

FINAL REPORT

Nutritional Repletion of the Child with Diarrhea

Submitted to PRICOR

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Egypt has successfully implemented a nationwide program of oral rehydration therapy (ORT) for acute diarrheal disease, which in the last several years has had a substantial impact on diarrhea-specific mortality. The program is operated through the primary health care (PHC) system and also through the private sector (pharmacies), and actively promoted through the mass media.

However, ORS alone cannot alleviate or prevent the malnutrition which commonly accompanies diarrhea and may contribute to the severity of an illness and/or the risk of a subsequent illness. Many traditional practices result in food being withheld from children who have diarrhea, thus contributing to the vicious cycle of diarrhea and malnutrition. Early and continued feeding of children with diarrhea has been shown to be effective when practiced; however, it requires specific efforts to educate mothers appropriately.

This study was designed to address the operational problem of promoting the nutritional repletion of children with diarrhea. Specifically, the tasks were to design an appropriate and practical message for the education of mothers, to test its delivery through the existing PHC system, and to incorporate it into the nationwide program of diarrheal disease control.

A Policy Committee (which included the national directors of relevant areas of the PHC system) was responsible for oversight of the project, analysis of the problem, deciding on alternative solutions to be tested, interpretation of results and ultimately, adoption of the project's recommendations into national health programs.

A baseline survey of knowledge, attitudes and practice (KAP) of mothers, health center professionals and pharmacists was carried out in July 1985 in three areas of Egypt (one urban and two rural). More than 1000 mothers were interviewed, as were 341 health care providers and 60 pharmacists. The mothers and health care providers were interviewed in PHC centers. Only mothers who were in the center because of a child with a current diarrheal illness were included. Questions were asked about the child's usual diet, changes made in diet during diarrhea, the mother's information and sources of information about diet and diarrhea, and about knowledge and use of ORT. Health care providers and pharmacists were asked specifically about the advice they give to mothers in both mild and severe diarrhea.

The three types of health care centers included in the study were selected to represent those which the Policy Committee decided had viable options for delivery of an education message: 1) PHC centers without special programs; 2) centers participating in the Strengthening Rural Health Delivery (SRHD) project; and 3) centers with a specific Nutrition Education (NE) project already in place.

A simple educational message was developed, based on knowledge of existing practices, consistency with the mass media messages already being given, and the addition of a component specific to this project. It was:

1. When your child has diarrhea, continue to feed him so that he will be able to catch up.
2. If you are breastfeeding your child, continue to breast-feed when he has diarrhea.
3. Feed the child whatever he was eating before having diarrhea, but boil it.

The third part of the message had a specific, consistent wording so that it could be traced. Analysis of existing data on diets of young children indicated that if breast milk and boiled items could be retained in the diet during diarrhea, a safe and nutritious regimen would result.

Following the initial KAP survey, the message was delivered through the PHC system, plus the NE and SRHD projects, for a period of three months. No special infrastructure or training was developed; rather, the directors of the three programs simply incorporated the message into their existing system of information flow and training.

After this period, a second KAP survey was conducted (December 1985) of mothers and health care providers in the same centers. Sample sizes and descriptive characteristics of mothers and providers were similar in both the baseline and the followup survey.

Analysis of data on children's usual diets from both surveys revealed a modal pattern of breastfeeding, supplemented gradually with various items from the usual household diet by late in the first year. After 18 months, most children received the household diet without a consistent source of milk. About 40 percent of mothers in the baseline survey reported that they changed the child's diet during diarrhea. About 10 percent of mothers reported stopping all food during diarrhea. Another 10 percent reported stopping breast feeding. Other common alternations included stopping some food items (most often eggs, meat, dairy products, beans, fruits and vegetables) and introduction of water, sugar water, tea, starch pudding, and/or ORS. Next to breast milk, the items most likely to be retained in the diet during diarrhea were rice and potatoes.

Three-quarters of mothers were aware of ORT, and slightly less than half mentioned using ORS in the current illness. Health care providers generally relied heavily on ORS, but fewer than half of them reported giving any specific dietary advice to mothers of children with diarrhea. Of those who did, the advice was usually appropriate. Providers in PHC-alone centers experienced more lack of information, were more likely to refer and less likely to give dietary advice than those in centers participating in the NE or SRHD program. Almost all providers expressed a desire for specific information about feeding a child with

Of pharmacists surveyed, about one-third reported giving advice about feeding children with diarrhea. In general, this advice was more likely to be inappropriate (e.g., stop feeding, or stop breastfeeding) than that of health center professionals. Few pharmacists delivered appropriate advice or reinforced desirable practices with regard to feeding the child.

The followup survey indicated several significant findings. Of mothers who had attended any PHC center in the previous three months, 78% reported that a staff member had talked to them about feeding their child during and after diarrhea. Ninety percent reported receiving information about ORS; 70% about breastfeeding; and 38% reported the specific information about feeding the usual diet, but boiled.

Behavioral differences between the two surveys also occurred. While there was no change in the portion of mothers who related that they stopped feeding the child, there was a marked and statistically significant increase in the proportion who continued to give breast milk during diarrhea. There was a significant increase in ORT use (about 2/3 of mothers, compared to less than 50% in the first survey).

Health care providers in the follow-up survey reported giving more, and more appropriate, dietary advice especially with regard to breastfeeding and continuation or use of rice, potatoes, and starch puddings.

In conclusion, the message was received and apparently acted upon by a significant portion of mothers. The PHC system, with no additional infrastructure, was able to successfully incorporate this educational component. The Policy Committee has now recommended the following;

- Continuation of this message in the PHC system
- Expansion to all health centers
- Consideration of other priority educational messages to be delivered in this way.
- Adoption of the message by schools and mass media.
- Further study, especially of the KAP of mothers who do not attend PHC centers.

2. BACKGROUND

The target population for this operations research project was mothers of children under the age of three years being treated for diarrhea. The health problem addressed was that of the vicious cycle of malnutrition and diarrheal disease, which constitutes a positive feedback loop resulting in growth stunting and progressively poorer health in Egyptian children.

The PHC system, which as a matter of policy is accessible throughout the country, includes 2555 health units in rural areas. These are staffed by a

physician plus nursing and paramedical staff, and offer a variety of curative and preventive health services including MCH, health education, family planning, sanitation, and emergency and urgent care. Ninety-nine percent of the rural population is estimated to have a rural health center within 5 km (walking distance). The health unit/population ratio is 1/8000; physicians are present at 1/6000 population, and nurses at 1/3000. Urban areas are served by urban health centers, of which there are 86, which offer comprehensive primary health care systems.

Since 1977, Egypt has implemented a successful program of oral rehydration therapy (ORT) for acute diarrheal disease in infants and young children. This program became nationwide in 1983, and is administered through the primary health care (PHC) system and actively promoted via mass media.

The current infant mortality rate of 76/1000 is down considerably from several years ago, although still high. However, ORT alone cannot alleviate or prevent the malnutrition which commonly accompanies diarrhea and may contribute to the severity of the illness or to the risk of the next illness. Accordingly, attention needs to be given to the issue of feeding during diarrhea. Since many traditional practices result in food being withheld from the child during and even after recovery from diarrhea - thus contributing to the development of malnutrition - this aspect requires specific education of mothers.

The Nutrition Institute began to address this problem with an operations research project designed to determine how best to incorporate a specific nutrition education message into the ORT program. This project was begun in February 1985 and the portion of the activity funded by PRICOR ended in March 1986.

4. STUDY PURPOSE

The PHC system in Egypt is the main official structure that deals with activities related to improvement of health. The rural areas, specifically the villages, are its common denominator of life. This system is responsible for detecting cases requiring ORT and also for providing the ORS cachet. The PHC system is also responsible for providing information necessary to use the cachet in an efficient way.

Only 10% of cases with diarrhea or severe diarrhea are judged not suitable for ORT and require paramedical administration of fluids and electrolytes. The system has its own network of communication for transfer of these cases to local government hospitals. The 90% of cases treated with ORT achieve dramatic response, and many infants and children are saved from death. Others thus gain more confidence in the treatment and learn more about it. As a result, the mother may become more tied to the PHC medical unit and willing to accept more of their advice. Nevertheless, it is not until sometime after the infant or child has been rehydrated that the mother could notice that the infant or child is not growing. His rate of growth is not as good as it would have been had he not suffered from diarrhea.

The use of ORS is widespread in Egypt now. In addition to its use through the PHC system, it is also available in private pharmacies. It is not necessary to have a prescription to purchase the ORS from the pharmacy; mothers can purchase it directly and use it, thus relying on the instructions of the pharmacists. This channel of delivery accounts for about 60-70% of all manufactured ORS in Egypt.

The problem in relation to development of malnutrition is well understood, as ORT only rehydrates the child. Traditionally, mothers used to stop feeding the child completely during and even after diarrhea. Due to unavailability of formula diets in rural areas home remedies were used which were dilute in calories and other nutrients. It was not until the last decade that encouragement of breast feeding during diarrhea has been a theme of management. Recently, an additional message has been developed that encourages the mother to feed the infant during and after diarrhea. The operational problem which faces our country is how to deliver that message effectively. In addition, the new trend to have a super-ORT (i.e. supplemented ORT) in our opinion should be conjoined with efforts to use home remedies as the "super" component of the ORT. This should be taken into consideration when developing messages for mothers and to find means and ways to incorporate the nutrition component in the ORT. The available channel to be tested is within the PHC system.

4. METHODOLOGY EMPLOYED

a. Problem Analysis

The operational problem to be studied was the integration of a nutrition message into the ORT system. ORT is delivered through a number of routes, including health clinics, pharmacies and various outreach programs. The goal of the research was not to study the PHC system as a whole, but to look at the effectiveness of the messages traveling through the PHC system in various ways. From the beginning of discussions of the possible research, directors of various parts of the Ministry of Health were included.

A policy committee was formed consisting of the relevant policy-makers from the primary health care system, representatives of the Nutrition Institute, and several other individuals with relevant expertise. This committee was charged with overall direction of the project and with the task of analyzing the problem and deciding which alternative solutions should be tested. They were also responsible for coordinating and monitoring field activities and endorsing recommendations for nation-wide adoption. They were later to create the nucleus of a network through which information generated from the study could be discussed and propagated through the PHC system.

In the first several meetings of the Policy Committee, the existing system was thoroughly described with regard to the delivery of ORT through the PHC system. Existing knowledge about usual practices and recommendations for

feeding children with diarrhea was also thoroughly reviewed and discussed. It was decided early that any solution to be implemented should be evaluated under both rural and urban conditions because diarrhea exists in both situations. Because the target for knowledge and behavior change in this study was to be the mother's behavior toward the child with diarrhea, the outcome of primary interest was whether or not the knowledge of the mothers would change in response to receiving information through various routes. In order to understand more about any possible changes in the mothers, the operations research design also attempted to evaluate the KAP of professionals including physicians, pharmacists and other medical and paramedical personnel.

The target mothers' sample to be studied was limited to those attending health centers and seeking advice for a child with diarrhea. This limitation was decided by the advisory committee on the basis that the time and financial constraints would not allow for the coverage of non-attending mothers. As the implementation of the project will be accomplished through the PHC system facilities, the issue of possible differences in characteristics of attending and non-attending mothers was discussed at length and responsible PHC personnel pointed out the similarity.

b. Solution Development

Several variables were identified early as constraints to the range of feasible solutions to the problem. First, it was clear that no new programs would be instituted to deliver an educational message; therefore existing programs were the only possible mechanisms for delivery of a nutrition message. This constrained the design to include only those systems which were operational and potentially moving to a nationwide status.

The simplest and probably the method, with the widest coverage, would be to incorporate the process into the ORT program. ORT was introduced into the PHC of Egypt using the WHO formula in 1977. Its promotion, however, was limited until the initiation of the National Control of Diarrheal Disease Project (NCDDP) in 1983. The NCDDP has launched training programs for health care providers, an educational program for the public and expansion of ORT production and distribution. Currently ORT is available in Ministry of Health facilities as well as in the private pharmacies. The PHC system is extensive and accessible all over the country, and ORT is now part of the PHC system for all health centers. The method available for delivery of the educational message in this system is to incorporate it into the contact that the mother has with health-care center staff when she brings her child for ORT. The advantages of country-wide coverage and close association with ORT are counterbalanced, at least potentially, with some significant disadvantages. Because they come to the center seeking treatment for a sick child, the mothers may be anxious. The ORT program is organized such that any health staff member may provide advice for diarrhea treatment; thus, understanding of and delivery of the message may be variable due to a larger number of potential teachers with varied backgrounds.

Two other programs were considered to be appropriate vehicles. These were the Nutrition Education (NE) program, which currently reaches more than 500 urban and rural sites, and the Strengthening Rural Health Delivery (SHRD) program which is operating in 232 rural health centers in four governorates. Other programs were considered but felt to be less appropriate. These two programs provide targeted, direct contact with mothers of infants and young children on a large scale. Both operate in and through the primary health care centers. They differ in the degree to which nutrition plays a major role in their program. The NE program, of course, focuses on nutrition and even already incorporates lessons on ORT and on feeding during diarrhea. In this program, regional nutrition organizers train health center nurses who in turn conduct group classes for mothers who attended health care centers in demonstration kitchen facilities in the health centers. The SHRD program is a multi-faceted program focused on upgrading the preventive services, especially MCH services, in the rural primary health care system. Several nutrition-related components are included among other services, but there is no systematic nutrition education. The policy committee felt it worth testing whether a message about feeding during diarrhea could be effectively delivered by the PHC alone, or whether a special commitment to and training in nutrition (as by the NE program staff) or preventive medicine (as in the SHRD program) would be required to be effective.

Table 1 summarizes the child-health related services available in each of the types of sites.

Table 1
Summary of child health related inputs in each study cell.

Current Inputs	N.E.	S.R.H.D.	P.H.C.
1. Service delivery:			
Immunization	-	++	+
Diarrhea treatment	-	+++	++
Growth monitoring	+++	++	+
2. Education regarding:			
Immunization	++	++	+
Use of ORI	+++	+++	+++
Feeding during diarrhea	+++	+	++
Sanitation	+++	+	+
Other health problems	+	++	+
3. Provider:			
Nurse	+	+	+
Physician	-	.	+
4. Site:			
in locality	+	+	+
outreach	-	+	-
5. Means of education:			
Visual aids	+++	++	-
Demonstration	+++	-	-
Teaching by doing	++	-	+
Mass media	-	-	+

A second variable known to be a constraint on the range of feasible solutions was the lack of a highly acceptable and widely distributed weaning food that would be safe and useable under these conditions. Thus any identified solutions had to rely on locally available foods that a mother could be expected to have in her household.

Third, whatever messages were identified had to be able to be delivered through the existing structures of the PHC system. Not only were new programs to reach the mothers not going to be instituted, but new education programs within any particular network were also not feasible.

The participation of several senior officials, in essentially a peer group discussion regarding constraints and characteristics of good solutions, made it possible to define at an early point in the research those characteristics of a solution that would truly allow it to be integrated into the Egyptian health care system. In addition the placement of decision makers in this peer group assured that whatever solution was found would have a high probability of being adopted.

Although the project director for the PRICOR project was trained in nominal group technique and other approaches to group consensus development by a PRICOR consultant visiting Egypt in the fall of 1984, these techniques did not prove feasible in the Egyptian context. The Egyptian system is very hierarchical, and as was described in the proposal, it is virtually impossible to have truly open interaction among people who are not peers. Thus the nominal group technique and other strategies were modified for use in encouraging open discussion among a small group of peers who directed their various parts of the Ministry of Health. It was possible to form a cohesive group of directors at a senior government level, and therefore ensure cooperation with the project and the implementation of any solutions identified. The process of developing and evaluating potential solutions was basically a series of meetings in which issues were openly discussed and new ideas were presented. As the group became more cohesive, it was possible to offer and evaluate potential solutions in a constructive framework. The data used in the preliminary analysis regarding the development of the solutions to be tested were basically from the knowledge of these directors about the functioning of their own units. No baseline data were used at this point to indicate which solutions might be most advisable. Sensitivity analyses were not performed.

The consensus which developed from these meetings was that a single, simple, specific message should be agreed upon in order that it be understandable to mothers and traceable in terms of evaluating the transfer of information to the mother. This message should be consistent with information which was planned to be given by the ORT program through the mass media, and should add to this information in a way designed to change the most detrimental feeding practices.

The message, once agreed upon, should be delivered through the existing mechanisms in each of the programs, since the addition of extra programming was unrealistic. The directors of each of the three programs, therefore, could incorporate the agreed-upon message into their programs by their usual training and management techniques.

The time constraints of the project would not allow an evaluation of any impact on child health or nutritional status. A more realistic goal was set to evaluate knowledge and reported behavior. Mothers of infants brought to health centers for treatment of diarrhea were identified as the major target population. Health center staff and pharmacists in the communities were also identified as targets since they will be the main deliverers of the educational message. It was decided that KAP of both groups would be assessed at a baseline period, the message would then be

incorporated into existing programs for a period of three months, after which a second KAP survey would be undertaken. The routes of information transfer were to be through the Primary Health Care system, through the Nutrition Education project, and through the Strengthening Rural Health Delivery project.

A message was developed which was simple to convey to mothers and which could be sent through all systems. To develop the message, several meetings were held which included local experts from universities and research institutes. Information which was utilized included knowledge of common practices, the data from the pretest of the survey questionnaire, the structure and content of existing programs, and the nutritional needs of the child with diarrhea. In addition, data from an ongoing project were analyzed with regard to the foods commonly included in diets of toddlers. The message agreed upon has three parts:

1. When your child has diarrhea, continue to feed him so that he will be able to catch up.
2. If you are breast-feeding your child, continue to breastfeed him when he has diarrhea.
3. Feed the child whatever he was eating before having diarrhea, but boil it.

The first two parts of the message reinforce information introduced into the mass media by the ORT program in Summer 1985. The third part, specific to this project, requires some explanation.

Analysis of existing data on diets of older infants and toddlers indicated that a wide variety of foods is included. There is no "weaning food" per se; rather, the child is introduced over time to the usual family diet while still breast-feeding. Among the most commonly introduced foods are rice, potatoes, macaroni, vegetables, bread, fruit, beans, cheese, soups, puddings, and occasionally egg and/or meat. From this list it appeared that if boiled items and other items for which boiling is an acceptable means of cooking could be retained, a nutritious, digestible and safe regimen would result.

Further, it was felt (and confirmed by pilot testing) that consumption of bread would not be hindered by this message, but rather mothers would be liable to toast bread (the equivalent of boiling) before offering it. By starting with the child's usual diet, the message does not require the mother or household to acquire anything special, but only not to withhold foods which are safe and easily digestible.

The specific message in Arabic uses the participle form (literally, "only boiled"), but connotes both those items which have been cooked by boiling and those which can be prepared in this way.

The characteristics of this message include simplicity, ease of oral communication, the inclusion of three important nutrition messages, and easy understandability. The message thus has the advantage of easy accessibility to illiterate mothers. It provides the mother with enough information to allow her to deal with her child instantaneously and proceed with repleting him. The simplicity of the message, in addition to its safety, should give the mother confidence to use it in recurrent attacks of diarrhea for the same child or other siblings.

c. Sampling

Three governorates were selected as follows:

1. Cairo as a metropolitan area.
2. Beheira governorate to represent Lower Egypt.
3. Assiut governorate to represent Upper Egypt.

Within Beheira and Assiut governorates, a number of urban and rural facilities were randomly selected (Table 2) for a total of 104 centers in the baseline survey.

Table 2

Type of Center by Governorate, Baseline Survey

<u>Nature of Center</u>	<u>Cairo</u>	<u>Beheira</u>	<u>Assiut</u>	<u>Total</u>
Nutrition Education	24	15	6	45
S.R.H.D.	-	14	11	25
PHC alone	10	14	10	34
Total	34	43	27	104

In the follow-up survey the centers/units surveyed in the three governorates are shown in Table 3.

Table 3

Type of Center by Governorate, Follow-up Survey

<u>Nature of Center</u>	<u>Cairo</u>	<u>Beheira</u>	<u>Assiut</u>	<u>Total</u>
Nutrition Education	27	15	6	48
S.R.H.D.	-	14	11	25
PHC alone	3	14	10	27
Total	30	43	27	100

d. Data Analysis Data were entered directly from pre-coded forms. Frequency distributions and contingency tables were generated. Where appropriate, tests of statistical significance were applied - chi-square or student's "t" test for frequency and proportional data, respectively.

5. RESULTS

Results of both the baseline and follow-up survey will be presented in this section, since they contribute information to evaluate the appropriateness of the solutions tested. This is a departure from the original design, which proposed to survey baseline KAP of mothers, health care providers and pharmacists, as part of the problem analysis. The second (follow-up) survey was then to assess change of KAP after delivery of the educational message by the three alternative routes. The actual evolution of the project resulted in a modification of the design. The baseline data were not analyzed, due to various factors involving selection of a suitable arrangement for data entry and analysis, until well after the message had to be decided upon and delivered. Thus a variety of other information (previously described) was utilized to decide on the message and the alternative delivery pathways. When the time came to implement the follow-up survey, the judgment was made that strict comparability with baseline data was less important than improvement of clarity and efficiency. Thus the second mothers' questionnaire was modified from the first. With few exceptions, the results of specific questions are not directly comparable. Therefore, the results of the two surveys will be described as separate cross-sectional studies. They took place in (mostly) the same health center sites, the first in summer (before delivery of the educational message) and the second in December (after three months of incorporation of the message into program efforts). When particular items are comparable between the two surveys, they will be compared.

A. MOTHERS OF INFANTS AND YOUNG CHILDREN WITH DIARRHEA

Description of the Mothers and their Children

A total of 1110 mothers were interviewed in July and August, 1985 in health care centers in three areas of Egypt. All were mothers of children under 3 years of age brought to the health centers for treatment of diarrhea. Interviewers in all cases were health care professionals who had been trained in the administration of the questionnaire by Nutrition Institute physicians. Distribution of mothers interviewed in each type of center and in the two rural versus the urban areas may be seen in Table 4. Distribution of mothers among the three types of centers were roughly equivalent in the rural areas. Nutrition Education sites represented 21% of the total, while PHC-alone and SRHD sites accounted for approximately 40% each. In the urban site, more than 70% of mothers were interviewed at Nutrition Education centers with the remainder from PHC-alone centers.

Table 4

Mothers Interviewed in Baseline Survey, by Rural/Urban Location and Type of Center

<u>Type of Center</u>	<u>Urban</u>	<u>Rural</u>	<u>Total</u>
PHC-Along	111	278	389
Nutrition Education	276	153	429
SRHD	0	292	292
Total	389	723	1110

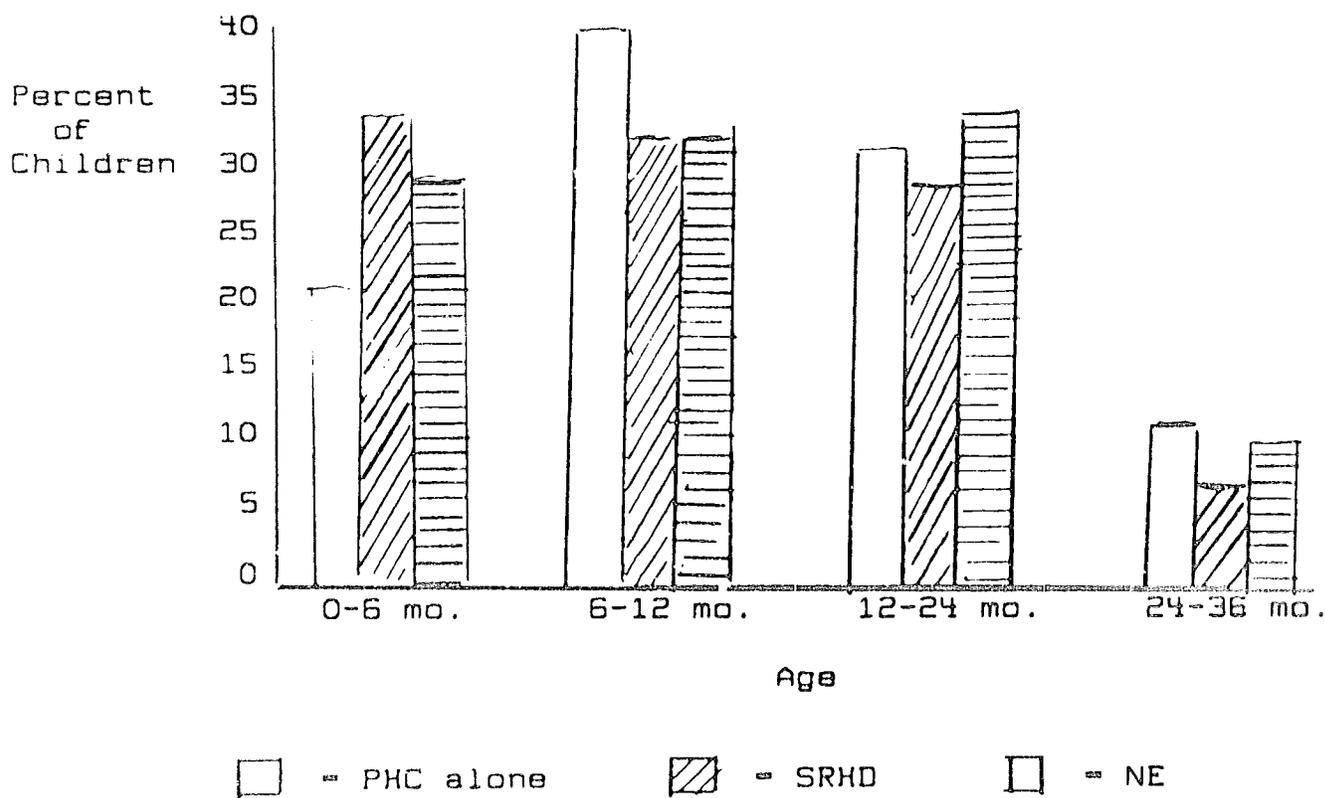
Ninety mothers (<10%) were unable to state their age. Of the remainder, 31% were below 25 years of age, 45.8% between 25 and 35 years, and 23.2% over 35 years. There was no difference in maternal age by type of center or by rural/urban category. Maternal education, in contrast, differed by type of center and by rural/urban categorization. Overall, 86% of mothers interviewed were illiterate based on separate questions about ability to read and to write. Ten percent reported having completed primary school, four percent secondary school, and less than 1% had gone beyond secondary school in their formal education. Nutrition Education centers and urban centers included a higher percentage of mothers who reported some formal education. Twenty-three percent of mothers attending Nutrition Education centers were literate compared to 9% in both of the other types of centers. Twenty-six percent of mothers were literate in the urban sample, and eight percent in the rural sample. The differential distribution of education by

type of center likely reflects the higher proportion of mothers in the Nutrition Education centers in Cairo rather than differential participation related to the program in the center.

All children were under the age of 3 years, with a distribution of age as shown in Figure 1. The age of the child brought for treatment was unrelated to maternal age or education. The age distribution of children being treated was not different by type of center or urban/rural category.

Figure 1

Age of the Child by Type of Center



Maternal age was highly correlated with the birth order of the child, as might be expected. Seventy percent of first-born children brought for treatment in these centers had a mother under 25 years old and 20% had mothers under 20 years of age. For children of high birth order (6 or greater), which account for almost 20% of the sample, almost all mothers were over the age of 30 years.

Mothers were asked how long the current illness had existed on the day of the interview (see Table 5). Assuming that the visit to the center at which the mother was interviewed was the first attempt to obtain medical

treatment for the child, this question should reflect the duration of illness before the child was brought for treatment. The number of days of diarrhea before the day of the interview was not related to the age or sex of the child, the education of the mother, or maternal age. Overall, 60% were brought for treatment on the 3rd day of the illness or before, and 72% on the 4th day or earlier. Twenty-two percent had diarrhea for one week or more before they were brought for treatment. There seems to be some distinction between rural and urban centers, with more children brought earlier for treatment in the urban centers. For example, 20% were brought on day 1 in the urban centers compared to only 8% in the rural areas. This may be due to the greater proximity of urban centers to the home.

Table 5

Duration of Present Illness on the Day of Treatment,
by Type of Center (Percent)

<u>Type of Center</u>	<u>Duration of Illness (Days) Before Treatment</u>			<u>Total</u>
	<u>1 - 2</u>	<u>3 - 4</u>	<u>5+</u>	
PHC-Alone	34.1	37.3	28.6	100
Nutrition Education	41.8	30.6	27.8	100
SRHD	47.3	33.1	19.6	100
Total	40.4	33.6	21.1	100

Concerning frequencies of diarrheal attacks per age group in July 1985, age 7-18 months represents the peak age for diarrheal attacks and corresponds to the age when supplementation of diets and weaning takes place. Overall, more than 55% of children at any age had one diarrheal attack in the previous month, about 30% had 2 attacks and fewer than 15% had 3 or more attacks (Table 6).

Table 6

Frequency of diarrheal attacks in previous month by area(%)

<u>Age-group</u>	<u>Urban</u>				<u>Rural</u>			
	<u>1</u>	<u>2</u>	<u>3+</u>	<u>Total</u>	<u>1</u>	<u>2</u>	<u>3+</u>	<u>Total</u>
0 - 6ms	52.0	26.0	21.9	36.5	62.7	27.5	9.8	23.4
7 -18ms	50.8	30.8	19.4	49.4	56.4	28.4	15.2	53.3
>18 ms	56.8	29.7	24.5	14.1	55.7	31.3	14.0	23.4
Total	52.1	28.9	19.0	28.6	58.2	28.9	12.9	71.4

Usual diet of the child

Mothers were asked a series of questions about the presence or absence of various foods in the usual diet of the child. Analysis of data on the presence of different food items in the child's diet indicates that 71% received breast milk, 17.5% artificial milk, 47.8% rice or potatoes, 33.6% vegetables and fruits; 32.8% received beans, 22% received meat or chicken, 26% eggs, 31% dairy products, and 31.8% bread. A variety of other foods were mentioned by the mothers, but it is of interest that only one mother spontaneously mentioned that the child's diet usually contains "boiled food".

Answers to the questions about usual diet were coded correct or incorrect based on criteria agreed upon by The Department of Pediatrics of Pediatrics at Ain Shams University. The criteria included the following: from 0 - 2 months a "correct" response would have been breast or formula feeding; from 3 - 6 months breast or formula feeding with or without the presence of yogurt, orange juice, starch pudding or vegetable soup, or egg yolk; from 7 - 9 months the addition of other foods including liver, beans, cheese, bread, rice, macaroni, fish and meat was considered correct. At ages over 9 months, the ordinary household diet plus two milk feedings per day was considered a correct answer. Based on these criteria, a majority of mothers reported a "correct" usual diet for the child prior to 6 months of age and after 18 months of age. During the period 7 - 18 months, the majority of mothers reported usual diets for the children which were not in accordance with these recommendations. The classification of an answer as correct or incorrect was unrelated to maternal education or to birth order or sex of the child.

The usual diets as reported by the mothers were categorized by complexity into five categories: milk alone (breast or other milk); milk plus one solid food; milk plus two solid foods; a complex diet (more than two solid foods) plus milk; and a complex diet (more than two solid foods) without milk. These categories were then analyzed by age of the child. In the first six months of life, a significantly greater proportion of rural than urban infants received milk only (Table 7). More than 80 percent of rural infants received milk only, with no change in this proportion up to the age of six months. Only 70 percent of the urban infants received milk only in the 0-3 month age group, decreasing to 49 percent at 4 to 6 months.

Between 7 and 12 months of age, when supplementation of a milk-based diet with other sources of calories and nutrients becomes important, a significant number of infants continued to receive an unsupplemented milk diet. This practice was more prevalent in rural than in urban areas (Table 8).

Table 7
Percent of Infants < 6 months Old by Diet Type

<u>Age Group</u>	<u>Site</u>	<u>(N)</u>	<u>Milk Only</u>	<u>Milk & 1 food</u>	<u>Milk & 2 foods</u>	<u>Milk & >2 foods</u>	<u>>2 Foods No Milk</u>
0-3 months	Rural	(60)	81.7	18.3	0	0	0
	Urban	(59)	69.5	25.4	5.1	0	0
3-6 months	Rural	(114)	82.5	8.8	4.4	3.5	0
	Urban	(75)	49.3	32.0	9.3	1.3	

Table 8
Percent of Infants 7-12 Months Old by Diet Type

<u>Age Group</u>	<u>Site</u>	<u>(N)</u>	<u>Milk Only</u>	<u>Milk & 1 food</u>	<u>Milk & 2 foods</u>	<u>Milk & >2 foods</u>	<u>>2 Foods No Milk</u>
3 months	Rural	(140)	51.4	16.4	12.1	15.0	5.0
	Urban	(83)	43.4	26.5	10.8	18.1	1.2
10-12 months	Rural	(95)	36.8	11.6	10.5	32.6	8.4
	Urban	(60)	23.3	8.3	15.0	48.3	5.0

By the age of 13-18 months, about one quarter of children were receiving a complex diet without milk. This percentage increased steadily to about one half in the age group 19-24 months and to three-quarters of children in the third year of life. There were no important differences between the rural and urban samples with regard to diet type in these age groups (Table 9).

Table 9
Percent of Infants 13-36 Months Old by Diet Type

<u>Age Group</u>	<u>Site</u>	<u>(N)</u>	<u>Milk Only</u>	<u>Milk & 1 food</u>	<u>Milk & 2 foods</u>	<u>Milk & >2 foods</u>	<u>>2 Food No Milk</u>
13-18 months	Rural	(147)	10.9	6.1	9.5	46.3	27.2
	Urban	(53)	13.2	8.7	9.4	50.9	20.8
19-24 months	Rural	(93)	9.7	2.2	6.5	39.8	41.9
	Urban	(34)	5.9	0	0	41.2	52.9
25-36 months	Rural	(71)	7.0	2.2	1.4	16.9	71.9
	Urban	(22)	4.5	0	0	18.2	77.3

Breast milk constitutes the corner stone of the usual diet up to the age of 18 months. When supplementation starts during the first year, it is mainly done by introduction of rice, beans, potatoes, dairy products and vegetables. By the end of the first year, about 50% of children consume rice and potatoes and around 30% consume dairy products, beans and vegetables. Complex carbohydrates seem to be the main nutrients and source of calories in the age group from 13-18 months, as more than 80% consume rice and potatoes and around 60% consume bread. Consumption of protein with high biological value, such as eggs and meat, is around 40% and that of plant origin (legumes) 60%. By the end of the second year, most types of food are consumed at the same level. At the urban and rural level, no distinct difference was noticed except that animal proteins are used more in urban than rural centers, especially below age one year.

Mothers' Knowledge of Appropriate Treatment for Diarrhea

Seventy-three percent of the mothers said that someone had told them about ORT. A response of "yes" to this question was significantly related to the type of center. Only 67% of mothers attending PHC-alone centers indicated that someone had told them about ORT, while 75% of those attending NE centers and 80% of those attending SRKD centers indicated that they had been told about ORT. This distribution may have been related to an urban/rural difference and a resultant differential in maternal information sources, including exposure to mass media. Eighty percent of urban women said they had heard of ORT while only 70% of rural women answered in this manner. Having been told about ORT was significantly associated with having received advice from a doctor or nurse about feeding the child during the current illness and was unrelated to maternal education.

Most of the mothers (761 or 69%) indicated that they had received some advice with regard to feeding their child during the current illness. Of these, 95% indicated that they had followed or intended to follow the advice. Having received advice was not related to the type of center or to

rural/urban category. The vast majority of advice had come from doctors and nurses.

The advice received seemed generally appropriate in so far as it was reported by the mothers. Only 33 mothers (4% of those who reported receiving advice) reported that they had been advised to stop feeding the child. Thirty-eight percent indicated that the advice had included the continuation or increase of breast feeding, while only 2% indicated that they were advised to stop or decrease breast feeding. Seventeen percent indicated that they had been advised to feed or increase the amount of water, 23% had been advised to give or increase sugar water, and 15% had been advised to give tea.

Change of the Child's Diet During the Current Illness

In response to the question "Have you changed the child's diet during this illness?", 438 mothers (39 percent) indicated that they had made a change. These mothers were then asked specifically about each food item in terms of what they had changed - increased, decreased, stopped, begun, and whether they had stopped feeding the child completely. Analysis of the data indicated that most mothers did not utilize the range of possible responses but did indicate whether the child was or was not receiving each food item during the illness, and whether she had stopped feeding the child completely. Accordingly, the few "increase" and "decrease" responses were analyzed as present in the diet (i.e., grouped with "yes" answers.)

Table 10 summarizes these responses in relation to the age of the child. About 10 percent of all mothers (20-25 percent of those who said they changed the diet) indicated that they had stopped feeding the child completely; this observation held only for children older than three months of age. For very young infants, complete stopping of feeding was rare.

Table 10

Changes of Diet During Diarrhea: Change, Cessation of Feeding, Stopping Breast Milk

<u>Age of Child</u>	<u>(N)</u>	<u>Percent of Mothers Stating they Changed the Diet</u>	<u>Percent of Mothers who Stopped Feeding Child</u>	<u>Percent of Mothers who Stopped Breast Milk</u>
0 - 3 months	(118)	22.9	1.7	6.7
4 - 6 months	(188)	33.0	7.9	11.7
7 - 9 months	(223)	44.8	10.8	15.3
10 - 12 months	(155)	41.3	11.6	12.3
13 - 18 months	(200)	43.5	8.0	10.2
19 - 24 months	(126)	44.4	11.9	14.9
25 - 36 months	(93)	44.1	9.7	27.2

~~The most common changes in diet during diarrhea involved stopping~~
 food items and the introduction of water, sugar water, tea, muhalabiya
 (starch pudding) and/or ORS. For those infants whose usual diets contained
 them, the items most likely to be dropped during diarrhea were eggs, meat/
 chicken, beans, fruits and vegetables, and milk other than breast milk. A
 minority of mothers stopped giving breast milk during diarrhea. The solid
 food item most likely to be retained during diarrhea was rice or potatoes.
 At all ages, 3/4 or more of mothers retained rice and potatoes in the diet
 of the child with diarrhea if he/she had been receiving these foods before
 becoming ill.

Of the food items added to the child's diet during diarrhea, the most
 common (aside from ORS) were sweetened water and tea (also surely sweetened).
 One-quarter to one-half of mothers gave these fluids during diarrhea, with
 an increasing percentage in older children compared to those under six
 months of age. Starch pudding was mentioned as being given by 4-25 percent
 of mothers, again with the prevalence being higher for older children than
 for young infants. The distribution of mothers who mentioned giving ORS is
 listed in Table 11.

Table 11

Percent of Mothers Mentioning Giving ORS
in this Illness

Age of Child

0-3 months	29.6%
4-6 months	37.1%
7-9 months	38.0%
10-12 months	46.9%
13-18 months	48.3%
19-24 months	44.6%
25-36 months	43.9%

Analysis of responses by rural/urban characteristics shows these
 differences:

1. Although the overall percentage of mothers who stopped feeding their
 infants during illness did not exceed 10% at any age-group, urban mothers
 tended more to stop feeding especially in the age group 4-12 months.
2. Continuation of breast feeding during illness was more common in urban
 centers in the first year of life, and in the rural sample for older
 children, especially those 13-18 months old.

3. Rice and potatoes were consumed more in urban than rural areas, and this significant difference decreases as children become older.

B. HEALTH CARE PROVIDERS

Three-hundred forty-one health care providers were surveyed (all those present on the day of the study in each center). They included mostly physicians and nurses (37% and 40% of the total, respectively) with a few nutrition supervisors and other types of health care providers (Table 12).

Table 12

Types of Health Care Providers Interviewed by Center

<u>Type of Provider</u>	<u>Type of Center</u>			<u>TOTAL</u>
	<u>PHC-Alone</u>	<u>NE</u>	<u>SRHD</u>	
Doctors	13	102	11	126
Nurses	19	80	39	138
Nutrition Supervisors	2	2	2	6
Others	27	12	32	71
Total	61	196	84	341

Providers in each study center were asked their current and preferred sources of information about child nutrition in relation to diarrhea: education and special training, mass media, drug and ORT representatives, their own experience, and other sources. The overwhelming majority of doctors and nurses expressed a preference for specific education and training in this regard, with or without other sources of information (94-100% of doctors and 80-100% of nurses and other providers). With regard to current sources of information, fewer had specific information about diet and diarrhea; this was especially so in the PHC-alone centers where fewer than 50 percent of providers stated that they had such information available. Providers in PHC-alone centers were significantly more likely to say that their information came from their own experience than were other providers. The specialized training programs of the NE and SRHD programs seem to have had considerable impact on filling this gap, especially for doctors (see Table 13). This finding is particularly interesting in relation to the NE centers, since the training program focuses on nurses rather than physicians. It is possible that the training provided directly to the nurses is transmitted informally to the physicians in the centers.

Table 13

Percent of Providers Who Had Relevant Training and
Materials vs Those Who Desire It

<u>Experience</u>	<u>PHC Centers</u>		<u>NE Centers</u>		<u>SRHD Centers</u>	
	<u>Have</u>	<u>Want</u>	<u>Have</u>	<u>Want</u>	<u>Have</u>	<u>Want</u>
<u>Doctors</u>						
<1 yr	50	100	89	100	100	100
1-3 yr	0	97	97	94	67	100
3-5 yr	40	80	89	100	100	100
>5 yrs	60	100	68	96	38	86
<u>Nurses</u>						
<1 yr	0	0	50	100	50	100
1-3 yr	25	75	64	93	75	81
3-5 yr	100	100	50	83	68	100
>5 yrs	60	77.7	72	84	44	87
<u>Others</u>						
<1 yr	50	0	0	100	0	50
1-3 yr	0	66.7	0	100	50	50
3-5 yr	50	100	100	100	50	68
>5 yrs	46	55	50	88	45	85

The situation with regard to perceived knowledge/information, very likely reflecting the specialized training programs in the SRHD and NE programs, is consistent with significant differences in reported practices among providers in the various types of centers (see Tables 14 and 15). Providers were asked what advice they provide to mothers in cases where the child has mild diarrhea and in severe diarrhea. All types of providers in the NE centers were less likely to refer cases and more likely to recommend RT, anti-diarrheal drugs and diet than were providers in PHC-alone centers. SRHD providers also had high levels of ORT recommendation for both mild and severe diarrhea and anti-diarrheal drug use for severe diarrhea. Their use of dietary recommendations was on the average higher than that of PHC-alone providers but not as high as that of NE providers. SRHD providers had low referral rates except for non-physician providers in cases of severe diarrhea.

Table 14

Advice Given for Severe Diarrhea (Percent)

<u>Doctors (N=133)</u>	<u>Center Type</u>		
	<u>PHC</u>	<u>NE</u>	<u>SRHD</u>
Refer	61.5	3.9	9.1
ORT	61.5	92.5	100.0
Anti-diarrheal drugs	23.1	40.2	70.6
Antibiotics	23.1	34.3	35.3
Diet	15.4	45.5	41.2

<u>Nurses (N=138)</u>	<u>PHC</u>	<u>NE</u>	<u>SRHD</u>
Refer	94.7	67.5	97.4
ORT	57.9	67.5	30.8
Anti-diarrheal drugs	10.5	6.3	2.6
Antibiotics	0	2.5	0
Diet	0	33.8	12.8

<u>Nutrition Supervisors (N=6)</u>	<u>PHC</u>	<u>NE</u>	<u>SRHD</u>
Refer	100	50	100
ORT	50	50	0
Anti-diarrheal drugs	0	0	0
Antibiotics	50	0	0
Diet	0	50	0

<u>Others (N=71)</u>	<u>PHC</u>	<u>NE</u>	<u>SRHD</u>
Refer	88.9	75.0	90.6
ORT	22.2	50.0	37.5
Anti-diarrheal drugs	14.8	0	12.5
Antibiotics	3.7	8.3	6.2
Diet	3.7	25.0	12.5

Table 15

Advice Given for Mild Diarrhea (Percent)

<u>Doctors (N=133)</u>	<u>Center Type</u>		
	<u>PHC</u>	<u>NE</u>	<u>SRHD</u>
Refer	46.1	2.09	0
ORT	69.2	89.2	94.4
Anti-diarrheal drugs	7.6	18.6	22.2
Antibiotics	0	8.8	11.1
Diet	38.5	54.9	44.4

<u>Nurses (N=138)</u>	<u>PHC</u>	<u>NE</u>	<u>SRHD</u>
Refer	42.1	18.7	13.2
ORT	57.9	85.0	94.7
Anti-diarrheal drugs	5.3	23.8	10.5
Antibiotics	0	0	2.6
Diet	26.3	61.3	36.8

<u>Nutrition Supervisors (=6)</u>	<u>PHC</u>	<u>NE</u>	<u>SRHD</u>
Refer	100	50	50
ORT	50	100	50
Anti-diarrheal drugs	0	0	0
Antibiotics	0	0	0
Diet	0	50	0

<u>Others (N=71)</u>	<u>PHC</u>	<u>NE</u>	<u>SRHD</u>
Refer	51.4	14.3	34.3
ORT	40.7	75.0	68.7
Anti-diarrheal drugs	11.1	8.3	6.2
Antibiotics	0	0	6.2
Diet	33.3	41.7	18.7

Years of professional experience was significantly related to practices among the physicians in PHC-alone centers, those with less experience being more likely to refer. In the NE and SRHD centers, the effect of experience on reported practice seems to be lacking, perhaps indicating that the special training in these programs compensated for the lack of knowledge felt by the inexperienced young physician in this important area of practice.

Most providers reported weighing the child during the course of a health center visit (Table 16).

Table 16

Do you weigh the child when he attends the Center? (%yes)

Provider	PHC	NE	SRND
Doctor	84.6	91.2	83.3
Nurse	94.4	97.5	94.9
Nutrition Supervisor	50	50	94.9
Other	55.5	54.5	28.6

C. PHARMACISTS

Fifty-six pharmacists and four pharmacists' assistants were surveyed during the initial survey. Fifteen were from Cairo governorate, 19 from Bihera and 26 from Assiut.

Table 17 presents their responses to questions about the advice they give to mothers in cases of mild and severe diarrhea. A majority, but by no means all, recommended ORT. A slightly smaller proportion recommended ORT for severe diarrhea than for mild diarrhea. More than half recommended anti-diarrheal drugs. The main differences in the advice given for severe diarrhea was the common use of antibiotics (infrequently advised as treatment for mild cases) and more emphasis on consulting a doctor.

Table 17

Pharmacists' Advice to Mothers about Treatment of Diarrhea
(Percent "yes") (n=60)

<u>Treatment Modality</u>	<u>Mild Diarrhea</u>	<u>Severe Diarrhea</u>
ORT	62	55
Antibiotics	6	45
Anti-diarrheal drugs	77	50
Diet	37	27
Follow doctor's advice	23	62

The pharmacists and their assistants were asked what specific advice they give to mothers about diet during diarrhea. Of 48 responding to this question, seven (14.5%) said they recommended that the mother stop feeding the child. Sixteen (33.3%) advised "no," "decrease" or "stop" with regard to breast milk. Table 18 summarizes their responses with regard to specific food items. Except for breast milk, a minority of these individuals advised feeding any food item. Animal protein foods (milk, other dairy products, meat/chicken, and eggs) were almost never recommended. Rice, potatoes and vegetables were recommended at a lower rate than mothers

themselves reported feeding these foods. Thus the specific dietary advice given by those pharmacists who reported giving advice was often inappropriate. Few pharmacists delivered appropriate advice with regard to diet or reinforced desirable practices.

Most individuals answering the pharmacists' questionnaire (81%) indicated that their major sources of information about child nutrition and feeding during diarrhea were their own previous education and training. Almost all (59/60) indicated that they advised customers to seek a doctor's advice.

Table 18

Pharmacists' Advice to Mothers about Diet on Diarrhea
(N=48)

<u>Food Item</u>	<u>Percent Recommending</u> <u>("yes" or increase")</u>
Breast Milk	67%
Other Milk	6%
Water	46%
Sweetened water	38%
Rice	25%
Potatoes	27%
Starch Pudding	17%
Vegetables or fruits	10%
Meat/chicken	0
Eggs	0
Dairy Products	6%

D. HEALTH CENTER CHECKLIST

A brief checklist of activities and facilities was devised and administered at all study centers. The major purpose was to document the comparability of the various types of centers as potential environments for the effective delivery of the nutrition education message. Data on the manpower available, the volume of activity, and vital statistics available in each center, have not yet been tabulated.

Analysis of data on the presence and use of various essential items revealed an apparently more comprehensive practice in the NE and SRHD than in the PHC-alone centers. All centers had ORS available and reported using it. The types of providers who distributed ORS varied by center, with physicians being the major distributors in PHC-alone and SRHD centers, and a more equal division of this responsibility between doctors and nurses in the NE centers (Table 19). PHC-alone centers were less likely to have a record book for recording diarrheal treatment than were the other types of centers (73.9% of PHC-alone centers, compared to 93.6% of NE centers and 83.3% of SRHD centers).

In terms of growth monitoring, a minority (17.4%) of PHC-alone centers had growth charts available, while three-quarters of NE and SRHD centers had them. Almost all centers had scales available and in useable condition; a slightly lower proportion of PHC-alone centers reported using them than in the other types of centers (Table 20).

Table 19

Who Gives out ORS Packages?

<u>Type of Center</u>	<u>Provider</u>		
	<u>Doctor</u>	<u>Nurse</u>	<u>Head Nurse</u>
PHC-alone	91.3	18.2	4.5
NE	31.9	38.8	46.8
SRHD	87.5	33.3	12.0

Table 20

Availability and Use of Scales in Health Centers (percent)

<u>Type of Center</u>	<u>Available</u>	<u>Ready to Use</u>	<u>In Use</u>
PHC alone	100	95.7	91.3
NE	95.7	97.8	97.3
SRHD	100	100	100.0

FOLLOW-UP SURVEY

Changes in Design from Baseline Survey

The second survey was conducted in the same health centers in December 1985-January 1986, after a 3-month period of exposure to the educational message through each program's usual structure. The follow-up survey consisted of mothers' and health care providers' interviews only. Pharmacists were not resurveyed, nor was the Health Center facility checklist re-administered.

The survey instrument used for mothers' interviews was modified from the baseline version in several important ways. Mothers interviewed included those who came to the center because of any illness of the child, rather than just those with diarrhea. In addition, all mothers were asked about the foods and liquids included in the child's diet during diarrhea, rather than just those mothers who said they changed the child's diet during diarrhea as was done in the baseline survey. The direct question about whether the diet was changed was not asked in the second survey, so it is not possible to directly compare the data from the two surveys on diet during diarrhea. The data on usual diet, however, can be directly compared.

In addition, the structure of the questions about dietary changes in diarrhea was modified in the second survey. Since most mothers did not make use of the range of possible options in answering questions about specific foods (i.e., increase, decrease, stop completely), the second survey elicited only "yes" and "no" responses to indicate the presence or absence of a food item in the diet during diarrhea.

Two new questions were added to the second survey to ascertain whether the mothers had heard the specific educational message. One read as follows:

- A) Did you attend this (health) center, or any, in the last 2 months?
- B) If yes, did anyone talk to you about diarrhea and how to nourish your baby during diarrhea?
- C) If yes, what did he say?

ORT

Continue breast feeding

Boiled foods

Other

The other question stated the educational message, and then asked a) "Did you ever hear this statement before?" and b) "from whom?" (Doctor, nurse,

pharmacist, mass media, others). Several questions were omitted from the follow-up survey. These included questions on advice received and intent to follow the advice (since it was perceived that these questions had not yielded useful information in the baseline survey), and questions on number of recent diarrheal illnesses, exposure to radio and television, and preferred sources of advice. The latter three questions were omitted because it was felt that the information gained in these topics from the baseline survey was sufficient.

The structure of the questioning related to ORT was also changed. If the mother had not mentioned ORT in her responses to questions about the child's diet during diarrhea or other treatments, then she was asked specifically, "Did anyone advise you to use ORT?" If the response was positive, she was then asked who advised it, and whether or not she had used it.

The Mothers and Infants

The followup survey included 1001 mothers, 560 in rural centers and 441 in urban centers. The distribution of mothers among the types of centers was similar to that in the first survey (see Table 21), with the urban sample divided about 86 percent in NE centers and 14 percent in PHC-alone centers and the rural sample about 40 percent each in the PHC-alone and SRHD centers and 20 percent in centers with NE. No center had both the NE and the SRHD program. Seven PHC-alone centers in Cairo which had been included in the first survey were omitted from the followup, four because they were undergoing remodeling during the followup survey period and three because they had entered the Nutrition Education project in the meantime.

Age distributions of mothers and infants did not differ between the two surveys (see Tables 22 and 23). As in the baseline survey, the following characteristics of the subject population were true:

- No relation of birth order, age or sex of the infant to the type of center.
- No relation of the age of the infant to birth order or sex.
- No relation of duration of diarrhea before treatment to age or sex of the infant, maternal age or maternal education.
- Significant association of maternal age with birth order of the child.

Table 21

Mothers According to Type of Centers and Location, Follow-up Survey

Center		Area		
		Urban	Rural	Total
	No.	440	558	998
PHC-Along	N	60	205	265
	(%)	(13.6)	(36.7)	(26.6)
NE	N	380	108	488
	(%)	(86.4)	(19.4)	(48.9)
SRHD	N		245	245
	(%)	(0.0)	(43.9)	(48.9)
Total (%)		(44.1)	(55.9)	(100.0)

 U.K. = 3 (unknown)

Table 22

Age Distribution of Mothers by Center Type,
Follow-up Survey (Percent)

Age Group	Type of Center			Total
	PHC-alone	NE	SRHD	
<24y	26.8	30.5	26.9	28.7
25-34y	53.2	45.7	53.5	49.6
>35y	20.0	23.8	19.6	21.7
Total	26.6	48.9	24.5	100.0

Age Distribution of Infants, Follow-up Survey by Location (Percent)

Age Group	Area		
	Urban (N=441)	Rural (N=59)	Total (N=1000)
0 - 3 months	12.7	7.0	9.5
4 - 6 months	17.5	12.2	14.5
7 - 9 months	18.6	11.8	14.8
10 - 12 months	16.3	17.2	16.8
13 - 18 months	21.3	19.3	20.2
19 - 24 months	8.6	18.1	13.9
25 - 36 months	5.0	14.5	10.3
Total	44.1	55.9	100.0

There were two significant differences between the samples for the two surveys. First, maternal education was significantly greater in the second sample for both rural and urban centers. We know of no particular reason for the difference, but a greater percentage of literate mothers occurred in the second survey (see Table 24).

The other difference between the two survey samples was in the relation of duration of diarrhea before treatment to the type of center. In the baseline survey, mothers in the urban centers reported a shorter duration of illness prior to the day of treatment than rural mothers. In the second survey, this relationship was reversed, the difference being accounted for largely by earlier treatment in the SRHD centers (see Table 25). For all types of centers, fewer infants in the follow-up survey had been ill for six or more days. There are several possible explanations for this phenomenon. First, the baseline survey took place in the summertime, when diarrhea prevalence and severity are greatest; the follow-up survey took place in December when fewer severe or chronic cases are to be expected. A second possible explanation is that the diarrheal treatment programs in Egypt have had a demonstrable effect in changing the pattern of treatment toward earlier intervention. Still a third possible explanation is that the higher proportion of more educated mothers in the second survey behaved differently with regard to bringing their children for early treatment. The latter explanation is not supported by the data, which indicate that duration of the present illness prior to treatment is not associated with maternal education. The improvement which occurred in the second study was noticed in SRHD centers where the percent of educated mothers was only 20% compared to 32% in NE urban centers. The proportion of educated mothers in rural centers as a whole was 16% vs. 36.4% in urban centers.

Table 24

Distribution of Mothers' Education, Baseline and Follow-up Surveys
(Percent)

<u>Educational Level</u>	<u>Rural</u>		<u>Urban</u>	
	<u>Baseline</u>	<u>Follow-up</u>	<u>Baseline</u>	<u>Follow-up</u>
Illiterate	92.4	83.4	74.4	63.7
Primary School	4.6	9.8	19.6	24.7
Secondary School & above	2.9	6.8	6.0	11.7

Table 25

Mean Duration of Current Illness at Time of Interview (days)

<u>Survey</u>	<u>Type of Center</u>				
	<u>PHC-alone</u>	<u>NE</u>	<u>SRHD</u>	<u>Urban</u>	<u>Rural</u>
Baseline (July 1985)	3.8	3.7	3.2	3.4	3.7
Follow-up (December 1985)	3.49	3.43	2.33	3.28	3.06
% change	8.2%	7.3%	27.2%	3.5%	17.3%

Table 26 presents the structure of the child's usual diet as reported in the second survey, analyzed in the same manner as the dietary types in the first survey. The distribution of usual diets appears to be somewhat different in two respects between the first and second survey populations. Fewer urban children under 3 months of age were receiving milk-only diets in the second survey, and fewer older children (13 months to 36 months) were receiving complex diets without milk. Nevertheless, the general distribution of dietary structure by age is similar. There was no significant relationship of diet type to maternal literacy.

Table 26

Follow-up Survey, Usual Diet
Percent of Infants by Diet Type and Age

<u>Age Group</u>		<u>(N)</u>	<u>Milk Only</u>	<u>Milk & 1 Food</u>	<u>Milk & Foods</u>	<u>Milk & >2 Foods</u>	<u>No Milk</u>
0-3 mo.	Rural	(39)	87.2	12.8	0	0	0
	Urban	(56)	73.2	17.9	5.4	3.6	0
4-6 mo.	Rural	(68)	77.9	13.2	1.5	5.9	1.5
	Urban	(77)	53.2	16.9	19.5	10.4	0
7-9 mo.	Rural	(66)	53.0	18.2	12.1	16.7	0
	Urban	(82)	22.0	14.6	11.0	52.4	0
10-12 mo.	Rural	(96)	37.5	8.3	15.6	36.5	2.1
	Urban	(72)	16.7	9.7	9.7	56.9	6.9
13-18 mo.	Rural	(108)	19.4	10.2	12.0	49.1	9.3
	Urban	(94)	8.5	8.5	10.6	55.3	17.0
19-24 mo.	Rural	(101)	6.9	3.0	5.0	39.6	45.5
	Urban	(30)	5.3	5.3	0	50.0	39.5
25-36 mo.	Rural	(81)	4.9	1.2	0	19.8	74.1
	Urban	(22)	4.5	0	4.5	40.9	50.0

Change of Diet during Diarrhea

As in the first survey, fewer than ten percent of mothers reported stopping all feeding during the current diarrheal episode (see Table 27). This percentage was not different from that in the first survey.

Table 27

Percent of Mothers Saying They Stop Feeding the
Child During Diarrhea, by Age of Child, Follow-up Survey
(N=number of children with diarrhea at
the time of the interview)

<u>Age group</u>	<u>% yes</u>	<u>(N)</u>
0-3 months	3.3	(61)
4-6 months	3.2	(93)
7-9 months	0.0	(92)
10-12 months	5.6	(108)
13-18 months	6.4	(125)
19-24 months	7.3	(82)
25-36 months	6.8	(59)
Total	4.7	(620)

A significantly larger percentage of mothers mentioned giving ORT during the current episode in the second survey compared to the first (see Table 28).

Table 28

Percent of Mothers Mentioning ORT during
Diarrhea by Age of Child, Follow-up Survey
(N=number of children who had
diarrhea at time of interview)

<u>Age group</u>	<u>% yes</u>	<u>(N)</u>
0-3 months	75.4	(61)
4-6 months	67.7	(93)
7-9 months	71.7	(92)
10-12 months	68.5	(108)
13-18 months	68.8	(125)
19-24 months	74.4	(82)
25-36 months	69.5	(59)
Total	70.5	(620)

Table 29 presents data on individual food items, by age of the child, in the following way: for mothers who attended the clinic because their children had diarrhea, the percentage of those who retained each food item in the child's diet during diarrhea and the percentage who stopped the item during diarrhea are listed. Thus for example, for infants 0-3 months of age who had diarrhea on the day of the interview, 5.4% of mothers stopped

breastfeeding during diarrhea, while 86.9% continued. 92.3% of infants of this age who had diarrhea had been receiving breast milk before becoming ill.

Table 29

Change of Diet during Diarrhea, by Age Group, Follow-up Survey
 where N=number of mothers whose children had
 diarrhea on the day of the interview

<u>Age</u>	<u>Foods Stopped</u> <u>(% of mothers)</u>	<u>Foods Retained</u> <u>(% of mothers)</u>
0-3 months (N=56)	Breast milk 5.4% Other milk 41.7% Rice/Pot. 3.6% Fruits/Veg. 1.8% Dairy products 0.0%	Breast milk 86.3% Other milk 11.5% Rice/Pot. 0.0% Fruits/Veg. 0.0% Dairy pdcts 3.6%
4-6 months (N=93)	Breast milk 5.6% Other milk 50.6% Beans 9.0% Fruits/Veg. 75.0% Dairy products 16.7% Eggs 60.0%	Breast milk 90.4% Other milk 8.6% Rice/Pot. 10.8% Beans 1.1% Fruits/Veg. 5.4% Dairy pdcts 5.4% Eggs 2.2%
7-9 months (N=92)	Breast milk 2.4% Other milk 47.4% Rice/Pot. 27.7% Beans 53.8% Fruits/Veg. 53.3% Meat 71.4% Eggs 78.9% Dairy products 33.3%	Breast milk 88.1% Other milk 10.9% Rice/Pot. 36.9% Beans 13.1% Fruits/Veg. 15.2% Meat 2.2% Eggs 4.3% Dairy pdcts 17.4%
10-12 months (N=108)	Breast milk 3.1% Other milk 92.9% Rice/Pot. 22.5% Beans 46.0% Fruits/Veg. 55.1% Meat 63.2% Eggs 75.7% Dairy products 67.9%	Breast milk 87.9% Other milk 0.9% Rice/Pot. 50.0% Beans 25.0% Fruits/Veg. 20.4% Meat 6.5% Eggs 8.3% Dairy pdcts 8.3%

Table 29 (continued)

Change of Diet during Diarrhea, by Age Group, Follow-up Survey

<u>Age</u>	<u>Foods Stopped (% of mothers)</u>	<u>Foods Retained (% of mothers)</u>
13-18 months (N=125)	Breast milk 5.0% Other milk 50.0% Rice/Pot. 23.7% Beans 58.7% Fruits/Veg. 54.5% Meat 68.6% Eggs 85.7% Dairy products 68.5%	Breast milk 76.0% Other milk 7.2% Rice/Pot. 56.8% Beans 24.8% Fruits/Veg. 24.0% Meat 7.2% Eggs 6.4% Dairy pdcts 13.6%
19-24 months (N=82)	Breast milk 0% Other milk 72.7% Rice/Pot. 23.9% Beans 45.0% Fruits/Veg. 32.8% Meat 64.4% Eggs 72.3% Dairy products 69.2%	Breast milk 43.9% Other milk 3.7% Rice/Pot. 65.9% Beans 40.2% Fruits/Veg. 52.4% Meat 19.5% Eggs 15.9% Dairy Pdcts 19.6%
25-36 months (N=59)	Breast milk 8.3% Other milk 50.0% Rice/Pot. 16.4% Beans 38.3% Fruits/Veg. 51.0% Meat 72.5% Eggs 68.4% Dairy products 58.8%	Breast milk 18.6% Other milk 3.4% Rice/Pot. 77.9% Beans 49.2% Fruits/Veg. 38.9% Meat 18.6% Eggs 20.3% Dairy pdcts 23.7%

Overall, fewer than 5% of mothers stated that they stopped giving breast milk during diarrhea, a significant difference from the baseline survey. Rice and potatoes, as in the baseline survey, were the items most likely to be retained in the diet during diarrhea, other than breast milk.

Analysis of data by rural/urban sites revealed that:

- 1) breast feeding was more prevalent in rural sites at ages below one year.
- 2) eggs, meat and vegetables were more commonly given in rural areas especially for older children.

- 3) ORS was used more in rural centers for young infants (<1 year) and for older children (>19 months).

For several critical questions, student's "t" tests were applied to determine differences in behavior between the baseline and follow-up survey).

For all age groups combined there was no significant difference between the two surveys in the proportion of mothers who stopped feeding the infant during diarrhea. In the age group 7-9 months, however, there was a significant decline (10.8% reported stopping all food in the baseline survey, 4.1% in the follow-up survey).

With regard to breast milk consumption, there was a marked and significant increase in the proportion who continued to give breast milk during diarrhea ($p < .05$ for all ages). The proportion giving breast milk before diarrhea was similar in both surveys (significantly higher in the follow-up survey only for ages 13-18 months), but in the second survey there was no significant difference in breast milk consumption before or during illness for any age group.

The Educational Message

Two questions were designed to elicit mothers' experiences in hearing the message, in a direct and an indirect way.

The indirect question asked mothers who attended any PHC center in the last 3 months whether they had heard something related to nutrition during diarrhea, and if so, what. Table 30 summarizes the responses.

Overall, 779 mothers (77.8%) answered this question with yes. Of these, 91.9% stated that someone had told them about diarrhea and how to feed children during diarrhea.

From Table 30 it can be seen that almost all mothers (90%) received information about the use of ORS during diarrhea, in all types of centers.

The component of the message concerning breastfeeding was reported received by 69.4% of mothers. NE and SRHD-center mothers reported a higher percentage of receiving it than those in PHC-alone centers. The subpackage of the message concerning "continue the diet, but boil it during diarrhea" was reported by 38.4% of mothers. NE centers showed the highest transmission, with half of the mothers having received this information.

Table 30

Percent of Mothers Who Received Message Concerning
Nutrition Repletion During Diarrhea

		<u>Type of Center</u>			
		ORT	NE	SRHS	Total
<u>Advice</u>	No.	192	353	171	716
ORT	N	172	329	168	669
	%	89.6	93.2	98.2	93.4
Continue Breast Milk	N	107	260	130	497
	%	55.7	73.7	76.0	69.4
Same Diet but Boiled	N	46	178	51	275
	%	24.0	50.4	29.8	38.4

It is worth noting some historical background concerning the introduction of ORS, the start of encouragement of breast-feeding and the importance of feeding children during diarrhea in educational programs in Egypt.

ORS was introduced in 1977 and became a national program in 1982. Its mass media component was initiated in 1985.

Feeding children their usual diet during diarrhea was focussed upon more recently, since 1984. It was advertized in mass media in late 1985 while boiling this food was only initiated from this study and has been incorporated into a mass media message very late in 1985.

This historical background throws light on why the subpackages of educational message have been received differently by mothers, depending on the timing of their introduction in Egypt.

The more direct question, in which the educational message was read to mothers, was reported familiar to 58% of mothers. Of these, 75.5% stated that doctors had given them the information, 26.9% received it from nurses and 49.0% reported hearing it from the mass media.

Treatment of the Current Illness

When mothers were asked about the actual treatment children received during their current illness, 85% stated that ORS was included. Sixty percent received drugs, and 26% of mothers depended on diet as well.

SRHD centers were slightly more effective in advising mothers with usage of ORS, while NE centers seem to take the upper hand in respect to dietary regimen.

For those who didn't mention ORS in their responses throughout the questionnaire, there was another question directly on ORS. Out of the 1001 mothers who were interviewed, only 162 (16%) didn't mention ORS except after this direct question, of those, 74% stated that they had been told about ORS from doctors, 7% had been told about ORS from nurses and 34% knew from the mass media. Also, of these 16%, about half mentioned that they actually used it.

To summarize mothers' experiences with ORS, not less than 90% heard about ORS, not less than 80% mentioned ORS in the actual treatment of the current illness, and about half of those who did not mention ORS stated that they had used it when asked directly about it.

Health Care Providers

The second survey covered 496 health care providers. About thirty percent were physicians and 40 percent were nurses; the remaining 30 percent included nutrition organizers in the NE centers and a few other types of personnel. The distribution of types of providers did not differ between the two surveys. There was no attempt to link baseline and later responses for individual providers, or to ascertain how many of the providers surveyed in the follow-up study had been included in the baseline study.

There were several significant differences in reported behavior between the first and second surveys. The most important were in terms of dietary advice given to mothers of children with diarrhea. Types of treatment (ORT, drugs, antibiotics, diet, and referral) did not differ between the two surveys with regard to mild diarrhea, but for severe diarrhea there was a marked increase in the proportion of physicians and nurses in PHC-alone and SRHD centers who included dietary advice in their treatment; this change brought the providers in these centers up to essentially the same proportion as in the NE centers (see Table 31).

In terms of specific dietary advice, there was a very noticeable increase in the proportion of providers who recommended the continuation of breastfeeding during and after diarrhea in the PHC-alone and SRHD centers, again bringing their level of practice up to that in the NE centers. Similar patterns were seen with regard to advising the feeding of rice, potatoes, and starch puddings. While there were some marginal changes in the recommendations for other items, none were significant. (Table 32).

With regard to sources of information, the situation at the time of the second survey was quite different from the baseline. Ninety percent of all providers stated during the second survey that they had had specific information provided about diet and nutrition during diarrhea (i.e., from their own education or specific training courses or activities).

Table 31

Advice Given on ORS and Diet by Health Care Providers
(Percent Recommending for Severe Diarrhoea)

Provider	Type of Center -->	ORS Advised			Diet Advice Given		
		PHC-alone	NE	SRHD	PHC-alone	NE	SRHD
Doctors	July 1985	61.5	92.2	94.4	15.4	45.1	38.9
	December 1985	82.8*	97.1	100.0	41.4*	49.0	57.9
Nurses	July 1985	57.9	67.5	30.8	0	33.8	12.8
	December 1985	51.2	60.7	56.3*	29.3*	24.3	20.8
Others	July 1985	24.1	50.0	35.3	3.4	28.6	11.8
	December 1985	32.8	32.5	30.8	5.2	15.0	3.8

*Significant increase

Table 32

Specific Dietary Advice Given by Health Care Providers
(Percent Recommending)

<u>Food to be continued</u>	<u>Provider</u>	<u>Baseline Survey</u>	<u>Follow-up Survey</u>
Breast Milk	Doctors	81.1	88.2
	Nurses	80.2	92.5
	Others	62.5	64.4
Rice	Doctors	37.7	44.4
	Nurses	19.0	47.1
	Others	5.4	18.5
Potatoes	Doctors	44.3	57.6
	Nurses	23.8	53.5
	Other	8.9	29.6
Starch Pudding	Doctors	27.9	32.6
	Nurses	13.5	36.9
	Other	3.6	11.9

6. CONCLUSIONS AND RECOMMENDATIONS

The original problem analysis which led to the concept for the PRICOR study was contributed to by many individuals, and included in-depth and fruitful discussions of the study Policy Committee. That analysis spelled out the need to modify food intake by Egyptian infants and children to ensure that they receive the required nutrients for full growth and development.

Previous Nutrition Institute studies had found that most Egyptian mothers stopped or drastically reduced food intake to their children during and after diarrhea attacks. Furthermore, many mothers continued to withhold food for a long time after diarrhea had stopped. The public health goal of the PRICOR Project was to change this attitude and rectify this feeding practice. A message was developed and sent to the mothers through the existing PHC system.

In general, the message was received, and apparently acted upon by many of the mothers. Thus, we conclude that the PHC system is a viable channel for sending messages. During the 13 months of the project the activities in the PHC system were exposed and constraints identified. A simple message was constructed so that health providers could explain it easily to the mothers. We believe this was responsible for the high retention of the message by both mothers and health providers. The time lapse between Survey I and Survey II, about 3 months, demonstrated that the message was retained by the providers for at least that period. Thus, the primary need for repeating such messages is to reach the new providers working in the centers, rather than to reinforce ongoing personnel.

Interpretation of the results and discussion with the policy group made it possible to make the following recommendations to decision makers, which will, we believe, promote child survival and improve the effectiveness of Primary Health Care in Egypt:

1. The adopted message should be kept alive by continuing to send it. This project did not verify the interval that the message should be re-initiated. The retention of the message by the mothers was not captured by our survey. But the second survey, which depended greatly on self-reporting demonstrated a high prevalence of retained knowledge by the mother. The ORS being distributed by pharmacists (60-70% of ORS produced) indicates that the mother need not go back to the health center for advice. The other problem of changes in staff, i.e. health providers at the health center, periodically needs to be known so the message can be repeated to the new health provider.

2. The project design tested the effectiveness of the message in relatively few health centers. The Advisory Committee recommended and agreed that expansion of the message be delivered to all health centers. This recommendation was a follow-up recommendation due to the success of message delivery.

3. The results demonstrated that through the existing PHC system, messages could be delivered efficiently. The message should be simple, practical and understandable. This project dealt with a first priority message, but other priority messages could also be included for strengthening child survival strategies. The time and duration of this project (13 months) demonstrated that the process of introducing the message to the PHC system is not a lengthy one. Most important of all is that messages that are effective would strengthen the PHC system. Therefore, the decision makers in the PHC system should start handling other priority messages to be delivered to the target population.

4. This project concentrated its efforts on delivering the message through the PHC system as it is the official health service delivery system. The fact that it was possible to deliver the message successfully led the group to think of other possible channels that would increase information to mothers. To change the PHC system as a channel for delivery of information meant that the target population will also change. Our results did not verify that any of the mothers knew beforehand that food introduced during and after diarrhea could be used as that before diarrhea, but boiled. It is hence important to reinforce the message using a channel that reaches both future mothers and pregnant mothers. The general education system can adopt this message and introduce it in the various and appropriate scholastic curricula. Another channel which recently adopted the message is the mass media. It is expected that it will deal with future mothers in addition to existing mothers.

5. The present study did not allow investigation of the non-attending mothers to the Health Centers. This needs further investigation with a different design. It is recommended that work should continue to elucidate this area of non-attending mothers and their behavior toward managing their child with diarrhea and study their relationship to pharmacists for obtaining ORS.

6. The present study demonstrated that the operations research technique is a tool which can be used to identify constraints on positive activities within a system that is used to serve individuals. Needless to say, health systems are systems of priorities that affect individuals in a country. As a byproduct of this research, it is expected that the Ministry of Health and its respective units associated with PHC will attain an increased awareness of operations research methodology and its potential for management and problem solving.

Members of the Policy Committee, being responsible people in the PHC, facilitated the implementation of the recommendations cited. Throughout the project recommendations have been implemented, as members of that committee are policy makers. Training activities for both medical and paramedical in the PHC System also introduced the feeding repletion component to ORI and many of its programs.

Dissemination of the study's findings has begun, including through scientific channels. A paper describing the dietary pattern during diarrhea from the baseline survey was presented at the First National/Regional meeting on Oral Rehydration Therapy, sponsored by the NDDCP and the Egyptian Pediatric Association, April 2-4, 1986 in Cairo. (The abstract is included as Annex 3).

7. ADMINISTRATION

This research study was planned and guided by a joint effort between the Nutrition Institute and the Department of Family and Community Medicine, University Of Arizona. The Principal Investigator (Dr. Osman Galal) assisted by the Project Director (Dr. Farouk Shaheen) and the U.S. consultants (Drs. Gail Harrison and Cheryl Ritenbaugh) developed the conceptual framework for the proposal. Later, they were assisted by a PRICOR consultant (Dr. Howard Smith) to re-design the proposal in an operations research setting. The project was approved for implementation in January, 1985 for a 13-month duration, ending in March, 1986.

A. Personnel:

The members of the Policy Committee included responsible authorities of the PHC system (Undersecretary of Health for PHC, Director of SRHD, Director of National Oral Rehydration Project, Principal Investigator and Project Director of the present project). Data were collected by field staff (18 junior physicians and 3 field social workers from the Nutrition Institute). Three mid-level physicians from the Nutrition Institute, namely Drs. Dana Shehab, Lobna Sharif and Magda Shaheen, supervised field work activities and managed data. Data were analyzed with the assistance of a programmer and renting a microcomputer facility.

Technical advice throughout the study was provided by the U.S. consultants Dr. Gail Harrison and Dr. Cheryl Ritenbaugh from the University of Arizona. Dr. Malek El-Nomrosy, an Egyptian statistician, provided technical assistance in the analytical phase. During the course of the study, PRICOR responded to the technical difficulties that faced the project.

This report has been written and edited by Drs. Galal, Harrison, Ritenbaugh, Shaheen and Shehab, assisted by administrative and secretarial help. The responsibilities of each participant in the project are cited in detail in Annex 1.

B. Budget:

Total Budget of NI	LE 42,618	
Total expenditure to end of February, 1986		21,956
Total obligated within the life of the project & to end of March, 1986		10,500

Grand Total	LE 32,456	

Expenditures did not exceed the allocated budget.

In addition, vehicle and operations costs of approximately LE 500-600/month for 12 months were contributed to the project by the Nutrition Institute.

C. Timetable:

All activities took place as planned, with some changes in the original timetable (Annex 2. Bar Chart). The start of Survey II was delayed for 3 months. It was planned for September 1985, but was implemented in December 1985. This delay was to assure that Survey II would cover the secondary peak season of diarrhea which occurs in November. In addition, our experience from Survey I assured us that allocating 3 months for Survey II would be more than required.

ANNEX I

Personnel Responsibilities

Principal Investigator:

1. Overall administrative and technical guidance of the project.
2. Review of data collection instruments, decision processes, programmed instructions and periodic reports.
3. Data interpretation and report writing.

Principal Project Director:

1. Day-to-day administration.
2. Preparation of workplans and periodic reports.
3. Review of data collection draft forms, decision trees and programmed instructions.
4. Recruitment and training of staff.
5. Overall supervision of field work and on-spot problem solving.
6. data interpretation and report writing.

Advisory Committee:

1. Development of overall research strategies.
2. Selection of research sites and overall co-ordination of work.
3. Review and approval of work plan.
4. Monitoring of major field activities.
5. Review of reports and implementation of recommendations for a nation-wide adoption.

Mid-level NI staff:

1. Organization of field work.
2. Direct supervision and support of field work.
3. Assistance in data analysis.

Junior physicians of NI:

1. Testing of questionnaires.
2. Data collection.

Social Workers:

1. Data collection and assist in conduction of household surveys.
2. Facilitate field work through orientation of mothers.

Clerical Staff:

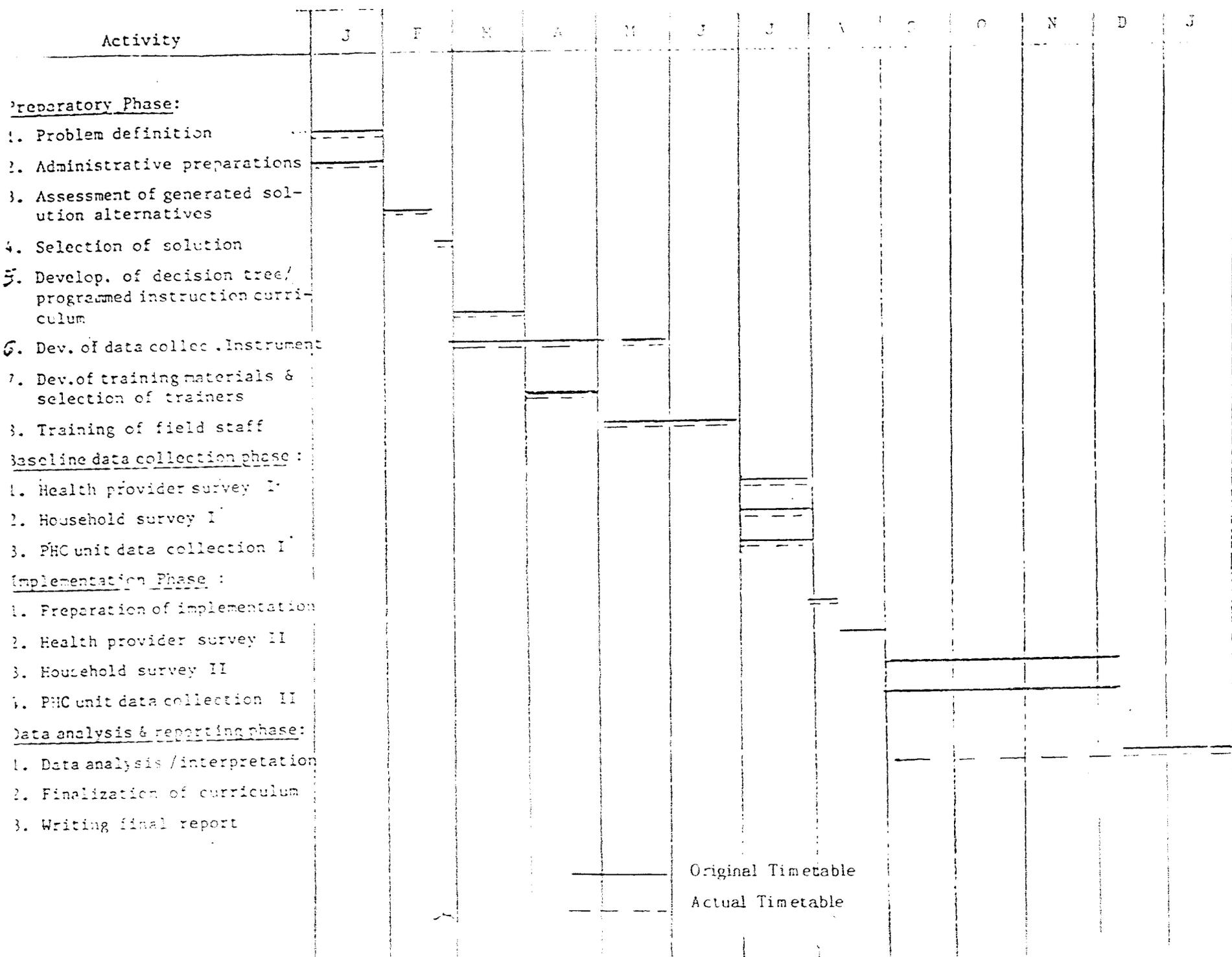
1. Execute organizational activities for field work.
2. Handle logistical and local financial arrangements.

Secretary:

1. Handle secretarial services for the project.
2. Keep accounting records.
3. Typing of field, periodic and final reports.

Drivers:

Driving data collectors to field sites.



ANNEX III

First National Regional Conference on Oral Rehydration Therapy
April 2-4, 1986

Dietary Pattern During Diarrhea in Egyptian Children Treated with
Oral Rehydration Solution

O. Galal, F. Shaheen, D. Shehab, G. Harrison and C. Ritenbaugh

Nutrition Institute, University of Arizona U.S.A.

EGYPT

Egypt continues to implement a successful programme of Oral Rehydration Therapy (ORT) for infants and young children within its Primary Health Care (PHC) system. Administration of ORT alone, however, cannot resolve the inherent difficulties brought about by malnutrition which accompanies diarrhea.

About 10% of the mothers (20-25% of those who said they changed the diet) indicated that they had stopped feeding the child completely, this observation held only for children older than three months of age. For infants less than 3 months of age, complete stopping of feeding was rare.

The most common changes of diet during diarrhea involved stopping of usual food items and the introduction of water, sugar water, tea, starch pudding and/or ORT. The items most likely to be dropped during diarrhea were eggs, meat/chicken, beans, fruits, vegetables, and artificial milk. There was some instance of stopping breast milk and rice/potatoes, where less than 10% of mothers of children at any age stopped giving breast milk during diarrhea and 75% retained rice or potatoes.