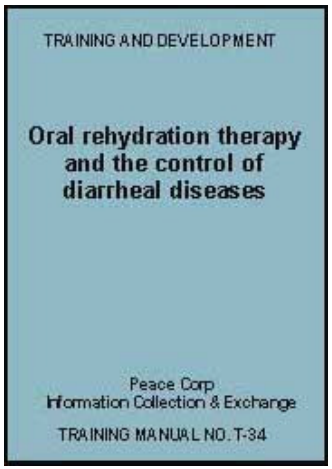

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Since 1961 when the Peace Corps was created, more than 80,000 U.S. citizens have served as Volunteers in developing countries, living and working among the people of the Third World as colleagues and co-workers. Today 6000 PCVs are involved in programs designed to help strengthen local capacity to address such fundamental concerns as food production, water supply, energy development, nutrition and health education and reforestation.

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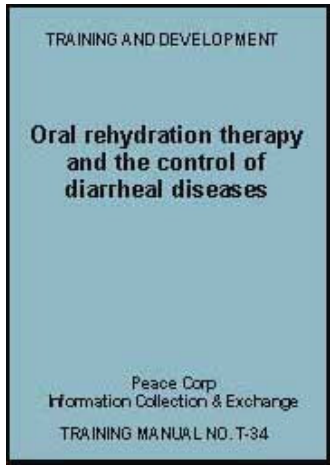

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We hope that the efforts of everyone who participated in the development and testing of this manual and to those who will use it in the future, will lead toward the goal, as stated by Mr. M. Peter McPherson at the International Conference on Oral Rehydration Therapy, "of applying a simple and effective technology to one of the scourges of mankind which is holding tenaciously to societies in the developing countries of the world".

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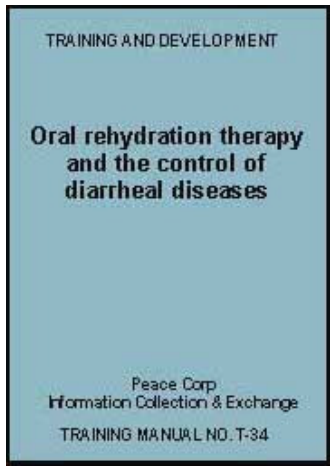

Introduction

An estimated 500 million children in the developing world suffer from diarrhea three or four

times a year. These frequent bouts of diarrhea aggravate malnourishment, increase health care costs, undermine the mental as well as physical development of the children affected, and place a greater burden on the parents and siblings who care for them. One out of every twenty children born into the developing world dies before reaching the age of five from dehydration resulting from diarrhea. The majority of these 5 million dehydration deaths could be prevented by the use of oral rehydration therapy (ORT), a relatively inexpensive solution that can be given in the home.

During the International Conference on Oral Rehydration Therapy (ICORT) in June 1983, top government officials and heads of mayor international health organizations made commitments to increase public access to oral rehydration therapy. One outcome of this meeting was an agreement between the United States Agency for International Development and the United States Peace Corps Washington Headquarters to Involve Peace Corps Volunteers in the promotion and Implementation of Oral Rehydration Therapy worldwide.

The Oral Rehydration Therapy Initiative, a collaborative effort between Peace Corps and AID aims to reduce child morbidity and mortality from diarrhea by promoting ORT at the village level.

The ORT Training Manual was developed to support this initiative with a generic training model designed to be adapted to country specific conditions and needs. The manual is intended for use in inservice training of Peace Corps Volunteers and their Counterparts, and can be adapted for preservice Peace Corps training, to develop the basic knowledge and skills in the broad areas of:

- **Prevention and control of diarrheal diseases (CDD) in the context of primary health care activities.**
- **Use of oral rehydration therapy (ORT) on a widespread basis in rural communities.**
- **Identification and referral of dehydration cases.**
- **Improvement of child nutrition through promotion of breastfeeding and nutritional foods during and after diarrhea.**

- **Health education project planning, implementation monitoring and evaluation with ORT and CDD.**

If Volunteers and Counterparts will be working heavily in dehydration assessment and treatment, the training curriculum should be adapted to provide participants with more opportunities to practice skills in the community and local clinic under the supervision of qualified health workers. Sessions 5, 6, and 7 can easily be expanded to include additional hours for observation and hands-on practice with actual cases of dehydration.

Drafts of different parts of this training design were pretested in the Philippines, Nepal, Senegal, Gabon and Mauritania and the outcomes incorporated into this final draft. Guidance with regard to the technical content of the manual was provided by the Office of Health, United States Agency for International Development, the Centers for Disease Control and the World Health Organization.

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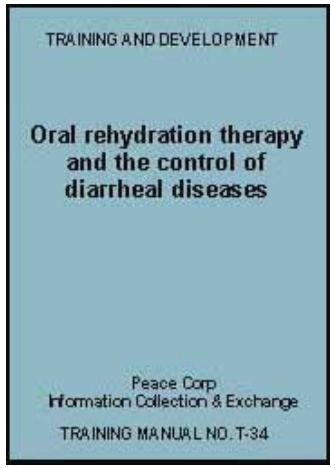

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Approach to training

The approach to training used in this manual is based on principles of nonformal education and adult learning. The sessions provide a balance between structured learning and independent discovery.

working assumption is that training is a creative process which requires that participants take an active role in identifying their own needs and in implementing session activities. Trainers are expected to identify and use the talents and resources within the group and community and to practice skills that help to motivate others toward self-reliance.

The goal of the training is for participants to develop a working knowledge of ORT/CDD, and skills for applying that knowledge in a meaningful way, particularly in health education activities and training of other community health workers. Both the goal and the approach follow from the Peace Corps philosophy of providing a role model and working with others rather than for them.

The ORT Manual can be considered a modified "competency-based" training design. It aims to help Trainees attain and demonstrate knowledge and skills (I.e. competencies) in ORT and CDD that they can apply in the community. Competencies are expressed in behavioral training objectives which appear at the beginning of each module. These objectives were developed based on review and analysis of the tasks performed by Volunteers working in ORT and CDD in the context of Primary Health Care. Within modules, each session includes one to four learning objectives. For the purposes of this manual, a learning objective describes what the Trainee does along the way toward accomplishing the terminal behavioral objective.

At the beginning of the training, participants should examine all of the behavioral objectives to be achieved by the end. Session 1 includes an activity in which trainers and Trainees examine, clarify and modify training objectives and design to meet group expectations.

Within sessions, activities follow the experiential learning cycle. This learning model provides an

effective way for Trainees to gain competencies and focuses on learner-centered adult education, emphasizing in particular:

- the trainer as facilitator of learning (rather than provider of information).

- variety of educational methods to meet individual learning needs.

- learning goals, objectives, and activities which relate Trainees' previous knowledge and skills to those acquired during training, and application to the Job.

- Trainees' taking responsibility for their own learning.

- active participation of Trainees'

Experiential learning occurs when a person' (a) engages in an activity, (b) reviews the activity critically, (c) derives insight from the analysis, and (d) applies the result in a practical situation. When adapting the sessions from this manual to tit specific training situations, we recommend retaining all four of these steps. For example, if a session needs to be shortened, the trainer should modify the steps such that the Trainees' still experience, process, generalize and apply' cutting out the application step to shorten the session time is not a viable modification.

Some techniques used to actively involve learners are:

demonstration	role play
large group discussion	simulation
small group tasks	case studies
lecturettes	slide shows
community visits and interviews	readings
storytelling	skills practice

In facilitating learning, the trainer should create "learning environments" which are stimulating, relevant and effective. To the extent possible, the local community and resources should be

utilized in conducting training.

For a fuller description of the experiential learning model and other valuable information on training design and delivery, please refer to A Trainers Resource Guide, Peace Corps and Session 19, Designing and Evaluating Health Education Sessions.

Basic Assumptions of the Manual

The ORT Manual reflects assumptions about the PCV as a development worker adapted from Peace Corps, The Role of the Volunteer in Development Manual:

Self Sufficiency:

Peace Corps Volunteers help others gain increasing self sufficiency.

Skill Transfer and Role Model:

PCVs are assigned a role in which the skills they possess are transferred to others, enabling local people to continue to solve problems.

Training as the Example:

We learn to train others the way we are trained. The sessions in this manual are designed to promote critical thinking, personal responsibility, active problem solving, and thorough analysis of information.

Problem Solving and Project Management

Volunteers are required to set goals, define tasks, and plan their day by day activities. Volunteers who are able to solve problems and manage themselves, possess a skill directly related to development work.

Gathering and Using Information

How information is gathered, sorted, filtered, verified, and put to use is critical to the process of understanding and defining development problems.

Role Definition:

Throughout the manual, focus is kept on the Volunteer's role in relation to ORT and CDD in the context of primary health care and development.

Organization of the ORT Training Manual

The ORT Manual is arranged in sections, called modules, which focus on interrelated health education and technical content areas. Each module begins with a set of behavioral objectives and contains a sequence of sessions which address the specific content area. The modular format allows the trainer to combine various modules and sessions as needed given training objectives, time limitations, and other program considerations.

It is important to note that these modules are not complete in themselves, They are based on modules in the Technical Health Training

Manual (THTM) and cross referenced to resources in the THTM. The cross-referencing feature is particularly useful in pre-service training and in providing elementary materials for Counterparts who may lack background in certain areas. (See "Using and Adapting the ORT Manual..)

The modules are:

1. **Climate Setting and Assessment**
2. **Diarrhea, Dehydration and Rehydration**
3. **Diarrhea and Nutrition**
4. **Working with the Health System**
5. **Working with the Community**
6. **Community Health Education.**

All sessions in the manual follow a consistent format which is briefly explained below. Sessions

often have several purposes. For example, the activities may provide skill development on ORT and also provide participants with practice in nonformal education methods and materials development for teaching mothers, children and health workers about ORT. It is important for the trainer to study and understand the multipurpose design of a session before conducting it.

Session Format

Session Number

TITLE

TOTAL TIME

The total time scheduled for the session.

OVERVIEW

A brief statement on how the session relates to the overall training program, the activities in the session, and the expected learning outcomes.

OBJECTIVES

Statements of what is expected of participants in order to successfully complete the training course

RESOURCES

Printed materials needed for the session or useful for background information and available to Peace Corps stats and Volunteers through ICE

Handouts follow most sessions. Each handout is coded to the corresponding session and paginated Copies of handouts should be made in advance for distribution to trainees as specified in the session.

Trainer Attachments are also coded and follow some sessions. These are intended as resources for the trainer and are sometimes to be shared with participants who help with session preparation.

MATERIALS

Supplies and tools needed for the session.

PROCEDURE

A series of steps to follow in order to meet the objectives of the session.

Trainer Note

Notes to further explain the activities of the session. These include such things as alternatives, scheduling considerations, suggestions and further directions to the trainer.

Allowance is made for break time in each session. As the nodules and sessions ate modified, the trainer should always work in 5 minutes of break time for each hour of training and should decide when the actual breaks occur.

The nine-day, six-day, and four-day training schedules shown on the following pages indicate overall program design and suggested sequence of sessions for varying degrees of ORT/COD material mastery. All three schedules assume that participants will undertake ORT/ CDD activities in their host communities after the workshop so that they will further develop the knowledge and skills introduced in the training The schedules should therefore be used as references for developing workshops which meet the needs of particular training situations, but should not be perceived as completely sufficient without follow-up and the opportunity to use the skills taught.

Day One	Day Two	Day Three	Day Four
Climate Setting	Climate Setting	Climate Setting	Climate Setting
Session 1 Diarrhea Dialogue (2 hours) Session 10 National Health Policy and Programs (2 hours)	Session 4 Dehydration Assessment (3 hours)	Session 13 The Impact of Culture on Diarrhea (4 hours)	Session 19 Designing Health Education Sessions (3 hours) Session 21 Resources (1 hour)
Lunch	Lunch	Lunch	Lunch
Session 3 Prevention and Control of Diarrheal Diseases (3 hours)	Session 5 Rehydration Therapy (4 hours)	Session 7 Nutrition During and After Diarrhea (3 ½ hours)	Session 22 Practicing and Evaluating Health Education Sessions (2 hours) Session 2 Training Program Evaluation (1 hour
Daily Review	Daily Review	Daily Review	

SAMPLE FOUR-DAY SCHEDULE

Day One	Day Two	Day Three	Day Four	Day Five	Day Six
Climate Setting	Climate Setting	Climate Setting	Climate Setting	Climate Setting	Climate Setting
Session 1 Diarrhea Dialogue (2 hours) Session 10 National Health Policy and Programs (2 hours)	Session 4 Dehydration Assessment (3 hours)	Session 7 Nutrition During and After Diarrhea (3 hours)	Session 15 Planning and Evaluating Health Education Projects (3 hours) Session 21 Resource (1 hour)	Session 17 Selecting and Using Visual Aids (3 hours)	Session 22 Practicing and Evaluating Health Education Sessions (3 hours)
Lunch	Lunch	Lunch	Lunch	Lunch	Lunch
Session 3 Prevention and Control of Diarrheal Diseases (3 hours)	Session 5 Rehydration Therapy (4 hours)	Session 13 The Impact of Culture on Diarrhea (4 hours)	Session 16 Selecting and Using Nonformal Education Techniques (3 hours)	Session 19 Designing Health Education Sessions (4 hours)	Session 12 Monitoring and Follow up (3½ hours) Session 2 Training Program Evaluation (1 hour)
Daily Review	Daily Review	Daily Review	Daily Review	Daily Review	

SAMPLE SIX-DAY SCHEDULE

Day One	Day Two	Day Three	Day Four	Day Five
Climate Setting	Climate Setting	Climate Setting	Climate Setting	Climate Setting
Session 1 Diarrhea Dialogue (2 hours) Session 10 National Health Policy and Programs (2 hours)	Session 4 Dehydration Assessment (3 hours)	Session 13 The Impact of Culture on Diarrhea (4 hours)	Session 8 Recognizing Malnutrition (2 hours) Session 9 Preventing Malnutrition (2 hours)	Session 15 Planning and Evaluating Health Education Projects (3 hours)
Lunch	Lunch	Lunch	Lunch	Lunch
Session 3 Prevention and Control of Diarrheal Diseases (3 hours)	Session 5 Rehydration Therapy (4 hours)	Session 7 Nutrition During and After Diarrhea (3 hours)	Session 14 Working With the Community (3 hours)	Session 16 Selecting and Using Nonformal Education Techniques (3 hours)
Daily Review	Daily Review	Daily Review	Daily Review	Daily Review

SAMPLE NINE-DAY SCHEDULE

Day Six	Day Seven	Day Eight	Day Nine
Climate Setting	Climate Setting	Climate Setting	Climate Setting
Session 17 Selecting and sing Visual Aids (3 hours)	Session 20 Health Campaigns (1 hour) Session 21 Resources (1 hour)	Electives (Selected Optional) Mini-sessions or Preparation Time for Health Education Sessions (4 hours)	Session 12 Monitoring and Follow up (3½ hours)
Lunch	Lunch	Lunch	Lunch
Session 18 Adapting and Pretesting (4 hours)	Session 19 Designing Health Education Sessions (4 hours)	Session 22 Practicing and Evaluating Health Education Sessions (3 hours)	Session 11 Encouraging Collaboration Among Services (2 hours) Session 2 Training Evaluatio (1 hour)
Daily Review	Daily Review	Daily Review	

SAMPLE NINE-DAY SCHEDULE (CONT.)

Use and Adaptation of the Manual

The manual was prepared as a model for design of training sessions which promote a logical flow of learning. It is not intended to be used without first adapting sessions to focus on country-specific CDD-related health problems and the learning needs of Trainees in their particular assignments. Thus, for example, role plays, character settings, problem situations and other aspects of training activities must be modified to fit local conditions. Information on National CDD policies, programs, and national and regional incidence of diarrhea should be provided during the training as well as a glossary of works and vocabulary for discussing ORT and other aspects of CDO in the local language.

In preparation for adapting the manual to meet specific training needs, the training should:

1. Identify host country health problems, needs and target groups to be addressed during training.

2. Collect country-specific health data and other relevant information, particularly for diarrheal diseases,

3. Determine the primary and secondary health functions which the Volunteer is being trained to perform (preferably utilizing a task analysis).

4. Determine the average level of health knowledge and skills of the group to be trained.

5. Outline desired training goals, objectives, content, activities and evaluation plan.

6. Determine resource needs and availability of resources (e.g. personnel, materials, facilities, and time).

7. Review existing training manuals, designs and materials to determine their adequacy for meeting training objectives.

8. Select, sequence, end adapt specific sessions to be used in the program.

9. Add to the training design:

- **opening and closing activities (e.g. Ice breakers, end-of-training dinner).**
- **climate-setting (e.g. sharing expectations, setting the agenda).**
- **group process (e.g. feedback sessions).**

10. Hake arrangements for participants to practice assessment of nutritional status and stages of dehydration under the supervision of a qualified healthworker after the workshop.

Point 10 requires special emphasis. During the short period of the workshop it is impossible for participants to master skills such as assessment of dehydration and nutritional assessment. Supervised practice with real children is an important part of the mastery of the ORT course material.

These steps are fairly standard for the design of any training program and can serve as a general guide. For a more detailed description of training design and organization, please read "The Trainers' Resource Guide" Peace Corps (ICE).

The following subsections provide ideas for how the manual can be adapted to suit different training situations.

Adaptations Based on Trainee Needs and Experience

The more skill, knowledge, and practical experience participants bring, the more effective and enriching are the small group activities that allow them to pool knowledge and resources to teach each other. The experiential nature of the sessions allows inservice Volunteers and Counterparts to draw on their experiences in the field. They begin with what they already know and apply it to the new learning task. The trainer can use the pretraining quesitonnaires, (Trainer Attachments 1A and 1B in Session 1) to assess entry level knowledge and skills and to become familiar with the Trainees' specific needs and expectations.

To assure that training activities address the practical needs and working conditions of the participants ask them to bring to the workshop: local utensils, treatments for diarrhea and visual aids they use.

Once the training is underway, every effort should be made to adapt training activities to provide experiences and "hands-on" skill practice in the local community (For example: participants can pretest visual aids with members of the surrounding community instead of among themselves in the classroom.)

When generalists and specialists or Trainees' with different Jobs (e.g. Health, water and sanitation, science teacher) are trained together, the trainer should modify sessions so that participants have opportunities to share their different skills and experiences. Through well-organized peer-learning and small group discussions, specialists can contribute their expertise to the generalist skill acquisition, while generalists can help broaden the community development perspective of specialists. Throughout the ORT Manual, specific reference is made to activities which represent opportunities for peer teaching.

Adaptations For Preservice Training Workshops Prior to preservice workshops, trainers can use questionnaires and interviews to identify technical skill levels, perceived needs and current project descriptions of the Trainees scheduled to participate.

During the design stage, the trainer should adjust the sessions so that the "starting point" is the PCV's recent training and U.S. experience. When possible, first and second year Volunteers can be invited to sessions to share experiences with the Trainees.

This manual cross references The Technical Health Training Manual (THTM) to make it easier for the Trainer to incorporate ORT/CDD sessions in a preservice training program. The THTM provides more elementary background in Community Organization and Analysis, and Health Education, it is assumed that participants in training programs using this manual have already developed and practiced skills la community analysis, community organization and health education, and the language spoken in their community for presence training. Participants may require assistance in the local language(s) from the language instructors and first and second year Volunteers to carry out activities gathering information in the community. The Trainer Notes and Resource Sections provide ample materials and suggestions for providing more elementary material or more specialized training.

Joint Volunteer-Counterpart Training

Providing inservice training to both Volunteers and their host-country Counterparts is an ideal training scenario for many Peace Corps programs. Such workshops, however, may present problems having to do with differences in culture, language, teaching and learning styles, and familiarity with the technical subject matter. It is particularly important to learn as much about the Trainees as possible in this situation so that the training design can be adjusted adequately and arrangements made for translation of handouts and charts.

Workshops for Volunteers and Counterparts should include a number of joint sessions in the areas of information-gathering, project planning, and skill practice end separate concurrent sessions in areas of "hard" technical information and theory. The training design may need to be modified for the Counterparts' sessions.

In planning for joint Volunteer-Counterpart training the following is suggested:

1. If possible, select a trainer who can speak the local language. If this is not feasible, have a bilingual/bicultural resource person assist in workshop design.

2. Use the services of a professional translator if the training will be conducted in two languages. Do not expect the trainer to have the skills of a translator.

3. Allow extra time during the training sessions for translation.

4. Encourage both Counterparts and Volunteers to increase their understanding of the way the other groups learn by working together in the training program. This is also a good opportunity for Volunteers to increase their vocabulary and skill in the local language.

5. Prepare both groups to be patient and with some repetition and translation during the training.

6. Prepare a vocabulary list of local words needed to talk about ORT and CDD.

Adaptations Based on the Size of the Training Group

The session and activities in tints manual are designed to accommodate training groups of approximately 20 participants. If you anticipate a significantly larger number of participants, consider dividing them into two subgroups, each with its own technical trainer. If the larger group cannot be broken into smaller groups, time allotments for many of the activities will have to be exceeded. This is especially true in sessions which include small group tasks followed by reporting back to the large group.

Adaptations Based on Previous Use of the Manual

The technical and educational information contained in this manual is current at the time of this writing. However, advancing technology means modification will be needed to keep the manual up-to-date. Trainers are encouraged to write notes in the margins of the manual where new information applies or on activity was changed and improved. Also note changes in the time

required to conduct the sessions as the session times listed are only estimates.

Adaptations Based On Available Materials and Equipment

It is best to use materials and equipment during the training that participants will have available in their host communities. They may have access to more or less variety of materials and equipment than suggested in the model and sessions should be modified accordingly. For example, you might want to use a film instead of a reading or discussion of a picture because particular health films are available in the country. Or you may want to substitute drawings or photographs where slides are suggested if slides are not available. Encourage participants to locate possible sources of materials and equipment from various agencies in the country.

Case studies, examples, stories and pictures will need to be modified to make them more appropriate for the local situation. If the trainer is not an artist, it is possible that someone in the community who has artistic skills would enjoy helping him or her adapt materials or design new ones.

Resources

In order to allow for broad applicability in a variety of countries, the ORT Manual has been written generically and has been drawn from a variety of references. The complete collection of materials used in the sessions is listed in the Bibliography at the end of the manual. The primary technical resources are the Supervisory Skills Modules: Programs for Controlling Diarrheal Diseases and Guidelines for Training Community Health Workers in Nutrition, both from WHO. Technical materials from CDC, AID, WHO, and UNICEF have also served as sources of accurate information and case examples.

Primary resources for Module 5, Community Analysis and Organization and Module 6, Health Education are Community Culture and Care, Helping Health Workers Learn, Bridging the Gap, Teaching and Learning with Visual Aids, and Community Health Education in Developing Countries.

The references, handouts and trainer attachments included with each session should be

considered the mayor resources for the actual training. All of these materials are either available to Peace Corps trainers and Volunteers through Information Collection and Exchange (ICE) or are attached to the sessions to which they pertain. ICE also provides an annotated listing of available health publications and an ORT resource packet.

If possible, participants in ORT Training Courses should receive: the ORT Resource Packet, Bridging the Gap, Helping Health Workers Learn and Community Health Education in Developing Countries.

In addition to assembling written materials, the trainer should visit local agencies and groups and international organizations to obtain a variety of visual aids and support materials for use by both trainers and Trainees during the program. Training staff should pay attention to the various items identified in each session under "Materials" and locate these at the beginning of the program. Many people find it helpful to photocopy and compile all of the handouts ahead of time to avoid last minute "crises" in preparations.

A final, but important note on reference materials' in the course of develop tog this manual, extensive review of published data has revealed significant variations in some technical information and recommendations, For example, there are several variations in the "correct" amounts of sugars and salt required for one liter of homemade sugar salt solution. In some cases these variations represent differences in technical perspective and in others, outdated information. As of the final revision of the manual, all technical information is based on the most current and accurate data and guidelines available from WHO and CDC. Great care has be taken to ensure the quality of the technical material included in sessions, handouts, trainer attachments and suggested readings. As with any technical document, however, the content will have to be revised and up-dated in accordance with conclusions drawn from the most recent research.

Trainers and other users of the manual should always check with Peace Corps as well as host country health ministries to revalidate or modify material to ensure that it is consistent with country health policy and programming, particularly in the area of measurements for Oral Rehydration Solutions and the effectiveness of home available solutions.

Staff Preparation

The ORT Manual includes detailed session procedures and explanatory trainer notes for the benefit of seasoned as well as less-experienced trainers; merely following the steps in the sessions, however, does not guarantee a successful program. The training staff who design and conduct the program outlined here should represent a balance of skill and experience in adult training methodology, experiential learning, and technical expertise in the subject matter. The staff should be flexible and able to "let go" so that the participants are encouraged to take an active role in their education,

In addition to trainers' background skills and expertise, program success depends on adequate preparation time. A "training of trainers" workshop should be scheduled before the program, to provide the stuff an opportunity to review the most up-to-date technical content, practice training skills and build a cohesive and supportive team.

During the preparation time, trainers should review and adapt the session designs, prepare lecturettes in their own words, and have a complete sense of exactly what each session is trying to accomplish. If at all possible, trainers should simulate or rehearse sessions in order to anticipate questions and gain a sense of session flow. AT least one member of the training team should have a technical health background. Local health professions can also act as resource persons and present some of the more technical health aspects of the training.

Evaluation

Before dealing with the "how to do it" aspect of evaluation, it is useful to discuss "why do it".

Evaluation is an integral part of every training program and should be designed from the start of planning. It should include an assessment of the conduct of the program (logistic and administrative organization, and presentation of activities) as well as of the outcomes (If the participants have accomplished the objectives). Evaluation is a learning process which allows both trainers and trainers to:

- **Test the knowledge and skills acquired during the course;**

- Analyze the effectiveness of the activities used;
- Judge the appropriateness of the educational material used;
- Give participants and trainers a chance to express their criticisms and suggestions.

Constant evaluation during training is as important as final evaluation. Comments, criticisms and suggestions can be solicited during periodic meetings, informal conversations at the day's end, or by way of a suggestion box in the conference hall. These inputs aid trainers in modifying the course as the need arises.

Evaluation Tools Included in the Manual

Several methods for assessing Trainee performance and evaluating the training programs are incorporated into the manual. These include:
- Pre-assessment forms for Volunteers and Counterparts.
- Behavioral objectives for each nodule which state in measurable terms what the participants should be able to do by the end of the segment of training. The trainer can use this to assess participant performance and identify weaknesses in program contort or process.

- A pre-test/post-test system which assesses the participants" acquisition of knowledge and, to some extent, attitude change. The pre-test is part of Session 1, General Assessment.

- A final evaluation session including an evaluation tore (Session 2).

- Participant-led projects and presentations which assess learning and provide participants with the opportunity to immediately apply and practice what they have learned in a "safe" environment. These education events occur throughout the modules and enable Trainees to demonstrate both technical knowledge of primary health care and teaching skills.

It should be noted that all of these evaluation measures reveal either immediate reactions or changes in participants knowledge skills and attitudes. A more reliable judgement of program effectiveness can only be made in the field where participants perform their daily tasks.

Questionnaires, supervisory visits and evaluation meetings, three to six months after the training, are means of gaining greater insight into the utility of the course and future training needs of Volunteers.

For more detailed information on evaluation, please refer to Demystifying Evaluation (Clark and McCaffery) and Helping Health Workers Learn.

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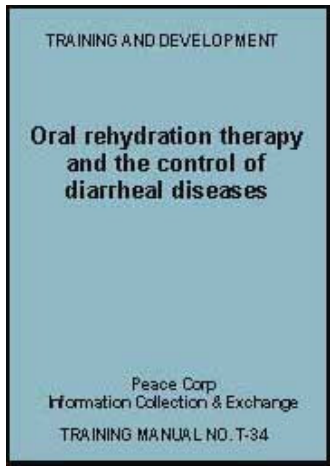


- **Oral Rehydration Therapy and the Control of Diarrheal Diseases (Peace Corps, 1985, 566 p.)**
  - **Module One: Climate setting and assesment**
    - **Session 1 - Diarrhea dialogue: Assessing our knowledge, needs and skills**
      - ***(introduction...)***
      - **Handout 1A: Pre-test**
      - **Handout 1B: Training objectives**
      - **Trainer Attachment 1A: Pretraining questionnaire for volunteers**
      - **Trainer Attachment 1B: Pretraining questionnaire for counterparts**
      - **Trainer Attachment 1C: Trainer pretest guide**
      - **Trainer Attachment 1D: ORT Pretest answer sheet**
    - **Session 2 - Training program evaluation**
      - ***(introduction...)***
      - **Handout 2A: Training evaluation**

Oral Rehydration Therapy and the Control of Diarrheal Diseases (Peace Corps, 1985, 566 p.)

Module One: Climate setting and assesment

Session 1 - Diarrhea dialogue: Assessing our knowledge, needs and skills

TOTAL TIME

2 hours

OVERVIEW

Participants in this training course bring different skills, experiences, knowledge and perspectives about diarrhea, oral rehydration and ways to prevent diarrhea. In this opening session, an icebreaker activity sets the climate for friendly group relations and enables individuals to share experiences and interests. Participants assess their knowledge of the training course content through a pretest. They also discuss country and community health problems related to diarrhea. Participants and trainers exchange expectations about the training course and review the training schedule.

OBJECTIVES

- **To assess knowledge, skills and experience in diarrheal disease control, particularly oral rehydration therapy.**
  (Steps 1-4)

- **To describe the kinds and extent of the country's health problems related to diarrhea.**
  (Steps 3, 4)

- **To list expectations about the activities and outcomes of the training course.**
  (Steps 4, 5)

RESOURCES

Handouts:

- **1A Pre-Test**
- **1B Training Objectives**

- 1C Training Schedule (to be prepared by the Trainer)

Trainer) Attachment:

- 1A Pretraining Questionnaire for Volunteers
- 1B Pretraining Questionnaire for Counterparts of Trainees
- 1C Trainer) Pretest Guide
- 1D Pretest Answers

Materials

Newsprint, markers, pencils and notebooks for ail participants.

PROCEDURES

Trainer Note

Prior to the training, if communications allow, send out the pre-assessment forms:

- Trainer Attachment 1A (Pretraining Questionnaire for Volunteers).
- Trainer Attachment 1B (Pretraining Questionnaire for Counterparts or Trainees).

Use this information to adapt the training design to fit the needs and interests of the Trainees and the health problems on their worksites.

Send the adapted training schedule and objectives to the participants prior to the training, if possible. Adapt the pretest (Handout 1A) according to the training schedule and background of the participants.

Locate visual aids on ORT and arrange them in the training room before the training course. Also, set up a "library" of primary health care and ORT reference books and articles for use during the training.

Translate the pretest into the appropriate language for Counterparts.

Step 1 (30 Min)

Coming Together

Welcome the group and use an icebreaker to make sure everyone has a chance to greet and learn about each other. Ask each individual to briefly describe their work in their community and to share one recent health-related experience. Ask someone to record these experiences on newsprint. Note any similarities or differences in experiences as a reference for the range of backgrounds they are bringing to the training.

Trainer Note

If there are any counterparts in the group, make sure that the Volunteers who invited them introduce them in a culturally appropriate way. Make sure the group includes them in dialogue and discussion throughout the training.

See the Training of Trainers Module in Combatting Communicable Childhood Diseases Training Manual (Peace Corps) for more ideas about setting the climate for the training. See Helping Health Workers Learn, "Getting off to a Good Start," Chapter 4, pp. 4-14, for ideas about specific icebreaker activities.

The length of time required for the step will vary with the type of icebreaker selected and the number of participants.

Step 2 (10 Min)

Introducing the Pretest

Introduce and distribute Handout 1A (Pretest). Explain that it is an "outline" of the main concepts to be covered in the training on ORT and other aspects of the control of diarrheal diseases.

Ask participants to read through the pretest and allow time for questions. Tell them to write

"don't known, whenever they cannot provide the information requested.

Trainer Note

Emphasize that the pretest is intended to enable individuals to assess their own skills and knowledge of diarrhea and ORT. Explain that they will receive the pretest answers at the end of the session in which each particular topic is covered. They can use the pretest as a basis to decide what they want and need to learn about ORT in this training. Suggest that at the end of each session they refer back to the pretest to make sure they have mastered the main concepts and to assess how well the training is covering the important topics.

Emphasize that they will also be learning and practicing skills needed to apply the concepts in community work.

Step 3 (20 min)

Knowledge Assesment

Give participants 20 minute to complete the pretest.

Trainer Note

If some of the Counterparts have difficulty in reading the vocabulary in the pretest, an alternative approach is to ask Volunteers to work together with their Counterparts to answer the questions

Step 4 (45 min)

Diarrhea Dialogue

Have small groups use the pretest experience as a starting point to discuss the following points:

- What local community-based experiences have you had with ORT or other aspects of control and prevention of diarrhea?

- Did your experience help you answer the questions in the pretest?

- What are the mayor health problems related to diarrhea in your community?

- What skills are available in the group to deal with the problems?

- Do the topics outlined in the pretest address these problems?

- What do you expect to gain from this training program?

- What hopes and doubts do you have about this training program?

- What rules should we follow for working together as a group?

Ask each group to select one member as recorder. Ask the recorder to Jot down comments, questions, impressions and experiences on newsprint to share later with the entire group. Make it clear the answers to these questions should provide a list of resources, expectations and rules for working together as a group during the rest of this training program.

Trainer Note

See Helping Health Workers Learn, Chapter 4, pages 11-13, for further descriptions of how to discuss hopes, doubts and other important topics in the first few days of training.

While the participants may not have a clear idea of exactly what they want or need to know at this point in the training, the opportunity to discuss their ideas will force them to reflect on their needs and expectations.

For preservice training modify the discussion questions to draw on participants previous experiences and provide information about health problems in the host country.

Step 5 (20 Min)

Sharing Resources and Expectations

Reconvene the group and ask each recorder to report on their group's discussion, using the newsprint they prepared.

Summarize by comparing impressions and experiences focusing on the resources available within the group. Draw on any unique perceptions of Counterparts in the group.

Make a list of participants" expectations about what they want to learn, and working rules for dally life as a group. Discuss these and get a consensus on the working rules and ideas about ways to deal with the doubts.

Trainer Note

Be prepared to provide accurate information about diarrheal disease particularly in the host country.

Examples of "working rules" from previous training courses include:

- **starting and finishing sessions on tire**
- **not smoking in the training room**
- **stating complaints when they arise; not waiting until the end of the course.**

Step 5 (45 min)

Reviewing Objectives

Distribute and discuss Handout 1B (Training Objectives). Explain each objective briefly by relating it to practical tasks in teching the community about ORT. Compare the objectives with the list of expectations for the training.

Distribute Handout 1C, (Training Schedule) and note that participants will be developing a plan for a health education project during this training and designing and conducting one session within the project plan. Encourage them to work with their Counterpart or another Volunteer to identify a topic and begin exchanging ideas for a project.

If necessary, modify the objective and schedule to fit the expectations expressed in the previous step.

Summarize by reviewing the objectives, and schedule. Encourage participants to express what is going well and what needs to be improved throughout the training, particularly during the dally review at the end of each day.

Trainer Note

If some expectations are outside the scope of this training course, discuss why that is the case. Depending on the teaching and language skills of the participants, ask them to help in preparing for and conducting at least one session now so they that have ample time to prepare. Those with technical or health education background may want to facilitate a session on their own. Such opportunities provide practice and feedback on health education skills. Participant facilitated sessions do require more of the Trainer's time because it is important to work with participants, to assure that their sessions will provide the other Trainees). with the experience and information needed to accomplish the objectives of the training course. In training programs where Counterparts are participating, the facilitator also needs good language skills unless the Counterparts speak English.

See Helping Health Workers Learn, Chapter 4, page 14 for additional ideas about forming trainee "committees"

Handout 1A: Pre-test

Name.....

I. DIARRHEA, DEHYDRATION AND REHYDRATION

1) Name two mayor causes of childhood diarrhea in your country. (Session 3)

2) Explain the primary way diarrheal disease are transmitted. (Session 3)

3) List four health practices that would prevent and/or control the spread of diarrhea. (Session 3)

4) Cite four signs of severe dehydration. (Session 4)

5) List the two most important things to do when a child has some dehydration. (Session 5)

6) Write the recipe for preparing home made sugar-salt solution. (Session 5)

7) List the two ingredients in ORS packets that are usually not found in other rehydration solutions and explain what purpose each of these ingredients serve. (Session 5)

II. NUTRITION AND DIARRHEA

1) Describe the appropriate diet for a one year old child during and after diarrhea. (Session 7)

2) Explain the meaning of "the vicious circle" of diarrhea and malnutrition. (Session 7).

3) Describe four signs indicating a child under two is at high risk for malnutrition and illness. (Session 8).

4) List three kinds of anthropometric measures used in growth monitoring. (Session B).

5) Describe four strategies for preventing malnutrition. (Session 9) .

III. WORKING WITH THE HEALTH SYSTEM

1) Explain the host country national recommendations for the use of ORS packets and home-made sugar-salt solution (or rice-flour water) in the treatment of diarrhea and dehydration (Session 10)

2) List two areas in which Peace Corps Volunteers can collaborate with Host Country National and or other international organizations in the implementation of CDD Programs. (Session 11)

3) Describe four tasks involved in monitoring. (Session 12)

4) Describe the host country's diarrheal disease surveillance system. (Session 12)

IV. WORKING WITH THE COMMUNITY

1) Explain two practices that villagers commonly use when their children have diarrhea. (Session 13)

2) Name two things that villagers believe are the causes of diarrhea. (Session 13)

3) State three techniques used to motivate communities in projects to prevent and control diarrhea. (Session 14)

4) Explain why identifying community leaders is an important step in the planning of your health projects. (Session 14)

V. COMMUNITY HEALTH EDUCATION

1) List five items to include in a health education project plan. (Session 15)

2) Cite three reasons for incorporating evaluation in your project plans. (Session 15)

3) List at least five nonformal education techniques that you can use in health education (Session 16)

4) Describe at least three criteria to use when selecting visual aids (Session 17)

5) Explain why it is important to pretest visual aids before using them with a large group. (Session 18)

6) List three reason for adapting visual aids. (Session 18)

7) List the four steps of the experiential learning cycle and give an example illustrating what you

would do for each step. (Session 19)

Handout 1B: Training objectives

At the end of this training course, participants will be able to do the following:

- **Describe and work in support of National ORT Programs that deal with the control of diarrheal diseases.**
- **Teach and motivate community members to prevent diarrhea through sanitation and personal hygiene.**
- **Teach health workers to assess stages of dehydration and select the appropriate treatment plans using the WHO chart.**
- **Detect and refer dehydration cases requiring IV Therapy or other medical care to appropriate health facility.**
- **Teach mothers and health workers to correctly mix and feed their children two kinds of oral rehydration solution during diarrhea.**
- **Promote breastfeeding and nutritious feeding during and after diarrhea.**
- **Identify and work with one community to modify local health practices affecting diarrhea which have the highest priority for change.**
- **Plan, conduct and evaluate health education session on ORT using appropriate nonformal education techniques and visual aids.**
- **Monitor the preparation and use of ORT in the home following health education and monitor the prevalence of diarrhea in the community.**

Trainer Attachment 1A: Pretraining questionnaire for volunteers

Name: .....

Program: .....

Site: .....

Province/Region: .....

Counterpart Name: .....

Relationship w/Counterpart (check): .....

.....1. Supervisor

.....2. Co-Worker

.....3. Other (specify):
....

Purpose:

The purpose of this questionnaire is to find out the training needs of the PCVs and their familiarity with Oral Rehydration Therapy (ORT) and Health Education. Results will be used in finalizing the design for the Training program.

Instructions:

Please go over the following subject areas by circling the number that best describes your level of understanding or skill now, ranging from Very Insufficient to Very Sufficient

A. CONTENT AREAS FOR ORT/HEALTH ED

1. What is diarrhea and how is it spread?

1	2	3	4	5
Very Insufficient		Somewhat Sufficient		Very Sufficient

2. Sanitation practices to help prevent diarrhea

1	2	3	4	5
Very Insufficient		Somewhat Sufficient		Very Sufficient

A. CONTENT AREAS FOR ORT/HEALTH ED

3. Recognizing different stages of dehydration.

1	2	3	4	5
Very Insufficient		Somewhat Sufficient		Very Sufficient

4. Correctly mixing three kinds of oral rehydration solution.

1	2	3	4	5
Very Insufficient		Somewhat Sufficient		Very Sufficient

5. What foods to give during and after diarrhea.

1	2	3	4	5
Very Insufficient		Somewhat Sufficient		Very Sufficient

6. Identifying Malnutrition.

1	2	3	4	5
Very Insufficient		Somewhat Sufficient		Very Sufficient

7. Preventing Malnutrition.

1	2	3	4	5
Very Insufficient		Somewhat Sufficient		Very Sufficient

8. National/regional health policies and programs related to ORT.

1	2	3	4	5
Very Insufficient		Somewhat Sufficient		Very Sufficient

9. Record keeping and referral for diarrhea and dehydration cases.

1	2	3	4	5
Very Insufficient		Somewhat Sufficient		Very Sufficient

10. Traditional beliefs & practices that affect diarrhea.

1	2	3	4	5
Very Insufficient		Somewhat Sufficient		Very Sufficient

CONTENT AREAS FOR ORT/HEALTH ED (Continued)

11. Community organization techniques for health projects.

1	2	3	4	5
Very Insufficient		Somewhat Sufficient		Very Sufficient

12. Planning and evaluating a health education project.

1	2	3	4	5
Very Insufficient		Somewhat Sufficient		Very Sufficient

13. Designing and evaluating a session within a larger health education project.

1	2	3	4	5

1	2	3	4	5
Very Insufficient		Somewhat Sufficient		Very Sufficient

14. Pretesting health education materials.

1	2	3	4	5
Very Insufficient		Somewhat Sufficient		Very Sufficient

15. Selecting and using appropriate nonformat education techniques.

1	2	3	4	5
Very Insufficient		Somewhat Sufficient		Very Sufficient

16. Selecting and using appropriate visual aid.

1	2	3	4	5
Very Insufficient		Somewhat Sufficient		Very Sufficient

17. Adapting a visual aid to fit the local setting.

1	2	3	4	5
Very Insufficient		Somewhat Sufficient		Very Sufficient

18. Resources available for health education controlling and preventing diarrheal diseases.

1	2	3	4	5
Very Insufficient		Somewhat Sufficient		Very Sufficient

CONTENT AREAS FOR ORT/HEALTH ED (Continued)

B. Learning Needs

Please write your answers in the space following the question,

1. What are the other skills/knowledge that you have in addition to those listed above:

2. What are your present projects and activities?

3. What problems have you encountered in educating the community about health!

4. What health education skills do you actually use in your work now!

5. What other health education skills do you need to learn and plan to use for the rest of your work in country?

6. What suggestions and comments can you give to make this in-service training most useful for you and your Counterpart?

Thank you for your cooperation. Kindly send this to (Trainer to specify address) together with the questionnaire from your Counterpart (Supervisor and/or co-worker) in this training on or before (Trainer to add date).

Trainer Attachment 1B: Pretraining questionnaire for counterparts

Name: .....

Position: .....

Site: .....

Province/Region: .....

Name of your Volunteer: .....

Relationship w/Volunteer (check): .....

.....1. Supervisor

.....2. Co-Worker

.....3. Other (specify):
....

Purpose:

The main purpose of this questionnaire is to find out the training needs of the participants and their familiarity with oral rehydration therapy (ORT) and health education. Some information on your community's health conditions and the activities of our Volunteers are requested also. These will help make the training design as realistic and applicable as possible. Results will be used in finalizing the design for the Training program.

Instructions:

Please go over the following subject areas by circling the number that best describes your level of understanding or skill now, ranging from Very Insufficient to Very Sufficient

A. CONTENT AREAS FOR ORT/HEALTH ED

1. What is diarrhea and how is it spread?

1	2	3	4	5
Very Insufficient		Somewhat Sufficient		Very Sufficient

2. Sanitation practices to help prevent diarrhea.

1	2	3	4	5
Very Insufficient		Somewhat Sufficient		Very Sufficient

A. CONTENT AREAS FOR ORT/HEALTH ED

3. Recognizing different steges of dehydration.

1	2	3	4	5
Very Insufficient		Somewhat Sufficient		Very Sufficient

4. Correctly mixing three kinds of oral rehydration solution.

1	2	3	4	5
Very Insufficient		Somewhat Sufficient		Very Sufficient

5. What foods to give during and after diarrhea.

1	2	3	4	5
Very Insufficient		Somewhat Sufficient		Very Sufficient

6. Identifying malnutrition.

1	2	3	4	5
Very Insufficient		Somewhat Sufficient		Very Sufficient

7. Preventing malnutrition.

1	2	3	4	5
Very Insufficient		Somewhat Sufficient		Very Sufficient

8. National/regional health policies and programs related to ORT.

1	2	3	4	5
Very Insufficient		Somewhat Sufficient		Very Sufficient

9. Record keeping and referral for diarrhea and dehydration cases.

1	2	3	4	5
Very Insufficient		Somewhat Sufficient		Very Sufficient

10. Traditional beliefs & practices that affect diarrhea.

1	2	3	4	5
Very Insufficient		Somewhat Sufficient		Very Sufficient

CONTENT AREAS FOR ORT/HEALTH ED (Continued)

11. Community organization techniques for health projects.

1	2	3	4	5
Very Insufficient		Somewhat Sufficient		Very Sufficient

12. Planning and evaluating a health education project.

1	2	3	4	5
Very Insufficient		Somewhat Sufficient		Very Sufficient

13. Designing and evaluating a session within a larger health education project.

1	2	3	4	5
Very Insufficient		Somewhat Sufficient		Very Sufficient

14. Pretesting health education materials.

1	2	3	4	5
Very Insufficient		Somewhat Sufficient		Very Sufficient

15. Selecting and using appropriate nonformal education techniques.

1	2	3	4	5
Very Insufficient		Somewhat Sufficient		Very Sufficient

16. Selecting and using appropriate visual aid.

1	2	3	4	5
Very Insufficient		Somewhat Sufficient		Very Sufficient

17. Adapting a visual aid to fit the local setting.

1	2	3	4	5
Very Insufficient		Somewhat Sufficient		Very Sufficient

18. Resources available for health education in controlling and preventing diarrheal diseases.

1	2	3	4	5
Very Insufficient		Somewhat Sufficient		Very Sufficient

CONTENT AREAS FOR ORT/HEALTH ED (Continued)

B. Health Problems and Projects

1. What are the leading causes of infant and children under five sickness in your area? List the top five causes in order of incidence

1. .....
2. .....
3. .....
4. .....
5. .....

2. What are the five mayor health problems in your areas What are the corresponding causes? (Example; problem is malnutrition; Cause/poverty, lack of health education).

A. Problems

1. .....
2. .....
3. .....
4. .....
5. .....

B. Corresponding Causes(s)

....
....
....
....
....
....
....

3. What are your present programs, projects or activities related to the control and prevention of

diarrheal diseases?

4. In which of these activities do you need your Volunteer's support!

Trainer Attachment 1C: Trainer pretest guide

The following 5 categories of topics are the basis for the ORT pretest:

I. Diarrhea, Diarrhea, and rehydration

II. Nutrition and Diarrhea

III. Working With The Health System

IV. Working With The Community

V. Community Health Education

Attached are the answers to the sample pretest (Handout 1A). The sessions in which the answers are addressed are listed on the pretest below in parenthesis for participants" future reference. Use or modify these questions as appropriate for your country. If you develop your own pretest, be sure it is no longer than 35 questions. Distribute it to participants as Handout 1A.

Trainer Attachment 1D: ORT Pretest answer sheet

I. Diarrhea, Dehydration and rehydration

1) These will vary with the county some suggested answers may include, dirty water, contaminated food, food practices, viruses, weaning.

2) Fecal-oral route

3) Use of latrines or proper disposal of excrete

Hand washing before eating and preparing food
Getting and protecting a safe water source
Keeping foods very cold or very hot to prevent growth of bacteria and other organisms

4) More than 10 liquid stools per day

No tears
Very fast and weak pulse
No urine for six hours

5) Give ORS

Continue breastfeeding or providing other liquids such as tea, lemon or orange juice, chicken broth etc.

6) Combine 1 teaspoon of salt and 8 teaspoons of sugar in 1 liter of water.

7) Potassium is usually not used in preparing home-made solution. Potassium is important because the body loses this substance and a minimum level is needed for the body to function. Sodium bicarbonate 'or trisodium citrate) is also found in ORS and helps prevents "acidosis", a condition that decreases the dehydrated child's appetite.

II. Nutrition and Diarrhea

1) Appropriate diet for a one year old child with diarrhea is to continue breastfeeding and give the child 1/4 - 1/2 cup of fluid after each loose stool. Give easily digested foods such as boiled rices, eggs and porridge and foods rich in potassium such as bananas or pineapple.

2) "The vicious circle" of diarrhea means that malnourished children appear to suffer more severe episodes of diarrhea than healthy children and diarrhea causes serious growth faltering.

3) Four signs indicating a child is at high risk for malnutrition and disease are:

- Child of a widow or divorced person

- Repeated bouts of diarrhea and/or illness in early months of life
- One of more than seven siblings
- Weight loss.

4) Three kinds of anthropometric measures are:

- Arm circumference
- Weight to age
- Weight to height or length.

5) Four strategies for preventing malnutrition are:

- Nutrition education
- Promotion of breastfeeding
- Use of nutritional weaning foods as a supplement to breastfeeding
- Monitoring growth and development.

III. Working With the Health System

1) This will vary with the country

2) This will vary with the country

3) The tasks involved in monitoring consist of:

- determining what to monitor
- determining how and when to monitor
- developing checklists for monitoring and
- after monitoring providing feed back

4) This will vary with the country

IV. Working With the Community

1) This will vary with the country

2) This will vary with the country

3) Members of a community can be motivated by:

- building on local self-help traditions
- starting with a project that will produce results quickly before going into more long term efforts.
- using teaching techniques that actively involve community members

4) Community leader contribute to the success of a project by:

- helping people in the community know and gain confidence in you .
- helping identify problems and resources in the community
- giving general information about the program and helping interpret it to the villagers.

V. Community Health Education

1) Items to include in health education project plans are:

- the objective (outcome you expect)
- the target group
- techniques and visual aids to use
- location and duration of the project
- resources needed (expertise, supplies, equipment etc.)
- when and how to evaluate the project

2) Evaluation should be included in your project to:

- measure how well your objectives are befog met
- assess the performance of the health education
- assess what the participants learned

3) Five examples of nonformal education techniques are:

- **role play**
- **story telling**
- **large group discussion**
- **demonstration with skills practice field trips**

4) Visual aids used should be

- **culturally appropriate**
- **well designed (communicate the message)**
- **accomplish the objective it was designed for**

5) It is important to pretest visual aids to understand whether they attract and hold the interest of the group and whether they communicate the intended message.

6) Visual aids should be adapted because:

- **it is often easier to change well-tested educational materials from another country to suit local conditions then to start from scratch.**

- **technical information requires few changes from one culture to another.**

- **it saves time and money**

7) The steps of the experiential learning cycle are:

Experiencing (doing something)
Processing (Discussing reaction and observations)
Generalizing (deciding what that experience tells you about the real world)
Applying (planning more effective behavior)

These examples should be similar to the one in Session 19

Session 2 - Training program evaluation

TOTAL TIME

1-2 hours

OVERVIEW

A constructive evaluation is an important part of any well-designed training program. During this session, participants and trainers will determine how well the training achieved its stated objectives and how the program might be modified to serve the needs of people working on the control of diarrheal diseases, particularly oral rehydration therapy, more appropriately in the future. The group will complete an evaluation instrument and discuss problems and potential improvements.

OBJECTIVES

- **To evaluate in writing and in discussion the effectiveness of the training program. (Steps 1, 3, 4)**
- **To check individual as well as group goal accomplishments during the training. (Step 2)**
- **To identify specific ways to improve the training design and program implementation. (Steps 3, 4)**

RESOURCES

List of expectations from Session 1.

Handouts:

- **2A Training Program Evaluation**
- **1A Pre-test (from Session 1)**
- **1B Training Objectives (from Session 1)**

MATERIALS

Newsprint, markers

PROCEDURE

Trainer Note

In Session 19 participants critiqued and used a session evaluation form Handout 19B (Session Assessment Sheet). You can use this throughout the course to assess the training course as planned and implemented in the field. Handout 2A (Training Evaluation is a final evaluation instrument to be used as described in this session.

Step 1 (20 min)

Written Evaluation of the Program

Post the list of expectations developed by the group during Session 1 (Diarrhea Dialogue). Review the session objectives and distribute copies of the Handout 2A (Training Evaluation to all participants, ask them to take 15 minutes to fill out the form. Explain that they will discuss the program afterwards.

Trainer Note

Ask participants to take out and refer to their copies of the Training Objectives and the Pre-test. These handouts were used in Session 1 to establish their entry level knowledge and expected outcomes at the start of the program, Now these sheets will help participants gauge their learning and skill development. If alternate forms were used during the initial objective-setting exercise, use them here. If participants also did dally or weekly evaluations of the course, refer back to those also.

Step 2 (15 min)

Individual Accomplishments

Have participants review their pre-tests from Session 1. In turn, ask each person to briefly comment on their personal accomplishments during the program.

Trainer Note

The idea in this step is to give each participant an opportunity to share accomplishments in the context of his or her particular Job and community.

Step 3 (15 min)

Identifying Problems in the Training

Have participants form small groups of four and list on newsprint two to three aspects of the program which have been problematic and possible suggestions for improvement. Encourage participants to be as specific as possible. As the groups finish the task, have them post the newsprint on the wall.

Step 4 (15 min)

Summary and Conclusions

Reconvene the group and review the newsprint suggestions with them. Ask someone to summarize the observations and suggestions for improvement which have resulted from the discussions. Have a participant record these on newsprint for use by the staff later. Circle those observations that seem to be generally agreed upon and most feasible for future training activities.

Close the session by asking the group to comment on how useful they found the written evaluation form and ask them to suggest other ways that program evaluations can be handled.

Alternate Step 4 (45 min.)

Fish Bowl Discussion

If more time is available for evaluation purposes the following sequence is offered as an alternative to Step 4. Have the group reconvene and occupy the chairs in the outer circle of the "fishbowl" (see the Trainer Note for a description of the arrangement). Explain the "fishbowl" activity. (Ask if anyone has had experience with this activity; have them help with the explanation). The explanation should include the following points:

- Only three people at a time will be in the inner circle.

- The role of each of the three people will be to discuss the posted observations and suggestions from Step 3.

- When someone from the outer circle wants to enter the discussion, they should quickly tap on the shoulder of someone in the inner circle and exchange places with that person.

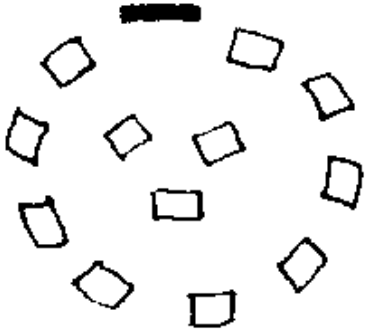
Explain that the reason for using the fish bowl activity is to provide a structure for discussion and to encourage constructive feedback and suggestions.

Before beginning the discussion, have one of the participants scan the lists and point out common themes or parallels among the observations. Ask for three volunteers to move to the inner circle. Initiate the activity by responding to one of the posted problems.

After all major issues have been discussed, return to the original Step 4 (Summary and Conclusions), and modify it so participants have the chance to comment on the appropriateness of a "fishbowl" discussion for evaluation purposes.

Trainer Note

While the small groups are working in Step 3, arrange the chairs in the room for a fishbowl type of discussion as shown by the diagram below. Place three chairs in the middle of the room facing each other. Place all other chairs in a circle around the three inner chairs. Be sure the newsprint is posted where everyone can see it.



Chairs in circle

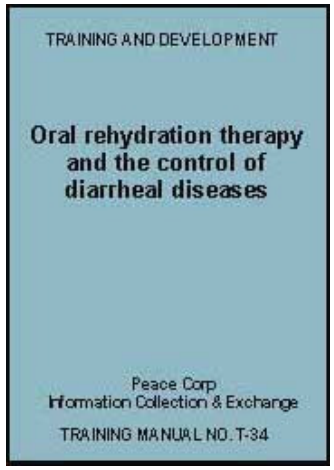
It is important that everyone feel free to express their thoughts. People should be encouraged to exchange places with someone and enter the discussion when they have something to soy. It is a good idea to have at least one member of the training staff remain in the discussion group "inside" the fish bowl.

Handout 2A: Training evaluation

We need your candid feedback on the training program so that we can make improvements in the design and provide the next group of participants with a richer experience. Please keep in mind the original Training Objectives.

Home"" """"> ar.cn.de.en.es.fr.id.it.ph.po.ru.sw

Oral Rehydration Therapy and the Control of Diarrheal Diseases (Peace Corps, 1985, 566 p.)
Module Two: Diarrhea, dehydration and rehydration
(introduction...)
Session 3 - Prevention and control of diarrheal diseases
(introduction...)



- **Handout 3A: Sanitation, water quality and the spread of disease**
- **Handout 3B: Common causes of diarrhea**
- **Handout 3C: Methods of controlling enteric diseases**
- **Handout 3D: Water, excrete, behaviour and diarrhoea**
- **Handout 3E: Primary health care**
- **Trainer Attachment 3A: The global impact of diarrhea**
- **Trainer Attachment 3B: A story about diarrhea**
- **Trainer Attachment 3C: Suggestions for using the picture story**

Session 4 - Dehydration assessment

- ***(introduction...)***
- **Trainer Attachment 4A: Pictures of children with signs of dehydration**
- **Trainer Attachment 4B: Guidelines for presentation of the who diarrhea treatment chart**
- **Trainer Attachment 4C: Answers for exercises**
- **Trainer Attachment 4D: Creating a case study**
- **Trainer Attachment 4E: Adaptation of the treatment chart**

Session 5 - Rehydration therapy

- ***(introduction...)***
- **Handout 5A: ORT preparation worksheet**
- **Trainer Attachment 5A: Materials and equipment needed for ORT stations**
- **Trainer Attachment 5B: Using models to show why rehydration is important**
- **Trainer Attachment 5C: Suggestions for a lecturette on the hows and whys of ORS**
- **Trainer Attachment 5D: Oral rehydration therapy: the scientific and technical basis**

- **Trainer Attachment 5E: Storing and maintaing supplies of oral rehydration salts (ORS)**
- **Trainer Attachment 5F: Oral rehydration with dirty water?**
- **Trainer Attachment 5G: A pinch of salt' a handful of molasses...**
- **Trainer Attachment 5H: Cautious prescription**

Session 6 - Practicing ort in the village

- ***(introduction...)***
- **Trainer Attachment 6A: Problem situations - ORT in the home**

Oral Rehydration Therapy and the Control of Diarrheal Diseases (Peace Corps, 1985, 566 p.)

Module Two: Diarrhea, dehydration and rehydration

OVERVIEW

This module includes the basic technical core of oral rehydration therapy knowledge and skills. Session Three provides an overview of the prevention control of diarrhea. Sessions 4 and 5 include demonstration and practice in basic skills in dehydration assessment and preparing and using oral rehydration therapy. Session 6 discusses problems encountered in using ORT in the home.

OBJECTIVES

- **To describe at least three mayor points on the route of transmission of diarrheal diseases.**
- **To list at least four ways that sanitation and good hygiene can control and prevent the spread of diarrhea.**
- **To correctly assess three stages of dehydration using the WHO Treatment Chart and case studies,**

- **To determine appropriate treatment for the three stages of oral rehydration according to the WHO criteria stated in the Treatment of Diarrhea,**

- **To correctly prepare sugar-salt solution and mix ORS packets according to the WHO recommendations stated in the Treatment of Diarrhea,**

- **To list the four basic ingredients in ORS packets and explain the purpose that each serves as stated in Session 5.**

- **To accurately describe four problems commonly encountered in using ORT in the home and describe one culturally appropriate, feasible way to resolve each problem.**

Cross reference with the Technical Health Training Manual:

Session 5 Primary Health Care
Session 42 Improving Health Through Safe Water and a Clean Community

Session 3 - Prevention and control of diarrheal diseases

TOTAL TIME

3 hours

OVERVIEW

In less technically developed countries diarrhea is one of the most common illnesses, and dehydration from diarrhea is one of the five leading causes of death in children under five. In addition, frequent bouts of diarrhea aggravate malnutrition. Most of these deaths could be prevented through oral rehydration therapy in the short term and through sanitation and hygiene efforts in the long term. In this session participants lock at the causes of diarrhea, how it is transmitted, and types of interventions that. can be used to prevent and control diarrhea as a part of primary health care efforts in the host country, Optional, mini-sessions on prevention techniques give participants a chance to improve skills in: latrine building and care; purifying and

protecting water; and proper disposal of refuse.

OBJECTIVES

- **To identify environmental; social and cultural factors that affect the occurrence of diarrheal diseases in the host country.**
  (Step 1, 2)

- **To explain how diarrheal diseases are transmitted.**
  (Step 3)

- **To identify ways to prevent and control diarrheal diseases in local communities.**
  (Step 4)

MATERIALS

Markers, newsprint, visual aids on prevention and control of diarrhea.

RESOURCES

Control of Communicable Diseases in Man. pp.: 78-82; 109-114; 147-151.

Water Treatment and Sanitation: Simple Methods of Treatment for Rural Areas

Technical Health Training Manual. Sessions: 5 (Primary Health Care); 8 (Factors Affecting Health); 42 (Improving Health Through Safe Water and a Cleaner Community).

Where There is ND Doctor. Chapter 12, pp. 131-145.

Community Culture and Care. pp. 206-210.

UNICEF Slides on the Global Impact of Diarrhea, Oral rehydration Therapy (ORT) for Childhood Diarrhea, (ORT Resource Packet)

Handouts:

- **3A Sanitation, Water Quality and the Spread of Disease**
- **3B Common Causes of Diarrhea,**
- **3C Methods of Controlling Enteric Diseases**
- **3D Water Excreta Behavior and Diarrhea,**
- **3E Primary Health Care Trainer Attachments:**
- **3A The Global Impact of Diarrhea,**
- **3B A Story About Diarrhea**
- **3C Suggestions for Using The Picture Story**

PROCEDURE

Trainer Note

This session builds upon the knowledge that participants acquired in basic training and their experience in the field, particularly the topics and skills covered in the Technical Health Training Manual, Sessions: 3 (Primary Health Care); 5 (Factors Affecting Health); and 42 (Improving Health Through Safe Water and a Cleaner Community). If participants lack this background, supplement this session with some of the activities or resource materials from those sessions.

In preparation for this session, adapt Trainer Attachment 3B (A Story About Diarrhea, to fit local conditions and characters. If time allows also adapt the pictures, using the tracing technique described in Session 18 (Adapting and Pretesting Health Education Materials).

Also prepare a lecturette on the global impact of diarrhea using Trainer Attachment 3A (The Global Impact of Diarrhea, and, if possible, slides or other visual aids, include information on the extent to which diarrhea is a problem in the host country. You may want to refer to the decrease in deaths associated with diarrhea in the U.S. after public health and sanitation measures were introduced, but prior to the introduction of antibiotics, These data make a strong case for the importance of preventive measures and home treatment to reduce deaths associated with diarrhea.

Locate and display visual aids on the prevention and control of diarrhea, particularly those aimed at teaching community people about oral rehydration therapy.

Step 1 (20 min.)

Introduction: the Global Impact of Diarrhea

Introduce the session by briefly reviewing the objectives and using the lecturette that you prepared on the global impact of diarrhea.

Trainer Note

The lecturette is a means to briefly give the participants a sense of where their work in ORT fits into similar work worldwide by Peace Corps programs as well as programs in other organizations. Some main points to include and discuss are:

- **number of cases of illness and death resulting from diarrhea, and the resulting dehydration, worldwide and in the host country.**

- **emphasize the fact that most of these deaths are preventable through oral rehydration therapy in the short term, and sanitation and hygiene in the long term.**

- **the prevention and control of diarrhea is part of primary health care.**

Step 2 (30 min)

A Story About Diarrhea,

Tell the story that you adapted from Trainer Attachment 3B (A Story About Diarrhea, using the pictures, and following the suggest tons in Trainer Attachment 3C (Suggestions for Using the Picture Story).

Ask participants to discuses Why did Musu Die? and list the causes that they suggest.

Then ask: Could Musu's death have been presented? How? and list the interventions that they suggest.

Point to the circle of pictures that you made when you told the diarrhea story and ask participants to identify where in the circle they can intervene in their work in the community. As they offer suggestions, post the appropriate intervention pictures beside the pictures in the circle. (See Trainer Attachment 3C for an illustration of how to do this.)

Trainer Note

See the end of the Procedure Section for an alternative to this step. During the discussion make sure that participants give cultural, economic and social factors affecting the death of Musu as well as the environmental (sanitation) and biological (disease agents) factors. Be sure that participants also discuss which interventions they can actually do in their work in the community.

Step 3 (20 min.)

Discussing How Diarrhea is Transmitted

Make certain that participants understand how diarrhea is transmitted by asking them to use the diarrhea story to explain diarrhea transmission in simple terms that they could use in the community. Ask someone to use the pictures from the diarrhea story to explain how diarrhea is transmitted from one person to another through contaminated food, water and hands.

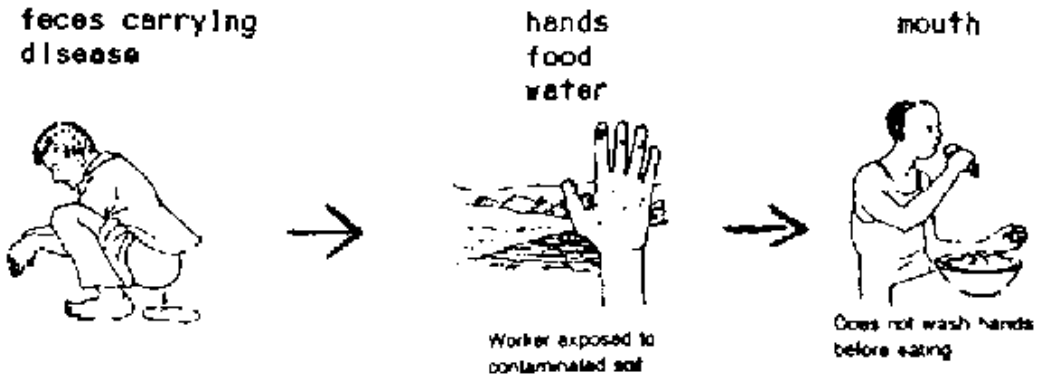
Distribute Handouts 3A (Sanitation Water Quality and the Spread of Diseases) and 3B (Common Causes of Diarrhea, as supplementary reading.

Trainer Note

Be sure to cover the following points in the discussion:
- During diarrhea, stools are more frequent and contain more water than normal. In most societies this is three or more watery stools a day. There are changes in color and odor of the stool as well.

- A number of different disease agents cause diarrhea (such as cholera, giardia). Handout 3B (Common Causes of Diarrhea) summarizes some mayor causes, also Control of Communicable Diseases in Man.

An example of one simple way to illustrate the spread of disease carried by feces is shown below:



Figure

Step 4 (30 min)

Preventing Diarrhea

Follow up the discussion of how diarrhea is transmitted with a discussion of how to prevent its transmission. Refer back to the interventions suggested in Step 1. Clarify the meaning of prevention and control. Discuss prevention in reference to actual conditions in communities where participants work. Some questions for discussion are:

- What and where are the primary sources of water in your community?

- Could these sources contribute to diarrhea in your community?

- What do community people think is the cause of diarrhea?

- Whose job is it to fetch water? What implications does this have for its use? Could this

contribute to the water's contamination?

- What happens during the dry season? Is there more diarrhea then?

- What demands are put on the water source? Is it good quality water? Are the people satisfied with the water quality?

- What latrine facilities are available now in your community?

- What are people's attitudes toward latrines?

- Who uses them? Why? Who doesn't use them? Why?

- How do people teach their children about personal hygiene, defecation, urination and hand washing? Is this different for male and female children?

Trainer Note

Be sure to discuss "control" and "prevention" as similar ideas; both are interventions that occur at different points in the cycle of the disease. Also make sure the following ideas are discussed:

- Prevention is important because once diarrhea occurs, the body is weakened and susceptible to malnutrition and future bouts of diarrhea.

- Sanitation, disposal of excrete and good hygiene are primary preventive measures; that is, they stop the spread of diarrheal diseases at their sources of contamination. Make the point that in preventive work we want to get as close to eliminating the source of disease as we possibly can.

Step 5 (20 min)

Discussing Different Types of Interventions

Ask participants to look at the interventions that they suggested and divide them into the

following categories:

- **Interrupting the transmission of the disease (for example clean water; use of latrines).**
- **Strengthening the body's defenses (such as providing good nutrition).**
- **Therapy 'such as oral rehydration**

Discuss the advantages and disadvantages of these different interventions particularly the short term and long term results that they offer.

Also discuss how these interventions are a part of primary health care, using the information on Handout 3E (Primary Health Care).

Discuss which interventions are most realistic for Volunteers and Counterparts, given the conditions in which they work.

Conclude the session by referring back to the objectives and training schedule to see where the participants will be developing skills in these areas.

Trainer Note

Tell the participants the following book is a good reference on the Prevention of Diarrheal Diseases. It is available through ICE.

Water Treatment and Sanitation: Simple Methods for Treatment for Rural Areas

The Water and Sanitation: for Health Project (WASH) is also a good source of materials.

Alternative Step 2 (30 min)

An alternative to using the picture story is to tell the story and lead a discussion of why Musu died. As people state reasons, list them on separate pieces of paper. Ask one person to take each reason. Have them pin the paper with the reason on it to the back of their shirt and form a circle, holding hands.

Ask each person to read their factor saying "I helped cause the death of Musu by (read the factor)." Ask the rest of the group what can be done to break this vicious cycle that killed Musu. Write each suggested intervention on another sheet of paper. Have one person (for each intervention) pin one paper to their shirt and break into the circle where their intervention is supposed to break the cycle. Lead a discussion following the suggestions in the Trainer Note at the end of Step 2.

Optional Step 4 (60 min)

Mini-sessions on Prevention Measures

Use Steps 2 and 3 from Session 42 (Improving Health Through Safe Water and a Cleaner Community) from the Technical Health Training Manual to plan prevention projects. If possible during the training course give participants an opportunity for practical experience such as building and cleaning a latrine and teaching community members to do so.

Trainer Note

The actual implementation of these control measures requires more time than allocated for the mini-sessions For example, latrine building requires several hours, depending on the soil and the number of diggers.

Handout 3A: Sanitation, water quality and the spread of disease

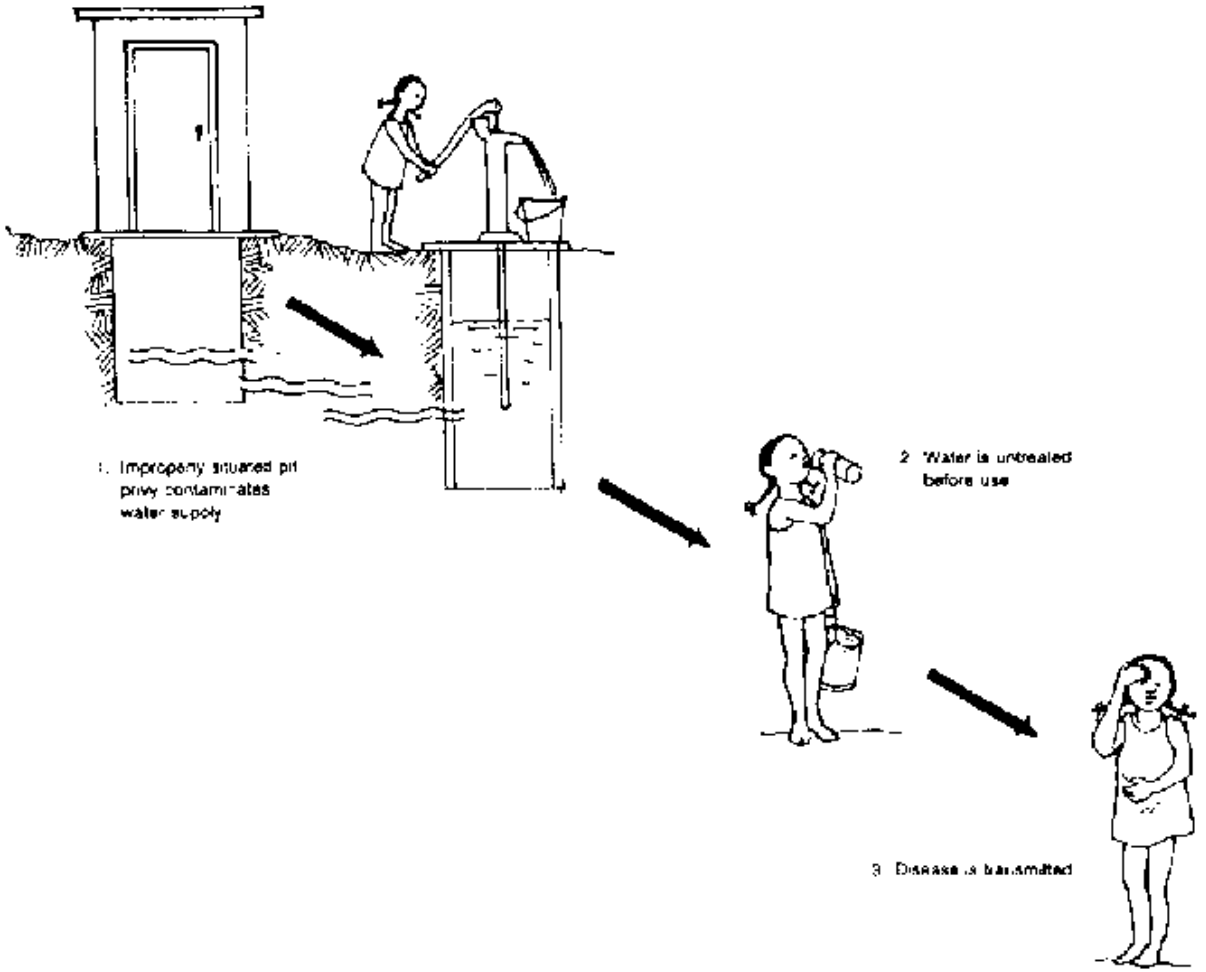


Figure 1. Spread of disease

Waterborne Diseases (Water Quality Related)

In the waterborne diseases, the microorganisms which cause the disease are swallowed with contaminated water. All but one, Guinea worm, are caused by organisms round in human excrete, the source of the contamination. The infective stage Or Guinea worm is not from fecal contamination, but is from a tiny larva that develops in a water-flea after the larva is discharged into the water. The larva comes from a blister on the skin of a person infected with the meter-

long adult worm.

Cholera and typhoid fever are the waterborne diseases which are most feared because, when untreated, they have high death rates. However, the diarrheas and dysenteries are more important because Or the infant deaths and huge numbers Or illnesses they cause. In the developing countries, the diarrheas and dysenteries cause hundreds Or millions Or illnesses and millions Or infant deaths each year.

The basic transmission Or waterborne disease is person to person. The microorganisms for infected people contaminate water which is consumed by other people. Figure 1 shows a common way that water becomes contaminated. The contamination of water supplies occurs:

1. Where latrines and privies are located uphill from or very close to a water source such as a spring, stream, pond or well. Liquids carrying the organisms seep from the latrines into the water supply.

2. Where privy pits, soakage pits, or sewage absorption systems penetrate 'he water table of an aquifer located near the surface and shallow wells and springs whose water comes from the aquifer are contaminated.

3. Where wells and springs are unprotected so that surface run-off renters these water sources. The runoff after rainfall carries disease-causing organisms into the water source.

4. Where sanitation is poor. If people defecate on the ground or in bodies of water rather than in safe latrines or privies, disease-causing organisms can get into water supplies.

5. Where Guinea worm occurs, water 19 contaminated when the skin of an infected person with a blister caused by the worm is immersed in water and great numbers of larvae are released into the water. Some Or the larvae are eaten by tiny water fleas (Cyclops). The larvae in the water fleas grow, shed their skins, and become infective. hen a water flea containing an ineffective larva is drunk with water from the contaminated source, the little worm is transmitted to a new person where it grows to maturity under the skin.

Water-Washed Diseases (Water Quantity and Accessibility Related)

Water-Washed diseases are diseases whose transmission results from a lack of sufficient clean water for frequent bathing, hand washing before meals and after going to the toilet, and for washing clothes and household utensils. Several common diseases fall into this category. Shilgellosis (bacillary dysentery), salmonellosis (food poisoning), trachoma, and scabies are all diseases that can be passed by direct contact between people or by the direct contamination of food by dirty hands or flies. Figure 2 shows one way water-washed diseases are spread. The diseases in this group are transmitted:

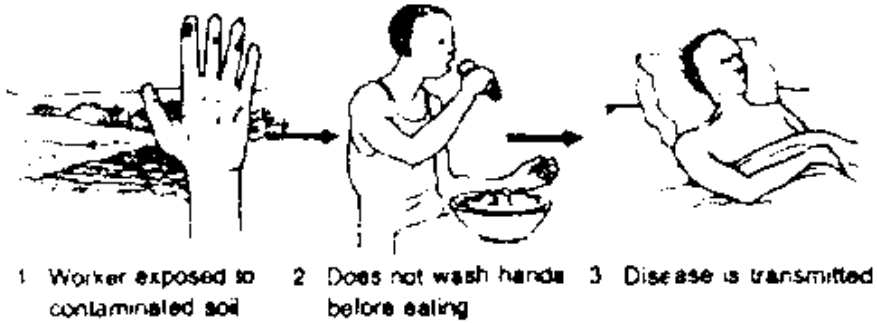


Figure 2. Transmission of Water-Washed Diseases

1. When a water supply produces insufficient quantities to meet peoples' needs or when the water supply is located at a distance from the users. The availability of only small amounts of water makes the practice of good personal and household hygiene difficult, or even impossible.

2. When feces are not disposed Or in a sanitary way. Uncovered or unprotected latrines or stools passed on the ground are breeding places for flies and sources Or bacteria. Bacteria and viruses are passed from feces to people by flies, contaminated fingers and food. Food contamination with salmonella quickly grows great numbers of the bacteria. When eaten, the food causes food-poisoning diarrhea with life-threatening consequences, especially for small children.

3. When people are ignorant of the need for personal hygiene and, for whatever set Or reasons, either do not bathe frequently or use the same water and towels to wash more than one person,

then trachoma and conjunctivitis are passed around within a family or other groups living together and scables get passed from the skin of one person to the skin of another.

Handout 3B: Common causes of diarrhea

This table gives the information that will help to identify, on clinical grounds along the most common agents of diarrhoea. It is greatly simplified. For example some agents produce a variety of clinical foods. Only agents of major importance world-wide have been included. In certain areas, at certain times, the picture may be quite different.

Try and find out what the important causes of diarrhoea are in your area.

Caution: There are a number of other conditions associated with diarrhoea such as infections outside the gut (e.g. measles and malaria), malnutrition, food intolerance etc. Remember to look for these and give specific treatment where appropriate.

If readers find this table useful, we may present other information in the same way in future issues of Diarrhoea Dialogue.

Please send us your comments on this clinician's guide.

COMPLAINT	ASSOCIATED CLINICAL FEATURES		INCUBATION PERIOD	EPIDEMIOLOGICAL FEATURES	ORGANISMS	FIRST LINE TREATMENT
	COMMON	OTHERS				
	• Vomiting • Fever	• Severe dehydration in some	24 -72 hours	• Infants and young children • Common world-wide in all socio-economic groups • Peak in colder seasons in temperate climates	Rotavirus	• Rehydration therapy
ACUTE WATERY DIARRHOEA	• Nausea • Vomiting • Abdominal pain	• Fever • Malaise • Severe dehydra	6 -72 hours	• Infants and young children in developing countries • Travellers diarrhoea in adults	Enterotoxigenic *Escherichia coli* (ETEC)	• Rehydration therapy

The stool takes the shape of the container		ation				
	• Nausea • Vomiting • Fever • Chills • Abdominal pain	• Malaise	8–36 hours	• Children • Common world-wide • Food-borne outbreaks (animal products) • Warmer seasons	Non-typhoid Salmonellae	• Rehydration therapy
	• **Abdominal pain** • Fever • Malaise	• Chills • Blood and pus in the stools	3–5 days	• World-wide distribution • In developed countries may be food-borne (animal products) or transmitted by handling of animals	*Campylobacter*	• Rehydration therapy • Erythromycin in severe cases
	• Vomiting • Abdominal pain	• Severe dehydration • Circulatory collapse, 'shock'	1–4 days	• Children in endemic areas • Adults in newly affected areas • Not found in Latin America	*Vibrio cholerae*	• Rehydration therapy • Tetracycline
	• Nausea • Vomiting	• Fever	6–72 hours	• Nursery outbreaks in developed countries • Uncertain in developing countries	Enteropathogenic *Escherichia coli* (EPEC)	• Rehydration therapy
DYSENTERY The stool is soft and watery with blood and/or pus	• Fever • Abdominal pain	• Malaise • Vomiting • Urgency to defaecate • Painful spasm on defaecation	36–72 hours	• Children • Poor hygiene • Malnutrition • Institutions • Warmer seasons	Shigellae	• Rehydration therapy • Ampicillin or Trimethoprim-Sulfamethoxazole
PROLONGED DIARRHOEA (OR DYSENTERY) For at least 7 days, stools have been more frequent or of softer consistency (with or without blood or pus)	• Abdominal discomfort		2–6 weeks	• All age groups • World-wide distribution	*Entamoeba* histolytica*	• Metronidazole
	• Abdominal distension • Flatulence	• Anorexia • Nausea • Malabsorption • Frothy stools	1–3 weeks	• Young children • Some travellers • Poor hygiene • World-wide distribution	*Giardia* lamblia*	• Metronidazole

*Can be identified on examination of the stools with a light microscope. Blood and pus from Shigellae and *Campylobacter* can also be identified.

Produced in collaboration with the Ross Institute of the London School of Hygiene and Tropical Medicine and The Save the Children Fund

Table

Handout 3C: Methods of controlling enteric diseases

Technical Note No. DIS. 2.M.4

Enteric diseases are those that affect the gastrointestinal tract of humans, They are caused by bacteria, parasites or viruses. The disease organisms are passed from infected people in their feces or urine. Others become infected when they take in the disease causing agents by eating soiled food or by drinking water contaminated with fecal matter. Enteric diseases are common throughout the world and, in most areas, some part of the population is always infected.

This technical note discusses measures which can be instituted to control the spread of enteric diseases. Special emphasis is given to basic preventive measures that should be taken to provide hygienic conditions in individual households and in the entire community.

Useful Definitions

DEHYDRATION - A condition in which the body loses more liquid than it takes in.

FECES - The waste from the body, moved out through the bowels.

PARASITE - Worms, insects or mites which live in or on animals or people.

STOOL - Human excrement, or a single bowel movement.

VIRUS - Germs smaller than bacteria which cause some infectious (easily spread) diseases.

Disease Transmission

The transmission of enteric diseases is by the fecal-oral route. The bacteria, parasites or viruses (germs) pass from the body of an infected person in excrete. The germs later enter the body of an uninfected person through the mouth. There are two main ways that germs can enter an uninfected person or re-enter the same person

- **Through the water that people drink. In many situations, water supplies are contaminated by enteric disease germs. If a person drinks fecally contaminated water, he is likely to surfer from an enteric disease.**

- **Through the consumption of food. Food can be contaminated by dirty hands or raw infected water, or by being exposed to fecally contaminated organic fertilizer or garden soil. Vegetables thus contaminated would only be safe to eat after befog cooked or sterilized. Flies can carry germs to food. Flies that light on and taste food can inoculate food with germs that are consumed with the food.**

Table 1 lists the principal enteric diseases and their routes of transmission. Diarrhea is a mayor symptom of all enteric disease. Many types of germs can grow on food if it is not refrigerated. Cholera and typhoid fever are dangerous to people of all ages. Cholera is an especially dangerous enteric disease. Among children, enteric diseases are a mayor cause Or high mortality. Diarrhea is the leading killer of small children in most developing countries. It kills by dehydration.

Diseases	Causative organisms	Common transmission route
Cholera	Vibrio cholerae, including biotype El Tor	Man - feces - water and food - man
Typhoid fever	Salmonella typhi	Man - feces - food and water - man
Paratyphoid fevers	Salmonella paratyphi: A, B, C,	Man - feces - food and water - man
Bacillary dysentry	Shigellae	Man - feces (flies) food (water) - man
Amoebic dysentry	Entamoeba histolytica	Man - feces (flies) food (water) - man
Infectious hepatitis	Hepatitus virus A	Man - feces - water and food - man
Diarrheal diseases	Shigellae, salmonellae, Escherichia coli, parasites, viruses	Man - feces (flies) food (water) - man

Table 1. Principle Enteric Diseases and Their Common Transmission Routes

Controlling Enteric Diseases

The control of enteric diseases involves three important interrelated activities: a health education program, a safe water and sanitation program, and home treatment of patients. These three activities should be implemented simultaneously and continuously.

Health Education

Most enteric diseases result from poor sanitation and a lack of safe (good quality) water in the community. Effective health education is necessary to help people understand the connection between improved hygiene and improved health. Health education aimed at eliminating the enteric disease should include the following:

- **Formation of a community sanitation committee to coordinate the various activities and work needed to attack the problem.**

- **Participation of community groups. Teachers should be trained in the basics of disease transmission and prevention so that they can teach their students. Community groups, 4-H clubs, women's groups, other clubs, and the like should be active in health education.**

- **Development of audio-visual materials. Films, puppets, slides, songs, flashcards, and other methods can be used to make the problem and its solution clear to the members of the community. Students and clubs should be taught how to prepare their own audio-visual materials for demonstration.**

- **Implementation of specific education programs in clinics and hospitals.**

Health education should start people thinking about the problem and create a desire to change their behavior to solve the problem. When people recognize the need to use a latrine and wash their hands, and understand the ways in which water is contaminated and the role of flies and other vectors in the spread of disease, they will be more willing to do something to change the situation.

Preventive Measures

Several measures can be taken to either remove sources of disease transmission or to prevent the sources from ever existing.

Latrines

- **Build latrines at least 15m from any water supply or household. Be sure to site latrines so that they are downhill from any water source. Do not excavate pits into the water table. See Figure 1.**

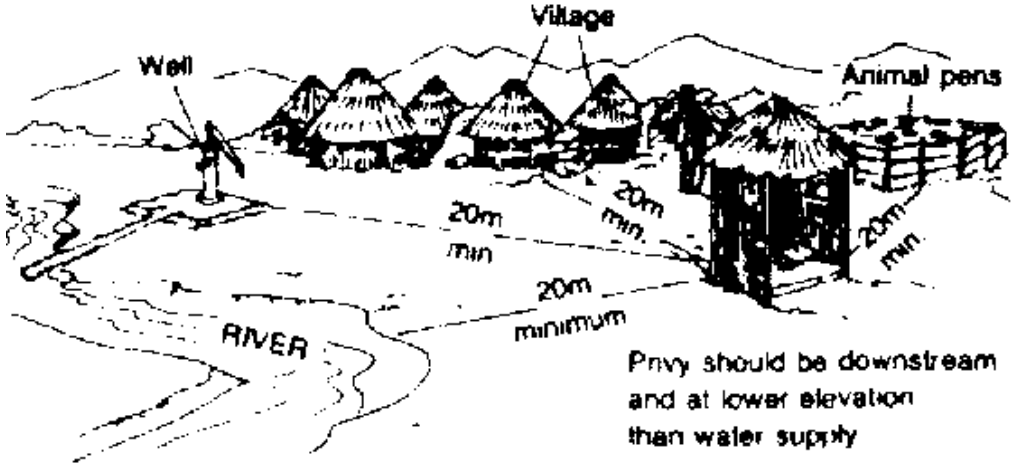


Figure 1. Proper Location of Privy

- **Make sure that all latrines are sanitary. Ideally, the latrine should have a concrete floor. When not in use, the hole through the floor should be covered. Uncovered latrines permit the breeding of files which can carry disease agents from feces to food. See Figure 2.**

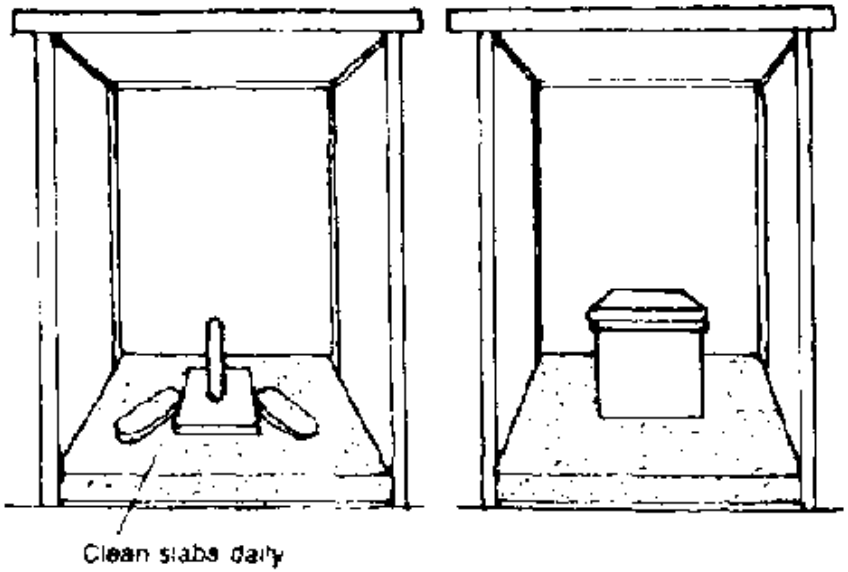


Figure 2. Cover Latrine Openings Tightly

- **Accustom people to use latrines. One of the biggest problems is getting young children to use a latrine. Parents may use it but allow their children to defecate on the ground. Latrine openings should be sized so that children do not fear falling in. For more information on latrine design and construction, read the appropriate technical notes on sanitation. See "How to Use Technical Notes," HR.G, for a full list of technical notes. If latrines are not used, water sources can easily be contaminated by surface run-off.**

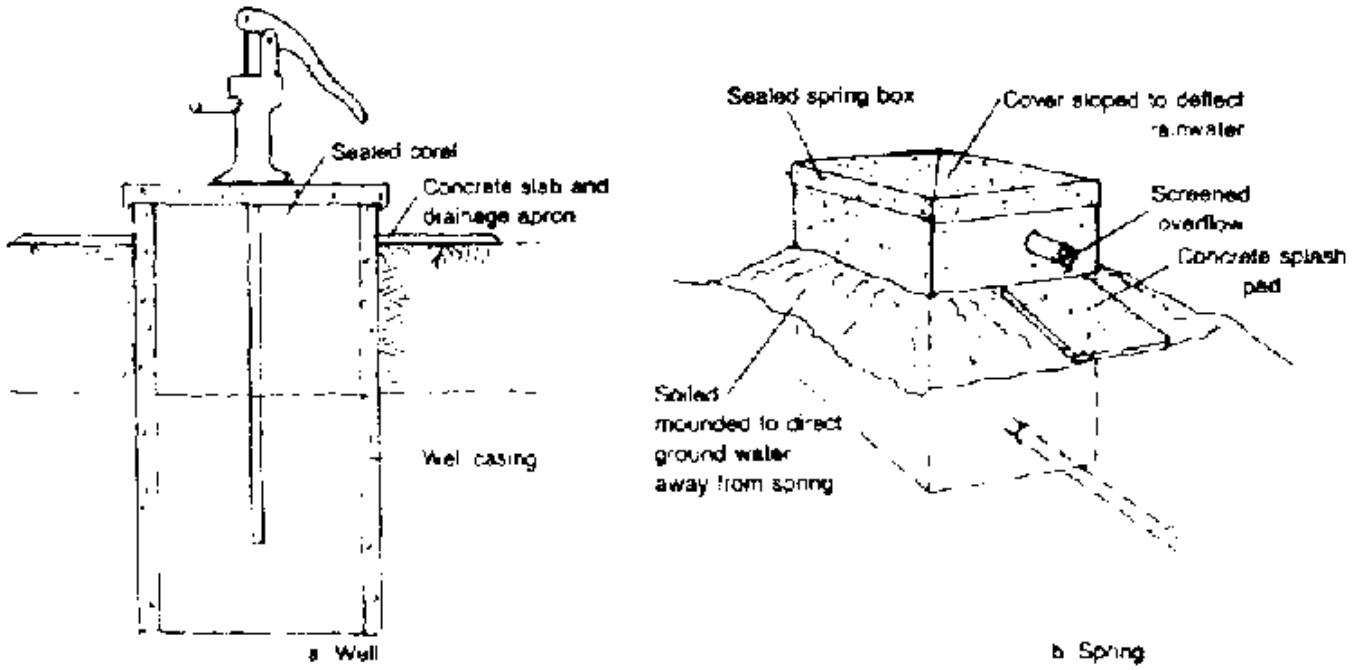


Figure 3. Proper Protection of Water Supplies

Water Supply

- **Provide for a safe supply of water for the community. Read the appropriate technical notes on rural water supply. Protect all wells from the entrance of surface run-off. A wellhead and a pump should be installed in order to prevent contamination from entering**

the wells.

- **Cap springs to prevent their contamination from surface run-off. See Figure 3.**

- **Where wells and springs are not protected or where surface water sources are used, water should be treated. Individual or community treatment should be used depending on the situation. Boiling and chlorination are the most common methods. For information on water treatment methods, see "Methods of Water Treatment,"
RWS.3.M.**

Hygiene

Personal and household cleanliness is important for preserving health. The following practices are essential for controlling the spread of enteric diseases. Figure 4 shows some of these practices.

- **Always wash hands with soap and water before eating and after using the latrine.**

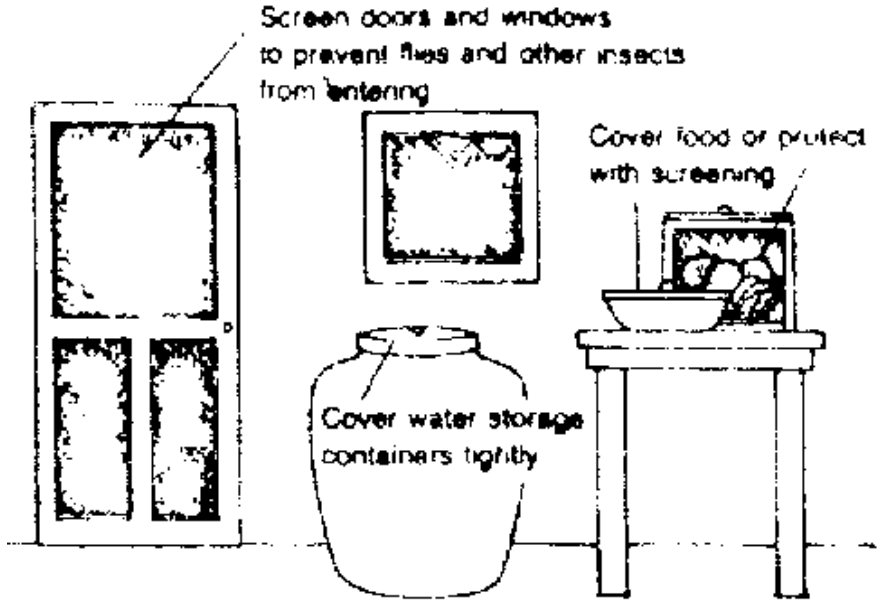


Figure 4. Individual Preventive Measures

- **Wash fruits and vegetables before eating them. Be sure to scrub those vegetables which grow in ground that may be infected.**
- **Do not allow animals to enter the house.**
- **Store food in screened areas or in refrigerators and cover food with netting. These measures will keep flies away from food and help prevent she spread of disease.**
- **Keep the house clean by sweeping it daily.**
- **Require that food handlers are trained in personal hygiene and are Aware of the need to store and cook food correctly.**
- **Dispose of all garbage properly. Make sure that garbage does not accumulate in such a way that flies can breed in it,**
- **Eat well. Diseases such as dysentery are more dangerous to people suffering from malnutrition**

Treatment Measures

At the same time that health education and preventive measures are being implemented, measures to treat patients with enteric diseases should be adopted. When diarrhea is present, liquid and salt are rapidly lost and must be restored to the body. Many children die from diarrhea or dysentery when they do not have enough water in their bodies. Persistently and frequently give liquids to a person with diarrhea. In severe cases in children, rehydration liquid should be given. Preparation of a rehydration drink: to a liter Or boiled water, add two tablespoons Or sugar, one-quarter teaspoon of salt, and one-quarter teaspoon of taking soda. Give the dehydrated person sips Or this drink every five minutes, day and night, until he begins to urinate normally. An adult needs at least 3 liters Or water each day while a child needs 1 liter. Table 2 lists foods that should and should not be eaten by a person with diarrhea.

When the person is vomiting or feels too sick to eat, he should drink:	As soon as the person is able to eat, in addition to giving the drinks listed at the left, he should eat a balanced selection of the following foods or similar ones:	
tea	energy foods	body-building foods
ice water	ripe or cooked bananas	milk (sometimes this causes problems)
chicken, meat, egg, or bean broth	crackers	
Kool-Aid or similar sweetened drinks	rice	
REHYDRATION DRINK	oatmeal or other well-cooked grain	chicken (boiled or roasted)
Breast milk	fresh maize (well cooked and mashed	egg (boiled)
	potatoes	meat, well cooked, without fat or grease
	applesauce (cooked)	beans, lentils, or peas (well cooked and mashed)
	papaya	fish (well cooked)

DO NOT EAT OR DRINK		
fatty or greasy foods	beans cooked in fat	alcoholic drinks
acidic raw fruits	highly seasoned food	any kind of laxative or purge

Table 2. Foods for a Person with Diarrhea

Where diarrhea is very severe and looks like it will not stop, keep giving liquids to the patient and seek medical help immediately. Seek medical help when:

- **Diarrhea lasts more than four days and is not getting better or more than one day in a small child with severe diarrhea.**
- **A person is dehydrated and getting worse.**
- **A child vomits everything it drinks. .**
- **The child begins to have fits or its feet and face swell.**
- **The person was sick or malnourished before the diarrhea began.**

- **There is blood in the stool.**

Under these conditions, a more serious enteric disease may be present in the system and some type of drug treatment will be necessary.

Handout 3D: Water, excrete, behaviour and diarrhoea

Improving only water quality or only latrines will have lime or no effect on the incidence of diarrhoeal disease. Richard Feachem discusses how only an integrated control pro" gramme can be effective in the long term.

Oral rehydration and other curative approaches to diarrhoea may have a great effect upon mortality, but they cannot significantly reduce transmission or the incidence of infection and disease. Most children may be kept alive by a comprehensive curative programme which makes simple therapy readily available in the village, but they will continue to be regularly reinfected. The main goal of diarrhoea programmes must therefore be control.

How is control to be achieved?

There are three basic approaches:

- **interrupting transmission by the improvement of water supply, excrete disposal and hygiene**
- **improving the general health of children by improved nutrition and reducing the incidence of other infections**
- **immunization.**

In the long run control will be achieved by a combination of each of these approaches but it is significant that, in developed countries, and in wealthy communities in developing countries, control has been achieved by a combination of the first two alone.

Transmission

The classical view of diarrhoeal disease transmission, derived from studies of mayor urban common-source outbreaks, was that it is primarily associated with faecally contaminated drinking water - in other words it is water-borne. This view has been progressively modified as more and more information has come to light on the non-water-borne transmission of diarrhoeal diseases in both endemic and epidemic situations.

It now seems very probable that, among poor people in developing countries, most of the spread of organisms which cause diarrhoea is by faecal-oral routes that do not involve drinking contaminated water. All the main diarrhoea-causing pathogens are transmitted from anus to mouth and there are many opportunities for such transmission in a poor and crowded community.

Water-borne transmission is but one special case of faecal-oral transmission and most authorities would agree that a great deal of the transmission of rota-viruses, shigellae, enterotoxigenic E. coli and Entamoeba histolytica is by non-water-borne routes. There is less agreement on the transmission of cholera. Some suggest that cholera is largely waterborne everywhere; others that it is mainly water-borne in Bangladesh but not necessarily elsewhere. However, a third group maintain that it is not primarily water-borne anywhere.

Water quality

Water-borne transmission is reduced by improving water quality. Many people drink heavily contaminated water (containing up to 10^2 E. roll per 100 milliliters) from open wells, ponds or streams. Replacing these sources by piped water or protected wells will dramatically improve water quality and will therefore reduce water-borne transmission. However, some studies in Bangladesh, Guatemala, Lesotho, the United States of America and elsewhere hare found that such improvements failed to have a marked effect on diarrhoeal disease incidence. One possible explanation for these findings is that diarrhoeal diseases in the communities studied were mainly non-water-borne.

Water availability and water use if diarrhoea-causing pathogens are being transmitted by non-water-borne routes (es instance on hands, clothes and food) it is important to improve personal and domestic cleanliness. This is difficult, if not impossible, when the nearest water source is far

from the house and the water must be laboriously carried in small containers. It is also difficult when there is a tap near the house which provides only an intermittent supply. Improved personal and domestic cleanliness depend upon an abundant supply of water (about 30- 40 litres per person daily) located near the house and available 24 hours a day for 365 days of the year. Improved cleanliness also depends on the correct use of the water once it is available, and this behavioural factor is discussed below and on page three.

Excreta disposal

The main diarrhoea-causing pathogens are shed in the faeces and therefore the hygienic disposal of human faeces is of the utmost importance. Each family must have access to a latrine which ail members use and keep clean. The latrine must be acceptable and attractive to the users. Some studies have shown that the construction of latrines does not necessarily reduce the incidence of diarrhoeal diseases. This is probably because the latrines were not used, not kept clean, or not used by the most important section of the community - the children.

Behaviour

The provision of good water supplies and latrines will achieve little unless people understand these new facilities, like them, maintain them and use them. Therefore ail water and excreta disposal projects must be accompanied by vigorous programmes of community education and must be planned and implemented in cooperation with the community The promotion of frequent hand washing may be especially effective

Focus on children

Children are not only the main sufferers from diarrhoea, they are also the main source of infection. Symptomatic and asymptomatic infection rates are highest in children and is their faeces which are most likely to spread infection to the rest of the family and neighbouring households. The defaecation and hygienic behaviour of children is the vital but neglected component of diarrhoeal disease control programmes.

For children under about four years the educational programmes must be directed at the parents,

especially the mothers. For older children, education of both children and parents is important. The design of educational programmes to change child hygiene will vary enormously from community to community. However, in many cultures (including my own in England) parents often believe that the faeces of small children are fairly harmless. It would be relatively simple to design a programme to convey the message the stools of small children are dangerous.

An integrated approach

There is abundant evidence that improving only water quality or only latrines will has e little or no effect on the incidence of diarrhoeal disease. We must hope, and evidence exists to support this hope, that a combination of improved water qualify' increased water availability, hygienic and acceptable latrines, and vigorous and sustained educational programmes will be effective. The impact of such an integrated approach will clearly be different on different types of diarrhoea. For instance, cholera, typhoid and shigellosis may be substantially reduced whereas rotavirus diarrhoea is likely to be unresponsive.

Nevertheless the goal must be to design affordable and effective integrated programmes which will reduce overall diarrhoeal disease morbidity and mortality even before there has been any dramatic reduction in poverty. The most cost-effective mixes of water, sanitation and education arc yet to be defined and arc a major priority of the applied research component of the WHO Diarrhoeal Diseases Control Programme to be described in the next issue of Diarrhoea Dialogue.

Handout 3E: Primary health care

> **"Primary health care is essential health care based on practically, scientifically sound and socially acceptable methods and technology made university accessible to individuals and families in the community through their full participation and at a cost that the community and country can afford to maintain at every stage of their development in spirit of self-reliance and self-determination. It forms an integral part both of the country's health system, of which is the central function and main focusa, and of the overall social and economic development of the community. It is the first level of contact of the individuals, the family and community with the national health system bringing health care as close as**

possible to where people live and work, and constitutes the first element of a continuing health care process."

- from the Declaration of Alma-Ata

A 1975 recommendation by the UNICEF - World Health Organization (WHO) Joint Committee on Health Policy was the first major official recognition of the primary health care concept, which has been steadily gaining momentu in recent years. Primary health care was elevated to an even higher level of importance at the International Conference on Primary Health-Care, held in Alma-Ata, USSR, in September 1978, jointly sponsored by WHO and UNICEF. There, delegates from 140 nations and a variety of Non-Governmental Organizations unanimously approved the Declaration of Alma-Ata, calling for urgent and effective international and national action to develop and implement primary health care throughout the world, particularly in developing countries, aiming toward "an acceptable level of health for all the people of the world by the year 2000."

Community, Communication, and the Health Practitioner
by Cecile De Sweemer

Like other development efforts, primary health care in developing countries depends heavily on communication, a dependence that is intensified both by primary care's special and by the importance of helth to other development efforts. Primary health care seeksto deliver promotive, preventive, and curative care for the most common diseases through the most cost-effective means. It aims directly at the reduction of morbidity and mortality, and, where the appropriate motivation exists, can be used to make related services such as family planning wide available. It thus contributes significantly to the aspect of development termed the "quality of life" and can have a strong impact on people's perception of their achievements in development.

Maurice King, in Medical Care in Developing Countries (Nairobi: Oxford University Press, 1966) suggests a number of principles on which primary health care should be based. These statements are as valid today as when they were formulated:

- **Patients should be treated as close to their homes as possible in the smallest, cheapest, most humbly staffed, and most simply equiped unit that is capable of looking after them**

adequately...

- **Some form of medical care should be supplied to all people the same time.**
- **In respect of most of the common conditions there is little relationship between the cost and the size of a medical unit and its therapeutic efficiency.**
- **Medical care can be effective without being comprehensive...**
- **Medical services should be organized from the bottom up and not from the top down.**
- **The health needs of a community must be related to their wants.**

The constant effort, in fact, is to get "the maximum return in human welfare from the limited money and skill available."

Primary health care projects around the world have found that the implementation of primary helath care hinges on the quality and quantity of communication. "Extension", "health education", and "community orientation" have all tried to capture the essence of the communication process. They are incomplete terms, as they seem to imply unilateral communication from the health services institutions to the people. The successful examples have gone far beyond this pattern, stimulating feedback from communities and recognizing in program design the importance of face-toface communication between community members.

Primary health care in developing countries consists only partially of the services to be performed for people in the curative and preventive realms. It also constitutes a major effort to reorient the helth-related behavior of the people by giving them new knowledge and new skills. Preventive and curative services derive part of their utility from their role in support of communication efforts to change health behavior.

For example, in most developing countries diarrhea is a major killer, particularly of small children. At least one-third of all early childhood deaths in Latin America are attributable to diarrhea. Diarrhea kills through dehydration and shock. If oral rehydration is started when the

first abnormal bowel movement takes place, the chances of the diarrhea's becoming fatal are greatly reduced.

Curative services for diarrhea should thus be accompanied by a major educational effort to teach the mother of the sick child the procedures for preparing and administering simple water-salt-sugar solutions for oral rehydration. If these are taught to a mother when her child has a diarrheal problem, she has an enhanced eagerness to learn, and she gets immediate feedback on the practicability and utility of the new behavior. This not only encourages the learning process but also sets a precedent to encourage the mother to help teach the new health behavior. This not only encourages the learning process but also sets a precedent to encourage the mother to communicate the new information in turn. Such lateral communication is likely to cover more of the population more quickly and with a deeper impact than would ever be possible merely through the health practitioners themselves.

Trainer Attachment 3A: The global impact of diarrhea

Oral rehydration therapy

As the half-way point in the first year of life approaches, one of two evils begins to undermine the normal growth and weight-gain of tens of millions of the world's infants. The first is that the mother will not begin to give her baby other food in addition to breastmilk. The second is that she will.

From the age of five or six months, breastmilk alone is no longer sufficient to meet the needs of a growing child. If supplementary feeding is not now introduced, then growth slows down, weight-gain falters, and resistance falls. Not beginning to add supplementary foods at this time therefore pushes the child towards the edge of the vortex of malnutrition and infection. Yet in many countries, including India and Bangladesh, more than a third of all infants are still being exclusively breastfed even at the age of one year or more. At that point, malnutrition is the certain result.

If, on the other hand, supplementary foods are introduced at the age of five or six months, then the risk of infection and malnutrition is almost as great. For as a child is weaned from the breast

on to other food and drink, so it is weaned into increasing contact with an outside environment which may well include unsafe water, contaminated foodstuffs, unhygienic sanitation and uncontrolled infection. Weaned or unweaned therefore, it is at this point - mid-way through that first year - that so many millions of young children slip into the downward spiral.

To keep a child growing normally, there is no question that the introduction of supplementary foods must begin at this time. So help for the mother - help in weaning her child safely - is the next obvious fulcrum against which leverage for improvements in child health and growth can be exerted.

For most infants in most pans of the developing world, the greatest danger of the weaning period is the danger of dehydration induced by diarrhoeal infections. A study in the villages of Guatemala, for example, has shown that the incidence of diarrhoea increased sharply in the second six months of life and rose to become twice as likely in the second year as in the first.

To protect the child from diarrhoeal infection is a task which no mother can accomplish alone. For it involves an armoury of deterrents - health and nutrition education, more and better weaning mixes, more hygienic preparation and storage of food, more water and safer sanitation, improved domestic and personal hygiene, and immunizations against diarrhoea-inducing infections like measles.

Action on all of these fronts is obviously necessary - and not just for the prevention of diarrhoea. But in the meantime, dehydration continues to claim the lives - and strike at the growth - of millions of children in almost all communities of the developing world. Mothers therefore need help now if they are to protect the health and growth of their children through the vulnerable years. Thanks to one of the simplest but most important breakthroughs in the history of science, that help may now be at hand.

Diarrhoea itself is so common in the developing world - with an estimated 500 million children suffering the infection three or four times a year - that most parents regard it as just a normal part of growing up (see Figure 1.11). Normally, the infection cures itself in a matter of days, but in about 10% of all cases, something starts to go seriously wrong.

Perhaps feeding stops - the natural reaction of most mothers when a child has diarrhoea. Perhaps the child just won't eat - the appetite depressed by infection. Or perhaps the child's powers of recovery are already at a low ebb. Whatever the cause, the infection persists and the fluids continue to drain from the body. soon, 5% of the child's bodyweight is lost. Even now, most children will recover- though their growth will have received another serious setback. But for some, the diarrhoea continues.

In a matter of hours now, the child's skin begins to lose its resilience and the thirst becomes unbearable? though the child may not have the energy to express it Without urgent treatment, 10% of body-weight is soon lost. Now shock sets in, and stupor. Blood pressure begins to drop. The pulse quickens. Within minutes the kidneys begin to malfunction. Acids build up m the body. Peripheral blood cells begin to collapse.

One our of every 20 children born into the developing world dies like this before reaching the age of five.

Until recently, the only effective treatment recommended for dehydration was the intravenous feeding of solutions administered by qualified personnel in medical institutions which were beyond the physical or financial reach of most mothers. Now, the great majority of those 5 million dehydration deaths could be prevented by another breakthrough in the child health revolution- the use of oral rehydration therapy (ORT).

Attempts had often been made to rehydrate patients by mouth - usually by making them drink solutions of salt and water. But diarrhoeal infections not only increase the loss of fluids and salts from the body, they also inhibit the absorption of salts and water through the intestinal wall. Nonetheless it was the addition of sugar to such a salt and water solution, in an attempt to make it more drinkable, which led to the accidental discovery of oral rehydration therapy. For it was shown that the absorption of sucrose was not affected by the infection. And the sucrose carries salt and water through with it.

So by using glucose as a Trojan Horse to smuggle salt and water through the intestinal wall, oral rehydration was suddenly made possible. Mixed in the right proportions, the sugar can increase

the body's absorption of the salt and water by twenty-five times. And by administering enough of the solution to replace fluids lost to body during diarrhoea, dehydration can be prevented or corrected in almost all cases. In the remote Teknaf region of Bangladesh, for example, a three-year study of over 30,000 cases of diarrhoeal infection has shown that 95% could be successgully treated by ORT.

Oral rehydration salts can be made up locally in health centres (see panel p. 3). Or with the right kind of community education programme, an almost equally effective mix can be made by mothers using ordinary domestic sugar and salt - supplying potassium in the form of bananas, plantains or papaya. Alterantively, the right proportions of salt and sugar, with small quantities of potassium and bicarbonate (to correct metabolic acidosis), can be made up and pre-packed in factories at a cost of less than 10 cents.

Whatever kind of oral rehydration method is used, the two vital messages for parents are:

- **Continue feeding even when your child has diarrhoea and...**
- **Begin replacing fluid losses by oral rehydration treatment as soon as the diarrhoea begins.**

By this technology and these messages, most dehydration deaths can be prevented and growth can be maintained. Studies in the Philippines, for example, have shown that children treated with oral rehydration therapy during attacks of diarrhoea maintained monthly weight gain whereas children who did not have ORT available had lost weight as a result of diarrhoeal infections.

So much for the theory. Does ORT work in practice?

- **In Guatemala, child deaths have been reduced by half among a population of 64,000 people in the eastern region of the country after 'health promoters' began teaching mothers how to use locally-made packets of oral rehydration salts (see panel p. 3).**

- **In Egypt, child deaths in the Nile village of Berket Ghatas have been reduced by 50% whithin a year of a community-backed oral rehydration campaign (see panel p.11).**

• In India, a population of 18,000 people in thirteen villages of the Punjab has seen its infant mortality rates from diarrhoeal infections halved by ORT in less than two years.

• In Costa Rica, child deaths from dehydration have dropped by more than 80% in hospitals since ORT was introduced and the hospital services have saved an estimated $3 million in the first year.

• In Egypt, thousands of mothers have reduced the overall pre-school death rate from Diarrhoeal diseases by 50% - using home-made salt and sugar solutions.

• In Bangladesh, community-based distribution of oral rehydration salts in the village of Shamlapur (population 7,000) resulted in 80% of diarrhoea cases being treated with ORT and a fall in the death rate to 0.5% of all cases as opposed to 2.4% in comparable villages.

• In India, death rates from diarrhoea in six village' fell to levels 80% lower than in nearby villages after health workers and community organizations began promoting locally-manufactured oral rehydration salts.

• In Honduras, the number of diarrhoea deaths among children under the age of two has been almost halved by the use of ORT. One year after the beginning of an education campaign-backed by intensive radio coverage - 95% of mothers knew how to make and administer the salts (see panel No.).

• In Trinidad and Tobago, child deaths from diarrhoeal infection dropped by 60% in the General Hospital, Port of Spain, in the five years after ORT replaced intravenous feeding as the main treatment for dehydration.

• In Haiti, the diarrhoea death rate among children brought into the State University Hospital, Port-au-Prince, fell from 40% to 1% after ORT was introduced in 1980. Because the mothers themselves were taught ORT, each child benefited from intensive care' and earlier rehydration.

• In Bangladesh, 900 field-workers have taught 2.5 million women how to make ORT

solutions from the salt and molasses available in every household. Follow-up surveys have shown that more than 90% of the mothers can prepare an effective mix and a significant number are now using it (see panel p. 29).

- **In Nicaragua, 80,000 young literacy workers have carried the ORT message into thousands of households and 334 ORT units have been set up across the nation. From being the leading cause of child death in 1980, Diarrhoeal infection had dropped to fifth place by 1982. (see panel p. 21).**

- **In Jordan, 1,720 out of 1,732 cases of diarrhoea were successfully treated by ORT in the General Hospital of Amman.**

- **In one area of Turkey, the number of cases of Diarrhoeal inaction which had to be referred to fully qualified doctors has fallen from 34% to 4% since Assistant Nurse Midwives began taking oral rehydration salts into village homes and teaching their use.**

Such examples demonstrate the potential of ORT. Both in preventing infant deaths and in preventing frequent setbacks to normal healthy growth, the technique could play a major part in a child health revolution And there are now signs that things are starting to move. Countries as diverse as Nicaragua, Haiti and Honduras have now launched ORT campaigns designed to put this breakthrough at the disposal of every family. In total, over 30 nations are now beginning ORT programmes and at least 20 are gearing up for large-scale factory production of oral dehydration "Its (see Figure 1.12). UNICEF itself is producing over 20 million sachets a year (or 87 nations and, together with the World Health Organization, we are assisting more than 20 countries to begin local manufacture. Brazil alone it preparing to produce 20 million sachets a year and Pakistan has stepped up its distribution of salts from one million sachets in 1982 to five million in 1983. In total, present annual production of oral rehydration gaits is running at around 80 million sachets a year as against the billion or more which would be needed if the sachets were to be made available to all children at risk.

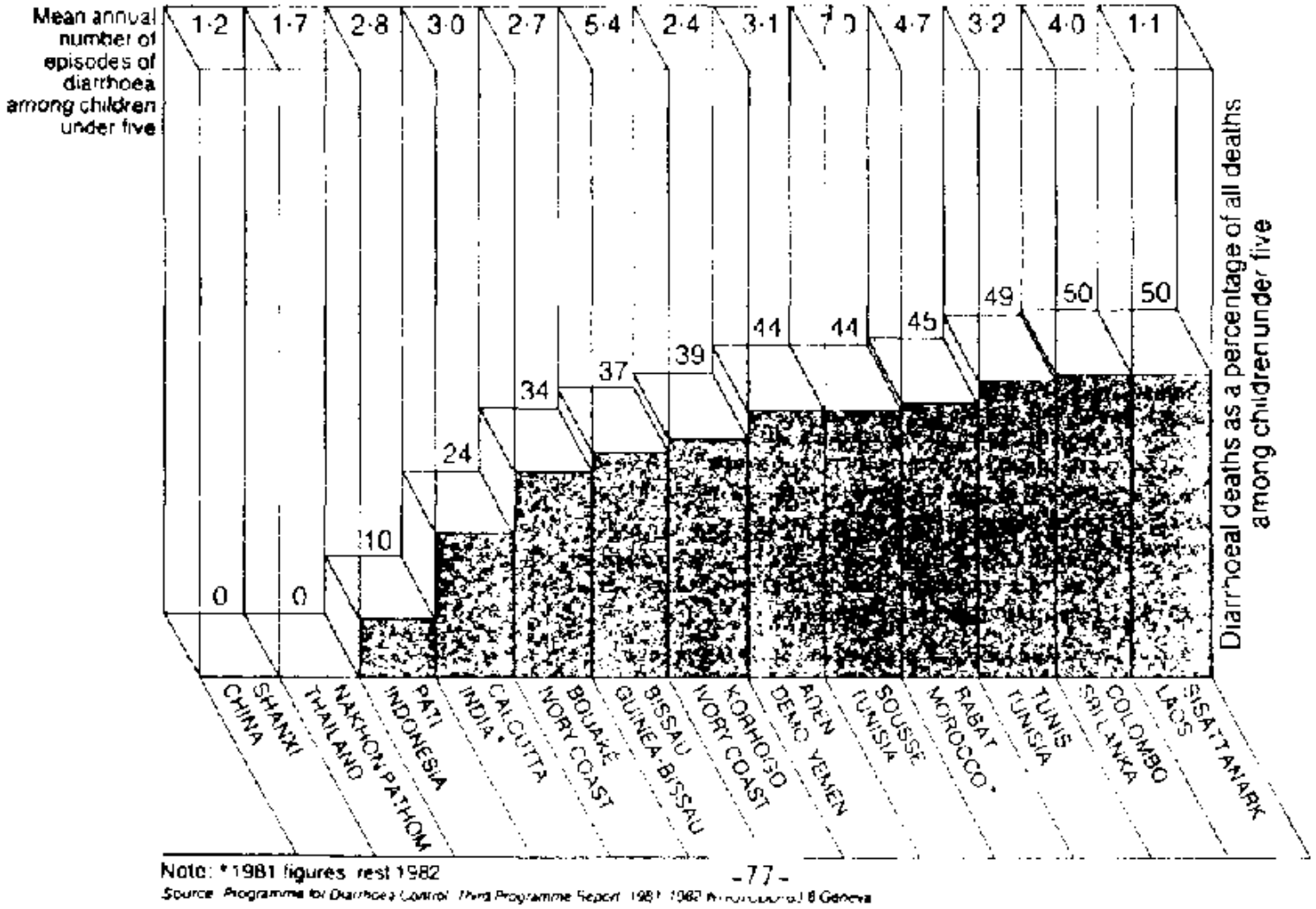


Fig. 1.11 Child deaths from diarrhoeal infections

But shortage of the salts themselves need not prevent the rapid spread of ORT. For if parents have the knowledge and the confidence to mix sugar and salt and water in the right proportions, then an almost equally effective oral rehydration solution can be administered in the child's own home. Although not quite as good as the pre-packaged salts made according to the UNICEF and WHO recommended formula, this slight disadvantage is more than made up for if home

preparation means that oral rehydration therapy can begin earlier. If the parents also know that they should keep on feeding the child throughout the illness and that the solution should be used to replace body losses as soon as the diarrhoea begins, then most of those 5 million child deaths per year could be prevented.

In all of this, the central challenge will remain the creation of support (or ORT among the health professionals, understanding within the community and confidence among mothers) (see panel p. 11). Several times, ORT campaigns have foundered because mothers who knew how to make an effective oral rehydrationmixture did not have the confidence to use it when the time came (see panel p.9). But once created, a parent's confidence in his or her own ability to bring about improvements in family health will probably not stop at ORT.

REGION	COUNTRY
AFRICA	ETHIOPIA LESOTHO MOROCCO MOZAMBIQUE ZAMBIA
AMERICAS	ARGENTINA BRAZIL COLOMBIA COSTA RICA DOMINICAN REPUBLIC ECUADOR EL SALVADOR GUATEMALA HAITI HONDURAS PARAGUAY PERU
EASTERN MEDITERRANEAN	AFGHANISTAN EGYPT PAKISTAN SYRIAN ARAB REPUBLIC TUNISIA
SOUTH-EAST ASIA	BANGLADESH INDIA INDONESIA NEPAL SRI LANKA THAILAND
WESTERN PACIFIC	CHINA DEMOCRATIC KAMPUCHEA MALAYSIA PHILIPPINES REPUBLIC OF KOREA VIETNAM

Source: Programme for Diarrhoeal Control, World Programme Report, 1981-1982 WHO/CDD/83.1 Geneva

Fig. 1.12 Developing countries producing oral rehydration salts

The campaign to promote the knowledge and use of oral rehydration therapy was given a major boost in June of 1983 when experts and practitioners from all over the world convened at the International Conference on ORT in Washington D.C. to share recent experiences and plan future strategies. The Conference (sponsored by US AID, WHO, UNICEF, and the International Centre for Diarrhoeal Disease Research, Bangladesh) reached a consensus on all the fundamental points - that diarrhoea is a major killer and debilitator of children; that ORT is a safe, affordable and effective therapy; that the right basic chemical composition of the salts is generally agreed upon; and that the challenge now is how to put the new technology at the disposal of all who need it. 'Much progress has been made,' said Dr. Lincoln Chen in his summing up of the Conference's proceedings, 'much more needs to be done, and done soon. Oral rehydration therapy is increasingly capturing the imagination of the policy makers, the scientists, and the public.'

Meanwhile, further advances in the therapy itself are still being made. In the last two years, the International Centre for Diarrhoeal Research in Bangladesh (a pioneering institute which has been given substantial support by the United States Agency for International Development and by the United Nations Development Programme) has run successful field-trials with an oral rehydration solution based on ground-rice boiled into a thin soup with only a three-finger 'pinch' of salt added. Other creals - all of which contain the necessary glucose - could be used in the same way. Even cheaper and more available than sucrose or sugar-based solutions, these cereal-based salts have even less risk of side effects and shorten the duration of diarrhoeal infection. And even without the chicken or vegetables which can be added, they can help in the vital task of maintaining nutrition and protecting growth even through bouts of diarrhoeal infection.

Research is now needed to prove the viability of cereal-based salts and to find and test the combinations of locally available ingredients from which effective oral rehydration solutions can be made. But the more difficult challenge is to put what is already known at the disposal of millions of farmers who need it. And just as glucose and salt are two vital ingredients of the 'technological brekthrough', so support of the national community through all avilable means of communication and the rise of new kinds of local community through all available means of communication and the rise of new kinds of local community development workers are the two

vital ingredients in the 'social breakthrough', so support of the national community through all avilable means of communication and the rise of new kinds of local community development workers are the two vital ingredients in the 'social breakthrough' which is as necessary as the salts themselves if ORT is to play its part in a child health revolution.

Nicaragua and Honduras: ORT cuds deaths

- **Because child diarrhoea and the malnutrition that goes hand in hand with it were such deadly scourges in Nicaragua UNICEF's emergency assistance at the end of (he civil war in July 1979 was concentrated on oral rehydration Twenty-three oral rehydration units were established with trained staff distributing oral rehydration salts tree of charge and leaching mothers how to mix them at home The units soon showed their effectiveness. and the emergency effort rapidly turned into a priority national programme**

The government used every available means to inform the public about oral rehydration All the mass media were co-opted. The campaign was splashed across billboards and leaflets comic books and posters were distributed nation-wide The 80 000 young workers of the mass literacy campaign carried the message to every part of the country along with the advice to continue feeding children during diarrhoea. Monthly reports from the oral rehydration units were widely circulated so as to dispel any doubts the medical profession might have

By 1982 there were 334 units in operation with a steady stream of child patients- more than 300 000 so far. And diarrhoea has taken from first to fifth place as a killer of Nicaragua's children

- **In Honduras likewise diarrhoea has traditionally been the foremost cause of infant and child mortality and an intensive public information campaign has been mounted to combat it.**

Radio was the principal channel for the Honduran campaign One 60-second radio spot - a song extolling the benefits of breastfeeding - quickly became a national hit; it was always followed by an announcement urging the use of Litrosol, a locally-packaged brand of oral rehydration salts. Other radio spots some of them humorous covered related topics such as the importance of hygiene in preparing a child's food.

Distributed simultaneously with the radio campaign was a large poster of a mother breastfeeding her child complete with rose laurel and the campaign emblem of a red heart Other eye catching posters gave instructions on why and how to use Litrosol

Mayors midwives and health workers were given stocks of Litrosol packers and they raised flags outside their homes displaying the red heart to identity them as dispensers of the salts

A year after the launching of the campaign the proportion of diarrhoea cases being treated with Litrosol rose from zero to 50%. Moreover 95% of women surveyed after a year knew about Litrosol and how to use it in the most heartening finding of all the death rate from diarrhoea in children under two fell by 40% within a year and a half.

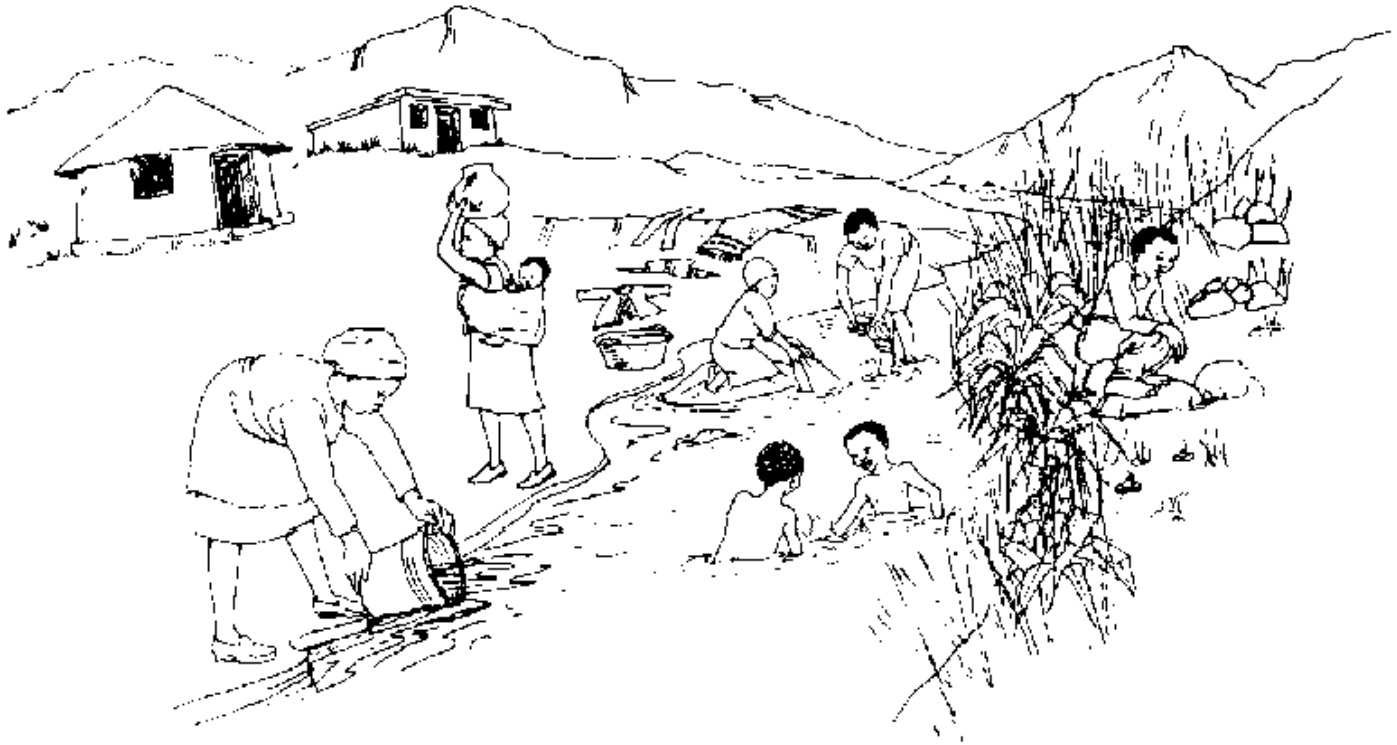
Trainer Attachment 3B: A story about diarrhea

Picture One

This is the story of Thabo. Here is young Thabo when he was a happy, healthy child

Picture Two

One day Thabo's sister was helping her mother bring home drinking water from the river where others do the wash and bring animals to drink. She beg m feeling pains in her stomach.



Picture Three

She had diarrhea by the river in the tall grasses where other people did the same. Then she went back home and poured the water in the clay pot in the kitchen where it was stored uncovered for drinking, cooking, and washing dishes.

Picture Four

She poured out some of the water into a baby bottle to feed to her little brother Thabo. She did not wash her hands or the baby bottle before she gave it to Thabo.

Picture Five

The next day Thabo cried all day long and had diarrhea. Mother told Fatu, "babies always get diarrhea. Don't worry."

Picture Six

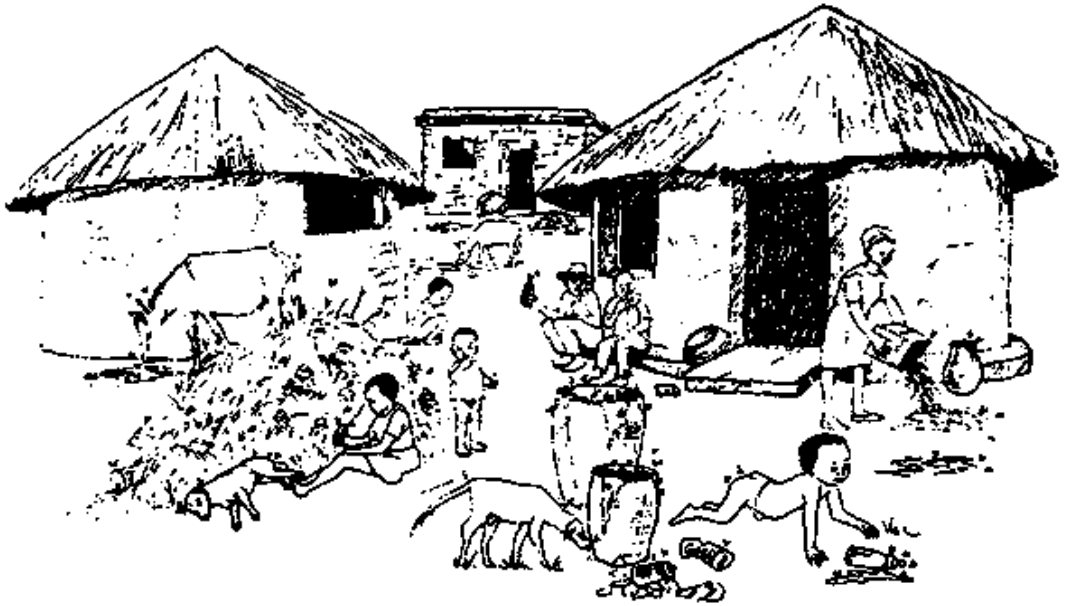
The next day Thabo still had diarrhea. His mother began to worry and decided that the only way to make him better was to stop giving him food.

Picture Seven

Thabo was very thirsty and cried for water but his mother did not give him water. She believed that water would make the diarrhea worse.

Picture Eight

Thabo became very weak and dry end still had diarrhea. His mother was very worried and she did not know what to do. When Thabo's father came home, he decided that the mother and baby should go to the clinic 10 kilometers away. He asked the local truck driver for a ride but the man demanded 100 francs and Thabo's father had only 50.



Picture Nine

Thabo's father tried to borrow money from his neighbor but the man had spent all his money on drink. He went to his boss Mr. Kola to ask for a loan. Mr. Kola refused, saying "you already owe 1000 francs from the last loan for Thabo's christening." Mr. Kola advised him " tell your wife to feed the family better so you and your children aren't so weak and thin.

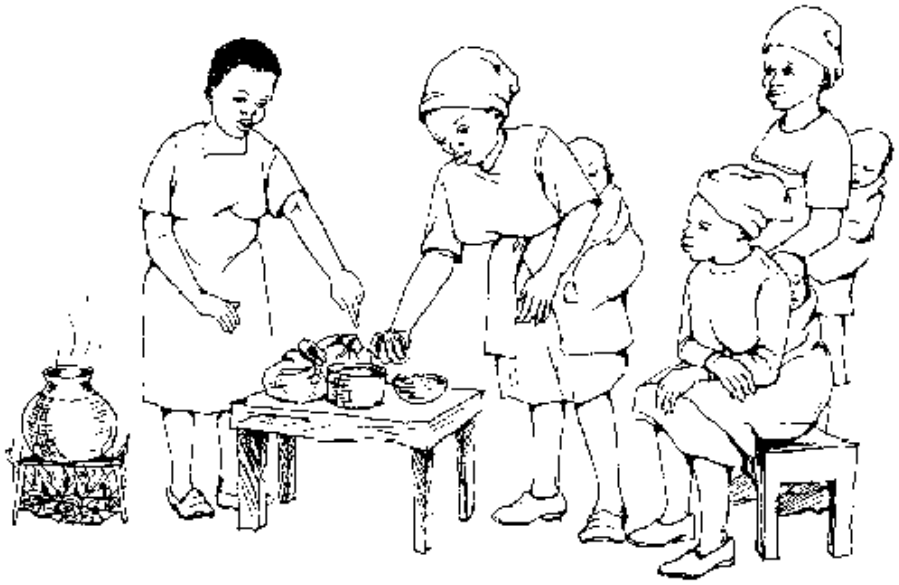
Picture Ten

Five days later Thabo died. What caused Thabo's death! Could his death have been prevented?

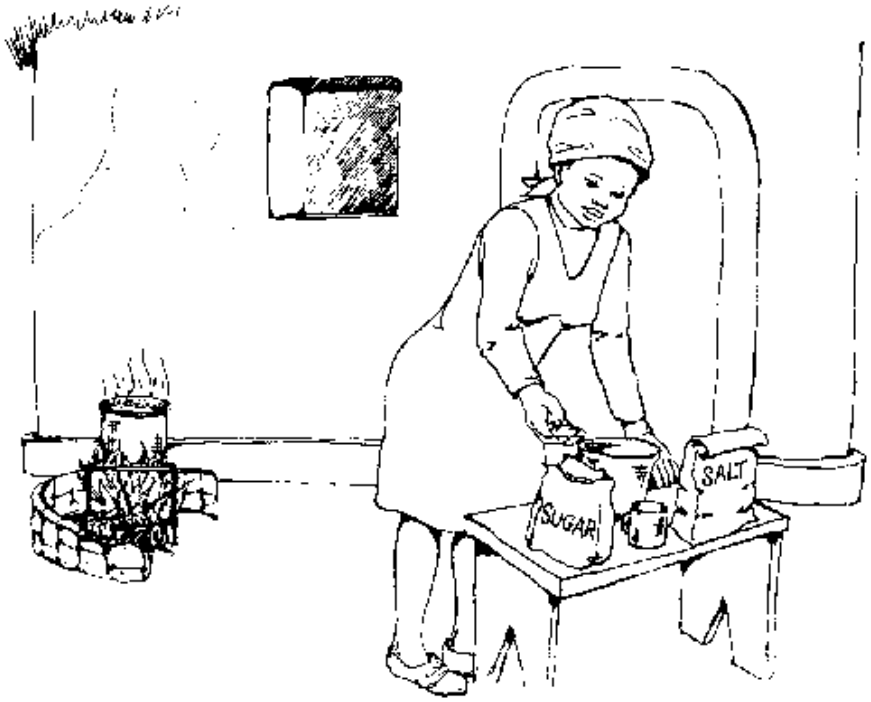
Intervention Pictures

Figure

Figure



Figure



Figure

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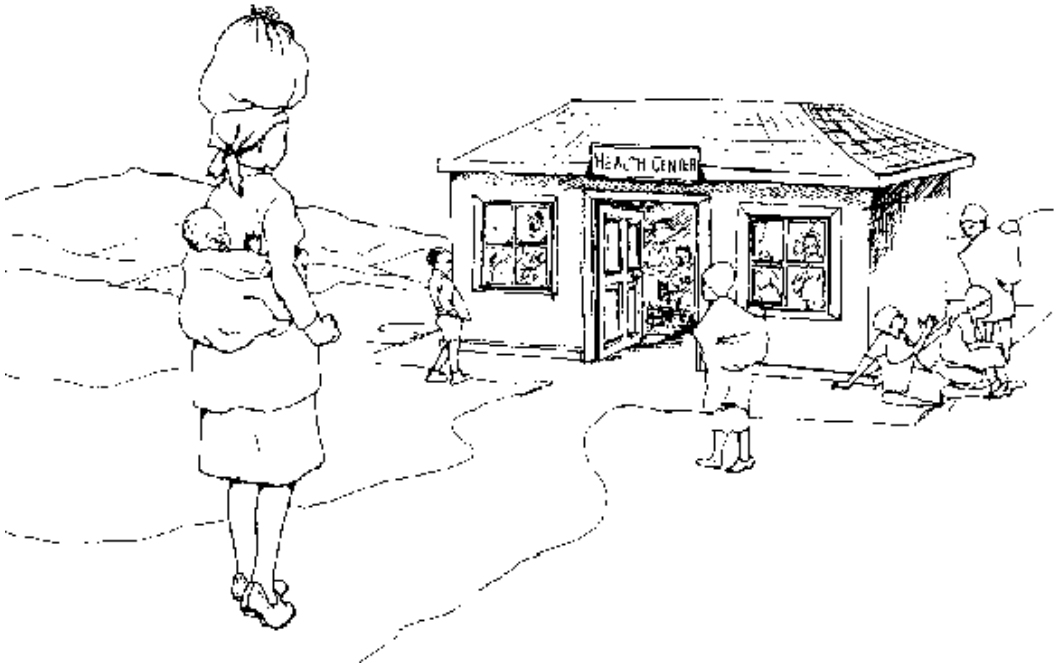
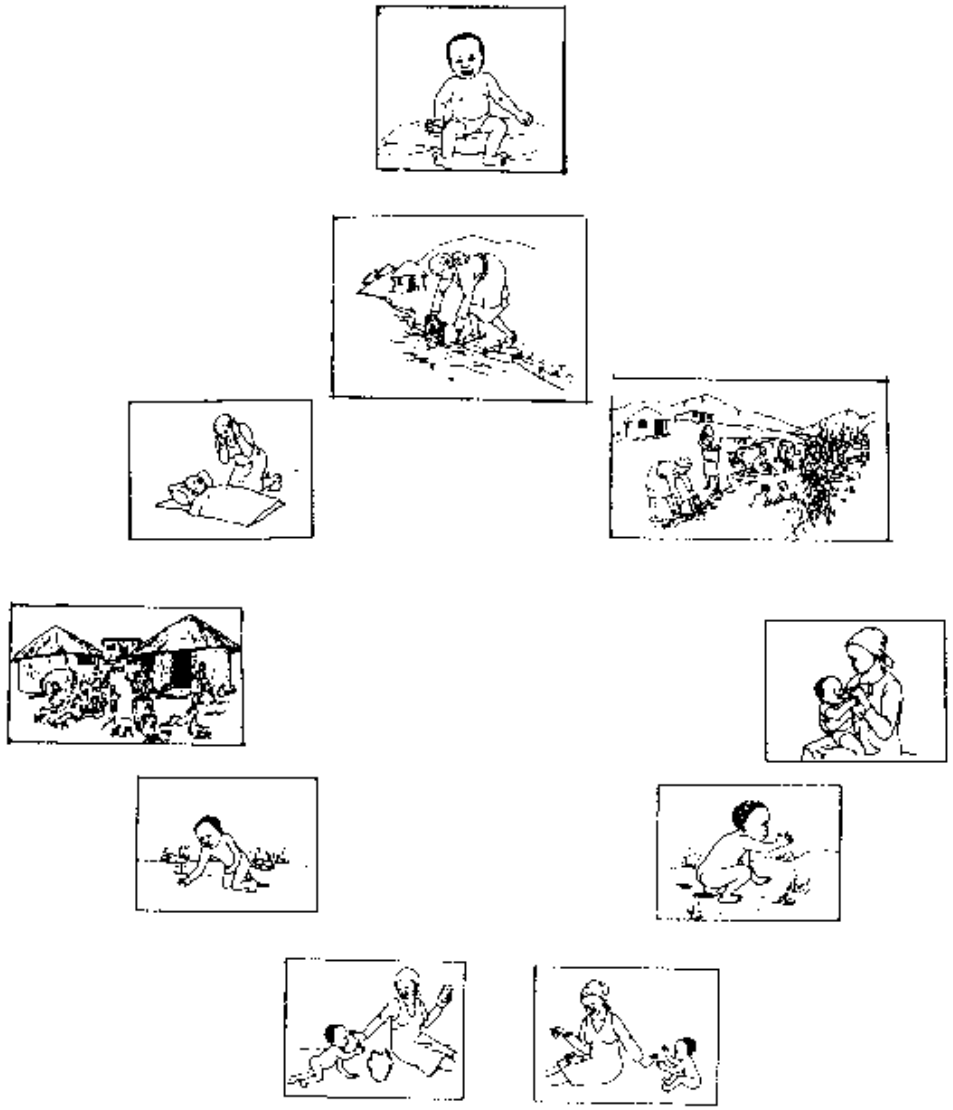


Figure

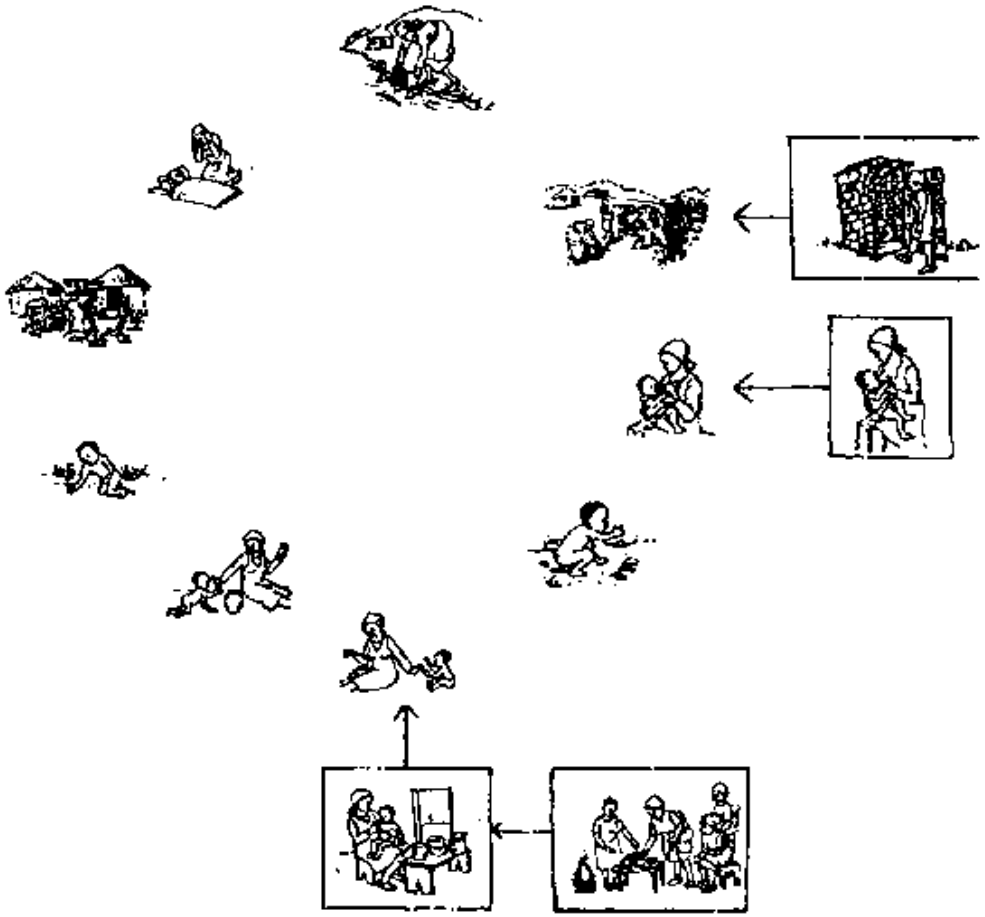
Trainer Attachment 3C: Suggestions for using the picture story

As you tell the story, hold up the appropriate picture. Then ask one of the participants to place it on the wall so that all the pictures form a circle going clockwise as shown below.



Figure

After the discussion of causes and interventions for diarrhea, ask participants to put the intervention pictures beside the pictures in the circle that the interventions affect, as shown below. Leave these pictures on the wall for reference in the next few sessions.



Figure

Session 4 - Dehydration assessment

TOTAL TIME

3 hours

OVERVIEW

Specific checklists and charts that summarize "what to look for" will help participants more

accurately identify potential dehydration resulting from diarrhea. In this session participants identify the visual signs and symptoms of dehydration resulting from diarrhea. Using the WHO Diarrhea Treatment Chart, they assess the signs of dehydration presented in case studies and determine the appropriate treatment plan to follow for severity and degree of dehydration. There is an optional discussion of how to adapt the treatment chart for use with community health workers.

OBJECTIVES

- **To identify the physical signs and symptoms of dehydration.**
  (Steps 1 and 2)

- **To use the WHO Diarrhea Treatment Chart to assess signs of dehydration and determine appropriate treatment plans.**
  (Steps 4-6)

RESOURCES

- **Treatment of Diarrhoea (ORT Resource Packet)**
- **Helping Health Workers Learn, Chapter 24, pp. 18-19.**

Trainer Attachments:

- **4A Pictures of children with Signs of Dehydration.**
- **4B Guidelines for Presentation of the WHO Treatment chart.**
- **4C Answers for Exercises**
- **4D Creating a Case Study**
- **4E Adaptation of the WHO Treatment Chart**

MATERIALS

Slide projector, (WHO or UNICEF) slides and/or pictures of children with physical signs of dehydration; poster-size version of the WHO Diarrhea Treatment Chart; newsprint and markers,

plastic bag, water, gourd or plastic baby, thermometer, weighing scales.

PROCEDURE

Trainer Note

Prior to this session, obtain photos such as those shown in Trainer Attachment 4A (Pictures of Children With Signs of Dehydration) or slides (UNICEF or WHO) of children who exhibit some of the following signs of dehydration:

- **dry cracked lips**
- **slightly sunken eyes**
- **inelastic skin (pinched skin does not respond after two seconds)**
- **weight loss**
- **sunken fontenelle**
- **sad listless appearance**

Post these pictures in the room prior to Step 1. Obtain a copy of the WHO poster-size Diarrhea Treatment Chart (available from either the WHO country coordinator or local UNICEF representative) or make one using the small version in Treatment of Diarrhoea Try to get copies of these materials in the local language. You may want to simplify the chart based on conditions in rural communities. For example, it may not be possible to take the temperature because thermometers may not be available.

Also make a vocabulary list of terms related to dehydration in the local language.

One or two days before this session, ask a participant with some health background, to help you prepare the presentation of the WHO Chart for Step 3. The information they should include in their presentation is found in The Treatment of Diarrhoea Suggested guidelines for this presentation are found in Trainer Attachment 4B.

Ask two participants to prepare a role play for Step 4 on assessing dehydration using the WHO chart. Have them read pages 8-10 of Treatment of Diarrhoea and use those in Exercise B as a

bests for the role play. Work with them to make sure that they ask all the questions and do all the measures listed in the left column of the WHO chart. Provide props such as a doll, a thermometer, scales for weighing, chart for the health worker, local dress for the mother.

Ask two participants to prepare a role play for Step 7 on Selecting the Proper Treatment plan using the WHO chart. Have them review the case on pages 20-22 in Treatment of Diarrhoea and use it as the basis for their role play.

The WHO Supervisory Skills Module for CDD, entitled Treatment of Diarrhoea, included in the CRT resource packet, is the primary handout for this session.

Step 1 (10 min)

Dehydration Picture Gallery

Introduce the session by reviewing the objectives, and explaining that they will be doing a "picture gallery" activity. Point to the posted pictures, or show similar slides or photos. Ask the participants to examine the pictures or slides and to individually record the physical symptoms they observe without discussing their observations with others. Have participants describe how each child appears to feel (e.g., lethargic, inactive).

Step 2 (20 min.)

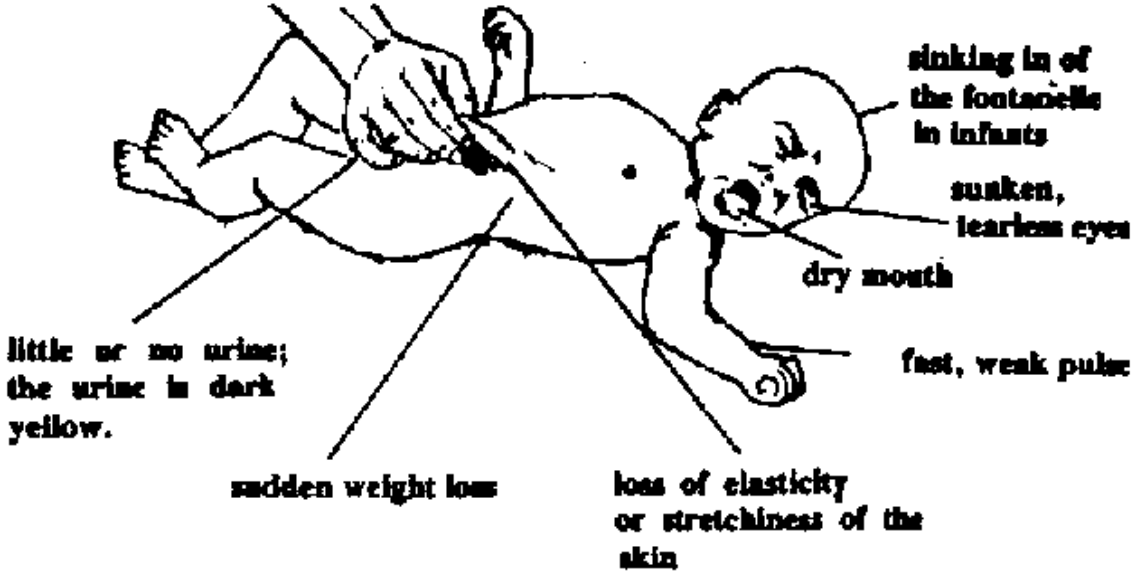
Discussion of Observations in Pictures

Hold up or show the pictures or slides of dehydrated children one at a time and ask the participants to share their recorded observations. Write their response on newsprint and post the appropriate picture next to it. Discuss the limitations of observations. Emphasize the need to ask questions, feel the child and take certain measurements.

Using the captions on the back of the pictures, review the signs and symptoms of dehydration.

Trainer Note

In reviewing the signs and symptoms of dehydration, also use a drawing such as the one below as a summary of all the key points. See the Treatment of Diarrhoea, pages 8-13 for a list of signs and symptoms.



Figure

Some of the participants observations may relate more to malnutrition, vitamin deficiencies and/or certain infectious diseases than to dehydration. While the children in the photos may indeed be suffering from these conditions, the purpose here is to concentrate on and discuss only the symptoms of dehydration. Sessions in Module 3 (Nutrition and Diarrhea) discuss the interrelationship between diarrhea and malnutrition.

Step 3 (15 min.)

Introducing the WHO Chart

Ask the preassigned person to assist you in introducing the chart. Post the large version of the WHO Chart. Refer to the photos from Step 1, during this presentation.

Step 4 (20 min.)

Using the WHO Chart to Assess Dehydration

Ask the two participants to perform the role play they prepared to demonstrate the use of the WHO chart to assess a "case".

Ask one of the participants to describe, step-by-step, what was done in the diagnosis of the dehydration case and questions the "health worker" asked the mother. Ask the rest of the group to add comments and corrections.

Ask participants to look at the chart in their copy of the Treatment of Diarrhoea and decide and discuss:
- Were the questions on the chart asked during the demonstration?
- What signs and symptoms were mentioned (point to these on the chart)? What was the assessments Has it correct?

Step 5 (20 min)

Practice Assessment of Diarrhea and Dehydration

Ask the participants to turn to page 28 of the manual Treatment of Diarrhoea. Have the participants form small groups and work through the exercises on pages 28-31 and write their answers on a sheet of paper. Suggest that they review the pictures of children with signs of dehydration to help them complete the assessment exercise more easily. Tell them to answer only the questions related to assessment and hold the questions on treatment until later in the session.

Step 6 (20 min.)

Comparison and Discussion of Assessments

Reconvene the group. Ask one small group to report and initiate discussion on each exercise, The

reports should include explanations of how each group arrived at an assessment. Allow time for questions and discuss any differences of opinion or conflicting answers. Also discuss any difficulties encountered in using The WHO chart. Encourage participants to help each other solve these problems.

Trainer Note

Use Trainer Attachment 4C (Answers for Exercises) as a reference for the discussion of answers here and in Step B.

Steps 5 and 6 take considerably longer if translation into the local language is necessary or if Counterparts have difficulty reading. In these situations, assign only one case to each group.

If time is limited, you can go through the case assessments in a larger group discussion. Another option is to use the cases in the Treatment of Diarrhoea bock for self instruction. Have participants work individually and check their own answers as "home work". Provide an opportunity for questions and answers if you use this test option.

Step 7 (25 min)

Determining Proper Treatment for Diarrhea and Dehydration

Uncover and point to the treatment plan portion of the large WHO chart. Note that Treatment Plan A is used when there are no signs of dehydration; Plan B is used with mild dehydration and Plan C is used in the clinic for severe dehydration.

Ask the second pair of role players to do their performance by selecting a treatment plan and advising the mother how to care for the child.

Discuss the role play and ask a participant to summarize Treatment Plan A.

Describe one of the case examples and answers from Treatment of Diarrhoea (pages 2324) to illustrate and summarize Treatment Plan B.

TRAINER NOTE

For the case using Treatment Plan A, the following rules for home treatment should be stressed:

- Increase fluids

- Continue feeding (food should be offered five to seven times a day).

- Lock for signs of dehydration.

- Give the sugar-salt or ORS solution (If available) every time the child has a loose stool and if the child vomits wait ten 10 minutes and then continue to give solution in small amounts.

- The mother should go to a clinic if diarrhea persists for longer than two days or at the first signs of dehydration.

Emphasize that Treatment Plan A is extremely important and that if begun at the first sign of diarrhea and mixed correctly this treatment may prevent dehydration.

The main points in Treatment Plan B are:

- The amount of ORS to give depends on the child's weight or age.
- The child's status should be reassessed after four to six hours of treatment.
- This plan should be followed if the child shows two or more signs of dehydration.

In both cases the participants should understand that the solutions should not be kept more than 12 hours. ´Also, that their role for the most part will be in explaining to mothers how to make and when to give sugar-salt solution and when children should be referred to health centers for treatment with ORS packets.

Emphasize that treatment Plan C is for health clinic use. Any cases with symptoms in column C should be referred to a clinic immediately.

Step 8 (20 min.)

Case Studies

Ask the participants to go back to the case studies from Steps 4 and 5 and work individually to answer the questions which refer to treatment using the WHO treatment charts and what they've learned from the previous step.

Give them 15 minutes then ask for volunteers to read their answers. Discuss any differences or difficulties the group encountered in using the chart.

Step 9 (10 min.)

Review of the Session

Ask a participant to summarize the main points they learned in this session.

Trainer Note

This summary should include the main things to "lock for" in assessing dehydration and when to refer children to health centers.

If possible, the participants should be taken IV a health center where they can observe health workers assessing children for diarrhea and dehydration and treating them. If possible; arrange for opportunities for- participants to practice assessing dehydration under the supervision of a qualified health worker. Practice with case studies and pictures is not adequate to master dehydration assessment.

In previous training courses it has been useful to provide additional case studies for practice in dehydration assessment. Trainer Attachment 4D (Creating Case Studies) can be used to develop other case studies similar to those in Treatment of Diarrhoea. You can present cases at the beginning of each day or turn them into role plays like the one used in Steps 4 and 7.

Optional Step (60 min)

Adapting The Chart For Local Use

As a final application of the material from this session, discuss the advantages and disadvantages of the WHO treatment chart as a teaching tool for community health workers and how to modify it for local use.

The discussion should include some of the following questions:

- **What modifications are needed for use in training literate community health workers?**
- **What basic information is needed for dehydration assessment in this country?**
- **Can the chart be adapted for training non-literate community health workers? How?**

Trainer Note

Explain that the WHO Treatment Chart was developed as a basic model for adaptation to specific country conditions. Stress the importance of retaining the most essential instructions when such adaptations are made. These are summarized in Trainer Attachment 4E (Adaptation of the WHO Treatment Chart).

Session 18 (Adapting and Pretesting Health Education Materials) has information on adapting materials for use with different target groups. There is also an activity on adapting the WHO chart.

Trainer Attachment 4A: Pictures of children with signs of dehydration

Sunken eyes, dry mouth (dry, cracked lips) sleepy

AGE: 18 MONTHS

Skin does not go back when pinched. No tears though baby is crying

AGE: 3 MONTHS

Sunken fontanelle

AGE: 18 MONTHS

Sunken Eyes, dry mouth and tongue

AGE: 2 YEARS

Floppy, severe undernutrition. Very sunken eyes.

Trainer Attachment 4B: Guidelines for presentation of the who diarrhea treatment chart

Explain the purpose of the Chart

- **To show how to assess patients for signs of diarrhea and dehydration**
- **To serve as a reference for medical personnel.**

Briefly review the kind of information included on the chart and the layout of the chart pointing to the parts of the chart as you mention them.

- **What to ask about, look at, feel and measure are listed in the left column.**

- **Across the top of the chart are three columns, A,B and C.**

- **Listed under A are symptoms indicating no dehydration.**

- **Listed under column B are symptoms indicating mild dehydration.**

- **Listed under column C are symptoms showing severe dehydration and other danger signs that require treatment at a clinic.**

- **Columns A, B. and C refer to treatment plans that you will discuss later in the training session.**

Explain how the information on the chart relates to the earlier discussion of the signs and symptoms of dehydration. Briefly review and illustrate the following definitions of diarrhea and

dehydration.

Diarrhea is a disease characterized by frequent passage of abnormally loose or watery stools.

Dehydration is loss of a large amount of water and salt from the body.

Use visual aids such as those shown below to illustrate these definitions.

For example. They can pick 2 flowers, put one in water, and keep the other without water. They will see that one lives while the other wilts and dies. Ask them why this happens.

Or the children can put a fruit like a plum or guava in the hot sun to see what happens to it.

Ask the children what they think happens to a baby when he dries out. Right! He loses weight and can become wrinkled.

Distinguish between chronic and acute diarrhea.

Acute Diarrhea is characterized by three or more abnormally loose or watery stools per day for

three weeks or less and is caused by an infection of the bowel.

Chronic Diarrhea is characterized by diarrhea lasting more than three weeks and is caused by an infection of the bowel, undernutrition or by worms and other parasites.

- Explain that all children who show signs listed under Column D alone or in conjunction with signs from Columns A, B or C need to visit a health center for treatment with specific drugs as well as with oral rehydration solution.

- If watches are available with second hands, have participants practice taking a pulse and timing respiration rates. Ask them to take their temperature under the arm and in the mouth and compare their readings, if thermometers are available in the community health center.

Close the step by mentioning the five things a person should do in his or her continued assessment of the child's condition.

- Ask the mother about the child's condition
- Look for signs indicating the child's condition
- Feel the child for skin elasticity, pulse rate and sunken fontanelle
- Weigh the child
- Take the child's temperature.

Trainer Attachment 4C: Answers for exercises

TREATMENT OF DIARRHOEA
Possible Answers to Exercise E

Case 1

a. Yes. Sione has the following signs of dehydration:

8 watery stools

some vomiting
a skin pinch which goes back slowly
a sunken fontanelle
eyes that are a little sunken

b. No. Sione is not severely dehydrated.

c. The health worker should select and follow Plan B - Treat Dehydration with ORS solution.

d. The child should be given 200 to 400 ml of ORS solution in the first 4 hours.

e. If the child vomits, wait 10 minutes. Then, give more ORS solution slowly in small amounts.

f. The child should be reassessed after 4 - 6 hours.

g. Since some of the signs of dehydration are still present, Treatment Plan B will still be followed. Sione should be given 200 to 400 ml of ORS solution for another 4 - 6 hours. He should be breastfed between the times he is receiving ORS solution. This procedure should be repeated until the signs of dehydration have gone.

h. Plan A should be selected because there are no longer signs of dehydration, and the health worker wants to ensure that further dehydration is prevented.

Case 2

a. Ana has only one sign of dehydration. She is thirstier than normal.

b. The health worker should select and follow Plan A to prevent dehydration.

c. The child should be given 100 - 200 ml (or 1/2 - 1 cup) of ORS solution after each diarrhoea stool.

d. Give increased amounts of locally available fluids such as

Feed the child as much as she wants 5 to 7 times a day, especially foods that are easily digested such as

_____

and those containing potassium such as

_____

e. Keep feeding the child and giving fluids. Also, watch for the signs of dehydration and bring the child to a health worker if they appear, or if the diarrhoea lasts another 2 days.

Case 3

a. Dano has the following signs of dehydrations

- **more than 10 liquid stools a day**
- **quiet and floppy**
- **no urine for 6 hours**
- **dry eyes**
- **very sunken eyes**
- **very sunken fontanelle**
- **very fast pulse**

b. There is severe dehydration.

c. Dano has a high fever of 40°C.

d. The health worker should prepare ORS solution for his mother to begin giving while taking Dano to the health centre (400 - 600 ml). m e solution should be given frequently in small amounts, such as by spoon.

e. The child should be given 150 ml (30 x 5) of IV fluid the first hour.

f. The child should be given 200 ml (40 x 5) of ORS during the next 3 hours.

g. Plan B should be selected and followed.

Trainer Attachment 4D: Creating a case study

Introduced by Joseph Naimoli and Elizabeth M. Edmands

Notes to the Trainer:

One way of teaching family health is through a case study. Case studies can focus on common situations that occur during the family life cycle. Case studies can also be used to teach students about factors to consider in uncommon situations. As a trainer, you can use the depth and richness of your experience to create your own case studies, which you can design for the specific group of health workers that you train, and which embrace the local customs, beliefs and practices in your setting. Creating a case study takes time, practice and skill, but you will find considerable satisfaction in what you can accomplish.

The general guidelines that follow provide a framework for you to create your own family health case study.

Guideline 1: determine specific objectives.

To begin, you must decide what you want the students to learn from the case study. It is assumed in family health case studies that the objectives extend beyond the teaching of clinical content to the broader concepts of concern and care.

Guideline 2: outline the content to be covered.

Collect information or recall the facts about cases you have known. Record this information. Decide what is missing. Determine whether to create some hypothetical "facts," or to purposely omit some information, such as the real names of a person or family.

Your outline should cover the broad categories to be included, but it need not be complete or detailed. Other content may suggest itself as you develop your case.

It is helpful to the reader to put in topical headings at appropriate points in the study. These headings also help to organize one's thoughts.

Guideline 3: develop the case study.

1. Focus on a family member in a community. The individual should have a problem and be identified by a title within the family (e.g., mother, son, grandfather).

Provide information about social, physical and personal history; age; appearance and personality; present signs and symptoms; and give beliefs and attitudes regarding current illness. Where appropriate, add occupation (current or previous).

A description of other family members is imperative - their relationship to the primary individual and their acute or chronic problems.

A description of the home and community is helpful: income, type of housing, sanitary facilities, food, resources, transportation and health personnel and facilities available. You may wish to have the students investigate some of these areas as part of the management of the case.

2. In writing up the case study, make a point of telling a story.

- **Visualize potential settings based on your own practice and experience.**
- **Explore the parts about which you are less certain. . Reflect the humor and the pathos gently, but recognize that it is there.**
- **Recognize also the relationship between anxiety and illness.**
- **Keep in mind the logic of the situation. For example, don't create a situation involving a 52 year-old mother with a 6-month-old child or a man with three years of school working as a teacher.**

Write as vividly as you can. Use descriptive adjectives to help the reader envision a person or a situation. Strive to awaken the students' interest without losing sight of the seriousness or

complexity of family problems.

3. Select a format that is suitable for your purposes. If you use the case study format presented in this Journal, then formulating questions will be one of the most thought-provoking tasks that you will face. For example: what are the critical thoughts on assessment? What ideas do you have to stimulate the students to think about nursing or midwifery management? Have you raised questions that promote problem-solving techniques?

4. Read the first draft of the case study carefully. Examine it for logic, relationships of people, facts, and sequence. Usually, some inconsistencies emerge. Correct them

5. It is important at this stage to obtain the reaction and critique of more than one colleague. Because reviewers will tend to visualize your case study a little differently, be sure they understand the objectives and points described in the preceding sections.

Guideline 4: test and revise the case study.

In writing their first case studies, most trainers prefer to test them on a small group of students. This is understandable ant has considerable merit. Always expect that there will be questions. Some things that seem perfectly clear to you will have no point of reference for the student. You may have used terminology that needs to be clarified; perhaps you have focused on complex issues that the student doe. not understand.

However, you have to be the final judge of what revisions are indicated. Change for the sake of change is seldom worth the effort. At the same time, be aware that the student is your best critic. If the case study is rejected as being too simple, too complex, not based on reality, or raising irrelevant questions, probably no learning will take place.

Remember also that case studies need to be re-evaluated after use on a larger scale: are the objectives being met, are students gaining anything from this method of teaching, how do they like this method of teaching?

Other reasons for re-evaluating and revising a given case study might include: new information

about etiology, prevention, diagnoses and treatment and nursing care of a specific disease.

Other considerations:

- **Some of the best case studies have been developed by a team whose members have specific expertise. Examples of some team compositions are: nurses from obstetrics/gynecology, pediatrics, psychiatry, and public health; nutritionists; social workers; and representatives from the fields of sociology and education.**

- **Maintain a balance between information that is included and information that is omitted. There should be enough information to stimulate the students' thinking and to give them something to work with. At the same time, it is important to omit certain data so that students can identify that it is missing and needed.**

- **Observe all the principles of professional writing - clarity, accuracy, simplicity, and cohesiveness.**

In addition to the above guidelines on how to write a case study, we present a new family health case study, "Stillbirth, " by Elizabeth M. Edmands, which we hope you will find appropriate and useful.

The preceding Braining tool is taken from A Manual of Case Studies in Family Health written during the African Health Training Institutions Project (AHTIP): University of North Carolina, Chapel Hill, N.C., USA.

Trainer Attachment 4E: Adaptation of the treatment chart

The following information is basic and should be included in even the simplest version of the chart.

1. Ask about: All information

2. Look at: Condition - well alert, sleepy, has fits.

3. Feel skin - pinch

4. Fever - burning

Treatment Plan A

1. Give homemade sugar salts solution after each loose stool 1/2 to 1 glass depending on age.

2. If child vomits wait 10 minutes and give a very small amount of liquid again.

3. Give other liquids (tea, breastmilk etc.) and other foods (multimix, carrot, soup, etc) 5 to 7 times a day.

4. Check for signs of dehydration, look, touch.

Treatment Plan B

1. Give solution made with ORS packets -

For children 6 months, give 1 to 4 glasses of pre mixed solution in 4 to 6 hours.
For children 6 to 12 months give 4 to 6 glasses
For children aged 18 months to 3 years give 6 to 8 glasses

2. Check for puffy eyelids. Stop giving until eyelids return to normal.

3. After 4 to 6 hour-e check dehydration status (skin, urine quantity, area of mouth is watery).

4. Give breastmilk or other liquid in between ORS.

5. If child vomits wait 10 minutes to give again.

6. After 12 hours make new solution.

Treatment Plan C

1. Send to health Center immediately.

Session 5 - Rehydration therapy

TOTAL TIME

4 hours

OVERVIEW

Effective treatment of dehydration requires the replenishment of salts, fluids, and nutrients to the body. Rehydration is necessary for all types of diarrhea. In Session 4 participants learned the signs and symptoms of diarrhea and dehydration that indicate the use of WHO Treatment Plan A (sugar and salt) to prevent dehydration, Plan B (ORS) to treat dehydration, and Plan C (IV or nasogastric tube) for severe dehydration and rapid Rehydration needs. In this session they develop a further understanding of the biological need for rehydration and the reasons for the effectiveness of ORS. Through hands on experience preparing solutions, participants explore the differences in ORT solutions. They also discuss the problems in preparing and giving ORT in the village.

OBJECTIVES

- **To explain why oral rehydration is necessary for the prevention and/or treatment of moderate dehydration.**
  (Step 1)

- **To accurately 01x two kinds of oral rehydration solutions.**
  (Steps 2, 3)

- **To describe the components of two kinds of oral rehydration solutions and the appropriate use of each solution.**
  (Steps 1, 4)

- **To describe problems in preparing and giving ORT in the village. (Steps 5, 6)**

RESOURCES

"Oral rehydration Therapy for Childhood Diarrhea, "Population Reports, The Treatment of Diarrhea (WHO Supervisory Skills).

Handout:

- 5A ORT Preparation Worksheet

Trainer Attachments:

- 5A Materials and Equipment Needed for ORT Stations
- 5B Using Models to Show Why rehydration is important
- 5C Suggestions for a Lecturette on the Hows and Whys of ORS
- 5D Oral rehydration Therapy: The Scientific and Technical Basis
- 5E Storing and Maintaining Supplies of Oral rehydration Salts
- 5F Oral rehydration With Dirty Water?
- 5G A Pinch of Salt, A Handful of Molasses
- 5H Cautious Prescription

MATERIALS

Newsprint, markers, Read Trainer Attachment 5A for list of materials and equipment needed for practice stations. Read Trainer Attachment 5B for materials needed for using models.

PROCEDURE

Trainer Note

In strict adherence to WHO guidelines, Peace Corps advocates the use of only two types of ORS solutions-prepackaged and sugar-salt solutions- in Peace Corps projects and in this training

program. As discussed in Session 4 and reviewed in this session, WHO Treatment Plans A and B outline the appropriate and effective use of these two solutions in ORT. Before this session, find out what recipes for oral rehydration solutions the government and bother agencies are busing. In some areas more than one agency may be encouraging the use of ORT with different recipes. Be prepared to discuss these differences and their potential for confusing the public.

Please note that research is currently being conducted on "rice powder" ORS. Ricepowder ORS substitutes rice powder (i.e., ground rice) for glucose, an essential component of the standard OR formula (Rice-powder ORS should not be confused with rice water. Rice water is the fluid drained from the rice after cooking. Since it generally contains very little salt and variable amounts of rice starch, rice water is considered unsuitable for active rehydration. It is not an oral rehydration solution.) Possible advantages & disadvantages of rice powder ORS are being studied but no conclusions can be drawn until further research is done.

Trainers should only emphasize rice powder ORS in countries where a definite policy and guidelines on this subject have been developed and operationalized by the MOH. Only in countries where definite policies exist should rice powder ORS be incorporated as an ORT approach. In such cases, the trainer has the responsibility of becoming familiar with exact MOH guidelines and explaining those to the participants through discussion and a handout.

The main purpose of this session is to provide actual experience in correctly preparing the two kinds of solutions. Be sure to allow ample time for practice.

This session requires considerable preparation. Recruit the help of several participants to set up the work stations (with the materials, equipment and task descriptions explained in Trainer Attachment 5A), prepare for the demonstration, and clean up afterwards.

Identify individuals in the group or training center who have had experience preparing and using ORT to act as resource persons during Step 3.

If possible invite a local health worker to participate and assist in this activity. He or she may be able to help you arrange to give the solutions mixed during the session to children in the community or clinic during Step 7.

Ask participants to bring commonly used utenslis from their community work site. Each solution must be mixed as accurately as possible. Predetermine the quantities and weights measured by locally available utensils so recipe mixing may be done precisely under local conditions. Use these utensils in your demonstrations. (See Oral rehydration Therapies for Childhood Diarrhea in the ORT resource packet.)

Ask a participant to help you prepare the demonstration described in Trainer Attachment 5B (Using Models to Explain Why rehydration is important) and the lecturette described in Trainer Attachment 5C (Suggestions for a Lecturette on the Hows and Whys of ORS.

If available, get copies of the WHO Treatment Chart in the local language. hive prepare a list of ORT terms in the local language with the assistance of Peace Corps language trainers.

Step 1 (20 min)

Demonstration and Discussion of Why Rehydration la important

Introduce this Session using the plastic bag, the gourd baby and the watered and wilted flowers to illustrate the need to rehydrate a child with diarrhea (as suggested in Trainer Attachment 5B).

Ask participants to describe Treatment Plan A on the WHO chart, which they discussed in Session 4 (Dehydration Assessment) and explain what this demonstration tells then about Plan A.

Briefly discuss the fluids available in village hoses that are already used or could be used during diarrhea to prevent dehydration (Including sugar salt solution). Also discuss any cultural beliefs that night help or hinder teaching mothers to give children liquids during diarrhea.

Trainer Note

The main point of this activity is to illustrate why rehydration is necessary during diarrhea in a clear simple way that can be used by participants with mothers in the village.

It also provides a way to reinforce and use their learning about Treatment Plan A in the WHO

Chart. They should recognize that the plastic bog and other models provide an explanation of why plan

Is very important. Emphasize prevention of dehydration as a major goal for their health education efforts in ORT. Refer back to the circle of pictures that you made for the diarrhea story in Session 3 (Prevention and Control of Diarrhea Note that oral rehydration is one important intervention in the circle.

Step 2 (15 min)

Lecturette on the Hows and Whys of ORS

Point to the pictures showing the signs of dehydration that were introduced in Session 4. Ask someone to quickly summarize the signs of dehydration. Explain that these physical signs are caused by the loss of sodium, potassium and nutrients during diarrhea, in addition to the loss of water.

Present the lecturette that you prepared using Trainer Attachment SC (Suggestions for a Lecturette on the Hows and Whys of ORS). If possible use a simple diagram to illustrate the way that the body chemistry balance is affected by diarrhea.

Ask someone to describe Treatment Plan B on the HO chart. Discuss the ingredients in ORS and how they help the body regain its chemical balance. Ask someone to explain in their own words when they would give ORS to a child with diarrhea and what the ORS does for the child in comparison to sugar salt solution.

Briefly discuss how people in the village have responded to ORS packets (or are likely to respond it they have not been introduced to them). Build on the discussion of cultural beliefs regarding the acceptability of liquids (from Step 1).

Close this step by telling the participants that they will be spending the rest of the session preparing two different oral rehydration solutions' the kind that should be used at the first sign of diarrhea to prevent dehydration (sugar-salt) and the type used to treat mild dehydration (ORS).

Trainer Note

Prepare two sheets of newsprint with the recipes for ORS and for sugar-salt solution as stated in The Treatment of Diarrhea, pages 17 and 42.

During the group's discussion of these two recipes, make sure that the following points are covered:

- Potassium is an essential element in the body and is lost during diarrhea. A minimum level of potassium is needed for the body to function.

- The amount of salt listed in the recipe 16 sufficient to replace sodium and water loss.

- Glucose is preferred to sucrose (table sugar) because it helps the body absorb liquid more quickly.

- Sodium bicarbonate helps prevent acidosis, a condition which decreases a dehydrated child's appetite.

- Mention that, as of 1985, the new WHO formula will replace bicarbonate of soda with trisodium citrate which has a longer shelf life and also appears to reduce stool volume.

- Home-made sugar-salt solution, made properly and used correctly along with other nutrients, can prevent dehydration but is not adequate treatment for dehydration because it lacks potassium in sufficient amounts to replenish body losses.

- OHS packets which are pre-measured and contain the added ingredients of potassium and bicarbonate of soda or trisodium citrate are important to use when treating mild cases of dehydration and can prevent the need for implementing Treatment Plan C, (IV or Nasogastric Therapy).

- None of these solutions should be kept longer than 24 hours. A fresh quantity should be mode daily.

For more technical background see Trainer Attachment 5D (Oral Rehydration Therapy: The Scientific and Technical Basis).

Step 3 (20 min.)

Preparing to Mix Oral Rehydration Solutions

Demonstrate how to mix the two kinds of oral rehydration solution. Have one or two people do return demonstrations and have the group critique their demonstration. Pass the solution around so that everyone has a chance to taste it.

Explain that everyone will be working in small groups at oral rehydration stations for the next hour. Each group will carry out the following tasks at each station:

- Read the instructions for preparing the solution at the station and take turns in mixing and tasting that particular solution.

- Discuss and complete Handout 5A (The ORT Preparation Worksheet) prior to moving to the next station.

- Clean up the station before moving on to the next one.

Trainer Note

In doing the demonstration, make sure that you'

- Emphasize washing hands before you begin mixing the solutions.

- Show all the utensils needed, using locally available items.

- Clearly state the ingredients and proportions, stressing the importance of being as accurate as possible.

- Emphasize that too much salt is dangerous to the child: too much aster makes the

solution ineffective.

- Cover the solution when it is mixed.

- Explain how to store ORS packets. You can refer to Trainer Attachment 5E (Storing end Maintaining Supplies of Oral rehydration Salts) and page 19 in The Treatment of Diarrhoea.

An alternative approach is to do a correct demonstration then tell participants that you will be doing an incorrect demonstration and you want thee to tell you what you did wrong. This repetition helps them learn and remember the steps in mixing the solutions.

Step 4 (60 min)

Preparing Oral rehydration Solutions

Ask the group to fore small groups, move to the first station and begin preparing the solutions.

Trainer Note

During this step you should:

- Have resource persons who have mixed these solutions observe, correct and assist the participants with any problems or questions they nay have. Also tints person should make sure everyone uses proper hygienic techniques when mixing the solutions (e.g. washing their hands and all utensils before and after making the solution).

- Make sure each station has adequate supplies and ingredients available for each new group.

- Assign each group the task of reporting on one solution. These reports should include information contained in Handout 5A (ORT Preparation Worksheet) and Incorporate Information from the WHO Diarrhea Treatment Chart as to how much solution should be given, when it should be given and what other fluids and foods should be given when the

child is belay treated with their assigned solution.

Step 5 (30 min.)

Discussing The Use of Oral Rehydration Solutions in The Village

Reconvene the group and ask each small group to report on their experience at one of the stations. Have someone from each group record the answers on newsprint, using the format from Handout 5A (ORT Preparation Worksheet). Allow about 5 minutes for each work station report. Encourage comments and discussion after each presentation.

Ask participants to think about what they have learned and answer the following questions:

- Which treatment should be used when a child has diarrhea? Some signs of dehydration? severe dehydration? Why?

- What problems do you foresee in preparation and use of ORS in the village? What about sugar salt solution?

- What can you do to overcome some of the problems encountered in teaching and encouraging people to prepare and use these solutions?

Trainer Note

Be sure to discuss the following kinds of problems:

- Lack of understanding in the village about the importance of accurate measuring.
- Lack of uniform measures.
- The use of too such salt or sugar.
- The cost or lack of availability of the ingredients.
- No ORS packets available at the local health post.
- Limited water supply and/or dirty water.

Make sure that everyone understands the difference between preventing and treating dehydration

sad recognizes the need for the potassium and sodium bicarbonate or trisodium citrate (In the ORS packets) for treating dehydration.

Emphasize the importance of adapting the sugar-salt solution recipe to use locally available ingredients and to amounts appropriate for the utensils available for measuring.

Trainer Attachments 5F (Oral rehydration with Dirty Water?) and 5G (A Pinch of Salt, a Handful of Molasses) discuss some of these problems and describe ways to deal with thee.

Following this step you may want to use the optional step (Discussing Drugs Used to Treat Diarrhea).

Step 6 (45 min.)

Practice in ORT

Demonstrate how to give oral rehydration solution to an infant, Including what to do if the infant spits up the solution or is reluctant to take it. Have one of the participants do a return demonstration.

If possible, give all the participants an opportunity to give the solution to an infant or child during or after this session.

After they finish practicing, discuss problems encountered and ways To overcome them.

Step 7 (15 min.)

Session Summary

Ask the participants to summarize the key points that should be taught about rehydration solution preparation and administration in the communities and how they would do this.

Trainer Note

Information that they should include on how to educate community and family members about home treatment of diarrhea can be found in The WHO Supervisory Skills Module, "Treatment of Diarrhoea" pages 4-6.

Optional Step (15 min)

Discussing Drugs Used to Treat Diarrhea

Depending on the health background and task assignments of the participants, you nay want to use Trainer Attachment 5H (Cautious Prescription) and page 55 of Treatment of Diarrhoea to discuss the types of diarrheal diseases that do require drugs in addition to oral rehydration.

- **What kinds of drugs are commonly used to treat diarrhea in this country?**
- **Why is this use of drugs dangerous?**
- **How can we overcome the idea that drugs are the best cure for any kind of diarrhea?**
- **What do people in your communities think about the power and/or danger of medicines?**
- **Who should decide whether a drug is needed to treat a case of diarrhea?**

Trainer Note

Emphasize that drugs should be "cautious prescriptions.. They should be given cautiously and only when there is a clear indication (such as bloody stools and high fever) that the cause of the diarrhea is a disease that requires drug treatment. They should be prescribed by a qualified health worker. Drugs should never be given as a routine practice for treating diarrhea. A drug that is not needed can be harmful to the body in a variety of ways; giving the drug is likely to divert the mother's attention from oral rehydration, widespread use of drugs promotes the development of drug-resistant strains of diseases; and antibiotics are expensive.

You nay want to assign two people to visit a local pharmacy or store to ask about and get samples of drugs commonly used to treat diarrhea in the host country. You can ask them to report their findings at the beginning of this step.

Handout 5A: ORT preparation worksheet

Observation Items (1-8)	Pre-packaged Solution (ORS)	Homemade Solution (sugar, salt)
1) List of Solution Ingredients and Amounts		
2) Availability of Ingredients		
3) Length of Time for Solution Preparation		
4) Difficulty of Instructions for Solution Preparation		
5) Problems In Solution Preparation		
6) Materials (Equipment) Needed to Prepare Solution		
7) When to Use the Solution		

Worksheet

Trainer Attachment 5A: Materials and equipment needed for ORT stations

Introduction

The set-up for Stations. 1 and 2 is' intended to permit participants to learn how to prepare two kinds of oral rehydration solutions under organized, clean conditions, wing local utensils and measures. Modify these preparations to fit government standards for ORT preparation.

If the training is conducted at a regional site near a community, you may want to arrange opportunities for participants to mix ORT solutions in local homes, under the supervision of someone skilled in mixing ORT.

Both Stations should have:

- **soap and water for handwashing,**
- **clean water for mixing the solution,**
- **ladle or means of drawing water,**
- **hand towels,**
- **spoons or utensils for stirring,**
- **drinking glasses or cups for tasting solution.**
- **large (over 1 liter) container to use in stirring the solution**

Station 1: Pre-packaged Solutions

- **Proper size containers (usually over one liter but marked to give volume corresponding to exactly 1 liter) for mixing packets and water**

- **Local containers that approximate 1 liter**

- Enough Packets for all participants to mix the solution

Instructions

- Mix the solution in the marked container and pour it into the local container.

- Note hoc closely the local container matches the volume of the marked container and what problems this could cause.

- Complete the ORT Preparation Worksheet (column one) this station.

Station 2: Homemade Solutions: Sugar and Salt

- Proper size local container and marked container for mixing.

- Measuring spoons

- Plenty of salt and sugar (If baking soda is available and is part of the government standards for mixing ORT solutions, include it)

- Knife for leveling measurements

- Weighed, labeled correct amounts of ingredients fusing the WHO recommendations).

It the government standard measurements are the handful and the pinch, have participants compare the weighed amounts of ingredients with their own "handful" and "pinch." This reduces variation in measurement resulting from differences in hand size and perceptions of what constitutes a handful or a pinch. Be sure to include the weighed ingredients in your demonstration. Stress the importance of accurate measurement.

If locally available salt is very coarse, provide a means to grind it for more accurate measurement.

Instructions:

- Measure and mix the solution.

- Compare your measured amounts with the samples of ingredients that were weighed exactly.

- Complete the ORT Preparation Worksheet (Column two). Give particular attention to " problems in solution preparation. and how they could affect the success of mixing ORT solutions in the home.

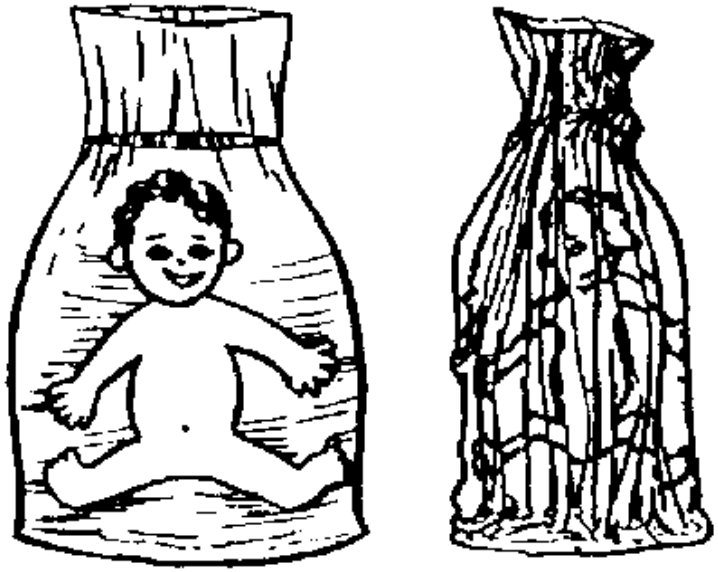
Trainer Attachment 5B: Using models to show why rehydration is important

Below are two examples of simple ways to present the idea of rehydration. See Helping Health Workers Learn, Chapter 24, pages 17-22 for additional ideas.

Plastic Beg Model

Take a clear plastic hag with no tear or bole in it. With a felt-tip pea (the kind with waterproof ink) draw a picture of a baby on it. Fill the bag with water; the picture of the baby will be full and well-rounded, like a healthy child. Now make a small hole la the lower part of tee bag with a pin. As water flows out, the bag and the picture will become wrinkled. This shows what happens to a child who has diarrhoea and becomes dehydrated.

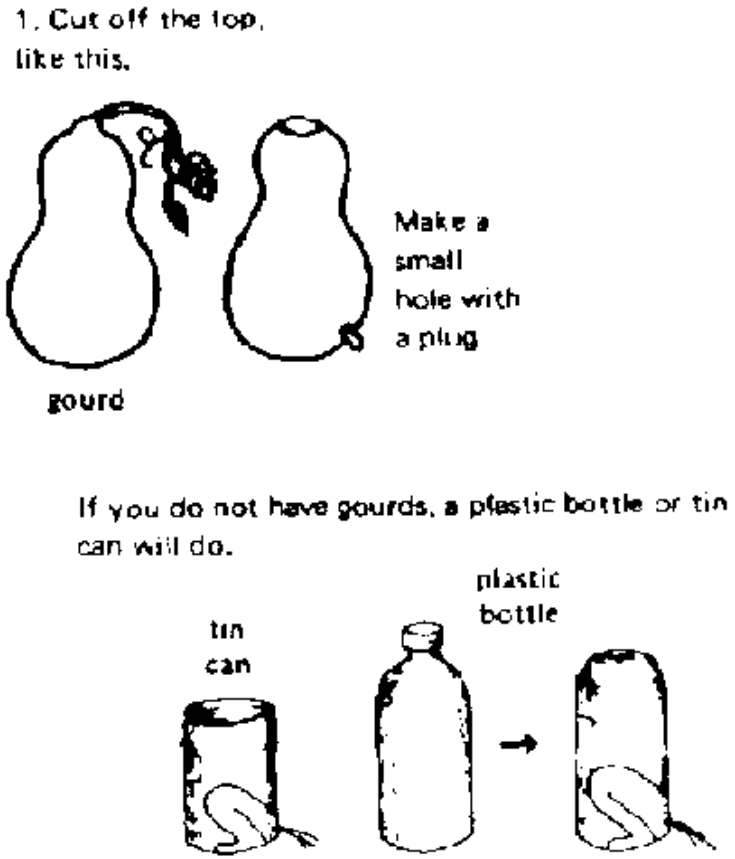
Ask a trainee to pour water into the bag faster than it is flowing out of the hole. This shows what happens with oral rehydration; the picture of the baby will become normal again. Now seal the hole with a piece of tape or sticking plaster so that the water stops flowing out. This shows that the diarrhoea has stopped and no more rehydration is needed.



PLASTIC BAG MODEL TO DEMONSTRATE DEHYDRATION

Gourd Baby

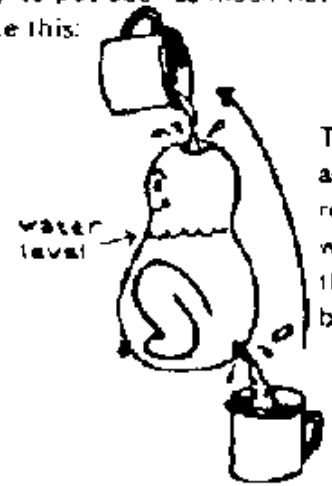
To leam about dehydration. the children can conduct their own experiment by making a gourd baby' like this one:



Figure

How can dehydration from diarrhea be prevented?

The children can find the answer by playing a game with the gourd baby. They pull the plug, then try to put back as much water as the baby is losing, like this:



They learn that, as long as all the lost water is replaced, the water level will never go down and the baby will not become dehydrated.

A child with diarrhea needs to drink **at least 1 glass of liquid each time he has a watery stool.**

Giving lots of liquid to a baby with diarrhea may at first increase the amount of diarrhea. But this is all right. Usually the diarrhea will soon get better. The important thing is to **be sure that the child *drinks as much liquid as he loses*.**

Figure

Trainer Attachment 5C: Suggestions for a lecturette on the hows and whys of ORS

RESOURCES

- **Oral Rehydration Therapy (ORT) For ChIIdhood Diarrhea (ORT Resource Packet. pp. 43-44.**
- **Trainer Attachment 5 (The Scientific Basis for Oral Rehydration Therapy)**

IMPORTANT INFORMATION:

1. Diarrhea upsets the body's chemical balance and its' ability to process and absorb eater and nutrients.

When the child is healthy, the lining of his or her intestines transforms food into a tore that can be absorbed and transported by the blood stream to all parts of the body. These nutrients provide energy and enable growth. The blood stream is also the source of the minerals and water needed by the intestine to transform the food into a useable form. The intestine "borrows" and returns water and minerals as it processes food. This chemical balance is upset during diarrhea.

Diarrheal diseases affect the functions of the intestines. During diarrhea, the small intestine loses its ability to absorb water and essential minerals called electrolytes (sodium chloride, potassium, and bicarbonate). Minerals and water needed to process food leave the body in the child's stools, depleting the body's store of these vital elements and the nutrients they help process.

2. Water and electrolye loss cause the physical signs and symptoms recorded on the WHO Treatment Chart.

Fluid and mineral loss of greater than five percent, but less than ten percent of body weight generally causes a weak rapid pulse, loss of skin elasticity, low blood pressure, severe thirst, and other signs noted in Column B of the WHO Diarrhea Treatment Chart.

A loss of more than ten percent of the body weight results in shock, stupor, disrupted kidney function, acids build up in the blood (acidosis), peripheral blood vessels collapse, and death follows (see Treatment Plan C on the WHO chart.

3. Infants and small children are nor- susceptible to dehydration from diarrhea .

Infants and young children are particularly susceptable to dehydration from diarrhea, because of their small body weight For example, it a child who weighs ten kilograms loses one kilogram of water, ho or she has lost ten percent of the body weight and is severely dehydrated.

4. Oral Rehydration Salts (ORS) restore the body's chemical balance, and replaces the water lost.

Oral Rehydration with ORS (Oral Rehydration Salts) replaces the blood's electrolytes nearly as quickly as they are lost in the stool. This is due in large measure to the special ability of glucose to increase the absorption rate of sodium through the intestinal lining.

ORS includes all the essential electrolytes. Sugar and salt solution only has one of the three. This is why it is necessary to give ORS to a mildly dehydrated child.

Summarized below is the formula for the new trisodium citrate ORS. The ingredients for the other solutions are stated in The Treatment of Diarrhoea, p.17 and 42.

ORAL REHYDRATION SALTS (ORS) FORMULATION CONTAINING TRISODIUM CITRATE

1. In 1982-1983 the WHO Diarrhoeal Diseases Control (CDD) Programme supported laboratory studies to identify a more stable ORS composition, particularly for use in tropical countries, where ORS has to be packed and stored under climatic conditions of high humidity and temperature. The results of these studies demonstrated that ORS containing 2.9 grams of trisodium citrate dihydrate in place of 2.5 grams of sodium bicarbonate (sodium hydrogen carbonate) was the best of the formulations evaluated.[1] The formulae of the standard ORS (ORS-bicarbonate) and ORS containing trisodium citrate dihydrate (ORS-citrate) are shown below:

ORS-bicarbonate	grams/litre	ORS-citrate	grams/litre
Sodium chloride	3.5	Sodium chloride	3.5
Sodium bicarbonate (sodium hydrogen carbonate)	2.5	Trisodium citrate dihydrate	2.9
Potassium chloride	1.5	Potassium chloride	1.5
Glucose anhydrous	20.0	Glucose anhydrous	20.0

ORAL REHYDRATION SALTS (ORS) FORMULATION CONTAINING TRISODIUM CITRATE

SUMMARIZE by stating that Oral Rehydration Therapy is used to:

- **Replace fluids**
- **Restore the chemical balance of the body.**

ANALOGIES THAT HELP LEARNERS UNDERSTAND THESE CONCEPTS'

To give participants a more concrete sense of what it means to lose chemical balance, ask someone to stand on one foot and hold objects of equal weight in each hand. Then ask them to remain on one foot but hold both objects in one hand. Ask thee to tell the others hoe that feels to go from a balanced to an unbalanced situation. How well can they function in this states This can provide the basis for discussion.

To convey the idea that children are particularly vulnerable to dehydration from diarrhea, put the sane amount of water in a large cup and in a small cup. Ask participants to compare the cups. Use this as a basis for discussion.

Trainer Attachment 5D: Oral rehydration therapy: the scientific and technical basis

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Resident Technician
National Control of Diarrheal Diseases Program
Egypt

When a child has diarrhea it loses body fluids - mainly essential minerals and water - and becomes dehydrated. So mix up some salts and sugar in water, and feed the solution to the child, as much as he/she will take until the child is no longer dehydrated, and diarrhea has slowed down or stopped. Make sure the child continues to take food or breast milk.

This is oral rehydration therapy, and it seems so simple (compared, say, to manipulation of genes or artificial hearts) that one may wonder what science has had to do with ORT, or why we need continue scientific studies on ORT. Many older physicians, nurses, or mothers have protested, "This is nothing new, we have been practicing ORT for years" Some of the great clinicians wrote

about ORT thirty to forty years ago - Darrow, Harrison, Chatterjee. But this is precisely the point: they wrote about using ORT, but did not know how ORT works (nor to be fair, could they have them and so there was no further development or spread of their anecdotal experience until some decades later. Even today, when we fail to understand and use the scientific approach, we continue erroneous or wasteful methods of therapy; actually, this is the case in all fields of medicine and public health. Not everyone who practices ORT must be a scientist, but the spirit of inquiry and joy of discovery which suffuses science may be shared by all. The spirit of inquiry is present in five stages:

1. Observation - using all one's senses to capture events and think about them: it was noticed that children with dehydration drank the oral rehydration solution vigorously and greedily and, when nearly hydrated, slowed down and often went to sleep.

2. Measurement - taking one's observations and gauging some values on scales of time, length, amount, and degree: children who drank oral rehydration solution at will tended to drink close to what their initial deficit was, as measured by intake, output, and change in body weight.

3. Creative hypotheses - thinking through the implications of a measured observation and asking interesting questions: who can choose more closely the correct amount of fluid for rehydration, the dehydrated child or the physician?

4. Testing experimenting - within the ethical boundaries of conduct, designing, with proper statistical force and safeguards against bias, a test of the hypothesis: in certain situations, children freely drinking oral rehydration solution became hydrated faster and reached better fluid and mineral balance than those on intravenous solutions controlled by physicians.

5. Application - using the results of scientific testing for the widest possible benefit. It is as Jon Rohde and Robert Northrup have written, "taking science where the diarrhea is" Human information must be shared across all political and other boundaries.

The data and information I will present in this paper have gone through several of these five stages of scientific inquiry.

ORT developed from two streams of inquiry, if I may use a liquid metaphor. The first established what dehydration actually meant, how it related to the clinical picture of the dying child, and what was needed to reverse the situation. Believe it or not, this line of inquiry has taken nearly eighty years to come to satisfactory resolution. The second line, still ongoing, is the discovery of how the intestinal tract handles the movement of salts, nutrients, and water between the body and the outside world.

The picture of the dying child is hauntingly familiar. The baby has lost about 10% of its weight in fluid. This amounts to one liter of fluid in a ten-kilogram child, or about a quart in a twenty-two pound baby. Now the child has hollow, sunken eyes; its pulse is feeble or absent; its breathing is deep and rapid; the skin, when pinched, tends to remain dented and inelastic; the abdomen many be distended; urine has ceased to flow; the mouth is parched; the eyelids do not quite shut properly; there are no tears. Dry as the child may be, vomiting and watery diarrhea persist nearly to the end, and this stage may be reached in as little as ten to twenty hours after onset of illness.

Virtually all these signs are due to loss of salt, water, potassium, and sodium bicarbonate, all essential ingredients for life. Most of the loss is in the watery stool, and some, especially in the case of potassium, is from the urine. Regardless of the cause of diarrhea (rotavirus, cholera, E. coli, etc.) or whether in Baltimore or in Bengal, once the child reaches these clinical signs the amount of loss of water and minerals is roughly the same (Table 1) This is fortunate in a way, because the replacement therapy may be uniform and does not require us to know which specific microbe is doing the mischief. Incidentally, while the loss of potassium is of the same magnitude as that of sodium, the body stores of potassium are several times larger. So replacement of sodium is more urgent and also helps conserve potassium.

Although the extreme case I have portrayed is present in 1% to 2% of all bouts of diarrhea, it is sobering realize that with very few visible signs of dehydration beyond thirst, the child may have already lost 5% of body weight, halfway to death, in as little as five to ten hours. By the time parents become alarmed, there may be only a few hours left in which to find competent help. The majority of children who die, however, do linger for two to three days: they have received some fluid, probably of dubious value, by mouth or intravenously; the diarrhea may have slowed a little if various medicines are tried. But by this time the parents may have exhausted their money or

the skills and resources of the local practitioner, and the nearest hospital is miles away. The child needs fluid therapy: effective, affordable, trustworthy, nearby.

But we learned about ORT only after we knew how to apply intravenous therapy. Beginning in the mid-1940s, diarrhea research centers in Dhaka, Calcutta, Manila, Cairo, Baltimore, and Taipei proved that intravenous solutions containing sodium chloride, potassium chloride, sodium bicarbonate (or lactate or acetate) in a well-determined combination could be given rapidly so that severely dehydrated children could, Lazarus-like, be resuscitated within two to four hours. Lives are saved by the use of a polyvalent solution, administered quickly with the correct proportion of ingredients. ORT is successful foremost because of this principle, first discovered for intravenous therapy. And we must still rely on intravenous fluids if the child is so severely dehydrated that it cannot drink at all. With this principal exception, what then makes ORT preferable to the intravenous route?

- **It can be given by persons with little formal education, even in the home.**
- **It needs no sterile equipment.**
- **It is inexpensive (a boon, incidentally, even to well-equipped hospitals)**
- **It is safer and, under most circumstances, more effective.**
- **In a pinch, a less-effective formula can be prepared at home from table salt and table sugar (sucrose)**
- **It allows parents to participate in the care of their children.**
- **It is comforting to the child and to the parents.**

Let us now consider the second stream of inquiry that led to the development of ORT: how the intestine handles salts and water

"What a piece of work is man," given form by skeleton, powered by muscles, coordinated and programmed by a chemical-electric skein of nerves and brain, nourished and defended by a red liquid distantly related to the primordial sea.

The intestine is but a hollow tube connected to the outside world at both ends, the core around which the rest of the body is wrapped. The intestine does many things, but its prime job is to take

food, break it into basic molecules that are usable by the body's cells, and transport these molecules across the one-cell-thick lining that separates inside from out. To digest food, it seems necessary to increase the surface area of the tube by multiple folds on the surface of the tube and by fingerlike projections from these folds, called "villa," which carry multiple digestive enzymes at or near their surface. If the surface area is much reduced, as occurs in the disease called "spree," key nutrients and vitamins are not absorbed. It also seems necessary to suspend the particles in liquid and let digestive enzymes do their chemical work. The ultimate source of the digestive liquid is the blood stream, from which the intestine abstracts and secretes salty water free of blood or serum. Secretion of salts and water seems largely to be the function of the youngest cells in the lining, called the "crypt cells" end is controlled by a marvelously organized sequence of enzymes, minerals, and small chemical messengers which ´'know" just when to turn the flow on and off. Infectious agents which cause diarrhea are able to turn the cell mechanisms for secretion to a fixed "on" state until new cells replace the infected ones, usually in two to four days, or until the microbes and toxins are cleared out by the defense mechanisms of the body.

It has been estimated that the intestine of a healthy adult secretes one hundred liters - 264 U.S. gallons - or more of fluid each day; amazing, of course, but, given the total surface area of two million square centimeters (the size of a ballroom carpet seventy by thirty feet), one hundred liters represents but one drop per square centimeter per day Since the well nourished adult body contains only forty-five liters of fluid altogether and the adult would die if just seven to ten liters were permanently lost, there must be a rapid, certain mechanism to put the digestive fluid back into the bloodstream nearly as quickly as it is secreted. In what is surely one of the neater bits of engineering, the very molecules produced by the liquidy digestion are the ones that help transport the salts and water back across the intestinal cell, from there to return to the inner pools of body fluid. The molecules that work this way are principally glucose, the simple sugar derived from starch or table sugar; galactose, a component of milk-sugar; and amino acids and peptides, the products of protein digestion. Each of these molecules combines with sodium, probably in close to a one-to-one ratio, and these dyads cross the cell membrane, per haps by linking in a menage-a-trots to carrier protein molecules anchored in the membrane. Water is pulled along by osmosis, and other minerals (potassium, bicarbonate, more sodium) follow along, caught up in the stream, as it were. Most of this absorption appears to take place in the upper, more exposed regions of the villi, so that if there is extensive damage to villi from, say, viral

diarrhea, oral rehydration may fail: failure occurs in about 5% to 10% of seriously ill children.

What is rather elegant about this system is that glucose, amino acids, and peptides seem to enter the cell linked to sodium, but each class of molecules joins with different carrier molecules or finds separate entrances specific to each. One predicts that if one adds an amino acid - glycine, say - to glucose in an oral rehydration solution, more fluid will be absorbed than if glucose or glycine are used alone. This is just what happens, and, as you shall hear shortly, this phenomenon promises a major advance in oral rehydration therapy. But for the moment, let us leave the alimentary canal and return to the child.

The formula for the oral rehydration solution was originally devised to combat epidemic outbreaks of cholera in which both adults and children are affected and where lifesaving intravenous fluids are scarce. The salts are packed in flat aluminum foil packets, paid for and stockpiled by UNICEF ready for shipment to any country on demand. The formula, often referred to as the "WHO formula,' was originally devised as a compromise between what adults needed and children could tolerate. The composition, however, is more inspired than that suggests (Table 2). The amount of salt is sufficient to replace sodium and water losses in severe de: hydration (Table 1), although adults may need to drink extra amounts. Glucose at 2% is optimal, as many studies suggest that water is best absorbed when glucose and sodium are in the ratio of one-to-one, and glucose does not exceed a concentration of 2 1/2%. Potassium deficit is only partially met by this formula because it is unsafe to completely replace losses so fast, but initial replacement must be started quickly (some suggest increasing the replacement rater Acidosis is corrected much faster with bicarbonate than without This formula has proved surprisingly versatile in the treatment of hundreds of thousands of children and adults, with documented success in #5% to 95% of cases, under the following range of situations:

- in persons who are able to drink;

- in malnourished children and the well nourished;

- in bacterial and viral causes of dehydrating diarrhea;

- with serum sodium levels as low as 110 milliequivalents per liter to as high as 165

extremes immediately threatening to life;

- with severe derangement of the blood alkaline-acid balance to the acid side (a condition called acidosis);

- in tropical climates and Baltimore winless;

- with no visible dehydration up to loss of body fluid equivalent to 10% of body weight.

- with voluminous, continuing loss of diarrhea, up to 10 milliliters per kilogram body weight per hour.

Even vomiting does not bar success except in a few instances; in fact, vomiting decreases in direct proportion to the degree of rehydration with ORT what makes ORT so versatile, in addition to its balanced formula, is that most children drink as much oral rehydration solution as is offered up to nearly the amount of which they are deficient. When they are hydrated, or nearly so, they seem to lose their taste for the fluid, then they either fall asleep, or cry for food.

Crying for food: we must think of ORT as more than simply rehydration with a solution of salts and sugar. ORT also means restoration, quickly, of a normal diet. It is now well established that a principal cause of malnutrition in children of the Third World is repeated episodes of diarrhea. The reasons are several and interactive:

- children lose their appetite for food because of salt and water loss and acidosis;

- children are often made to fast when they have diarrhea, sometimes for several days, because it is feared that food makes diarrhea worse;

- potassium loss may make muscle tone too weak for eating and digestion;

- when a child is ill, anxiety and restlessness burn up calories from the child's own stores of fat and protein (which may be already seriously depleted;

- diarrhea and fasting independently damage digestive enzymes in the intestinal tract,

leading to malabsorption and loss of food that is eaten.

- with each serious bout of diarrhea, a child loses weight and may never catch up to its potential for growth and good nutrition.

In well-designed studies in the Philippines, Iran, Turkey, India and Panama, ORT appeared to protect against acute weight loss with an episode of diarrhea when the parent was also encouraged to continue to feed the child despite the diarrhea. Breast milk, soft foods and porridges, even fish and fruit and breads were advised. ORT restores a child's appetite u within a few hours, so suddenly this advice made sense to parents. The protective effect was most apparent in those already undernourished, and in those with repeated episodes of diarrhea and protection seemed to last several months. But of course no food, no protection.

We do not know, exactly how ORT works to protect nutrition, but we observe regularly that rapid restoration of fluid and mineral balance restores appetite. Potassium may play a key role here; there is also an intriguing possibility, based on studies of adults who go without food, that the glucose in ORT may help restore or protect intestinal digestive enzymes. The parent certainly finds (ceding the child more acceptable, and the child becomes more settled.

Oral rehydration therapy is, thus, two therapies: rehydration and continued feeding. ORT has already been proved to reduce mortality from diarrhea. It would be an amazing achievement if ORT could also reduce the prevalence of malnutrition.

This hope leads me to consider an impending development in ORT. Often, parents" and physicians' prime concern is to stop the diarrhea, and until they see otherwise, they do not believe that rehydration is the first order of business. ORT does not stop diarrhea, which generally runs its own course of a few days; we spend a lot of effort getting that point across. Perhaps we soon will have the means to slow stool loss even while rehydrating the child.

You will recall, back in the alimentary canal, that the different breakdown products, or metabolites, of digestion (sugars, peptides, amino acids) linked up to sodium and promoted salt and water absorption through different gates in the intestinal cell membrane. There is now sufficient evidence that if we combine these metabolites in a single oral solution, we not only

rehydrate but can actually decrease the total loss of stool. Peptides and amino acids are particularly necessary in the combination because they act on absorption all along the small intestine, whereas the action of glucose is more confined to the upper portion. Absorption of peptides and amino acids are also far less susceptible than glucose to damage by diarrhea. So the next step is to develop an enriched ORT, one that combines salt, potassium, bicarbonate, glucose or a simple starch, and peptides or a simple protein. Here are some expected advantages of such a formula.

- Diarrhea is lessened.

- With less diarrhea, there will be less waste of nutrients in regular food, and possible more protection of intestinal enzymes.

- Common local foods, already familiar to parents, may be adapted to form an enriched ORT.

Early studies with such a formula are encouraging. We look forward now to a burst of research to define its optimal composition, the range of severity of illness it can be used for, its advantages over the WHO solution and food given separately, its cost and distribution. We will need to consider, also, how we can enlist parents to prepare and use an enriched ORT at home.

Where does all this take us? From a global public health view, it is possible that ORT is nothing more than a palliative until research produces effective antidiarrheal vaccines. Now. sadly, for many children, ORT merely postpones death. Optimists among us hope ORT programs will enable people to trust other health services, such as family planning, to encourage better nutrition and hygienic practices, to improve the health worker's morale, and to help achieve "Health for All".

We hope these hopes prove true; they need testing. But little can be advanced, I believe, as long as nations fail to make human welfare the first priority.

This brings me full circle to the beginning of this paper.

The international agencies sponsoring this conference have done a lot for our children. They

support research; they supply services and technicians; through a generous network of information they link scientists from Boston to community health workers in Bangladesh; but most of all they demonstrate that the global village exists: in helping our neighbor's child survive we establish our common humanity.

Table 1

AVERAGE WATER AND SALT LOSSES IN SEVERE DIARRHEA OF A 10-KILOGRAM CHILD BEFORE TREATMENT (milliequivalents)

	Water	Sodium	Potassium	Chloride
Infant diarrhea	1.1 L	90	100	80
Baltimore				
Child cholera	1.0L	120	70	100
(Calcutta)				

Table 2

COMPOSITION OF THE "WHO FORMULA" FOR ORAL REHYDRATION SOLUTION

Grams per Liter Solution

Sodium Chloride	3.5
Sodium Bicarbonate	2.5
Potassium Chloride	1.5
Glucose	20

Chemical Concentration in Millimoles per Liter Solution

Sodium	90
Chloride	80

Chloride	80
bicarbonate	30
Potassium	20
Glucose	111

Trainer Attachment 5E: Storing and maintaing supplies of oral rehydration salts (ORS)

Whether a country is producing ORS locally or using UNICEF sachets, the product must be properly stored so that it remains effective from the time it is delivered to the central store to the moment it is used. Sodium bicarbonate causes decomposition of glucose in oral rehydration salt mixtures. High temperatures and humidity may accelerate this process and manufacturers must consoider these factors when preparing and packing ORS.

Storage

- **Temperatures in buildings where ORS is stored should not exceed 30°C. Above this temperature the ORS may melt or turn brown. If this happens, it may be very difficult to dissolve and should not be used. If, however, it has only turned yellow, as long as it can be properly dissolved, it is still safe to use and effective.**
- **Supplies of ORS should not be stored in buildings with galvanized roofs directly exposed to the sun whithout adequate ventilation. These rooms get very hot.**
- **Humidity in stores should not exceed 80 per cent. In higher humidity the ORS is likely to cake or turn solid. Increase ventilation and avoid standing water in or near storage rooms.**
- **As far as possible, stoorage areas should be cleared of insects and rodents.**
- **Packets should be packed so they are protected from puncturing by sharp objects.**
- **UNICEF recommend storing their ORS sachets in stacks of cartons approximately 1 to 1 1/2 metres high.**

- **A rotating system should be introduced so that the oldest ORS (identified by date and batch number) is used first. When in a hurry, avoid distributing the packets which are at the front of the top unless you are sure they are the oldest in the store.**

- **Regional storage areas should be located in places that will be convenient for subsequent distribution.**

Regular inspection of packets

- **Laminated foil ORS packets have an estimated shelf life of at least three years. Note the production date on the label. Packets of ORS must be checked regularly (every three months) to see if the quality is still acceptable. Open at least one packet in each batch to see if ORS is usable. Locally produced packets of ORS is usable. Locally produced packets of ORS are often packaged in plastic and will probably have shorter shelf life. It is especially important to check them regularly.**

- **Check ORS packets in any boxes that appear to be damaged. Open at least one packet from the top, middle and bottom of the box to see if the ORS is still usable.**

Keeping records at each point where ORS is received and delivered

- **Records should show:**

  - the quantity, batch number or letter, and date received.
  - the quantity and date issued (i.e. sent from one point in the distribution system to another).
  - the amount currently in stock.
  - stock level at which a new supply should be requested.

- **Records should also indicate any problems (such as spoilage due to a leaking warehouse).**

- **Supplies should be counted every three months and results compared with quantities**

shown in the recors.

- **The evaluation of stock is an important factor in determining future quantities of ORS required.**

If you are interested in further information on local production of ORS and quantity control, the following publications are available from the Programme Manager, CDD Programme, World Health Organization, 1211 Geneva 27, Switzerland.

- **Guidelines for the production of oral rehydration salts.**
- **Good practices for the manufacture and quality control of drugs.**

Trainer Attachment 5F: Oral rehydration with dirty water?

Many of you have asked about the use of dirty water in making up oral rehydration solution when clean water is unavailable. Richard Feachem suggests that the benefits of early replacement of water and electrolytes in acute diarrhoea far outweigh the possible risk of using contaminated water.

Mothers are encouraged so prepare oral rehydration fluid using only clean water. However, most people in rural areas of developing countries have no access to clean water and in some communities the only available water is heavily contaminated with faecal material. In these circumstances it is recommended that the water be boiled and allowed to cool before preparing the oral rehydration fluid. This is often impracticable - involving use of expensive fuel and delaying the start of treatment. If oral rehydration therapy becomes common place in villages it is certain that the ore's rehydration fluid will often be made up with water containing pathogens of faecal origin. Does this matter? The answer is we don't yet know but it probably doesn't.

The main questions

The dirty water used to make up the fluid may contain faecal viruses, bacteria and intestinal parasites. Of these only tile bacteria may multiply if conditions are right. Oral rehydration fluid is normally used for about 24 hours after it is prepared and therefore the two central questions are:

- **can certain bacterial pathogens that ma' be present in water multiply in oral rehydration fluid stored in the home at 20-30°C**

- **if they can, what is the effect of ingesting a large dose of bacterial pathogens on an intestine already colonized by the same pathogen or by another viral, bacterial or protozoal pathogen**

Only multiplication (rather than enhanced survival) of a pathogenic bacterium in oral rehydration fluid is important, since only if multiplication takes place might the child receive a greater dose of the bacterium in the oral rehydration fluid than in plain water.

Laboratory experiments

The results of laboratory experiments are conflicting. Some have found a steady decline in the numbers of pathogens introduced into oral rehydration fluid. On the basis of these findings a WHO Scientific Working Group, concluded that "Escherichia coli, Vibrio cholerae, Salmonella and Shigella do not multiply in oral rehydration fluid and survive in declining numbers for up to 48 hours".

This is unlikely to be true in all circumstances and one recent study has shown that V. cholerae and entero-pathogenic and enterotoxigenic strains of E. cold increased in concentration by between 1 and 5 log10 units after 24 hours in oral rehydration fluid. However, all these experiments used oral rehydration fluid made up with distilled water, or with sterilized surface water and therefore failed to duplicate actual field conditions.

Gambian study

A more relevant study on the behaviour of wilds E. cold in oral rehydration fluid made up with well water has recently been reported from The Gambia.

The concentration of E. cold in well water alone fell slightly during 24 hours storage (2330° C). However, in well water plus oral rehydration salts the concentration increased by over 2 log10 units. The same study compared the response of children (three months to four years) receiving

oral rehydration fluid made up with well water with those whose fluid was made up with sterile water. There was no difference in the incidence and duration of acute diarrhoeal attacks, or in the growth rates, between the two groups it was estimated that the E. cold ingested in stored oral rehydration fluid were at most 5 per cent of the E. cold regularly ingested in food eaten by these children in The Gambia.

A sound strategy

In conclusion, some bacteria may multiply in stored oral rehydration fluid. 'There is no evidence, however, that using contaminated fluid increases the incidence severity or duration of diarrhoea, and there is one study indicating that it does not.

A sound strategy, pending more field research, is to advise mothers to use the cleanest water available, to boil it where possible and not to keep the oral rehydration fluid more than 24 hours. To those who express concern at this approach it must be stressed that the proven benefits of water and electrolyte replacement early in acute diarrhoea far outweigh the possible risk of using contaminated water.

Trainer Attachment 5G: A pinch of salt' a handful of molasses...

Bangladesh

In remote Sulla, a deprived area of Sylhet district in Bangladesh, an epidemic of diarrhoea among young children prompted an emergency do-it-yourself solution. That "solution" - salt, water, molasses - has proved a saviour of children's lives. By MEHR KAMAL

Sulla, a low-lying tract in Bangladesh's Sylhet district, is one of the poorest areas in the world. Here, farmers wrest one rice crop a year out of tiny plots of land. Most people, however, are landless and find only seasonal employment as farm hands or as fishermen when the rain-swollen rivers spill over, converting the marshy area into a vast monsoon lake.

So remote and neglected is Sulla that few Bangladeshis have heard of it. In 19 72, when a local non-governmental organization, the Bangladesh Rural Advancement Commitee (BRAC), began

rehabilitating destitute refugees returning home after the creation of Bangladesh, it chose Sulla as a base of operations because of its extreme deprivation.

But BRAC workers arriving there were immediately faced with another more urgent problem as a diarrhoea epidemic broke out and hundreds of children began to die of dehydration and malnutrition. With no health services or pharmacies to rely on for support. in dealing with the problem) they prepared oral rehydration solutions for the children with salt, molasses and water, all of which were available even in the poorest homes.

This simple treatment - approved by the International Centre for Diarrhoeal Disease Research in Bangladesh (ICDDRB), the world's leading institution for research on diarrhoeal diseases-and BRAC'S method of teaching mothers how to use it, are now generally recognized as the best hope for an early reduction in infant deaths in Bangladesh.

Of every 1,000 children born alive in the country, some 140 die before reaching their first birthday, approximately half of them from complications such as dehydration and severe malnutrition connected with diarrhoea. While not a serious problem in itself, since the body purges itself of most diarrhoeal infections without any medication, diarrhoea can be devasting to a small child because essential fluids, minerals and nutrients are sometimes expelled from the body in a day. In Bangladesh, most of the 17,000 children who lose their eye-sight every year do so because diarrhoea drains away their already meagre reserves of vitamin A.

The treatment for diarrhoea is simple. A solution of salt, glucose and electrolytes mixed with water and taken orally can help to reverse dehydration. In Bangladesh, the Government is packaging oral rehydration salts (ORS) at four national centres assisted by UNICEF. These are then distributed free through the health services, and commercially-produced ORS packets are sold in dispensaries.

The total national production of ORS is not enough to meet the need. But stepping up production would address only a small part of the problem of getting mothers to use ORS when they should. In one of the world's least developed countries, health services reach only 21 per cent of the people and the nine out of ten people who live in rural areas have no access to pharmacies

because these exist only in urban or semi-urban areas.

In addition, only 14 per cent of Bangladeshi women are literate and thus able to read the instructions for mixing the solution. At prices ranging from a few cents to over one dollar a packet, the cost may also be prohibitive, since the annual GNP per capita is only US$110, and four out of every five people live below the official poverty line.

Overcoming the hurdles

In Sulla, BRAC devised a programme which overcame ail of these hurdles. Since the accurate measurement of ingredients is crucial to the success of the therapy, it chose the method that most rural South Asian women use in measuring ingredients for cooking: their fingers.

The only spoon available in many homes is a wooden ladle used for stirring and serving, and women judge the proportion of spices required by pinches and heaps. BRAC therefore suggested a three-finger pinch of salt and a handful! of molasses mixed with an appropriate quantity of water.

Next, BRAC concentrated on one of the most difficult aspects of the problem: a change in attitudes and ingrained habits. Many Bangladeshi women believe that diarrhoea is either an air-borne affliction or is caused by evil spirits. So they hide the problem until it becomes severe. Doctors at the ICDDRB say that, at this stage, death can be only hours away, particularly for under-nourished children. Dehydration is accelerated by the fact that most mothers deny their children food and water during diarrhoea in the hope that this will stop the runny stool.

BRAC devised a simple flip chart which explained the connection between diarrhoea and dehydration by likening a child suffering from diarrhoea to a pitcher of water with a hole in the bottom. Armed with these, a ream of seven girls, who received five days training in diarrhoea management, went from house to house in Sulla, stressing the importance of rehydration from the moment the first loose motion begins.

With ingredients provided by the mother, they demonstrated the proper way to prepare a solution in a utensil available in the home. At the end of the session, the inside of the container

was scratched to mark the appropriate water level, and a discussion ensued on the prevention of diarrhoea.

Each team was preceded by male workers who talked to the men about diarrhoea, and the "doctor" who will come to teach mothers how to treat it. Such persuasion was crucial to gaining the confidence of the community and giving the female workers access to all families.

One of the workers, 23-year-old Rooma, says that while mothers almost always accept the treatment, persuading them to take appropriate steps to prevent diarrhoea is hard. She cites the case of Mumtaz Begum whom she has just visited.

Mumtaz is one of the very few rural Bangladeshis lucky enough to have access to both a tubewell and a latrine. Yet, ignorant of the connection between clean water and sanitation and her children's frequent diarrhoea, she uses neither. The tubewell water is rejected because its high mineral content gives it a "peculiar" taste and the latrine her brother constructed when he came home for a visit from Dubai is regarded as a quaint city facility.

When pressed to wash her hands frequently with soap, Mumtaz said that her husband who sells vegetables in the village earns only Taka 30, U.S. $1.20, a day. This, supplemented with occasional remittances from Dubai, is barely enough to buy food. At 20 cents a bar, soap is a luxury they cannot afford on a daily basis.

In Bangladesh, diarrhoea will continue to be a major health hazard as its prevention requires the installation of millions of new tubewells and latrines, as well as a massive health education effort designed to motivate people to use them. The BRAC method of oral rehydration therapy with its home-made solution and house-to-house instruction is therefore winning widespread support. The experiment begun in Sulla, was extended in 1980 to cover five districts. In October 1983, it will enter its second phase, covering another seven of the country's 20 districts by June 1986.

It will take time to wipe out the agony of diarrhoea in Bangladesh, a land where medical historians believe cholera was reported for lee first time ever in the seventeenth century. But random surveys of its own programme carried out by BRAC have shown very positive results. Three months after receiving initial instructions, some 90 per cent of mothers have been able to

answer all questions about diarrhoea correctly, and approximately 82 per cent have been able to prepare accurate oral rehydration solutions. Mizanur Rehman Chaudhry, BRAC'S area manager in Sylhet, claims that, at the cost of Taka 7 (U.S. 29 cents) per mother trained, this could be the most cost effective health programme anywhere.

Trainer Attachment 5H: Cautious prescription

Professor Harold explains the clinical situations which justify the use of drugs in addition to oral rehydration therapy.

Two main groups of drugs are commonly prescribed in the treatment of diarrhoeal diseases:

- **Antimicrobial drugs - which kill the responsible organism and so lessen the illness.**
- **Antidiarrhoeal drugs - which diminish the amount of fluid loss by various pharmacological mechanisms.**

These two types of drugs are often combined and many preparations are marketed containing both antibiotics and antidiarrhoeal drugs. These combination drugs should never be used.

Only single drugs should be given and only where appropriate.

Antibiotics in bowel infections

For certain specific infections of the gut an appropriate antimicrobial drug is an important part of the treatment.

Shigella infection: in mild, transient diarrhoea caused by shigella, antibiotic treatment may be unnecessary as, for example, in mild Sonne or flexneri dysentery. Antibiotics are, however, an essential part of the treatment of severe bacillary dysentery especially in infants with persistent high fever. Choice is difficult because transferable drug resistance has become very common in these organisms and local knowledge of their drug susceptibility has to be taken into account. Ampicillin or co-trimoxazole are usually suitable (ampicilin 100 mg/kg/day in four divided doses for five days, or trimethoprim 10 mg and sulfamethoxazole 50 mg/kg/day in two divided doses

for five days). Single dose treatment in adults with tetrad cycling (2.5g) is also very effective if the bacilli are known to be susceptible to this drug.

Campylobacter infection: Campylobacter jejuni may invade the bowel wall causing abdominal pain and mildly dysenteric stools. Most cases recover well without chemotherapy. Severe cases may be treated with erythromycin (40 mg/kg/day in three divided doses for five days) but its efficacy is unproved. A recent controlled trial showed no clinical benefit from erythromycin but treatment was not started until an average of six days from the onset of illness.

Cholera: Several antibiotics, particularly tetracycline, have been shown to shorten the duration of the disease and are therefore useful in the management of cholera patients. Tetracycline is given as 50 mg/kg/day in four divided doses for three days. Drug resistance is now being seen in areas where mass chemoprophylaxis has been carried out. Alternative drugs include furazolidine and chloramphenicol.

Enterotoxigenic and enteropathogenic E. coli: Relatively few clinical trials have been done on the effect of antibiotics in this group of bowel infections. Enterotoxigenic E. cold generally cause acute episodes of relatively brief duration, making antibiotics unnecessary. Because of the difficulty in identifying these organisms, there seems to be little justification at the moment for treating them with antibiotics. Similarly, for enteropathogenic E. coli, there is no clear evidence that antibiotics are beneficial

Salmonella infections: For the vast majority of acute diarrhoeal illnesses caused by nontyphoid Salmonella strains. antibiotics do not change the course of illness and may actually prolong the period during which stool cultures remain positive. Salmonella septicaemia. which may present in childhood as a combination of diarrhoea with systemic illness and fever requires antibiotic treatment. Ampicillin, chloromycetin, or co-trimoxazole may be used, depending on the sensitivity of the organism.

Amoebiasis and Giardiasis: Both these parasitic infections respond to several antimicrobial agents. Metronidazole is the first choice for either.

Antibiotics in bowel infections of unknown cause

The cause of many bowel infections is never identified, or the organism may be found after the acute illness is over. Antibiotics have no role in the treatment of the large group of viral diarrhoeas. It has sometimes been suggested that antibiotics should routinely be prescribed in case the illness turns out to be due to an infection for which antibiotic treatment is indicated.

This practice is to be avoided for several reasons:

- **The giving of antibiotics may divert the attention of mother and nurse from the essential task of replacing water and electrolytes.**
- **The widespread use of antimicrobials promotes the selection of antibiotic resistant strains and thus lessens the likelihood that the drugs will later be effective for those few patients who need them.**
- **Antibiotics are expensive.**

The balance of factors therefore clearly lies against the blind use of antibiotics in diarrhoeal disease of unknown origin.

Other drugs in gastroenteritis

The most commonly used agents are kaolin and pectin in one or other of many available preparations, despite clinical trials proving lack of efficacy. Most children improve so quickly with fluid and electrolyte replacement that the use of 'constipating agents is unnecessary in acute diarrhoea.

Drugs such as opiates, diphenoxylate and loperamide which reduce bowel motility. although widely used, should never be given to children. By slowing peristalsis they make the situation worse - this has been seen in a number of children and in volunteers with shigellosis. These drugs also depress respiration and are an important cause of accidental poisoning in childhood

Research

Several research projects arc underway aiming to find drugs which will reduce the abnormal transport of fluid across the small bowel mucosa. For example, anti-inflammatory drugs (aspiring and indomethacin) may decrease the action of cholera and other toxins acting on the trowel. Bismuth subsalicylate, in large doses, has been beneficial in adults with travellers' diarrhoea.

Other substances have also been tried; for example, chlorpromazine, which probably inhibits adenylate cyclase, was shown to reduce diarrhoeal losses in cholera. However, since it may cause drowsiness in children and hence a decrease in fluid in lake. it is unsuitable for widespread use Attempts have also been made to prevent cholera toxin binding to the bowel wall, but these studies have not shown the method to be useful in practice.

None of these experimental drugs have reached a stage where they can be recommended for general use in patients with diarrhoea. If drugs which reduce intestinal secretion become better defined, and can be shown to be effective in field conditions against diarrhoea caused by 8 broad range of aetiologic agents, they will be useful adjuncts to therapy.

Conclusion

Oral rehydration therapy- remains the essential treatment and antibiotics arc useful only in the few clinical situations described.

Professor H.P. Lambert, Communicable Diseases Unit, St. George's Hospital-London UK.

Session 6 - Practicing ort in the village

TOTAL TIME

2 hours

OVERVIEW

In Session 13 (The Impact of Culture on Diarrhea) participants gathered and analyzed information on the local beliefs and practices regarding diarrhea. In so doing they indirectly

began to realize some of the problems associated with implementing ORT in the village. In this session, participants consider the advantages and disadvantages of using ORT in the village. They explore ways to overcome some of the problems they may face in preparing the different types of rehydration solutions in village conditions, including inappropriate utensils, dirty water, unavailability of key solution ingredients, and so forth. The participants also practice teaching mothers to prepare and give ORT solution to their children.

OBJECTIVES

- **To identify problems in mixing pre-packaged salts (ORS), Sugar-Salt Solution, and other home-available ingredients in village settings.**
  (Steps 1-3)

- **To demonstrate and teach technically correct and culturally appropriate methods of rehydration solution preparation and administration in the village.**
  (Step 3)

- **To list potential advantages and disadvantages of using ORT in the village.**
  (Step 4)

RESOURCES

Helping Health Workers Learn. Chap, 1, pp. 17 -25, and Chap. 27, pp. 1-34.
"Oral Rehydration Therapy (ORT) for Children (ORT Resource Packet).

Trainer Attachment:

-6A Problem Situations: Ort in the Home

MATERIALS

Markers, newsprint.

PROCEDURE

Trainer Note

Use this session after participants have completed the activities in Session 13 (The Impact of Culture on Diarrhea), completed Session 5 (Rehydration Therapy) and Session 16 (Selecting and Using Nonformal Education Techniques).

Adapt the problem situations in Trainer Attachment 6A (Problem Situations: ORT in the Village) to fit the local situation.

If possible, arrange opportunities for participants to teach mothers to mix ORT solutions in homes or the local clinic, under the supervision of someone skilled in mixing them.

Step 1 (30 min.)

Sharing Problems and Discussing Solutions

Begin the session by explaining to the group that they will apply what they've learned to a village setting and deal with a number of problems often encountered in ORT programs at the village level.

Lead a large group discussion of problem situations encountered using ORT in communities in the host country. Adapt and use the problem situations found in Trainer Attachment 6A (Problem Situations: ORT in the Home).

For each problem situation: read it to the group, discuss the more specific questions stated at the end of each problem situation as well as some of the following questions:

- **Are adequate containers for measuring and mixing available?**
- **Are necessary ingredients or alternates available?**
- **Is there an adequate water source?**
- **What is the mother's or caretaker's likely perception of the situation?**
- **What is your perception of the situation?**
- **Are there any health education opportunities regarding prevention of diarrhea or**

teaching about ORT?
- What is the most important health education message to communicate?
- What could your role be in the follow-up of this situation?

Finally, ask the group to determine:

- Which problems seem to be most common?

- Which problems can be solved or reduced most immediately?

- How can they be solved?

- Which problems are inherent to the type of ORT used and which are specific to conditions in the country?

- Were the problems presented here realistic? If not, what other problems might be encountered?

Trainer Note

Be sure to discuss the following:

- Availability of substitutes for sugar and other ingredients.

- Water quality, lack of fuel for boiling water, mothers' motivation to boll water.

- Hygiene including hand cleanliness and "kitchen" sanitation for preparing rehydration solutions.

- Inaccurate measures with which to prepare rehydration solutions, and implications of inaccurate measuring for the child.

Examples of some of the basic information the group should include in their answers to each problem situation is given at the end of the problem.

Step 2 (30 min)

Preparing Skits for Teaching Sessions on ORT in The Village

Divide into three groups. Assign one of the problem situations to each group. Tell them that they have 25 minutes to use the problem situation as the basis for planning a ten minute "skit" on how they would teach a mother and her family in that situation.

Trainer Note

For information on what to include when educating family members about home treatment of diarrhea, ask the group to read pages 4-6 in the WHO Supervisory Skills Module "Treatment of Diarrhea".

Step 3 (30 min)

Performing Skits on Teaching ORT in the Village

Ask each group to perform their skit After each skit discuss some of the following questions:

- **What was the most important message that needed to be conveyed?**
- **Was that message conveyed?**
- **Was all the necessary information provided?**
- **Was the information accurate?**
- **Was it presented clearly?**
- **Was the mother or caretaker actively involved in the session?**
- **What was good about the teaching session and what could be improved?**

After participants have reviewed the teaching sessions, ask someone to summarize the key points that should be taught about solution preparation and administration in the village, and the most effective ways to teach them.

Trainer Note

The main point of this critique and discussion of the teaching sessions is to ensure that participants recognize and can use the most effective techniques for teaching mothers important points about preparation and administration of ORT in the village.

Emphasize the importance of teaching mothers individually and following up to make sure that they have mastered the skills and know when to use them. They can read about the importance of this in "Oral Rehydration Therapy (ORT) for Children" in their ORT resource packet.

Some specific points about effective teaching in the village include:

- Learning by practice (rather than lecture)
- Making certain that the learner understands (by paraphrasing, demonstrating her understanding, etc.)
- Showing respect for the knowledge and skill of the learner
- Drawing on the experiences of the mother or caretaker during the learning session
- Presenting new skills and information in terms that make sense to the mother or caretaker.

Step 4 (15 min)

Discussion of Pros and Cons of Preparing ORT in the Home

Summarize and close the session by ask, participants to discuss the advantages and disadvantages of preparing ORT in the home, based on the teaching activities during this session, their findings in Session 13 (The Impact of Culture on Diarrhea) and their own experiences in the communities where they work. Have someone list these on newsprint.

Trainer Note

Some of the Advantages and disadvantages likely to come out of the discussion are:

Advantages

- Self reliance in health
- Lower cost health care
- Immediate initiation of treatment.

Disadvantages

- Danger of incorrect measurement and lethal or ineffective ORT.
- Requires careful instruction of Mothers to mix and use correctly
- Conflicting messages about using ORT can cause problems.

Trainer Attachment 6A: Problem situations - ORT in the home

The following problem situations are exaggerations of ones that Volunteers may encounter when trying to prepare Oral Rehydration Solutions in their villages. Each situation should be adapted to be culturally appropriate and then read to the participants. Based on their knowledge and experience to date, the group should describe how they would handle each situation given the ingredients available and their ingenuity. Each situation contains ingredients either for:

- preparing homemade sugar-salts solutions,
- using ORS packets
- providing simple nutritious foods and/or
- replenishing the liquids and nutrients lost during diarrhea but not correcting the electrolyte imbalance.

Problem Situation Number 1:

Situation Description: The child who is one year old had four to six loose stools yesterday. The mother had only one packet of ORS and mixed half of it on the first day of her child's diarrhea. She gave the ORS solution from a cup but the baby coughed and choked, and refused to drink. The mother is trying to wean the child from the breast and so is nursing only once a day. The child only wants to sleep and when awake is always reaching for the mother's breast.

Problem: What would you do if in the household you only found the following:

- a fresh but half empty packet of ORS
- water from a clean source
- rice powder
- a dirty one liter container
- salt
- large bulk tea

Answer: Follow treatment Plan B of the WHO Treatment Chart and the information for mixing ORS. If the child continues to have diarrhea after finishing the half liter solution of ORS and if it is used in the local culture give the child the rice powder solution. If the diarrhea persists for longer than two days and or the child shows more signs of dehydration, take him or her to the health center.

Problem Situation Number 2:

Situation Description: The older daughter (ago 7) has told you that both her younger brother and sister have had a runny tummy several times today. The mother is at the market selling bread. The children have diarrhea and cry a lot but appear to be fine. When you check their pulse you find it to be normal. Their skin goes back immediately after you pinch it and they are constantly asking to drink.

Problem: What would you do if in this household you found the following foods and materials:

- potatoes
- salt and molasses (or appropriate country specific sugar substitute)
- large mixing spoon
- water
- large gourd

Answers Follow treatment under Treatment Plan A of the WHO chart and include relevant information from the sessions on nutrition and how to mix sugar-salts solutions.

Problem Situation Number 3:

Situation Description: it is the rainy season and there is little food available. The roads to the health center are washed out. The mother is in the fields most of the time. When you pass by her house you find the woman at home worried because her two year old son has had diarrhea since yesterday. She asks you for some Western medicine to treat her son. You have been told never to give out the medicine from your Peace Corps kit.

Problem: What would you do and say to this mother if, in this household, you look around and find the following:

- **sugar cubes**
- **dirty water in a bucket**
- **several small tea cups**
- **carrots and other vegetables and tubers**
- **small mortar and pestle.**

Answer: This scenario should lead to a discussion of the pros and cons of treating children with medicine that is not readily available in that culture or village. If the child is not in danger of dehydration all the materials are there for preparing the sugar-salt solution and providing some nutritious food in between drinking the solution. Review Session 5 for the discussion of the pros and cons of using dirty water to prepare the solution, and Session 9 for information on preventing malnutrition.

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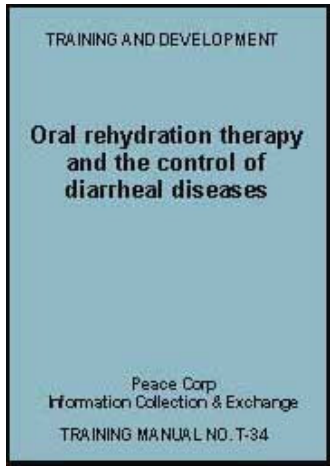
Oral Rehydration Therapy and the Control of Diarrheal Diseases (Peace Corps, 1985, 566 p.)
Module Three: Nutrition and diarrhea
(introduction...)
Session 7 - Nutrition during and after diarrhea
(introduction...)



- **Handout 7A: The diarrhoea-malnutrition complex**
- **Handout 7B: Carry on feeding**
- **Handout 7C: Breast to family diet**
- **Handout 7D: Persuading children with diarrhoea to eat**
- **Trainer Attachment 7A: Problem poster activity**
- **Trainer Attachment 7B: Nutrition counseling demonstration**
- **Trainer Attachment 7C: Therapy begins at home**
- **Trainer Attachment 7D: Enriched ORT**
- **Trainer Attachment 7E: Child description and recommended diet**

Session 8 - Recognizing malnutrition

- ***(introduction...)***
- **Handout 8B: Weight for height (stature) for both boys and girls**
- **Handout 8C: Weight for age chart**
- **Handout 8D: How to measure weight-for-length**
- **Handout 8E: Recording the weight on a growth chart**
- **Handout 8F: Measures recording sheet**
- **Trainer Attachment 8A: Comparison of anthropometric measures**
- **Trainer Attachment 8B: Growth monitoring**
- **Trainer Attachment 8C: Growth chart exercise**

Session 9 - Preventing malnutrition

- ***(introduction...)***
- **Handout 9A: Multimixes as village level weaning foods**
- **Trainer Attachment 9A: Ali's story**
- **Trainer Attachment 9B: Case studies**
- **Trainer Attachment 9C: Nutritional rehabilitation centers**
- **Trainer Attachment 9D: Guide for multimix preparation stations**

Oral Rehydration Therapy and the Control of Diarrheal Diseases (Peace Corps, 1985, 566 p.)

Module Three: Nutrition and diarrhea

OVERVIEW

Sessions in this module focus on understanding the "vicious circle" of diarrhea and malnutrition and developing skills to break the circle through appropriate diet during and after diarrhea, growth monitoring, nutritional counseling and nutritional rehabilitation. Session 7 presents nutritional needs during and after diarrhea. Session 8 covers growth measurement and growth charting to identify children "at risk" for malnutrition and disease. Session 9 focuses on interventions to prevent malnutrition through health education.

OBJECTIVES

- **To accurately list the appropriate kinds and amounts of foods for a child, or a specific age and weight, during and after diarrhea, following the WHO recommendations.**

- **To counsel a mother appropriately about diet during and after diarrhea, using the rules for counseling stated in Session 7.**

- **To correctly identify at least five signs and symptoms of children at high risk for malnutrition and disease.**

- **To explain how to use and interpret anthropometric measures for the identification of high risk children according to the guidelines in Session 8.**

- **To describe at least four strategies for preventing malnutrition as stated in Session 9.**

Cross reference with the Technical Health Training Manual:

Session 28 Foods and Nutrition
Session 29 Recognizing Malnutrition
Session 30 Breastfeeding and Weaning

Session 31 Preventing Malnutrition
Session 34 Well Baby Care

Session 7 - Nutrition during and after diarrhea

TOTAL TIME

3 hours

OVERVIEW

Diarrhea and malnutrition are mayor causes of childhood illness and death in less developed countries. The interaction of diarrhea and malnutrition is complex and still not fully understood, Malnourished children appear to suffer more severe episodes of diarrhea than healthy children. Diarrhea, more than any other infection, causes serious growth faltering in many areas of the world. In this session participants learn about proper nutrition during and after diarrheal episodes by watching and discussing a demonstration of nutrition counseling in the home. They also discuss the importance of breastfeeding and supplementary weaning foods with particular attention to cultural attitudes toward feeding during diarrhea, Participants practice counseling mothers about foods to give a child during and after diarrhea.

OBJECTIVES

- **To explain the concept of the "vicious circle" of diarrhea, malnutrition and illness. (Step 1)**
- **To describe appropriate foods to feed a child during and after diarrhea. (Steps 2-4)**
- **To counsel a mother about child nutrition during and after diarrhea. (Steps 5, 6)**

MATERIALS

Markers, newsprint and posterboard

RESOURCES

- "Oral Rehydration Therapy (ORT) for Children," pp. 53-54. (ORT Resource Packet)
- Infant Nutrition in the Subtropics and Tropics, pp. 236-268
- Treatment of Diarrhoea pp. 4-6.
- Helping Health Workers Learn, Chap. 25
- Community Culture and Care, pp. 189-195, and Chap. 12.
- Technical Health Training Manual. Sessions 28 and 29. (Peace Corps)

Handouts:

- 7A The Diarrhoea Malnutrition Complex
- 7B Carry on Feeding
- 7C Breast to Family Diet
- 7D Persuading Children With Diarrhea to Eat

Trainer Attachments:

- 7A Problem Poster Activity
- 7B Nutrition Counseling Demonstration
- 7C Therapy Begins at Home
- 7D Enriched ORT
- 7E Sample Child Description and Recommended Diet

PROCEDURE

Trainer Note

It is assumed that participants have some knowledge of child nutrition and the conditions and beliefs that affect feeding practices and nutritional status in their communities. Use the resources listed above to supplement participants" knowledge if necessary.

Prepare the posters for Step 1 using Trainer Attachment 7A (Problem Poster Activity).

Invite a health worker(s) with skill in nutrition counseling to participate in this session during

the nutrition counseling demonstration and practice. Ask two participants to help with the preparations for this demonstration. Trainer Attachment 7B (Nutrition Counseling Demonstration) offers suggestions for this activity.

Step 1 (25 min)

Recognizing the Vicious Circle of Diarrhea and Malnutrition

Introduce the session using Trainer Attachment 7A (Problem Poster Activity). Distribute Handout 7A (The Diarrhea Malnutrition Complex) as supplementary reading.

Step 2 (25 min)

Nutrition Counseling Demonstration

Present the demonstration of counseling about nutritional needs during and after diarrhea. After the demonstration discuss the following questions:

- **Why is it important to continue feeding during and after diarrhea?**
- **Why is important to continue breastfeeding?**
- **What do you feed a child during diarrhea?**
- **What do you feed a child after diarrhea?**
- **What local cultural practices could help or hinder you in convincing mothers to continue feeding during diarrhea?**

Distribute Handouts 7B (Carry on Feeding), 7C (Breast to Family Diet) and 7D (Persuading Children With Diarrhea to Eat) as supplementary reading.

Trainer Note

Emphasize availability and cultural acceptability of foods as important guidelines to what to feed a child during and after diarrhea. Trainer Attachment 7C (Therapy Begins at Home) and 7D (Enriched ORT), Treatment of Diarrhoea, pages 4-6, and "Oral Rehydration Therapy (ORT) for

Children" pages 53-54, provide background for leading this discussion. Allow time for participants to ask questions about nutrition and diarrhea.

An alternative approach to this step is to ask a health worker to present a talk on nutritional needs during and after diarrhea.

Step 3 (20 min)

Recommending Appropriate Diets for Children With Diarrhea

Divide the group into three small groups ((depending on overall group size) and give each group one child description based on Trainer Attachment 7E (Sample ChIId Description and Recommended Diet). Ask each group to recommend an appropriate diet for the child assigned to then.

Their recommendations should include'

- **A description of the diet.**

- **Estimates of the cost of the food.**

- **Estimates of the required items to appropriately feed and care for the child in the manner they have described.**

- **An assessment of the cultural acceptability of the diet.**

Tell the groups to they have 15 minutes to discuss the child description and record their recommendations on newsprint for large group sharing.

Trainer Note

Encourage the participants to be as detailed and exact as they can in describing the appropriate diet, including such information as' when the child should be fed, ho. much food. Also, encourage them to think about the practicality of their dietary suggestions, given food availability, food

beliefs and preferences, who could be feeding the child (e.g., an older sister), other demands on their time, and so forth.

Step 3 (25 min)

Reporting on Nutritional Recommendations

Reconvene the group. Ask the small groups to present their nutritional recommendations following the format below. Allow about five minutes for each report. Be sure that each small group has a chance to report on one of their child descriptions.

- **Ask the small group to read the child description aloud and post it.**
- **Ask them to post their nutritional suggestions below the description and explain why they recommend this particular diet.**

After all the small groups have reported on one dietary recommendation each, have participants point out and discuss any recommendations which seem inappropriate or impractical.

Then ask the group to look at all the posted child descriptions and identify the child that is most likely to become seriously ill and possibly die. Ask them to explain this choice and predict what would happen if no nutritional interventions occurred. (If time allows, examine other cases similarly.)

Trainer Note

During the discussion, refer to the concept of the vicious circle of diarrhea and malnutrition.

Step 4 (20 min.)

Introducing the Counseling Activity

Facilitate a discussion of the techniques used during the nutrition counseling demonstration. Based on the discussion, make a list of "rules" for nutrition counseling. Ask someone to record this on newsprint for reference later in this step.

Divide into groups of three. Explain that the next activity will be practice in nutritional counseling and the format will be as follows:

- The group selects one of the child descriptions and recommendations from Step 3 and briefly discusses how to counsel the mother of this child.

- Each person in a group selects one of the following roles: mother of a sick child, health worker, observer.

- The health worker does practice counseling with the mother. The observer assesses how well the practice applies the rules for counseling and correct information about diet during and after diarrhea.

- The mother and the health worker comment on how they felt about playing their roles and the effectiveness of the counseling.

- The observer critiques the counseling practice.

- Members of the group change roles and repeat the counseling scenario, applying what they learned from the first practice.

Trainer Note

The "rules for counseling listed should include the following points;

- Show a concerned and caring attitude.

- Pay attention to building a good relationship.

- Listen carefully.

- Try to understand the problem as that person sees the problem (help them identify the problem; don't name it for them)

- Never persuade a person to accept your advice.

- Share information and resource ideas the person can use to solve the problem.

- Never share what the person tells you with others.

- Help people become aware of their feelings and cope with them (understand and accept a person's feelings; don't pity them).

Step 5 (45 min.)

Practice Counseling

Give participants time to carry out the activity. Circulate among the groups and contribute to the discussion and critique of the counseling.

Trainer Note

If possible, enlist the help of other Trainers or health counselors to help you facilitate the small group critique to assure that participants get adequate and accurate feedback on their counseling efforts

Step 6 (15 min)

Sharing Counseling Experiences

Reconvene the large group and have participants share problems encountered in counseling practice. Ask other participants to offer suggestions to overcome the problems. Close the session with a discussion of ways participants can apply what they have learned about diet during and after diarrhea and nutrition counseling techniques.

Handout 7A: The diarrhoea-malnutrition complex

The main mechanism by which diarrhoea leads to malnutrition is uncertain and few data exist to

clarify the situation. Mike Rowland reports from a long-term study in The Gambia looking into this problem.

Diarrhoea and malnutrition are major causes of childhood morbidity and mortality in less-developed countries. the interaction between the two was highlighted during the early 1960's and an excellent account later published. The complex relationship is still not fully ater published. The complex relationship is still not fully understood but two generalizations appear valid.

Failure to thrive

Malnourished children (i.e. children who are failing to thrive) appear to suffer more severe episodes of diarrhoea than their better nourished counterparts and to excrete infective organisms for longer. This situation is complicated by the fact that impaired growth in many of these children may he largely due to the heavy burden of diarrhoea already experienced.

Diarrhoea more than any other infection causes serious growth-faltering in children in many areas of the world. It is significant that in the three continents where this has been well described all mothers in the study communities breastfed their children for long periods. The children would almost certainly have been worse off if fed otherwise but protection is not complete in most subjects nor does breastfeeding preclude serious morbidity in under-privileged communities.

Food shortage

Some workers feel that food shortage in the community plays a relatively minor role in early childhood growth-faltering and that if diarrhoea could be prevented near-normal growth could occur. The main mechanism by which diarrhoea leads to malnutrition is uncertain and few data exist to clarify the situation. Some suggest that anorexia is the main cause, others that malabsorption due to abnormalities of gut flora and function is a more likely explanation.

Seasonal variation

In The Gambia there is marked seasonal variation in growth and disease in young children and

studies there have thrown some light on these problems.

At certain times of the year it appears that normal and even catch-up growth is possible on a traditional diet of locally grown food, provided the individual child suffers little diarrhoea. At other times of the year, however, growth is uniformly depressed whether or not diarrhoea occurs and this tends to be the case in the traditional "hungry season". Thus diarrhoea at different times appears to have an effect on growth of widely differing magnitude. Just as the aetiology may vary from season to season and also from one age-group to another, so may the nature and severity of the pathological processes which follow infection.

Malabsorption

In the Gambian community studied diarrhoea is certainly responsible for some reduction in complementary food intake in the weanling child (i.e. the child receiving troth breast milk and additional foods). hut so are a number of other infections which have little or no detectable effect on growth. Furthermore there tare indirect indications that some degree of intestinal malabsorption may be common in the young village children. On balance it appears that in this community at any rate malabsorption is more important than anorexia in explaining diarrhoea-induced growth-faltering.

Weanlings at risk

Whatever the mechanism it seems clear that the initiation of the weaning process, even when breastfeeding is continued for long periods afterwards, puts children at serious risk. This is supported by examination of the weaning foods used. In The gambia the earliest weaning foods are cereal gruels or paps. These are grossly inadequate nutritionally with approximately half the energy-density of breast milk and many of other nutrients are inadequate or totally lacking.

Furthermore it is these earliest foods which show the highest levels of bacterial contamination, both with faecal "marker" organisms and known gut pathogens. Local fuel shortages make it impossible for mothers to cook frequent meals for small children. Instead larger quantities are prepared and kept for long periods, when they may easily become contaminated.

A total approach

In this situation we cannot afford to neglect any health strategy including promotion and active support of the breastfeeding mother, the appropriately timed introduction of hygienically prepared, nutritious weaning foods, the general use of complete oral rehydration mixtures, and various aspects of environmental sanitation. In the course of treating children with diarrhoea, breastfeeding should be maintained and other foods withheld only if there appears to be clinically important intolerance (and not just malabsorption) to these foods.

We may hope for vaccines against a number of diarrhoeal agents in the near future but as title is known of the impact of various individual agents on growth in different communities it would be unwise to try to predict the efficacy of this stage is which, if any, organisms are part6icularly important in the diarrhoea-malnutrition complex; useful work is already being undertaken along these lines in Bangladesh.

Handout 7B: Carry on feeding

In communities where malnutrition la common, correct feeding is as important as rehydration for children who have diarrhoea We report on studies from Bangladesh illustrating this point.

A recent careful survey of young children in Bangladesh revealed that, on average, each child suffered 6.8 episodes of diarrhoea per year. Added up, this meant they had diarrhoea for 55 days or 15 per cent of the year). Such children will end up severely deprived of nourishment if they are starved all the time they have diarrhoea. Although digestion is less effective during diarrhoea, there is still a significant amount of absorption of nutrients. The Dhaka work has shown that, in children given as much ordinary food as they will take, the amount of protein absorbed is reduced to about 50 per cent, the amount of fats to 60 per cent and the amount of carbohydrate to 80 per cent. This fall in digestive efficiency varies to some extent with the cause and mechanism of the diarrhoea, but the figures show that, in spite of the disease, the children manage to absorb valuable amounts of essential nutrients.

Breastmilk - energy value

Another Bangladesh study compared the normal dietary intake of small children with diarrhoea with that of a group of matched controls. The energy intake of the ill children was reduced by 40 per cent, but among those children who were being breastfed; the energy intake from mother's milk showed very little decrease. This suggests that the loss of appetite is mainly associated with supplementary foods. Breast milk is therefore a particularly valuable nourishment for children with diarrhoea, especially among deprived communities where it may be the main source of high quality protein. Every effort ought to be made to continue breastfeeding during diarrhoea, not least because breastmilk supplies depend on the stimulus of sucking. If breastfeeding is interrupted every time diarrhoea occurs, there will soon be much less of this important food available for the child at the time of greatest need.

Which foods and when?

Despite recent studies, unanswered questions remain about what are the best foods to offer during diarrhoea and when to introduce them. In acute diarrhoea, most foods can be given safely and soon. In chronic diarrhoea, feeding may be more of a problem (ace Diarrhoea Dialogue 10 for Professor G. C. Cook's article on causes and control of chronic diarrhoea). Mother's milk is better tolerated than cow's milk and breastfeeding should continue during diarrhoea. Children with diarrhoea who are being bottlefed need to have the formula diluted with an equal volume of water while the diarrhoea continues.

The important point is to start giving small, frequent feeds of a familiar diet as soon as rehydration is complete, preferably mixed with a little extra vegetable oil to increase the energy content. Vitamin A supplementation is required in areas where xerophthalmia (night blindness) is common.

During convalescence after diarrhoea, children need extra food for 'catch-tip' growth. This can be given as nutritious snacks between meals or as an extra meal every day for several weeks.

Compiled by the Scientific Editors from information provided by A. and A. M. Molla, ICDDR, B, Dhaka, Bangladesh.

Handout 7C: Breast to family diet

Weanlings are particularly vulnerable to infection. Michael Gurney considers how this important time can be made safer and more beneficial for the baby.

Weaning does not refer only to the stopping of breastfeeding. It is the gradual process by which a baby becomes accustomed to semi-liquid and solid foods which increasingly complement breastfeeding. It is complete when the child is eating the regular family diet and breastfeeding has completely or nearly stopped. Phrases such as "the baby should be weaned at six months" can be very misleading.

Weaning is one of many changes that all take place together. The weanling child is becoming accustomed not only to new foods but to a new environment and to new physical and mental skills. He is very vulnerable to illness at this time.

When should weaning start?

The best way to wean varies according to the circumstances of each family. If a mother has to go out to work she may have to start giving extra foods earlier than is best for the baby, while continuing to breastfeed whenever she is at home. Where sanitation and cooking facilities are poor, she may be wise to start weaning foods later than is ideal.

In general, breastmilk is perfectly adequate until the baby is at least four to six months old, or weighs about seven kilograms. Other foods need to be introduced about this time to complement breast milk. They are unnecessary, and can be dangerous, if given earlier.

What makes a good weaning diet?

Texture: At first, the baby needs liquid foods. These become thicker until, by his first birthday, he is able to chew pieces of food. A good practice is to start with a porridge or pap containing the food ingredients mixed together into a creamy consistency.

Quantity: Babies have very small stomachs and are growing very fast. They need small amounts of foods which are rich in dietary energy. Little and often is the rule. At first weaning food is extra to breastfeeding; as time goes on it becomes the main food, and breastfeeding becomes less

important. The frequency of feeding should increase rapidly until the baby is soon taking at least five meals a day plus breastmilk. Feeding should continue at this rate well into the baby's second year. Snacks, such as fruit, between meals are useful - as long as they are always clean.

Quality: Most weaning diets around the world are based on starchy staple foods such as rice, potatoes and cassava. This is fine as long as certain precautions are taken. Such staples are not nutritious enough in themselves. A porridge using the staple mixed with something extra is excellent. The best additions are peas and beans mashed with the skins removed; milk; meat (finely chopped) or other animal foods; plus dark green leafy vegetables or yellow-orange fruits such as papaya and mango. Suitable recipes and methods of preparing weaning mixes can be found and developed in most cultures.

Energy supplement: Many weaning porridges do not contain enough energy for the baby's needs. During cooking, the starch used in the porridge takes up water and becomes very bulky. Extra oil added to the porridge has two benefits: it adds energy (oil is very rich in calories); and the oil changes the consistency of the porridge, making it easier for the smallest babies to swallow. Oil should be incorporated in all weaning foods except where obesity is a problem.

Two other ways of reducing the bulkiness of weaning foods and making them better and easier for the infant are fermenting or roasting the staple grains. This is done in some parts of the world and can be of great benefit.

Economy: if people spend extra money to buy special weaning foods they are likely to give too little in order to make it last. Weaning foods made at home can be just as good as those bought from shops. In fact, some products sold for babies are very poor in nutritional quality. It is usually best to rely on foods available from the family pot.

Hygiene: Contaminated food is one of the most critical problems during the weaning period. In poor, unsanitary environments it is very difficult to avoid diarrhoea in young children. Breastfeeding provides a major protection against diarrhoea. Good hygiene is essential in preparing weaning foods and keeping them until the next feed. But it is difficult to feed a baby five or more uncontaminated meals a day, when the mother can only afford to light the kitchen

fire once. Local technologies need to be used to resolve the problem.

Utensils: Bottles and rubber teats are difficult to keep clean. Moreover, in order for a weaning porridge to pass through the teat it has to be very dilute; therefore the baby risks not getting enough food. It is best to keep suckling from the breast, not the bottle. When food is mashed for a baby, avoid using sieves which are difficult to clean. A cup and spoon are suitable for giving weaning foods; this allows the mother to change the food from liquid to semisolid as the baby grows.

Breastfeeding: Breast milk is very nutritious and protects against infections. It also provides the close, loving contact that encourages secure development. As far as possible, breastfeeding should continue throughout the difficult process of weaning.

Dr Michael Gurney, Nutrition Unit, WHO, CH-1211 Geneva 27, Switzerland.

Handout 7D: Persuading children with diarrhoea to eat

Encouraging a child with diarrhoea to eat is a difficult and exhausting task for the mother. However, children should be encouraged to eat as early as possible during an attack.

Although rehydration is the most immediate and vital aspect of the management of diarrhoea, the giving of energy in some form of food is essential. In many parts of the world, people think it is necessary to starve children with diarrhoea. This is dangerous. Starving can start off malnutrition, or worsen it, making the child too weak to fight infection.

Extra meal

Food should be given to the child as soon as dehydration is corrected, any vomiting stops, and the appetite returns. Breast milk and other liquids (but not cows milk and infant forumla foods) should continue during oral rehydration. Once the diarrhoea has stopped, at least one extra meal should be given each day for a week if possible.

Small portions

Feed the child with small portions throughout the day. Do not force him to take too much food at a time. The composition of the food can be changed gradually until the child goes back to his normal solid diet. The motjher will know which food the child likes best and can further encourage his appetite by adding additional flavouring.

Every effort should be made to feed the children as there is evidence that even during diarrhoea as much as 60 per cent of nutrients are absorbed. In may developing countries, low-energy gruels from the basis of children's diets, and therefore the sick children has to eat much more to obtain sufficient calorie intakes. Try to give a child with diarrhoea a higher intake of energy foods (see Chart A). Mothers need to be shown how to use locally available foods to the best advantage to their children.

Other important points

- **Try to prepare all food in a clean place, using clean pots and utensils.**
- **Food should be eaten soon after it is cooked. If not, it should be thoroughly heated again before eating.**
- **Wash uncooked food in clean water before eating.**
- **To be sure a young child is getting enough food, try to give him a separate plate or dish. The dish should have a cover.**

Trainer Attachment 7A: Problem poster activity

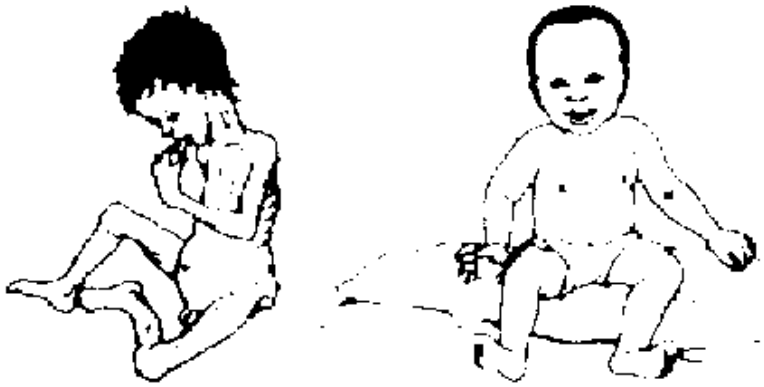
Setting:

A community meet-leg or woman's group meeting to discuss prevention of health problems.

Preparation:

- Prepare two large posters - one depicting a malnourished child and the other depicting a healthy child

- Prepare two sets of small cards: one set has drawings of causes of malnutrition associated with diarrhea such as: a child with diarrhea defecating in the yard, a child refusing to eat during diarrhea, an unbalanced meal; a mother withholding food during diarrhea etc. The other set shows ways to prevent malnutrition resulting from diarrhea in children such as: feeding the child, a mother breast-feeding, using a latrine, washing hands etc.



Figure

- Tape the posters and cards on the wall or blackboard.

Procedure:

- Show the picture of the malnourished child and ask the participants, "how would you describe this child?.

- Show the poster of the health child and ask, "How would you describe this child?."

- Place all the small cards on a table and ask for volunteers, one at a time, to select a small card and place it next to one of the large posters and explain why he or she is placing it there.

- Have the group discuss these answers. Use this as a basis to discuss the vicious circle of diarrhea and malnutrition.

- Ask someone to draw a diagram showing how diarrhea and malnutrition interact.

- Ask the participants what could be done to break the vicious circle of malnutrition and diarrhea in their communities.

- Have them discuss ways they could use this activity in their communities.

Trainer Attachment 7B: Nutrition counseling demonstration

Setting:

The home of a woman with a child suffering from diarrhea. It is the rainy season and the food supply is limited, consisting mainly of starchy foods.

Use Case two on page 29 of Treatment of Diarrhoea for additional details of the setting and the case.

The health worker

You heard about the case from a neighbor visiting the health post. and decided to make a home visit. You want to counsel the mother about what to feed her child during and after this bout of diarrhea, following the WHO recommendations stated in Treatment of Diarrhoea on pages 4-6. Emphasize locally available foods and recognize local food practices and beliefs. Take great care to follow the rules for good counseling listed in the Trainer Note following Step 4, because participants will be using this demonstration as a model for their own counseling practice later in the session. You show the mother how to prepare oral rehydration solution and supplementary food using ingredients available in the home. You ask her to do a return demonstration to show that she understands what you have shown her.

The Mother

You are very concerned about your child. You are a traditional woman and have always followed the traditional practice of withholding food and liquid from your children when they have diarrhea. Your family has little land and the food stores are getting low because it is the rainy season.

Props needed

Chairs, table, local dress for the mother and white coat or hat for the health worker, doll or blanket "baby." utensils and ingredients for preparing the food.

Trainer Attachment 7C: Therapy begins at home

Careful exploration in each society will be needed to determine the most scientifically appropriate, culturally acceptable, and affordable household fluid mixture with which to start therapy at home. Breast milk is, of course, an excellent solution. White its protective effects are well recognized, I wonder if we have really fully explored its potential in the therapy of diarrhea. Clean, nutritious, and widely available to the age group of highest risk, six to twenty-four months, we need only to find ways of further increasing quantity on demand. Increased frequency of suckling during illness has already been documented. The additional milk rehydrates and nourishes as well.

While we can give an unqualified endorsement to breast milk. further investigation of potential home solutions are needed before they can be widely recommended. The studies of rice starch have used finely ground flour carefully stirred into hot water to facilitate dissolution. Preparation requires time, patience, and fuel. The solution becomes undrinkable within six to eight hours. Other starch or liquid nutrient mixes are even less well studied. Nonetheless. I remain confident that appropriate home remedies are out there waiting to be discovered, more widely used, and integrated into our therapeutic schema. Rice water, carrot soup, broths, or others may provide effective, cheap, believable, and universal antidotes to the world's biggest killer

Of equal importance to rehydration, and even more often neglected, is attention to feeding during convalescence, that brief period of a few days following illness when a recovered child has an increased appetite and will take even more food than normal. The phenomenon of catch-up

growth or growth spurt following illness has been well documented for cases of severe malnutrition, endocrine disorders, and overwhelming systemic infection. While it is not yet well understood, such increased growth rate is possible in the immediate days following acute illness, provided adequate additional food is available Growth two, three, or even four times normal can make up for weight losses incurred during illness and bang the child back to his normal growth curve. This requires frequent feeding with readily digested foods administered throughout she day, almost as if on a prescription. But the opportunity is a brief and fleeting one. The small food supplements provided in most nutrition programs are just not enough. From 150% to 200% of Recommended Daily Allowance for three to five days is needed to capitalize on this growth potential. It appears that targeted use of food supplements providing intensive feeding for only several days following diarrhea may be a major intervention strategy in the nutrition infection interaction Food is an integral part of the oral therapy strategy without it we accomplish little more than a delay in mortality With food comes the prospect of improved health and quality survival.

All of this depends on the critical understanding and willingness of mothers to treat every diarrhea episode in her child as important, with early and aggressive use of appropriate fluids and nutrients available to her in her home. i low do we reach the mother? How do we penetrate the ignorance and misinformation surrounding diarrhea? How do we work together?

First, it is our ignorance more than that of mothers that has led to failure, our ignorance of how they perceive illness and health. of causality and reasonable responses. Diarrhea is often not considered an illness, not life threatening but a healthy cleansing of the body Fluids cause more diarrhea; intestines need a rest; food cannot be digested; and so on. Only by understanding their concepts, beliefs. and practices can we tailor our communication approach to build upon what mothers know, a better understanding and acceptance of the whets and whys of diarrhea management Too often what we say just does not make sense.

Mothers, on the other hand. need to understand some facts, too: what diarrhea is, how it leads to malnutrition and occasionally death, why fluid and nutrients given by mouth save lives, how extra feeding for even a few days hastens recovery. We cannot expect blind acceptance of our instructions which, more often than not, fly in the face of every tradition and logical response

they know. We need to listen to and understand each other

Second, is our attitude towards mothers. We must recognize each mother for what she is: the person most vitally concerned about her child's health, but, even more, a valued and important member of the health team. We must treat her as other health workers, informing her in an appropriate and respectful way. She must see for herself and learn by experience. as ail of us have done in this field. Our approach must therefore be a collegial one, addressed to her capacity, but constantly involving her in the active learning process. It is the mother who must treat her child, whether in the hospital, in the health renter, outpatient department, community or home. We must demonstrate in a patient and effective fashion the precise activities that we expect from her do assess, the we do during the training of any other health worker, her understanding and capability of accepting and carrying out this skills. Competency-based experiential training is the key. The classical approach of haranguing mothers in a crowded, noisy, hot waiting room with an unfocused and boring lecture is no substitute for the personal approach and demonstration of how the mother should handle diarrhea in the home.

Third, it may come as a surprise to many of us caught up in She enthusiasm for the role d mothers that fathers are often intimately involved in the decisions affecting childrearing, especially during illness. From the Bangladesh Rural Advancement Committee (BRAC) we will hear that although Bangladesh mothers could clearly recall the proper formula for mixing home sugar/salt solution, only following special efforts to inform fathers about early home rehydration was the treatment widely accepted and used. Let us not forget that in some societies men still have a role in decision making.

Fourth, is our approach to information dissemination Modern communication techniques are used throughout the developing world to sell useless and often even harmful products. These same techniques, in the hands of skilled professional marketing experts, can introduce behavioural change leading to widespread adoption of the home oral therapy strategy in The Gambia and Honduras, following well-established market research procedures, culturally sensitive messages were widely disseminated through a variety of mass media. Knowledge and use of oral rehydration rose from less than 3% of mothers to over SO% in one year.

Social marketing is a complex process, much more than a few billboards and a radio jingle. As professionals in health, we must appreciate the unique professional qualities required d our colleagues involved in mass marketing, calling upon experienced firms to assist us. Together we must start with a comprehensive understanding of presently held beliefs and practice in order to assure the communication strategy is believable and acceptable in a given cultural-context. We must be precise and clear about the product or message that we err trying to sell, building on what is known and believed and changing accepted approaches only when they are unequivocally harmful. We must neither belittle nor ignore traditional culture or wisdoms. We must present our product in a believable and attractive way, convincing people that the home approach to rehydration and nutritional therapy for diarrhea is in no way a second-class therapy, but is rather a first-class response to the biggest threat to health in the world. It is, in fact the only workable response, and its elements must be clearly understood by all. Weoveramplify - the must not overamplify - the ORT approach is a comprehensive home nutrition strategy Rehydration with appropriate nutrient mixes, early refeeding, and added attention to nutrition during, convalescence are all integral parts d the oral therapy message without which we can expect little more than attenuation of the deaths occurring from diarrhea.

We must be sure that we have a consistent message, one that is reinforced in a coordinated way at all levels d our system. Somehow we must demonstrate to our doctors and nurses that ORT is technically effective. We must bury this strange, unfounded, yet deep-rooted belief among, medical professionals, of resting the gut - resting gut rapidly atrophies, enzyme levels fall, absorption worsens. Yet in the so-called "advanced medical centers" of the United States, children continue to be exposed to the costly an< unnecessary risks of intravenous infusions, while intestinal mucosa atrophies under the strict doctors orders of NPO (Nothing, by Mouth Until the medical profession understands, accounts, and practices oral therapy, can we expect others to embrace it? Where these professionals have been bypassed, failure has been almost universal. From Haiti, Indonesia, Jamaica, Costa Rica, and others, we will hear the important role that doctors can and must play to make the "mother strategy" a success.

Trainer Attachment 7D: Enriched ORT

Bert Hirschhorn considers the nutritional value of oral rehydration therapy.

Mothers and doctors alike have long believed that to feed a child with diarrhoea makes the condition worse. Those who insisted that malnourished children ought not to he starved did so apologetically, accepting a lesser risk. Now we ate told that continued feeding is good even for the adequately nourished. Why such a change in advice? It was oral rehydration therapy (ORT) with the full formula that made this feeding possible. Contrast the considerations before and after ORT was introduced:

Before	After
1. A child with diarrhoea feels sick and loses its appetite	1. ORT reduces nausea and vomiting and restores appetite*, partly through rapid correction of acidosis, hypotension and potassium losses
2. Food, especially milk, increases diarrhoea through osmotic fluid loss due to incomplete digestion after damage to intestinal enzymes.	2. Glucose-salt solution given as well as milk increases absorption and decreases osmotic fluid loss.
3. If food is withheld, diarrhoea was thought to slow or stop. (This was only partly true, for diarrhoea results from intestinal secretion which occurs independently of the digestion of food.)	3. With easy and rapid replacement of fluid loss by ORT, we are less concerned about stopping the diarrhoea immediately. Food is needed for recovery and to stimulate digestive juices and enzymes.

So now we can feed during diarrhoea and protect children from under-nutrition, without apologies.

Another use for foods

In the course of clinical experience, however, another use for food has been suggested. As early as 1971, after initial rehydration of American Indian children suffering with diarrhoea, an artificial milk formula made up from starch, glucose, casein, with medium chain fats and electrolytes. could maintain fluid and electrolyte balance in spite of continuing losses. The formula was effective, despite being hypertonic and with a large imbalance between sodium and glucose concentrations, conditions normally causing more diarrhoea and fluid loss.

Modern understanding of intestinal physiology suggests that it was the addition of casein (milk protein) that made the difference. Casein is easily digested to tri- and di-peptides and amino acids. Each of these molecule types stimulates sodium and water absorption by pathways across the intestinal cell membrane which differ from pathways for glucose. Moreover, peptides, and amino acids are more easily digested than sugars if the intestine is damaged by diarrhoea or malnutrition children with kwashiorkor are known to have less diarrhoea or malnutrition when fed a glucose-starch-casein formula.

Combining electrolytes with foods

Several recent clinical teals of enriched oral rehydration fluids have combined a sugar and an amino acid (glucose and glycine), or starch and protein (rice powder and breastmilk) with electrolytes. In each study, stool output was actually reduced by about half and duration of diarrhoea shortened by one third. This is just what mothers and doctors have always wanted: a treatment that prevents dehydration, reduces stool output and, at the same time, provides the nourishment to hasten recovery. Certain foods, in an enriched ORT, may turn out to be superior to antisecretory drugs, and have the advantage of being found in the home and not in the pharmacy. Research on optimal food-electrolyte combinations is now underway.

Trainer Attachment 7E: Child description and recommended diet

Prior to this session, the trainer should develop three to four descriptions of infants or young children under five for Step 3.

Make certain that the infant and child descriptions you create are significantly different, particularly in age and nutritional cultural practices that would affect that age of individual. Also be sure the descriptions are related to diarrhea so that participants have the chance to practice developing appropriate diets for children susceptible to, suffering from, or recovering from diarrhea.

The descriptions must include the followings his/her name, age, ethnic group or religion (If appropriate), season of occurrence, any relevant medical or social history, physical appearance, current health condition (weight, height and body temperature are optional pieces of information

for inclusion).

Use the example given below as a model for writing the children's descriptions:

Child Description for Nutritional Description Exercise

Hawa is a 1 1/2 year old girl. She is a Moslem. It is the middle of Ramadan this year. She is very thin except for her big belly. Her mother has Just had another baby whom she is breast feeding. Hawa has a five year old sister, Adama, with whom she shares food. Adama helps her mother care for the younger children and has told her mother that Hawa has had "poopoo" five times today.

Suggestions for a Diet for Hawa

After you have written the child descriptions you should also write expected answers for the dietary prescription of the children. These "prescriptions" should not be considered to be the only acceptable answers, but possible ones. Be sure to take seasonal variations of foods into account when writing the dietary prescription expected.

In suggesting a diet for Hawa the health worker should:

- Use the WHO or country specific diarrheal assessment and treatment chart to assess Hawa's diarrhea and select a treatment plan.

- Take into account the host country's traditional feeding practices for an 18 month old child.

- With no further information available (Ie. how many stools a day is normal for Hawa, is her pulse faster than normal, is she irritable etc.) other than the fact that she has five loose stools a day, the health worker should suggest that she be treated with ORS solution for rehydration and continue breastfeeding. When Hawa is rehydrated provide small amounts of multimix preparation.

It should be noted that the dietary prescription given for this example will vary from country to country depending on the availability of food and acceptability the child's age.

Session 8 - Recognizing malnutrition

TOTAL TIME

2 hours

OVERVIEW

In Session 7, participants discussed the "vicious circle" of diarrhea, malnutrition and disease leading from one to another, weakening and leading to death of the child if the circle is not broken. An important complement to prevention and control of diarrheal diseases is the identification and treatment of children who are at "high risk" for malnutrition and nutritional deficiencies. These weakened children are likewise susceptable to repeated cases of diarrhea and other illnesses. In this session, participants use pictures or slides to identify "symptoms" of malnutrition as well as the social indicators of "at risk" children. Later the group discusses growth measurement as a way of assessing children's nutritional status. In optional activities, participants practice weighing and measuring children and using and interpreting growth charts.

OBJECTIVES

- **To recognize the signs and symptoms of children at high risk for malnutrition and diseases.**
  (Step 1)

- **To use and interpret the Road to Health Chart. (Steps 4, 5)**

- **To use and interpret the anthropometric measures for identifications of "at risk" children.**
  (Steps 3, 6, 7)

RESOURCES

- **Pediatric Priorities in the Developing World (Chapter 9).**
- **Guidelines for Training Community Health Workers in Nutrition (Chapter 2)**
- **Helping Health Workers Learn (Chapter 25, pp. 7-23.)**
- **Technical Health Training Manual (Peace Corps)**

Handouts:

- **8A Growth Chart (to be obtained from the country health system)**
- **8B Weight For Height Chart**
- **8C Weight For Age Chart**
- **8D How To Measure Weight-for-Length**
- **8E Recording Weight on a Growth Chart**
- **8F Measures Recording Sheet**

Trainers Attachments:

- **8A Comparison of Measures**
- **8B Monitoring Growth**
- **8C Growth Chart Exercise**

MATERIALS

Slides or pictures of malnourished children, slide projector, newsprint, markers, scales, arm circumference tapes, dolls, tape measures or meter sticks, weight for length board (see Handout 8D for instructions).

PROCEDURE

Trainer Note

It is assumed that participants have a basic understanding of malnutrition and have seen actual

cases in their communities. If they lack this background, use the Trainer Attachments in Session 29 (Recognizing Malnutrition) in the Technical Health Training Manual to provide additional background. There are also optional steps at the end of this session Procedure section which you can use as more practice for the techniques covered in this session. Participants should understand that this session is only an overview of these techniques. Participants need practice to master them.

Before the session, learn as much as possible about the prevalent nutritional deficiencies in the country and be prepared to discuss them thoroughly. Prepare a vocabulary list of words in the local language describing these conditions.

Make sure the slides or visual aids you prepare for Step 1 allow participants the opportunity to see and identify specific signs and symptoms of various kinds and stages of malnutrition and nutritional deficiencies that are common in the country.

Ask a local health worker and a participant who has had experience in weighing children and using growth charts to help you prepare and conduct the demonstrations in Steps 3 and 4 and the optional activities. In preparation for this use Handout 29A (How do you Measure Malnutrition?), from Session 29 (Recognizing Malnutrition), Technical Health Training Manual, and information from Helping Health Workers Learn, Chapter 25, pages 7-16.

Obtain copies of the growth chart used in the country's health system and arm circumference tapes for each participant,

Prepare large versions of the growth charts using local data or the information in Trainer Attachment 8B (Monitoring Growth). Be sure to use cases including bouts of diarrhea. Also prepare one large growth chart with no measurements recorded.

Arrange with parents to bring a few children, from local families or Peace Corps staff, to the session for demonstration and practice of the measurement techniques. You could combine this with a health education activity for parents and children. An alternative is to hold the session in a local health clinic that weighs and measures children.

Step 1 (15 min.)

Recognizing MaInutrition

Using pictures or slides, ask the participants to identify and discuss the physical signs of the various forms of malnutrition they have observed in their communities and name them if they can. Suggest that participants assess malnutrition starting at the head and working down to the feet of a child.

Conclude this step by stating that while the group has Just reviewed pictures that represent various signs of severe malnutrition, the primary focus of the session is to provide participants with the necessary skills and knowledge to identify children at risk of developing severe forms of maInutrition.

Trainer Note

The following points may be included in the discussion on signs and symptoms of malnutrition. You may also want to add others. General symptoms of malnutrition:

- Hair-lighter colored, sparse, falls out easily, breaks easily, loses its shine

- Eyes-pale membranes (anemia); bubbly spot on white of eye indicates vitamin A deficiency

- Inner lower lip and tongue-pale membranes

- Upper arms-very thin

- Skin-patches of different color, very dry (these signs are easy to confuse with adverse environmental conditions or poor hygiene)

- Feet and ankles-swollen (edema): see if a mark remains after pushing finger in for a few seconds (also may see this in pregnant women)

(All the above signs are nonspecific and should not be used to diagnose malnutrition but to indicate that a problem may exist.)

Step 2 (15 min)

Identifying "At Risk" Children

Briefly explain what is meant by "at risk" children. Discuss the importance of monitoring their growth in terms of the effects that diarrhea and other diseases will have on their health status, if interviews are not taken early to prevent or treat these diseases.

Ask participants to recall situations they have observed in their communities where children were sick and malnourished. Ask them to think of physical signs and social conditions associated with these children. Brainstorm a list of social and physical signs that they could use to identify children at risk.

Have the group identify which of the risk factors from their list may be most significant in their communities.

Trainer Note

High-risk groups are usually children between the ages of six months and three years, and women who are pregnant or lactating. The following indicators which can be used to identify "at risk" children should be mentioned:

- Maternal weight below 43.5 kg.

- All birth orders over seven - Breakdown of marriage or death of either parent - More than four sibling deaths

- Birth weights below 2.4 kg. for males and 2.3 kg. for females.

- Failure to gain 0.5 kg. a month in the first three months of life and 0.25 kg. In the second three months of life.

- Breast infections and difficulties in breast feeding.

- An episode of measles, whooping cough and severe repeated diarrhea in the early months of life.

Emphasize the importance of careful observation as well as taking physical measurements to assess the nutritional status of a child.

For specific details concerning these factors, refer to See How They Grow (Chapter 9) or Pediatric Priorities in the Developing World (Chapter 9). WHO Guidelines for Training Community Health Workers in Nutrition discusses in simple terms the relationship between diarrhea and dehydration.

Step 3 (50 min.)

Assessing Nutritional Status

Begin this step by facilitating a discussion of the relationship between growth and nutrition. Tell the participants that monitoring a child's growth is one way of assessing his or her health and nutritional status.

Demonstrate the use of the arm circumference band, weighing and measuring length and height by measuring several children from the local community or Peace Corps staff. Record their measurements on newsprint. Distribute Handout 8B (Weight for Height) and 8C (Weight for Age) and ask the participants to use these charts to interpret the recorded information.

Ask at least one participant to do a return demonstration of each technique. Use Trainer Attachment 8A (Comparison of Measures) to discuss some of the limits of and distinctions between the measures and to cite the advantages and disadvantages of having a few discrete measures with which to assess a child's nutritional status.

Distribute Handout 8D (How to Measure Weight for Length) for their future reference.

Trainer Note

Be sure participants recognize the difference between the levels of information provided and uses for the arm band, the weight-for-age and the weight-for-height (or length) measures.

When discussing age-for-weight, briefly mention various ways that the health worker can determine a child's age. Several methods that can be used are:

- **birth certificate**
- **developing a local events calendar**
- **counting the number of teeth the child has, and**
- **noting other developmental characteristics to estimate age.**

See Guidelines for Training Community Health Workers (WHO), pages 23-24 on Nutrition for further discussion of estimating age.

If possible, it is important to use the optional step (Assessing and Iinterpreting Nutritional Status) to give participants practice in these techniques.

Step 4 (30 min.)

Introducing the Growth Chart

Introduce this step by noting that because growth and health status are not static, monitoring of growth should be a continual process of weighing, observing and systematic recording. This permits the health worker or parent to detect early signs of growth failure and hence high risk for illness and death. Distribute a blank copy of Handout 8A (Growth Chart) to all the participants.

Show a large version of a growth chart from Trainer Attachment 88 (Monitoring Growth) or from charts used locally. Explain the chart to the participants by pointing to the parts of the chart as you discuss them and stating:

- **A child's age in months is listed in a column at the left side of the chart; the months are**

filled in across the bottom of the chart.

- The upper line on the chart shows the weight of well-fed children.

- The lower line indicates the area below which a child weighs less than they should for their age.

- The space between the line is the road to health and life.

- A child's growth curve should always be rising, if it isn't, this indicates that the child is in danger no matter where the child is on the chart.

Point to the place on the chart where the child had diarrhea and discuss the effect of diarrhea on growth.

Use the data collected in Step 3 or one of the exercises in Trainer Attachment 8C (Growth Chart Exercises) to demonstrate how to fill in the growth chart and interpret it. Use another exercise, and ask a participant to fill in the chart, with suggestions from the rest of the group. Ask the group to interpret the chart.

Distribute Handout 8E (Recording Weight on a Growth Chart) as a reference. Trainer Note

If time allows, it is important to use the optional step, "Using Growth Charts", after this step to give participants practice.

Step 4 (20 min.)

Discussing Problems and Applications of Measures For Assessing Nutritional Status

Ask the participants to review the growth chart and to list the different purposes that it can serve in preventing malnutrition associated with diarrhea. Ask for a volunteer to write their statements on newsprint.

Also discuss problems associated with using the various measurement techniques, interpreting

the growth chart and teaching mothers to understand the chart. Close the session with a discussion of the possible uses of growth monitoring by participants to break the vicious circle of diarrhea, malnutrition and disease.

Trainer Note

Reemphasize the point made in Step 3 that measuring growth is a means to monitor nutritional status. Several purposes the chart serves include:

- Keeping pertinent and concise medical records on children during critical developmental stages,
- Encouraging mothers' ongoing involvement with an Under-Fives' clinic,
- Providing a quick visual means of monitoring a child's medical history for untrained workers,
- Charting a child's age and appropriate times for immunizations,
- Having a record of the health history for different health personnel if the child moves.

Some of the points that should be mentioned or discussed concerning the use and importance of the growth chart are:

- If a child is growing well he or she is probably healthy and adequately nourished. Months before a child has obvious signs of malnutrition, he or she will have stopped growing

- Growth is measured in several ways and baby weight is the simplest.

- The health worker may have difficulty getting correct age from mother.

- The mother or health worker may have difficulty in accurately charting the weights. (e.g. Individuals may use January-December calendar rather than the child's birth calendar),

- Individuals can become so involved in completing the chart that they forget to look at the child, analyze the data or discuss the child's progress with the mother.

- Host Country Nationals may feel that the standards used in developing the growth lines are not appropriate for their population.

Make sure the group understands the relationship between growth and nutrition as well as the relationship between diarrhea and growth as discussed in Session 7 (Nutrition During and After Diarrhea).

Optional Step (90 min)

Assessing and Interpreting Nutritional Status

Tell participants they will be practicing measurement techniques in this activity. Form small groups of two or three persons, and distribute Handout 8F (Measures Recording Sheet). Demonstrate how to record information on the sheet. Stress the importance of recording each measurement immediately, to reduce errors in measurement. Encourage them to be as accurate as possible.

Assign specific groups to the work stations and have them take turns weighing children, measuring their height/length and measuring their arm circumference. Ask them to record these measurements on Handout 8F and talk with the parents to establish the children's ages and general health history.

When groups have finished measuring the children and recording the data, have them spend a few minutes discussing the individual measurements for the various children, referring to Handouts 8B (Weight For Height), 8C (Weight for Age Chart), and page 44, "Use of the Colored Arm Strip" in the Treatment of Diarrhoea. Thank the community members again for their help in the training program.

Reconvene the group and have each small group report on the information for the various children they measured. Ask a participant record this information on newsprint and compare the variations in measurements within the small groups with the variations among the small groups. Have the groups discuss any difficulties they may have had in doing the measurements. They should also briefly discuss the problems encountered and identify any additional information or

skills they need.

End the activity by asking each participant a skill or attitude needed for monitoring growth.

Trainer Note

Prior to this activity, set up work stations with measuring and weighing equipment that is available in the local area.

This step will vary slightly depending on whether the trainer was able to arrange for local infants and children to come in to be measured or, preferably, to visit an Under-Fives Clinic. If children are coming in, the trainer should explain to the group that this is a real opportunity to do some nutrition counseling and to apply the health education information they have already learned. When the families arrive, the trainer should welcome them and thank them for helping the training effort. Explain the purpose of the measuring tasks and what procedures will follow. Avoid overwhelming any infant or child with many strangers at one time. Make sure the child is not measured by more than two small groups using the same techniques. You may wish to have participants assess children for other clinical signs and symptoms, (e.g. Vitamin A deficiency, anemia, etc.).

If time permits you may also wish to have participants discuss the accuracy of different local weighing and measuring tools or consider making of some of the measuring devices themselves in their sites. Helping Health Workers Learn (Chapter 16, pages 1-2) includes information on making simple measurement equipment. Handout 8D shows how to make a measuring board.

Optional Step (40 min.)

Using Growth Charts

Ask individuals to form pairs and spend 20 minutes filling in the charts using the information posted. Also ask them to interpret the health status of the child.

After 10 minutes ask one pair to present their assessment of the child's health.

After the presentation have the other participants add additional comments, evaluate the assessment and state whether they agree or disagree with the diagnosis and why.

Ask the group to discuss any difficulties they had in using the chart and to identify the benefit and drawbacks to using it as an assessment tool.

Trainer Note

For this activity use Trainer Attachment 8C (Growth Chart Exercise) or data from the local citric. Post this on the vail or duplicate the information for each person and have them plot it on Handout 8A (Growth Chart). Make a large version of a correctly filled in chart to use during the discussion.

Handout 8B: Weight for height (stature) for both boys and girls

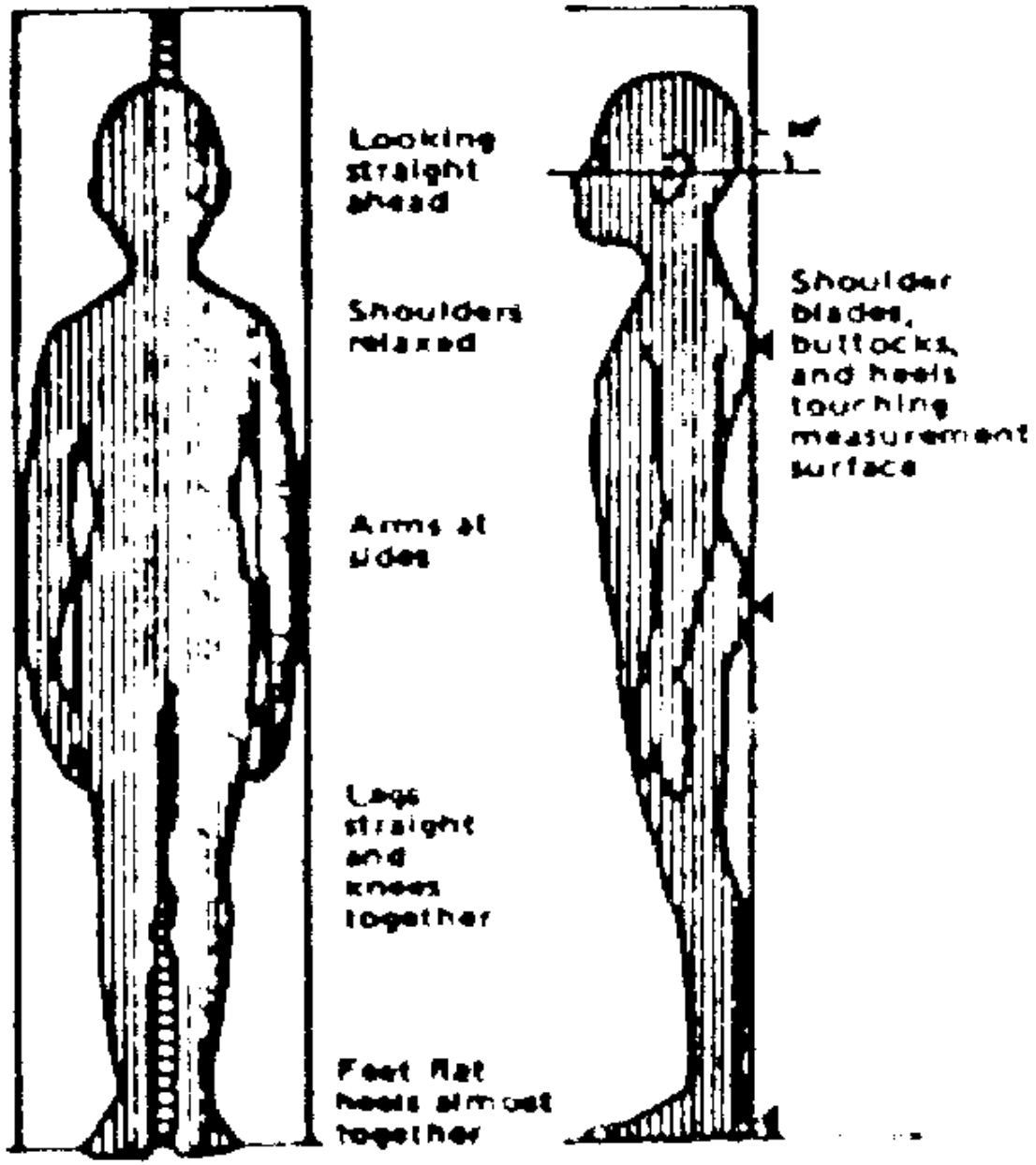
Height	Median	Percents of Median			
		85%	80%	75%	70%
85.0cm	12.0kg	10.2kg	9.6kg	9.0kg	8.4kg
85.5	12.1	10.3	9.7	9.1	8.5
86.0	12.2	10.4	9.8	9.1	8.5
86.5	12.3	10.5	9.8	9.2	8.6
87.0	12.4	10.6	9.9	9.3	8.7
87.5	12.5	10.6	10.0	9.4	8.8
88.0	12.6	10.7	10.1	9.5	8.8
88.5	12.8	10.8	10.2	9.6	8.9
89.0	12.9	10.9	10.3	9.7	9.0
89.5	13.0	11.0	10.4	9.7	9.1
90.0	13.1	11.1	10.5	9.8	9.2
90.5	13.2	11.2	10.6	9.9	9.2
91.0	13.3	11.3	10.7	10.0	9.3
91.5	13.4	11.4	10.8	10.1	9.4
92.0	13.6	11.5	10.8	10.2	9.5
92.5	13.7	11.6	10.9	10.3	9.6
93.0	13.8	11.7	11.0	10.3	9.7
93.5	13.9	11.8	11.1	10.4	9.7
94.0	14.0	11.9	11.2	10.5	9.8
94.5	14.2	12.0	11.3	10.6	9.9
95.0	14.3	12.1	11.4	10.7	10.0
95.5	14.4	12.2	11.5	10.8	10.1
96.0	14.5	12.4	11.6	10.9	10.2
96.5	14.7	12.5	11.7	11.0	10.3
97.0	14.8	12.6	11.8	11.1	10.3
97.5	14.9	12.7	11.9	11.2	10.4
98.0	15.0	12.8	12.0	11.3	10.5
98.5	15.2	12.9	12.1	11.4	10.6
99.0	15.3	13.0	12.2	11.5	10.7
99.5	15.4	13.1	12.3	11.6	10.8
100.0	15.6	13.2	12.4	11.7	10.9
100.5	15.7	13.3	12.6	11.8	11.0
101.0	15.8	13.5	12.7	11.9	11.1
101.5	16.0	13.6	12.8	12.0	11.2
102.0	16.1	13.7	12.9	12.1	11.3
102.5	16.2	13.8	13.0	12.2	11.4
103.0	16.4	13.9	13.1	12.3	11.5
103.5	16.5	14.0	13.2	12.4	11.6
104.0	16.7	14.2	13.3	12.5	11.7
104.5	16.8	14.3	13.4	12.6	11.8
105.0	16.9	14.4	13.6	12.7	11.9
105.5	17.1	14.5	13.7	12.8	12.0
106.0	17.2	14.6	13.8	12.9	12.1
106.5	17.4	14.8	13.9	13.0	12.2
107.0	17.5	14.9	14.0	13.1	12.3

Weight for height

Height	Median	Percents of Median 85%	80%	75%	70%
107.5cm	17.7kg	15.0kg	14.1kg	13.3kg	12.4kg
108.0	17.8	15.2	14.3	13.4	12.5
108.5	18.0	15.3	14.4	13.5	12.6
109.0	18.1	15.4	14.5	13.6	12.7
109.5	[illegible]	[illegible]	14.6	13.7	12.8
110.0	[illegible]	[illegible]	14.8	13.8	12.9
110.5	18.6	[illegible]	14.9	14.0	13.0
111.0	18.8	16.0	15.0	14.1	13.1
111.5	18.9	16.1	15.1	14.2	13.3
112.0	19.1	16.2	15.3	14.3	13.4
112.5	19.3	16.4	15.4	14.4	13.5
113.0	19.4	16.5	15.5	14.6	13.6
113.5	19.6	16.7	15.7	14.7	13.7
114.0	19.8	16.8	15.8	14.8	13.8
114.5	19.9	16.9	16.0	15.0	14.0
115.0	20.1	17.1	16.1	15.1	14.1
115.5	20.3	17.3	16.2	15.2	14.2
116.0	20.5	17.4	16.4	15.4	14.3
116.5	20.7	17.6	16.5	15.5	14.5
117.0	20.8	17.7	16.7	15.6	14.6
117.5	21.0	17.9	16.8	15.8	14.7
118.0	21.2	18.0	17.0	15.9	14.9
118.5	21.4	18.2	17.1	16.1	15.0
119.0	21.6	18.4	17.3	16.2	15.1
119.5	21.8	18.5	17.4	16.4	15.3
120.0	22.0	18.7	17.6	16.5	15.4
120.5	22.2	18.9	17.8	16.7	15.5
121.0	22.4	19.1	17.9	16.8	15.7
121.5	22.6	19.2	18.1	17.0	15.8
122.0	22.8	19.4	18.3	17.1	16.0
122.5	23.1	19.6	18.4	17.3	16.1
123.0	23.3	19.8	18.6	17.5	16.3
123.5	23.5	20.0	18.8	17.6	16.5
124.0	23.7	20.2	19.0	17.8	16.6
124.5	24.0	20.4	19.2	18.0	16.8
125.0	24.2	20.6	19.4	18.2	16.9
125.5	24.4	20.8	19.6	18.3	17.1
126.0	24.7	21.0	19.7	18.5	17.3
126.5	24.9	21.2	19.9	18.7	17.5
127.0	25.2	21.4	20.1	18.9	17.6
127.5	25.4	21.6	20.4	19.1	17.8
128.0	25.7	21.8	20.6	19.3	18.0
128.5	26.0	22.1	20.8	19.5	18.2
129.0	26.2	22.3	21.0	19.7	18.4
129.5	26.5	22.5	21.2	19.9	18.6
130.0	26.8	22.8	21.4	20.1	18.7

Weight for height (continued)

DIRECTIONS FOR MEASURING CHILDREN WHO ARE 85 CM OR MORE IN HEIGHT



Measuring children

Step 1. Place the measuring board in a verticle position on a flat surface

Step 2. Have the mother (or assistant) remove any footwear or headgear on the child and lead the child to the measuring board.

Slap 3. Place the child so that the shoulder blades bullocks and heels are touching the vertical surface of the measuring board. The feet must be flat on the floor slightly apart teas and back straight and arms at sides. The shoulders must be relaxed and in contact with the measuring board The head usually is not in contact with the measuring board. Tell the child to stand "straight and tall" and look straight ahead

Slap 4. One assistant (the recorder) checks that the child elands flat fooled with the knees fully extended The shoulders and bullocks should be in line with the heels

Step 5. The movable headboard is then brought to test firmly on the crown of the child's head by the measurer while the head is held so that the child's eyes point straight ahead

Step 6. The measurer reads the measurement to the nearest 0.5 cm.

Step 7. The recorder then writes the measurement clearly on the form.

Step 8. The measurer then looks at the recorded value on the form to be sure that it is correct.

Handout 8C: Weight for age chart

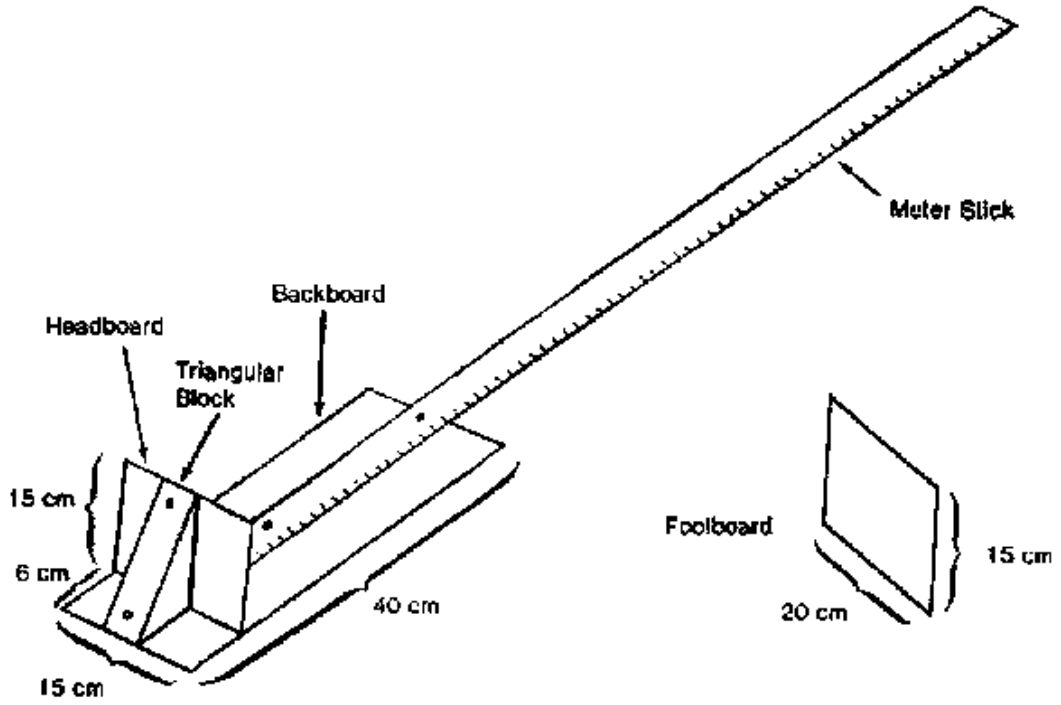
Age of the child	If the child weighs less than this amount he is MALNOURISHED	Standard weight for this age
0 months	2.4 kg*	3.2 kg*
1	3.1	4.2
2	3.7	5.0
3	4.3	5.7
4	5.0	6.4
5	5.4	7.0
6	6.0	7.5
7	6.4	8.0
8	6.8	8.5
9	7.2	8.9
10	7.6	9.2
11	7.9	9.6
12	8.1	9.8
13	8.4	10.1
14	8.6	10.4
15	8.8	10.6
16	9.0	10.8
17	9.1	11.0
18	9.2	11.2
19	9.4	11.4
20	9.6	11.5
21	9.8	11.7
22	9.9	11.8
23	10.0	12.0
24	10.2	12.1
25	10.3	12.2
26	10.5	12.4
27	10.6	12.6
28	10.8	12.8
29	10.9	13.0
30	11.0	13.2
31	11.2	13.4
32	11.3	13.6
33	11.4	13.8
34	11.6	14.0

WEIGHT-FOR-AGE LIST

Age of the child	If the child weighs less than this amount he is MALNOURISHED	Standard weight for this age
35 months	11.7 kg*	14.2 kg*
36	11.8	14.4
37	12.0	14.6
38	12.1	14.7
39	12.2	14.9
40	12.4	15.0
41	12.5	15.2
42	12.6	15.4
43	12.8	15.5
44	12.9	15.7
45	13.0	15.8
46	13.1	16.0
47	13.3	16.2
48	13.4	16.4
49	13.5	16.5
50	13.6	16.6
51	13.8	16.8
52	13.9	17.0
53	14.0	17.1
54	14.1	17.2
55	14.3	17.4
56	14.4	17.5
57	14.5	17.7
58	14.7	17.8
59	14.8	18.0

WEIGHT-FOR-AGE LIST (Continued)

Handout 8D: How to measure weight-for-length



How to make a measuring board

Make a measuring board

You can make a measuring board like this:

1. Buy a meter-long measuring stick at a bookstore or hardware store.

2. Get a piece of plywood 1/2 to 1 cm thick. Cut it in 3 pieces:

- **15 cm x 15 cm (Headboard)**
- **15 cm x 40 cm (Backboard)**
- **15 cm x 20 cm (Footboard)**

3. From another piece of wood, about 5 cm thick, cut a triangular block 15 cm x 6 cm.

4. Attach the meter stick, backboard, triangular block, and headboard as shown in the drawing. Use small screws. (The footboard stays separate and is not attached to the other pieces.)

5. Since the backboard will be rough (because of the meter stick and the screws), you can cover the backboard with a cloth, to make the children comfortable.

WEIGHT FOR LENGTH (Supine) FOR BOTH BOYS AND GIRLS

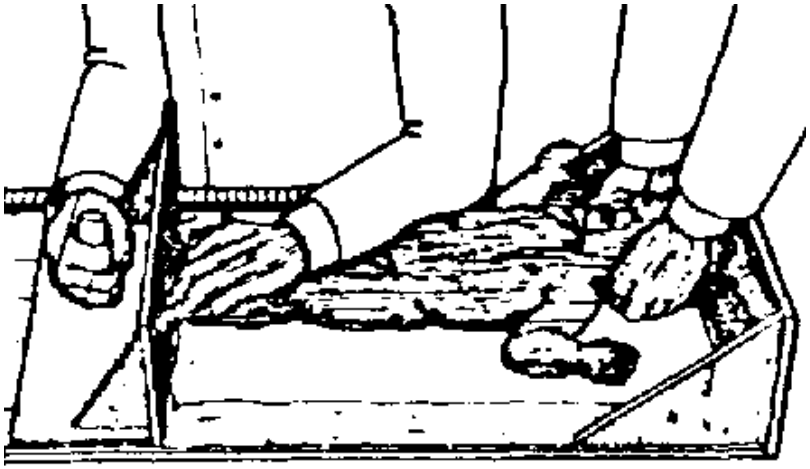
Length	Median	Percents of Median 85%	80%	75%	70%
49.0cm	3.2kg	2.7kg	2.6kg	2.4kg	2.3kg
49.5	3.3	2.8	2.6	2.5	2.3
50.0	3.4	2.9	2.7	2.5	2.4
50.5	3.4	2.9	2.7	2.6	2.4
51.0	3.5	3.0	2.8	2.6	2.5
51.5	3.6	3.1	2.9	2.7	2.5
52.0	3.7	3.1	3.0	2.8	2.8
52.5	3.8	3.2	3.0	2.8	2.8
53.0	3.9	3.3	3.1	2.9	2.7
53.5	4.0	3.4	3.2	3.0	2.8
54.0	4.1	3.5	3.3	3.1	2.9
54.5	4.2	3.6	3.4	3.2	2.9
55.0	4.3	3.7	3.5	3.2	3.0
55.5	4.4	3.8	3.5	3.3	3.1
56.0	4.6	3.9	3.6	3.4	3.2
56.5	4.7	4.0	3.7	3.5	3.3
57.0	4.8	4.1	3.8	3.6	3.4
57.5	4.9	4.2	3.9	3.7	3.4
58.0	5.1	4.3	4.0	3.8	3.5
58.5	5.2	4.4	4.2	3.9	3.6
59.0	5.3	4.5	4.3	4.0	3.7
59.5	5.5	4.6	4.4	4.1	3.8
60.0	5.6	4.8	4.5	4.2	3.9
60.5	5.7	4.9	4.6	4.3	4.0
61.0	5.9	5.0	4.7	4.4	4.1
61.5	6.0	5.1	4.8	4.5	4.2
62.0	6.2	5.2	4.9	4.6	4.3
62.5	6.3	5.4	5.0	4.7	4.4
63.0	6.5	5.5	5.2	4.8	4.5
63.5	6.6	5.6	5.3	5.0	4.6
64.0	6.7	5.7	5.4	5.1	4.7
64.5	6.9	5.9	5.5	5.2	4.8
65.0	7.0	6.0	5.6	5.3	4.9
65.5	7.2	6.1	5.7	5.4	5.0
66.0	7.3	6.2	5.9	5.5	5.1
66.5	7.5	6.4	6.0	5.6	5.2

Weight for length

Length	Median	Percents of Median 85%	80%	75%	70%
67.0cm	7.6kg	6.5kg	6.1kg	5.7kg	5.3kg
67.5	7.8	6.6	6.2	5.8	5.4
68.0	7.9	6.7	6.3	5.9	5.5
68.5	8.0	6.8	6.4	6.0	5.6
69.0	8.2	7.0	6.6	6.1	5.7
69.5	8.3	7.1	6.7	6.2	5.8
70.0	8.5	7.2	6.8	6.3	5.9
70.5	8.6	7.3	6.9	6.4	6.0
71.0	8.7	7.4	7.0	6.5	6.1
71.5	8.9	7.5	7.1	6.6	6.2
72.0	9.0	7.6	7.2	6.7	6.3
72.5	9.1	7.7	7.3	6.8	6.4
73.0	9.2	7.9	7.4	6.9	6.5
73.5	9.4	8.0	7.5	7.0	6.5
74.0	9.5	8.1	7.6	7.1	6.6
74.5	9.6	8.2	7.7	7.2	6.7
75.0	9.7	8.2	7.8	7.3	6.8
75.5	9.8	8.3	7.9	7.4	6.9
76.0	9.9	8.4	7.9	7.4	6.9
76.5	10.0	8.5	8.0	7.5	7.0
77.0	10.1	8.6	8.1	7.6	7.1
77.5	10.2	8.7	8.2	7.7	7.2
78.0	10.4	8.8	8.3	7.8	7.2
78.5	10.5	8.9	8.4	7.8	7.3
79.0	10.6	9.0	8.4	7.9	7.4
79.5	10.7	9.1	8.5	8.0	7.5
80.0	10.8	9.1	8.6	8.1	7.5
80.5	10.9	9.2	8.7	8.1	7.6
81.0	11.0	9.3	8.8	8.2	7.7
81.5	11.1	9.4	8.8	8.3	7.7
82.0	11.2	9.5	8.9	8.4	7.8
82.5	11.3	9.6	9.0	8.4	7.9
83.0	11.4	9.6	9.1	8.5	7.9
83.5	11.5	9.7	9.2	8.6	8.0
84.0	11.5	9.8	9.2	8.7	8.1
84.5	11.6	9.9	9.3	8.7	8.2

Weight for length (Continued)

DIRECTIONS FOR MEASURING CHILDREN WHO ARE LESS THAN 85 CM IN LENGTH



Measuring children

Step 1. The measuring board is placed horizontally on the ground or on a table

Step 2. With the help of one or two assistants place the baby barefoot and without head covering on the measuring board with the head against the fixed (non-movable) end

Step 3. An assistant holds the baby's head so that the eyes are pointed straight up and applies gentle traction to bring the top of the child's head info contact with the fixed end of the measuring board

Step 4. The measurer holds the child's knees together and pushes them down against the tabletop with one hand or forearm, fully extending the child. With the other hand the measurer slides the movable footboard to the child's feet until the heeds of both feet touch the footboard.

Slop 5. The measurer then immediately removes the child s feet from contacts fact with the footboard with one hand (to prevent the child born kicking and moving the footboard) while holding the footboard securely in place with the other hand.

Step 6. The measurer reads the measure meat to the nearest 0 5 cm.

Step 7. The recorder then writes the measurement clearly on the form

Step 8. The measurer then looks al the recorded value on The term to be sure that it is correct.

Handout 8E: Recording the weight on a growth chart

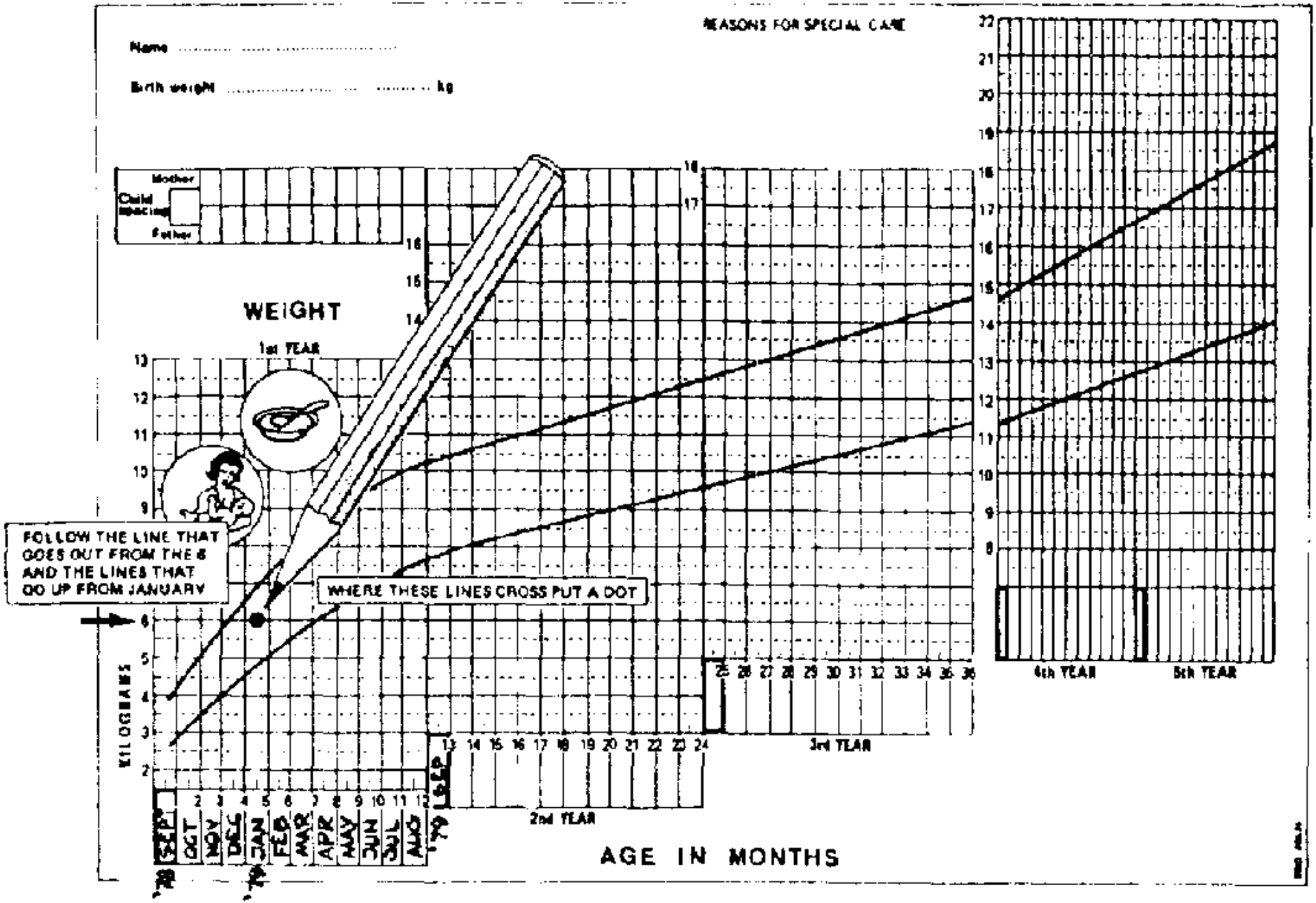


Fig. 8 An example of a growth line plotted on three weight measurements

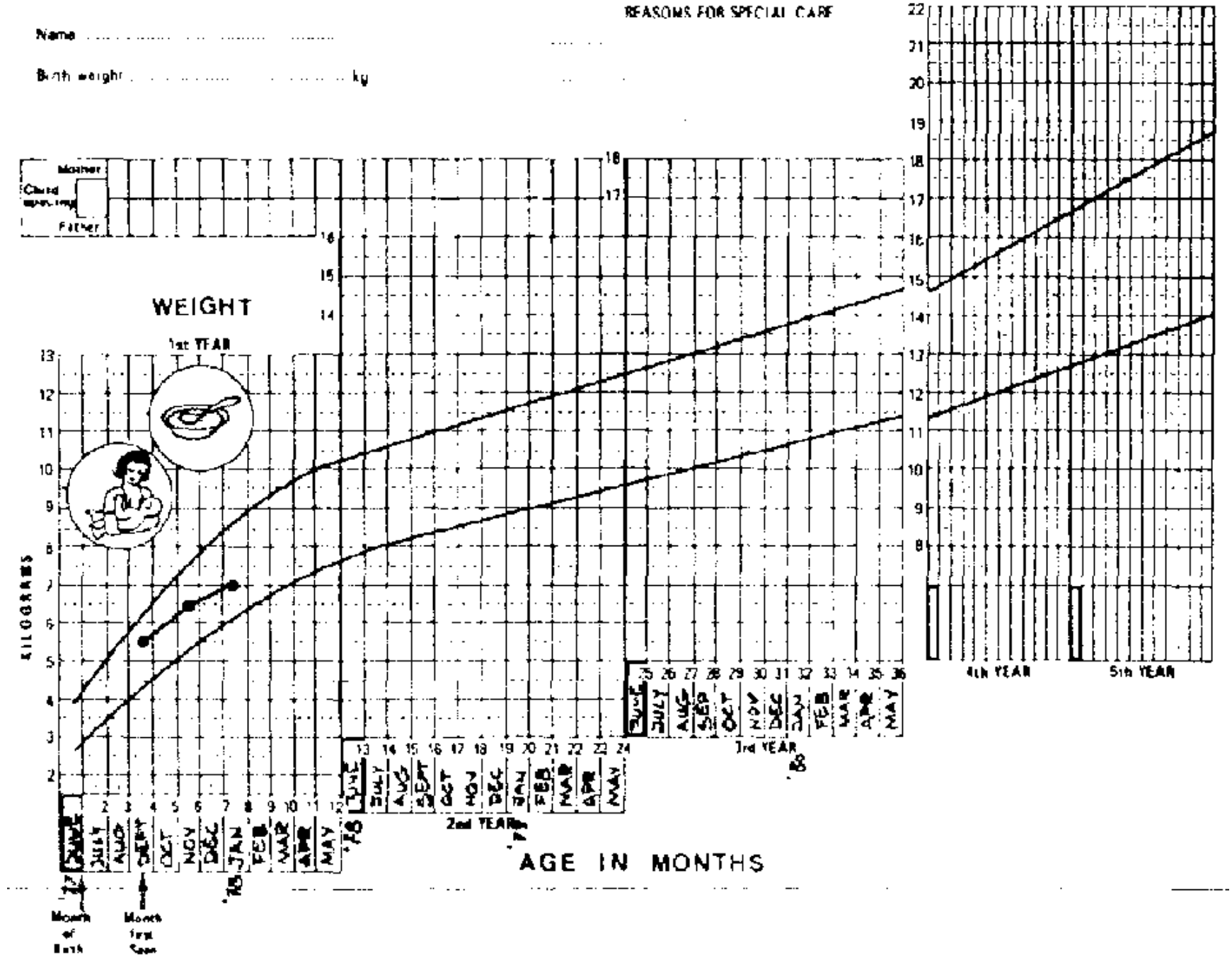

REASONS FOR SPECIAL CARE
Name
Birth weight kg
Mother
Father
WEIGHT
1st YEAR
KILOGRAMS
AGE IN MONTHS
2nd YEAR
3rd YEAR
4th YEAR
5th YEAR
Month of Birth
Month first Seen

Fig. 8 Second example

Recording weights on the growth chart

The weight of a child should be recorded on the chart according to the instructions given below.

1. Write the name, address, and other information about the child and the family on the back of the chart. It is important to do this at once to show whose record this is and to avoid recording one child's weight on another child's chart.

2. Write the month of birth in the box below the first vertical column (the first box which has thick lines around it). Near the box write the year of birth. This is September 1978 in the example shown in Fig. 7.

3. Note that there are 5 sets of 12 columns. Each set is for one year of the child's life. Beginning with the month of birth (see instruction 2), write out the following months of the year in the following boxes. When you reach January, write the year near that box exactly as you wrote the year of birth (see instruction 2) near the box for the month of birth.

4. Record the weight by putting a big dot on the line corresponding to that weight in kilograms. For example, if the weight of a child is 6 kg in a given month, find the horizontal line representing 6 kg and put a dot at the point on that line where it meets the column for the month in which the weight is being taken. This is January 1979 in the example shown in Fig. 7.

5. The position of the dot within a column can be adjusted. The purpose of this is to indicate when (early in the month, in the middle of the month, or late in the month) the child is being weighed. If the child is being weighed early in the month, put the dot towards the left side of the column. Put the dot in the middle of the column if the weight is being taken in the middle of the month. If the weight is being taken late in the month, put the dot towards the right side of the column.

The above instructions should be followed each time you record the weight on a chart. An example of a weight-chart showing 3 weights of a child taken on 3 different occasions is shown

in Fig. 8. Notice that the three weight dots are joined by a line. This is the line of growth. It is very important.

Notice too, that the chart in Fig. 8 is for a different child from the one in Pig. 7. The child in Fig. 8 was first seen and weighed in September 1987 by the community health worker, who questioned the mother about when the child was born. The month of birth (June 1977) was written in the first box on the chart and the first weight record was placed in the fourth column (September).

Handout 8F: Measures recording sheet

Small group #_____

Small Group Member's Measures

#1 Child Name_____	#1	#2	#3
Height/Length (in cm. or inches)			
Weight (in lbs and ozs. or kilograms and gms.)			
Arm circumference (in inches or cm.)			
Age_____			
Other Child Information:			

#2 Child Name_____	#1	#2	#3
Height/Length (in cm. or inches)			
Weight (in lbs or kilograms			

and ozs. and gms.)

Arm circumference
(in inches or cm.)

Age _____

Other Child Information:

*Note: If more than 2 persons are measured, use the back of this sheet for recording the same information.

Small group member's measures

Trainer Attachment 8A: Comparison of anthropometric measures

Indicator	*Advantages*	*Disadvantages*	*Comments*
1. Weight-for-Age	• Good basic indicator, combining acute and chronic malnutrition, for monitoring ongoing programs (125, 136). • Sensitive to small changes (although many variables influence small fluctuations in weight) (82). • Measure is objective and repeatable (82). • Sole tool (scale) is portable and relatively inexpensive. • Weighing is relatively easy for inexperienced health workers to manage, although it does require a	• Not sensitive to a stunted child who is growing well (below but parallel to a normal growth channel) (8, 27) or to the very tall child who may be malnourished (1). • Relies on age data, which are often subject to error. Age data for children below two years old have been found accurate, or, if in error, easily corrected, but it is difficult to accurately estimate unknown ages for children over two years (76). • Mothers in some countries have objected to hanging their children	• Better if used with children 0-2 years because height retardation is less pronounced (125); however, it is a valid indicator through the preschool years.

	literate worker. • Measure is not time consuming.	from the scale during weighing (67).
2. Length/Height-for-Age	• Good indicator of past nutrition problems (125). • Measure is objective, repeatable, and has a low variability (82). • A length and height board can be made locally for a minimum investment, and the boards are easily transported. • Rarely are mothers reluctant to have child measured because of appearance of the board.	• In growth monitoring projects it should be supplemented by another indicator like weight-for-age or weight-for-height because changes in height occur relatively slowly. • Requires two different techniques if programs include all preschoolers: recumbent (lying down) length (children 0-2 years) and standing height (children 3-5 years). • More difficult for unskilled workers to learn to take accurate length/heights than to weigh a child with a simple scale. • Requires two persons to take the measure. • Relies on age data, which are often subject to error.
3. Weight-for-Length/ Height	• Good indicator to distinguish those who are well proportioned (weight/height) from those who are thin (or heavy) for their height (8, 122). • Indicator does not require age data, which are often inaccurate and difficult to obtain. • Measures are objective and repeatable.	• Depending on the cut-off points chosen (see Chapter III), weight-for-height can underestimate malnutrition by classifying those who are short and thin as normal (102, 106). • Requires taking two measures; therefore, problems of purchasing or making the instruments and transporting them are compounded. • Weighing and measuring height

		will require more training time and may be too complicated and time consuming for the inexperienced clinic worker to do with frequency. • Some mothers may be reluctant to have their children weighed. • Requires two persons to take length or height measure.	

Comparison of anthropometric measures

Indicator	*Advantages*	*Disadvantages*	*Comments*
4. Arm Circumference	• Indicator of severe current malnutrition (1), whether or not stunting is present (8). • While it may not detect changes as rapidly as weight monitoring, it will indicate changes in nutritional status over a short time. • Measurement is taken with an inexpensive and portable arm tape, which can be made by project personnel. • Quick to use. • Arm tape can be color coded for use by non-literate health workers. • Indicator does not require age data, which can be inaccurate and difficult to obtain. • No known objection by community to this measure.	• Will only identify children with severe malnutrition. It is more difficult to determine who is borderline. • Variability is high on measurement. Field workers need practice taking measurement to do it accurately. Finding the *mid*-upper arm and placing the tape around the arm without compressing the tissue is difficult.	• Some researchers indicate that measure should be used only with children 1-3 years old (7, 96), although others say it is valid for children 1-5 or 6 years old (106), and that it can be used beginning at 6 months (132).

Comparison of anthropometric measures (Continued)

Indicator	What Does It Measure?
Weight-for-age	wasting and stunting* combined
Height-for-age	stunting
Weight-for-height	wasting
Arm circumference	wasting

*Wasting, which is extreme thinness, reflects acute, current malnutrition; stunting, which is retarded skeletal growth, reflects chronic, long-term malnutrition.

Anthropometric indicators for children

Trainer Attachment 8B: Growth monitoring

The charts shown here are reproduced from the actual growth charts of individual children. Around the edges of the charts - and on the reverse side - there are panels of advice on other aspects of child's health- e.g. immunization records and reminders, advice on when and how to use oral rehydration therapy, and messages about breastfeeding and weaning.

The child who's growth is depicted on this chart made good progress, despite set-backs at the time of coming off the breast and after a bout of measles. Weight loss was not allowed to continue once it had been detected by the chart.

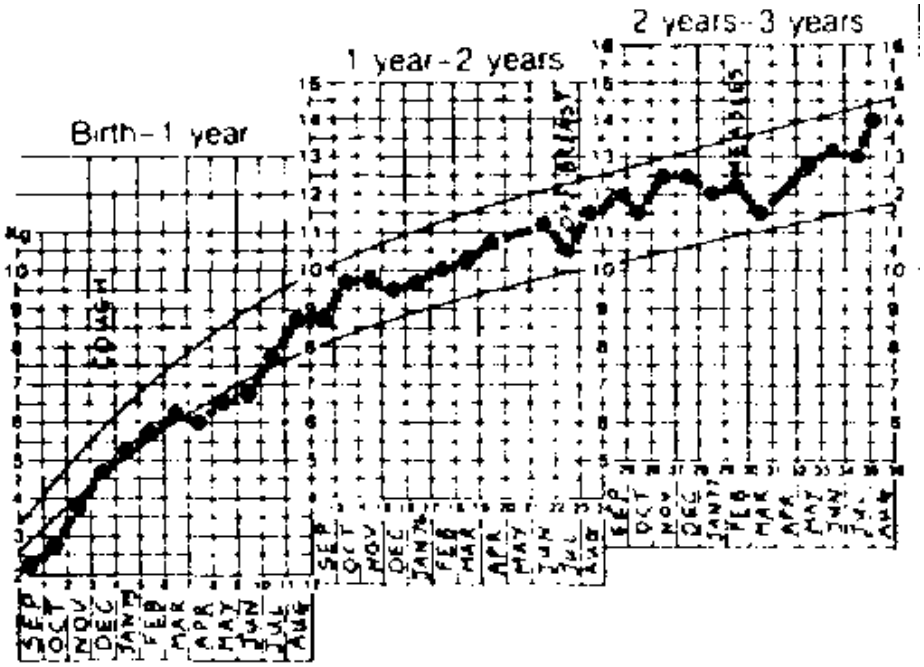


Chart 1

This child a boy also grew quite well for a year. But then measles, diarrhoea, bronchitis and whooping cough struck in quick succession. Wit no time for recovery inbetween each bout of illness and weight loss, the sheer frequency of the set-backs finally proved too much and the boy died half-way through his second year The cause of death was recorded as 'whooping cough' But as the chart shows the real cause was the combination of infection and malnutrition, each reinforcing the other

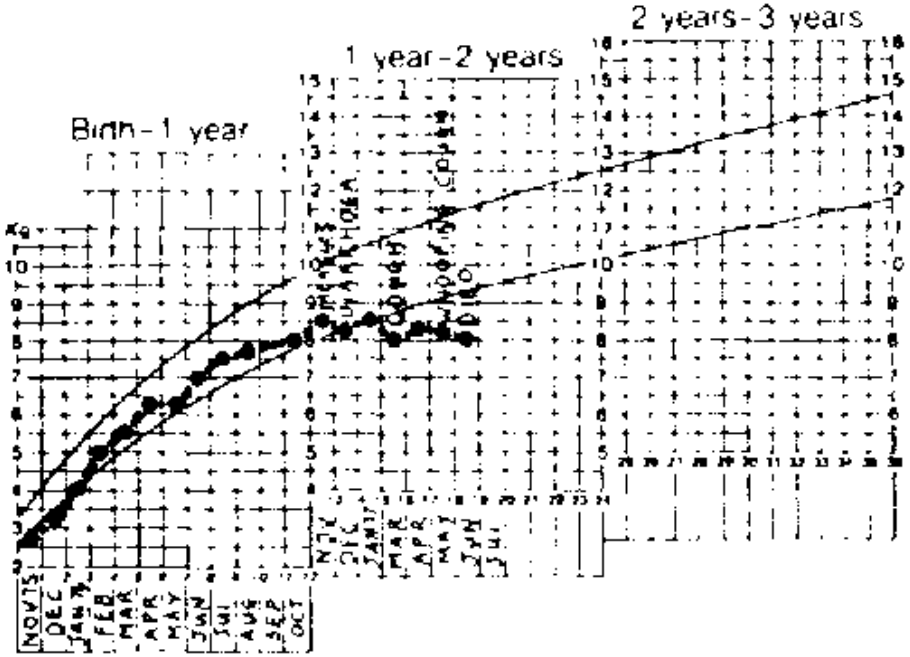


Chart 2

This child progressed well unlit coming off the breast al about 18 months of age. Soon afterwards, she developed measles and lost more than a quarter of her body weight Part of the weight loss was caused by dehydration. Without a growth chart, this serious setback might have gone un-noticed. As it was, extra feeding helped a satisfactory recovery and a rapid making-up of growth (original chart in Spanish)

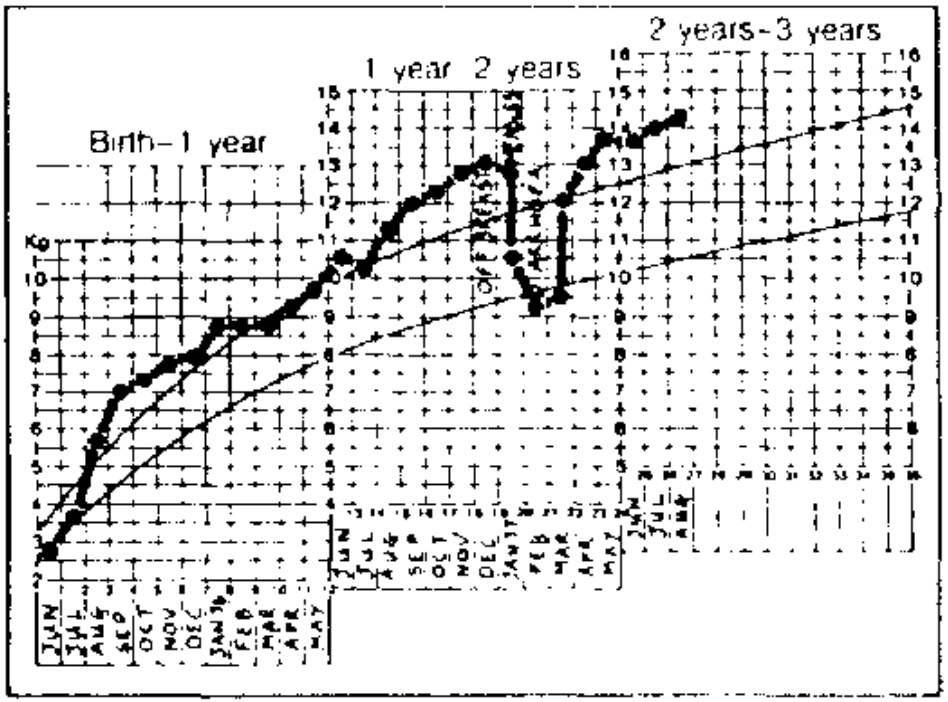


Chart 3

Trainer Attachment 8C: Growth chart exercise

Give one of these examples or ones that you have collected from local records, to the group for plotting and interpretation. Make a large version of the correct form to shot. when participants complete the activity.

A girl was born in May 1976. Her name is Laxmi. She was weighed on different months following her birth. The weights in each of the months are given below.

1976	May	3.0 kg	1977	June	7.5 kg	
	June	4.0 kg		September	9.0 kg	
	July	4.5 kg		October	10.5 kg	
	August	5.5 kg		December	11.5 kg	
	September	6.0 kg	1978	January	11.5 kg	Stopped breast-feeding
	October	6.5 kg				
	November	Did not attend		February	11.5 kg	
	December	7.0 kg		April	10.5 kg	
1977	February	Had measles		June	12.0 kg	
	March	6.5 kg Had diarrhoea		July	11.5 kg	
	April	6.0 kg Put under special nutrition care		November	12.0 kg	Brother born
	May	6.5 kg		December	11.5 kg.	
			1979	February	11.5 kg	
				April	12.5 kg	

Growth chart 1

The following weights are for Jose who is the first and only child of a couple who have been married 10 years. Jose has only been bottle fed. He was born in February of 1975.

1975	February	3.5 kg		1976	February	-
	March	-			March	6.5 kg
	April	4.0 kg			April	- kg
	May	-			May	5.5 kg Pneumonia
	June	4.5 kg			June	-
	July	- kg			July	6.5 kg
	August	4.5 kg	Diarrhea		August	
	September	4.5 kg			September	7.5 kg
	October	-			October	-
	November	5.0 kg			November	8.5 kg
	December	-			December	
1976	January	5.5 kg		1977	January	9.5 kg

Growth chart 2

Session 9 - Preventing malnutrition

TOTAL TIME

2 hours, 30 minutes

OVERVIEW

In the session on "Nutritional Needs During and after Diarrhea" participants discussed special nutritional problems faced by children with diarrhea and learned about appropriate feeding

during and after diarrhea. In this session, participants focus on interventions for children "at risk" for malnutrition and disease. Participants examine the causes and conditions which underlie malnutrition, and use this understanding to develop specific health education plans for the prevention of malnutrition through efforts in the health center, the family and the community. The session includes optional activities on nutritional rehabilitation and preparing multimixes.

OBJECTIVES

- **To recognize and describe the chain of events leading to malnutrition. (Steps 1, 2)**

- **To identify and discuss possible strategies for preventing malnutrition. (Step 3)**

- **To develop and present a health education plan that promotes good nutrition. (Steps 4, 5)**

- **To explain the basic principles and methodology of nutritional rehabilitation. (Optional)**

- **To prepare multimix weaning foods in the proper proportions. (Optional)**

RESOURCES

- Helping Health Workers Learn. Chapter 25
- Nutrition Rehabilitation , its Practical Application.
- Bridging the Gap

Handout:

- 19D Session Plan Worksheet (From Session 19)
- 9A Multimixes as Village Level Weaning Foods

Trainer Attachments:

- **9A Story of All**
- **9B Case Studies**
- **9C Nutritional Rehabilitation Centers**
- **9D Guide for Multimix Preparation Stations**

MATERIALS

Newsprint, markers, see Trainer Attachment 9D for materials needed to prepare multimixes.

PROCEDURE

Trainer Note

Participants should be asked to bring to this session information they gathered and analyzed during their visits to the community (Session 13 - The Impact of Diarrhea on Culture) and notes from other training sessions that you think would help them identify underlying factors which may affect a child's nutritional status.

Since they will also be asked to design a health education activity, this session should be used after Sessions 16 (Selecting and Using Nonformal Education Techniques) and 19 (Designing and Evaluating a Health Education Session.

Step 1 (15 min.)

Identifying the Conditions Which Underlie Malnutrition

To introduce the session, post and read the definition of "Causal Chain" and "Causal Web" stated in the Trainer Note below, to the group. Give a few examples to illustrate each concept. Ask the participants to discuss these concepts and ask any questions they have.

Tell the participants that in this step you will read them a story and they should listen and identify the causes (chains and webs) of hunger and nutrition mentioned in this story. After the

story you will play a game and apply the concepts of chains and webs. Read the story adapted from Trainer Attachment 9A (Story of All).

Trainer Note

The definitions for "causal chain" and "causal web" are:

Causal Chain can be considered "a chain of events leading to disease or III health". It is a micro way of viewing a health problem. (Examples: bottle feeding, diarrhea, abrupt weaning)

Causal Web may be defined as "all the underlying factors contributing to and enhancing the disease sate". It looks at a health problem from a macro perspective. (Examples: poverty, inadequate medical care, population pressure.)

Step 2 (20 min.)

Processing The Story

Play the game called "Another One. as a way to stimulate discussion of the many related causes of hunger and nutrition. Mention that this is a training activity the participants can use at their work sites as well.

Tell the participants that you will ask them a question based on what they remember from the story that you have Just read. They are to give an answer to that question and then "another one" and "another one". Ask two participants to write the answers given under two headings "causal chains" and "causal webs". Assign one heeding to each recorder.

Play the game "Another One". After the participants have generated as many answers as they can, have the group review the lists as well as the information they obtained from previous sessions and their visits to the community and address these questions:

- **Are the items listed under the correct headings"**
- **What are other causes or underlying factors that have not been considered? (Please list)**

- Which of the factors listed are most relevant to your programs and community? (Please circle)

Trainer Note

The list of factors related to malnutrition may include:

Chain Factor	Web Factors
• Low birth weight	• Inequitable food distribution
• Bottle feeding	• Insufficient food production
• Abrupt weaning	• Poor utilization of available food
• Parasitic infections	• Poverty
• Lack of medical care	• Infections compounding malnutrition
• Lack of sufficient protein/calories in the diet	• Inadequate medical care
• Dehydration	• Traditional beliefs/practices (e.g. food taboos)
• Diarrhea	• Population pressures
• Measles	• Poor climate for growing food
• Malaria	
• Wastage due to pests	
• Low priority of health/nutrition	
• Insufficient preservation of foods	

Emphasize the concept of the vicious circle of diarrhea and malnutrition discussed in Session 7 (Nutrition During and After Diarrhea) also refer back to the larger causal circle discussed in Session 3, (Preventing and Controlling Diarrheal Diseases). Step 3 (20 min.)

Identifying Strategies for Preventing Malnutrition

Based on the list of factors the participants have identified as most relevant to their programs,

ask the participants to identify:

- **strategies for preventing malnutrition**
- **realistic ways PCV's could intervene in any of these factors to prevent malnutrition**
- **ways to involve mothers, local health workers, health officials, etc.**

Trainer Note

Write the answers to some of the questions on newsprint as the participants state them. List the strategies for preventing malnutrition next to the list of causal factors. Some strategies for preventing malnutrition include:

- **Nutrition education**
- **Promotion of breastfeeding**
- **Use of nutritional weaning foods as a supplement to breast feeding**
- **Gardening/small animal raising**
- **Adequate medical care, e.g. to treat parasitic infections**
- **Monitoring of child growth and development**
- **Pre-Natal Care**

Discuss ways to combine teaching mothers about preventing both diarrhea and malnutrition.

Step 4 (45 min.)

Teaching Mothers About Feeding During and After Diarrhea

Ask the group to count off to form three groups. Distribute one of the case studies from Trainer Attachment 9B to each group and ask them to develop a plan (using the planning worksheet from Session 19) for a health education session that could prevent this situation in the future. Trainer Note

During this step tell the group that Chapter 25 of Helping Health Workers Learn provides useful ideas and methods for teaching nutrition. Also recommend Bridging the Gap.

Step 5 (45 min)

Reviewing Their Plans

Ask one member from each group to read their case study to the group, then present and explain the nutrition education plans they have developed for helping the community solve and or prevent this problem from reoccurring.

After each small group has finished their presentation ask the large group for their comments. Have the group focus on:

- **The constraints they see in implementing this activity.**
- **The cultural appropriateness of the activity.**
- **The approach used (e.g., lecture, dialogue, discussion, participatory/experiential).**
- **The respect that the activity shows for people's knowledge and beliefs and practices.**
- **The extent to which community members will be involved in carrying out the activity.**

Close the session by making plans to carry out one or more of these session plans during or after the Training course.

Optional Step 6 (60 min)

Nutritional Rehabilitation

Ask several participants to describe what is meant by Nutritional rehabilitation". Have participants discuss the idea of nutritional rehabilitation done in the home, or with mothers, groups and other modifications of the idea. Discuss feeding of a sick child and extra "catch-up" mea-is as part of nutritional rehabilitation. Have several participants discuss how proper use of weaning foods may be seen as nutritional rehabilitation.

Ask another participant to discuss the concept of Nutritional rehabilitation. Centers (NRCs) using Trainer Attachment 9C (Nutritional Rehabilitation Centers). Hold a discussion on the purposes, activities and need for an NRC in your area. If possible, arrange for a visit to a local rehabilitation.

Center to observe and learn.

Specifically discuss the role of nutrition education and appropriate food preparation which NRCs serve and why this function is so important.

Ask participants to explain how most mothers learn about child development and good child nutrition in their host country and why some mothers might be at risk for not learning that kind of information. (Participants should dray on information from Session 13 (The Impact of Culture on Diarrhea) for this latter discussion as well as their own community experience).

Trainer Note

Use this step for health volunteers working in nutrition and Diarrheal disease control. You can also use it as a minisession for a few people with this interest.

The main purpose of nutritional rehabilitation. Is to educate the mother through her active participation in the care and rehabilitation. of her child. See Trainer Attachment 9C (Nutrition Rehabilitation Centers) for more background.

Discussion should include the role of NRCs as "parent education" centers and why this may be needed in the country. Such things as the new mobility of the family or change in the family structure, lack of formal parenting education (either in the form of general education, or the health system) to help replace the eroding traditional informal system of teaching child care/nutrition may be reasons why such places are important. The role of the "housemother" in most NRCs may also be discussed.

The main points they should observe and learn in the Nutritional rehabilitation. Center are:

- **How are they organized (buildings, staff, equipment, supervision, record keeping).**
- **Types of cases they treat (severe and uncomplicated PEM cases)**
- **Types of subjects or topics they teach (nutrition, meal planning, health household**

budgeting, gardening, home craft skills)

- The work schedule

- Follow-up practices in the home or community

If a visit to the Nutritional rehabilitation or Mothercraft Center is not possible, invite the supervisor of this type of center to discuss his or her program with the group. Whichever way you choose to conduct this step, please review Joan Koppet's book Nutrition Rehabilitation for good information on planning and operating a Nutritional rehabilitation. Center.

Optional Step 7 (60 min.)

Preparing Multimixes

Briefly review the concept of "multimixes". Demonstrate the preparation of multimixes using local foods. Distribute Handout 9A multimixes as Village Level Weaning Foods). Divide in three or more groups (depending on number of participants and stations set up) and have each group go to the stations for preparing multimix weaning focus as described in Trainer Attachment 9A Guide for Multimix Preparation Stations). Give the group 30 minutes to prepare and measure out appropriate portions of the mix. Have them refer to Handout 9A as they do this, and Jot down notes regarding information they would share with parents on Super porridges".

After participants finish preparing the multimix, discuss:

- cultural acceptability of multimix
- how they could use multimix in their teaching about nutrition after diarrhea,

Trainer Note

If participants have not learned to prepare multimixes in their previous training, and plan to do nutrition education along with ORT, use this step as a part of one session or as an extra mini session for those interested. Refer to The Technical Health Training Manual, Sessions 28 (Foods

and Nutrition) and 30 (Breastfeeding and Weaning) for basic background on nutrition and child feeding requirements.

Multimixes (super porridges) are nutritionally sound, easy to prepare weaning foods made from ingredients that are already widely available and acceptable to the community. To the extent that this is not true of the prescribed recipes presented in Handout 9A, (Multimixes as Village Level Weaning Foods) modify the ingredients of the multimix for your area.

In the discussion be sure to note the possibility that in some cultures or groups in which separate items of family food contain the important different food elements (such as fish or oil, greens and rice) it may be irrelevant or distasteful to ask the mother to mix all these together.

You may want to invite local children to eat the multimix as prepared by participants in a nutrition education activity such as the one planned in Step 4.

Handout 9A: Multimixes as village level weaning foods

Components

1. The staple

The main source of calories in a village-level weaning food will be the local staple. If alternative staples are available in the particular community, the most nutritious should be used, with special regard to its protein content. In particular, if culturally acceptable, a cereal should be employed in preference to a tuber or plantain (Table 1).

Type of food	Approximate protein content (%)	Amino acid deficiency
Tuber or plantain	1–2 a	Lacking in lysine
Cereal grain	±10	
Legumes	±20 b	Lacking in methionine
Dark green leafy vegetable	4–10 c	

a Dried : 3% b Soya beans : < 40% c Dried : 30%

Table 1: Approximate protein content and amino acid deficiency of main categories of vegetable foods used in multimixes

It is often insufficiently appreciated that if the staple is a tuber or plantain, it will itself be bulky. high in water and fibre, and a poor source even of calories, especially with • child's small capacity.

It may, therefore, be necessary to consider the feasibility of adding'. compact calories " to dishes. In West Africa, this has been carried out with red palm oil, and in East Africa, with other vegetable oils and with sugar. Another source of ready-to-eat, easily mashable " compact calories " is the avocado pear.

2. Legumes

Protein will almost certainly have to be derived mainly from legumes. Selection will depend not only on protein content, but also on local availability and cost, cooking properties and apparent digestibility, and cultural attitudes as to suitability for young children.

Because of their undoubted poor digestibility, it is important to see that legumes are well cooked

and carefully prepared. For example, the skins should be removed from dried red beans (Phaseolus vulgaris) before cooking by soaking or scalding, or after cooking by sieving. Particular care is needed with the soya bean.

- **Reprinted, with slight modifications, from Jelliffe (1967 C).**

3. Animal proteins

In almost all places, animal protein is in very short supply, 60 that it is important to use it advantageously.

Firstly, attempts should be made to incorporate portions of all available animal proteins into the weaning food, These may include such widely used protein foods a. eggs, fish meat and cow's milk, but other more unfamiliar sources should be considered, such as acid milk preparations, village cheeses duck's eggs, fermented shrimp paste, edible insects, etc.

Secondly, if practicable, the available animal protein should be given throughout the day and eaten in small amounts intermixed with as many meals as possible.

4 Dark green leafy vegetables

These are often much too little wed by tropical communities, especially for infant feeding. They represent an excellent source of carotene, vitamin C, iron, and the vitamin, B complex, as well a, protein, whose amino acid composition complement that of staple foods

Principle of Multimixes

Most communities have by age-long experiment come to use foods in mixtures, so that their nutrients complement one another in fact, an important generalization in relation to human diets is that the wider the range of foods included and the greater the variety, the less the likelihood of nutritional deficiency

The best way of planning • nutritious, village-level weaning food is as a mixture of ingredients,

designed to complement and mutually reinforce one another, in particular to ensure a simultaneous intake of the full range of essential amino acid' at the particular meal (see also p. 188)

With this principle in mind, three types of mixture can be considered All are built around the staple, with the addition of one, two or three other foods These are known a' double mixes, triple mixes and quadrimixes, respectively (Table 2)

Type of mixture	Ingredients*
Double mix	Staple + legume (or) Staple + animal protein (or) Staple + dark green leafy vegetable (DGLV)
Triple mix	Staple + legume + animal protein (or) Staple + legume + DGLV (or) Staple + DGLV + animal protein
Quadrimix	Staple + legume + DGLV + animal protein

* Mixtures containing animal protein are preferable in all cases.

Table 2 Village-level multimixes

1. Double mixes

These consist of the local staple (preferably a cereal grain, it more than one staple is used by the community), together with the most suitable legume, or animal protein, or dark green leafy vegetable.

Initially, a double mix containing 4 parts of staple to I part of legume can be used, with a gradual increase in the legume content until a 2:1 mixture is used.

In this mix, the essential amino acid lysine, deficient in the staple, is supplied by the legume, which is itself lacking in methionine, available from the staple (Table 1).

Traditional double mixes sometimes used for infant feeding in different parts of the world, include sweet potatoes with red beans (Rwanda) and rice with soya bean (Indonesia).

Alternatively, the staple can be directly reinforced with an animal protein, with its abundant surplus of essential amino acids. Examples include various cereal porridges with added egg or milk. Less satisfactorily, the staple can be mixed with dark green leafy vegetables.

3. Triple mixes

Sometimes it may be possible, if only for an occasional preparation to reinforce a " double mix" of staple and legume with small amount" of animal protein, thereby converting it into a " triple mix ".

This approach ensures that the child will be receiving calories, while the surplus essential amino acids from the animal protein will be available to complement and reinforce still further the essential amino acids of the vegetable protein mixture.

Typical examples of triple mixes used for infant feeding include plantain, pounded groundouts and egg in Buganda, East Africa, and a mixture made of soft boiled rice, Bengal gram (chickpea) and milk in India.

Alternatively, triple mixes may be prepared from a mixture of staple, dark green leafy vegetables and a small quantity of animal protein; or from staple, legume and dark green leafy vegetable.

3. Quadrimixes

It local food resources and local practices permit, the staple, legume and animal protein " triple mix" can be converted into a " quadrimix " by adding small quantities of dark green leafy vegetables, which are sources of vitamin A (beta-carotene) and vitamin C, as well as of protein and iron.

The nutritional value of the various weaning food mixes suggested increases the number of ingredients (Table 2). In planning mixtures, therefore, the aim should be to use the largest number of these ingredients, especially quadrimixes containing small quantities of animal protein, but double or triple mixes containing no animal protein may also be used, if need be.

Trainer Attachment 9A: Ali's story

All was a large healthy baby when born. His mother breastfed him whenever he gave his "hungry cry". By six months All had kits first tooth and seemed to be growing faster than his cousin, who was born 3 weeks before All. His mother was happy. Two of her four children had died during infancy, but tints time All looked quite healthy and happy. She was proud and content and continued to breastfeed Ali. On occasion she would give him a millet gruel. He seemed to like it, but she didn't have tine to make him a separate meal each day. She had a heavy schedule already; fetching water and wood, pounding millet, working in the fields, making single pot meals over the fire, going to the market, caring for her children, sweeping sand and chasing animals out of the house.

During the second half of All's first year, he didn't seem to grow and develop as fast. He had frequent bouts of diarrhea. He was given some of the left-over rice at times when Just breastfeeding didn't seem to satisfy him. All's mother did not know that he was now behind normal growth and development. When All was 9 months, his mother abruptly stopped breastfeeding him. She learned that she was pregnant again, and believed that a pregnant woman's milk was not good. So All was expected to eat from the communal bowl with the rest of the family. The food was spicy and Ali was not accustomed to anything but the rice. His mother watched sadly as ha became thin and miserable. He was frequently 111 with diarrhea and seemed to stop growing. This is what had happened to her other two children. She was sure he was going to die, but accepted it as her punishment for being too proud and content with All when he was an infant.

Trainer Attachment 9B: Case studies

Case Study #1

Food had never been abundant in the village of Afar, as it was in the desert and the main roads leading to the town were often covered with sand. Host of Taraba's large family were undernourished and frequently had runny tummy's. Her youngest child, Sari, was born small and seemed to be a slow learner. Taraba, being undernourished herself, had very little breastmilk to give her young child. Sari received goats milk and occasionally water mixed with a little dried milk and some porridge. Whenever Sari received the powdered milk mixture, she had a runny tummy and refused to eat. The local healer was away and Taraba had no money to take Sari to a clinic. Her husband's peanut crop had failed again because there was no rain and what he had stored to sell and feed the family was damaged by insects and rats. Her husband went into debt. What little food was available, kept the family alive and he had no surplus to pay for Sari to go the clinic.

Case Study #2

Kiku was a healthy baby. At 18 months she was still befog breastfed and receiving some supplementary food on occasion. At times, Kiku's mother (Aru) attended a clinic where Kiku was weighed and Aru given a soybean meal to prepare at home for Kiku. When Kiku. became sick with a cold and diarrhea, Aru immediately stopped feeding her, believing that food made the diarrhea worse. At first Aru did not take Kiku. to the clinic because it did not seem necessary, she would get better. But then Kiku. became worse. She developed a heavy cough and fever and was very weak from the illness and lack of food. By now Aru was too ashamed of her condition to take her to the clinic. She decided to go to a traditional healer instead.

Case Study #3

Jose was 2 1/2 years old when he returned from the hospital 40 miles away. He had suffered from a severe case of protein deficiency and stayed at the hospital for two months getting treatment. He was now at a weight appropriate to his age and in fairly good health, so he was allowed to go home. His family was happy to have him back home. His younger sister was now 10 months old and beginning to eat some of the family food too.

Jose quickly went back to the familiar pattern - of eating yens one day, rice the next. He was also

back to the familiar environment with the pigs and goats wandering around the yard. It became his Job to chase them away from the cooking area. Jose soon had worms again, like all the other children. His belly was bloated and hard, he was either constipated or had diarrhea and frequently his mother saw worms in his poop. She didn't know where they came from or what damage they did to her son. After a few months, Jose began to show the signs of Kwashiorkor again, puffy looking ankles and hands, thin upper arms and he was always miserable and not hungry. His parents didn't know what to do - they couldn't afford to send him back to the hospital. Besides it didn't seem to cure him since the "disease" came back so fast.

Trainer Attachment 9C: Nutritional rehabilitation centers

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Introduction

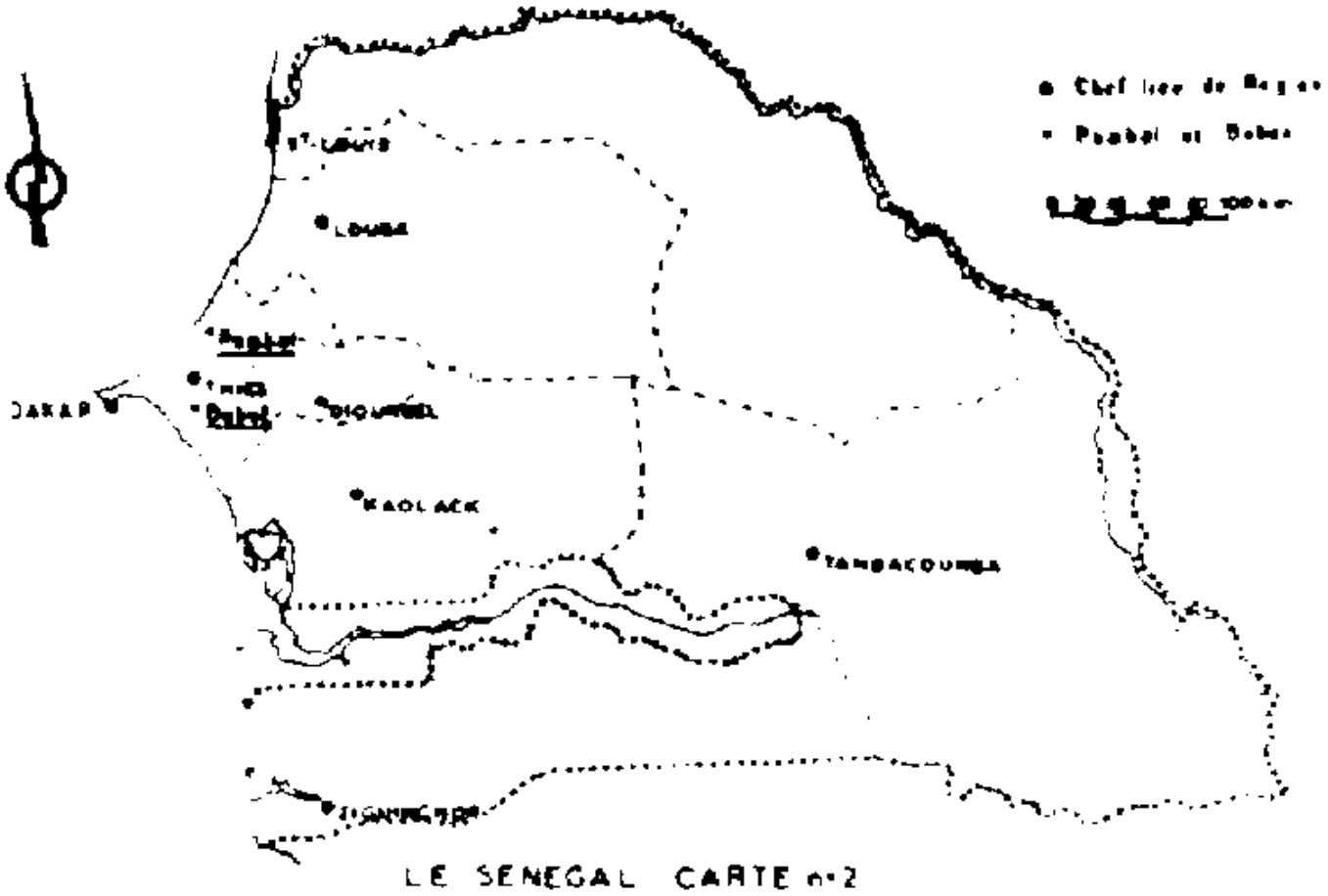
More than 20% of Senegal's rural children aged 1 to 4 suffer from protein-calorie malnutrition (PCM). PCM in children results from poor, unbalanced or insufficient diets.

To correct these diets, nutritional rehabilitation centers (NRCs) have been established in the villages of Babak and Pambal, in the region of This. Children and mothers come to these centers for periods of up to three weeks. Mothers learn to use locally available food products, and to prepare well-balanced meals high in calories and proteins needed by children. In this manner, mothers can provide their children with 890-1,420 calories and 41-62 grams of protein daily.

Results of the teaching process are determined by observation of weight-curve records and of clinical symptoms in a child. In 72% of the cases on file, substantial weight gains have been noted, and in 75%, clinical symptoms have disappeared.

The centers have socioeconomic appeal as well, since a three-week NRC stay costs only 5,250 CFA (Communaut Financire Africaine, carrying a current exchange rate of 300 CFA/$1), or about $18. This cost compares to 45,000 CFA - about $150 - for a 15-day hospital treatment period. Hospital treatment also lacks the educational aspect of the NRC method, which emphasizes self-sufficiency in food and encourages personal initiative.

This map shows the locations of the villages of Babak and Pambal where the nutritional rehabilitation centers have been established as part of existing health centers in the rural sectors of the province of This. Each village contains about 1,000 residents. The Babak center, a privately run Catholic station, operates three outlying posts, each supervised by a nun who is assisted by a midwife, assistant nurses and an office worker. The state health station at Pambal also operates a nearby medical outpost. Advanced cases of malnutrition which cannot be handled in the rural centers are treated in urban hospitals, such as in the Senegalese capital of Dakar.



Locations of the centers

Few Senegalese mothers are skilled in handling the dietary transition from nursing to adult food for their children who generally shift from the nursing stage to a regular diet between the ages of 18 and 30 months. While many mothers do provide supplementary nutrients - such as a millet semolina mash - to their children during the later nursing period, the practice rarely continues once nursing ends. The abrupt transition to an adult diet, which often lacks sufficient protein and calories for a child's needs, can result in protein-calorie malnutrition (PCM). At least 20% of Senegal's children aged i to 4 are affected by two broad types of PCM: marasmus, more common in rural areas, and kwashiorkor, usually found in urban areas. Complicating factors include the likelihood of infections and parasitosis, along with anemia and multiple deficiencies of minerals and vitamins A and B. Because these factors rarely occur independently, it is often difficult to determine which type of malnutrition is responsible for a child's condition. But the use of Simple indicators to detect malnutrition in its early stages can help prevent the degeneration of the disease and expedite its treatment in rural settings.

Rural treatment more effective

Malnutrition, a leading cause of illness and death among Senegal's children, has traditionally been treated in urban hospital settings. But a more inexpensive and often more effective treatment for many cases of malnutrition is emerging in rural health centers, such as the one at Babak, where Catholic nuns work with malnourished children and their mothers to treat the disease and to prevent its recurrence. These nutritional rehabilitation centers (NRCs) emphasize the importance of the mother's role in creating and maintaining a balanced diet for the child once treatment ends. An average NRC stay for mother and child costs about 1/10 that of a hospital stay, and appears to be more effective in preventing malnutrition once the mother and child return home. Because the NRCs in Babak and Pambal reflect the traditional' rural setting, they car serve as demonstration models for other centers in similar areas.

Preventing the recurrence of PCM in a child once treatment ends involves careful training of mothers in the use of locally available foods which contain sufficient calories and proteins for a child's nutritional needs. This aspect is particularly important since the Senegalese tend to reject "free" food offered by officials once treatment is over, preferring to use foodstuffs purchased or cultivated at home. While many high-nutrition foods are not generally consumed by children

living in rural Senegal, items such as dried fish, cherry tomatoes, onions and peanut flour can be incorporated into a family diet at little additional cost. NRC workers stress the necessity of maintaining a balanced diet for children, using the traditional cooking techniques of the typical rural home during the mothers' stay at the center to reinforce continuation of that diet after treatment ends. Mothers are also taught better methods of selecting, cultivating and preserving foods in the home environment, along with specific recipes for use during the weaning period and other stages.

Depression a sign of malnutrition

The sad eyes of depression are often a sure sign of the onset of PCM in a young child, along with such physical symptoms as brittle hair, skin lesions, abnormally low weight, edema and digestive disorders. Malnourished children are generally sad and irritable, often refusing to play or respond to their surroundings. Smiles are rare among malnourished children. But successful treatment of the disease can restore the bright smile of infancy to a child's face, a small but important step toward the larger goal of preserving the vitality of the developing population in Senegal Because the NRC approach seems more effective, at least in studies thus far, in preventing a recurrence of PCM, it may become a widespread alternative to traditional hospitalization. Limited resources are available at present, but the success of the Babak and Pambal centers serves as a beacon in the treatment of PCM. Elimination of malnutrition as part of a larger economic development policy depends on community awareness, the NRC approach, aimed at establishing a permanent dialogue on both therapeutic and educational levels, is an efficient model for others to follow.

Examples of Recipes used in Nutritional rehabilitation Centers:

Chart 1: The "Gar" recipe

Nutrients in grams	Quantity in grams	Calories	Proteins
Millet semolina	600	1,920	40
Dried fish	285	598	120
Sorrel leaves (bissap)	300	141	11
Cherry tomatoes	1,200	252	12

~~Cherry tomatoes~~	~~1,200~~	~~232~~	~~12~~
Onions	300	93	2

Note: This preparation contains 3,004 calories and 185 grams of protein, and provides 150 tablespoons of food. Its sharp taste reflects its high content of minerals (calcium, phosphorous and iron) and vitamins.

Chart 2: The "Lakh-Thiakhane" recipe

Nutrients in grams	Quantity in grams	Calories	Protein
Millet semolina	900	2,880	60
Dried fish	300	927	127
Cherry tomatoes	150	31	1
Peanut semolina	300	1,740	77
Bissap sorrel (fresh calyx)	75	33	3
Niebes beans	225	779	52
Onions	75	23	0.5

****can be replaced by fresh fish or meat**

Note: This preparation is Wolof, well known throughout Senegal. Easily and quickly digested, it is especially nutritious for a weaned child. It contains 6 413 calories and 321 grams of protein, and provides 147 tablespoons of food.

Chart 3: The "Natt" recipe

Nutrients in grams	Quantity m grams	Glories	Protein
Niebes beans	1,000	3,460	233
Cherry tomatoes	1, 150	241	12
~~Dried fish~~	~~150~~	~~315~~	~~63~~

Onions	275	85	2
Sorrel leaves (bissap)	137	64	5
Peanut flour	250	1,450	65

Note: This preparation is well-adapted to use during weaning because of its high content of protein, calcium and iron. It contains 5,615 calories and 380 grams of protein. It will prepare 51 tablespoons of food.

Chart 4. Diets using these recipes

Lunch	Dinner	Calories	Protids	% Proteidic Calories
Natt	Gar	650	41	25
Gar	Natt	650	41	25
Natt	Lakh	770	45	23
Lakh	Natt	770	45	23
Natt	Gar	650	41	25
Gar	Natt	650	41	25
Natt	Lakh	770	45	23

Note: The nutritional needs of the child are best met by providing two main meals during the day - one at lunch, one at dinner - and two snacks, one in the morning and one in the afternoon. Maternal nursing should continue as a nutrient until weaning is completed, with a minimum of 500 grams of milk per day 1325 calories and 7.5 grams of protein. A least five tablespoons of each preparation in the diet are considered a minimum per meal.

Trainer Attachment 9D: Guide for multimix preparation stations

For session 9 the trainer should set up 2 or 3 work stations where participants can prepare the locally used recipe for multimix weaning foods.

Provide the raw ingredients for the mix which will likely include the following kinds of ingredients (after Handout 9A):

- a legume of some sort (e.g.: beans, peanuts, dahl, lentils, etc.)

- the local staple (e.g.: cassava, rice, corn, maize, etc.) - a green leafy vegetable (greens, of some sort)

- a piece of dried fish, cooking oil or egg, etc.

Be sure the necessary utensils are provided for the proper preparation of these mixes. These may include a mortar and pestle, knives, spoons, mashers, strains/sieves, bowls, kettles, etc. Also be sure that a water source is available for washing raw ingredients if beginning "from scratch" and that other kitchen-like amenities are available.

Depending on the availability of a heat source for cooking these foods, or equipment to pound the fish, rice, etc. for use in the mixtures, participants may only be able to do part of the multimix preparation - either the beginning or the end. If this is the case, have either the finished product or raw ingredients there for them to see, taste, etc. explain any of the steps in the preparation of the multimix which they were unable to participate in and have them share their own experiences with preparation of these foods or similar foods to compensate for the lack of firsthand experience in this step.