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PRACTICAL RESEARCH AS APPLIED TO A NATIONAL DIARRHEAL DISEASE PROGRAM

February 15, 1984

Introductory Remarks

STRUCTURE AND FUNCTIONS OF THE NATIONAL CONTROL OF DIARRHEAL DISEASES PROJECT (NCDDP)

LOUTFI M. EL-SAYYAD, M.D.
Executive Director

The purpose of the NCDDP is to reduce the death rate from diarrheal disease substantially and within five years. We began with certain known facts:

- Nearly all the deaths occur in children under 3 years of age.
- 80-90% of children dying saw a physician at least once before death and the great majority died dehydrated.
- Most malnutrition in Egyptian children is due to diarrheal disease.
- The methods of treatment prevalent in Egypt include antibiotics, antidiarrheals and starvation.

Our basic objective, therefore, is to make methods of rehydration (especially oral) and good nutrition widely available, well known and practised by mothers and health workers alike.

The NCDDP was designed to give as much flexibility as possible to enable us to achieve our aim.

First, this is a well-endowed project. Egypt and the U.S.A. (with contributions also from UNICEF and W.H.O.) have generously committed a total of 43 million dollars. Second, we are a campaign: we mean not to build an institution but to institutionalize certain ideas and practices. This can be done by training, mass education and social marketing, supported by practical research.

Third, the NCDDP, while a part of the Ministry of Health is an autonomous agency; it is guided by a Steering Committee with members drawn from several ministries, universities and the commercial sector. The Executive Director is empowered to negotiate contracts and to pay contractors (within acceptable C.O.E. and USAID regulations). This mechanism truly makes the NCDDP a National program not just another vertical health project because we can draw on the skills of any public and private sector agency or individual. A partial listing of groups and persons under contract to NCDDP in 1983/1984 will illustrate the robustness of this approach:

- Two pharmaceutical companies
- State television and radio
- Private television producers
- Four advertising agencies (3 private)
- Governorate of Alexandria
- Five universities
- Five private consulting firms (4 Egyptian, 1 USA)
- Nearly a dozen private individuals with skills in management, madicine, industry, education, etc.
- Three autonomous health service projects.

The NCDDP is structured along functional lines. Five sections comprise the NCDDP Secretariat.

Under Marketing and Mass Education, headed by Dr. Farag Elkamel, we draw upon the methods of social marketing. This means defining and developing a product and mass education messages based on the language, perceptions, needs and wants of the target population.

The Research Unit under Prof. Shafika Nasser, supports the marketing approach with qualitative and quantitative surveys, product research, and it sponsors clinical and epidemiological investigations by qualified Egyptian scientists.

The Training Unit, led by Dr. Mansour El Occa, manages the practical training of physicians, nurses, and pharmacists in regional rehydration centers. Workshops and conferences are also given. The Training Unit is also responsible for production of training materials (in cooperation with the other units).

The Production and Distribution Unit is headed by Dr. Hosni Mahrous. It designs, coordinates and supervises the production and logistics of a national ORT package: sachets of ORS, a single I.V. solution, rehydration chairs, standard size containers, etc.

The Unit for Coordination and Implementation under Dr. Gamal Abdel Aziz works with Ministry of Health and University staff to develop rehydration centers, promote use of ORT locally and monitor progress.

The Evaluation Unit is directed by Prof. Mervat El Rafei and has designed and coordinates the national evaluation scheme that will assess program impact on knowledge and practice and on child survival.

An administrative section gives the necessary support to the technical units.

The campaign has been divided into two phases, the first, 1 1/2 years long, has just ended. This phase now under review, was called a "Rehearsal". We tried out a whole range of methods and strategies and learned what works, what does not. We built our staff and prepared plans for each function. We conducted operationally-oriented research to provide data for important decisions (the choice of a packet for 200cc, for example). Finally, we began to promote the ideas of the campaign on a national scale so that all sections of the population would be ready for the great burst of activities this coming summer.

I have given a brief overview of the structure and functions of the NCDDP.

The story of the actual work to be presented this week and your visits to the field, will better inform you about the start we have made to improving the survival and life of Egyptian children.

Thank you.

Report

search operations:

a) Operational research to determine efficient and effective means for delivering rehydration therapies;

b) Clinical trials to discover or verify in the Egyptian setting which therapies are effective and to make their results available quickly to the medical community;

c) Ethnographic investigations to measure cultural and emotional norms of knowledge, attitude and practices of mothers and practitioners, in order to design effective mass media campaign and training.

a) Operational Research

- A container survey (in 5 governorates of Egypt by cluster sampling in rural and urban areas) showed that a 200 ml container was the most prevalent household container used for feeding liquid to children; no standard liter container was found anywhere.
- The electrolyte, protein and carbohydrate content of commonly used home fluids were analysed and found deficient with respect to an oral replacement fluid except in the earliest stage of diarrhea.
- A study with mothers showed that those given a 200 ml cup made up an ORT solution with greater accuracy and safety than those simply told to use a large water glass.
- Market research into different forms for delivery of ORS is in the planning stage.
- A study with mothers showed the need to produce ORS packages that are easy to open and whose contents are easy to dissolve in order to gain acceptance of ORS.
- Informal testing of equipment showed the adequacy of a simple, inexpensive spring balance scale, and especially designed mothers' chairs.
- Modern behavioral teaching methods were used to train over 500 mothers in diagnosis of dehydration, mixing of ORT solution; evaluation of their knowledge is underway; also the spread effect will be measured.

- An epidemiologic analysis of daily prevalence and patterns of diarrhea, its severity and mothers' response has been completed in seven urban and rural communitites in a population of 35,000 in several parts of Egypt. Data analysis is in process. Peak prevalence is 33 per cent in summer.
- A follow-up survey of doctors trained in rehydration training centers one year ago shows effective retention in about one-half.

b) Clinical Trials

- Cortagen B_6 plus oral rehydration was tested against oral rehydration plus placebo in a double blind trial; the results show no advantage to the drug whatever.
- Five regimens of feeding during diarrhea have been tested compared to fasting; various mild regimens (including breast) appear not to increase diarrhea and may even decrease it.
- A study of a food enriched ORT is in planning stages.
- A trial comparing three polyvalent intravenous solutions is underway.
- ORT has been shown to restore or improve electrolyte balance in dehydrated children in 6-24 hours whether iso, hypo or hypernatremic.
- Analysis of data recorded in a NCDDP-designed treatment register show the target group to be under two years predominantly, requiring a mean of 600-700 cc for rehydration. A bias toward males was discovered.

c) Ethnographic Research

- Focus group and anthropological research has given us excellent insights into KAP of mothers and doctors.
- Surveys have measured mothers media listening and viewing habits, and use of medical care.
- A study of channels of folk media for communication of health messages was done.

- Message testing is continuing for all products of the media campaign (logo, product name, box design, radio programs, T.V. spots, personal appearances, print materials). A full evaluation of the Alexandria media campaign is now being analysed, with very favorable results so far.
- A study is underway to identify which lay persons in satellite village communities may be used to deliver ORT to children of neighbors.

THE NATIONAL CONTROL OF DIARRHEAL DISEASE PROJECT

THE COMMUNICATION STRATEGY

Prepared by: Farag Elkamel, Ph.D.

I. OBJECTIVES

To teach, persuade, and change the behaviors of (a) all mothers of children under five , and (b) other specific target groups, especially health personnel, pharmacists, mass media reporters, and decision makers, with regard to the management of diarrhea and dehydration. In order to attain these objectives, these audiences must be informed in both efficient and effective ways. Information which must reach these audiences can be classified into three types of knowledge:

A. AWARENESS-KNOWLEDGE

1. Diarrhea is a disease which can lead to more serious ones.
2. Two kinds of diarrhea are known to exist. The serious one is eshal zayy el mayyia, which is usually accompanied by vomiting and nazla maawia.
3. Diarrhea can lead to gaffaf which is very serious and can lead to death.
4. There are different degrees of gaffaf. Gaffaf is easier to treat in its early stages.
5. Only serious gaffaf needs special treatment in hospitals and health centers. Mild cases can be treated by mothers at home.
6. You will be able to recognize it if your child has gaffaf. The child will vomit, have sunken eyes, dry skin, no appetite, and will be weak.

B. HOW-TO-KNOWLEDGE

1. Complications of diarrhea can be prevented if child is given plenty of liquids during diarrhea.
2. Food and/or breast milk must continue during diarrhea to give child strength.

3. Examples of liquids to give child during diarrhea are soups, juices, or soft drinks. Examples of food to give are vegetables, fruit, rice.
4. Children who have eshal zayy el mayyia must take Mahlaul Moaalget el Gaffaf. You can buy this Mahlaul from the pharmacy for a few piasters, or even get it free from hospitas and MCH centers.
5. You must dissolve the MMG solution right, otherwise it will not be effective. To be sure, read the instructions on the box and ask your doctor, pharmacist, or nurse how to dissolve the solution right.
6. Give your child the solution slowly and gradually, not in large quantities at once. Give at least two full spoons every five minutes.
7. Gaffaf can be very serious. If your child is constantly vomiting and looks very dehydrated, it must be taken to a doctor or hospital at once.

C. PRINCIPLES-KNOWLEDGE

1. Diarrhea may be caused by Viruses, Bacteria, Parasites, etc. Factors that make it prevail include poor personal hygiene, poor food preparation, contaminated water, and flies.
2. Dehydration is the loss of body fluids and essential salts and minerals. This happens because of acute diarrhea. Unless restored, this loss of body fluids, salts, and minerals seriously affects the fragile body of the child, resulting , perhaps, in death.
3. MMG will restore the child's appetite to eat, and food and milk will strengthen the child. MMG, food, and liquids restore the lost body fluids, salts, and minerals, therefore protecting child against dehydration.
4. Certain kinds of food will also help stop diarrhea faster, in addition, of course, to strengthening the fragile body of the child.
5. When your child has diarrhea, your first worry should be to prevent dehydration, not to stop diarrhea. Diarrhea will eventually stop, but depending on waht you do, your child may or may not get gaffaf, which is your child's number one enemy.
6. Severe dehydration can negatively affect the health of a child, his growth, and his mental development. A good and loving mother never lets her child, therefore, get dehydrated.

II. CHANNELS OF COMMUNICATION

Characteristics of the main target audience (mothers of children under five) are pretty well known. The majority are illiterate and live in low-income urban areas. Only wise and planned use of communication will enable them to get the project message outlined above. There is enough evidence from different media surveys conducted in Egypt to prove that only innovative social marketing techniques would succeed in reaching the target audience. Print media, as well as health programs on radio and television should be used very lightly and with extreme caution, because they reach a small, and a particular segment of the target audience. Advertising in the print media should be kept at an absolute minimum, if at all. Interpersonal communication should be utilized in teaching doctors, pharmacists, social workers, as well as other health personnel.

The following social marketing activities should be carried out either directly by the project or through competitive bidding according to specific Requests for Proposals (RFP's) issued by the NCDD Project.

1. Development and production of audio-visual aids and other training material for doctors, pharmacists, and other health personnel.
2. Development and production of radio and television spots and special programs for the main target audience.
3. Development and production of booklets, posters, pamphlets, billboards, etc.
4. Planning and organization of national and regional conferences for doctors, pharmacists, and other health related decision makers and national and community leaders.
5. Design and execution of special person-to-person communication campaigns with particular groups and in problem areas.
6. Development, production, and distribution of certain point-of-sale and promotional items.
7. Securing and producing testimonials advocating ORT by prominent doctors and famous personalities.

III. GUIDELINES FOR SOCIAL MARKETING

A. Message Design.

Characteristics of the main target audience will have to be observed in designing the social marketing communication. Messages must be appealing to this general audience, and the information contained in the message should be clear and phrased in simple, non-technical, colloquial Arabic.

B. Format and Time of Broadcast

Time of broadcast can be very decisive in affecting the success of spots and special programs to reach the target audience. It is important to note that the most popular format both on radio and television is drama, a fact which can be exploited by the project in at least two ways. First, ORT messages, spots, and special programs would perhaps attract a larger audience if produced in the form of drama. Second, any spots, commercials, or special messages will reach more viewers and listeners if aired during, before, or immediately following soap operas, movies, or other popular entertainment programs and shows.

C. Theme.

All ORT messages communicated by the NCDD project should be designed to appeal to mothers, who should be described as caring, loving, and smart, and certainly not as negligible or ignorant. In communicating with doctors and other "elite" target groups, the theme should be the scientific or medical "revolution" resulting from ORT.

IV. ORGANIZATION OF CAMPAIGN ELEMENTS

In addition to person-to-person communication as described above, the project mass communication activities can be classified into four rather different elements which complement each other:

1. News Releases and Public Relations on behalf of the project. This campaign activity involves the publication and broadcast of feature stories and news highlighting project activities, the opening of Rehydration Centers, Conferences and Seminars sponsored by the project, etc. While this aspect of project communication activities may best be handled by the ministry of health information office, very close supervision by the NCDD project is essential.

2. Integration of ORT messages into existing media programs. Each radio or television station has its own health programs as well as other much more popular programs. Both may be used to diffuse ORT messages. The press also has different health and family sections which typically discuss different health issues. The first order of business should be to educate reporters and producers about Oral Rehydration and motivate them to address the subject matter in their programs. Second, detailed arrangements should be made with selected programs, within a general framework, to integrate ORT into the subjects addressed in these programs. Different approaches will be required for the health and the general popular programs.

   This aspect of the program communication effort must be undertaken directly by the project with the media personnel involved. The project should provide the content, approach, and means to pretest the material and evaluate its impact, the production being left to the media people as their responsibility, in close coordination with the project. It should be mentioned here that as the audience of the specialized health programs, sections, and magazines is relatively much smaller, and is of a particular quality, emphasis should be more on popular programs and less on health programs, sections, or publications.

3. Specially-produced programs. The project should start negotiations with one or two radio stations and make arramgements to produce and broadcast "Al Om Al Waaia" program nationally. The program should be put on the radio during the peak of the diarrhea season, and should include competitions and prizes for listeners who follow the program regularly and can answer specific questions on the subject matter. The program would be publicized intensively through spot announcements few times a day which should be inserted before or immediately after other programs that are most popular among the target audience. While the same may be done on television, the cost could be prohibitive. An ideal arrangement would involve rerunning the program on additional radio stations, but such an arrangement may be quite difficult. For literate audiences, the same idea can be implemented, where press supplements or sections may be edited in direct cooperation with the project. While the NCDD project should subsidize the production of such programs or press sections, it should not by any means waste the project funds on buying newspaper space or radio time for these specially produced programs. They are not to be confused with advertising.

4. Social Marketing. By far, this will prove to be the most effective activity in reaching the target audience, different, but small segments of which are reached through the other communication campaign elements outlined above. Since the project does not have the means to produce communication material, this activity will have to be accomplished through the cooperation of three parties. First, the NCDD project must assume overall responsibility. Content development, pretest of ideas and of material at different stages of the production, approval of scripts and story boards and evaluation of effect are typical NCDD project responsibilities. Second, radio and television officials should be involved at different stages, such that a sense of involvement develops among them which would make the broadcasting of project messages more possible. These people, or some of them at least, have good judgements of what does or does not work. Third, the actual filming and production

should be contracted out to one or more of the public or private agencies specialized in quality production of audio, video, or print communication material. Such contractors, however, will have to be closely coached by the project, mainly because almost all possible contractors have little, if any, experience in social marketing communication, and have little experience in communication with the kind of audience the project seeks to reach.

V. Pretest, Evaluation, and Monitoring.

Two types of pretest of campaign material are advised, of course in addition to pretest among in-house experts. First, a pretest must be done with key experts in the technique being used (e.g., audio, video, photography, drama, etc.) Second, all material must be pretested among relatively small samples of the target audience. Both types of pretest may be repeated at different stages of the production. The NCDD project should assume the primary responsibility for pretesting.

Monitoring techniques will vary according to the kind of communication activity. For example, while the ministry of health information office could be responsible for sending over copies of each of the news releases it manages to get printed on behalf of the project, other activities may require the specific attention of one or more persons on the NCDD project staff. Detailed monitoring schemes should be devised in conjunction with each activity.

Evaluation, both of the process and the product, should be undertaken both by the project itself and by outside contractors. Evaluation reports submitted by contractors on the project's request may not substitute for the project conducting its own evaluations of different communication activities.

May 1984

Training of Health Manpower and Mothers

Introduction

As regards training during Phase-One of the project, much has been achieved. In fact training stands among the other activities of the project as a very important component in promoting O.R.T. Training is a systematic process through which an individual learns to perform assigned tasks more effectively. While attitude changes and the acquisition of new knowledge are important, skill development is the primary goal of training tailored to performance specifications for a particular job.

Rationale

The prevention of diarrheal diseases and repair of dehydration in an attempt to reduce infant mortality which is the major goal of the project, needs a multidiscipline approach entailing environmental sanitation, health education and nutrition. This might require community development which will take a rather long time. Nevertheless, prevention of mortality from diarrhea can be attained if proper management of diarrheal cases is adopted. This requires:

1. Training of the health team on a face-to-face basis in proper therapy for diarrhea, with major stress on oral rehydration.

2. Training of mothers to be able to correct dehydration losses; to maintain adequate nutrition; in addition to improving their knowledge, attitude and practice in caring for children with diarrhea.

   Training of mothers on a face-to-face basis is necessary to complement the project efforts in education through mass media.

   Phase-One of the project required a detailed training plan which describes:

   Target groups
   The basic content addressed to each group
   Materials and methodology
   Management
   Follow up and Evaluation.

The project started its activity with the following:

1. Selection and Preparation of Trainers

   In addition to the Project staff most of the trainers are university staff, mainly specialists in pediatrics and child health, who have the experience in child

health particularly in diarrhea: its curative and preventative aspects as well as its nursing care. Besides this group of trainers (at Abu El Reesh Hospital - El Shatby Hospital - Bab Al Sharia Hospital) the project selected other professionals from around the country: leading pediatricians in medical schools and M.O.H. hospitals and senior nurses to be good trainers. They will in turn teach governorate physicians and nurses to provide training to health centers and health units personnel who will be responsible for face-to-face instructions of mothers coming to the most peripheral units. Eventually these training teams are supposed to work also with village councils and traditional practitioners.

We can say now that the project has many Egyptian experts in O.R.T.

2. Opening of New Rehydration Center

Besides the two centers at Abu El Reesh and Al Shatby University Hospitals, the project provided training and equipment to open 35 new rehydration treatment and training centers in the different university and M.O.H. hospitals.

A one week course of practical experience and demonstrations was sufficient to give hospital staff all information and skills needed to operate a total rehydration program.

3. Define and Prioritize Target Groups to be Trained

The list of groups to be trained is extensive. The following were considered the priority group for Phase One:

1) Physicians working in pediatric hospitals, M.C.H. Center, R.H.U. and Centers.

2) Different levels of nurses working in child health set up.

3) Pharmacists.

4) Mothers.

Training of Physicians and Nurses:

A. Curriculum

The curriculum was designed to change the behavior of both doctors and nurses. The term behavior here is used in the broader sense to include thinking, acting and performance. Emphasis is based on skills required to manage rehydration and to communicate with and

educate mothers and other personnel to manage rehydration for the sick child. The curriculum stresses ways of assessment of dehydration and how to correct or prevent dehydration. It focuses on methods of maintaining adequate nutrition and how to carry out nutritional rehabilitation. It also provides knowledge and skills to mothers particularly in mild dehydration, in feeding their babies and in hygienic practices related to feeding and rearing.

B. Training of Physicians

320 physicians in batches of 10-15 were trained in 6 day-courses at 3 model rehydration centers set up in:

1. Abu El Reesh pediatric hospital (Cairo University)

2. El Shatby pediatric hospital (Alex. University)

3. Bab Al Sharia pediatric hospital (Al Azhar University)

By the end of the course trainees were able to:

- manage acute diarrheal cases properly in order to minimize mortality and complications from diarrheal diseases

- establish rehydration centers in their health units

- Teach O.R.T. to nursing staff

- Provide health education to mothers in how to improve environmental sanitation

- Realise the importance of feeding during diarrhea.

The method of training is face-to-face and practice. Trainers are University Professors and project staff. A follow up survey showed about 50% of a sample actually practicing ORT on site.

C. Training of Nurses

450 nurses were trained in 6 day-courses put on by the project staff. They were recruited from M.C.H. centers, pediatric sections in general hospitals and R.H.U. Training took place at Fom Al Khaleeg training center. The training method is both didactic and experiential. More emphasis was put on the practical side of training: two days observation and practice instead of one.

By the end of the course the trainees were able to:

- provide the needed nursing care to infants and children suffering from diarrhea

- conduct individual and group teaching to mothers as regards:

  preparation of O.R.S.
  administration of O.R.S.
  hygiene and feeding of infants.

Evaluation of their activity in the field has not been done yet.

D. Training of Pharmacists

Pharmacists are an important element in the Egyptian Health system who often advise on drugs, medical care and give personal counsel. They have an important role in marketing, teaching mothers, and may even compound O.R.S. in their pharmacies.

29 directors of pharmaceutical sections in different governorates were trained in O.R.T. mixing and administration and feeding during diarrhea. They were also prepared to be good trainers to other pharmacists in different governorates: governmental and private.

Another group of pharmacists (8) was trained. They are the professional sales representatives. They will give one clear and unified message to all physicians and pharmacists (in 5 metropolitan areas) especially those working in the private sector. This group was trained in salesmanship in addition to the most important aspects of O.R.T. Training was conducted by project staff.

E. Training of Mothers

Diarrhea starts at home and so the role of the mother is crucial in the modern management of diarrhea. Valuable time may be lost before the mother can contact any health facility. Further, wrong practices may change the balance to an unfavorable outcome. Naturally the mother is the very specific person who will administer treatment: O.R.T. and feeding. Without her compliance nothing can be achieved. An experiment is nearly complete in which over 1,000 mothers received training at Bab El Sharia Hospital using modern methods in diagnosis of dehydration, preparation and administration of O.R.S., feeding and improving of environmental sanitation. The evaluation is now underway.

As all curricula for the training courses of health manpower and mothers were designed to give skills and change

discussions was resorted to to give academic knowledge, plus audio-visual aids:

demonstrations
blackboard
overhead projector
slides
charts

4. Development of Training and Educational Materials

During Phase-One, the project produced the following:

1. Treatment charts in Arabic and English
2. Treatment brochure in Arabic
3. Brochure for pharmacists
4. Standard teaching slide sets and lecture notes
5. First issue of the newsletter
6. Nurses self instructional manual
7. Video film on O.R.T. featuring 4 eminent pediatricians
8. A clinical training film on all aspects of rehydration (due Summer 1984).

5. Conferences and Seminars in Different Governorates

Presentations to audiences of specialists, general practitioners, nurses and pharmacists ranging in size from 20-400 had been done in some governorates. All were well received.

6. Evaluation

a. Pretest to assess the knowledge of trainees before the training courses

b. Observation during group discussion

c. Observation during clinical rounds and in performance of skill learnt

d. Post-test for cognitive objectives.

Self Criticisms and Comments

No one can say that everything went all right, 100%, or there were no obstacles in implementation of the training plan. Several self criticisms may be made at the outset:

1. Recruiting Trainees

   a) The selection of trainees was left entirely to governorate co-ordinators with no particular guidance from the project; as a result a number of these trainees showed disinterest, failed to complete or even appear for the course.

   b) The nurses were selected without reference to whether physicians from their units knew anything about O.R.T. or had received training; as a result the majority were unable to put into practice what they were taught.

   c) Training of pharmacists began somewhat late due to shortage of personnel in the training section. The training co-ordinator was not recruited except in January 1984.

   d) Difficulty in finding the appropriate accommodation for trainees, especially nurses, hampers some of the training courses.

2. Curriculum

   a) Much emphasis was put on didactic lectures covering all aspects of diarrheal diseases.

   b) There was no unified curriculum or content in the courses, or explicit listing of educational goals: some professors advise naso-gastric tubes for most cases, some advise different drugs or feeding regimens.

3. Co-ordination and developing joint activities in training with other health organisations working on diarrheal diseases control is going slowly (although co-ordination in research and exchange of data is good).

4. Follow up of trainees was poor.

5. The project records were kept in such a way as to require much time to determine who was trained and to which health unit or center they belong.

In spite of this, the overall results are however encouraging. All these faults, once identified, are readily corrected.

THE INTEGRATED TRAINING PLAN AND TRAINING MATERIALS

In the early days of the project, training materials were developed on a more or less ad hoc basis--as a need was identified or as an opportunity presented itself. A number of the materials that will be described later and that you will see during the course of this review were developed in this way and have been well received.

Now that the project is more mature and the Training Division has grown to two full-time and two part-time staff, we are beginning to adopt a more planningful approach. Now materials are being planned to support larger training strategies. Specific targets and training objectives are being identified and materials will be developed for use within these specific contexts.

Before describing the materials themselves, it is important to first describe the plan, which we call the Integrated Media and Training Plan, into which they fit. The need for such a plan was not only one internal to the Training Division but arises from the need for coordination and integration among the various divisions of the project--primarily among the divisions of training and mass media but also with the division for implementation and coordination as well. These divisions share a common mission, common goals and common targets, and their strategies and methods are complementary.

This mission, as described in the plan, is:

> To instill in all members of the health care system and the population at large a commitment to follow the basic precepts of oral rehydration therapy (ORT) and to provide them with the knowledge and skills to do so.
>
> The three basic precepts of ORT state that:
>
> 1. Oral rehydration therapy is the superior method of treatment for dehydration under all but a few exceptional circumstances.
>
> 2. Antibiotics, antiemetics, and antimotility drugs should not be given during the routine course of treatment.
>
> 3. Continuity of feeding, particularly breastfeeding, is essential to successful treatment as well as the long term prognosis of the child with diarrhea.

Six major goals have been identified:

1. The concept of oral rehydration therapy (ORT) will be well-known and accepted throughout Egypt.

2. All persons coming in contact with a dehydrated child will recognize the condition, the need for treatment and the need to proceed with treatment according to their level of technical competence.

3. All persons administering treatment to a dehydrated child will do so properly.

4. All health professionals will be prepared to teach mothers how to mix ORT, how to administer it and when to provide nutritional supplements.

5. Institution-based health professionals will be prepared to establish rehydration centers in their own institutions.

6. Families will adopt behaviors which will minimize the incidence of diarrhea.

The strategies that will be employed to meet these goals fall into the same broad categories. There are basically three:

1. Planning, organization and funding of activities and their supporting materials are entirely from within the control of the project. This includes hiring consultants from outside the project to work alongside project staff.

2. Setting in motion a diffusion model whereby training activities are planned and organized by the project. The materials are developed and produced in ample supply. The first level of training will be carried out and funded by the project but then personnel outside the project, trained or provided with guidelines, will carry out the training through one or more levels independent of the project. Some examples of this strategy are the training to establish rehydration centers and the development of model medical school curricula and training aids.

3. The project develops materials and guidelines and then hands them over to other public and private sector organizations to utilize as part of their own system. As part of this strategy, the project will make use of the

highly organized structure of the medical and pharmacists' syndicate, and the training capabilities of other Ministry of Health projects and PVOs.

In keeping with the project's social marketing approach, we have identified a number of primary target markets and further segmented these markets according to the messages that need to be given to them and the channels by which they can be reached. We are in the process of trying to quantify each of the market segments. Three primary market segments share top priority: physicians, pharmacists and mothers. Without the full involvement of any one of these segments, the project has little chance of succeeding. Of second level priority but still immediate target markets are nurses--who may ultimately be those responsible for managing oral rehydration therapy and teaching mothers--and medical, pharmacy and nursing students--the frontline workers of tomorrow. Also of second level priority are national level influentials who can promote ORT widely throughout Egypt. The third level of priority includes groups with high potential for promoting ORT but who, at the current time or under the current system, are removed from doing so. These markets include alternate caretakers of children (sibling, grandmothers, day care center staff), village level influentials such as dayas, and other health professionals such as social workers and health educators.

The Integrated Media and Training Plan is still in its initial stage of development but even as it is being written we consider it "organic". We plan for it to grow and change as the project goes along. As activities unfold, they will be assessed to see how well they have met their market objectives. If planned activites fail to achieve their anticipated market penetration, it should be clear that new activities should focus on these areas of shortfall. Also, as new activities are suggested, they can be checked against the plan to see if they are addressing a target market that remains unsaturated or whether the new activity is redundant and resources are best focused in a different direction.

The materials developed under this plan will be scientifically designed. Several behavior change models will serve as guidelines for their initial development including adoption theory, the health belief model and principles of behavior modification. Specific language and content inserted into these models will be derived from the extensive research already carried out by the project. Existing research will be supplemented, if necessary, with focus group interviews and participant observation. Drafts of all materials will be thoroughly pretested and revised as many times as is necessary to ensure that the materials meet their intended objectives.

At the present time, a number of training materials have been completed:

- Treatment Chart--This is an illustrated, wall-size chart developed to display at a glance the treatment protocols for diarrhea without visible dehydration, mild dehydration, moderate dehydration and severe dehydration. The chart, intended to serve as a quick reference in the clinical setting, has been published in both Arabic and English, and has been widely distributed.

- Treatment Booklet--This booklet describes the steps in the treatment of dehydration from diarrhea. Its major target is doctors but it has some applicability for nurses. It is written in Arabic.

- Video taped roundtable discussion--This video tape consists of a discussion among four eminent physicians who explain all aspects of ORT in Egypt. In Arabic, The video attempts to anticipate and answer questions likely to be raised by physicians. It is used as an introduction to oral rehydration at meetings and seminars attended by doctors.

- Set of 35 teaching slides--This set of slides is designed to show the methods of diagnosis and treatment of dehydration. It is accompanied by a script that explains the important points of each of the slides. Recently, a professionally produced cassette tape of this script has been made and will be tested.

- Set of slides showing a rehydration sequence--This five-slide sequence will be distributed to all trainers to be used to demonstrate the effectiveness of ORT.

- Pharmacists' booklet--This booklet, in Arabic, describes ORS and its components in pharmaceutical terms, explains how ORS is used and gives hints about how to teach mothers to use it.

- Newsletter--The first issue of the Newsletter has been published. It gives an overview of the key aspects of oral therapy. Articles were written by experts well-known in Egypt lend credibility. The primary method of distribution has been through the governorate coordinators but it is also distributed in all meetings and training session held with doctors and pharmacists. The second issue, reporting the findings of recent diarrheal research conducted in Egypt, is in the process of being editted and will be published in July.

A number of other training materials are planned and are in various stages of development.

- Self-instructional booklet for nurses--This book has been written and a final Arabic version is being prepared for pretesting. An English translation is

available.

- Film for physicians--This film is intended to promote ORT and to gain acceptance among graduate physicians by exposing the scientific basis for ORT. The behavioral objectives have been written, a contract signed with Mobak Advertising Company to produce it and the "treatment" being written. It is expected that the film will be used in trainings conducted prior to rural service and as an introduction and discussion starter when training house officers and residents in the start up phase of rehydration centers.

- Fact Sheet--With the number of project staff increasing and consultants being used, it has become clear that some mechanism must be found to ensure that the information being given out by the project be consistent. This fact sheet will serve this purpose. It will serve as a source document for all media messages, curricula, and training materials. It will be organized in outline form so that each subheading of the outline will explain in more detail the major heading that proceeds it. Several sections of the fact sheet are in draft form.

- Textbook for physicians--This will be a reference booklet containing the medical facts about diarrhea, dehydration and their treatment. It will be used as a resource in the training of physicians and will be derived from the fact sheet.

- Guidelines for Establishing and Operating a Rehydration Center--This is a guide booklet currently in draft form that will serve as the basic reference for the training of rehydration center staff. Dr. Gamel will discuss this in detail.

- Mothers Teaching Package--This collection of trainmaterials is still in the planning stage. It is intended to be a complete package of material to be used by any health professional teaching mothers about the signs of dehydration, mixing and administering ORS, nutrition in conjunction with ORT and prevention of diarrhea. It will contain a complete teaching protocol and audiovisual materials, possibly a flip chart. Both the protocol and all visuals will be thoroughly tested before production.

- Question and Answer Booklet for Pharmacists--This booklet is intended as a teaching aid for pharmacists to enable them to better teach mothers who purchase ORS packets from the pharmacies. The booklet will expand on the current pharmacists' booklet. It will emphasize the importance of careful teaching of mothers and identify many of the unanswered questions that remain after a mother is given the basic instructions for mixing ORS. It will contain sample

sample answers pharmacists can give in ways that mothers can understand. The answers will be thoroughly tested before their inclusion in the booklet. A draft list of questions has already been developed.

These are the training materials currently under development. However, as the Integrated Media and Training Plan undergoes further expansion, new strategies and training activities may suggest the need of additional materials to support them in reaching their speicified objectives.

Report On Training In 1983 By N.C.D.D.P.

Prepared by Dr. Gamal Abdel Aziz, Dr. Ahmed Youseef Selim, Dr. Bert Hirschhorn.

I Introduction:

Training of professionals in rehydration therapy, nutritional management and diarrhea control is an essential component of the NCDDP. Training of mothers on a face-to-face basis is also necessary to complement our efforts in education through mass media.

Training in 1984 may be summarized in the following categories:

1. Opening of new rehydration centers;
2. Training of physicians and nurses at established rehydration centers;
3. Development of a model for training of all personnel from individual Rural Health Units, Urban, and MCH centers;
4. Evaluation of training of professionals;
5. Development of training and educational materials for professionals;
6. Major conferences in different governorates;
7. Training of mothers;

These items will be explained in detail in this report. Also at the end of the report tentative plans for 1984 will be discussed.

II. Summary Of 1983 Training:

1. Opening of New Rehydration Centers.

With assistance of Dr. Mathu Santosham (U.S.A.), Prof. Mahmoud El Moughi (Al-Azhar University), Dr. Hirschhorn (NCDDP), Dr. Samia Riyadh (ORT Coordinator, Alexandria), Dr. Mary Khalil Ibrahim (ORT Coordinator, Giza), the NCDDP provided training and equipment

to open eight new rehydration treatment and training centers:

- Bab El Shaareya university hospital (Cairo).
- Hossein university hospital (Cairo).
- El Galaa teaching hospital (Cairo).
- Om El Masreen Giza central hospital (Giza).
- El Ramle pediatric hospital (Alex).
- El Kebari polyclinic-hospital (Alex).
- Siddi Bisher polyclinic (Alex).
- Mansoura fever hospital (Dakhaleya).

It was determined that one week of intense practical experience and demonstrations led by an expert in rehydration was sufficient to give hospital staff the confidence to operate a total rehydration program. It was important to identify an energetic physician (or two or three) who would be in charge of the center under direction of a cooperative chief. Two centers benefitted, and greatly helped the NCDDP, by doing small but important clinical research projects.

Most important, the NCDDP now has an enlarged corps of Egyptian experts in ORT in addition to staff of El Shatby and Abu El Reesh centers, many of whom will , in turn, help develop other centers in Egypt.

2. Training of Physicians and Nurses at Established Rehydration Centers.

196 physicians in batches of 6-10 were trained in week-long courses at El-Shatby and Abu El Reesh rehydration centers; 362 nurses in batches of 8-15 received lectures at the NCDDP for five days and demonstration of ORT for one day at Om El Masreen hospital.

Several self criticisms may be made at the outset:

- Too much emphasis was put on didactic lectures covering all aspects of diarrheal disease, not enough emphasis on actually doing rehydration.

- The selection of candidates was left entirely to governorate MOH officials with no particular guidance from the NCDDP; as a result a number of candidates showed disinterest, failed to complete or even appear for the courses.

- The nurses were selected without reference to whether physicians from their units knew any thing about ORT or had received training; as a result, the majority are unable to put into practice what they are taught.

- There is no unified curriculum or content in the courses, or explicit listing of educational goals ; some professors advise naso-gastric tubes for most cases, some advise different drugs or feeding regimens.

- So far there has been no followup of trainees to assist them in establishing their own rehydration centers with equipment, materials, technical or financial assistance; in fact, the NCDDP records have been kept in such a way as to require several days to determine who was trained and to which health unit or center they belong.

All these faults, once identified, are readily corrected and will be. Evaluation of the outcome of training is described in section 5, below.

3. Development of a Model for Training of all Personnel of Rural Health Units Urban and MCH Centers.

We tested a model for training (evaluation of outcome described in section 5, below) in which the complete physician and nursing staff - in one or two batches-dealing with children in a RHU or MCH clinic were brought to one of two rehydration training centers in Alexandria. They stayed for two to three days observing rehydration - in some cases doing it themselves-and education of mothers. Only one or two general lectures were given.

It was found that batches of 8–10 persons is the maximum that should be trained at one time; 6–8 are the preferred number. Three days training is the minimum. Some professionals (physicians, especially) are simply not interested in doing rehydration with their own hands. Some investigation into their reasons is needed.

4. Evaluation of Training of Professionals:

The implicit educational goals are:

- Trainees are to set up rehydration centers in their own units or hospitals;
- Trainees are to know when intravenous therapy is to be used;
- Trainees are to teach ORT to their nursing staff;
- Trainees are to provide health education to mothers;
- Trainees are to reduce dependence on non-essential drugs;

Evaluation was done in two groups; 18 doctors trained for one week at El Shatby hospital in 1982 (a 15% sample from nine governorates) and 17 doctors from Alexandria trained at Ramle pediatric hospital for 2-3 days in 1983 (a two-thirds sample). The results are tabulated here.

	Trainees	
	1982	1983
1. N =	18	17
2. RHU	2	4
MCH Clinic	11	1
Health Center	1	3
Hospital	4	-
3. Supported with NCDDP equipment	39 %	100 %
4. Rehydration takes place in unit	50%	100 %

	1982	1983
5. Nurses know ORT	24%	47%
6. Nurses may start ORT on their own	33%	0
7. Mothers advised to continue breast milk	67%	74%
8. Mothers advised to continue food	78%	No Data
9. Mothers shown how to mix ORT	55%	0
10. Mothers shown signs of dehydration	22%	0
11. Doctor uses antibiotics, antidiarrheals routinely	44%	94%
12. Doctor knows indications for I.V.	79%	80%
13. What, in Doctor's opinion, could block use of ORT?		
Vomiting	60%	65%
Mother refuses	40%	57%
Liter too much	60%	43%
No equipment/ORS	0	70%

We also inquired what materials or equipment the doctors wished from the NCDDP. Virtually all the requests were appropriate and modest: simple ORT materials, educational materials for mothers, more space for a rehydration unit.

We also looked at stocks of oralyte in each unit, the number of cases seen in the previous two weeks, and average number of liter packs dispensed per case.

Packs on hand	Cases in last 2 weeks	Packs/average case
751	276	0.2
3547	118	1.2
2885	49	2.9
1620	132	0.3
4750	25	0.4
112	35	0.4
950	3	1.0
47	11	1.5
1091	15	3.5
14500 (local depot)	140	1.0
345	29	1.3
462	53	1.9
1000	47	1.6
1000	26	2.0
850	105	2.0
300	40	3.8
70	55	3.6
600	360	0.2

No correlation existed between stocks on hand, patient load, type of unit. Use of oralyte varied 19-fold.

The overall results are, however, encouraging:with little supply, followup and supervision 50% of trainees nonetheless establish ORT centers. One week of training appears to provide a more solid base of knowledge than do 2-3 days. Nurses and doctors from the same unit should be trained together. A better supply-need information system is necessary.

5. Development of Training and Educational Materials for Professionals

NCDDP has produced the following:

- Newsletter
- Nurses self-instructional manual (due summer 1984)
- Treatment charts in Arabic and English
- Treatment brochure in Arabic
- 20-minute video film on ORT featuring four eminent pediatricians
- Standard teaching slide set (35 slides) and lecture notes
- Brochure for pharmacists

6. Major Conferences in Different Governorates

Presentations to audiences of specialists, physicians, pharmacists, nurses, social workers, ranging in size from 50-400, have been done in Assiut, Sharkia, Dakhaleya, Gharbia, Tanta Alexandria (2), Kafr El Sheikh, Cairo (6), Beheira. All were well received.

7. Training of Mothers

An experiment is nearly complete in which 500 mothers received training, using modern pedagogical methods, in diagnosis of dehydration and mixing of ORT. The evaluation is now underway. A flip chart for clinic use is now being prepared.

1. Tentative Plans for 1984

1. Rehydration Centers

We hope to train and supply 25 new centers, in all University Hospitals and 15 Governorate Central Hospitals. These new

centers should attempt to train staffs from 10-20 RHU/MCH or Urban Clinics each in their vicinity.

2. We expect to produce a clinical training film on all modes of rehydration.

3. We hope to produce a self-instructional manual for physicians.

4. The newsletter should appear twice a year

5. We hope to send key planners, educators and pediatricians on observation tours of other national programs

6. A model rehydration training and research center is being developed at Abu El Reesh Hospital.

7. We hope to recruit several hundred volunteer medical students, train them in interpersonal communication and have them visit pharmacists and mothers at home, to promote ORT.

8. Physicians and nurses from key centers will continue to be trained at Shatby, Abu Reesh and (new to 1984) Bab El Shaareya Hospitals; improvements in selection, curriculum, management and followup are expected.

May 1984

Epidemiology of Diarrheal Diseases In Egypt

Morbidity and mortality due to diarrheal diseases constitute one of the major health problems among children in developing areas. In Egypt diarrhea accounts for more illness and death in children than respiratory disease (Tables 1 and 2).

Diarrhea may be defined as the frequent passage of unformed stool, usually more than 3 times/day but may reach up to 20 times. It may be acute or chronic and in both conditions they are associated with water and electrolyte inbalance and malabsorption.

1. Causative agents in acute diarrhea:

   Infectious agents: At least 25 etiologic agents are responsible.

   Bacterial: Salmonella, shigella, campylobacter feotus, vibrio cholera, entropathogenic E Coli. All these are responsible for a minority of cases. E. Coli is an important cause in fatal neonatal diarrhea.

   In Alexandria a study of 500 hospital cases during the diarrheal season proved the following isolates (in percentages): 3.8% for salmonella, 7.8% for shigella, 11.4% for campylobacter and 10.4% for E.coli (Table III).

   Viral: Entero virus group, coxaackie, echo and rota virus - these agents nowadays cause the majority of cases. Rota virus was first detected in human 1973 in Australia and it emerged to be the single most important cause in infants and children admitted to hospital for treatment of G.E., in Alexandria it accounted for 18.6%.

   Fungal: Actinomyces, candida and histoplasma, usually following prolonged use of antibiotics.

   Protozoal: Giardia lamblia and entameba histolytica. The first is usually resistant to many therapeutic agents. El Shamy reports finding giardia in 43% of children with diarrhea in a longitudinal study in Lower Egypt; but only 2.8% were positive in a Giza village study.

   Secondary enteritis is seen due to other infectious diseases as otitis media, measles and broncho pneumonia and may account for some of the cases with no pathogen isolated.

2. Toxic diarrhea: Bacterial toxins, different types of food poisoning, also physical and chemical poisons.

3. Dietary causes: irritant food, food allergy, and non absorbable sugar.

Incubation period: varies from few hours to one or more weeks depending on the causative agent.

Mode of transmission: as in food borne infections contaminated food, especially milk and water play an important role, reflected mainly on the age where beginning of weaning is concomitant with the disease. In Egypt a seasonal peak of births is in November-February, so that children enter the summer diarrhea season while weaning. Contaminated hands are very common with illiterate mothers.

Clinical picture: This also varies according to the causative agent, resistance of the person and endemicity of the disease in the area, with nausea vomiting, abdominal pain, watery diarrhea mainly for children below 2 years and tenesmus and mucous for those above 2 years (Table IV). The marasmus-diarrheal syndrome is a well known consequence (Table V).

Incidence: Morbidity statistics are lacking in Egypt due to deficient notifications. It is estimated that infants have between 3-5 major episodes per year. In the summer daily prevalence ranges from 14% to 33% (urban to rural), 80% of which is watery diarrhea. Mortality statistics reflect the severity of this problem in Egypt.

National statistics proved that more than 50% of deaths in infancy and pre-school children below the age of 5 years are due to gastroenteritis (Table I).

Analysis of registry statistics from hospitals and different community surveys proved that more than 75% occurred below the first year of life and more than 90% of cases below 3 years of age (Table VI). Table VII shows that the age group most affected by death is under one year.

Since the latest estimated population for 1983 is 46 million, with approximately 10% being children below 3 years, i.e. 4.6 million. With an under-3 death rate of 38.7 /1,000 nearly 180,000 died last uear (Figure 1). The rates of death from diarrhea have hardly changed in the last quarter century (Table VIII).

Males are more often reported to have diarrhea - currently or by history - and more often treated for diarrhea (Table IX). Nonetheless, females are more likely to die (Table VII, Table X), a differential eliminated by effective treatment ! (Table X). Table X also shows that effective treatment has proportionately more impact on the under 1 year olds.

Seasonality: with prevailing bad environmental sanitation deaths are usually highest in summer and early fall perhaps exacerbated by greater possibility of dehydration and electrolyte imbalance. The seasonal peak is May - October, where more than 75% of cases occur (Figures 1, 2). The season begins earlier in Upper Egypt where the severity is greater and more than 66% of deaths among pre-school children occur due to G.E. compared to only 4 % in Lower Egypt (A. Hassouna, 1984). This difference may reflect the poorer nutritional practices in Upper Egypt. The interaction between malnutrition and infection plays an important role in mortality (Table XI).

This leads us to consider predisposing factors.

- Artificial feeding increases the possibility of infections, and risks increase with poorly educated mothers.

- Low socio-economic standards of living with low income, high rate of illiteracy, poor housing, big family size, lack of adequate medical care all contribute.

- Environmental factors: poor sanitation with lack of a plentiful water supply, unsanitary waste disposal, and high prevalence of flies are important in precipitating infection. Table XII gives univariate analyses of some of these factors on diarrhea incidence in Upper Egypt.

As a Diarrheal Disease Control Program we cannot simply discuss epidemiology and clinical management. We must look toward prevention.

Primary prevention: It is estimated that good environmental hygiene and sanitation would rapidly reduce infant mortality to 50/1,000. The trend to artificial feeding will raise it.

General preventive measures:

- Raise the standard of environmental sanitation and plentiful safe water supply.

- Health education to the mothers to encourage breast feeding, food hygiene.

- Prevention of other infectious diseases which play a role in increasing the severity of diarrheal diseases by the already available very efficient immunization system in Egypt.

- Nutritional education, and proper weaning practice promoting locally available weaning food.

Specific Prevention:

Till now it is not available for diarrheal diseases but recently a vaccine for rotavirus is under trial. It is living attenuated form, similar to that of Sabin's in poliomylitis. Also passive immunization is recommended for the mothers to raise the standard of maternal inherited immunity.

Management:

Early diagnosis of watery diarrhea before appearance of manifest dehydration is needed so to apply replacement therapy by ORT, without the need for knowing the causative agents in the disease, even with very few visible signs of dehydration. 5% of body weight might be lost without clear dehydration, whereas in the dying child about 10% of body weight is lost. ORT is preferable to I.V. route as it can be given with little formal education and even at home with no need for sterile equipment, comforting to the child and his family, cheap and safe in the majority of cases. An independent survey now shows that 40-47% of mothers now know and have used ORT, all over Egypt (Table XIII).

Other drugs (antiemetic and constipating agents etc.) are not recommended. Recent studies proved that vomiting does not affect success of oral therapy. Breast feeding, soft food and porridges are advised with ORT and may decrease diarrhea. Broad spectrum antibiotics are recommended only under certain circumstances.

If the child does not respond, hospital referral for more supervision and possibly I.V. therapy is needed - this is usually below 10%. Case fatality for treated cases has been markedly reduced recently to under 1%, and under 6% for shocked cases, desperately ill.

Tertiary Prevention or rehabilitation is needed for severely malnourished cases, as PEM usually results from repeated attacks of diarrhea, where nutritional rehabilitation will prevent the vicious circle between nutrition and infection.

A study is underway to follow up hospital treated cases at home so as to give continuing care and to observe the fate of those children after returning to their home.

Prepared by Professor Dr. Mervat El Rafic
Mrs. Linda Tawfik
NCDDP

Appendix: General Data of Egypt

Table I

Main Health Problems Facing Infants and Pre-school Children in Egypt (%) from various Surveys

	Aggregate Helwan District 1980	Urban Health Center 1980	Rural Clinic Village Monieb 1979		El Galaa Hospital (Cairo) Admissions 1981
			M	F	
Diarrheal Diseases	29.0	39.6	51.9	63.7	54
Pneumonia and Bronchopneumonia	43.9	25.9	22.9	24.2	24
Measles	1.3	3.3	2.8	3.2	-
Malnutrition	-	-	-		20

Table II

Diarrheal Disease as a Cause of Mortality among Vulnerable Groups (MOH)

	1977	1978	1979	1980	1981	1982
Infant Mortality (I.M.)	85.3	73.2	76.2	67.8	71.7	74.3
I.M. due to diarrhea	50.4	51.9	52.4	-	-	-
Neonatal Mortality (All)	14.8	13.8	12.2	13.0	13.9	15.1
Pre-School Mortality (All)	17.9	11.4	14.1	10.1	9.1	11.6

N.B. Estimated under-registration for infant deaths by well

Table III

Causative Agents in Infectious Diarrhea in Egypt

	% of Cases Various Surveys		
	Urban	Rural	Alexandria Hospital Cases
Salmonella	4.2	3.3	3.8
Shigella	2.8	4.4	7.8
Campylobacter	2.1	2.1	11.4
E. Coli	56.0	34.8	10.4
Klebsiella	39.0	36.9	-
B. proteus	38.2	34.8	-
Staph aureus	2.8	4.3	-
Rotavirus	Not done	Not done	18.6
Total Cases	141	92	500

(Source: Dr. Amira Koura, and Prof. Dr. Samir Kassem)

Table IV

Clinical Manifestations of the Affected Children

	University Hospitals*	El Galaa Hospital*	Rural Units*
Watery diarrhea	93.2	100	98.6
Vomiting	57.1	68	49.6
Dehydration	22.2	69	12.6
Blood, mucous	15.2	-	9.8
Fever		61	
Case fatality	0.6%	3%	0.3%(est.)
Av. volume ORS needed	600 cc	950 cc	-

Table V

Incidence of Acute Undernutrition
In Egyptian Pre-schoolers Related to Diarrhea

	% With Deficits in Weight for Height	
	Diarrhea Season	Non-Diarrhea Season
Upper Egypt	11.1%	2.8%
Lower Egypt	4.1%	0.8%
	% With Deficits in Weight for Age	
	Recent Diarrhea	No Recent Diarrhea
Upper Egypt	40%	29%
Lower Egypt	15%	9%

(From the 1978, 1980 National Nutrition Surveys)

Table VI

Age Distribution of the Children with Acute Diarrhea
Hospital, Clinic and Community Surveys (%)

	2 Rehydration Centers in Hospital	Village Kafr Hakem	Village Clinic El Monieb	Abou El Reesh Hospital	
Years	1983	1983	1982	Out-patient	In-patient
< 1	76.4	69	54.1	58	83
- 2	18.4	29	37.7	30	17
- 3	2.8	2	8.2	7.6	0
3+	1.8	-		3.8	0

Table VII

Death rates due to diarrheal disease and to all causes combined by sex, 12 villages, Menoufia Governorate, 1979-1980

Age at death (years)	Popul-ation	Age specific death rates per 1000 All causes Male	Female	Total	Diarrhea Male	Female	Total
< 1	1588	152.6	145.7	149.2	64.0	78.7	71.2
- 2	1154	53.4	81.0	66.7	36.7	50.4	43.3
- 3	1646	10.6	13.8	12.2	4.7	5.4	4.3
0-3							38.6

NOTE: The infant death rates rather than the age specific death rates are as follows: All causes, male = 119.6, female = 110.7, total = 115.2; diarrheal, male = 50.1, female = 59.7, total = 54.9 per thousand.

Source: American University in Cairo

Table VIII

Main Causes of Death among Infants (per 1,000) Egypt 1950-1976

	Respiratory Infections	Diarrhea	Congenital Prematurity*	Others
1950 - 55	14	54	28	4
1956 - 60	14	55	28	3
1966 - 69	14	57	24	5
1970 - 72	26	45	19	10
1973 - 76	24	50	15	11

* May reflect tetanus, or catch-all diagnosis.

Table IX

Sex Distribution of Children with Diarrhea

Study Population	Severity of Illness	Male	Female	Male:Female Ratio
Home visits to 1,119 children in 6 governorates	Most mild	634	480	1.33:1
693 patients in urban health center	90% mild	360	333	1.08:1
Recall of last illness in child, 100 rural mothers Upper Egypt	Mild-Moderate	69	31	2.23:1
210 children in a rural clinic	Mild	123	87	1.41:1
110 children in a rural clinic	Mild	61	49	1.24:1
Abou Reesh Hospital				
. Pre-ORT (1982)				
- 550 outpatients	Mild-moderate	316	234	1.35:1
- 50 inpatients (I.V.)	Severe	30	20	1.50:1
. Post ORT, 100 DN (I.V.)	Severe	63	37	1.70:1
Hospital ORT Rehydration Units, 2,673 patients	30% moderate 5% severe	1,560	1,113	1.40:1

Table X

Distribution of Diarrhea Specific Deaths and Rate per 1,000 Children; By Age and Sex - in ORT Intervention versus Control Villages

	Study Villages						Total		
	ORT Intervention			Controls					
	Est. Child Pop.	Deaths #	Rate	Est. Child Pop.	Deaths #	Rate	Est. Child Pop.	Deaths #	Rate
0-11									
M	1,907	55	28.8	1,456	79	54.3	3,363	134	39.8
F	1,804	52	28.8	1,377	81	58.8	3,181	133	41.8
T	3,711	107	28.8	2,833	160	56.5	6,544	267	40.8
12-23									
M	1,711	24	14.0	1,306	17	13.0	3,017	41	13.6
F	1,618	17	10.5	1,236	23	18.6	2,854	40	14.0
T	3,329	41	12.3	2,542	40	15.7	5,871	81	13.8
24-59									
M	4,789	4	0.8	3,657	6	1.6	8.446	10	1.2
F	4,530	3	0.7	3,459	5	1.4	7,989	8	1.0
T	9,319	7	0.8	7,116	11	1.5	16,435	18	1.1
Totals									
M	8,407	83	9.9	6,419	102	15.9	14,826	185	12.5
F	7,952	72	9.1	6,072	109	18.0	14,024	181	12.9
T	16,359	155	9.5	12,491	211	16.9	28,850	366	12.7

N.B. Distribution of child pop. by age and sex is based on the proportional distributions as shown from SRHD project-wide household surveys.

Source: Dr. Ahmed Nagaty, Executive Director
Strengthening Rural Health Delivery Project

Table XI

Diarrheal deaths as a proportion of all deaths in infancy according to milk regimes prior to onset of fatal episode

Age (months)	Percentage dead due to diarrhea: Breastmilk only	External Milk and Breastmilk	External Milk only
0-5	28	63	60
6-11	76	71	86
0-11	41	67	79
Number of diarrheal	62	22	15
Total deaths	150	33	19

NOTE: The table excludes children who were receiving food supplements and refers only to those on exclusively milk diets.

Diarrheal deaths as a proportion of all deaths for different types of diets in the second year of life

Age (months)	Percentage dead due to diarrhea: With food	Without food
12-17	58	68
18-23	57	100
12-23	58	74
Number of diarrheal deaths	30	17
Total deaths	52	23

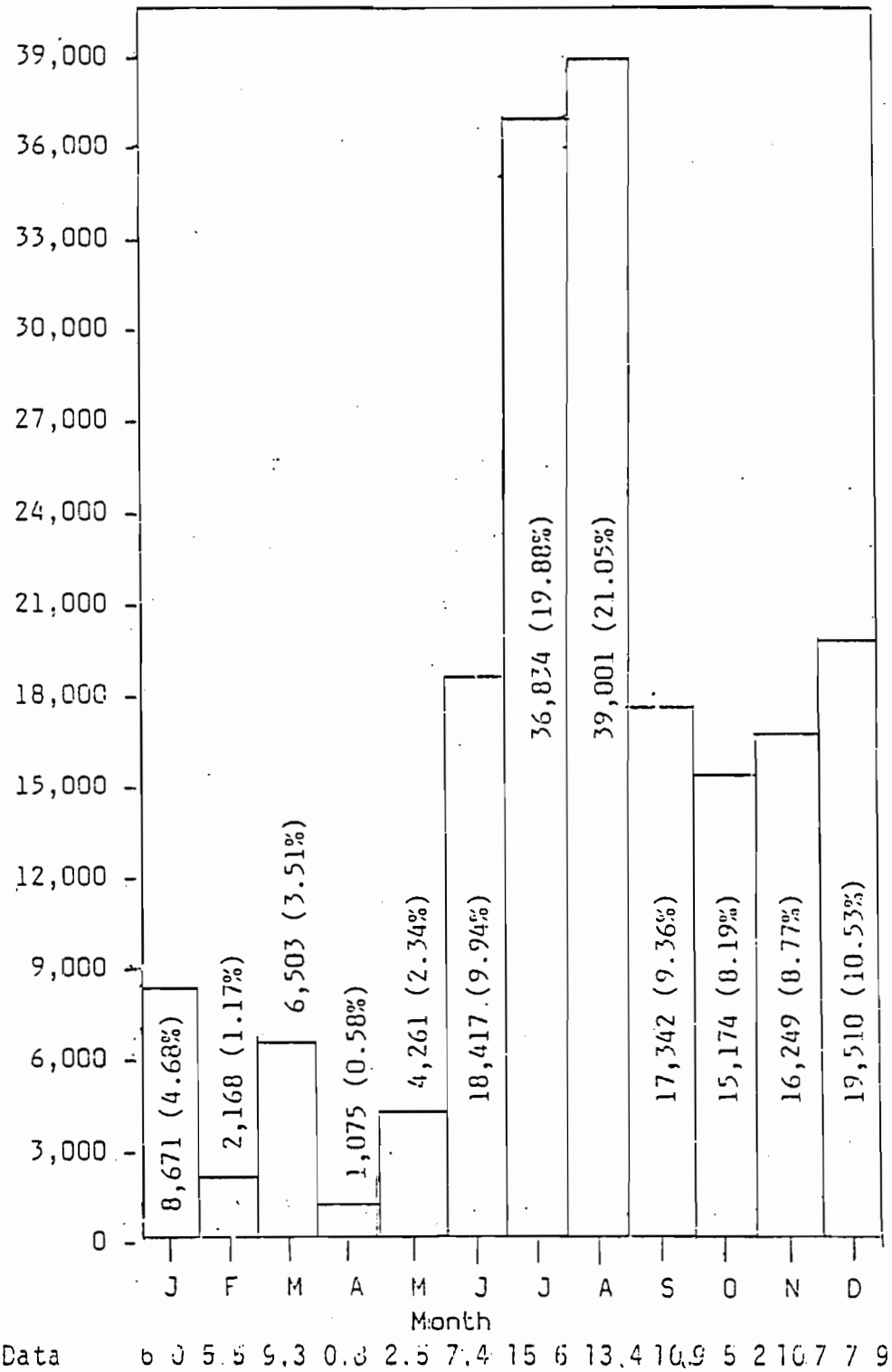
NOTE: With food means solid or semisolid food alone or as a supplement to milk.

Source: Tekce, B. Studies in family planning:

FIGURE 1

ESTIMATED DIARRHEAL RELATED DEATHS

IN CHILDREN UNDER THREE YEARS OLD, BY MONTH*



Dakahlia Data 6 0 5.5 9.3 0.8 2.5 7.4 15 6 13.4 10.9 5 2 10.7 7 9

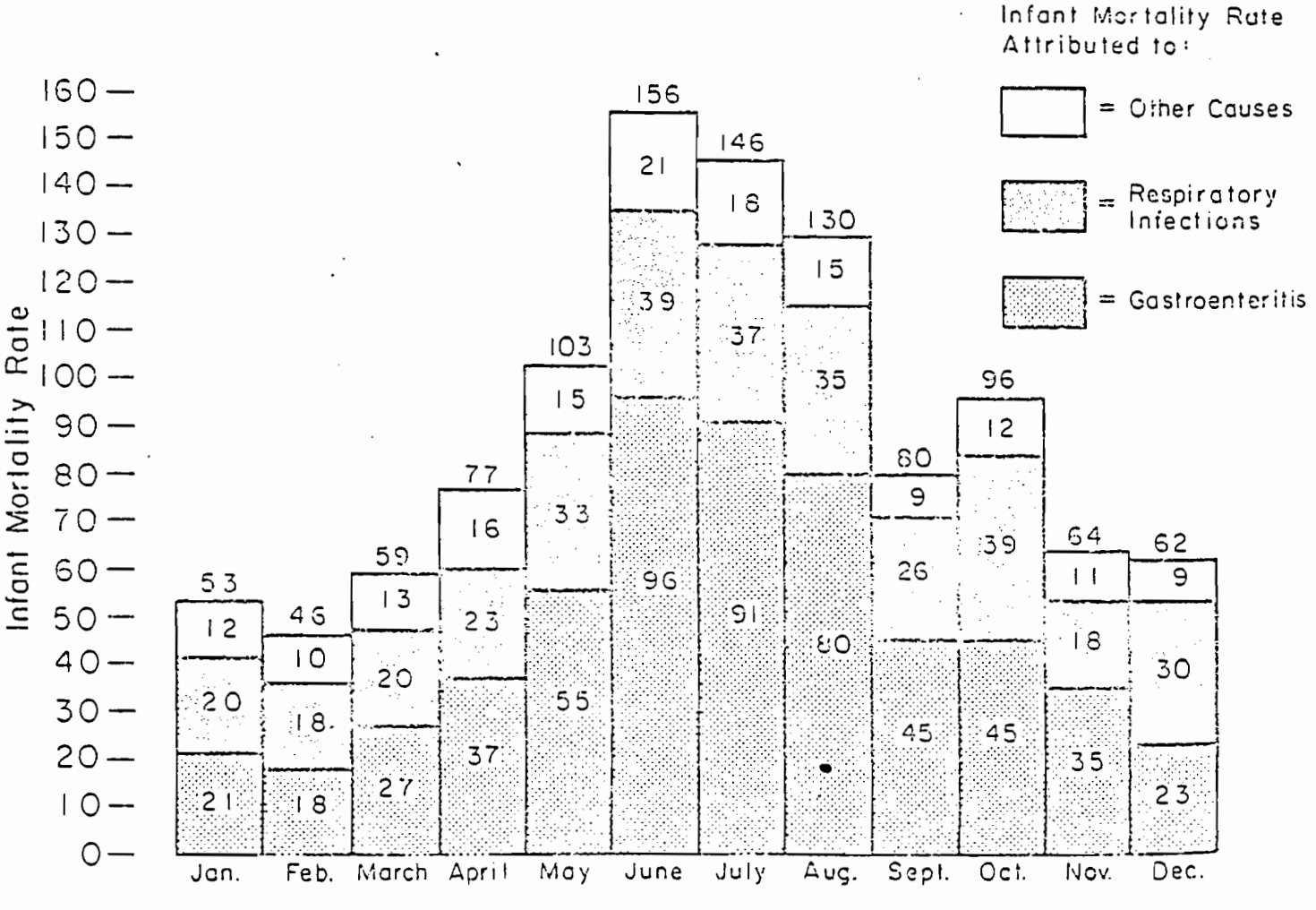
* 1984 year-end population estimated to be 48 million. The under three year old population is estimated to be 10 percent of the total population, or 4.8 million. The American University in Cairo (AUC) found in its Menoufia study, the diarrheal related deaths in under three year olds to be 38.6 per 1,000 children. If this rate applies nationally, there will be 185,280 such deaths in 1984.

NCDD

FIGURE II

MIT - Cairo University Health Care Delivery Systems Project
Health System Questionnaire : Part II
March 1978
Questions #4 and #6

Histogram: The Infant Mortality Rate in Rural Egypt by Attributed Cause of Death, 1977



Note: The histogram is based on responses from 119 of 131 (90.8%) centers/units. Centers/units were excluded from the computations if they provided incomplete information or if the sum of deaths due to gastroenteritis and pneumonia is reported to be over 20% more than deaths due to all causes for 1977.

Table XII

Factors associated with increased incidence of diarrhea in children (episodes per 100 children 0-5 years old in a three month period) in Upper Egypt

Factor	Incidence
Breast feeding only	37
Artificial feeding	83
Well water indoors	27
Well water outdoors	35
Piped water indoors	24
Piped water outdoors	36
One-two children in family	24
Three-four children in family	31
More than four children	37
Child is 0-6 months old	46
Child is 7-12 months old	80
Father is a:	
Landowner	19
Tradesman	23
Government employee	27
Tenant farmer	39

Source: Farouk Hassanein, M.D.
Assuit University

Table XIII

National Knowledge of ORT *

	Upper Egypt		Lower Egypt		Great
	Urban	Rural	Urban	Rural	Cairo
Oral Therapy					
Know it and used it	82/207 (40)	95/212 (45)	90/209 (43)	94/212 (44)	99/209 (47)
Know it and did not use it	62/207 (30)	48/212 (23)	66/209 (32)	39/212 (18)	68/209 (32)
Did not know it	63/207 (30)	69/212 (32)	53/209 (25)	79/212 (37)	42/209 (20)

Source: EPI and PHC Review Ministry of Health Egypt, 3 May 1984

* Response___ (percent)

Cluster size

General Data of Egypt

Population 46 million (1983), 48 million (expected end 1984)

Urban 44% Rural 56%

Number of children under 5 is approx. 15% of population or 6.9 million (1983)

Number of children under 3 is approx. 10% of population or 4.6 million (1983)

Projected population growth rate

Birth rate 38.9 to 36.6 (1977 to 1980)

71% of adults illiterate (1977) ; illiteracy rate of males 55%, of females 80% (est.)

4% of Egypt's land is habitable

Population density in habitable region is 2400/sq. mile

70% of urban dwellers have access to potable water within their dwellings (1977)

6% of rural dwellers have access to potable water within their dwellings (1977)

46% urban dwellings lit by electricity, 19% of rural

Shortage in urban housing units 1.5 million (1977)

Egypt is divided into 26 governorates (4 urban, 22 rural)

132 districts

4000 separate village communities

755 official villages

Per capita gross annual domestic product $357 (1982), $228 (1977)

44% of civilian labor force in agriculture (1977)

14% of labor force is abroad, or 1.43 million (1977)

Labor force abroad provides $286 million remitances (1977)

General Data - Health Resources

3% of the Egyptian Government's annual operating budget is allocated to health

Per capita government operating expenditure for health L.E. 4.65 (1982), L.E. 2.9 in 1977

Per capita public and private health expenditure L.E. 7-8 (1977)

Of the MOH budget 70% goes to salaries, 19% to operating expenses, 11% investment

Annual budgetary allocations of the MOH (1978):

Rural health unit-L.E.2200 (including L.E. 1800 for drugs)
Hospital Outpatient Attendance - L.E. 0.150 (35 million attendants/yr)

Health Personnel in Egypt

Physicians	32,000	(1977)
	4,000	graduating per year
	22,000	MOH employed
	8,000	working abroad in Arab countries, on leave, engaged in post-graduate studies or fellowships
	4,000	full-time private practices
	75-80%	of active urban physicians devode time to fee-for-service practice after MOH obligations are met
	1:1000	resident physician-to-population ratio (expected 1982)
Nurses	35,000	registered nurses (1977)
	4,000	graduating per year
	23,000	nurses of various levels
	5,700	school health visitors (part-time MOH nursing aids)

Other providers:

16,000	pharmacists (198)
5,000-6,000	pharmacies (1984) - 36% Cairo, 13% Alex, 31% rest of L.Egypt, 20% Upper Egypt
4,000	dentists (1977)
2,800	sanitation technicians
1,500	lab technicians
800	x-ray technicians
120	dental technicians
50%-80%	of all home births are attended by dayas

Health Facilities in Egypt

Urban (defined as cities of Cairo & Alexandria, capitals of Governorates, and 139 Markaz) unofficial 1982 data:

220	MCH centers
62	general urban health centers
320	health bureaus (public health units)
144	school health units
170	specialized school health units
50	school health polyclinics
5	" " hospitals
350	genral and specialty hospitals
9	university hospitals

Rural Areas:

2,400	rural care centers (1700 totally ambulatory care centers and 600 small hospitals with out-patient clinics
1,826	rural health units (small village)
550	rural health clinics
34	hospitals

Infant Mortality Rate in Egypt & Life Expectancy

Number of children under 5 yrs. is approx. 15% of pop. = 7.2 million (1984)

Number of children under 3 yrs. is approx. 10% of pop. = 4.8 " 1984
4.6 " 1983

Infant mortality rate - 98/1000 (1975)
85/1000 - 74/1000 (1977-80)

Infant mortality rate (1972) by cell:

Rural: 103/1000

Upper Egypt: 112/1000
Lower Egypt: 97/1000

Urban: 133/1000

Upper Egypt: 151/1000
Lower Egypt: 100/1000

Life expectancy (1975 MOH) - 52.3 for men
55.2 for females
Those who survive 1st yr. live an average of over 9 yrs more.

Diarrheal deaths in Egyptian Children

Mortality Rates in Children with Diarrhea

Estimated diarrheal deaths in children under 5:
Approximately half of all death in Egypt are children under 5.
Half of these infant and child deaths due to diarrhea.

60% diarrheal deaths in Upper Egypt
45-50) " " Lower Egypt

Over 90% of these deaths occur in children under 3.

Diarrheal Attack Rate: Mean number of attacks/child under 2 yrs. is 5
Most prevalent in children between 6 and 12 months.

Episode Incidence: 2-18 bouts/yr. in Egypt
3-5 bouts/yr. average in developing countries
Children under 2 years suffer twice the number of bouts than the average for children under 5 in Egypt.

Average duration of diarrhea: 4 days

Add this plus his calendar Table to menat Tables

Table 6: Proportional distribution of diarrhea specific deaths among children under 18 months by age category and study cell

Cell \ Age in month	0 - 5			6 - 11			12 - 17		
	Total deaths	Diarh. Sp'c.		Total deaths	Diarh. Sp'c.		Total deaths	Diarh. Sp'c.	
		No.	%		No.	%		No.	%
S/S - HP	32	14	43.8	41	31	75.6	18	13	72.2
DR - HD	33	25	75.8	26	19	73.1	19	12	63.2
S/S - PP	11	8	72.7	17	10	58.8	9	4	44.4
OR - Com.	16	12	75.0	13	13	100.0	4	1	25.0
Cont. 2	30	26	86.7	25	24	96.0	11	9	81.8
Cont. 1	47	36	76.6	57	49	86.0	22	15	68.2
Total	169	121	71.6	179	146	81.6	83	54	65.1

Total Dspec
93 74
95 86
37 25
225 185

~~185~~
~~410~~

~~185/410~~ ~~45%~~

185/225 82% in control area

Table 3: Distribution of total and diarrhea specific child deaths by calendar month

Months	Total Deaths		Diarrhea Specific Deaths		
	No.	%	No.	Col.%	% of total deaths
May' 80	26	5.0	18	4.9	69.2
June	36	6.9	27	7.4	75.0
July	73	14.0	57	15,6	78.1
August	61	11.7	49	13.4	80.3
September	61	11.7	40	10.9	65.6
October	24	4.6	19	5.2	79.2
November	52	10.0	39	10.7	75.0
December	51	9.8	29	7.9	56.9
January' 81	39	7.5	22	6.0	56.4
February	31	6.0	20	5.5	64.5
March	43	8.3	34	9.3	79.1
April	8	1.5	3	0.8	37.5
May	16	3.1	9	2.5	56.3
Total	521		366		70.2

May 1984

ADMINISTRATION: STRENGTHS AND CONSTRAINTS

by Jerry M. Russell, MSW, MSPH, DrPH
Management Advisor

The National Control of Diarrheal Disease Project (NCDDP) is in an unique position, administratively, to achieve its goal of reducing infant and childhood deaths related to dehydration. Because it is a new organization, operating semi-independently from the governmental structure, it can determine how best to organize itself to optimize its effectiveness. Furthermore, it can utilize private as well as governmental resources to implement its program. Finally, it has adequate financial resources to carry out its ambitious program.

I. Strengths

A. Strategy: The strategy of the NCDDP has been to coordinate and facilitate the work of existing organizations, governmental and private, in implementing a national ORT program. It tries not to duplicate activities these existing organizations already have or are capable of having. It seeks to facilitate their work through training, grants, contracts and supportive activities, such as mass media programs, conferences, newsletters, provision of technical materials and research. Egypt is fortunate to have an extensive health infrastructure, large numbers of health professionals, numerous private pharmacies, medical and nursing schools, universities, private research organizations, advertising agencies and pharmaceutical production companies. The Project has been able to work closely with these organizational resources and has not had to undertake long-term institutional development. Interest and cooperation has been excellent during the first phase of the Project.

B. Structure: The NCDDP has a well-designed structure (Figure 1) which facilitates its work. Within the framework of the Project Grant Agreement between the Ministry of Health and the Agency for International Development, policy is determined by a Steering Committee composed of representatives of the Ministries of Health, Information, Education and Social Affairs. Implementation is under an Executive Director, assisted by Coordinators (Technical Directors) for Mass Media, Production, Training, Research, Evaluation and Coordination/Implementation. In addition, there is an administrative section (currently without a Director) for contracting, accounting, transportation, procurement, supplies, typing and personnel management.

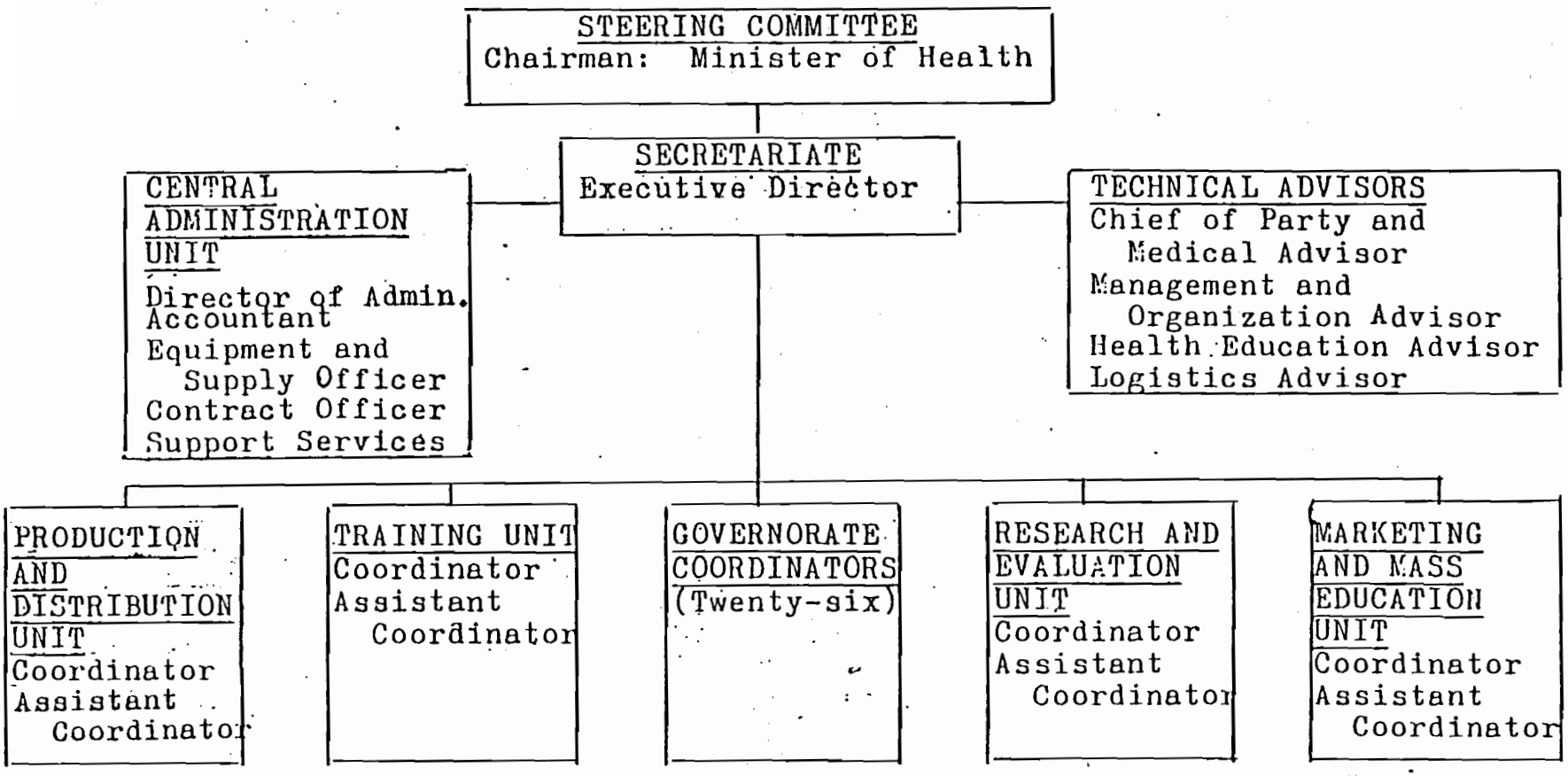
One must also consider as part of the structure, the approximately twenty contractors and grantees of the Project, as well as the many individuals who are used as consultants and trainers. By use of these "outside" resources, the organizational structure of the Project maintains a flexibility and expandibility to meet all contingencies, without locking it into an unwieldy and costly institutional structure.

C. Resources: The NCDDP is fortunate to have sufficient financial resources (US $43 million) to implement a national program without neglecting any necessary activity. In addition, as has already been mentioned, the Project has at its disposal the extensive network of hospitals, health centers, pharmacies, universities, research institutes, advertising agencies, television and radio stations, pharmaceutical production companies and well-qualified individual consultants, both governmental and private.

Figure 1

NATIONAL CONTROL OF DIARRHEAL DISEASE CAMPAIGN

ORGANIZATIONAL STRUCTURE



II. Constraints

Phase I of the NCDDP has been one of testing and development. It should be recognized, therefore, that many of the administrative constraints identified below are the consequence of rapid development and the identification of administrative requirements for expension to a national scale. They are not criticisms of the organization, but are recommendations considered to be necessary for the smooth expansion during Phase II.

A. Direction: In May, 1983 the Minister of Health decided the give the Executive Director the additional responsibility of Director of Health for one of the governorates. This has resulted in the NCDDP having the Executive Director available for an average of just over one day per week for the past 12 months. This situation has severely hampered the functioning of the Project. By necessity, during his one or two days with the Project, the Director was mostly concerned with administrative details, such as signing of letters, checks and making personnel decisions. The senior staff were unable to have more than a few minutes of his time to discuss their plans and problems. Decisions of importance were frequently delayed because there was no time to explain and discuss them with the Director. The new Director, who will start the first of June, will be available five days a week. It is hoped that this increased availability will help to resolve these problems.

B. Personnel Management: Before the Project moves into a national implementation phase, it is absolutely esential that a professional staff of the highest quality be in place. Several issues appeared during Phase I of

the Project which hampered the Project from completing this task.

1. Salaries: The Project has not felt itself free to offer salaries competitive with non-governmental organizations. In some cases job applicants have withdrawn their applications upon learning the salary being offered. In two or three cases, highly qualified persons interested in working for the Project were asked to accept salaries from one-half to one-third their current salaries. The Steering Committee should, based on the urgency of reducing the infant and child mortality due to dehydration, approve a policy allowing the Executive Director to determine an appropriate salary scale based on comparable non-governmental positions. As contract employees, Project personnel positions will terminate with the end of the Project. Hoiwever, although long-term security cannot be offered, attractive salaries will partially compensate for this lack.

There is a special problem for governmental employees assigned to work in the Project Directorate. They are restricted from receiving from any project incentive payments exceeding 200 percent of their governmental salaries. Since governmental base salaries are so low, they are likely to receive considerably lower total compensation than contract employees. This issue must be explored and a solution found which will minimize the disparity and provide a real incentive to governmental employees to consider working for the Project. Consideration might be given to provision of non-taxable allowances or to granting them leaves of absence from the Government so as to work as contract employees of the Project.

At stake are the recruitment and retention of qualified personnel,

their morale and willingness to work as equal team members of the Project staff. This is a most serious constraint to the successful implementation of the national project.

2. Complete Staff: During the first phase of the Project, several positions were not occupied, were occupied by a series of different people, or were occupied by persons who were unable to work full-time for the Project. All required positions must be filled. If part-time staff are hired, they will need to have full-time and competent assistants. The other staff must be able to know when someone will be present so that they can make their own schedules. The staff is interdependent and they rely on one-another to perform their respective tasks. Adequate salaries will help in filling vacant positions, but it is also necessary for the Project to take an early decision to actively initiate recruitment. Existing staff will be greatly hampered in an expanding program if key positions are left vacant. Positions approved by the Steering Committee in March, 1983, which are vacant include the Director of Administration, Contract Officer, Senior Accountant, and Assistant Coordinators for each of the technical sections. In addition, there are several administrative support positions which are required.

3. Personnel and Office Regulations: Personnel regulations/benefits and office procedures must be clearly defined and available to all staff. At the present time, these are not written. It is recommended that an office manual be prepared, with copies available to every staff member. The manual should contan an organizational chart, job

descriptions, personnal regulations, personnel benefits, procedures for use of vehicles, for use of typists, for travel, and for obtaining office supplies. It should contain copies of all Project forms, including the travel request form, travel authorization, travel voucher, invoice certification procedure and all pertinent instructions.

C. Financial Management: During the first phase of the Project, a number of financial management issues have appeared. There have been serious delays in issuing payments for Project obligations; the budgeting and accounting system will not facilitate subsequent evaluation of cost effectiveness; and the organization of the financial management section needs revision.

1. Payment of Outstanding Obligations: A major problem in this first phase has been the inability of the Project to make prompt payment of its financial obligations, both to its staff and to external persons and organizations. When the obligation is to an external agency, such as an advertising company, delayed payment causes hardship for the company, delays in implementing planned activities, and negatively affects the reputation of the Project, causing other companies to become reluctant to accept contracts with the Project. In the long run, this may prevent the Project from achieving its objectives.

When the delayed payment is internal, such as the payment of salaries or reimbursement to staff for travel, there is a negative impact on staff morale. They become reluctant to leave the office for field work and bad feelings develop among them. One can expect, if this continues, for there to be high turnover rate among Project

employees. They will seek other employment and new employees will have to be recruited and trained. It will become extremely difficult for the Project to achieve its objectives.

Actions which will help to resolve this problem include the following:

a. Voucher Performance Certification: Each Project Coordinator should be responsible for certifying that services or commodities, for which invoices are received, have in fact been received or performed in accordance with a Project contract or procurement issued by his/her section. When an invoice is received, the accountant should immediately give it to the appropriate Coordinator for this certification. It is not the accounting section's responsibility to make performance determinations.

b. Verification of Fund Availability and Calculations: After performance certification by the appropriate Coordinator, the Accounting Section should verify that funds are available under the appropriate procurement account and that the mathematical calculations on the invoice are correct. This will require that all procurement orders and contracts be numbered and that accounts be maintained so as to show exactly how much has been spent and, consequently, how much remains available.

c. Prompt Payment: According to the AID Project Grant Agreement, all financial obligations using AID funds must be paid within 30 days of receipt of the invoice or the vendor notified as to why payment cannot be issued. The Project should adopt a policy of issuing all payments within five work-days of receiving the invoices. The only exceptions should be incorrectly submitted invoices or invoices for

work not completed according to contract. In these cases, the appropriate Coordinator should be informed and requested to notify the vendor.

2. Budgeting and Accounting System: The present accounting system responds to the requirement of AID to account for expenditures by its traditional "resource-based" or "input-based" budgeting system. The budget and financial statements show the amounts allocated for such items as personnel, commodities, travel, etc. They do not show the amounts to be spent for each of the major program activities such as mass-media, production, coordination, research, evaluation and administration. The Project submitted its budget proposal for FY 1984 in a format which would allow both types of expenditures to be shown, but AID recast it into its own format. AID divided the budget into two overlapping and unclear categories titled: "Operational and "Program" expenditures. Because this is the way AID requires the Project's monthly invoices to be submitted, the Project has retained its accounts using the same categories.

It is recommended that both the budget and accounting system be revised to enable the Project to report and evaluate the costs for each Project activity or objective. Because this is the first national program of its type, it is important to document how much is required for each type of activity. Simply indicating how much has been spent on transportation or personnel will not adequately reflect what has been done, nor how much it cost.

3. Accounting Section: Already indicated is the need for the Project accounts to be maintained so as to show expenditures by major type of activity. Also recommended has been the need to institute a system of numbering all contracts and procurement orders so as to easily management the certifications and attributions of invoices. To manage the Accounting Section, a university trained and qualified senior accountant should be recruited. With the present two bookkeepers, this should provide the Project with a greatly strengthened system for financial management. The Project will then be able to obtain various financial analyses which are currently unavailable.

D. AID Approval Process: According to the Project Grant Agreement, AID has the right to approve all major expenditures, including the supporting ducments such as the Request for Proposals, Invitation for Bids, draft contracts and final contracts. During Phase I this approval process has varied from one day to more than two months. This has caused the Project serious delays and introduced difficulties in negotiating with potential contractors who, on occasion, seemed to believe the Project was purposely introducing delays for some ulterior purpose. These approval delays, combined with the payment delays already mentioned, have not contributed to the Project's reputation for dependibility. AID is aware of this difficulty and has begun consideration of ways to facilitate the approval process. This should be supported and implemented as early as possible.

May 1984

PRODUCTION AND DISTRIBUTION OF REHYDRATION MATERIALS IN 1983-1984

DR. HOSNI MAHROUS

I. PRODUCTION

1. Objective to assure the availability of oral rehydration salts/solution (ORS) all over the year for both Ministry of Health (M.O.H.) and the private sector, either as powder, pre-mixed solution or any other formulation to help the objective of the project according to good manufacturing procedures.

2. Establishing a quality control system for the post-production of the ORS, quality to assure the validity of the product during the shelf life.

3. Development, implementation and evaluation of special projects to determine the feasibility of alternative or supplementary packaging (for example: ready-to-use ORS), the possibility of making a one-unit dose tablet - one tablet for 100 cc. -, the use of rice powder in the ORS formula, or the use of citrate instead of bicarbonate to give a more stable ORS.

4. Production of physiologically correct intravenous fluid.

5. Production or purchase of ancillary rehydration materials.

STRATEGY

1. Calculation of market size and market potential in our calculations. We assume the 1984's end population to be 48 million and our target group, the under threes, comprise 10% of the population, i.e. 4.8 million children. 20% of 4.8 million children may need to be seen in hospitals or M.O.H. clinics and 30% of 4.8 million children to be seen in the private clinics or going to the pharmacy for advice; if we assume in the former that the child will be rehydrated in M.O.H. units using the INICEF packets, and the mother will take three packets of 5.5 gm. for maintenance, the calculations will be:

20% of 4.8 million
at M.O.H.

960,000
x 3
= 2,880,000 packets 5.5 gm.

30% of 4.8 million
at pharmacy or clinic

1,440,000
x 10 (market packaging size)
= 14,400,000

Total market needs
for 1984

= 17,280,000 packets

These estimates accurately reflect current usage of home remedies only in 50% of cases. They will be underestimates if the media campaign convinces mothers doing home care to buy ORS. But this may be offset by the fact that 60-75% of cases are in under 1-year olds, 90% in under two's. In any case, actual need and sales will be closely monitored.

2. A contract has been signed with Chemical Industries Development (C.I.D.) Co. for the production of 16,000,000 packets 5.5 gm. starting June 1st up to the end of the year according to the attached schedule, and they cover the market need for April/May with their current 5.5 gram product, Rehydran, producing 1,750,000 packets.

   C.I.D. is the only company with the capacity to produce the 1984 needs, and during the year they can increase their capacity to reach 20,000,000 packets. In C.I.D. plans for 1985 they want to increase the production capacity to reach 50,000,000 packets per year.

3. In addition other companies are highly interested in producing the ORS, but they have no capacity for the time being. To assure good product quality across time - stability - we will collect some samples from the pharmacy, distribution stores, and the Ministry of Health Units to be tested periodically. We have started our negotiations with the National Organization for Drug Control and Research (NODCAR) to set up the followup and evaluation system.

   Our plans during 1984 for the new forms of ORS begin by making a standard citrated tablet form each tablet for 100 ml of water. Market and

clinical tests will be done, but in the end we intend to use only one product.

The addition of rice powder to the ORS formula will be tested in one of our cooperating hospitals during 1984.

4. A highly successful trial of 3 poly-electrolyte intravenous solutions for severe dehydration indicated one of them - with slight modifications - should be produced for major hospitals this summer. Contract negotiations are underway with El Nasr Co.

5. The medical company for packaging is mass producing the special mothers' chair, hundreds of which are already sent to M.O.H. and University hospitals and clinics. Sherif Co. is mass producing one million standard 200 cc plastic cups (with the product logo printed on it) and plastic spoons. The cups and spoons will be given to pharmacies for free who will sell them for 5 piasters with the ORS packets - a good incentive for both pharmacist and mother.

   The project is purchasing and distributing 8-liter containers for rehydration centers, and nasogastric tubes, butterfly needles, infusion sets. An inexpensive ($39) 20 kg dial-face spring scale will be imported from the U.S. with an infant cradle and used in major centers. They have been tested and perform well.

PRODUCTION SCHEDULE OF ORS DURING 1984

Month	ORS Production (5.5 gm)	Remarks
January	-	
February	-	
March	-	
April	500,000	Rehydran
May	1,250,000	Rehydran
June	2,000,000	ORS
July	2,500,000	
August	2,500,000	
September	2,500,000	
October	2,500,000	
November	2,500,000	
December	1,500,000	
Total/year	17,750,000	

C.I.D. PRODUCTION 1983/1984 FOR ORS
5.5 gm PACKETS

Month	PRODUCTION		Remarks
	1983	1984	
January	312,000	-	
February	207,500	-	
March	-	-	
April	26,500	500,000	
May	-	1,250,000	
June	721,500	2,000,000	
July	1,251,200	2,500,000	
August	475,500	2,500,000	
September	282,800	2,500,000	
October	173,700	2,500,000	
November	947,700	2,500,000	
December	777,700	1,500,000	
Total/year	6,176,100	17,750,000	

290% increase for 1984 as result of project requirements

II DISTRIBUTION

Based on last year's experience with public sector distribution to assure the availability of the product all over the country in 1984 we looked for a private sector company which has a good coverage for all pharmacies. The contract has been signed with Middle East Chemical (M.E.C.). It is a private sector company for distribution and they distribute for Squibb Company, Bristol Myers Co., and Johnson Wax. They have five branches and more than 25 vans. They have 50 salesmen covering all Egypt. Each salesman in his area pays two visits per month, at least, to the pharmacy. M.E.C. will submit monthly report including sales, area coverage, pharmacies visited, and this can help us very much in the evaluation of our campaign.

III MARKETING

In addition to point-of-sale displays and standard project cups we will use 30 medical representatives - doctors and pharmacists - to explain ORT and diarrhea care to practicing physicians and pharmacists.

IV PROBLEMS

1. How to mix the ORS in a proper quantity of water is one of the major problems we faced in the market, and many hypernatremic cases have been received in the hospitals. To solve this problem we will give a very clear message to all target groups in how to mix the ORS (5.5 gm per 200 cc water); we will distribute a measured cup of 200 cc + spoon in M.O.H. units free of charge.

2. The availability of two dosage forms 5.5 gm and 27.5 gm can confuse the mother and we cannot use one message for mixing ORS, so we recommend the availability of one dosage form, the 5.5 gm packet, because it is easy to mix, easy to find a measure of 200 cc, and there is less waste and contamination.

3. The pharmacy profit is one of the most important factors for promoting ORS in the pharmacy. We try to increase the pharmacist's profit in two ways:

    a. Distribution of cups and spoons, free of charge to the pharmacy, to be sold to the mother for 5 piasters, one spoon and one cup for each box of 10 packets. This will increase the profit margin to 30% which is a very good margin compared with the other pharmaceuticals used in the pharmacy, and at the same time will assure the proper mixing of ORS.

b. Payment facilities for the pharmacy will be 60 days. This encourages the pharmacist to stock more than one month's needs and avoid the out of stock situation in the pharmacy during the month.

OBJECTIVES

. Assuring ORS availability and production

1984	16,000,000
1985	35,000,000
1986	45,000,000
1987	60,000,000

. Establishing quality control system for the post-production of ORS

. Development and evaluation of special projects to determine the feasibility of alternative or supplementary packaging.

R-T.U. ORS
Tablet form
Addition of starch

MARKET SIZE

	1984 end population		48 million
10%	Target group - under threes		4.8 million
20%	of target group seen in hospital		960,000
	each mother given 3 packets (5.5 gm) for maintenance	x 3	2,880,000
30%	of target group seen in private clinics. Each case ask for one box of 10 packets (5.5 gm)	x 10	14,400,000
	TOTAL NEEDS		17,280,000

DISTRIBUTION

Middle East Chemicals

5 branches
50 salesmen
25 vans

PRODUCTION OF ORS

BY

CID DURING 1984

Private Sector

12,000,000
packets of 5.5 gm

M.O.H.

4,000,000
packets of 5.5 gm

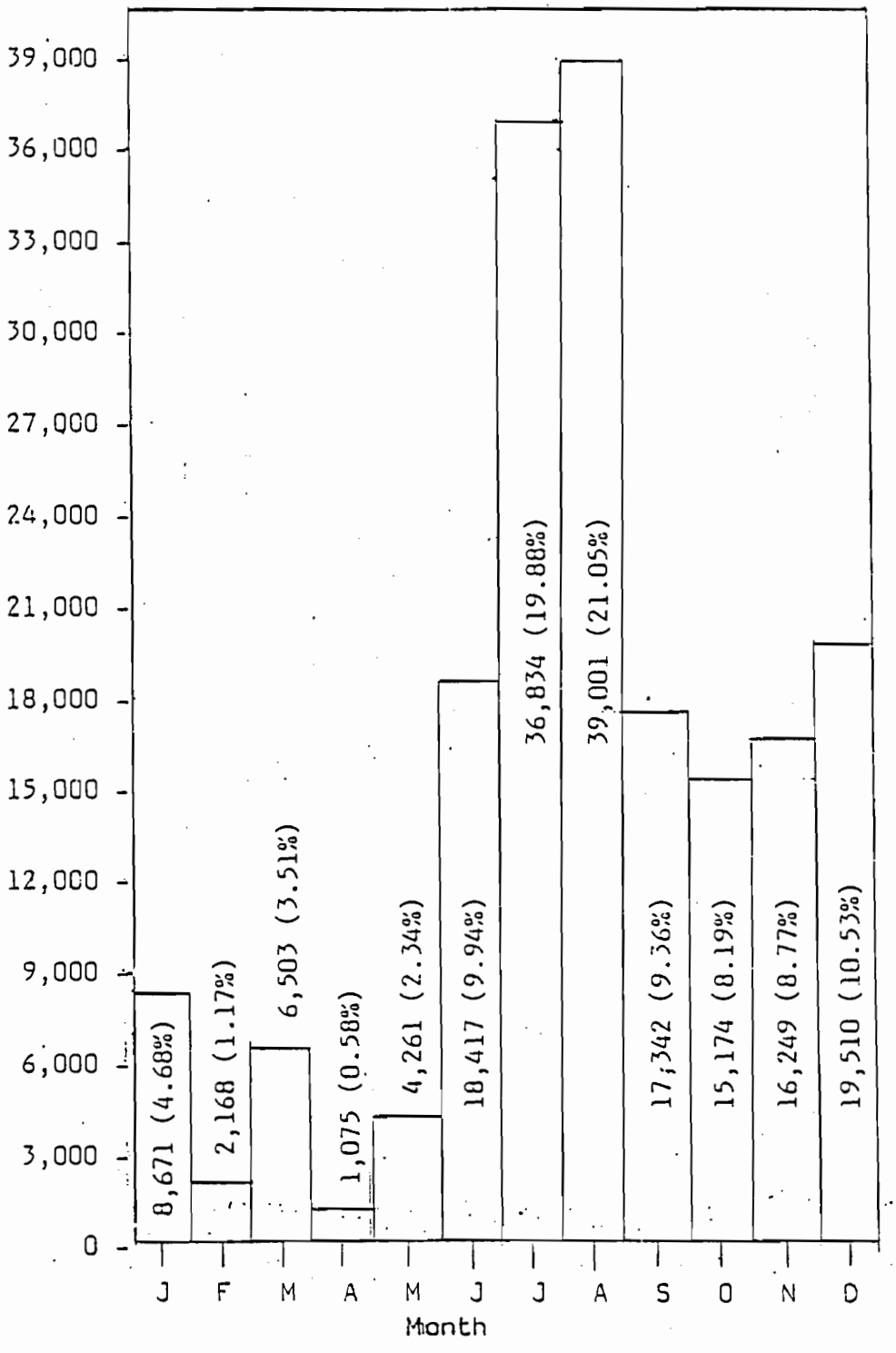
To be given to the mother for maintenance at home, average 3 packets/case

2,000,000
packets of 27.5 gm
(UNICEF)
For use in Health Units only

- Production of ORS 5.5 gm packets will start in June 1984
- We recommend that UNICEF start negotiations with CID to change their package to 5.5 gm to be available during 1985 in the health units
- CID will continue the production of 27.5 gm packets for the supply of MOH for the year 1984
- CID cover the market needs for April/May with Rehydran

ESTIMATED DIARRHEAL RELATED DEATHS

IN CHILDREN UNDER THREE YEARS OLD, BY MONTH*



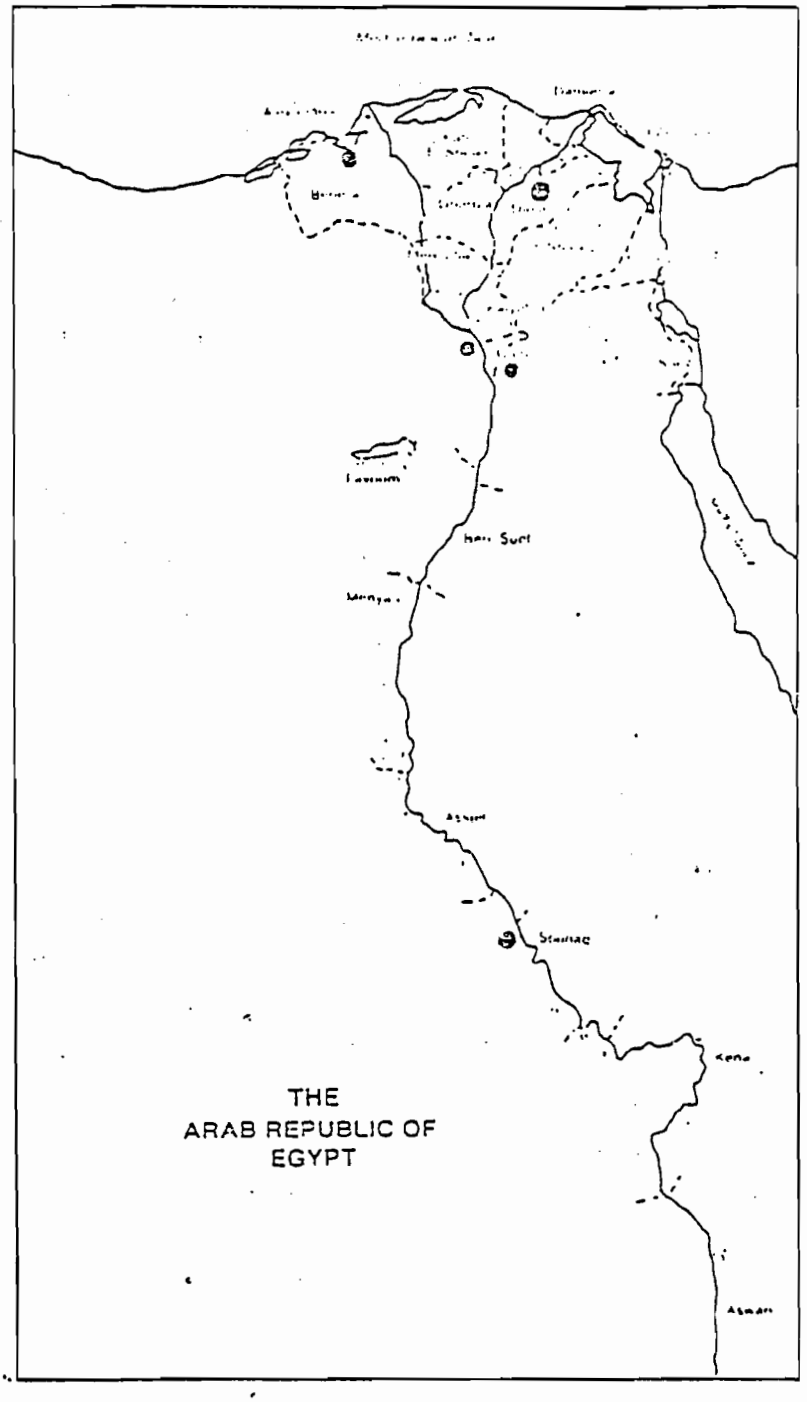
* 1984 year-end population estimated to be 48 million. The under three year old population is estimated to be 10 percent of the total population, or 4.8 million. The American University in Cairo (AUC) found in its Menoufia study, the diarrheal related deaths in under three year olds to be 38.6 per 1,000 children. If this rate applies nationally, there will be 185,280 such deaths in 1984.

NCDD

DISTRIBUTION

Middle East Chemicals

5 branches
50 salesmen
25 vans



٥,٥ جرام

ريهيدران

لعلاج الجفاف

5.5 Gm.

rehydran

ANTIDEHYDRATION

وزارة الصحة

مسحوق

لعلاج الجفاف

للاستعمال عن طريق الفم

إرشادات الاستعمال

يحضر بإذابة محتويات الكيس في لتر من ماء الشرب - ويقدم للشرب منه بحرية حسب إحتياج المريض أو تبعا للإرشادات الطبية .

إحتياطات

- يجب عدم غلي المحلول .
- لايستعمل المحلول بعد ٢٤ ساعة من تحضيره .

إنتاج شركة تنمية الصناعات الكيماوية - الجيزة - ج.م.ع
بمساعدة اليونيسيف لوزارة الصحة .

محلول معالجة الجفاف بالفم

أعداد المحاليل وأستعماله :

تذاب محتويات هذا الباكر الواحد ل كوب ماء (سعة ٢٠٠ سم٣) ويعطى للطفل ليشرب منه أكبر قدر ممكن مع استمرار أرضاع الطفل من ثدى أمه وتغذيته الطبيعية .

الباكر الواحد يحتوى على :

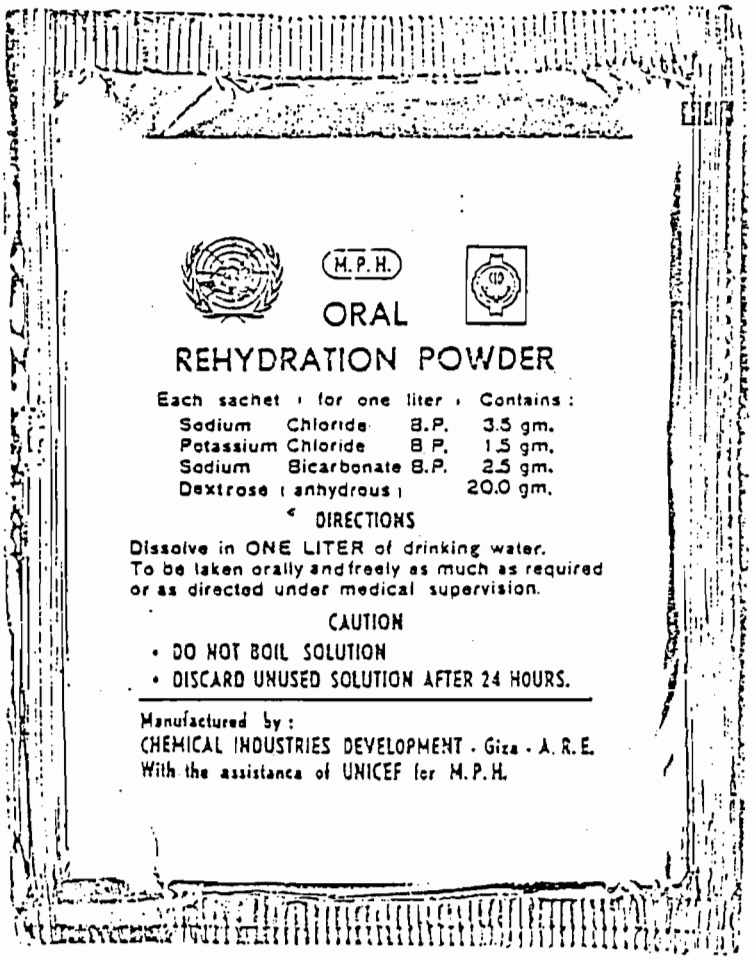
كلوريد صوديوم	٣٫٥ جم
بيكربونات صوديوم	٢٫٥ جم
كلوريد بوتاسيوم	١٫٥ جم
جلوكوز	٢٠ جم

تذاب المحتويات مباشرة قبل الاستعمال فى كوب ماء سعته غليه وتبريده

يحتوى على :

كلوريد صوديوم	٣٫٥ جم
بيكربونات صوديوم	٢٫٥ جم
كلوريد بوتاسيوم	١٫٥ جم
جلوكوز	٢٠ جم

تذاب المحتويات مباشرة قبل الاستعمال فى كوب ماء سعته غليه وتبريده



Guidelines for Establishing and Operating a Rehydration Center

I. THE CONCEPT OF A REHYDRATION CENTER

Dehydration is the largest killer of children in Egypt. Each year more than 150,000 Egyptian children die from dehydration due to diarrhea. Most of these children need not die. They can be saved through rehydration with an electrolyte solution. We now know that all but the severest cases can be rehydrated quickly, simply and effectively with an electrolyte solution administered orally.

Because up to 70% of the children seen in health facilities in Egypt are suffering from diarrhea and show signs of dehydration, all health facilities serving children should place special emphasis on rehydration by establishing a rehydration center.

The purpose of a rehydration center is threefold:

1. To provide specially trained staff to diagnose dehydration and determine the appropriate treatment;

2. To provide a place where the initial rehydration can be done on-site under the supervision of trained staff; and

3. To provide a place where mothers can be taught about dehydration, how to properly mix ORS and how to give it to their children.

II. ESTABLISHING A REHYDRATION CENTER

A. Services

1. Oral Rehydration

Between 90 and 95% of the children seen at the rehydration center suffering from dehydration from diarrhea will be good candidates for oral rehydration.

The child determined to be in need of oral rehydration is kept in the center from 2-4 hours (or until the initial rehydration is accomplished) during which time the mother administers the ORS under the supervision of the staff. In addition to therapy, the mothers are

given education that will help her care for the child during the current bout of diarrhea and to prevent subsequent cases. Upon discharge, the mother is given either a prescription for ORS packets or the packets themselves to enable her to maintain hydration in the child until the current bout of diarrhea subsides. Mothers are encouraged to return to the center if the signs of dehydration return in spite of giving the child the ORS at home.

2. Nasogastric Rehydration

Not all children who are conscious are able to take ORS by mouth. Some children vomit too frequently. Others are conscious but are too tired to drink. In some cases, the child with diarrhea needs sleep as well as rehydration; in others, it is the mother who has been awake caring for her child who needs the sleep. In such cases, rehydration with the oral rehydration solution using a nasogastric tube is the appropriate method of therapy.

Nasogastric rehydration should be limited to those facilities where trained staff are available.

The treatment area for nasogastric rehydration should be separated from the treatment area for oral rehydration but should be adjacent to it or close by. In facilities where space is limited, the treatment area may be divided into sections--one for oral rehydration and the other for nasogastric.

3. Intravenous Rehydration

Intravenous rehydration is the treatment of last resort rather than first resort for children suffering from dehydration from diarrhea. It should be reserved for the small percentage--usually about 5%--who show signs of severe dehydration.

Because they are the recipients of referrals of the more serious cases from other facilities, all hospital-based rehydration centers should have intravenous rehydration available to those cases in need of parenteral rehydration.

The treatment area for intravenous rehydration should be in a separate room from the treatment area for oral rehydration. The intravenous treatment area and the nasogastric treatment area may be combined.

B. Space

The space assigned to the rehydration center should be an area that has been specifically designated for that purpose and is physically separated from other units in the facility.

The exception to this is the small, rural health center with limited space. In these cases, the rehydration activities may be carried out on a porch or in a garden.

1. Location

The location of the rehydration center is very important. It should be located in a place that is highly visible to patients using the facility for other health care needs so that they become aware of its existence and seek it out when their child comes down with diarrhea. It should also be easily accessible from the triaging unit so that mothers can proceed directly to the center with a minimum of confusion to themselves and disruption to the functionning of the rest of the facility.

Locations that meet these criteria, in priority order, are:

- Adjacent to or near the emergency room since the rehydration center, like the emergency room should be in operation 24 hours a day
- Adjacent to or near the outpatient clinic
- Adjacent to or near the pediatric section

In choosing the location for the rehydration center, other factors should also be considered:

- A location on the first floor provides ...
- The location should be near a WC in order that it can be used by the mothers when needed and also so that the mothers can wash out the babies clothes when they become soiled
- If possible, the center should be located near a place where accompanying children can play and other family members can wait since the mother and dehydrated child may remain in the center for as long as 6 hours.

2. Square footage

a. Minimum square footage

b. Additional space requirements

3. Lighting

4. Ventilation and Temperature

Adequate ventilation and temperature control is essential in the rehydration center. In the summer, the temperature can easily reach 40 degrees centigrade. Children in the center are already dehydrated and remaining in a hot room with stagnant air will stimulate perspiration and thus aggravate dehydration. Therefore, the center must have the ability to maintain the temperature below 35 degrees centigrade with adequate air exchange. Equipment needed to meet this objective is either an air conditioning unit or a ceiling fan.

o Air conditioning unit

An air conditioning unit is the preferred method of ventilation and temperature control, especially in areas where temperatures consistently reach 40 degrees centigrade. Centers installing air conditioning units must be entirely closed in, preferrably air tight, in order for the air conditioning unit to operate effectively and efficiently.

o Ceiling fan

A ceiling fan is an acceptable alternative in areas which are cooler. If a fan is used, the room should be set up in such a way that the children being rehydrated are placed between the fan and an open window or doorway so that they may receive the maximum cooling effect from the fan.

5. Plumbing

A sink with running water should be available within the center itself so that both personnel and mothers can wash their hands after handling the children and before preparing the oral rehydration solution. The center itself should be a model for good sanitary practices and thus for diarrhea prevention measures.

6. Screens

In centers which are not air conditionned, screens are a necessity to keep out flies.

7. Decor

Mothers will spend several hours in the center rehydrating their children and therefor the center should be a relatively attractive place to be. Walls should be in good repair and painted a light color. The walls may be decorated with pictures or educational posters.

B. Equipment

1. Basic Equipment for an ORT Facility

- Balance--This is used to weigh the child before rehydration begins, periodically during the rehydration process and before discharging the patient to gauge the amount of rehydration that has actually taken place.

- 200 cc. glasses--Plastic glasses measuring exactly exactly 200 cc. and bearing the ORT logo are available through the project. The center should have a sufficient number of these glasses on hand to cover the peak summertime load.

- Mothers' chairs--These are school desks with the writing arm on the right-hand side. A hole has been cut in it to hold the glass and prevent it from spilling. The mother's chair was designed so that the mother can hold the child in the correct position in her left arm and feed the child with her right hand.

- Benches--Benches may be provided in addition to the mothers' chairs since some mothers prefer to sit cross-legged on these benches when feeding their child.

- Mixing vessel (1 litre)--If the center has a supply of the UNICEF 27.5 gram packages of oral rehydration salts, these packages should be used for bulk mixing of the solution for on-site feeding. Bulk mixing requires a mixing vessel of at least one liter capacity, preferably 8-10.

- Mixing/Demonstration Table--In most rehydration centers, the staff prepares the oral rehydration solution in volume for the mothers to use for on-site rehydration. The proper procedures for mixing the 5.5 gram packages should be demonstrated to the mothers since this will be the package that they will be preparing at home. A table should be placed in the center for both of these purposes.

- Coleman (Thermos jug)--This is used to store and dispense the ORS in the center. It can also serve as the mixing vessel

- Thermometers--Children who are feverish should have their temperatures taken in order to determine whether drug therapy is called for or whether steps should be taken to reduce the child's temperature.

- Storage shelves or cabinet--A storage cabinet or storage shelves large enough to hold the packages of rehydration salts, the cups and spoons, and teaching materials will be needed.

- Sign--To clearly identify the rehydration center, a sign is necessary. The sign should be ___ X ___ in metal or wood, painted in black and white using a good quality paint. To aid in recognition, the sign should include the ORT logo so that the mothers can associate the center with the media promotions and the packages of rehydration salts available from the pharmacies.

- Treatment Chart--At least one treatment chart, written in Arabic should be hung on the wall of the rehydration center so that the staff may refer to it as necessary.

- Teaching materials--A variety of audiovisual materials and props should be readily available in the center to teach mothers how to mix the oral rehydration solution and feed it to their children. At a minimum, teaching materials should include:

  -- A 200 cc. glass with the ORT logo on it to show mothers the ideal glass in which to mix the rehydration solution

  -- A variety of sizes of glasses found in the home to show the mother what is meant by a 200 cc. glass

  -- A variety of empty soft drink bottles to show mothers how to calibrate the glasses they have in their homes

  -- A flip chart for teaching mothers how to mix the oral rehydration solution and administer it to their children (This flip chart is currently being developed by the NCDDP)

- Refrigerator or cooler--

2. Additional Equipment Necessary for Centers Doing Nasogastric Rehydration

   - Table or beds for the child

   - Stand with hook to hold the bottle of ORS

3. Equipment Necessary for Doing Intravenous Rehydration in Hospital-Based Rehydration Centers

   - Table or bed for the child

   - Stand with hook to hold the IV bottle

- o Cart or table for supplies

4. Special Equipment for University-Based Rehydration Centers Doing Research

   - o Flame photometer
   - o Microscope Binocular
   - o Micro Haematocrit
   - o Pocket Calculator
   - o Scale sensitive to 5 grams for weighing diapers

D. Supplies

1. Supplies Necessary for a Basic Oral Rehydration Center

   - o Rehydran or Mahloul Moalget al Gefef (5.5 gm packets)
   - o Oralyte (UNICEF) 27.5 gram packets) for use at the center only
   - o Glasses and spoons
   - o Register book

2. Additional Supplies Necessary for Doing Nasogastric Rehydration

   - o Nasogastric tubes (pediatric)
   - o IV bottles
   - o Plastic syringes

3. Additional Supplies Necessary for Hospital-Based Centers Doing Intravenous Rehydration

   - o Special intravenous solution
   - o Scalp needles
   - o Straight needles
   - o Infusion sets
   - o Syringes
   - o Alcohol cotton

o Tape

4. Special Supplies for University-Based Rehydration Centers Doing Research

o Urine collectors

o Plastic-backed disposable diapers

E. Lay-Out of the Center

The physical lay-out of the center of the rehydration center is a critical factor in the efficient operation of the center which in turn has a impact on good patient care. In a well laid out center, the supervisor and staff have better control over the flow of patients and can assure patients receive the care they need in a timely fashion. From the staffs point of view, a well-controlled center is an easier and less tiring place in which to work.

The lay-out of the center can be thought of in terms of work stations, separate areas within the center where specific tasks are performed. The following work stations are recommended for rehydration centers:

1. Intake--This is the work station where the patient will go immediately upon entering the rehydration center. It is here that the mother will present their referral slip. The patient will be registered and triaged (that is, their degree of dehydration assessed and method of treatment decided on).

   This work station should consist of a table or desk on which is placed the Register Book and the balance. There should be enough space on the table to place the patient while her or she is being examined and still not interfere with the other tasks being carried out at the work station.

   The table should be place either directly outside or directly inside the door of the center. It should be positioned in such a way that, on a busy day when are lining up for intake, the line will not interfere with the movement of staff or patients in and out of the center.

   The intake work station is ideally be staffed by both a doctor and a nurse.

2. Treatment Area--This work station will take up the majority of the space of the rehydration center. If center provides nasogastric and/or intravenous rehyration as well as oral rehydration, there should be a sep-

arate treatment area for oral therapy.

In the treatment area for oral therapy, the mothers' chairs or benches should be placed around the outside of the room facing inward. This leaves the center of the room completely open. Such an arrangement may be to be a waste of space but it serves several very useful purposes. It allows the staff to move freely around the treatment area. It also allows the staff member supervising the treatment area to do so from almost any location within the room. It also allows the mothers to see the faces of other mothers and watch what they are doing; it encourages interaction between mothers.

The treatment area for intravenous and nasogastric....

3. Mixing Area--The mixing area should be located in the area where running water is available. Mixing should be done on a flat surface where the packets of ORS can be counted and laid out.

   Mixing is a critical task so it is important to locate this work station in a place where the person doing the mixing will not be distracted during the task. If the mixer loses count of the number of packets used, the solution will be too weak or too strong.

4. Dispensing Station--The dispensing area should be located in the same room as the treatment area, either on one side or in the center. It should consist of a table on which the Coleman (thermos) of ORS is placed.

5. Supervisor's Station--This work station consists of a on which a nurse sits to supervise the mothers as they administer the ORS to their children. It can be located either on one side of the treatment area or in the center of the room. The dispensing station and the supervisor's station may be combined.

6. Teaching and Demonstration Station--A place within the treatment area should be designated for teaching mothers about diarrhea and dehydration and training them to mix the ORS themselves. For this, a table is required. It should be placed so that it can be seen clearly by all of the mothers. This station may be combined with the dispensing and supervisor's station.

7. Exit Interview--This is the last work station is the rehydration center. It should be placed so that all patients must stop there as they leave the center. This means that is must be located either directly inside or directly outside the door of the rehydration center, near the intake station so that the Register Book can be consulted. In centers that are not very busy, the exit interview can be combined with the intake station as

long as the line of incoming patients can be kept separate from the line of patients who are leaving.

Several sample lay-outs are included in Appendix __ to show how these stations can be organized for rehydration centers in different kinds of facilities and of different sizes.

F. Staffing

1. Hospital-based: staff should be dedicated to the center, all trained.

a. Staff Composition

o Physicians

At least one pediatrician trained in all aspects of rehydration therapy

o Nurses

The number of nurses necessary will depend on the number of patients seen each day in the center.

0-10 patients per day	1 nurse
10-20 patients per day	2 nurses
20-30 patients per day	3 nurses
more than 30 patients per day	4 nurses

o Accessory personnel

b. Role of Pediatrician

o Intake--The pediatrician should do the initial assessment of the child and decide upon the appropriate method of rehydration

o Reassessment--The pediatrician is responsible for reassessing the condition of each patient periodically, at least every two hours

o Supervision--The pediatrician is responsible for supervising all other physicians and nurses to ensure that they are carrying out the jobs assigned to them

c. Role of the Nurses

o Intake--The nurse should interview the mother and enter all of the data in the Register Book. The nurse should weigh the baby and record its weight.

- Mixing ORS--The nurse should be responsible for mixing the ORS and keeping the Coleman (thermos) replenished.

- Dispensing--The nurse should be responsible for dispensing the ORS. The mother may be allowed to help herself to the ORS each time the child finishes a cup but the nurse is always responsible for keeping track of how many cups the child has received.

- Supervising--The nurse is responsible for making sure that the mothers are administering the ORS correctly. She should watch for the following:

  --The child is being held in the correct position

  --The ORS is being administered at a rate of one teaspoon per minute

  --The child is not breastfed until the initial rehydration is accomplished

  --The child is awakened to continue rehydration if it falls asleep

  If the nurse observes that any mother is administering the ORS incorrectly, it is her responsibility to correct the mother and demonstrate the proper technique.

  In her role as a supervisor, the nurse should also be the eyes and ear of the doctor. If she hears or sees anything relevant to the treatment, she should inform the doctor. For instance, if in her discussions with the mother she learns that the mother has been given incorrect information by another doctor or a pharmacist, she should notify the center's doctor so that he or she can correct the misinformation. Also, if she observes a child's deteriorating condition, continued vomiting or frequent diarrhea while the doctor is not in the treatment area, it is the nurses responsibility to report these to the physician immediately.

- Educating Mothers--The nurse should be trained to teach mothers about diarrhea and dehydration, the mixing of ORS and the prevention of diarrhea using the protocol in this book. She should hold at least one group session each day and do individual teaching if a mother misses the group session.

- o Exit Interview--As the patient leaves the rehydration center, the nurse is responsible for recording the number of cups of ORS the child has taken, weighing the child and recording the weight, giving the mother packets of ORS to take home (if this is the center's policy), and reviewing the directions for mixing the ORS with the mother to be sure she understands them.

2. MCH Centers

   - o All personnel must be trained

3. Urban Health Center-based

   - o 1 trained MD
   - o All nurses must be trained since they will share the responsibility of working in the center

4. Rural Hospitals

   - o 1 physician
   - o 3 nurses (1 per shift)

5. Rural Health Center

   - o 1 trained physician
   - o All nurses must be trained since they will share the responsibility of working in the center

6. Rural Unit
   - o

G. NCDDP Starter Kit

The National Control of Diarrheal Diseases Project will provide all cooperating rehydration centers with a kit of material needed to open a rehydration center for doing oral rehydration therapy. The kit contains:

- o Cups and spoons--Cups and spoons will be provided to the rehydration center for both on-site rehydration and for distribution to mother along with the packets of ORS.
- o Mothers chairs--according to the space allocated

- Treatment charts--The starter kit includes two large wall charts, one in Arabic and on in English, describing the correct treatment for dehydration. The Arabic chart is to be hung in the rehydration center. The placement of the English version is optional. It may also be placed in the center or it may be hung in some other place where it will be seen by other members of the facility's staff such as the staff room or the director's office.

- ORT buttons--1 lapel button containing the ORT logo will be provided for each of the trained staff members identifying them as a person who can provide information about oral rehydration.

- Sign--metal, with the logo identifying the room as the rehydration center for children with diarrhea

- Record book

- Teaching materials:

  -- Flip Chart (as soon as it is developed)

- Scientific articles for staff education (also Hopkins in English and in Arabic

- Calendar

- Fouad El Mohandis tape

Appendix __ shows the quantity of each of these material provided in the Starter Kit according to the type of facility and the expected number of patients.

III. OPERATING THE REHYDRATION CENTER

A. Hours of Operation

- The rehydration center should be open 24 hours a day

B. Operating Procedures

1. Intake Procedures

2. Triage Plan (who to send home, who to keep, who to refer)

3. Patient Management Plan

a. Oral rehydration

Oral rehydration is indicated in almost all cases of dehydration. As long as the child is strong enough to drink, oral rehydration is the treatment of choice.

b. Nasogastric

Nasogastric rehydration is indicated in the following cases:

- o Child is too weak to drink
- o Child vomits more frequently than four times per hour

Nasogastric rehydration may be performed in a health center but only by ....

c. Intravenous

Intravenous rehydration is necessary in less than 10% of the cases of dehydration. It need only be used in the following cases:

- o Child is in shock
- o Child is too weak to drink
- o Child vomits more frequently than four times per hour

Intravenous rehydration is accomplished using a special single solution of the following composition:

Components	Milliequivalents/Liter
o Sodium	90
o Potassium	15

- o Chloride 65
- o Acetate 40
- o Glucose 111

This solution is available through the project.

The following routes may be used for intravenous rehydration. They are listed in priority order:

- o Scalp vein using a butterfly needle
- o External jugular using a butterfly needle
- o Internal jugular using a syringe and 21 gauge needle
- o Femoral (vein, artery) using a syringe and 21 gauge needle
- o A cutdown is rarely necessary and be cause of the danger of infection, it should be considered only as the very last resort

Intravenous rehydration can be accomplished quickly and requires only 6 to 8 hours. As soon as the child is out of shock or is strong enough to drink, intravenous rehydration should be replaced by oral rehydration.

d. Drug therapy

e. Nutrition therapy

f. Special procedures

1. Lowering body temperature--minimizing continued dehydration using cold compresses/alcohol rubs

4. Teaching Plan

All mothers should be taught about the signs and symptoms of diarrhea and dehydration, how to mix the ORS, and what measures to take to prevent diarrhea in the future.

Teaching is most effective and efficient when done in a group. Group training sessions should be organized at least once a day and more often if there are many mothers or the mothers' arrivals are spread out through the day.

It is best to wait to begin the teaching until most of the children have begun to be rehydrated. At this time, the children are less irritible and the mothers are less worried so they can turn their attention to the information that will be given. For a center where most patients arrive between 9 AM and 10 AM, 11 AM is usually a good time to hold the first teaching session. Additional sessions may be held at about 1 PM and 3 PM if necessary.

If any mother misses the group session, she should be taught individually. NO MOTHER SHOULD LEAVE A REHYDRATION CENTER WITHOUT BEING TAUGHT HOW TO MIX AND ADMINISTER THE ORS.

a. Mixing

MOTHERS SHOULD BE TAUGHT TO MIX THE 5.5 GRAM PACKET ONLY. The 27.5 gram UNICEF packet should be reserved for bulk mixing only.

A special 5 part process has been developed that makes it easy for the staff to teach the mothers the skill of mixing and also makes it easy for the mothers to learn.

Part 1: Show the mother one step at a time how to mix the ORS. Describe what you are doing as you do it.

The individual steps that make up the process of mixing are:

- o Choose the correct glass. The plastic glass with the ORT logo is the best. Otherwise, the mother should be taught to recognize a 200 cc. glass out of a selection of glasses.
- o Take the packet of ORS and shake it so that all of the powder goes to the bottom of the packet
- o Carefully open the packet so that no powder is lost
- o Pour all of the powder from the packet into the glass
- o Check inside the packet to make sure it has been completely emptied
- o Use the cleanest drinking water available.

- o Pour in exactly 200 cc. of water. If using the glass with the ORS logo, this means pouring water up to the line. If no standard 200 cc. measure is available, a small soda bottle should be filled to the first ring on the neck and this water added to the powder in the glass.

- o Stir the solution well with a spoon until all of the powder is dissolved.

- o Taste the solution to see what the correct mixture tastes like

Part 2: Show how all of the steps go together to form the single task of mixing. Perform the mixing process at normal speed.

Part 3: Repeat the mixing process but purposely make mistakes at each step and ask the mothers to point out your mistakes

- o Choose the wrong glass such as a small tea glass

- o Begin to open the packet without shaking it down

- o Begin to open the packet carelessly

- o Pour only part of the packet into the glass or take only a teaspoon or two

- o Do not fill the glass to the line or use less than a bottle full of water (let the mothers tell you this is wrong but do not correct this mistake so they will be able to taste the difference when the solution is too strong)

- o Give a quick stir that is not enough to dissolve the powder

- o Finish stirring and let the mothers taste the stronger solution

Part 4: Ask one mother to demonstrate how to mix correctly and ask the others to look for any mistakes. Be sure to tell the mother 'good' after each

step she performs correctly.

Part 5: Ask the mother to repeat the mixing process again but this time at normal speed rather than step by step.

b. Administration

The same 5 part process is used to teach mothers how to correctly administer the fluid to their child, but the steps of the administration process, of course, differ from those in mixing process. The steps of the administration process are as follows:

- o Sit the baby upright on the your lap with the baby's head supported on your arm
- o Give the baby one teaspoon every minute. (If the baby is small or if it crying for more fluid, it may be better to give only a few drops on the end of the teaspoon continuously. This results in the same amount of fluid being taken but is better for the child.)
- o If the baby falls asleep, it is awakened to continue giving fluids. Fluid should not be poured in the baby's mouth while it sleeps

5. Dispensing

a. Prescription or actual dispensing, according to the policy of the center

b. NCDDP recommends dispensing of 3 small packets to the mother on discharge

c. NEVER DISPENSE THE 27.5 g. PACKAGE TO MOTHERS

C. Record-Keeping and Reporting

1. Patient Registration

The treatment register has been designed for two purposes:

- to provide a work sheet for diagnosis and treatment of a child with diarrhea

- to provide a ready means of compiling statistics about patients and their treatment

Two sample pages of the treatment register are presented in Appendix I. The first, Sample A, is a blank form as seen in the register book; the second, Sample B, is a form filled in with data as may be commonly found in a rural health unit, MCH center, or outpatient department of a hospital. Each sample page has numbers in circles which correspond to the descriptions given below.

Sample A

1 This section identifies the location of the health facility and should be fiAed in on each page

2 Each page has space for 10 patients. Each page should be filled out with 10 patients even if they come on different dates. That is, do not start a new pae until the previous one is filled with 10 patients. As will be explained later, using 1 page with 10 patients makes compiling statistics much easier.

3 Fill in month, day, and year for each patient.

4 Patient's temperature on entry is recorded in this column. If it is not measured, place a dash (-).

5 The age of the child is recorded in this set of five columns by placing a check ( ) in the appropriate column:

-1 = Birth - 11 months

-2 = 12-23 months

-3 = 24-35 months

-4 = 36-47 months

-5 = 48-59 months

Estimation of age may be necessary. If a child is more than five, do not enter the patient in this register but, of course, treat as usual.

6 This set of three columns is used to ask about the patient. The doctor or nurse will ask more questions than these three, of course ("Is there any cough?" "How many days has s/he been ill?") but these three questions are the most important. The worksheet record is sufficient for the three questions listed here; other information may be noted under "comments" (see 13 below).

6A If the diarrhea is watery (would run to all sides of a container), put a check here. If not, no mark is made. Watery stool always means some dehydration is present.

6B If there has been vomiting, put a check here. If not, no mark is made. Vomiting is an indication to observe the child more closely.

6C If the mother reports blood and mucus in the stool, put a check here. If not, no mark is made. Dysentery may require treatment with antibiotics especially if there fever.

7 This set of four columns are for the most important observations of signs of dehydration. Other important findings of the physical exam (such as heart murmur, or rales) may be noted under comments (see 13 below). As before, place checkmarks ( ) only where there are findings.

7A Is there decreased skin elasticity?

7B Are the eyes sunken?

7C Is there decreased urine output? (This column may be filled in after one or two hours observation, or from the history. It is important to follow urine output as a sign of hydration.)

7D Is the child in shock? (no pulse, stupor or coma)

Watery diarrhea without a sign of dehydration should be taken to mean loss of weight (in fluid) of about 5% of body weight.

Watery diarrhea with any sign of dehydration, but the child is not in shock, should be taken to mean loss of weight (in fluid) of about 10% of body weight.

If there is dehydration and shock, the child needs intravenous therapy for fluid loss of 10-15% of body weight.

8 The body weight in kilos and grams is recorded to the nearest 10 grams. Body weight is a useful measure but not critical to successful rehydration.

9 The number of 200cc. cups of oral rehydration solution taken at the health unit is recorded by ticks: ||| = 3, |||| = 5. The child should be given as much fluid as he desires.

10 Weight after 4 hours of treatment should be recorded here.

11 The outcome is recorded in two columns:

11A The child is improved

11B The child is referred to the hospital

A child may not be improved but is also not sick enough to be referred. In this case, no ( ) is made in either column. Improved means that if a child had signs of dehydration, these are gone, and that urine flow is established. Return of appetite and activity are also signs of improvement.

12 This column is available for any comments not covered by prior columns.

13 The doctor or nurse in charge of the case signs here.

14 The bottom row is for page totals where space is open. These may be done after each page is completed or at any time later on.

15 Pages of the register are numbered. 10 times the page number plus the number of patients on a page not completely filled up equals the number of patients seen so far. Page totals for each column are added. When each of these are divided by the total number of patients and the answer multiplied by 100, percentages of patients with each of the findings may be calculated.

Sample B

Here are some ways the data may look:

1 Different dates may be entered on the same sheet. This column shows the last two patients from 17/5/83, all seven patients from 18/5/83, and the first patient from 19/5/83.

2 The first child entered is under one year of age. Note that none of the 10 children is between 36 and 47 months old (-4).

3 Child #6 has no vomiting, so no ( ) was placed here.

4 Child #2 has watery diarrhea, vomiting, blood and mucus in the stool.

5 Child #5 has no signs of dehydration.

6 Weight is recorded to the nearest 10 grams.

7 Tick marks are made as each cup is finished. At the end of treatment, the total number of cups each child drank is written.

8 Outcome is recorded here.

9 Note that child #5 is neither improved or referred The comments indicate that the child is to return the next day.

10 Comments are used to add information (patients #2, 6, 7), prescribe extra treatment (patients #2, 7), indicate a complication (patients #3, 9), or mention scheduled visits (patients #5, 10).

11 Note that patient #10 was seen the day before and listed as patient #5. There are several ways to identify a child who has been in for treatment before. In the regular patient record kept by the unit, note the register page number and child's number on that page, from 1 to 10, whenever a visit is made. Alternatively, use the road to health chart to record that information. Lastly, give the mother a card with that information.

12 Totals are entered for each page. The number of 200cc. cups is divided by 5 to give liters. Eventually, percentages and liter per patient may be computed when large numbers of patients have been seen or after a specific amount of time has passed.

D. Supervision

E. Inventory Control

The purpose of an inventory control system is to ensure that supplies, especially the ORS, are always available when they are needed.

The simplest effective inventory control system is called the 'two bin system'. Just as the name implies, the stock is divided into two parts which are physically kept separate. One is called the active stock and the other is the reserve stock.

The amount of the stock in each bin is calculated according to the specific characteristics of the center--the number of packages distributed per day on a busy day X the number of days it takes to receive new stock from your supplier after placing an order.

When the active stock is used up, the reserve bin become the active bin and a new order is placed immediately to restock the empty bin. When the new stock arrives, this bin becomes the reserve bin. The process continues in a cyclical fashion.

F. Hygiene

The center should be an example of good hygienic practices for the mothers to follow. If the mothers are taught one thing in the training session and then observe the staff acting in a contradictory way, they cannot be expected to follow the staffs advice.

In the home, we say that there is always a possibility that there are germs present that can cause diarrhea and that we should take precautions to spread these germs to the children. In the rehydration center, there is not only a possibility that there are such germs; it is a certainty. There are germs on the children's bodies, there are germs on the children's clothes, there are germs on the floor where the children have vomitted and deficated, there are germs on the hands of the mothers, and on the hands of the doctors and nurses who have examined and treated the children. Therefore, there are a number of hygienic practices that should be obvious:

- o Handwashing (with soap and water)
  - -- Before mixing ORS to be given to the child
  - -- Before feeling a child's tongue for signs of dryness
- o Washing Utensils
  - -- If feeding spoons fall on the floor, they should be replaced by cleans ones. The dirty one should be washed with soap and water
  - -- If teething rings or pacifiers fall on the floor, they should be washed with soap and water before being given back to the child
- o Fly control
  - -- Flies should be swatted from the children's faces and cups and spoons
  - -- Children's faces may be covered with a cloth between spoons of ORS

G. Maintenance

1. Floor washing
2. Fly control

محافظة ____________
مديرية الشئون الصحية
الإدارة الصحية ____________
الوحدة الصحية ____________

وزارة الصحة - المشروع القومى لمكافحة أمراض

سجل قيد معالجة حالات الجفاف الناتج عن الإسهال عند الأطف

م	التاريخ	إسم الطفل	درجة الحرارة	عمر الطفل (✓) للسنة المناسبة					أسأل عن (✓) عند الإيجاب			لاحظ مايلى (✓) عند الإيجاب			
				١-	٢-	٣-	٤-	٥-	إسهال مائى	قىء	دم ومخاط بالبراز	فقد مرونة الجلد	العينان غائرتان	قلة التبول	غيبوبة
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