solid food mixture. This strategy would require several levels of behavior change, however, including a variation of the composition and consistency of the pap presently offered, as well as a change in the way the pap is fed. These multiple behavior changes are possible and may even be necessary if nutritional status of weaning-aged infants is to improve in this setting. To effect such changes, however, first requires that the problem be correctly identified. In this case, the "problem" includes the combination of a sub-optimal weaning food, the late introduction of solid foods, and strong cultural beliefs against offering solid foods earlier or changing the traditional way of feeding, which may be related to maternal time allocation and multiple work roles. Only by understanding the problem in such depth could a culturally feasible intervention message be formulated and disseminated.

To summarize, the program planner will be faced with the difficult task of deciding exactly what new information must be obtained to develop a successful program strategy. The desire to collect extensive background material for planning purposes must be balanced against the cost and time that will be required for this effort. Often, pertinent information is already available; time and energy invested in seeking this existing information will generally be amply rewarded by future reductions in the need for primary data collection. Thus, the program planner must:

- Decide when the program needs to understand the "what" and the "why" regarding infant and child feeding and health;
- Collect enough information to ensure sufficient understanding of these issues to permit key decisions, without needlessly expending program resources.



## **PART TWO**

### **STEPS TOWARD IMPLEMENTATION**

This section of the manual guides the program planner through the specific steps to achieve program implementation. It is essential that the program planner has read all of the background information before proceeding with specific actions. This includes Part I of this manual, the appendices that are attached, and possibly some of the background literature that is referenced at the end of this manual.

## STEP ONE GENERATING POLITICAL COMMITMENT

A critical, preliminary activity is to convince key decision-makers within the health sector that this is an "idea whose time has come." An important lesson has been learned from the attempt to replace intravenous therapy with oral rehydration therapy in developing countries: local policymakers, program planners, and health professionals must be brought on board very early in the process.

Why might there be political opposition or inertia to incorporating dietary management into CDD program efforts? First, the process of program implementation is potentially more complex than distributing or promoting ORS packets or household solutions. Some individuals may perceive dietary management efforts as too complicated or too expensive, or they may feel uncomfortable discussing nutrition, "behavior change," or the need to do "research." Second, until very recently it was widely believed by the medical and health community that feeding should be discontinued during diarrhea — that the "gut should be rested." Many practitioners and program planners within health ministries were trained with this concept, and they may need to be convinced that promotion of feeding during diarrhea is the proven, optimal therapeutic recommendation. These individuals should be viewed as the first target group, and program "messages" should be designed so that information is heard and understood by policy makers and health professionals.

## PROMOTING ACCEPTANCE OF DMD INTO CDD PROGRAMS

What are some of the key "messages" to communicate? A few of the more important ones are listed below, and can provide some preliminary "ammunition:"

- Improved feeding practices during diarrhea and/or extra feeding during convalescence are important to prevent growth faltering.
- Studies have shown that children who are well-nourished or who continue to be well-fed during diarrhea are better able to withstand repeated diarrhea episodes without adverse effects on growth.
- A substantial amount of nutrients are absorbed during diarrhea; in fact, many more nutrients are generally absorbed than are lost.
- Continued feeding with appropriate foods during diarrhea supports fluid reabsorption and helps to prevent dehydration; therefore, improved dietary management of diarrhea is complementary to on-going oral rehydration therapy program efforts.
- Most societies have a rich folk wisdom about which foods to feed during diarrhea and which foods to avoid; the identification of these is necessary for designing program messages.

## PROGRAM ACTIONS TO GENERATE POLITICAL COMMITMENT

What are some actions that can be taken to generate the political commitment needed to proceed with subsequent activities? Some ideas are presented on the following page, but circumstances will vary in each case depending upon the context of a particular CDD program.

## STEP TWO PRELIMINARY INFORMATION GATHERING PHASE

A matrix of the categories of information and a list of possible individuals and institutions that can provide the information should be constructed. Table 3 provides an example of such a matrix. As the matrix is developed, it will be possible to identify information gaps and which categories of primary data to collect. The types of individuals and institutions that should be considered include the following key informants:

### ◦ DEMONSTRATE THE EXPERTISE OF THE PROGRAM PLANNER

To "sell" the idea of improved dietary management of diarrhea, the program planner needs to become an expert. He or she should review available literature that shows the positive effects of continued feeding during diarrhea, as well as program documents that describe some of the early efforts to promote feeding during/after diarrhea. The program planner must be prepared to "argue" for the program with skeptics, citing solid "data" from reputable sources. (Selected references are provided at the end of this manual).

### ◦ CONDUCT A ONE-DAY SEMINAR OR WORKSHOP FOR DECISION-MAKERS

The important decision-makers that must be convinced should be identified. A one-day "training" workshop to educate them could be planned. The seminar could include regional or local experts who present material from a scientific and policy perspective. This opportunity can promote the need for an interdisciplinary approach, and will identify individuals who might be key "team players" for the work ahead.

### ◦ PREPARE A SHORT BROCHURE OR NEWSLETTER

Information from the literature that demonstrates the efficacy of improved feeding during diarrhea could be abstracted into a brochure or newsletter and distributed to a wide variety of institutions and individuals. A quarterly or biannual newsletter that reports on the progress of program efforts could be established.

The program planner must stay motivated and actively involved in the program's activities. He or she should be the main person to disseminate information to key policymakers, and should know exactly where the program is going and why.

- nutritionists from nutrition departments within universities and/or national nutrition research institutions;
- individuals within the Ministry of Health, including nutritionists, clinicians, planners, economists, and epidemiologists;
- individuals within the Ministry of Agriculture, including agronomists, economists, and planners;
- anthropologists and other social scientists from university departments or private or public organizations;
- health educators and communications specialists from the public and private sector (including market survey research agencies).

Contacts with the individuals and institutions listed in the matrix should be made by the program planner. This preliminary activity should be viewed as an opportunity to compile as much secondary data as possible, and to learn relevant information from local experts. Detailed notes of each meeting should be kept. This exercise will help the program planner identify individuals who might be appropriate for future participation in the interdisciplinary program planning team.

During this process, the reports and data that have been collected should be reviewed. A definition of the "problem" and possible program strategies should be sketched out. For example, based on available nutrition surveys and infant feeding studies, does it appear that children suffer from chronic nutritional problems related to inadequate weaning practices? Would fortification of the traditional weaning food be possible? Do there appear to be

seasonal fluctuations in available food supply? Could improved storage or food distribution systems help alleviate the seasonal shortages? Are there cultural beliefs that may contribute to poor infant feeding practices and child nutrition? How might these cultural beliefs be changed in a communication program?

The matrix should be expanded as the number of contacts and the information base increases. Decisions should be made about which information is of value, and which is not. Gaps of information should be identified, and strategies for filling in the information developed. The names of individuals, institutions, or private agencies that can provide or collect the information should be compiled.

Once this exercise has been completed (which may take several weeks or more, depending on the size of the country and the scope of the intervention objectives), the program planner is ready to assemble the expert planning team. The team should not be brought together until a clear idea of both the problem and the possible program strategies to address the problem have been delineated. Defining the problem and strategies before assembling the team enables the program planner to remain in control of the process, guiding the team toward the programmatic objectives.

To summarize, the steps for implementing the preliminary information gathering phase are:

- construct matrix of information needs and resources;
- conduct "key informant" interviews and keep detailed notes;
- collect secondary data from nutrition surveys, infant feeding studies, agricultural agencies, health educators, commercial marketing sources, and other sources;
- review reports and secondary data;
- identify gaps of information;
- begin to define the problem and formulate alternative intervention strategies;
- identify candidates for an interdisciplinary planning team.

Table 3

**TYPES AND POSSIBLE SECONDARY SOURCES OF INFORMATION  
PROGRAM MANAGER WORKSHEET**

| Information Required  | Sources of Information   | Repository of Information  | Information Acquired & People Contacted |      |
|---|--|--|---|------|
|   |  |  | Type/Person                             | Date |
| Infant feeding patterns and nutritional status of young children        | "Key informant interview," university publications, theses, national nutrition surveys   | University departments: Nutrition, Child Health and Development, Community Medicine; Ministries of Health, Child Welfare, UNICEF, CARE, other donors |   |      |
| Food availability, agricultural cropping, and food consumption patterns | "Key informant interviews," market information, price information, agricultural crops, seasonality data, food consumption data | University departments: Economics, Agricultural Economics, Agriculture, Agricultural Extension; Ministries of Agriculture                            |   |      |
| Cultural information (child feeding, care, definitions of diarrhea)     | "Key informant interviews," qualitative/ethnographic reports, theses, manuscripts, and publications                            | University departments: Anthropology, Sociology, Rural Sociology, Health Education; Libraries  |   |      |
| Maternal work roles   | "Key informant interviews," census data, household economic data   | University departments (as above); private research groups; Ministry of Labor; Vital Statistics Division   |   |      |
| Current health provider recommendations                                 | "Key informant interviews," pediatric texts, curricula, training materials   | Medical schools; Professional Associations; Pediatric Departments; Primary Health Care Training Courses  |   |      |
| Communications information  | "Key informant interviews," communication information: "channels," "reach," audience   | Market survey research organizations; advertising agencies; Ministries of Information, Education   |   |      |



## STEP THREE ASSEMBLING THE INTERDISCIPLINARY TEAM

Specialists from a number of disciplines should be brought together as part of the planning and implementation team. They should include a:

### ◦ NUTRITIONIST

to assess the current dietary practices and nutritional status of the target group, and to evaluate possible "new" dietary regimens/recipes for nutritional composition and adequacy

### ◦ ANTHROPOLOGIST OR OTHER SOCIAL SCIENTIST

to guide the information gathering on cultural beliefs and practices regarding food preparation, feeding, child care, and diarrhea; to assess information and evaluate the feasibility of strategies to change beliefs and behavior

### ◦ COMMUNICATIONS OR HEALTH EDUCATION SPECIALIST

to create specific messages and to develop and implement the dissemination plan, including preparation of supportive communications materials

In addition to these core people, it may be advisable to include a:

### ◦ CLINICIAN

to define current medical treatment practices and to review the intervention plan from the perspective of the practicing health professional

### ◦ EPIDEMIOLOGIST

to define high risk groups for targeting the intervention and evaluating its success

In addition to these individuals, temporary advisors or consultants may be required. For example, if a survey is planned, assistance in sample size, selection, or even implementation may be necessary. If biochemical (nutrient composition) analysis of a weaning food is considered necessary, a subcontract with the appropriate individuals or laboratory may be required.

The choice of individuals for the team is extremely important. Ironically, the "top" nutritionist in the country may not be the best choice, if he or she is biochemically or clinically oriented, or has never worked outside of the city limits. Likewise, health educators who have never worked in rural areas will have little understanding of communication strategies for rural people. Anthropologists or sociologists who teach but never go the village would also be poor choices. Medical doctors who believe they already "know the problems" may have ready-made solutions — perhaps the wrong ones.

The following criteria should guide the program planner in choosing appropriate team members. Ideal program team members are people who:

- have already been involved in interdisciplinary, "team" programmatic work or who express a keen interest to do so;
- spend a significant amount of time away from their desks and in "the field";
- listen and appear curious;
- will make a serious commitment of time and energy to the project;
- will be "team players," who will listen to others from diverse backgrounds, and who will take cues from the team manager.

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## STEP FOUR DEFINING THE PROBLEM THROUGH INTERDISCIPLINARY EFFORT

Following the preliminary information gathering phase and the first meetings of the interdisciplinary planning team, the program planner should be able to define the problem more precisely. In other words, the program manager should now have a general idea about infant feeding patterns, the age of weaning, the nutritional status of the target group, the availability and consumption patterns of staple food items, broad cultural beliefs regarding feeding and caring for children, etc. With this information, it should be possible to estimate the magnitude of the problem and to formulate possible intervention strategies. No doubt, more specific information will need to be collected to formulate a final program strategy.

The planning team should go through this exercise *before* initiating any primary data gathering activities. This early problem definition exercise allows the team to see where they are in the process, what information is lacking, and what questions remain to be answered through data collection.

## STEP FIVE COLLECTION OF PRIMARY DATA AND CHOICE OF METHODS

After an analysis of the available secondary information, the planning team should list the questions that remain to be answered through direct primary data collection. Methods of data collection can then be decided upon, based upon the most appropriate method for each category of information, and the time and resources that are available. The different methods that can be used for data collection are summarized briefly below.

### ETHNOGRAPHY AND PARTICIPANT OBSERVATION

In the classical anthropological sense, ethnographic research requires long-term residence in a single village or community. Through a series of repeated unstructured interviews with key informants, descriptive or qualitative data are collected across a wide variety of topics. Ethnographic research seeks to describe how people conduct their lives and make decisions within the context of the ecological, political, and sociocultural environment. This process of "immersion" into the activities and culture of the study group is called "participant-observation" and is the hallmark of anthropological research.

The main advantage of ethnographic research is that a problem or process can be described in depth and with a high degree of accuracy regarding actual practices. The major disadvantage is that classical ethnography takes time — too much time to be useful for programmatic purposes — and does not address the variability that may be found from site to site, or provide quantitative estimates of variability within one site.

It is possible, however, to compromise — to use *focused ethnographic research* to collect information on a particular problem and to complete the data collection within a relatively short period of time (six to eight weeks). (See Scrimshaw and Hurtado 1987) The type of information that could be collected through focused ethnographic research includes cultural definitions and concepts of diarrhea, feeding practices and usual treatment regimens during diarrhea, cultural norms about "healthy" and "unhealthy" children, maternal work roles and time allocation, infant feeding and weaning practices,

local food preparation technology and cooking techniques, etc. It is for just this sort of descriptive, background information that ethnographic techniques are most suited. To address the issue of variability, multiple sites may be purposely selected. Within sites, too, a careful selection of respondents can help assure that the full range of socioeconomic and ethnic group variability is represented.

To undertake focused ethnographic research, it is necessary to find ethnographers (anthropologists or sociologists) who are already experienced in "total immersion" ethnography, and to contract with them to do short-term, focused data collection. The anthropologist on the program team would supervise the content and implementation of the fieldwork. A manual that lists the questions and describes the techniques for conducting the interviews should be developed (an example is shown in Appendix II).

*The ethnographers must be adequately trained in the technical aspects of the problem and goals of research.* Most local ethnographers or sociologists who have done qualitative research will not have had training in health. It is essential that adequate time and resources be devoted to training them before they begin data collection. It is recommended that frequent interim debriefings of the ethnographers be conducted by the program team. This will assure that the information that is being collected is useful, and allow the process of interpretation of the information to begin.

## FOCUS GROUP INTERVIEWS

Focus group interviews can be done as a part of ethnographic research, or they can stand alone as a methodology. A focus group involves a guided group discussion whose purpose is to explore a particular set of issues or questions (such as appropriate feeding practices during diarrhea). The type of information that is generated from focus group interviews include *beliefs, attitudes, and reported practices*. Focus group interviews will not necessarily provide information about actual practices.

A focus group is usually formed with 6-10 persons from similar backgrounds and interests. Under the direction and guidance of a facilitator, topics related to the subject matter of the research are introduced for discussion. The facilitator of the group must be someone trained in conducting focus groups. Market research agencies rely heavily on focus group

interviews to obtain product and market information, and they may have trained personnel who can be called upon to direct the interviews. It is necessary to invest an adequate amount of time to train the facilitator(s) in the technical issues of the project. Alternatively, a technical specialist can be trained to be a *focus group facilitator*. The information that is collected from focus group interviews will depend to a very great degree on the knowledge and understanding of the project by the facilitator. In some cases it might be advisable to employ two facilitators, one who is well versed in focus group methods and one who is an expert in the technical issues to be discussed.

The advantage of focus group interviews is that the group dynamic is often the catalyst for providing information that might not emerge from a face-to-face interview. In addition, because more individuals can be contacted at the same time, this is an efficient and cost-effective method of data collection. The disadvantages are that respondents may report upon idealized patterns of behavior that do not reflect what they ordinarily do, and (like survey data) may not be highly reliable predictors of actual patterns of behavior. Also, there may be the question of whether the respondents are representative of the larger population. This issue can be addressed to some extent by careful selection of the sites and the respondents for each focus group.

## SURVEY RESEARCH

Survey research uses structured interview techniques (questionnaires) to obtain specific information from a large and systematically selected sample of individuals. A survey is useful when it is necessary to quantify the variability of the outcomes or responses. For example, the distribution of the consumption of major weaning foods by age of child, or the percent of mothers who work in the formal market economy may be considered essential information. Likewise, investigating the correlates of these outcomes with socioeconomic or demographic variables, such as whether there are differences in feeding practices that are related to urban/rural residence or socioeconomic group, may be required. The survey method is the best technique for providing such quantified descriptions.

The major disadvantage of survey research is that it provides, at best, only a superficial understanding of behavior. Responses given to a relative stranger who is filling in a sheet of paper attached to a clipboard may not reflect what people actually do. In general, a survey is undertaken when it

is necessary to extrapolate from the survey sample to the larger population. In countries with large populations and cultural/ecological variability, surveys may be a necessary information gathering activity. Undertaking survey research, however, can be expensive and time-consuming, and requires technical supervision from the design through the analysis phase. A decision to do survey research, therefore, should be well-justified.

## USE OF COMPLEMENTARY METHODS

These alternative information gathering methods should not be viewed as "either-or" choices by the program team. In fact, these techniques must often be used together. To design a survey questionnaire, for example, it will probably be necessary first to complete some qualitative, ethnographic research to pre-code the survey responses.

Also, because of the strengths and weaknesses of the different methods, the best strategy may be to choose a mix of methods. This allows the most accurate definition of the problem, and minimizes the risk of making a wrong decision based on misleading or inadequate data.

One possible approach is to conduct survey and ethnographic research simultaneously. In this model, ethnographers accompany the survey researchers to some of their clusters or previously selected sites, and complete unstructured interviews and observation for a week or two following the initial structured interview. The two sets of information can be compared to identify any discrepancies between reported beliefs (survey data) and the observed behavior.

Because ethnographic research techniques can efficiently provide accurate, programmatically relevant information at relatively low cost, they are recommended for use in most settings where the appropriate expertise is available.

## SELECTING AND TRAINING THE DATA COLLECTORS

The choice and training of individuals or research groups to collect the data are important components of the program. For the collection of

dietary data, the nutritionist should be actively involved in selection of appropriate investigators and in the training process. Likewise, the ethnographers should be directly supervised by the social scientist/anthropologist on the planning team.

The choice of investigators to conduct the research should be based on the availability of competent, skilled individuals. For example, to conduct focused ethnographic research, the optimal choice would be to employ professional and experienced ethnographers. Survey enumerators should have previous experience in conducting surveys among the target group of respondents. The collection of dietary data should be done by dietitians who know how to make such estimates, or non-dietitians who have been well-trained by experts. In practice, it may not be possible to identify the most highly trained individuals — either because they do not exist or (more likely) they are not available. When this occurs, in order to ensure data reliability, it will be necessary to invest in an intensive training program.

An efficient and effective method of providing the technical and methodological background for the investigators and data collectors is to run a short training workshop. The "teachers" should be the various members of the interdisciplinary team and others the program planner has identified in the course of program development.

## TESTING INSTRUMENTS AND MONITORING DATA COLLECTION

An adequate amount of time should be budgeted to pilot test each data collection instrument and to complete the phase of data collection. The pilot exercise can provide an "in the field" training exercise. Protocols or instruments can be revised based upon problems that are identified during the pilot study.

An interim review of the preliminary data results of key questions should be completed as part of the research monitoring efforts.

## ANALYSIS AND INTERPRETATION OF THE DATA

The program planner should be actively involved in the data analysis and in the interpretation of the results. The program planner need not *plan* the statistical analysis, but he or she should work with a

statistician on the analysis plan. If there were questions or hypotheses that need to have been investigated, then these should be listed. Ideally, the analysis plan should be completed before any data collection is initiated.

For analysis and interpretation of the ethnographic data, the program planner should work with the anthropologist and ethnographers on the outline of their report. If the interviews were conducted in multiple sites, the ethnographers should summarize their data in tables that disaggregate the findings by site. Several "debriefing" sessions with the ethnographers are recommended throughout the data collecting exercise. Often this proves to be a useful exercise to help the program team understand "what's going on out there."

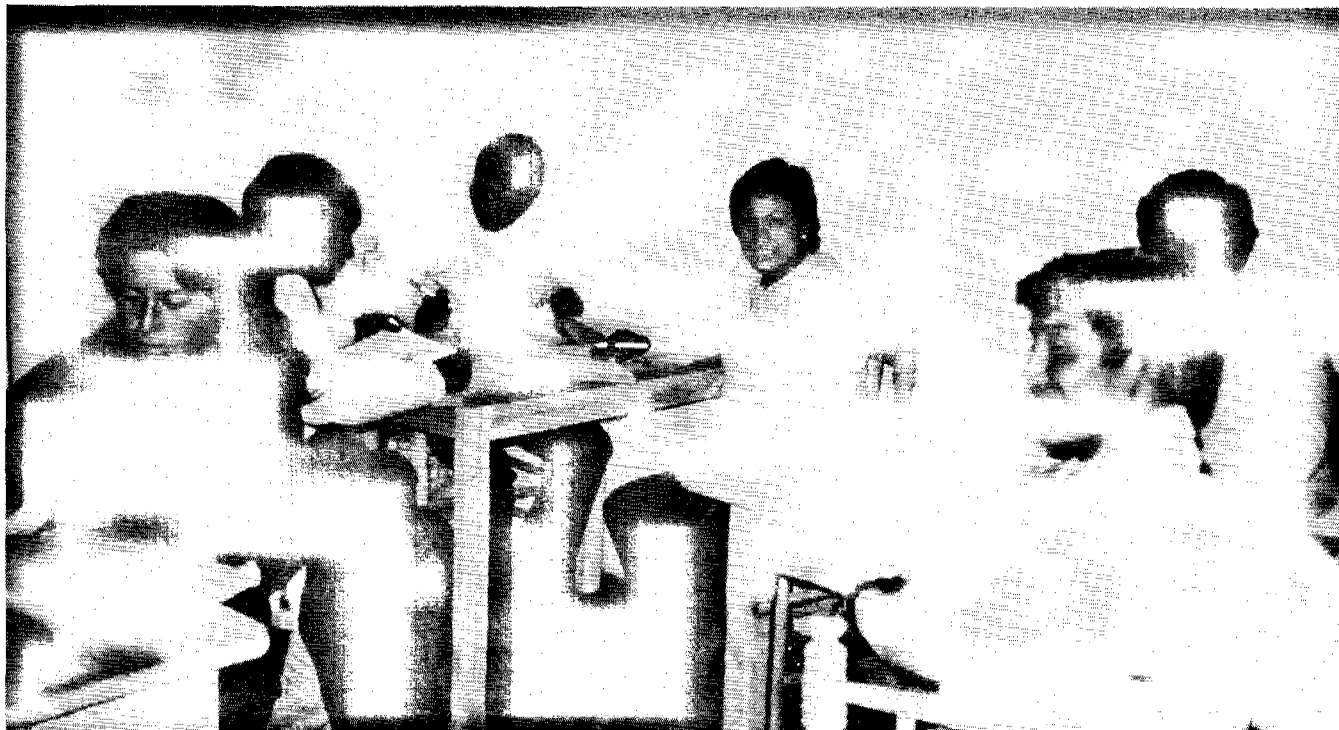
If a market research agency has been contracted to conduct focus group interviews, they should articulate how they plan to analyze and summarize the group sessions. It may also be useful for the program planner or other team members to attend one or two of the focus groups and to "debrief" the facilitators afterward.

The program planner should "listen" to the data, putting aside any preconceived notions about what mothers think or what they do. Objectivity in the interpretation of the data is essential.

It is important at this point to avoid falling into the "data trap" — the generation of an overwhelming number of tables and numbers, with little understanding of what it all means. The objective of the entire effort is to *formulate program recommendations for feeding during and after diarrhea episodes* — be it a new or revised "recipe," or a set of specific messages about feeding the usual diet during diarrhea. It is essential here to utilize the interdisciplinary team to its full capacity, evaluating the data from nutritional, cultural, economic, and agricultural/market perspectives. The goal is to establish a set of recommendations that will improve the nutritional adequacy of the diet during and after diarrhea, *and that will be acceptable to the community on cultural and economic grounds*. For example, a recommendation of the addition of milk or eggs into the diet of young children may be unacceptable for one or both of these reasons, even though this would obviously improve their diet.

If there are questions that remain after the data have been collected and analyzed, the program team should decide whether they are important enough to require additional data collection. At some point, however, the program team will have to move into action with whatever information is available.

All of the information should be compiled into a summary report by the interdisciplinary planning team. The report should be carefully studied by all of the team members as the first step in moving from the data to program intervention activities.



## **STEP SIX MOVING FROM THE DATA TO THE INTERVENTION**

After the problem has been adequately defined and a program strategy developed to address the problem, it is time to move from the data to the design of messages. A brief discussion of the "social marketing" approach to message design and promotion is presented below.

### **THE SOCIAL MARKETING APPROACH**

The social marketing approach to health intervention utilizes the same modern techniques and "channels" of communication that are used for marketing commercial products (ref: Child Survival-Communications Manual). For example, commercial marketing strategies to sell bar soap usually begin with product development research and analysis of market demand. Focus group or in-depth interviews of individuals from the "target" population are conducted to uncover their perceptions of personal hygiene, their practices, and their preferences regarding the smell, texture, color, and cost of soap. Sometimes trial samples of soap are distributed for use, and information collected afterwards about user satisfaction. If user satisfaction is low, the soap will be reformulated and the trials conducted again. Customer statements about product expectations and positive attributes of the soap are documented, and some of these may be adopted (or adapted) as key messages for the marketing campaign. This same sort of approach has been used to market contraceptives and other family planning "products," ORS, EPI, and other health care concepts and products.

### **"TESTING" THE FEASIBILITY OF THE INTERVENTION**

If the program strategy requires a major behavioral change, it will be necessary to determine whether such changes are possible. One way of doing this is to introduce the desired change to a small

sample of households or individuals, and to monitor the effect of the message upon behavior. This is another place where ethnographers may be required, both to interview the target group and to make observations within the household.

For example, the program team may decide to improve the nutritional quality of a traditional weaning food by adding two or three locally available ingredients. Ideally, this decision was made based upon a full analysis of the background information that was compiled. The program team believes that the required behavior changes are possible, but would like to have more information about whether the target group will accept the recommendations.

In such a case, it is a good idea to "test" the intervention to see whether it is feasible or not. This may be done by running several focus group interviews to introduce the new recipe and the educational messages. A demonstration of the preparation of the recipe may be done, and mothers' responses elicited. A subsequent activity would be to ask the mothers to return home to prepare the recipe. The mothers would then be visited in their homes to observe whether and how they prepare the recipe, and to interview them about their experience and opinions regarding the new weaning food.

This sort of intervention is a complicated one, and should be undertaken only after careful consideration. If the program team decides to "tamper" with the dietary patterns of the target group, an adequate investment of resources will be required to conduct a trial of the intervention among a small sample of households or villages. Again, it goes without saying that a nutritionist and an anthropologist should be involved in such an intervention.

### **DESIGN OF PROGRAM MESSAGES**

How does the program team best interpret the information that has been collected to design the messages for a communication campaign? This is where available social scientists, health educators, and communication specialists will work in close collaboration with the technical experts on the design of culturally and nutritionally appropriate messages.

A thorough analysis of the data will begin to suggest key ideas, themes, or metaphors upon which to base the educational messages. Message development and content should be approached from the perspective of the target group (i.e., the mother or health provider).

Once these messages have been developed, they must be field tested for their ability to communicate the desired information effectively. The best method for field testing both verbal and visual messages is in the focus group and/or face-to-face interview.

After program messages have been pretested and changed, if necessary, they may be disseminated to the larger target population.



## STEP SEVEN DISSEMINATION OF INTERVENTION MESSAGES

It is unlikely that the program will choose to implement these messages in a vertical communications campaign. Rather, it is more likely that the messages should be integrated into the program's broader communications efforts. It is especially important that the messages be complementary to program messages that promote oral rehydration therapy.

### CHOICE OF "CHANNELS"

Communication programs are most successful when a mix of "channels" is used. Although each has its relative advantages and disadvantages, no one channel alone will do the job.

Face-to-face communication and demonstration are an effective channel, especially if a "new" recipe is to be introduced. Indeed, it may be impossible to communicate recipe instructions without some sort of expert demonstration. Opportunities for direct inter-personal communication include the use of mothers' clubs, village health workers, clinics, extension agents, and market demonstrations.

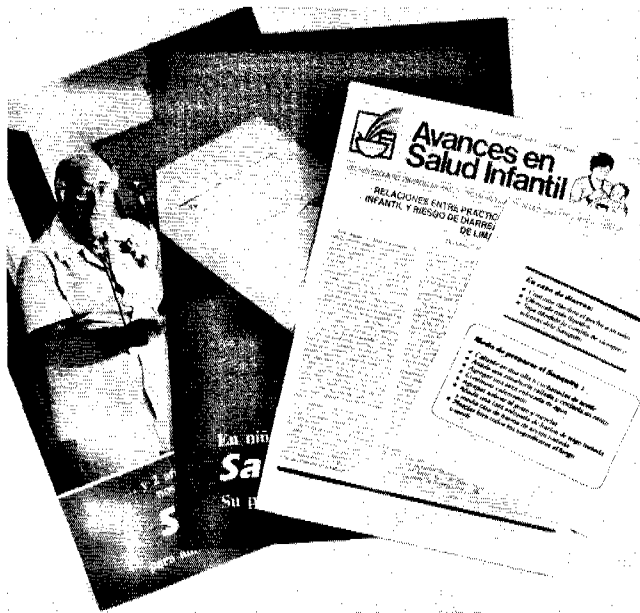
The use of print materials is effective to assure that the messages are consistently received across time and geographical range. The distribution of wall calendars that contain program messages has been a common programmatic strategy. This has the advantage of displaying the program messages within the household, where they will remain for at least a year. In populations where literacy is low, print materials must use pictorial information to communicate the desired concepts.

The use of mass media to reinforce more traditional channels is undeniably powerful. Use of mass media alone, however, is probably not a viable strategy because the messages may be too complicated to communicate without some visual or face-to-face explanation. In some settings, the prohibitive cost of mass media channels or their lack of "reach" may undermine their use.

The choice of channels for the intervention messages should be based upon an analysis of what possibilities are available in the intervention area, their cost, and the time estimated and available to effect a behavioral change.

## TRAINING OF HEALTH PROFESSIONALS



Once information about health provider beliefs and practices has been documented, training workshops or seminars can be conducted to communicate the desired dietary recommendations and any appropriate behavioral change. An interactive seminar has the advantage of creating "peer pressure" for the practitioners to accept the intervention program and to do their part in the promotion of the messages. Recruitment of senior health personnel to address the seminar often lends authority and credibility to the program objectives, but care should be taken that the speakers are communicating the right messages. Training materials for this second "target group" should be prepared as part of program activities.



## STEP EIGHT MONITORING AND EVALUATION

The purposes of monitoring and evaluation are to assure that the educational messages are reaching the target audience, and to ascertain whether the messages are understood and applied. If this is not occurring, structural changes may be necessary to improve coverage and/or message design. Monitoring activities should be conducted continuously or at intervals throughout the life of the project to assure that any early successes are sustained. Simple process indicators include, for example, the number of leaflets produced, the number of mothers who receive them, the number of cooking demonstrations conducted, etc. Likewise, process indicators for professional training activities might include the amount of training materials produced and number of training sessions held, as well as the number of individuals trained according to clinical specialty and region of country. Evaluation of changes in behavior is more difficult, and requires survey and/or ethnographic methods.

Obviously, specific monitoring plans and data collection instruments must be developed according to the design of the intervention. The hallmarks of a good monitoring instrument are simplicity and ease of rapid analysis. Otherwise, it is unlikely that the evaluation will meet its objective or influence future implementation of the program.

GOOD DIARRHEA  
CASE MANAGEMENT =  +   
FLUID FEEDING



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## SUMMARY

This manual has provided background information and step-by-step instruction on how to introduce improved dietary management of diarrhea into on-going CDD program efforts. As stated above, the manual should be read together with the appendix *before* any program activities are undertaken. Further background reading may also be necessary. Some references are provided on the following page.

The manual does not suggest that a vertical program in DMD be implemented. Rather, program activities should be integrated within the larger set of CDD program strategies. Opportunities through other programs, such as growth monitoring, breastfeeding promotion, or family planning should be identified and exploited where possible to disseminate the "DMD message."

Dietary management of diarrhea program activities are new, and it will take a number of years to achieve their full integration into diarrheal disease control program efforts. The benefits of DMD, however, go far beyond improving dietary patterns during diarrheal episodes. DMD provides the opportunity to address a major problem in child nutrition and growth. The expected improvement in nutritional status afforded by these programs should also contribute to reduced severity of diarrheal diseases and reduced diarrheal fatality.

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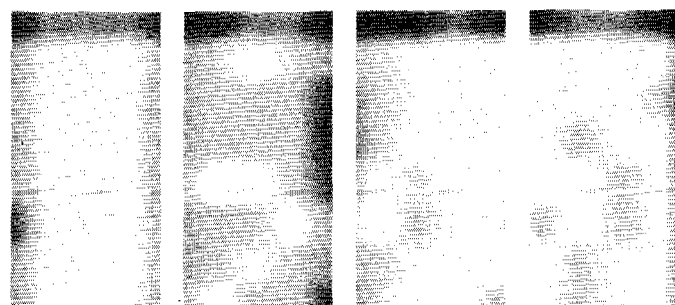
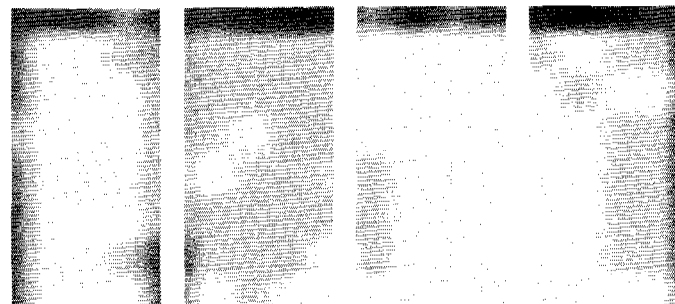
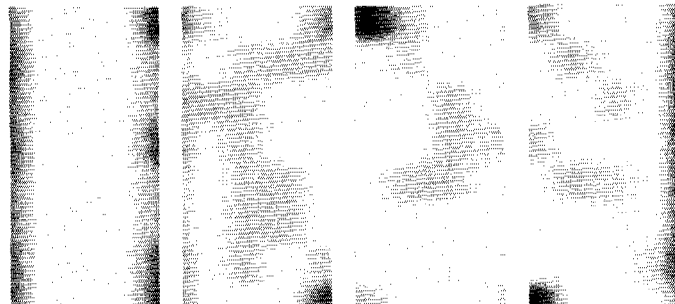
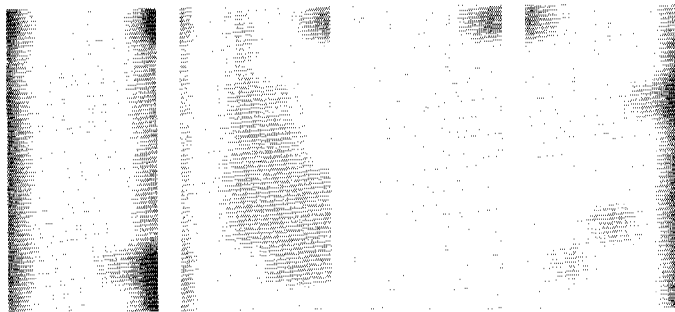
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# APPENDICES

# APPENDIX I GENERAL RECOMMENDATIONS FOR APPROPRIATE FEEDING IN RELATION TO CHILDHOOD DIARRHEA

Programs to promote improved nutritional management of childhood diarrhea require knowledge of optimal feeding recommendations in order to evaluate the adequacy of current practices. Much of the foregoing material has explained how to collect information on current feeding practices; this appendix summarizes current guidelines on the appropriate nutritional management of diarrhea. Actual feeding practices identified in a particular setting can be compared with these recommendations to determine whether any modifications of the current practices might be desirable.

To counteract the adverse nutritional effects of diarrhea, children should be offered a nutritionally complete diet during the episode of diarrhea. This diet should be formulated to maximize its digestibility and palatability. In addition, extra amounts of food should be offered during convalescence to compensate for any reduction in intake or absorption that occurs during illness. Optimal feeding in relation to these different stages of illness or recovery will depend on the age of the child and will be determined to some extent by the child's usual feeding practices, as explained below.

## FEEDING DURING ILLNESS

Recently completed clinical studies have shown that patients who receive breast milk or lactose-free formula diets during the acute stage of diarrhea have similar or reduced severity of illness compared with those who are not fed or receive only oral glucose-electrolyte solutions (Figures 1 & 2). Moreover, the nutritional outcomes are more favorable among those who receive a complete diet (Figure 3). Thus, continued feeding with nutritionally adequate diets should be strongly advocated during diarrhea.

Special advice may be necessary on some occasions to translate this general recommendation into specific diets. One particular problem may occur

when young infants are fed exclusively with non-human milk. Malabsorption of lactose, the sugar present in these milks, occurs fairly commonly during diarrhea. When this sugar is incompletely absorbed it draws more water into the intestine, thereby increasing the severity of the diarrhea. For this reason, doubts remain about the optimal management of children fed exclusively with non-human milks. Whereas some clinicians report a favorable experience with continued feeding of these milks during diarrhea, others have noted that diarrhea severity may increase dramatically in a sub-group of their patients. When children are entirely dependent on animal milks as their sole source of nutrients prior to diarrhea, one of several possible dietary modifications may, therefore, be necessary during illness.

Dilution of the lactose load can be achieved by adding more water to the prepared milk diet. Unfortunately, this will also result in reduced nutrient density of the diet and, almost certainly, in reduced nutrient consumption. Thus, some other nutrient source, such as a locally available staple food, should be added back to the diluted milk diet to achieve adequate levels of nutrient intake. Examples of mixtures of milk with a staple food are provided in Table 1.

Alternatively, the lactose content can be reduced by fermentation (as in yogurt) in areas where this food processing technique is commonly practiced. Microbial enzymes produced during fermentation partially pre-digest the lactose in milk. Obviously, the selection of one or another of these feeding options will require research to identify locally available foods and food processing techniques for preparation of an optimal mixed diet.

With the exception of these non-human milks, probably all other locally-available mixed diets can be used safely during diarrhea. Unfortunately, many of these weaning diets are inadequate nutritionally, even in the illness-free child. Reasons for inadequate nutrient consumption from weaning diets include poor nutrient density, inadequate intake per feeding, and an insufficient number of feedings per day. General considerations for the improvement of weaning practices will be discussed below.

To summarize, the following general recommendations for feeding during illness should be included in CDD programs. Breastfeeding should continue as usual during and after diarrhea. Other foods, with the possible exception of non-human milks, should likewise be fed continuously during the course of illness, as appetite permits. The combined amounts of all foods offered, including breast milk, should satisfy energy and nutrient requirements, as recommended by international advisory committees (Tables 2 & 3).

All foods should be fed more frequently so that the amount of nutrients presented to the gut for absorption is reduced per unit time, while providing the same total amount of nutrients. Foods of high osmolality, such as artificially sweetened fruit juices and other heavily sugared or salted foods, should be avoided because they may contribute to diarrheal severity. More detailed recommendations on the types and amounts of individual foods offered during illness will differ for individual countries and must be developed on the basis of field studies.

## INCREASED FEEDING DURING CONVALESCENCE

Despite optimal dietary management during diarrhea, some children may not satisfy their nutrient requirements because of anorexia, reduced food absorption, or both. Therefore, increased feeding during convalescence will be required to compensate for the nutritional deficits that occur and to assure that the children return at least to their pre-illness nutritional status.

It has been clearly demonstrated that infants and young children are able to consume as much as twice their usual energy requirements when they are provided with nutrient dense, liquid diets during recovery from malnutrition. These levels of intake can promote rates of growth that greatly exceed those expected for normal children of the same age, thus permitting rapid nutritional recovery.

Recommendations have been published on the levels of energy and protein intake required to achieve increased growth velocities (Table 4). One simplified rule of thumb that can be adopted is based on the assumption that energy availability may be reduced by approximately half during each day of diarrhea because of reduced nutrient intake and absorption. Thus, dietary intakes that are increased by approximately 25 percent should be provided during two days of convalescence for each day of illness. If the average duration of diarrheal episodes is about five or six days, an alternative message could simply state that the enhanced diet should be provided for ten days to two weeks following recovery. Presumably these levels of increased intake are achievable for limited periods of time, even under field conditions, although there is as yet little practical experience to indicate with certainty just how much extra food can be successfully provided and consumed in these situations.

To achieve the desired levels of energy intakes, diets should be formulated to achieve minimum energy densities between 80 and 100 kcal per 100 g. The diets will probably require the addition of an edible oil to achieve the desired energy density while preserving the liquid or semi-liquid form of presentation that is generally preferred for younger children. Because of the increased protein required for catch-up growth and the fact that diets that may already be marginal in protein adequacy will be further reduced in protein density by the addition of oil, it may be necessary to add extra sources of protein as well. Considerations for the selection of protein sources are described below.

Constraints to optimal convalescent feeding include the amount of time available to the caretaker for the preparation of special food mixtures and increased feeding frequency, as well as belief systems that may not regard this type of treatment as necessary. Even under the best of circumstances, the foods that are available may not be suitable for the preparation of nutrient dense formulations unless special processing techniques are employed. Some of these latter issues will be discussed in more detail below.

## IMPROVED WEANING PRACTICES

The consumption of energy and selected nutrients by weaning-age children in developing countries is often inadequate for the reasons discussed above. Biological adaptations to inadequate levels of energy consumption include slight reductions in basal metabolic rate and more substantial decreases in discretionary physical activity and growth.

Interestingly, several pieces of recent evidence from published and unpublished studies suggest that weaning-aged children who are fed adequately when they are free from illness may grow normally despite frequent bouts of diarrhea.

Weaning is the period of transition from exclusive breast feeding to exclusive consumption of non-breast milk foods. During this period, liquids, semi-solids, and solid foods are added to breast milk in increasing quantities while the amounts of milk begin to decline. The continued production of optimal amounts of breast milk is dependent on maintaining the frequency and duration of suckling. Because of the excellent nutritional quality of human milk, it is critical to encourage continued frequent nursing for as long as possible. In many societies breast feeding for at least two years is a cultural norm that is entirely compatible with public health goals.

During the initial three to six months of life, when breast milk alone is sufficient to maintain adequate rates of growth, the addition of other foods or liquids to the diet is contraindicated because they increase the risk of diarrheal and respiratory infections. Nevertheless, almost all infants will require other foods by six months of age if they are to match international reference patterns of growth. The amounts of energy consumed by healthy infants and children growing within reference limits have been used to establish the recommended levels of intake, as shown in Table 2. However, because of substantial inter-individual variability, the only way to ascertain that a particular child is meeting nutrient requirements is to monitor his or her pattern of growth. This can be accomplished through repeated weighings and plotting of the measurements, as occur in growth monitoring programs.

Dietary energy is provided by the macronutrients (fat, carbohydrate, and protein) contained in individual food sources. Whereas carbohydrate and protein contain approximately four kilocalories (kcal) of metabolizable energy per g, fat contains about nine kcal per g.

Estimates of the amounts of breast milk and breast milk energy that are consumed by children of different ages in developing countries are shown in Table 5. The differences between the recommended amounts and the amounts provided by breast milk must be offered as complementary foods. Obviously, non-breast fed children must receive all of their nutrients from these foods. By making certain assumptions about the amount of food that can be consumed at one feeding, the minimal energy density of the complementary foods can be computed according to the number of feedings offered daily (Table 6). If we assume, for example, that an eight-month-old infant who weighs 9 kg has a functional gastric capacity that is three percent of body weight, then a maximum of 270 g can be ingested per feeding. If this infant requires 414 kcal from complementary food, an energy density of about 77 kcal/100 g would permit consumption of the required amount in just two feedings. If the energy density were just 40 kcal/100 g, four feedings would be necessary. In some countries average energy densities of weaning foods have been reported to be as low as 25 kcal/100 g.

Most weaning foods are based on locally available staples — cereals (such as wheat, rice, maize, millet or sorghum) or tubers (such as potato, yam or cassava) — which are high in starch content. When these starches gelatinize during cooking, they produce thick, viscous pastes unless diluted further in

water. The high viscosity of most cooked staple foods limits the maximum energy density of liquid or semi-liquid weaning mixtures that incorporate them. As noted above, oil or sugar, which do not contribute substantially to viscosity, can be added to the weaning mixture to enhance its energy density. Recently, attempts have been made to reduce the viscosity of starch by adding malted flours (produced from germinated cereals) to the cooked product. The results of these trials, although encouraging, are still preliminary.

Safe levels of protein intake are usually expressed as the amount (g) of reference, or ideal, protein required per kg body weight. Milk or egg protein, as well as other high quality proteins from animal sources, can be considered as reference protein. Reference proteins are almost completely digestible and are composed of essential amino acids that closely reflect the amino acid requirements of humans. These reference proteins can satisfy protein requirements when they provide as little as six percent of energy intake. Thus, a child with energy requirements of 100 kcal/kg/d could satisfy his or her protein requirements with the equivalent of six kcal (or 1.5 g) provided by reference protein.

Because of their relatively poor digestibility and incomplete amino acid profiles, vegetable proteins are not used as efficiently as reference animal proteins. As a rough guide, between 10 to 15 percent of energy should be provided as protein when it is derived from vegetable sources. The net protein quality of the mixed diet can be improved by selecting protein sources with complementary amino acid patterns. For example, cereals, which are generally limited in lysine (and possibly other amino acids) and rich in methionine and cystine ("sulfur-containing amino acids"), can be mixed with beans or lentils, which generally contain excess levels of lysine but low amounts of the sulfur-containing amino acids. Much information is available in the nutrition literature on ideal vegetable mixtures to maximize the utilization of dietary protein from these sources (Cameron and Hofvander, 1983).

Although a complete discussion of the requirements for micronutrients (vitamins, minerals, and trace elements) is beyond the scope of this document, it is important to recognize that these essential nutrients must also be provided by the diet. Dietary sources of vitamin A and iron are particularly important because deficiencies of these nutrients are common in many developing countries. Ascorbic acid can also be particularly important to facilitate the absorption of iron from vegetable products.

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Micronutrients are present in varying amounts in breast milk and the staple foods, but fruits and vegetables will also be required to satisfy these requirements. Again, the appropriate foods in a particular setting will require some knowledge of available foods and their nutrient contents and cultural acceptability. The nutrient contents of these foods can be estimated from nutrient composition tables and compared with recommended intakes to formulate a suitable mixed diet. In most cases, a dietitian or nutritionist will be required to assist in this task.

In summary, an ideal weaning diet includes both breast milk and a steadily increasing amount of complementary foods. Breastfeeding should be continued for as long as possible, preferably beyond two years. Complementary foods should provide the shortfall in all nutrient requirements not satisfied by breast milk. These diets should be formulated from mixtures of locally available, affordable foods that are prepared at a sufficiently high nutrient concentration to allow complete consumption of recommended allowances using a reasonably low number of feedings per day and amount per feeding. A soft, semi-liquid consistency is preferred for infants, and the viscosity can be increased with age.



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**SAMPLE DIETS USING MIXTURES OF MILK AND STAPLE FOOD  
FOR TREATMENT OF DIARRHEA**

(Note: these diets are not complete for all vitamins and minerals)

|          |                             | Energy and Macronutrient Contents |              |              |               |
|----------|-----------------------------|-----------------------------------|--------------|--------------|---------------|
| Food     | Amounts(g)<br>per 110 Kcal* | Energy(Kcal)                      | Prot(g)      | Fat(g)       | CHO(g)        |
| Milk     | 50                          | 32                                | 1.65         | 1.83         | 2.32          |
| Noodles  | 20                          | 70                                | 1.74         | 0.08         | 15.66         |
| Sugar    | 2                           | 8                                 | 0            | 0            | 2.00          |
| Total    | 150**<br>% of energy        | 110<br>100                        | 3.39<br>12.3 | 1.91<br>15.6 | 19.98<br>72.5 |
| Milk     | 50                          | 32                                | 1.65         | 1.83         | 2.32          |
| Rice     | 20                          | 69                                | 1.36         | 0.10         | 15.64         |
| Sugar    | 2.25                        | 9                                 | 0            | 0            | 2.25          |
| Total    | 150**<br>% of energy        | 110<br>100                        | 3.01<br>10.9 | 1.93<br>15.8 | 20.21<br>73.5 |
| Milk     | 50                          | 32                                | 1.65         | 1.83         | 2.32          |
| Potatoes | 80                          | 78                                | 1.28         | 0.08         | 18.08         |
| Total    | 150**<br>% of energy        | 110<br>100                        | 2.93<br>10.6 | 1.91<br>15.6 | 20.40<br>74.1 |

\* Provide 110 Kcal/kg body weight/d if offered as single nutrient source. Divide into 4-5 feedings/d

\*\* Add water to make final weight of 150 g

Appendix 1 - Table 2

**RECOMMENDED (AVERAGE) ENERGY INTAKES AND EXPECTED BODY WEIGHTS  
FOR INFANTS AND YOUNG CHILDREN ACCORDING TO AGE GROUP**

|                              | Age Group (Months) |     |       |       |       |       |
|------------------------------|--------------------|-----|-------|-------|-------|-------|
|                              | 5-6                | 7-9 | 10-12 | 13-18 | 19-25 | 25-36 |
| Expected weight (kg)*        | 7.6                | 8.8 | 9.9   | 10.9  | 12.1  | 13.8  |
| Recommended energy intakes** |                    |     |       |       |       |       |
| Kcal/kg body weight/d        | 96                 | 95  | 102   | 105   | 105   | 100   |
| Kcal/d                       | 730                | 836 | 1010  | 1145  | 1270  | 1380  |

\* Median weight (WHO reference data) for midpoint of age range (boys)

\*\* Data derived from FAO/WHO/UNU Technical Report on Energy and Protein Requirements (1985)

Appendix 1 - Table 3

**RECOMMENDED DAILY DIETARY ALLOWANCES OF SELECTED NUTRIENTS  
FOR INFANTS AND YOUNG CHILDREN\***

| Nutrient          | Age Group (months) |      |       |
|-------------------|--------------------|------|-------|
|                   | 0-5                | 6-11 | 12-47 |
| Protein (g/kg )   | 2.2                | 2.0  | 1.8   |
| Vitamin A (µg RE) | 420                | 400  | 400   |
| Thiamin (mg/)     | 0.3                | 0.5  | 0.7   |
| Riboflavin (mg)   | 0.4                | 0.6  | 0.8   |
| Niacin (mg NE)    | 6                  | 8    | 9     |
| Vitamin C (mg)    | 35                 | 35   | 45    |
| Calcium (mg)      | 360                | 540  | 800   |
| Phosphorus (mg)   | 240                | 360  | 800   |
| Magnesium (mg)    | 50                 | 70   | 150   |
| Iron (mg)         | 10                 | 15   | 15    |
| Zinc (mg)         | 3                  | 5    | 10    |
| Iodine (µg)       | 40                 | 50   | 70    |

\* Food and Nutrition Board, U.S. National Academy of Sciences (1980)

Appendix 1 - Table 4

**ESTIMATED ENERGY AND PROTEIN REQUIREMENT  
FOR "CATCH-UP GROWTH" FOLLOWING ILLNESS\***

|                    | Desired Rate of Weight Gain (g/kg/d) |      |       |
|--------------------|--------------------------------------|------|-------|
|                    | 5.                                   | 10.  | 20.   |
| Energy (Kcal/kg/d) | 108.                                 | 130. | 174.  |
| Protein (g/kg/d)** | 1.67                                 | 2.72 | 4.82  |
| (% of energy)      | 6.20                                 | 8.40 | 11.10 |

\* Data from Ashworth, Nutr Rev 44:157-163, (1986)

\*\* Expressed as reference protein

Appendix 1 - Table 5

**ESTIMATED AMOUNTS OF BREAST MILK AND BREAST MILK ENERGY CONSUMED  
BY DEVELOPING COUNTRY CHILDREN, AND AMOUNTS OF ENERGY  
REQUIRED FROM COMPLEMENTARY FOODS, ACCORDING TO AGE**

|  | Age group (months) |     |       |       |       |       |
|--|--------------------|-----|-------|-------|-------|-------|
|  | 5-6                | 7-9 | 10-12 | 13-18 | 19-24 | 25-36 |
| Amount of breast milk consumed(g/d)*                           | 700                | 650 | 600   | 550   | 500   | 300   |
| Amount of breast milk energy(Kcal/d)**                         | 455                | 422 | 390   | 358   | 325   | 195   |
| Amount of energy required from complementary foods (Kcal/d)*** | 275                | 414 | 620   | 787   | 945   | 1185  |

\* Estimated from data presented by Jelliffe (1982), Brown (1982), Brown (1986), Whitehead (1978), and Creed de Kanashiro (unpublished).

\*\* Assumes 65 Kcal/100 g breast milk.

\*\*\* Difference between total energy requirement (See Table 2) and estimated amount provided by breast milk.

**MINIMUM ENERGY DENSITY OF WEANING FOODS NEEDED TO SATISFY  
ENERGY REQUIREMENTS OF BREASTFED AND NON-BREASTFED  
CHILDREN, ACCORDING TO AGE GROUP AND NUMBER OF FEEDINGS PER DAY**

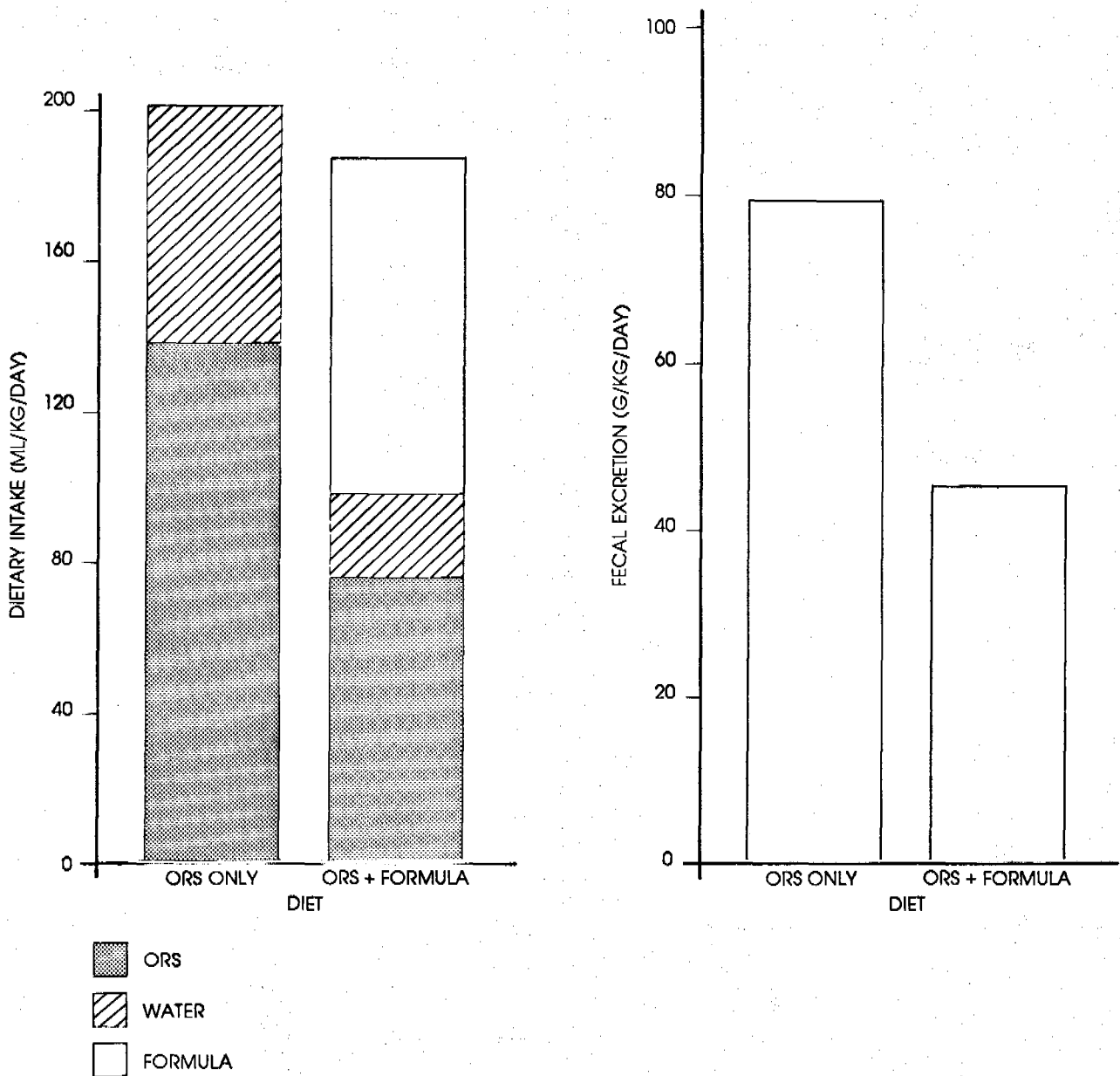
|   | Feeding Status and Age Group (months) |       |       |               |       |       |
|---|---------------------------------------|-------|-------|---------------|-------|-------|
|   | Breastfed                             |       |       | Non-Breastfed |       |       |
|   | 5-6                                   | 10-12 | 19-24 | 5-6           | 10-12 | 19-24 |
| Estimated gastric capacity (g)*   | 228                                   | 297   | 363   | 228           | 297   | 363   |
| Energy required from weaning foods(Kcal/d)**                                | 275                                   | 620   | 945   | 730           | 1010  | 1270  |
| Minimum energy density of weaning food (Kcal/100 g) by number feedings/d*** |                                       |       |       |               |       |       |
| 2 feedings/d  | 60                                    | 104   | 130   | 160           | 170   | 175   |
| 4 feedings/d  | 30                                    | 52    | 65    | 80            | 85    | 87    |
| 6 feedings/d  | 20                                    | 35    | 43    | 53            | 57    | 58    |

\* Estimated as 3% of median body weight for age group

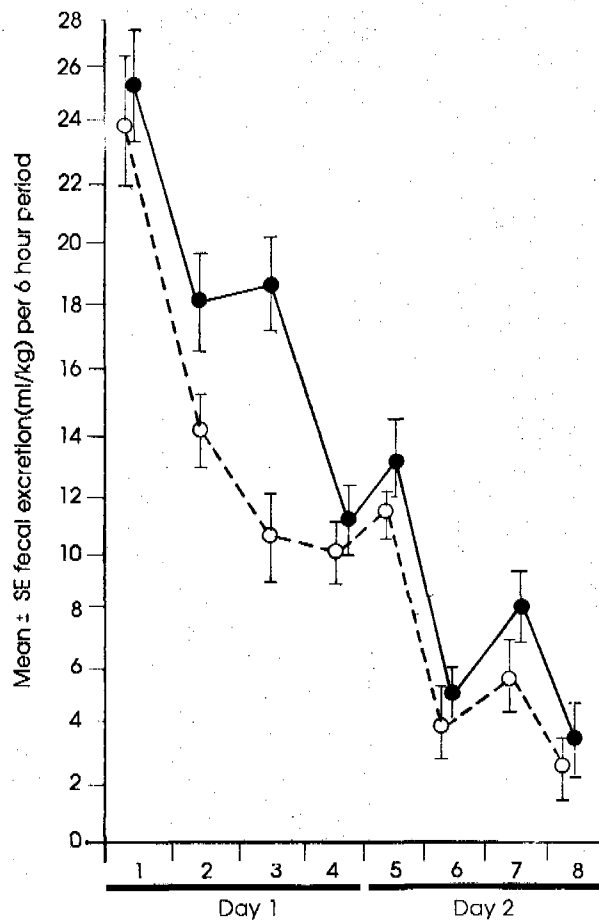
\*\* From Table 5

\*\*\* Computed as (energy required/number of feedings/gastric capacity) x 100

**FLUID CONSUMPTION AND FECAL EXCRETION OF CHILDREN  
WITH ACUTE DIARRHEA BY TREATMENT GROUP**  
TREATMENT VARIED TO INCLUDE ORS (GLUCOSE ELECTROLYTE SOLUTION)  
AND WATER WITH OR WITHOUT LACTOSE - FREE INFANT FORMULA  
DATA FROM SANTOSHAM ET AL., 1985

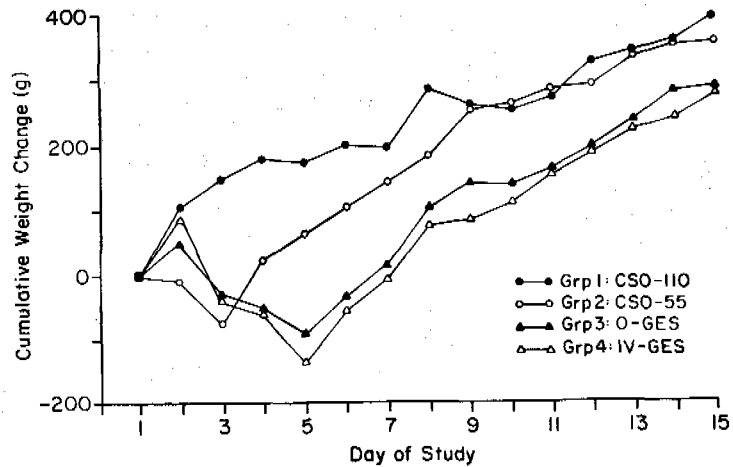
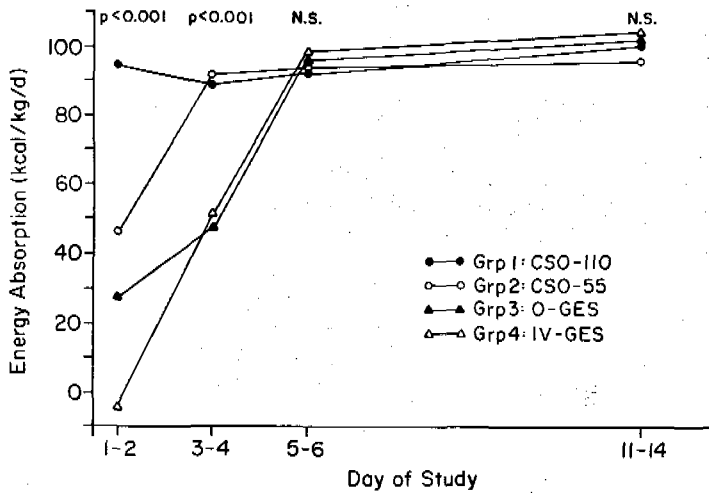


**SEVERITY OF DIARRHEA AMONG BREASTFED INFANTS  
WHO RECEIVED BREAST MILK AND ORS (--○--)  
OR ORS ONLY (--●--) DURING FIRST DAY OF THERAPY**



Adapted from Khin-Maung-U, *et al.*, Br Med J 290:587-589, 1985

### NET ABSORPTION OF ENERGY AND INCREMENTS IN BODY WEIGHT OF CHILDREN WHO RECEIVED VARIED AMOUNTS OF DIETARY ENERGY DURING EARLY HOSPITAL-BASED THERAPY FOR ACUTE DIARRHEA



CSO-110: 110 Kcal/kg/d; CSO-55: 55Kcal/kg/d for two days, then 110 Kcal/kg/d;

O-GES: oral glucose electrolyte solution only for two days, then 55 Kcal/kg/d for two days, then 110 Kcal/kg/d;

IV-GES: Intravenous glucose electrolyte solution only for two days, then 55 Kcal/kg/d for two days, then 110 kcal/kg/d.

Data from Brown, *et al.*, J Pediatr 112:191-200, 1988.



## APPENDIX II

# ETHNOGRAPHIC FIELD GUIDE

## COLLECTION OF INFORMATION ON FEEDING PRACTICES DURING DIARRHEA

### INFORMATION TO BE COLLECTED

This guide covers the breadth of information that should result from interviews with key informants. Interviews with others, which must necessarily be of shorter duration and of a non-repeated nature, should not go into great depth on general issues. The key issues of diarrhea management should be the emphasis for non-key informant interviews.

The guide should be read through carefully several times before conducting the first interview and may be helpful for the first several interviews. The goal should be to "know" the material well, so that interviews will be complete in content, but spontaneous in form. The sequence that is presented here need not be strictly followed. However, all the key elements should be covered in each topical area.

### EXPLANATION OF STUDY

Introduce yourself. Explain your program association and that you are interested in learning about child feeding, health, and illness. Stress that you are not an expert in any of these areas, but that your work is to understand what people do.

### GENERAL ILLNESS TAXONOMIES

Begin by asking, "Can you give me the names of all the kinds of illness people have around here?" First, simply acquire a list of all the names. Try

prompting the respondent by suggesting seasonal illnesses: "What kinds of illness occur here in winter?" After compiling the list of illnesses, go back to the beginning of the list and ask, "What is the symptom of this illness?" Probe for detail here. For example, the respondent may give the name *gripe*, with the following associated symptoms: fever, sore throat, and runny nose. Ask, "If there is only fever and sore throat, but not a runny nose, is it still called *gripe*, or would that illness have another name?" For this primarily taxonomic exercise, there is no need to ask about causes or treatments.

### CHILD ILLNESS

Refer to the list of general illnesses. Ask, "Which of these illnesses do children experience?" Make a new list of child illnesses. With this list, repeat the exercise used for general illnesses. Find out what the symptoms for each illness are. Once this has been accomplished, ask whether any of these illnesses are serious, and under what circumstances. For example, if the respondent answers, "Measles is very serious," you should ask, "What can happen to a child with measles? Are there any circumstances when measles is not so serious?"

For some of the childhood illnesses, ask about causes and treatments. Don't do this for all illnesses, as it would require too much time. The objective is to be able to make some distinctions between diarrhea and other illnesses. For example, ask, "When the child has *gripe*, what do you do? If he or she doesn't get better, then what do you do?"

### CHILD DIARRHEA — GENERAL

If diarrhea has been mentioned as a childhood illness, return to it by saying, "You mentioned that diarrhea is a childhood illness, what is diarrhea? How do you know the child is having diarrhea?" How diarrhea is *perceived* by the respondent is one of the key questions. Ask if there are any special names that are given for diarrhea. Are there different "types?" What are the names and physical characteristics (descriptions) of each type? What is the cause of each type? What is the best treatment for each type?

Ask if the respondent considers diarrhea to be a serious thing? If not, probe for why not. If yes, find out the reason. Ask if any one type of diarrhea is more serious than another. Determine why. Ask what can happen to a child with diarrhea. Here probe for cognitive beliefs about a developmental sequence

for a diarrhea episode. Get good descriptions of the symptoms and physical characteristics of each stage. Probe for distinctions between the different types of diarrhea and possible alternative outcomes.

Refer to the causes that have been given for each diarrhea type. Ask if the respondent thinks diarrhea can be prevented. If yes, how? If no, why not? Refer to the treatments that have been mentioned for each type. Probe for more detail on treatment. Find out when during an episode a particular treatment should be done, and why. Do people use both home and health/medical treatments at the same time? What kind of advice do their doctors and health practitioners give them about what to do during diarrhea? (Ascertain what kinds of health care is available, what people prefer, etc.)

## CHILD FEEDING — NORMAL, DURING DIARRHEA, AND AFTER DIARRHEA

Determine what people normally feed their infants and children. Ask about breastfeeding and weaning practices: When is the best time to wean, and why? What are the best foods to offer, and why? When should other foods (list them) be offered, and why? When should breastfeeding be stopped completely, and why?

Ask about how food availability and food production influences what a child eats, and determine the amounts available. Find out if there are any times of the year when there is not enough food. If so, do people have enough money to buy from the market? Do they ever experience hunger? Are there times of the year when mothers think their children don't get enough to eat?

For some interviews with mothers who have small children, get a 24-hour recall of all foods that were consumed. Begin by asking, "Yesterday when the baby or child woke up, what was the first thing that he or she ate?" Find out what the mother gave the child throughout the day until the child went to bed. Don't worry about recording *amounts* of foods, just find out which types of foods the child consumed. Be sure to get these lists for a wide range of ages of children.

Ask about feeding during diarrhea. Start with a general question: "When a child has diarrhea, should he or she be fed differently?" Let the respondent answer spontaneously, then probe for

details about changes in the amounts and kinds of foods that should be given during diarrhea. Find out the reasons for these changes. If the respondent believes that some foods are useful or harmful during diarrhea, get a list of these along with the reasons.

After discussing feeding during diarrhea, go back to the matrix of the different "types" of diarrhea. For each type, ask whether there should be changes in the amounts or kinds of foods that should be given. Find out when changes in feeding during a diarrhea episode should occur: At the onset? After a few days? Probe, but don't lead. For those foods that have been listed as useful, get precise recipes (if such preparation is required). Ask about child feeding right after the diarrhea has stopped. Are there any changes in the amounts or kinds of foods given? Does a child appear more or less hungry?

## THE LAST DIARRHEA EPISODE

Ask about the last diarrhea episode that occurred in the household. Find out the age and sex of the child. Ask the respondent to describe everything that happened, beginning with the physical description and symptoms (e.g. number, color of stools, vomiting, etc.). What do they think caused the diarrhea? Ask about treatments that were given. When during the episode, and why, was each treatment done? Who and how was the decision made for each treatment? Were they happy with the outcome of the treatment/s?

Ask about feeding during diarrhea. Find out amounts and kinds of foods given. Was more or less food given? Did the child seem more or less hungry? When during the episode, and why, did changes in feeding occur? What were the reasons for these changes? Were the changes perceived as beneficial?

## WOMEN'S WORK/CHILD CARE

Find out what kind of work women do during the day, and how this changes throughout the year. Begin by talking about the current season. Ask what women do when they first wake up: Then what? Then what? Next, ask how this changes during the next season. Probe to see if women perceive conflicts between their non-domestic work and their domestic work—including child care. If women do work substantially outside of the home, who takes care of their children?

## FOOD PRODUCTION/AVAILABILITY/ CONSUMPTION

Ask what foods are currently being grown. Find out who does the agricultural work. What happens to the food when it is harvested? Is the food processed in the home? By whom? Is the food grown for local/household consumption, or for the market? What foods are grown during different seasons? Within a household, do all family members eat these foods — how is the food that is grown distributed? Which foods that the family consumes must be bought in the market place? Which foods are obtained not from food production or the market, but from alternative sources (e.g. food aid, exchange/barter). Make lists. In the homes of your key informants, do a food inventory (list all the foods, and amounts, that are currently in stock).

## COMMENTARY ON INTERVIEW GUIDE

In the everyday activities and experiences of people, childhood diarrhea — its perceived causes and consequences, and what to do about it — is but one small footnote. Understanding how people "get their groceries," or provide resources for their families, is of key importance. For women who have multiple work roles but finite time, a description of their usual activities (and how these vary seasonally) is a necessary prerequisite to understanding how they manage an illness like childhood diarrhea. Therefore, one important goal of the preliminary ethnography is to "paint a picture" of women's work and how this changes throughout the day and year.

Although the focus of a DMD project is on feeding during and after diarrhea, these behaviors cannot be separated from the larger cultural context of childhood diarrhea. Similarly, it is necessary to understand how diarrhea as a child illness is perceived in relationship to other child illnesses, such as measles, chickenpox, upper respiratory infections, etc. It is possible that some respondents will perceive that diarrhea episodes follow a somewhat predictable sequence of developmental stages, and that specific symptoms will trigger a change in behavior — an action. For example, an increase in the number of stools may result in the mother (or other caretaker) making a change in feeding patterns, or the child may be taken to the doctor. Similarly, the combination of fever and vomiting may precipitate specific actions. In the interviews, first probe to see if diarrhea can be described developmentally, and if so, link these descriptions or "stages" to beliefs about what the appropriate response (or action) should be.

*Probing for cultural definitions and subcategorizations of diarrhea, beliefs about cause and treatment for each "type" of diarrhea, and differences in feeding for each diarrhea "type" is of key importance.* The matrix shown below structures the key information. In writing the final report, it should be possible to fill in this matrix from information gathered during the ethnography. It is assumed that the ethnography will be done in multiple sites, where ecological and/or cultural differences exist. The matrix, therefore, will no doubt be different for each site.

The names for the different "types" of diarrhea may or may not reflect its characteristics. Probe in detail for the descriptions. There may be more than one characteristic for each diarrhea type. The perceived cause for each diarrhea type should be described in detail. Often, the perceived cause may lead to clues about intervention barriers. For example,

### MATRIX OF SUBCATEGORIES OF DIARRHEA

|   | Name of Diarrhea | Characteristics (Description) | Cause | Preferred Treatment | Feeding Practices |
|---|------------------|-------------------------------|-------|---------------------|-------------------|
| 1 |                  |                               |       |                     |                   |
| 2 |                  |                               |       |                     |                   |
| 3 |                  |                               |       |                     |                   |
| 4 |                  |                               |       |                     |                   |
| 5 |                  |                               |       |                     |                   |

## LOGISTICAL ISSUES

In some cultures, teething diarrhea (which is perceived to be caused by teething and related to a developmental stage in a child's life) is considered a "rite of passage," and to some mothers may not be seen as requiring or responding to an intervention. It may not be seen as serious, but rather a positive benchmark of growth. This is the kind of description that should be brought out in the interviews. It is not enough to know that one type of diarrhea is called "teething diarrhea" and that it is caused by teething. The context around each finding must be determined.

Beliefs about what are thought to be the best or most appropriate treatments should be described for each type of diarrhea. Often what people think are the best things to do are not what they actually do. One way of finding out what people do is to ask about the last diarrhea episode. Find out about actions that were taken then. Treatments should include both home treatments (e.g. herbal) or treatments outside of the home (e.g. medical doctor, village health guide, chemist, exorcist, etc.). It is expected that for different "types" of diarrhea, there will be different treatments.

The information about feeding during diarrhea is key to the project. A significant portion of the interview should address the feeding issue. In order to contrast differences in feeding patterns during normal or healthy times compared to when the child is having diarrhea, normal infant and child feeding patterns must be understood: When should a child be weaned? What kinds of solid foods should be given first? etc. In reference to feeding during diarrhea, questions should be asked about amounts and kinds of foods given. Foods that are considered useful and harmful during diarrhea should be listed, and the reasons for these beliefs. It may be that the different types of diarrhea have different lists of foods, or that the amount of food that should be given will vary by type. Determining this will require extensive questioning. For those foods that are considered "useful" or that are often given during diarrhea, obtain a detailed recipe for its preparation.

Feeding after diarrhea, during what is called the convalescent stage, is important. Find out if mothers feed differently during this time, compared to during the episode or when the child is healthy. Amounts and kinds of foods should be listed, along with reasons for these beliefs and practices.

It is assumed that the selection of sites for the preliminary ethnography will be made in the field by the project team. The sites will be chosen based upon ecological, agricultural, cultural/linguistic, population demography, etc. criteria. Given time and logistical constraints, a small number of sites will be chosen for the preliminary ethnography. Fieldwork should be carried out for about two weeks in each site.

The entry process for each site must be done carefully and sensitively. The first people to approach are the village leaders. A letter of authorization from the Ministry of Health should be shown, and the project explained. It is essential to gain the goodwill of the important influencers. Without it, there is little chance of conducting free-flowing interviews over an extended period.

If it is possible to live directly in the village or site where the preliminary ethnography is to be done, this is optimal. However, this may not be practical or acceptable to the villagers, and discretion is required in making a decision about where to base the ethnography.

Within each site, some fairly systematic criteria for choosing respondents should be established. Decisions about who to interview should be based upon one important principle: *capture the variation*. For example, suppose the ethnography will take place in a village of one thousand population, with approximately 200 households. On the first day of ethnography in this village, some quick demographic surveillance should be done to "map" or stratify the village into important divisions. For example, is there a clear socioeconomic stratification? One way of measuring this is to map the physical "types" of houses: Which are made with more expensive materials? Which have tile floors as opposed to mud floors? Are the different types clustered in one area of the village? Rapid surveillance and quick sketches will provide a structure for selection of respondents. For the example provided above, it is important to choose respondents from all the levels of strata.

Within each strata (and socioeconomic status is often the most important as it covaries with a number of other important variables) identify key informants. Key informants are respondents who may be particularly knowledgeable about the issues. Lengthy, repeated interviews should be done with key informants. In a DMD project, key informants could include a midwife or village health guide or mothers who have several young children. Again, choose enough key informants to capture the variation. Although knowledgeable, a village health guide may

## ANALYSIS OF DATA AND REPORT WRITING

know too much about the "scientific" way to manage diarrhea, and may be out of touch or judgmental about what other people do. The only way to find key informants is to talk to many different kinds of people, and return for second interviews with key informant candidates. For each of the two sites, there should be about five key informants.

Along with key informant interviews, which are characterized by their more intensive, longitudinal nature, one-time only interviews should be done with a wide variety of people. Don't limit the choice to mothers of young children only, although this is certainly the target group (the focus should be on mothers with children three years and under). Don't forget grandmothers and mothers-in-law, who are important influencers, especially if they live in an extended family where young children are being raised. If it is possible to talk to fathers, carry out some interviews with them. It is not unlikely that they are important decision-makers in the household, and it is important to know what they believe. In many settings, fathers are the household members most likely to make a decision to take a child to the doctor, and often they, not the mother, take the child to the practitioner, clinic, or hospital.

In many cultural settings, group discussions (focus group interviews) provide valuable information. Often, focus group interviews may allow a more free-flowing and open discussion, and information may come out which would not in a person-to-person depth interview. However, it is possible that the composition of the group will actually inhibit spontaneity. An example of this could be when a mother-in-law and daughter-in-law are both in the same focus group, and the daughter-in-law is overshadowed or inhibited by her mother-in-law. Make your own evaluations on whether group interviews are useful. In many settings, it may be impossible to conduct interviews that are not in some sense focus group, as people will wander in and sit down to talk. When this happens, find out who is there: Mothers of young children? Do they work outside the home? Write this information in your notes.

When conducting interviews, it is important to cover the same topics for each interview. Notes should be taken during each interview. In the late afternoon and evening, read through the notes and add details. Remember, this is the only data and it must be result in *usable* and *reliable* information. It is very likely that project investigators will want copies of the notes. They should be legible and understandable. Make sure to allot enough time to transform field notes for this purpose.

Use the format of the guide as an outline for your data analysis and write-up. Given time constraints, don't worry about elegant style, but focus on pulling out the key pieces of information.

Where there are differences of opinion between respondents, point these out. And list all of the different responses, giving weight to those that are more commonly mentioned. Beware of giving "normative" descriptions and don't make statements like, "mothers believe this or that...." There are many different kinds of mothers.

One of the most important tasks is to look for the variation. Be careful not to overemphasize interesting or "exotic" results at the expense of less interesting but more relevant data. For example, do not give undue attention to mothers who take their children to exorcists. In fact, the percent of mothers who do this may be very low, but because it makes for interesting discussion and reading, there may be a temptation to dwell upon such a finding in the report.

Summarize the data in tables, and provide frequency distributions of pertinent information. Disaggregate the tables by site or urban/rural categories. Tables help in the organization of notes and are useful to the interdisciplinary team members.