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12N 49435

A.I.D. EVALUATION SUMMARY: PART I

A. REPORTING A.I.D. UNIT:

USAID/Egypt

ES#: 86-11

B. WAS EVALUATION SCHEDULED IN CURRENT FY EVALUATION PLAN?

yes X slipped ___ ad hoc ___

C. EVALUATION TIMING

interim X final ___
ex post ___ other ___

D. ACTIVITY EVALUATED:

<u>Project #</u>	<u>Project Title:</u>	<u>First PROAG (FY)</u>	<u>PACD (mo/yr)</u>	<u>Planned LOP Cost</u>	<u>Amount Obligated</u>
263-0137	Control of Diarrheal Diseases	81	9/87	\$ 26 Million	\$ 26 Million

E. ACTION DECISIONS APPROVED BY THE MISSION DIRECTOR

OFFICER RESPONSIBLE

COMPLETION DATE

- 1. Complete Amendment extending the project by at least two years. Amendment should incorporate the following activities:

Dr. Nagaty, MOH and C. Mantione, USAID/HRDC/H

3/87

- (a) Development and implementation of a plan that addresses the continued institutionalization and the sustainability of key program activities, including production of ORS and transfer of key program coordination functions to the MOH;
- (b) Expanded and improved training for health professionals in diarrhea case management, including efforts to limit the inappropriate use of drugs in treatment of diarrhea;
- (c) Training of health unit staff in health education and communication techniques;
- (d) Greater emphasis in media messages on correct use of ORT, feeding during diarrhea, and prevention of diarrhea;
- (e) Expansion of the ORS depot holder scheme in rural areas;

ACTION DECISIONS APPROVED BY
MISSION DIRECTOR (CONTD.)

RESPONSIBLE
OFFICER

COMPLETION
DATE

- (f) Research emphasizing effective ORT use, diarrhea prevention, and management of ORT services;
 - (g) Greater emphasis in evaluation on "process" indicators and intermediate effects, and provision of appropriate statistical expertise to supervise mortality studies.
2. Revise current planning, evaluation and follow-up procedures to provide a greater role for governorate and district level personnel. Dr. Nagaty, MOH and Dr. Gipson, JSI* 8/87
 3. Simplify project reporting system and train local administrators in data analysis, to improve relevance of reporting for local health personnel. Dr. Nagaty, MOH and Dr. Gipson, JSI 8/87
 4. Establish a special committee to revise the current incentive system, with the involvement of district level health personnel. Dr. Nagaty, MOH and Dr. Gipson, JSI 6/87

F. DATE OF MISSION REVIEW OF EVALUATION: July 15, 1986

G. CLEARANCE/APPROVAL OF EVALUATION SUMMARY AND ACTION DECISIONS:

Technical Office/Directorate

Program/Evaluation Office

Deputy Director

C. Mantione, HRDC/H²/a
C. Collins, HRDC/H²/C
L. Ervin, AD/HRDC (A) *[Signature]*

S. Conly, PPP/PL *[Signature]*
V. Mollrem, PPP/PL *[Signature]*
S. Anderson, PPP/P *[Signature]*
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A. Handly, DD *[Signature]*

Approved:

[Signature: Frank B. Kimball]

10 FEB 1987

Frank B. Kimball, DIRECTOR

Date

*John Snow International

H. EVALUATION ABSTRACT

The National Control of Diarrheal Diseases Project (NCDDP) in Egypt aims to reduce diarrheal mortality in children through a national program to train health professionals and to educate mothers in treatment of diarrhea, and to make oral rehydration salts (ORS) and oral rehydration therapy (ORT) widely available. The following are the major findings of this joint donor review:

- o The Ministry of Health, through the semi-autonomous NCDDP Secretariat, has successfully implemented a national, multi-sectoral ORT campaign, within three years, at a cost of about LE 1.00 per mother served. The project has established over 2700 rehydration centers at 77% of all health facilities, and ORS is widely available.
- o The public education campaign in support of the ORT program has been highly successful in promoting widespread awareness and use of ORT through national television. 96% of mothers interviewed by the review team recognized the ORS packet, 32% reported using it, and 97% of users were able to mix it correctly. Media messages need to be reinforced through improved health education, since mothers still need more information on many aspects of diarrhea case management.
- o The NCDDP has trained large numbers of health personnel, but training activities are behind schedule. ORS is widely used by health professionals, but many of them lack adequate case management skills and still prescribe drugs along with ORS.
- o Local-level personnel are not adequately involved in the central program planning process, and are dissatisfied with the current incentive system.
- o NCDDP-sponsored operations research has been very effective and has directly contributed to program success. Studies of mortality, however, have not been able to link ORT to reduced mortality, owing to the difficulties in measuring short-run changes in mortality and isolating program effects from other factors. The project reporting system needs revision to make it more relevant to project management needs.

The major recommendations of the review team are as follows:

- o The project should be extended for at least two years, during which time integration of activities into the MOH should begin. The program planning process should provide for more local involvement, and the incentive system should be revised.
- o The NCDDP should give top priority to training health personnel in case management. Media messages should emphasize correct use of ORT, feeding practices and diarrhea prevention. Health education through health facilities should be strengthened.
- o Future research should stress effective ORT use, diarrhea prevention and health services management. The NCDDP should consider employing appropriate expertise to oversee mortality studies.

I. EVALUATION COSTS

1. Evaluation Team: (Only USAID nominated team members are listed below. See Annex 2 for other team members.)

Name/Affiliation	Contract # <u>OR</u> TDY Person Days	Contract Cost <u>OR</u> TDY Cost (US \$)	Source of Funds
Mr. Robert Clay, AID/Washington	15	\$ 3,000	OE
Dr. Carl Stevens, Consultant	15	(\$24,000	Project
Dr. William Woodward, Consultant	15	(Project

2. Mission Staff Person Days: 30

3. Grantee/Staff Person Days: 120

A.I.D. EVALUATION SUMMARY: PART II
J. SUMMARY OF EVALUATION FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

USAID/EGYPT: CONTROL OF DIARRHEAL DISEASES PROJECT (263-0137)
SECOND JOINT GOE/DONOR REVIEW, JUNE-JULY 1986

PROJECT DESCRIPTION: The Control of Diarrheal Diseases Project aims to reduce mortality from diarrhea in children by making rehydration services and materials widely available and used through a national program. The project has provided \$ 26 million to train practitioners and to improve mothers' knowledge, attitudes and practices regarding the proper treatment, management and prevention of childhood diarrhea; and to produce and to distribute oral rehydration salts (ORS) sufficient to ensure wide access throughout Egypt.

EVALUATION PURPOSE AND METHODOLOGY: This second "joint" donor review of the National Control of Diarrheal Diseases Project (NCDDP) in Egypt was conducted by a team of 19 persons nominated by the Ministry of Health (MOH), USAID, WHO and UNICEF. The review aimed to assess the progress of the national program. The team interviewed NCDDP staff, reviewed project documentation, and visited ten governorates, where they interviewed over 160 health personnel and pharmacists, as well as 161 mothers.

FINDINGS AND CONCLUSIONS

Project Administration: The semi-autonomous status of the NCDDP has given it the necessary flexibility to coordinate a large, multi-sectoral program. It has successfully completed a wide range of planning and administrative functions. The establishment of over 2700 rehydration centers at 77 per cent of all health facilities is itself a major accomplishment. Integration of central planning and coordination functions into the MOH is, however, desirable in the long-term.

To the project's credit, all activities at the governorate level and below have been carried out within the health service system. However, decision-making has been overly centralized; the NCDDP structure has not adequately involved the governorates in the planning process. Local personnel also lack control over, and understanding of, centrally-administered incentive payments. As a result, the present incentive system has become a source of contention, rather than of motivation for good performance.

Improving Mothers' Knowledge and Use of ORT: The project's major success has been in the area of mass communication. It can be attributed in large part to two well planned and implemented national television campaigns. The campaigns concentrated on a few, simple messages that were carefully derived from relevant operations research. The use of television was a wise choice, given its virtually universal coverage in Egypt, and its effectiveness compared with other media.

The results of these campaigns are impressive. Within three years, a new concept in childhood disease - dehydration - and a method for its prevention and treatment have been introduced to the public and widely accepted. Project studies indicate that awareness of ORT is almost universal, with the vast majority attributing their knowledge to TV. Increases in use have been substantial. Review team field visits supported these findings. 96% of 161 mothers interviewed by the team recognized the ORT packet and its purpose, and 82% reported using it. 97% of the users could correctly mix ORS.

The review team concluded that the project's focus on the primary target audience, i.e., mothers, has resulted in a demand-driven system with important positive implications for the sustainability of project achievements. Increased access to and knowledge of ORS has been achieved at a modest cost of a little more than L.E. 1 for each mother gaining this benefit.

However, studies and field visits indicate that while mothers know of and use ORT, they need more information on many aspects of diarrhea case management, e.g. how often to give ORT, how to feed their children during diarrhea, etc. The media campaigns require reinforcement through health education, but the MOH system has thus far been unable to meet this need. Improved coordination of project communication and training activities is needed, so that health personnel can more effectively reinforce media messages.

Training Practitioners in Diarrhea Treatment and Management: The NCDDP has trained over 9,000 government physicians and 3500 nurses. Progress has been made in integrating diarrhea case management into medical and nursing school curricula. The project has also trained between 300 and 400 pharmacy inspectors and government pharmacists.

Despite these achievements, there are several problems in the training area. Priority training activities for the current phase - production of training materials and a new, task-based curricula - are behind schedule. There has been little follow-up of training impact. The review concluded that training activities have lagged behind other components, and that the NCDDP needs to increase the volume and improve the quality of training.

ORS is widely used in both public and private health care sectors. However, project studies and field visits indicate that many health professionals still lack appropriate ORT knowledge and case management skills. ORT is rarely used alone; antibiotics and "antidiarrheal" drugs are frequently prescribed in conjunction with ORS. Moreover, more attention should be given to feeding practices during diarrhea. However, the project made a deliberate strategic choice to emphasize ORT - and it was a good one.

NCDDP supervisory activities tend to focus on physical facilities, rather than on performance monitoring. The impression of the review team was that supervisory visits to health offices and facilities are infrequent, and provide little feedback for improving health worker performance.

The pilot community "depot-holder" scheme for ORS distribution is still largely functional more than six months after official termination of the pilot study. The team concluded this scheme is a low cost and effective model for improving access to ORS, and recommended its phased expansion.

Production and Distribution of ORS and ORT Materials: The NCDDP has contracted a public sector firm to produce national ORS requirements, and uses three distribution channels to reach both public and private sector outlets. The review concluded that ORS stocks are widely available and the multiple distribution channels are functioning well. The continuous, adequate supply of ORS to most outlets is a significant achievement. The team observed that ORS and ORT equipment supplied to health facilities are often not related to actual needs. (However, the report provides few specific examples and no recommendations regarding equipment.) The team also noted that old 27.5 g ORS stocks were in deteriorating condition and needed to be destroyed.

Current dependence on a single, public sector firm for ORS production may have implications for long-term program sustainability. The NCDDP should assess the advisability of increasing the number of ORS producers, and allowing them to distribute directly to the private sector. Local sources for raw materials should also be explored.

Project Information Systems: The team concluded that the project's routine reporting system lacks clear objectives and collects excessive information. The relevance of reporting requirements is not apparent to health unit staff, who therefore neglect or poorly carry out these duties.

However, the research program, which has supported a wide range of operations research activities, has been very effective. The emphasis has been on rapid, low-cost studies, designed to obtain information of immediate programmatic relevance. Research results have been directly applied to the design of project components, and have contributed to the project's success.

Impact on Mortality: Recent project studies of mortality data have claimed that the ORT program has lowered infant and child mortality rates. After carefully reviewing these studies, the team concluded that these claims were premature. Infant and childhood mortality in Egypt have declined significantly over the past few decades, but there is considerable inter-annual fluctuation in childhood death rates. Significant departures from an overall trend can rarely be detected by comparing data for just two years. Moreover, project research has thus far failed to isolate program effects from other factors, and has often been based on flawed statistics and/or methodology. There is, however, general agreement that ORT substantially reduces the risk to children of death from dehydrating diarrhea.

KEY RECOMMENDATIONS:

- o The project should be extended for at least two years. The current administrative structure should continue, but planning for transfer of administrative responsibility to the MOH should begin as soon as possible.
- o The NCDDP should more actively involve governorate and district level personnel in program planning. The incentive system should be overhauled with input from local personnel, and more closely linked to performance.
- o Priority should be given to training health professionals in diarrhea case management skills. Efforts should be made to limit inappropriate use of drugs in diarrhea treatment. The NCDDP should emphasize correct use of ORT, feeding during diarrhea, and diarrhea prevention, and mass media efforts should be reinforced by improved health education.
- o The routine reporting system should be simplified, and data should be compiled and analyzed at each level of the tiered reporting system.
- o Research efforts should emphasize effective use of ORT, diarrhea prevention and health services management. Mortality studies should continue, but NCDDP should consider employing an epidemiologist or statistician to closely supervise these studies.
- o The ORS depot holder scheme should be expanded to other rural areas.

K. ATTACHMENTS:

Report of the Second Joint Ministry of Health/USAID/UNICEF/WHO Review of the National Control of Diarrheal Disease Project (NCDDP) in Egypt;

Annex, Economic, Financial and Fiscal Considerations.

L. COMMENTS BY MISSION

1. Joint Review Process and Report:

This is the second of two joint donor reviews of the National Control of Diarrheal Diseases Project. The Joint Review process was included in the Control of Diarrheal Diseases Project Paper not only as an evaluation tool for the Egypt ORT campaign but also as a resource for the major donors in ORT - AID, WHO and UNICEF - to use in assisting other developing countries in launching campaigns. The first Joint Review, held in 1984, was successful; it resulted in an objective report incorporating practical guidance for project implementation. USAID used this report as a project evaluation.

Based on this experience, USAID determined that the second Joint Review would serve as a mid-term evaluation of the project. Another factor in this decision was that we felt separate evaluations by different donors would increase the workload for the NCDDP Secretariat, and might result in conflicting recommendations to the MOH and the project.

However, the second Review was not satisfactory. It became clear that WHO and USAID had very different agendas. WHO's primary interest was to conduct a country assessment of ORT activities; USAID was seeking specific guidance for the design and implementation of the next phase of project activities. Although WHO had agreed in principle to a Scope of Work prepared by USAID, this Scope was not followed by the WHO team leader. WHO also incorporated reporting tasks of minimal value which reduced time available for report writing and detracted from the quality of the final report. Although the Joint Review can be a useful process, USAID would be reluctant to evaluate the project through this mechanism in the future.

The report does have some value. It identifies a number of important issues, and bases its findings to a large extent on empirical data. However, it lacks a comprehensive overview of project accomplishments and problems. The team was divided into small groups to review individual program components, and the presentation of findings in the full report reflects this fragmented approach. As a result, the report fails to convey a sense of the relative importance of specific achievements and problems, and is sometimes internally inconsistent.

The report is not balanced. It emphasizes problems rather than accomplishments, and frequently adopts a negative tone. The executive summary attempts to redress this imbalance by highlighting the positive accomplishments of the project, but does not adequately discuss important issues. Finally, the very large number of recommendations are not prioritized, nor do they include practical guidance for project implementation, reducing their utility from a project management perspective. In some instances, they also reflect a lack of understanding of the project and the Egyptian health sector.

2. Sustainability: The report also gives short shrift to the issue of sustainability. This was an important question in the original Scope of Work for the Review prepared by USAID, and one of direct relevance to the Project Paper Amendment USAID is currently preparing. The team economist did attempt to address this issue, but did so in a highly theoretical and simplistic manner. The report falls short of identifying the types and levels of program inputs required to maintain the achievements of the NCDDP over the long-run.

The project was originally designed as a "campaign" to promote ORT. Although it was very successful on these terms, USAID now recognizes that the "campaign" approach may not adequately sustain achievements beyond the project time-frame. The report's primary guidance in this area is to integrate NCDDP functions into the MOH, but it provides very little specific advice on how to undertake this process. Moreover, institutionalization goes beyond the transfer of NCDDP administrative functions to the MOH. The Amendment should identify activities critical to maintaining current program achievements, and address their continuation beyond the project.

3. Impact: The report concludes that a variety of problems make it virtually impossible to isolate the impact of ORT on mortality in the short-term. However, the report appears inconsistent in recommending continued efforts to analyze mortality data, despite the disappointing results of mortality studies to date. The team's rationale, as expressed orally to USAID, was that it was worth continuing these efforts because "if any place can prove that ORT reduced mortality rates, Egypt can".

This is not the first USAID evaluation to draw attention to the significant difficulties inherent in attributing changes in mortality to specific health interventions. USAID is increasingly skeptical that this is a worthwhile exercise. During the amendment period, we will continue mortality studies, but we will place greater emphasis on complementary efforts to track "process" indicators and intermediate effects, e.g., severity of diarrheal admissions to hospitals, nutritional status, etc. This is probably a more realistic approach to impact evaluation.

XD-AAN-340-A

Final Draft, February 1987

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REPORT OF THE SECOND JOINT
MINISTRY OF HEALTH/USAID/UNICEF/WHO
REVIEW OF THE NATIONAL CDD PROJECT

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EGYPT
15 JUNE TO 3 JULY, 1986

	<u>Page</u>
PART A: EXECUTIVE SUMMARY	1
1. Introduction	1
2. Major findings of the Review	1
3. Major recommendations	3
4. Acknowledgements	4
PART B: REVIEW METHODOLOGY	5
1. Terms of reference	5
2. Outline of review methodology	5
3. Places visited and interviews conducted	5
<u>PART C: BACKGROUND INFORMATION</u>	7
1. Brief description of Egypt	7
2. Demographic data	7
3. Overview of the health sector	8
4. A brief history of the NCDDP	11
<u>PART D: FINDINGS AND RECOMMENDATIONS OF THE REVIEW</u>	12
1. Administration, planning and implementation	12
1.1 Administrative structure	12
1.2 Planning and implementation	13
1.3 Payment of monetary incentives	14
1.4 Key issues	14
1.5 Recommendations	15
2. Supervision	16
2.1 Supervisory activities and responsibilities	16
2.2 Field visit findings	17
2.3 Key issues	18
2.4 Recommendations	18
3. Training of health personnel	19
3.1 Training plan	19

	<u>Page</u>
3.2 Curriculum development	19
3.3 Manpower trained by the NCDDP	20
3.4 Types of training courses	20
3.5 Training materials	23
3.6 Monitoring and evaluation of training	23
3.7 Field visit findings	23
3.8 Field visit findings and observations at training centres	24
3.9 Key issues	25
3.10 Recommendations	25
4. Health education and communications	27
4.1 Responsibilities of the communications unit	27
4.2 Mass media campaigns - 1984 and 19185	28
4.3 Expenditures on different mass media	28
4.4 TV message design	28
4.5 Field visit findings	29
4.6 Interviews with 161 mothers	29
4.7 Key issues	33
4.8 Recommendations	33
5. Production and distribution of ORS and ORS materials	34
5.1 Objectives	34
5.2 ORS production	34
5.3 Quality control procedures	34
5.4 ORS distribution	35
5.5 ORS price	35
5.6 Production of polyvalent IV solution	35
5.7 ORT materials	35
5.8 Field visit findings	35
5.9 Key issues	37
5.10 Recommendations	38

	<u>Page</u>
6. Diarrhoea Case Management	39
6.1 Introduction	39
6.2 The case management strategy of the NCDDP	39
6.3 Progress in implementation of the case management strategy	41
6.4 The impact of the case management strategy	41
6.5 Monitoring of hypernatraemia	45
6.6 Studies on rice-based ORS	45
6.7 Field visit findings - case management in health facilities	46
6.8 Interviews with 30 private medical practitioners	48
6.9 Interviews with 52 private pharmacists	49
6.10 Key issues	51
6.11 Recommendations	52
7. ORS depot holders	53
7.1 Background	53
7.2 Objectives of the field visits	53
7.3 Sample selection	54
7.4 Continued functioning of the system	54
7.5 Apparent effectiveness in increasing mothers' KAP and specific deficiencies	56
7.6 Factors apparently associated with continued function of the depot holder programme	58
7.7 Programme costs	59
7.8 Key issues	59
7.9 Recommendations	60
8. Management information system (MIS)	60
8.1 Responsible units	60
8.2 Routine reporting on diarrhoea cases, deaths and treatment	61
8.3 Routine reporting on supervision	61
8.4 Analysis of data from the routine reporting system	61

	<u>Page</u>
8.5 Data from special studies	63
8.6 Feedback	63
8.7 Field visit findings	63
8.8 Key issues	63
8.9 Recommendations	64
9. Research	
9.1 Role of research in the NCDDP	65
9.2 Organizational structure for managing research	65
9.3 Research priorities	66
9.4 Research studies: a cumulative listing	67
9.5 Key issues	72
9.6 Recommendations	72
10. Project evaluation	73
10.1 Evaluation strategy	73
10.2 Major evaluation methods	74
10.3 Other evaluation activities	77
10.4 Current evaluation activities	79
10.5 Key issues	79
10.6 Recommendations	79
11. Measuring the impact on infant and child mortality	80
11.1 Introduction	80
11.2 Child mortality in Egypt	82
11.3 NCDDP estimates of infant and child mortality	85
11.4 The two NCDDP double-round surveys	85
11.5 Other NCDDP sources on mortality	89
11.6 Recommendations	91

	<u>Page</u>
12. Other strategies for control of diarrhoeal diseases	92
12.1 Introduction: A conceptual framework for cost analysis of ORT projects of the NCDDP type.....	92
12.2 The cost of two important system changes: mothers' knowledge about ORT dehydration and improved access to ORT.....	93
12.3 Were the development expenditures to effectuate a system change worth it?.....	94
12.4 Cases treated with ORS and cost per case treated.....	96
12.5 The question of cost effectiveness.....	98
12.6 Fiscal-burden implications of NCDDP: an aspect of sustainability.....	98
PART E: FULL LIST OF RECOMMENDATIONS OF THE REVIEW	101

- 6- (11)
- Annex 1: Control of Diarrhoeal Project (263-0137)
Key evaluation questions
- Annex 2: List of Review Team Members
- Annex 3: List of project staff and resource persons
- Annex 4: NCDDP listing of scientific papers - January 1986
- Annex 5: Governorates visited during the Second Joint Review of the
NCDDP in Egypt - 15 June-3 July 1986
- Annex 6: NCDDP organizational structure
- Annex 7: Findings of visits to seven diarrhoea training centres
- Annex 8: Report on field visits to rehydration units at two university
teaching hospitals
- Annex 9: Composition of 15 antidiarrhoeal compounds found in a single
pharmacy
- Annex 10: Suggestions concerning studies to monitor the incidence of
hypernatremia among diarrhoea cases
- Annex 11: Depot holder system - estimated programme costs per district for
initial 5 month period
- Annex 12: Keeping research relevant - research and the NCDDP
- Annex 13: Economic, Financial and Fiscal Considerations
- 15

MINISTRY OF HEALTH/USAID/UNICEF/WHO REVIEW
OF THE NATIONAL CONTROL OF DIARRHOEAL DISEASE
PROJECT (NCDDP) IN EGYPT
15 JUNE - 3 JULY 1986

PART A: EXECUTIVE SUMMARY

1. Introduction

The review was conducted by a team of eight national and 11 international members. For two days NCDDP staff presented an overview of the project to the review team. Five subsequent days were spent in interviewing Project staff and resource persons, in groups and individually, and in reviewing the extensive documentation of the Project. During a 6-day field visit eight 2-person teams visited 20 districts in 10 governorates and conducted more than 160 interviews with government health staff, pharmacists and private practitioners. In addition, 161 interviews with mothers focusing on knowledge and use of ORS, and other aspects of diarrhoea case management were conducted. To a large extent, places visited and interviewees were randomly selected.

The review team then spent a week in Cairo compiling data from the field visits and preparing a final report. This report is briefly summarized here and presented in greater detail in parts B-D.

2. Major findings of the Review

- o Consistent with findings of a number of studies reported by the Project, the Review found impressive levels of knowledge and use of ORT among mothers. Of 161 mothers interviewed during the Review, 96% knew what a packet of ORS was used for, 82% said they used it and 71% knew some signs of dehydration. Of the users 97% could correctly mix ORS.
- o The production of adequate quantities of ORS within Egypt and its effective distribution through more than one channel to around 3000 government facilities and approximately 6000 commercial pharmacies is a major achievement. Only six of 64 facilities and one of 52 private pharmacies visited were without stocks of ORS, and few had experienced significant difficulties in its supply. The establishment and supply of equipment to over 2700 ORT units in government health facilities is commendable.
- o The greatly increased access to and knowledge of ORS have afforded mothers opportunities to prevent death due to dehydration in their children - an important accomplishment which has been achieved at a modest cost of a little more than L.E. 1.0 for each mother gaining this benefit.
- o It is also noteworthy that these impressive achievements have been largely made in the short time span of three and a half years.
- o It is apparent that the above findings can be attributed in large part to a well planned and carefully implemented mass media campaign very largely channelled through television, of which ownership in Egypt is remarkably high.

- o Operational research has been utilised to advantage throughout the project especially in the design of the mass media campaign.
 - o The Project's wise focus on the primary target audience, mothers, has resulted in creating a demand-driven system which has important positive implications for the sustainability of the Project's achievements.
 - o There is general agreement in the international health community that properly administered ORT will reduce the risk of death due to dehydration. Given the widespread use of ORS achieved by the NCDDP in Egypt it is reasonable to assume that there has been a favourable impact on childhood mortality. It is now important for the Project to undertake the necessary studies to estimate the extent of this impact by appropriate demographic and epidemiologic means.
 - o The semi-autonomous administrative model of the NCDDP as a coordinator of a multisectoral approach was useful and successful. Integration of the activities of the Project into the appropriate sections of the Ministry of Health at central level is desirable in the long term. It is important to note that throughout the life of the Project all activities at governorate and lower levels have been carried out within the health service system. This has been a major factor in the Project's success.
 - o Large numbers of existing, trainee and newly graduated health care providers have been trained in diarrhoea case management. The recent initiation of a task-oriented training programme with an emphasis on practical treatment skills is commended.
 - o The Project's management information system is ambitious. It is designed to obtain information for Project planning and evaluation. However, partly due to its complexity, it has not yet adequately served this purpose.
 - o In both the government health services and in the private health care sector, use of ORS is widespread. However, it is rarely used alone. Antibiotics and "antidiarrhoeal" drugs are frequently prescribed as a routine treatment for diarrhoea. It is noted that it was a deliberate strategy of the Project to give greatest emphasis in the first instance to the promotion of ORT.
 - o The strategy used by the depot holder scheme is an effective means of increasing mothers' knowledge and use of ORS.
- .1

3. Major recommendations

The review recommends that:

- o The NCDDP should be extended for at least 2 years beyond September 1987. The current administrative structure should be maintained in the short term, but planning for phased transfer of administrative responsibility for all Project activities to relevant sections of the Ministry of Health should be initiated as soon as possible.
- o Priority should be given to the training of health professionals in diarrhoea case management skills based on the newly developed guidelines of the NCDDP. A continuing effort to formally incorporate this training into the basic curricula of all health educational institutions needs to be maintained.
- o Having effectively created public demand for ORS, the NCDDP should direct attention towards its correct use, feeding during diarrhoea and the prevention of diarrhoea. While maintaining mass media communications, health education through health facilities should be strengthened, particularly by improving the communications skills of health staff.
- o The NCDDP should more actively involve governorate and district level personnel in the planning, evaluation and follow-up of Project activities.
- o The routine reporting system of the NCDDP should be simplified to collect only the information needed for Project management. There should be a tiered reporting system with appropriate compilation and analysis of data at each level.
- o A variety of carefully planned and implemented research and evaluation studies should continue to be undertaken. These should aim to measure the extent of the impact on infant and child mortality, especially that part attributable to dehydrating diarrhoea, while also giving priority to effective use of ORT, diarrhoea-preventing interventions and health services management.
- o Evaluation activities carried out by contractors should be closely monitored. This will be facilitated by the newly formed Scientific Committee and its sub-groups. However, in view of the large amount of quantified statistically-based evaluation and research being undertaken, consideration should be given to employing a skilled epidemiologist/statistician to ensure appropriate statistical design and analysis.
- o Efforts should be undertaken to limit the inappropriate use of drugs in the treatment of diarrhoea. These may include:
 - guidelines for health care providers on the correct indications for the use of antibiotics;
 - restrictions on the registration of inappropriate drugs particularly multi-component "antidiarrhoeal" drugs; and,
 - stopping the distribution of inappropriate drugs through the government health services.

- o The ORS depot holder scheme should be expanded to other rural areas, beginning in governorates where the responsible officials are already familiar with the scheme.
- o The payment of incentives to peripheral health personnel should be more closely linked to objectively evaluated performance. To this end, the incentive system should be reviewed with the involvement of district level personnel. Non-financial incentives should also be considered.

More specific recommendations are listed at the end of each section of the full report and a complete list appears in section E.

4. Acknowledgements

The review team expressed its gratitude for the full support and cooperation given to it throughout its work in Cairo and the field. The guidance provided by Dr Mustapha Hammamy, Under-Secretary of State for Basic Health Services and Family Health was much appreciated, as was the helpful collaboration of Dr Ahmed Hashem, Executive Director of the NCDDP, and project staff and advisers at central and governorate levels.

The many resource persons from the Ministry of Health, as well as USAID, UNICEF, universities and other institutions, who brought special insight to the Review, are also thanked. Lastly, the large number of health workers, pharmacists, depot holders and mothers who interrupted their busy schedules to answer questions, all contributed willingly to the Review.

PART B: REVIEW METHODOLOGY

1. Terms of reference

The objectives of the Review were defined by the four parties involved as the following:

- o to evaluate NCDDP's progress towards achievement of its objectives and targets (according to the Project's Logical Framework and Implementation Plan);
- o to evaluate the Project's progress towards implementation of the First Joint Review recommendations;
- o to identify and assess relevant obstacles and constraints related to implementation of Project activities;
- o to make recommendations for the final phase of the Project; and,
- o to submit a report to the Executive Director of NCDDP and the Ministry of Health.

In addition, a list of 7 key evaluation questions formulated by USAID Cairo was considered by the team (Annex 1).

2. Outline of review methodology

The review was conducted by a team of 8 national and 11 other members nominated by USAID, UNICEF and WHO (Annex 2).

For two days, staff of the NCDDP briefed the team on each of the components of the Project. Five subsequent days were spent interviewing Project staff and resource persons (Annex 3), individually and in groups and in reviewing programme documents (Annex 4).

During a 6-day field trip in 10 governorates, over 340 interviews were conducted in government health offices and health facilities and with private practitioners, pharmacists, ORS depot holders and mothers.

3. Places visited and interviews conducted (Annex 5)

Seven two-person teams visited the following governorates:

- o Cairo
- o Alexandria
- o Dakahleya
- o Qena
- o Beni Suef
- o Behera
- o Sharkeya

The first 4 of these were visited as they had been covered by the First Joint Review of the Project in 1984. The other 3 were randomly selected.

In these seven governorates the following total numbers of interviews were conducted at the various levels shown:

Governorate Directorate of Health	7
District Health Office	13
General, Fever or Paediatric Hospitals	9
District Hospitals	9
Urban Health Units	8
MCH Centres	12
Rural Health Facilities	27
Private Pharmacies	52
Private Medical Practitioners	30
Households	137

A further 6 districts in 3 governorates (Assiut, Kalioubia and Sohag) were visited to evaluate the ORS Depot Holders Scheme. Interviews were conducted in a number of health facilities, with 12 depot holders and 24 mothers.

Standard data collection forms were utilized at all levels. To a large extent the places visited and the interviewees were randomly selected.

A specialist in mass media communications spent 10 days in Cairo reviewing this component of the Project and a demographer spent the whole duration of the review examining data on childhood mortality.

The Review team spent a final week in Cairo compiling data from the field visits and preparing a final report. The executive summary of the report was presented to Dr Mostapha Hammamy, Under-Secretary of State for Basic Health Services and Family Health on 3 July.

PART C: BACKGROUND INFORMATION**1. Brief description of Egypt**

Egypt comprises a total area of 1 002 000 sq.kms. The country may be divided into three major geographical regions, namely: The Nile Valley, the eastern desert and the western desert. Only 4 per cent of the total area of Egypt is inhabited and the remainder is desert. The dominant feature of life in Egypt is the River Nile which stretches about 1800 kms. from south to north.

The population of the country is largely concentrated along the Nile, making large portions of Egypt among the most densely populated areas of the world. Per capita GNP as of 1984 is approximately US\$690 (World Bank Development Report, 1984). In Egypt there is wide availability of mass media, including TV, and the private sector is strong.

The country consists of 26 administrative units which are called governorates. Each governorate is divided into a number of districts and the total number of districts is 154. Four of the governorates (Cairo, Alexandria, Port Said and Suez) are almost completely urban. At the other extreme are the five frontier governorates in Sinai and the desert areas east and west of the Nile Valley (Northern and Southern Sinai, Red Sea, Matrouh and the New Valley governorates). The other 17 governorates are grouped into the traditional regions of Upper and Lower Egypt.

2. Demographic data

Between 1897 and 1947, Egypt's population doubled from 9.7 million to 19 million at an average rate of increase of 1.3% per year. In the 29 years between 1947 and the last census in 1976, the population doubled again to 38.9 million at an average annual growth rate of 2.5 per cent. In the late 1970s and early 1980s, the annual rate of population increase was 2.7 per cent, so that the 1985 population is estimated at 48.6 million. Since about 1947, the crude death rate has declined quite steadily from about 26 per 1000 to about 12 per 1000 in the 1980s. There have been wider fluctuations in fertility over this period largely explicable in terms of earlier fluctuations. The "echo" effect of earlier fertility variation in the 1940s also contributed to the drop in the crude birth rate in the late 1970s and early 1980s. Since 1967, the five-year average for the crude birth rate has not been far from 40 per 1000.

The trend in infant and childhood mortality is of immediate interest to this Project. This is discussed in some detail in section D11 of this report. The NCDDP began at a time when the downward trend in infant mortality had accelerated after a period of slow change between 1957 and 1971. The mortality of children aged 1-4 seems to have decreased even faster than infant mortality in the period 1947-1976, falling from about 53 per 1000 in 1947 to about 17 per 1000 in 1976.

22

3. Overview of the health sector

The health service sector in Egypt is composed of a variety of public and private organizations and institutions which provide such services as:

- o free health services through Ministry of Health and University facilities;
- o Subsidized cost-sharing inpatient and outpatient medical care through state curative organizations (in Alexandria and Cairo);
- o fee-for-service care by private physicians and hospitals;
- o reduced fee-for-service care through some government general hospitals (during evening hours) and through social and religious groups operating polyclinics;
- o services for the military in facilities operated by the Armed Forces; and
- o emergency services offered by the Ministry of Health, with support from the Red Crescent Society.

All health institutions in the country are under the Health Sector Council, presided over by the Minister of Health, which is responsible for setting health policy, defining health plans, and coordinating the efforts of all agencies working in the health field.

Ministry of Health services

The Ministry of Health itself, together with the Governorate Health Directorates, is organized to provide free care, primarily to the neediest groups of the urban and rural population.

The central level structure of the Ministry consists of eight major sectors, each headed by an Under-Secretary. Diarrhoeal disease control is located in the Primary Health Care and Family Health Sector.

The organizational pattern is generally replicated in each of the 26 governorates under the direction of a Director-General or Under-Secretary supervised by the Governor. Within each Governorate Health Directorate a multidisciplinary team usually headed by physicians is responsible for each of the technical departments. Governorates are subdivided into districts (140 rural and 72 urban) each of which has a health structure headed by a District Health Officer, staffed by categorical supervisors and responsible for supervising primary and secondary care facilities.

University hospitals

Eleven medical schools operating under the auspices of the Ministry of Higher Education, offer a full spectrum of free (and fee-for-service) tertiary and secondary inpatient and outpatient services in major cities of Egypt.

Private sector and charity organizations

The private health sector is a loose network of private clinics and hospitals (5% of total beds in Egypt), many of which are staffed by physicians also in public service (attending private clientele in afternoons and evenings). Ministry of Health physicians in rural areas are permitted to carry out low-cost fee-for-service home visits.

Private sector activity has experienced a very rapid growth, partially related to the limited growth capability of the public sector, and the large volume of medical school graduates.

Private health insurance in Egypt is limited to a small range of activities, based on contracts with private sector providers, carried out by a division of one of the national insurance companies.

A growing number of charity clinics and hospitals are operated by several religious and social organizations. Generally these provide curative care and reduced fees are collected in some instances.

Other health sector activities

Drugs are a major item of interest from a financial perspective. Pharmaceutical production within Egypt, which accounts for about 80% of national consumption, is subsidized by the Government through public ownership of major producers. There is price control on retail sales. The approximately L.E. 37 million of health sector expenditures (1981) channelled to drugs, covered mainly "essential drugs" distributed "free of charge" at urban health facilities throughout Egypt. The rural areas received L.E. 0.18 per capita of this sum.

In summary, this multi-level structure is the supporting framework for 4 levels of direct medical care, which are summarized in the following table:

Level	Services	Source
I	Basic Health Care (GP, outpatient, MCH/FP, school health, health education, environmental health)	Ministry of Health: Rural health units (2013) Rural health centres (528) Urban MCH centres (245) Urban health centres (101) School health units (164) Health bureaux (377) Health insurance clinics
II	Specialized ambulatory and basic inpatient care	Ministry of Health: Rural health hospitals (55) (1522 beds) Urban polyclinics (17) School health specialized centres (48) School health hospitals (6) (631 beds) Chest dispensaries (85) Specialized clinics (51)
III	Secondary inpatient and out-patient basic specialized care	Ministry of Health: General governorate and district hospitals (183) (24 275 beds) Chest disease hospitals (34) (7046 beds) Specialized hospitals (201) (24 904 beds) HIO hospitals (24) (3646 beds) Curative care organization hospitals (5) (3356 beds)
IV	Tertiary inpatient and out-patient specialized and sub-specialized care for referred patients	Teaching hospitals (8) (2992 beds) Specialized research institutes (9) (596 beds) University hospitals (21) (13 208 beds) University student hospitals (2) (176 beds)

4. A brief history of the NCDDP

Oral rehydration therapy in Egypt began in the early 1960s. In 1961, following a WHO consultancy, the Ministry of Health started to advocate the use of this therapy. In 1966, the Ministry of Health included ORT in its booklet on MCH guidelines, although the formula of the solution used was different from the present formula.

In 1977, the Ministry of Health adopted the WHO recommended ORS formula and began distributing 27.5g packets of ORS to the health centres. These packets were supplied by UNICEF, who supported the establishment of a production line in 1982 at Chemical Industries Development Co. (CID) by provision of the necessary supplies and equipment. Production and distribution of 27.5g packets with UNICEF support continued until 1984 when the packet size was standardized to 5.5g. Since 1978 a commercial product "Rehydran", had been available to pharmacies from CID, but production of ORS under this brand name ceased in 1984.

In 1980 the Strengthening of Rural Health Services Delivery Project funded by USAID studied the effect of ORS provided at the household level (packet or home-prepared) and showed marked reduction in mortality, compared to control areas. This study, conducted in collaboration with WHO, laid the foundation for a national programme.

In 1981, WHO EMRO collaborated with the Department of Paediatrics at Alexandria University, in the establishment of a Regional Demonstration and Training Centre for Oral Rehydration. This centre has given much support to the National Programme, particularly in the early stages of the Project.

In 1981, a USAID grant agreement (totalling US\$ 26 million) was signed with the Government of Egypt for the establishment of the NCDDP, to train practitioners in proper oral therapy for diarrhoea; to improve mothers' knowledge, attitudes and practices in caring for children with diarrhoea, and to ensure production and distribution of oral rehydration salts in sufficient quantity. In January 1983 Phase I of the Project started. In May 1984, a Joint Government/USAID/UNICEF/WHO review team assessed the situation and made recommendations for Phase II. In July 1984, Phase II started with full-scale nationwide implementation of the Project. This second phase of the Project is due to last until September 1987.

PART D: FINDINGS AND RECOMMENDATIONS OF THE REVIEW

1. ADMINISTRATION, PLANNING AND IMPLEMENTATION

1.1 Administrative structure

There are several organizational levels in the National Control of Diarrhoeal Diseases Project (NCDDP) as shown in Annex 6. At the policy-making and coordination levels there is the National Steering Committee. The chairman of this committee is the Minister of Health or his representative, the Under-Secretary of Health for Basic Health Services and Family Health. The committee members are appointed by the Minister of Health and include representatives of many ministries, departments and other organizations. The purpose of the National Steering Committee is to determine the general policy of the NCDDP and to ensure the cooperation of the multiple organizations involved in its activities. Plans prepared by the NCDDP are also brought before this committee for approval or alteration.

The NCDDP secretariat ensures the overall management of the Project. The secretariat is made up of an Executive Director, seven unit coordinators and supporting staff. The seven coordinators have responsibility for the following units: administration, research, evaluation, training, production and distribution, mass media & communications, and coordination and implementation. A contracting firm (John Snow Public Health Group) provides technical assistance to the secretariat as well as to the National Steering Committee.

In each of the 26 governorates in Egypt, there is a Governorate NCDDP Coordinator in charge of diarrhoeal disease control activities. From the field visits it was reported that the proportion of working time devoted to CDD activities by these coordinators ranged from 16% to 20%. The Governorate Coordinators are scheduled to meet monthly, in Cairo, to discuss their activities and plans.

In each of the governorates, a Governorate Steering Committee was established during Phase II of the Project. They are each headed by the Director-General or the Under-Secretary of Health for the governorate and like the National Steering Committee, they include members from multiple disciplines. The Governorate Steering Committees are scheduled to meet every month. However, the field visits showed that this was not often the case. They are intended to identify and address problems which arise at the governorate or district levels.

At the district level, there is one health officer who has been assigned major responsibility for implementation of CDD activities. At hospitals, rural health centres and rural health units physicians generally have the major responsibility for CDD activities.

The organizational model of the NCDDP is designed to coordinate activities through the Ministry of Health system and other institutes rather than to implement services itself. The Project is administratively semi-autonomous which has allowed greater flexibility in coordinating the multiple institutions involved. This overall design has been both useful and successful.

The NCDDP has made considerable progress in specific administrative matters during Phase II. Under growing demands, the project has completed many central level administrative functions. These have included the preparation and revision of annual workplans, the preparation of annual budgets for project activities, the administration of numerous work orders and contracts, payment for goods and services, provision of transportation and preparation of financial reports. The management of a staff of over 70 persons is also a sizeable administrative undertaking and accomplishment. The unit provided considerable support for the Regional ORT Conference held in April 1986 and attended by over 500 participants, and for the current Second Phase II Joint Review of the NCDDP.

1.2 Planning and implementation

The NCDDP plan for Phase II is comprehensive. It calls for coordination rather than actual implementation of services and goes beyond the traditional government health services planning model by including the private sector (for example, in project evaluation, communications and ORS distribution) and the professional health education institutions.

The governorate level has limited involvement in the planning process. Of the NCDDP governorates and districts that were surveyed, none had a copy of the national plan of operation, though some were aware of overall objectives. Governorates had not been requested to formulate workplans with local objectives and targets. There was a general feeling among staff at this level that they were not sufficiently involved in the planning process which takes place largely at the central level.

During Phase II the NCDDP established over 2700 rehydration centres throughout Egypt, that is, in over 70% of health facilities. Grants were given to either refurbish or establish these centres. This is a sizeable achievement.

The Project has also upgraded 2 university hospital laboratories during this period.

In the establishment of ORT units, the emphasis has been on provision of supplies and equipment. The review team got the impression that in some areas a "functioning ORT unit" was defined as a room having specially designed chairs and some other equipment, that is, the focus was on the physical facility rather than on provision of services. The supervision conducted also focused on supplies and equipment and less on performance. As the Project seeks to coordinate a wide range of implementation activities through the Ministry of Health system, adequate tools for assessing the implementation plans are essential. Check lists for supervision have been developed by the Project, and field visits indicate that these were sometimes utilized. Section D2 covers this topic in more detail.

Although the Project conducts regular governorate coordinators' meetings in Cairo, many governorate level staff, and particularly directors of the district health services, stated that they received insufficient feedback on activities that were implemented.

1.3 Payment of monetary incentives

Financial incentives offered to health personnel involved in the activities of the NCDDP are intended to motivate workers to perform better towards achieving the Project's objectives by partially compensating for the current low salaries. The present incentive system is centrally administered by the Coordination and Implementation Unit, based on reports from the field as described in Section D8.

The General Directors of Health in the governorates and the Governorate NCDDP Coordinators receive an incentive payment of L.E. 50 per month. There are also quotas for each level and each type of health staff.

Governorate and district level staff felt that they are in a good position to evaluate actual performance of health workers, the intended criterion for incentive payment. However, they did not feel part of the decision-making process. Many said they were not given an explanation when changes were made in the allocation of incentives by the central level. Often workers had felt that they had performed properly, and wanted to know the reason for not receiving an incentive. This has led to some frustration and dissatisfaction among the staff, possibly to the extent of jeopardizing the quality of work.

1.4 Key issues

1.4.1 There appears to be inadequate coordination between the various units of the NCDDP. This may partly be attributed to the lack of regular NCDDP staff meetings. The original plan of operation called for weekly meetings, but these have not been conducted as planned.

1.4.2 Delays in processing due to Government of Egypt and USAID requirements and regulations have resulted in inefficiency and frustration. The production of training materials, for example, seems to have been delayed in this way.

1.4.3 The National Steering Committee has substantially reduced the frequency of its regular coordinating meetings. Since August 1985, only one meeting of the Steering Committee has been held (January 1986). Even though many central level activities (ORS production and the mass media campaign) do not require as much discussion by the Steering Committee as previously, the field implementation of the Project does require such a regular forum for discussion.

The phased integration of the activities of the Project into the appropriate sections of the Ministry of Health, at central level, will require immediate discussion and planning at this level.

1.4.4 A major issue in the NCDDP is the division between the central and governorate/district activities. Under the existing administration framework, most of the decision making, policy discussion, and feedback concerning the Project takes place at the central level. Although there is a forum for Governorate Coordinators to discuss issues, recently it has not met regularly enough and has had limited linkages with the National Steering Committee.

1.4.5 In order to fully carry out the future plans of the Project, a complete NCDDP staff at central level is needed. At the time of this Review, a total of 14 approved positions had not been filled.

1.4.6 It is felt that a programme as complex and comprehensive as the NCDDP requires full-time direction, and as the current director also has responsibility as the General Director for Urban Primary Health Care this is not always possible. In addition, over the past four years, there have been four different project directions. This has caused repeated disruptions in Project direction and administrative procedures. Unit coordinators are also often holding other positions, reducing their overall time for NCDDP activities.

1.4.7 There appears to be an overall lack of understanding regarding the general administrative policies among the NCDDP staff. The last Joint Review recommended that an office procedure manual be prepared. The Review team found that the manual, which has subsequently been prepared, is limited in scope and has not yet been approved by the Ministry of Finance.

1.4.8 The present system of incentives has generally become a cause of dissatisfaction due, in part, to a lack of understanding of the criteria for the payment of incentives.

1.5 Recommendations

- Rec. 1 The NCDDP should be extended for at least two years beyond September 1987. The current administrative structure should be maintained in the short term, but planning for phased transfer of administrative responsibility for all Project activities to relevant sections of the Ministry of Health should be initiated as soon as possible.
- Rec. 2 NCDDP staff meetings should be conducted regularly and attendance be required. The NCDDP National Steering Committee should also meet regularly and give priority to discussions on the phased integration of project activities into appropriate sections of the Ministry of Health, and to the decentralization of the Project.

- Rec. 3 The Governorate Coordinators' meeting should be strengthened, and more effectively used to resolve key issues and develop future plans. The Project should more actively involve governorate and district personnel in the planning, evaluation and follow-up of Project activities.
- Rec. 4 Priority should be given by the administration to securing additional personnel to assist the Project. The Review team suggests that priority consideration be given to the following appointments, to strengthen key areas: a medical scientist in the Research Unit, a statistician/epidemiologist in the Coordination and Implementation Unit, a full-time contract officer in the Administration Unit, secretarial support for the Training Unit and field personnel for supervision and training.
- Rec. 5 As it will be unlikely to have a full-time NCDDP Director, given the staffing policies of the Ministry of Health, it is recommended that a full-time Deputy Director be appointed and given authority to make many of the routine administrative decisions. All Unit Coordinators should devote adequate time to NCDDP activities.
- Rec. 6 The procedure manual should be revised and expanded, to be more comprehensive, and its approval expedited.
- Rec. 7 The payment of incentives to health personnel should be linked to objectively evaluated performance. To this end, the incentive system should be reviewed with the involvement of district level personnel. Non-financial incentives should also be considered.

2. SUPERVISION

2.1 Supervisory activities and responsibilities

The NCDDP supervisory activities focus on government health facilities and in particular on the physical environment, equipment, staffing pattern, availability of ORS and number of diarrhoea patients treated. To date there has been little emphasis on supervision as an opportunity to monitor and improve health staff performance.

Checklists focusing on the items mentioned above have been developed and a new checklist for performance evaluation has been designed.

Supervision is carried out from the central level by a mobile team for which 3 physicians work part-time. At governorate level the NCDDP Coordinator and the Deputy Directors for preventive medicine or MCH are assisted in supervisory activities by the District Health Officers and Nurse Inspectors.

2.2 Field visit findings

The frequency of reported supervisory visits to and from governorate and district levels is shown in table 2.1. Four of 6 governorates and 8 of 12 districts had received supervisory visits with respect to NCD DP activities in the past one year.

Three districts said they used checklists for supervision. Three others admitted to never conducting supervision in relation to NCD DP activities.

Of the 64 health facilities visited 52 (81%) had received supervisory visits in the past 12 months. The frequency of visits is shown in table 2.2. Only 4 health facilities reported being aware of checklists being used by their supervisors.

The overall impression gained was that supervision was not sufficiently frequent and when carried out was not aimed at critically assessing or improving health worker performance.

Table 2.1: Reported frequency of supervisory visits to and from the governorate and district health offices visited

Frequency visits in past year ^a	Number of health offices receiving the following types of supervisory visits			
	From: Centre	Governorate	Higher level	District
	To: Governorate _b	Periphery _b	District	Health facility _c
Regular	2	6	6	8
Irregular	3	0	2	1
No visit	2	0	4	3
Total reporting	7	6	12	12

^a Regular = Monthly to 2 visits per year
Irregular = Only one visit

^b As reported at governorate level

^c As reported at district level

Table 2.2: Reported frequency of supervisory visits to
64 health facilities visited

Frequency of visits in past year ^a	Number of health facilities receiving visits made by staff from			
	Central NCDDP	Governorate	District	Any Level
Regular	2 (3)	26 (41)	29 (45)	52 (81)
Irregular	8 (13)	5 (8)	8 (13)	
No visit	54 (84)	33 (51)	27 (42)	12 (19)

^a Regular = Weekly to 2 visits in the year
Irregular = Only one visit

2.3 Key issues

2.3.1 Although checklists based on performance assessment have been developed at central level, they are not yet in use. The previous checklists which focus on physical properties of the ORT units have been irregularly used or not used at all in some places.

2.3.2 The reports submitted by supervisors reflect the above-mentioned focus on physical findings rather than staff performance. In some places submission appears to be motivated by the incentive system rather than serving as a genuine management tool.

2.3.3 Supervisory staff have a somewhat limited ability to interpret and use information collected, for evaluation and appropriate action.

2.3.4 Visits made by the central three-person mobile supervisory team obviously cannot achieve high coverage of ORT units given the large number of these scattered throughout the country. Their role in stimulating and guiding governorate and district level supervisors is not yet adequate.

2.3.5 Feedback on supervisory visits to health units is minimal.

2.4 Recommendations

Rec. 8 The whole system of supervision should be revised to find better ways to monitor performance, and achieve prompt problem solving.

- Rec. 9 Supervisors need to be trained in supervisory skills (see also Recommendation 17).
- Rec.10 Use of the newly designed task oriented checklist for performance assessment should be widely implemented following appropriate training in its use.
- Rec.11 The role of the central supervisory team should be revised to coordinate the activities of, and receive information from supervisors at the governorate level. The Coordination and Implementation Unit staff should be increased to strengthen supervision activities.

3. TRAINING OF HEALTH PERSONNEL

3.1 Training plan

During Phase II of the NCDDP the Training Unit has been developing a task-based curriculum and a performance assessment manual for the training of trainees to strengthen the training activities and supervision of the NCDDP. The training workplan for 1984-1985 indicated that the major tasks were to develop training materials to prepare for training of trainers and to develop a task-based curriculum. These were initiated during the first part of Phase II of the Project, but have not yet been fully achieved. In the 1986-1987 workplan, similar priorities are listed, namely, to:

- train trainers in training skills;
- complete task-based curriculum and develop training materials;
- complete "Guidelines for Establishing and Operating a Rehydration Centre"; and
- develop, train, and implement a case management support system.

There is a need for full implementation of these activities, which have been designed and initiated. Activities listed as lower priority were production of additional material for mothers, and training of sanitarians, health educators and community leaders. One health education research project involving community leaders was carried out by the Research Unit in 1986. Field training support for medical students in community medicine has been carried out in some medical schools.

3.2 Curriculum development

The conceptual framework for a task-based curriculum has been thoroughly defined and analysed by the Training Unit. Diarrhoea case management has been incorporated into lectures and examinations at some medical schools where trained, experienced and motivated paediatricians are present. According to the NCDDP, all medical house officers are now exposed to case management at ORT units during their training. The Coordinator of the Training Division of the NCDDP is also the Director of Continuing Education of the MOH. However, there are no formal linkages or integration between the curriculum activities of the NCDDP and related activities going on at the Ministry of Health or the Ministry of Higher Education.

3.3 Manpower trained by the NCDDP

3.3.1 The number of health personnel trained in diarrhoea case management varies according to different Project sources. Table 3.1 presents the numbers of Ministry of Health personnel trained in 1984-1985. Approximately 6000 (80%) newly graduated physicians in government service, 3155 (30%), MOH physicians and 3549-3765 (20%) nurses at MCH or Rural Health facilities have been trained. The number of these health personnel who have had sufficient "hands-on" experience, that is, actual practice in treating cases, during their clinical training, is not available. The high turnover of staff should be considered when evaluating these figures. The large number of newly graduated doctors had up to 2 days' exposure to CDD training, not necessarily with actual experience in treating cases.

3.3.2 Training of trainers

A cadre of experienced trainers exists in Egypt, but recruitment of trainers remains a problem. A plan to train trainers according to the task-based curriculum is under way and the first workshop on "Basic Training Skills" was held in June 1986.

3.3.3 Training of pharmacists

The NCDDP has trained approximately 335-414 (10%) of Pharmacy Inspectors and governmental pharmacists. There are, however, 23 110 registered pharmacists in Egypt. To reach the private pharmacists the Professional Sales Representatives (PSR) programme was started in 1984, but was discontinued in mid-1985. It has not been evaluated nor reinstated as planned.

3.4 Types of training courses

3.4.1 Clinical case management

The training in management of diarrhoea cases has taken place at 32 established training centres in 20 governorates. Seventeen governorates have been equipped with training materials and aids. Three training centres are functioning as model centres for senior trainers. Coordination, supervision, follow-up and evaluation of the decentralized training was mentioned as a problem by the central level. No regular supervision of training centres and training activities is carried out. Pre- and post-tests given to trainees have shown increased knowledge, but the extent to which the training has led to increased skills and practice of ORT is not clear.

Table 3.1: Clinical training of health workers

Category	Number trained ^a			Total number in government service ^b	Approximate percentage coverage
	1984	1985	1984-1985		
Pharmacists:					
Pharmacy inspectors and other government employed pharmacists	150-198	185-216	335-414	3804	10
Physicians:					
New graduates	2000 (approx.)	4000	6000	7200	80
Government employed physicians	1369	1786	3155	10500 ^c	30
Nurses:					
	0-1187	2000-3765	3549-3765	18000	20
Others:					
Nurse educators	N/A	N/A	225		
Social workers	0	282	282		
Community leaders	27	0	27		
Hakima Nurses	346	0	346		

Source of information:

^a Different numbers from different sources^b Total number of health workers provided by Ministry of Health.^c Assuming an average of 3 doctors needing training in each of 3150 health facilities

Table 3.2: Training in WHO CDD Supervisory Skills Training Courses

Category	Number trained			Total with Supervisory Duties*	% coverage** 1985
	1984	1985	1984-1985		
Governorate Coordinators, District Health Officers, Directors of Model Training Centres	58	85	143-156**	240	60-65
Governorate Directors of Nursing Nursing sectors and nursing supervisors	76	94	170	200	85
Directors of government pharmacies	25	0	25	200	14

*Governorate coordinators and assistants 26+18 = 44. District Health Officers 156, Model Training Centres 40.. Data provided by Ministry of Health statistics.

**The actual proportion of current (1986) supervisory staff in service with CDD training, is not available. As turnover is high, the coverage figures shown in the table may be significant overestimates.

***Different "totals" given by different Project sources.

A draft of "Guidelines for Establishing and Operating a Rehydration Centre" has been prepared, but is not yet finalized.

3.4.2 Supervisory and management skills training

Training of health staff with supervisory responsibilities in CDD supervisory skills at mid-level WHO/CDD training courses in 1984-1985 is presented in Table 3.2. Information on the numbers of health staff trained in the WHO/CDD Programme Managers' training courses, was not available at the Project, neither was information on numbers of trained health officers who currently have supervisory positions and responsibilities.

3.5 Training materials

Training materials for physicians, nurses and pharmacists have been designed and are listed in the NCDDP Mass Media and Training Materials Catalogue. There have been considerable delays in finalizing, producing and printing these materials, due to shortage of staff and delayed approvals from the Administration Unit.

There is no information available on the further distribution and utilization of training materials already despatched to the governorates.

3.6 Monitoring and evaluation of training

The NCDDP Training Unit finds the absence of an effective information system unsatisfactory. No coordinated supervision has been carried out in a systematic way to follow-up the impact of training or to monitor training activities. The central level does not receive information in time on scheduled courses to enable supervision of training. Logistics, accommodation and low per diem have been listed as constraints that prevent supervision of training by the NCDDP central staff. The NCDDP Evaluation Unit has developed a plan for evaluation of training with key indicators, instruments, and targets, but it was not planned in close cooperation with the Training Unit nor has it yet been implemented.

3.7 Field visit findings

3.7.1 Governorate training activities

All visited governorates were able to report numbers of health workers in their governorates trained in CDD. Reported figures ranged from 155 to 589 nurses, 120 to 602 doctors and included several other categories of worker (social workers, depot holders and rural health centre staff reported from one governorate). The training courses given in two governorates were reported to be 4-6 days in duration with lectures and practice in clinical management. One governorate listed training of rural health centre staff and depot holders, and two mentioned social workers and/or clerks. Only two governorates reported training in CDD Mid-Level Supervisory Skills (5 doctors, 21 nurses and 5 other supervisory staff).

3.7.2 District training activities

No district visited reported training courses given in the district, some had health workers trained at governorate level, but no information was available on those trained at higher levels.

3.7.3 Trained manpower in the health facilities visited

The number of health workers who had received training in diarrhoea case management in the 64 health facilities visited varied from one governorate. The range for doctors was from 7 to 54 and the range for nurses was from 0 to 56. This does not include "on-the-job" training, but only training at specific courses at ORT training centres.

The health facilities visited had an average of 3 trained doctors (range 0-20) and 4 trained nurses (range 0-23). Fifty five (86%) of health facilities had at least one trained personnel. Forty-three (70%) had at least one nurse and one doctor trained. Five of the 9 facilities with no trained health worker were found in the same governorate. Six health facilities reported "on-the-job" training - out of these, 3 were in the same governorate.

In 3 health units, staff categories other than doctors and nurses were listed as trained: health inspector (1), social worker (1) and school health nurses (2). Two supervisory staff at one hospital had attended CDD Supervisory Skills courses. In the health facilities visited, the ratio of doctors to nurses trained was almost 1:1 in 3 governorates, significantly more nurses than physicians had been trained in 3 governorates and in 1 governorate no nurses at all had been trained.

3.7.4 Training materials

The field visit indicated that six of the seven visited governorates had the standard set of training equipment and materials. This set consists of one 26" television, one video-cassette player, one overhead projector, one slide projector and screen, one magnetic board and films, slides and pamphlets. This equipment was located at the training centres. One governorate had received funds for local purchase of this equipment in 1985, but had not done so.

The field visit indicated that almost all ORT Units were equipped with chairs, tables, balances, large fluid containers with taps, cups and spoons by the NCDDP. Many health facilities (49%) did not have wall charts or other guidelines for diarrhoea treatment.

3.8 Field visit findings and observations at training centres

The Review team visited 7 ORT training centres, including 3 model training centres. The current training objectives, strategies and methods are discussed in Annex 7. The current training courses provide some opportunity in "hands-on" practice of case management as does the 6 week pre-service training for house officers. These courses are not yet based on the newly developed task-based curriculum of the NCDDP. Implementation of this curriculum including clear policies on antibiotics, antiemetics and antidiarrhoeals is needed.

The recruitment of trainers does not follow specific criteria and trainers have proven inappropriate in some cases. Suggestions for criteria for training instructors are also given in Annex 8. Supervision, monitoring and evaluation of training in these centres are aspects of the NCDDP training programme that need strengthening.

3.9 Key issues

3.9.1 A coordinated and comprehensive training plan is needed. Phasing of training and media inputs to enable mutual reinforcement has not been adequate with the result that health care provider skills have lagged behind public demand for ORT. The Project is in its final year of Phase II, and most priority training activities remain to be implemented in a short time, to meet the objectives set.

3.9.2 The curriculum development activities which have been the main focus, have had no formal linkages with similar efforts of the Ministry of Health and Ministry of Higher Education, and there is little evidence of formal incorporation of NCDDP training into the curricula of medical students and nurses apart from changes at some medical schools as a result of the interest of individuals.

3.9.3 There are no guidelines for training available at the training centres to provide guidance in "hands-on", task-based training activities, in monitoring performance and in follow-up activities.

3.9.4 The training of private pharmacists through the PSR-programme was discontinued in 1985, and has not been evaluated or reinstated as planned.

3.9.5 The production and distribution of training material has been pending for a long time, awaiting action from the Administration Unit.

3.9.6 The lack of routine relevant information is a major problem felt by the central Training Unit.

3.9.7 Monitoring and evaluation of training activities are not conducted on a regular basis with coordinated supervision from central or governorate level.

3.10 Recommendations

Rec.12 A coordinated training and media plan with clearly stated objectives, strategies, targets, timetable and key indicators should be developed.

Rec.13 Implementation of the task-based curriculum should be accelerated by:

- establishing formal linkages with the responsible units/officers of the Ministry of Health, the Ministry of Higher Education and the universities; and

Facilitating incorporation of curriculum into the medical education, nurses' training and pharmacy education, e.g., by joint workshops in curriculum development and incorporation.

- Rec.14 Guidelines on training methodology should be finalized, produced and distributed, including a model plan of activities and emphasizing "hands-on" task-based training, and the health education component of case management. Monitoring and evaluation tools (checklists and course evaluation protocols) should be used in training courses.
- Rec.15 Priorities should be set for health professionals in ~~in-service~~ training or refresher training:
- Priority (1): Interns, medical students, nursing ~~students~~ and pharmacy students through appropriate curricula ~~modifications~~. The pre-service training should include practical ~~management~~ management.
- Priority (2): Practising physicians and nurses, ~~particularly at~~ rehydration centres, who need refresher training.
- Priority (3): Practising pharmacists should be informed of diarrhoea case management. The NCDDP's ~~Professional~~ Representative programme should be ~~evaluated~~ ~~and~~ if appropriate, reinstated and the training ~~of~~ ~~pharmacy~~ inspectors should continue.
- Rec.16 Priority should be given to the approval and endorsement of the production and printing of training materials by the Administration Unit. Distribution and utilization of training materials should be monitored.
- Rec.17 The Project should consider increasing the secretarial support to the Training Unit to improve information collection and dissemination and record keeping.
- Rec.18 All potential resource persons should be involved in the supervision of training:
- (1) Model training centre staff: Guidelines for training centres should include supervisory plans to follow-up training activities in other decentralized training centres, to give support and get feedback.
 - (2) Governorate/district supervisory staff.
 - (3) All NCDDP staff, not only those in the Training Unit.

- Rec.19 Supervisory Skills training courses for governorate and district supervisors should be continued using modified WHO/CDD modules and a core of facilitators should be trained.
- Rec.20 A study on the impact of different approaches to training (i.e. subject vs task based curricula) on practices of health professionals should be carried out.

4. HEALTH EDUCATION AND COMMUNICATIONS

4.1 Responsibilities of the communications unit

This section focuses on the contribution to the objectives of the NCDDP made through the use of mass media. Since the transfer of specific information to medical personnel and pharmacies generally has been the responsibility of the Training Unit, only brief reference will be made here to such activity.

The Communications Unit of NCDDP consists of its coordinator and his assistant. It is primarily responsible for developing the communication objectives, as well as the design, production and release of mass media messages. It also acts in a secondary role in support of the Training Unit by assisting with the design and production of training materials. The great bulk of the Unit's output is accomplished through sub-contracts with relevant suppliers, such as research organizations, advertising agencies, film-makers, and printers. A sizeable portion of work is done by freelance market consultants, writers and artists.

The message content - the information meant to be conveyed to target audiences - is not determined by the Unit itself. In the early stages of the Project this was achieved through a somewhat informal process; more recently, the process has become more elaborate and time-consuming. The final draft of the technical content of the 1986 ORT communications campaign took months to reach its present stage, having been reviewed by some fifteen people. It contains about 60 separate message "bits", for example, "most drugs are not safe to take during lactation", "measles vaccine is very safe", and "ORS must be used for all kinds of watery diarrhoea". In consultation with relevant experts and Project management, the Coordinator sets priorities among a formidable list of objectives and, on the basis of appropriate research, develops messages, strategies and media plans. Specific messages fortunately seem somewhat less subject to the laborious review and approval processes. The Coordinator then is able to begin sub-contracting for scripts, production and media.

Thus, there is intimate involvement of a wide variety of parties in the decisions regarding what the Unit is to communicate. Though cumbersome, such involvement is probably necessary from a technical viewpoint, and is in any event probably unavoidable. On the other hand, the bulk of the decisions on how the Unit is to communicate is left to the professional discretion of the Coordinator; overall the arrangement seems quite effective.

4.2 Mass media campaigns - 1984 and 1985

The two national mass media campaigns have in general been professionally executed and their strategy carefully derived from relevant research. Those responsible for the communications effort have attempted to keep messages as simple as possible and have concentrated on using the most effective media.

The results of the campaigns are impressive. In some three years a new concept in childhood disease - dehydration - and a method for its prevention and treatment have been introduced to the public and widely accepted. Awareness of the specific intervention - oral rehydration therapy - has become almost universal. Recognition of the Project's packaged ORS product has spread to the point that the vast majority recall it spontaneously with 85% attributing their knowledge to TV. Increases in use have been substantial, although less than the increase in awareness, a discrepancy that is to be expected.

4.3 Expenditure on different mass media

The majority of the Project's budget for communications was directed towards television spots or commercials; almost 59% of the costs of the two national campaigns (excluding salaries and overheads) were thus committed. This allocation seems clearly warranted by data on the reach of TV (some 90% of respondents in one survey) and on respondents' attribution to TV of discrete bits of information such as brand-name. Indeed, expenditures for other media during this period, with the exception of that for radio, seem to have had considerably less impact. Radio seems to have reached about one-third of the sample; billboards, accounting for approx 1% of the expenditures, were not mentioned by survey respondents as a source of information.

4.4 TV message design

As stated above, TV messages have evidently been successful in raising levels of consciousness about diarrhoea and the threat it poses to the well-being of children. The knowledge of the correct mode of use of ORS is less certain. The remaining confusion may be the result of some ambiguity in the TV messages. An examination of the first ten TV messages, six of which were designed for the 1985 season and currently being aired, is instructive. On the difficult issues of when to begin ORS and whether to see a doctor, the first message seems to recommend both ORS and a physician, the sixth says a doctor should be seen if the child continues to vomit and refuse ORS; others recommend ORS and do not mention a doctor (five and seven) and others encourage continued ORS and a visit to a doctor or a rehydration centre (eight and nine).

- Rec.19 Supervisory Skills training courses for governorate and district supervisors should be continued using modified WHO/CDD modules and a core of facilitators should be trained.
- Rec.20 A study on the impact of different approaches to training (i.e. subject vs task based curricula) on practices of health professionals should be carried out.

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It seems likely that television will not serve adequately to convey certain concepts or precise instructions to certain segments of audience. However, it could serve to promote information-seeking behaviour on the part of the mothers. If such efforts were better coordinated with the Training Unit, the health facilities could reinforce TV messages about dehydration and ORS mixing.

4.5 Field visit findings

4.5.1 Health Education and Communications at Governorate and District Levels

The field visits to governorate and district health offices indicated that 60% (12 of 20) were informed on key messages in relation to diarrhoea and on materials or media for health education and communication in their areas. Nine of 12 gave information on activities in their own areas, and out of this 3 referred to related programs from other projects (Urban Health Project, SRHD, Nutrition Education Project and Second Population Project).

No districts or governorates indicated awareness of results of KAP evaluations. Two commented that they had not received feedback from surveys conducted in their districts.

4.5.2 Health education materials at health facilities

Out of the 64 health facilities visited, 33 (51%) had health education materials related to CDD. Twenty had a magnetic board for visual health education and learning kits, supplied by the Strengthening of Rural Health Services Delivery Project. Eleven (17%) had posters or wall charts. One health unit showed films for mothers and another unit had a video recorder/player but no video cassettes.

Overall, the field visits indicate that the majority of health facilities have insufficient health education materials and express a need for such supplies. Health education was reported as given face-to-face and/or in groups, depending upon the subject, but few health units had assigned the responsibility to a specific individual. The guidelines for teaching mothers to care for their child with diarrhoea, developed by the Project in 1985, are rarely followed. Health education as part of case management in the training of health workers is discussed in Section D3.

4.6 Interviews with 161 mothers

During the field visits, eight teams visiting 20 districts in ten governorates each interviewed approximately 20 households. The main findings are presented in Tables 4.1 and 4.2.

Of the 161 mothers in the sample, 155 (96%) knew what the ORS packet is used for and 132 (82%) said that they used ORS. Virtually all those giving reasons for not using ORS said their children had not had diarrhoea.

One hundred and twenty-eight mothers (97%) of those who said that they used ORS, demonstrated that they could prepare ORS correctly (counted in this number were some who did not wash their hands before preparing the ORS, but are not for this reason disqualified). Those who failed to prepare ORS correctly, in every instance, failed to measure the water accurately. As the Project's 200ml plastic cup was available to mothers served by the depot holder system (see section D7), no preparation errors were found in these areas. It is important to note that in many households, NCDDP ORS mixing cups were not available. The widespread presence of an alternative measuring vessel (a 200ml soft drink bottle) appears to have been critical in achieving correct knowledge of ORS mixing. It was not possible to learn in the course of these interviews how adequately respondents actually managed cases of diarrhoea. The findings suggest a somewhat mixed picture on this score. About half of those who use ORS said that they started giving ORS when the diarrhoea started and that they continued with ORS until the child recovered. These responses are encouraging. But this still leaves about half of the respondents either not providing information in this domain or providing answers that suggest less adequate case management.

One hundred and fifteen mothers (71%) of the sample, knew the signs of dehydration well or fairly well; important knowledge if diarrhoea cases are to be managed appropriately. As the last question in Table 3. shows, 128 (80%) respondents identified TV as a source of their information about diarrhoea. In the other answers to this question, it was not always clear whether the response "doctor" meant a private practitioner, a doctor at the government health facility or the doctor on TV. In the "other" category answer to this question, in only two instances were pharmacists identified as a source of information about diarrhoea.

Table 4.1: Summary of findings concerning management of diarrhoea from interviews with 161 households
June 1986

		<u>%</u>
Number knowing what ORS packet is used for	155	(96)
Number saying they use ORS	132	(82)
When they start to give ORS*:		
When diarrhoea starts	88	(67)
Later	41	(31)
How long is ORS given*:		
Until recovery	70	(53)
Mention some number of days	42	(32)
Stop when child refuses ORS	4	(3)
Number saying they know how to prepare ORS	121	(92)
Number preparing ORS correctly	128	(97)
Number knowing signs of dehydration:		
Knows well	77	(48)
Knows fairly well	38	(24)
Does not know	28	(17)
Where they take child when sick with diarrhoea:		
Doctor	93	(58)
Health Facility	61	(38)
Source of information about diarrhoea:		
TV	128	(80)
Doctor	31	(19)
Health Facility	33	(20)
Other	21	(13)

*Denominator = 132; for all other questions, denominator = 161

Table 4.2: Summary of responses concerning action in relation to food and fluids when a child has diarrhoea (from 161 household interviews)

	Stop	Decrease	Continue as usual	Increase	Other Responses	Total Responses Each Item
Breast Feeding	27	7	94		9	137
Bottle Feeding	36	1	20		31	88
Other Fluids	16		51	52	8	127
Solid Food	31	8	85		10	134

Turning to what respondents do about food and fluids when a child has diarrhoea, the findings of Table 4.2 are interesting. Of those responding to the questions, 69% indicated that they continued breast feeding as usual, 81% indicated that they continued other fluids as usual or increased them, and 63% continued solid foods as usual. On the other hand, 20% of responding mothers said that they stopped breast feeding, 13% that they stopped other fluids, and 23% that they stopped solid foods. In addition, 23% said that they continue bottle feeding. Thus, the overall picture, although encouraging, is mixed.

The findings of the household survey suggest that the NCDDP's health education effort in this domain has had an impact, but requires reinforcement. They point to a number of areas to which the Project needs to direct increased attention. Central here is the question of precisely how and how adequately the mothers actually manage diarrhoea cases - whether ORT is begun and terminated at the proper time, and given in adequate volumes. The more general nutritional aspects of diarrhoea management also need greater emphasis.

It should be noted that a potentially important aspect of household management of diarrhoea episodes was not covered in this survey - namely, what medications, if any, mothers give in addition to ORS? It will be important for the Project to assemble information on this matter. Findings from the evaluation team's survey of private pharmacies suggest that households very frequently use so called antidiarrhoeals and antibiotics in the treatment of diarrhoea.

4.7 Key issues

4.7.1 Although television has markedly increased awareness of ORS among mothers, they still lack sufficient information to make appropriate decisions on their own regarding treatment: when to start ORS, how often to give ORS, how long to give ORS, how to feed children with diarrhoea, how to handle common problems such as the child's refusal to take the solution.

4.7.2 Health facilities have been inadequate in providing mothers with health education and information on diarrhoea case management and prevention. There is a lack of health education materials and, more importantly, of communication skills among staff at many health facilities.

4.7.3 The fact that "antidiarrhoeal" and antibiotic drugs are still used extensively by medical practitioners could well send confusing messages to the mother concerning the adequacy of ORT. Moreover, nutrition advice from doctors is not always appropriate.

4.8 Recommendations

- Rec.21 Having effectively created public demand for ORS, the NCDDP should concentrate attention on its correct use, feeding during diarrhoea and the prevention of diarrhoea. While maintaining mass media communications, health education through health facilities should be strengthened, particularly by improving the communications skills of health staff.
- Rec.22 The content of TV messages to mothers should include key information needed for them to take appropriate decisions on:
- o when to start ORS;
 - o how often to give ORS;
 - o what to do about feeding and fluids during diarrhoea; and,
 - o what to do about common problems like child's refusal to take the solution.
- Rec.23 Attention should be given to communicating to mothers that in most cases of diarrhoea, ORT is the appropriate and adequate treatment, not an adjunct to drug therapy.
- Rec.24 The attention being directed towards prevention of diarrhoea should be carefully monitored to ensure that it is not at a cost to maintenance of high levels of effective ORT.
- Rec.25 Mixing of the 5.5 g ORS packet should be demonstrated to mothers in health facilities even when ORS mixed in bulk from 27.5gm packets is in use.

5. PRODUCTION AND DISTRIBUTION OF ORS AND ORT MATERIALS

5.1 Objectives

The objectives of the NCDDP in production and distribution of ORS is to ensure its availability in adequate quantities free of charge in all government health facilities and at an affordable cost through private pharmacies.

5.2 ORS production

The public sector company Chemical Industries Development (CID) was selected by the NCDDP as the supplier of ORS to the Project. CID had been producing its own ORS product "Rehydran" since 1978. It also started producing 27.5 g ORS packets for UNICEF in 1982, but this production ceased after 1984 when ORS packet size was standardized to 5.5 g.

The NCDDP has contracted CID since 1984 to produce an annually predetermined quantity of ORS as shown in Table 5.1. No other company is producing ORS or similar products in Egypt at present. CID has an estimated production capacity of 100 million packets per year through its two production facilities in Cairo and Assiut.

It was estimated by the Project that, on the basis of the incidence of diarrhoea in children, around 125 million 5.5 g packets would be required annually. However, ORS use rates in 1985 were reported to be in excess of 70% with production at only 45 million packets, suggesting that the needs were overestimated. CID has been contracted to produce 60 million packets in 1986, including 15 million to be produced for UNICEF.

It was planned to start production of ORS-citrate formula in early 1986, but this has been postponed as a quantity of aluminium foil labelled with ORS-bicarbonate formula was in stock. Production of ORS-citrate is expected to start in September 1986. The UNICEF 5.5 g packets will continue to be produced with the bicarbonate formula as enough raw material is available for 45 million packets, 15 million in each year 1986-1988.

5.3 Quality control procedures

The quality control procedure involves testing of raw materials released from the bulk store at CID and testing during and after production. Finished packets are tested for appearance, labelling, uniformity of weight, package seal, moisture content, solubility, composition and microbial contamination.

In addition, post-production quality control at distribution is conducted by the National Organization for Drug Control and Research (NODCAR).

Detailed results of quality control testing were not reviewed by the Review team. However, assurance was given that there had been no problems in this area.

5.4 ORS distribution

Three channels of distribution of ORS have been utilized. Government health facilities are supplied directly by CID through 26 governorate warehouses as part of the general drug distribution system. Distribution to the private sector is through the 42 distribution centres of EGY Drug Company from which pharmacists collect supplies and through five branches of the Middle East Chemicals Company which send supplies to pharmacies on order. The first of these companies is a usual distributor of CID produced drugs to the private sector, the latter was contracted by the NCDDP for this purpose. The amount of ORS distributed through these three channels is shown in Table 5.2.

5.5 ORS price

The NCDDP purchases ORS from CID at a price of L.E. 0.36 (approximately US\$ 0.30) per box of ten 5.5 g packets (sufficient for 2 litres of solution). This price includes the company's 20% profit margin and a 12% charge for distribution costs. As the NCDDP contracts Middle East Chemicals to distribute a certain quantity of ORS, the cost of distribution for packets delivered through this channel is in effect borne twice by the Project.

Retail outlets sell a box of ten small packets of ORS for L.E. 0.45.

5.6 Production of polyvalent IV solution

The El Nasr Pharmaceutical Company was contracted to supply 50 000 half-litre bottles of specially formulated IV fluid for use in rehydration units in some Ministry of Health and University teaching hospitals. The success of this endeavour is currently being evaluated.

5.7 ORT materials

The Project has produced and distributed plastic cups bearing the Project logo and spoons for the mixing and giving of ORS. The non-availability of cups has been reported as a problem in some areas and in at least one study, absence of the cups at household level was associated with errors in mixing ORS. In 1985, 3.5 million cups and spoons were distributed. Although private pharmacies are authorized to sell the cups, provided to them free of charge, for L.E. 0.05, in most cases they provide one cup free with ten packets of ORS.

The Project has also distributed equipment to ORT training units as shown in Table 5.3.

5.8 Field visit findings

The current stocks of ORS and details of recent packet consumption were obtained at five levels of the government health services: governorate, district, hospitals, urban health units and rural health units.

Overall, the impression obtained was that ORS stocks are widely available and few serious supply problems had been encountered. There were some UNICEF packets in many health facilities and the condition of some of these was deteriorating.

Average monthly consumption of ORS was calculated for each health office and facility visited, where data were available, to estimate the projected life of the current stocks, as shown in Table 5.4. It is apparent that supply of ORS is not always based on consumption, resulting in shortages in a few instances and excess stocks in others. Seven out of 64 facilities visited were without 5.5 g packets of ORS and six of these had no larger packets either.

Although no careful assessment of the availability of ORT unit equipment was undertaken, it was noted that the specially designed chairs were being used for other purposes or were broken in some facilities. In some health facilities staff felt that supply of ORT chairs was of no great benefit while other basic requirements could have been useful.

Table 5.1: Oral rehydration salts imported and locally manufactured 1980-1986

Year	5.5 g Packets "Rehydran"	5.5 g Packets NCDDP ORS	27.5 g Packets imported	27.5 g Packets local mfg.	Total litres
1980	6 854 240	0	3 125 760	0	4 496 608
1981	7 253 920	0	3 050 000	0	4 500 784
1982	3 540 500	0	1 000 000	618 540	2 326 640
1983	5 176 100	286 000	0	2 275 700	3 368 120
1984	4 932 330	18 711 800*	0	1 577 200	6 306 020
1985	0	43 181 400	0	0	9 000 000
1986*	0	60 000 000	0	0	12 000 000

*Projected, including 15 000 000 5.5 g ORS packets produced for UNICEF

Table 5.2: ORS distribution through 3 channels in 1985

Sector	Company	Opening stock	Received	Distributed	Closing stock
Private	M.E.C. Co.	704 000	15 428 040	13 383 580	2 751 460
	EGY Drug Co.	5 629 300	15 362 500	14 844 400	6 147 870
Public	CID stores	1 000 000	10 343 000	11 343 000	0

Table 5.3: Distribution of materials to ORT units

Item	Total	Distributed	Remaining for distribution
1. Baby Scales	3 000	2 031	959
2. Water Containers "thermos jug"	192	152	40
3. Scalp needles	5 000	2 700	2 300
4. Nasogastric	2 000	1 200	800
5. Thermometers	17 000	17 000	-
6. Mother's chair	10 000	9 896	104
7. Mixing-demonstration table	2 500	1 900	600

Table 5.4: Projected life of current 5.5 g packet ORS stocks at various levels at the time of field visits

Level	Projected life of current stock (months)		Proportion with less than 3 months stock
	Average	Range	
Governorate	6	1-18	2/6
District	7	1-13	0/7
Hospital	6	0-27	7/12
Urban Health Unit	11	0-83	12/18
Rural Health Unit	13	0-68	10/25

5.9 Key issues

5.9.1 The continuous adequate supply of ORS to most outlets is a significant achievement. The multiple channel approach to distribution appears to have functioned well. However, the inequitable distribution of ORS in the Government sector, with shortages in some places and excess stocks in others, indicates that the supplies to the health facilities are not currently linked to consumption.

5.9.2 The production of ORS currently relies on imported raw ingredients; such ingredients are not available on the local market and the production of these ingredients is not possible at present.

5.9.3 The use of 27.5 g ORS packets for distribution to the population in a minority of health facilities conflicts with stated policy as well as mass media promotional efforts exclusively related to the 5.5 g packet.

5.9.4 The supply of ORT unit equipment is not always linked to the needs of the individual health facility. In some cases, equipment other than that which is routinely supplied to an ORT unit would be more beneficial to its function.

5.10 Recommendations

- Rec.26 The likely impact of the eventual termination of the Project on the price of ORS should be examined. A course of action which ensures its continued availability free in government health services and at an affordable price in the private sector should be defined. The following two recommendations may have a bearing on this issue.
- Rec.27 The quality control of ORS performed by NODCAR, should be maintained to complement that undertaken by the manufacturer.
- Rec.28 The 27.5 g packets of ORS currently in stock in peripheral units should be recalled and either:
- destroyed if spoiled, or
 - used in large ORT units for preparation of ORS solution in bulk
- Rec.29 The need for plastic cups and spoons for ORT should be re-examined with a view to either:
- phasing out their production, or
 - improving the distribution system.
- Rec.30 In training courses for health staff related to ORT or supervisory skills, attention should be given to planning and management skills such as calculation of ORS requirements.
- Rec.31 A plan for equipping ORT units should be implemented which is more sensitive to the real needs of individual facilities.

51

6. DIARRHOEA CASE MANAGEMENT

6.1 Introduction

It has been estimated that diarrhoeal disease in the past accounted for half of all deaths among children 0-4 years in Egypt. As a consequence, over some years preceding the initiation of the NCDDP, attempts were made to improve diarrhoea case management. These have included oral rehydration therapy, which has been available since 1977. National promotion of ORT came with the start of the NCDDP Phase II in 1984.

6.2 The case management strategy of the NCDDP

The stated case management strategy of the Project aims at reducing deaths due to dehydration and improving nutritional status through continuous feeding.

In the original USAID Project document of August 1981 the case management strategy was stated to have two components:

- "- to train all practitioners in proper treatment of diarrhoea; and
- to improve mothers' knowledge, attitudes and practices in caring for children with diarrhoea".

Thus, the Project has two principal foci: health professionals and the community. These are addressed through training and the establishment of ORT units and through the mass communications efforts described earlier. The number of "functional ORT units" is shown in Table 6.1.

Table 6.1: Number and per cent of health facilities with ORT units

Type of Health Facility	Total Existing Facilities	With Functional ORT Unit	Per Cent With ORT Units
University Hospitals	11	11	100.0
Teaching Hospitals	8	5	62.5
General and District Hospitals	191	123	64.4
MCH Centres	215	195	90.7
Urban Health Centres	90	83	92.2
District Clinics	69	25	36.2
Specialized Hospitals (Fever and Paediatric)	74	41	55.4
Rural Hospitals	49	43	89.8
Health Centres and Combined Health Centres	536	412	76.9
Rural Health Units	1967	1533	77.9
Total	3210	2471	77.0

From the NCDDP "A Three Year Status Report, February 1986"

The decision was taken early in the NCDDP to strengthen the implementation of the case management strategy through relevant research activities. Research on related topics such as vomiting during ORT, breast feeding and ORT, the use of ORS in low birth weight infants and the effects of antidiarrhoeal and other drugs in diarrhoea has stimulated interest in diarrhoea case management and enhanced knowledge

Another early decision of the NCDDP was to promote ORS not only for the treatment of dehydration but also as the appropriate early treatment in the home for the prevention of dehydration.

6.3 Progress in implementation of the case management strategy

The level of knowledge and practice of ORT among mothers in Egypt is impressive. Table 6.2, taken from the NCDDP Three Year Status Report, February 1986, shows the findings from various evaluation studies of mothers' knowledge, use of ORS and feeding during diarrhoea. Reference should also be made to the Review findings described in section D4.6.

Knowledge of ORT is also widespread among health professionals. However, complete, appropriate diarrhoea case management is not yet widely practised. It was noted in 1984 by the First Joint Review that there was still a lack of acceptance, knowledge and use of ORT and nutritional therapy among some health professionals. There have been significant improvements since that time. KAP studies show that in 1985, over 97% of physicians surveyed were satisfied with ORS. In addition, there have been significant increases in physicians recommending breastfeeding during diarrhoea (from 78% to 91%) and light feeding during diarrhoea (from 60%-84%). By 1985, 61% of physicians (up from 37%), and 76% of nurses (up from 36%) had attended ORT training. In 1985, 78% of pharmacists interviewed said they prescribed ORS for diarrhoea. The use of fasting, antidiarrhoeals and antibiotics in the treatment of diarrhoea was said to be widespread. Various recommendations of the First Joint Review addressed these problems. On the recommendation to provide guidelines on the specific indications for using antibiotics, the "Guidelines for the Management of Acute Diarrhoea in Children", was prepared by the Project, with a section on drug therapy. However, it was found that these guidelines were rarely followed by the units visited by the Review team. Nevertheless, improvements in knowledge of ORT and treatment of cases have been achieved, as noted in Section 6.7.

6.4 The impact of the case management strategy

The impact of the NCDDP on infant and childhood mortality is discussed in section D11.

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Table 6.2: National Control of Diarrhoeal Diseases Project
Summary of Key Findings from Various Evaluative Studies

VARIABLE	Alexandria May 1983 Baseline Before Pro- ject Began	Alexandria Oct. 1983 After 3 Mo. Radio Campaign	Alexandria March 1984 After One Mo. TV Campaign	WHO/EPI Survey June 1984	Double- Round Census June 1984 *	NEAG Media Survey Oct. 1984 **	SPAAC KAP of Mothers Jan. 1985	UNICEF Behira EPI Survey Apr. 1985 **	SPAAC KAP of Mothers Nov. 1985
Know of Dehydration	32.0%	-	-	-	-	90.0%	86.0%	-	98.0%
Know of ORS	1.5%	59.4%	87.4%	69.0%	-	96.0%	94.0%	-	98.0%
Ever Used ORS	1.0%	12.4%	36.2%	44.0%	-	57.0%	50.0%	62.6%	66.0%
Used ORS Last Episode	-	-	-	-	69.9%	-	-	-	70.0%
Recognize ORS Packet	-	-	-	-	-	90.0%	77.0%	88.7%	-
Know Correct ORS Use	-	-	-	-	-	59.0%	53.0%	69.8%	90.0%
Diarrhoea in Last 6 Months	-	-	-	-	-	39.0%	80.0%	-	76.0%
Diarrhoea in Last One Week	-	-	23.4%	-	43.1%	-	-	-	30.0%
Continue Feeding Regular Diet	3.0%	22.0%	65.0%	-	-	-	61.0%	-	67.0%
References	(5)	(5)	(6)	(7)	(2)	(4)	(11)	(10)	(11)

From the NCDDP "A Three Year Status Report, February 1986"

Case fatality rates are observed to be high among inpatients at some hospitals. Estimates from records of patients admitted at one rehydration centre attached to a tertiary care hospital showed case fatality rates ranging from 5.7% (in May-August 1983) to 26.3% (in January-April 1985) (Table 6.3). Clearly, interpretation of changing case fatality rates in a tertiary care institution is complex as it reflects both community and hospital practices and the impact of conditions complicating acute diarrhoea.

There is a general impression among health professionals working in rehydration units, however, that there has been a reduction in severity of diarrhoea cases coming to health units for treatment. Some data on selected indicators were presented to the Review team to support this.

Figure 6.1 shows graphically the percentage of severely dehydrated cases by four-month periods as reported for one hospital in Table 6.3. A significant reduction in severe cases is observed over the three years in the months January-April and May-August, but no significant change from 1983 to 1985 is observed at this hospital during the months of September-December.

Table 6.3: Rates of severe dehydration, admission and case fatality among diarrhoea cases aged 0 to 5 years, Bab El Shaariya Hospital, Cairo 1985-1986

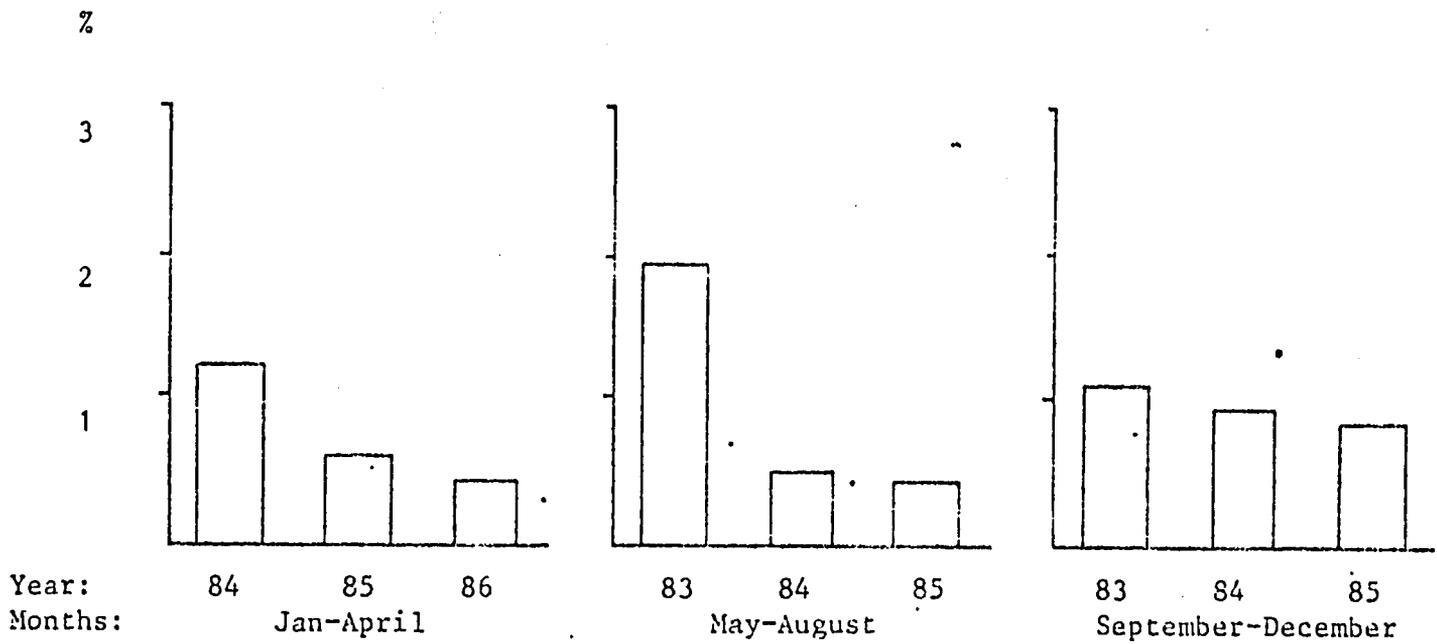
Year	Months	Total	Severely dehydrated	Admissions	Deaths	Proportion severely dehydrated ^a (%)	Admission rate (%)	Case fatality rate (%) ^b
1983	May-Aug	1225	23	106	6	1.9	8.7	5.7
	Sep-Dec	1618	18	50	8	1.1	3.1	16.0
1984	Jan-Apr	1182	14	24	2	1.2	2.0	8.3
	May-Aug	2386	12	61	11	0.5	2.6	18.0
	Sep-Dec	1446	13	30	5	0.9	2.1	16.7
1985	Jan-Apr	1038	6	19	5	0.6	1.8	26.3
	May-Aug	1635	7	74	12	0.4	4.5	16.2
	Sep-Dec	1466	12	118	7	0.8	8.0	5.9
1986	Jan-Apr	1234	5	50	3	0.4	4.1	6.0

From: Patient register of the Diarrhoeal Diseases Rehydration and Research Centre, Bab El Shaariya Hospital, May 1983-April 1986

^aProportion severely dehydrated by four-month periods, 1983-1985 - see also Fig. 6.1.

^bInpatient CFR assuming all deaths were among inpatients

Figure 6.1: Percentage severely dehydrated of all presenting diarrhoea cases 0-5 years, by four-week period
Bab El Shaariya Hospital, Cairo, 1983-1985



6.5 Monitoring of hypernatraemia

In June 1984, the first review of the NCDDP suggested monitoring for the frequency of hypernatraemia as the usage of ORS became more frequent. As a result, four university hospitals began screening a sample of paediatric admissions. A primary analysis of results was provided to the Review team.

It should be noted that the patients among whom these studies have been conducted, at tertiary care institutions, tend to be those with more severe dehydrating diarrhoea episodes. The reported frequency of hypernatraemia (serum sodium 149 mEq/Litre) by month varied from 4% to 53%. An apparent peak during the cooler months of the year is unexplained. Some discussion continues concerning the relative sensitivity and specificity of the two commonly used tests of serum sodium concentrations.

It has been suggested that figures from Abou Reesh Hospital demonstrate an increase in hypernatraemia admissions with the introduction of ORS into the general community over the last 3 years. These figures are difficult to interpret, however, since the rehydration clinic did not begin operations until May 1985, the type of cases included (outpatient and/or inpatient) varied over time, the frequency of hypernatraemia increased before ORT use was introduced and, thereafter, the two variables show no consistent relationship.

Compared with non-hypernatraemic cases, hypernatraemic patients at Abou Reesh tended to be younger, more dehydrated, more likely to have received ORS in the 24 hours preceding admission, and more likely to have received other fluids (except breast milk) as well, although not all of these differences were statistically significant. Such patients apparently received less fluids while hospitalized, as measured by the percentage of weight gain after rehydration.

From the data given, it is not possible to determine whether pre-admission use of ORS was the cause of hypernatraemia or merely the result of a more dehydrating episode of diarrhoea. Attempts to clarify this point are continuing, but will require rigorous study design and a reasonable number of patients.

6.6 Studies on Rice-based ORS

A controlled clinical trial of a rice powder-based ORS has recently been conducted at Bab El Shaariya Hospital in Cairo. A mixture containing 50 g of rice instead of 20 g glucose was compared with the standard WHO solution (30 patients with mild-moderate dehydration in each group). Cases in each group were comparable with regard to 11 pre-study criteria.

The experimental group benefitted significantly ($p < 0.01$) in comparison with the control group in all measures of outcome: mean duration of diarrhoea (28.4 versus 34.3 hours), mean weight gain (5.7 versus 4.1% of recovery weight in the first 24 hours), mean ORS intake (270 versus 341 ml/kg in the first 24 hours), mean stool output (163 versus 245 g/kg in the first 24 hours), and mean frequency of vomiting per 24 hours (4.1 versus 4.9 times).

These results are encouraging but further research is required to verify the findings and to examine the feasibility of production and packaging of such a formula and its acceptability.

6.7 Field visit findings - Case management in health facilities

The review teams visited 64 government health facilities: 15 hospitals, 7 urban health units, 12 MCH centres and 30 rural health units.

In only 12 instances was the treatment of a diarrhoea case observed. In all but one of these the assessment of dehydration and selection of treatment were appropriate. In two instances ORS was improperly prepared, in two improperly administered and in four instances mothers were improperly advised about continuing ORT at home. In half, no instruction about future diarrhoea episodes was given, in one third no dietary advice, and in no case was advice on the prevention of diarrhoea offered.

In 56 centres, information regarding case management was obtained by interview. In all but three, knowledge on preparation and giving of ORS was judged good or acceptable. The median number of packets of ORS given per case was 3 (range 1-10). Fifty per cent of those interviewed prescribed antibiotics and/or "antidiarrhoeal" agents routinely.

The majority of those interviewed gave the proper indications for use of intravenous fluids, mentioning severe dehydration, persistent vomiting, coma, ORT failure, and shock (in rank order). Only three inappropriate indications were mentioned.

In response to more specific questioning, 93% of those interviewed indicated usage of antibiotics, 97% claimed to advise mothers to continue ORS at home, 31% advised that breast feeding be discontinued or delayed, 14% postponed other fluids and 76% postponed solid foods. Sixty-five per cent claimed to advise mothers about treating future episodes at home, and 88% claimed to tell mothers about prevention. Forty-eight (96%) of 50 centres demonstrated correct mixing of ORS to the Review team.

The reviewers' overall assessments of case management are summarized in Table 6.4. Urban facilities were judged to have performed well somewhat more often than were rural clinics.

Table 6.4: Overall assessment by reviewers of diarrhoea case management in 64 health facilities visited

Task	Percentage of health workers whose knowledge was judged:		
	Good	Acceptable*	Poor
Assessment of dehydration	43	50	7
Selecting appropriate treatment	29	53	18
Preparing and giving ORS	60	35	5
Advising the mother	24	58	18

*Not dangerous to the patient, but not good.

Written guidelines, including manuals and wall charts, were observed to be present in 51% of 63 centres. Often the materials were judged to be inconveniently displayed or inadequate in type or number.

Health education activities infrequently involved anything more than instructions to individual mothers. A few centres provided occasional classes or films, demonstration kitchens, home visits, or pamphlets.

To further observe diarrhoea case management, three model rehydration centres were visited: Abou Reesh and Bab El Shaariya in Cairo, and El Shatby in Alexandria. A description of observations at the first two paediatric hospitals are given in Annex 8.

6.8 Interviews with 30 private medical practitioners

6.8.1 Introduction

Private practitioners were interviewed by the Review team members to assess their knowledge and practices with regard to management of childhood diarrhoea in their private practices. Selection of the practitioners within the randomly selected districts was left to the judgement of the team members.

It should be noted that the sample was small and cannot be considered as representative of all practitioners. Of the 30 private practitioners interviewed, ten were paediatricians and 20 general practitioners or specialists who also work in general practice. Most also worked in government service.

Sixteen had not received special training on diarrhoea case management. Of those who had received training, two had attended more than one course, and one paediatrician was a trainer himself.

The estimated number of diarrhoea cases treated in the private clinics visited in one month (during the diarrhoea season) varied greatly among practitioners, ranging from 15 to 800, with an average of 200 cases. On average, 85% of cases were said to be children below 5 years of age.

6.8.2 Knowledge

In response to an open question about "the usual line of management" for a case of "watery diarrhoea", ORS or rehydration were mentioned in 59% of the 61 different responses; antidiarrhoeal drugs in 18%; antibiotics, intestinal antiseptics or antiamoebics in 15%; and antiemetics in 3%, while 5% were ill-defined responses. It is of interest to note that none of the respondents mentioned maintenance of nutrition as a usual part of case management.

Responses to an open question on the indications for using ORS were equally divided into three categories: for early treatment of diarrhoea, for treatment of watery diarrhoea and for treatment of mild dehydration.

The commonest indication given for IV fluids was severe dehydration (50% of the responses). The next most frequently mentioned indications were shock/coma, persistent vomiting and non-response to ORS. With only two exceptions, responses were appropriate.

Fever was considered in 44% of responses as an indication for antibiotics, while 38% mentioned "infective", dysenteric or "complicated" diarrhoea as the indication. While two practitioners saw no indication for antibiotics, two others said that they are indicated in all cases of diarrhoea.

64

6.8.3 Practices

When asked what drugs they "most commonly prescribed for a case of watery diarrhoea in a child less than 5 years", 76% of respondents mentioned antidiarrhoeals, 66% antibiotics and 48% ORS. On direct enquiry, ORS was said to be prescribed to an average of 85% of diarrhoea cases (range 33-100%), which seems high in view of the spontaneous mention of ORS by only 48% of respondents. IV fluids were given to an average of 9% (range 0-33%) and antibiotics to 54% (range 0-100%).

Though six practitioners said that they do not give IV fluids in their private clinics and refer children to hospitals, some others mentioned that they give them as an emergency measure prior to referral. The fluids most commonly prescribed in descending order of frequency were: Normal Saline, Ringer's Lactate and Glucose 5%. It should be noted that the "polyvalent fluid" promoted on a limited scale by the NCDDP is not available on the private market.

6.8.4 Advice given to mothers

The interviews suggested that most of the practitioners could correctly advise parents on how to use ORS, 76% of respondents claimed to advise mothers to continue breast feeding during diarrhoea, 66% to continue or increase other fluids, 31% to continue bottle feeding and 55% to continue solid food as usual. How this reported behaviour relates to actual practice could not, of course, be judged.

6.9 Interview with 52 private pharmacists

6.9.1 Treatment of diarrhoea cases

Fifty-two pharmacists in seven governorates visited were asked what services they would usually provide for a child with diarrhoea. Over 80% said they would sell drugs (some without prescription), 21% refer to a physician and 15% would offer instructions.

The drugs most commonly sold for diarrhoea in children were:

- o ORS
- o "Antidiarrhoeal drugs" (frequently mentioned were Enteroquin, Diapec, Kapect, Pectokal, Fudizol, Flagyl and Septasol, among others)
- o Antibiotics (notably Streptopenicol).

63

The composition of 15 antidiarrhoeal compounds found in one pharmacy is shown in Annex 9.

Fever (44%), "infective" diarrhoea and stool colour were mentioned as indications for antibiotics.

Between 40-50% of pharmacists thought breast feeding, other fluids and solid foods should be continued as usual during diarrhoea. However, 28% and 23% suggested stopping breast feeding and solid foods respectively.

6.9.2 ORS Supplies

All but one pharmacy had stocks of ORS present, and only four had faced difficulties with supply. Of the 52 pharmacies visited, 35 mentioned Middle East Chemicals as a supplier, 25 CID and 14 EGY Drugs. Clearly some pharmacies receive ORS from more than one source.

Plastic cups were available in almost all pharmacies and given away free of charge in 46 of the 52 visited, although they are entitled to charge L.E. 0.05.

6.9.3 Sources of information

Eight of the pharmacists visited mentioned TV as their source of information on diarrhoea case management and seven mentioned drug sales representatives. Most cited their experience as the most important factor. Only three pharmacies had been visited by an NCDDP professional sales representative. However, all but five had been visited by a pharmacy inspector, many of whom enquired about ORS stocks.

6.9.4 Turnover of ORS and antidiarrhoeal drugs

Reviewers were asked to enquire about the retail price and usual turnover (in a month of the diarrhoea season) of the three remedies most commonly sold for diarrhoea and ORS if it was not included. Some reviewers only enquired about ORS if it was included in the three top selling items and the range of antidiarrhoeal drugs mentioned was vast. Nevertheless, the figures in Table 6.5 give some idea of the relative importance of ORS. It should be noted when interpreting these figures that the percentage profit margin for ORS (20%) is high in comparison to other drugs.

Table 6.5: Reported turnover of ORS and some antidiarrhoeal drugs in 52 pharmacies

Drug (Brand name)	Numbers of pharmacies listing the drug in the "3 most commonly sold"	Number of units sold in one month		Price per unit (L.E.)	Average monthly turnover (L.E.)
		Average	Range		
Enteroquin	27	135	15-1000	0.50	67.50
Diapec	26	123	20- 600	1.00	123.00
Streptophenicol	13	116	20- 400	0.95	110.00
Enteroguanil	11	101	15- 400	0.25	25.00
Kapect	20	91	15- 200	0.85	77.00
ORS	39*	110	10- 300	0.45	49.50

*Not necessarily mentioned in 3 most commonly sold. Reviewers were supposed to enquire about ORS price and turnover at all pharmacies.

6.10 Key issues

6.10.1 Despite the stated dual strategy for improving diarrhoea case management, efforts have been mainly focused on rehydration, with less attention given to feeding practices during diarrhoea.

6.10.2 In both the government health services and in the private health care sector, use of ORS is widespread. However, it is rarely used alone. Antibiotics and "antidiarrhoeal" drugs are frequently prescribed as a routine treatment for diarrhoea. It is noted that it was a deliberate strategy of the Project to give greatest emphasis in the first instance to the promotion of ORT.

6.10.3 It was found from interviews with private pharmacists and practitioners that appropriate case management skills, including rehydration, selective drug use, and health education still need to be communicated to, and adopted by, many health professionals. The household interviews showed that "doctors" remain the most important contact when a child has diarrhoea.

6.10.4 The treatment practices promoted at rehydration units vary between individual health professionals.

The guidelines for diarrhoea case management prepared by the Project are often not available or not followed.

6.10.5 The supervision of case management at health units is not focused on the actual performance of health workers.

6.10.6 The current and completed research studies have not yet resolved the issue of the incidence of hypernatraemia among cases treated with ORS. The issue of rice-based ORS also requires further research before wide use can be considered.

6.11 Recommendations

- Rec.32 Advice to mothers on feeding during diarrhoea and on prevention of diarrhoea should be emphasized in all health facilities and in all training in case management.
- Rec.33 The guidelines for establishing and operating rehydration units should be finalized and widely distributed. The guidelines for management of acute diarrhoea in children, revised as necessary, should be made available in all health facilities, (see also Rec.32), rehydration, indications for additional drugs and health education. (See also Recommendation 14).
- Rec.34 Efforts should be undertaken to limit the inappropriate use of drugs in the treatment of diarrhoea. These may include:
- guidelines for health care providers on the correct indications for the use of antibiotics;
 - restrictions on the registration of inappropriate drugs, particularly multi-component "antidiarrhoeal" drugs; and
 - stopping the distribution of inappropriate drugs through the government health services.
- Rec.35 Rice-based ORS should not be included in the national programme until further research in this subject has been conducted. Studies should include various formulations, palatability, preparation, acceptability, digestability and cost.

Various suggestions related to research into hypernatraemia are listed in Annex 10.

Other relevant recommendations are also found in sections D3 and D4.

7. ORS DEPOT HOLDERS

7.1 Background

A pilot study of a system of distribution of ORS as a community service by selected village residents, to be known as ORS depot holders, was undertaken in four villages (two intervention, two control) in Tema District in Sohag Governorate in 1983. In 1984 the test was extended to 213 villages in five governorates. The study ended in November 1985 with a recommendation, not yet implemented by the NCDDP, for expansion of the system to all districts in five governorates. Despite the formal termination of the study, the system has continued to function informally, in full or in part, in many of the study areas.

Because this system represents an important effort to enlist community members in providing ORS information and packets to mothers in rural areas, field visits were undertaken as a part of this Joint Review, to assess its effectiveness.

7.2 Objectives of the field visits

The objectives of the Review's of the depot holder system were six:

- to see to what extent the system is continuing to operate more than six months after the official programme ended (November 1985);
- to see whether the programme has been effective in increasing mothers' levels of knowledge, skill and use of ORS in managing infant and early childhood diarrhoeas;
- to identify deficiencies in mothers' knowledge, attitudes and practices for future emphasis in training programmes, health education, and communication through mass media;
- to identify factors which appeared to be associated with the successful continuation of the system after the experimental period and subsidies had ended, or conversely to identify barriers to successful continued functioning;
- to identify issues which must be resolved if the system were to be implemented on a larger scale; and
- to make a recommendation about expansion of the depot holder scheme to other parts of Egypt, taking into account the estimated costs of expansion, estimated ongoing operating costs, and apparent effectiveness of the system in reaching mothers.

7.3 Sample selection

Nine rural health units in six districts in three governorates were visited. One of these units had been included in the original Depot Holder Study, two units had never participated in the system, six units had joined the programme only in its second phase. Detailed interviews were conducted with the senior physician in five of the nine units, with 12 depot holders relating to six of the units, and with 16 mothers served by these six depot holders. In addition, eight mothers from the two units which had never participated in the depot holder system were also interviewed.

Selection of rural units within each district was random, with the exception of Meshna, one of the original study villages, which was included to see the effect of a longer exposure to the programme. Depot holders working with a particular unit were randomly selected from a list provided by the doctor. For each depot holder, one or more mothers was randomly selected from a list of those living reasonably close to the depot holder.

Although this in no sense represents a true random sample of units, depot holders, and mothers, we consider it broad enough to provide a suggestive overview of the current state of the depot holder system.

7.4 Continued functioning of the system

A wide range in the level of functioning of the depot holder system was observed. Four criteria were used to group the health units by functional status of the system:

- o 80% of depot holders still at work.
- o Support of the rural health unit doctor for the depot holder.
- o ORS resupply from the health unit to the depot holder.
- o Active supervision of the depot holder by doctor or nurse.

By these criteria, we found three of the seven units fully functional, three units partially functional and one unit no longer functional. With the two units which had never had the depot holder system, the nine units can be classified on an ordinal scale of depot holder functional status as in Table 7.1.

Table 7.1: Status of Depot Holder System six months after termination of the project - June 1986
Number of Health Units visited, depot holders and mothers interviewed

Criteria for classification	Fully functional	Partially functional	No longer functional	Never had the depot holder programme
a) Cooperation of health unit doctor	Yes	No	No	N/A
b) Percentage of depot holders still working	80%	25-79%	25%	N/A
c) ORS supplied from the health unit	Yes	No	No	N/A
d) Supervision from health unit/district	Good	Minimal	None	N/A
Number of health units visited	3	3	1	2
Number of depot holders interviewed	4	7	1	-
Number of mothers interviewed	8	7	1	8

These categories have formed the basis for further examination of the interviews.

The continued functioning of many aspects of the depot holder system more than six months after it officially came to an end is remarkable in itself. This means that the depot holders and their supervisors have worked without incentives and, where feasible, the unit has continued to supply ORS to the depot holders from its own stock for more than six months. This is a tribute both to the care with which the system was initially designed and implemented, and to its apparent value to the health unit doctors, the depot holders themselves and the mothers they serve.

7.5 Apparent effectiveness in increasing mothers' KAP and specific deficiencies

Mothers were questioned about five general areas:

- o recognition and preparation of ORS
- o administration of ORS
- o feeding practices during diarrhoeal episodes
- o hygiene and sanitation
- o relationship to depot holder system, where applicable.

Examination of the 24 interviews by functional status of the depot holder programme suggested an apparent relationship between mothers' knowledge attitudes and practices and current functioning, full or partial, of the depot holder programme. In general, mothers in fully or partially functioning areas were able to respond correctly to the questions posed. In the other areas only about half of the responses were appropriate.

Virtually all mothers recognized the ORS packet and knew how to mix it properly, but those with a fully or partially functioning depot holder programme were better informed about the administration of ORS. The cup was available in all but one household in areas in which the depot holder system was fully or partially functional; no cups were found in the households not covered by the depot holder system. The availability of cups in the home may account for the greater success in depot holder areas in mixing ORS correctly.

Moreover, those with and those without functioning depot holders seemed to show different patterns of deficient responses; those without the depot holder programme appeared to be particularly weak in the knowledge of good feeding practices, and of hygiene and sanitation when compared to those with a currently functioning programme (Table 7.2). It is interesting to note in this connection that there were no differences in the proportion reporting having watched Mrs Karima Mochtar's promotion of ORS on television.

Table 7.3: Deficiencies in mothers' knowledge and practice by functional status of the depot holder system

Area of Deficiency (Number of mothers)	Functional		No longer or never functioned	Total
	Fully 8	Partially 7	9	
<u>I. Recognition and Preparation of ORS:</u>				
Number of responses:				
- total	32	28	26	96
- incorrect	0	2	10	12
<u>II. Administration of ORS</u>				
Number of responses:				
- total	24	21	27	72
- incorrect	7	8	16	31
<u>III. Feeding practices</u>				
Number of responses:				
- total	24	21	27	72
- incorrect	3	3	15	19
<u>IV. Hygiene and Sanitation</u>				
Number of responses:				
- total	16	14	18	48
- incorrect	3	1	10	14

Householders in the fully or partially functional areas have more options for obtaining ORS than those in the other areas. When asked where they would advise a neighbour to go for ORS, mothers with depot holders indicated that they would recommend obtaining ORS from several sources: the health unit, the depot holder, themselves, a neighbour, or in one case from the pharmacy. Mothers not in the system gave only one source, relying in equal numbers on the health unit and the pharmacy. The system appears to have stimulated community involvement, as approximately two-thirds of the mothers in functioning areas mentioned the depot holders and themselves as potential sources of ORS.

7.6 Factors apparently associated with continued function of the depot holder programme

Field observations and responses to questionnaires for health units and depot holders were reviewed for factors likely to be responsible for continued functioning of the system, six months after its official closing, and thus possibly critical to its long term sustainability. The most important results of this analysis follow:

- o Such items as accessibility, population, and staff/population ratios did not appear to have been important factors in whether or not the depot holder system has continued to function, fully or partially.
- o The presence or absence of fully equipped rehydration facilities in the responsible health unit did not appear to affect the continuation of the depot holder programme.
- o A policy of support, whether written or unwritten, at the district and governorate level appeared to be essential to the programme's continued functioning. Strong support from the health unit physician was also a key factor.
- o Relationships of trust between the doctor and the depot holders, and the doctor and the community appeared to be important in continued functioning of the system.
- o Newly assigned physicians who had not been adequately oriented to the depot holder scheme have not taken it up on their own initiative.
- o Supervision of the depot holder is important; it can be successfully undertaken by either doctor or nurse, but training for supervision will be important to make adjustments in the system as needed.
- o We did not have information about the selection of depot holders except in one case (Candion). There, selection by the doctor has been very successful. His criteria included mid-level education and standing in the community.
- o Most of the depot holders who have continued are those who work at the health unit, or who had been previously licensed as health aides, or who carry social or other community responsibilities.
- o Few depot holders sell the packets of ORS; the overwhelming majority give it free as a service. Many see this as a way of ensuring goodwill for their other activities.

- o Resupply of ORS from the health unit has been critical to continued depot holder functioning. This depends upon the health unit doctor's willingness to support the programme, which in turn depends upon both his or her knowledge of the programme and the adequacy of the health unit's supply of ORS. Only one doctor who had worked with the depot holder system expressed reservations about the concept, and his reservation was based on a concern about their charging for the packet in his area.

7.7 Programme costs

The costs to the programme of initial implementation of the depot holder system in one district have been estimated from figures provided by the previous contractor to be L.E. 4725 (Annex 11). Assuming an average district population of 100 000 this results in an initial cost per woman 15-35 years of age of about L.E. 0.3. Estimated ongoing programme costs are minimal, less than L.E. 2700 per district per year. To these figures must be added any allocated central or governorate administrative costs, or the cost of contractor administration.

7.8 Key issues

A number of issues have been identified which would need to be resolved if a depot holder programme is to be adopted nationally.

7.8.1 Various options for expansion of the depot holder programme exist. The Project has not yet initiated the planned expansion, nor is it clear what strategy will be adopted.

7.8.2 The formal responsibility of health unit staff for supervision of, and ORS supply to, the depot holders will require definition, as will the means of compensating supervisors for the additional work entailed.

7.8.3 Criteria and decision processes for selection of effective depot holders need to be established.

7.8.4 The question of whether depot holders should sell the ORS packets (and cups), or provide them free of charge has not been resolved.

7.8.5 A mechanism for the adequate orientation of newly assigned doctors and nurses to the depot holder programme has not been defined.

7.8.6 It is not clear whether the depot holders should be trained to do other health education, for example, on nutrition, weaning, hygiene and sanitation.

7.9 Recommendations

- Rec.36 The depot holder programme should be expanded, following a phased strategy of implementation. Initial expansion should be in the governorates where the responsible officials are already familiar with the programme. Priority for subsequent extension could be considered for more remote rural areas.
- Rec.37 Expansion of the depot holder system should be implemented by the NCDDP. Once implemented, adequate provisions should be made to transfer control to the appropriate section of the Ministry of Health as soon as possible.
- Rec.38 Responsibility for the depot holder programme at the health unit should be formally assigned to a medical officer who would control the ORS supply. Either a doctor or nurse should regularly supervise the depot holder's work with householders. Such supervision should be added to the job description of the person chosen, and compensation paid in the form of overtime rather than less clearly defined incentives. Current orientation programs for newly assigned doctors should incorporate information about the depot holder-system, where appropriate.
- Rec.39 Depot holders should be chosen from among respected community residents; experience suggests selection of individuals, male or female, who work in the health unit, or those who carry other community responsibilities.
- Rec.40 The depot holder should be supplied with the ORS packets and cups free of charge and should not sell them.
- Rec.41 A small operational research study should be carried out to determine the feasibility of expanding the role of the depot holder to provide education to mothers about weaning and hygiene, in addition to distributing ORS.

8. MANAGEMENT INFORMATION SYSTEM (MIS)

8.1 Responsible units

Each technical unit of the NCDDP is responsible for collecting and analysing information which it requires. There is no clearly defined single information system designed to meet the needs of all of the project units. However, a considerable amount of information has been collected and various data can be extracted if required by the appropriate unit.

Data from each unit is made available to other units of the Project, to the Executive Director and to the Steering Committee. These include, for example, the number of functioning and reporting ORT units and the number of ORS packets produced and distributed.

Two of the project units have the primary responsibility for information and monitoring of progress: the Coordination and Implementation Unit and the Evaluation Unit.

8.2 Routine reporting on diarrhoea cases, deaths and treatment

Independent of the Ministry of Health's routine reporting system which does not provide detailed information on diarrhoea cases attending health facilities, the NCDDP has established a reporting system for this purpose. A register for cases treated at health facilities, revised in January 1986, provides space for a rather detailed line listing of cases treated. Data to be recorded include name, age, sex, signs and symptoms, temperature, dehydration status, feeding mode, pre- and post-rehydration weight, amount of ORS given, IV therapy and outcome. These records are unduly complex for a management information system while at the same time lacking some relevant data (such as information on drug usage and ORS intake prior to visiting the health facility), which might be useful if the records were to be used for detailed analysis of case management.

The recorded data are compiled monthly at district level, listing the total numbers for each health facility, forwarded to governorate level, where they are totalled by type of facility, and submitted monthly to the central NCDDP office. Line listings of cases from all 2471 ORT units are also expected to be forwarded to the central level, monthly. Delays in monthly reporting occur at all levels.

8.3 Routine reporting on supervision

In addition to the above-mentioned two types of reports received monthly at the central NCDDP office are two further reports: written summaries of supervisory visits made to ORT units, and recommendations for incentive payments based on supervisory activities or appropriate reporting practices.

These four types of report: are reviewed together by the Coordination and Implementation Unit which approves or rejects each recommendation for incentive payment.

8.4 Analysis of data from the routine reporting system

The analysis of data is carried out by the Coordination and Implementation Unit. Monthly or quarterly tracking of key variables has not been formalized in the form of written reports although this is theoretically possible. Annual summaries are available and summarized in Table 8.1.

Table 8.1: Cases 0-4 years treated with ORS and IV fluids, diarrhoea-related deaths and ORS consumption reported to the NCDDP 1983-1985

	1983	1984	1985
Cases treated with ORS	598 875	949 920	1 310 972
Cases treated with IV fluids	23 958	39 103	34 413
Deaths	8 503	7 185	6 324
Ratio of cases treated with IV fluids to cases treated with ORS (%) ^a	4.0 (+2.0)	4.7 (+1.6)	2.6 ^b (+1.3)
Ratio of deaths to cases treated with ORS (per 1000) ^c	14.0 (+5.5)	8.6 (+3.1)	4.8 (+2.0)
Average litres of ORS used per case treated ^d	1.85	1.97	0.97

^a Figures in parentheses are 2 x standard error of the mean calculated from figures for individual governorates. There is no significant difference in the ratios for the three years.

^b For individual governorates, this figure ranged from 0.06% to 9.4%, a degree of variability which probably reflects reporting practices rather than treatment practices. Even larger ranges were seen in 1983 and 1984.

^c Figures in parentheses as for ^a above. There is a statistically significant difference between the ratios for 1983 and 1985. Most of this difference is accounted for by the increase in cases treated with ORS rather than the decrease in absolute numbers of deaths.

^d Mostly 27.5 g packets used in 1983 and 1984, 5.5 g packets in 1985.

It can be seen that there is a large degree of variability between governorates. This appears to be due to differences in reporting completeness and accuracy rather than to epidemiological variations, and suggests that the system is not yet functioning well.

The three personal computers available are used for only a part of the MIS data.

8.5 Data from special studies

The information collected through the routine information system is complemented by special research studies and evaluation activities. These are discussed elsewhere in the report (Sections D9 and D10).

8.6 Feedback

It was stated that the main instrument for feedback to the field level is the NCDDP Newsletter, which mainly summarizes information from research and evaluation studies. Its distribution appears to be limited. There is not a feedback mechanism directly related to the routine reporting system.

Incentive payments to health staff are not approved if reporting seems inaccurate or questionable. However, due to a limited total available sum for incentives, even adequate reports are not necessarily rewarded in this way.

8.7 Field visit findings

The Review team found that data collected through the NCDDP management information system at health facility level were in many instances incomplete or inaccurate (14 of 64 facilities visited) and in some places virtually non-existent (17 facilities). In some facilities visited, figures reported monthly were based on counting individual prescriptions, were derived from ORS packet consumption, or were simply "estimated". At district level none of the 13 districts visited was found to have compiled, complete and apparently accurate data available. In keeping with these findings, none of the governorates visited was found to have data available and compiled for 1985 which were judged satisfactory by the Review team, although in all cases data had been forwarded to the central level for that year.

In virtually all instances at all levels, the data were simply compiled and forwarded to the next higher level without any form of analysis or interpretation.

All special studies on diarrhoea found on field visits were already known to the Project.

8.8 Key Issues

8.8.1 The objectives of the existing routine reporting system are not clearly defined.

8.8.2 The routine information which is supposed to be recorded monthly is excessive (it includes a line-listing with more than 20 columns for each case of diarrhoea treated in each of 2471 ORT units).

8.8.3 At health unit level, recording of these data is time consuming and, in the absence of feedback, its relevance is not apparent. As a consequence it is often neglected or poorly carried out.

8.8.4 Supervision and monitoring of reporting is inadequate with the consequence that many reports are incomplete or inaccurate.

8.8.5 Data are rarely used at any level other than central.

8.8.6 The NCDDP reporting system is not yet linked in any way with the routine Ministry of Health reporting system.

8.9 Recommendations

- Rec.42 The objectives and structure of the management information system (MIS) should be reviewed and clearly redefined.
- Rec.43 The register for recording of information on diarrhoea cases should be redesigned to include only the essential variables, to render the MIS more manageable at all levels.
- Rec.44 A sample of health facilities should be selected as sentinel reporting sites and staff trained in the rationale and methods of reporting and in simple data analysis (e.g., use of preprinted bar graphs to record cases treated monthly with ORS) and self-evaluation.
- Rec.45 Supervisory staff training at all levels should include monitoring of reporting, simple data analysis and feedback. A greatly reduced number of sentinel reporting sites would make supervision of reporting feasible. (See also Rec.19).
- Rec.46 Centrally, further consideration should be given to microcomputerization of the MIS to allow a more sensitive monitoring of Project activities and more timely feedback. Computerization is not recommended for other levels and should not be attempted without prior revision of the MIS.
- Rec.47 The appropriate sections of the Ministry of Health should be involved in future development and implementation of the MIS, with the ultimate objective of integrating it with the routine information system of the MOH.
- Rec.48 Feedback in the form of a periodic pamphlet could be sent to all ORT units presenting simple information on NCDDP activities throughout the country.

9. RESEARCH

9.1 Role of research in the NCDDP

Research has played a key role in the NCDDP from its inception. Epidemiological, socio-cultural and operational research studies have provided information for planning Project activities, and for designing and testing specific programme components and operational strategies. Findings from biomedical and clinical research sponsored by the Project have given ORT greater credibility within the scientific and medical community, while providing information for preparing guidelines for case management and for training. Communication and marketing research have been critical in ensuring that effective ORT messages have reached their intended audiences. Baseline and ongoing morbidity and treatment studies provide the framework for monitoring and evaluation. Annex 12 is a selected listing of research studies whose results have been directly applied to Project activities.

9.2 Organizational structure for managing research

9.2.1 The Research Unit

The Research Unit is responsible for managing the NCDDP programme of research grants and contracts. Through this programme a wide variety of Egyptian research institutions have been assisted in undertaking research needed by the Project. Research priorities have been set each year, initially in coordination with the directors of the other Project units and the Project Secretariat, and since 1986 with a Scientific Committee, made up of senior staff from the Project, Ministry of Health, and Universities. Priority topics recommended by the Egyptian scientific community, in workshops held for this purpose since 1984, have been taken into account in setting the research agenda.

Relatively few proposals have been subject to competitive bidding; most have come through an interactive solicitation process. Many have been designed with the active assistance of Project staff, to ensure that the study was both scientifically sound and directly relevant to Project needs. Until recently the internal review process for protocols submitted by collaborating institutions has therefore been relatively informal and reasonably rapid. Beginning in 1985 the Scientific Committee, now enlarged and chaired by the Under-Secretary of Health, will review all proposals, initially in one of five sub-committees, and then in the full committee. The sub-committees will focus on five areas; nutrition, improved ORS, preventive interventions (health education, measles immunization, etc.), the epidemiology and ecology of diarrhoea, and health delivery management research (i.e. operational research). It is anticipated that the sub-committees will strengthen the Research Unit's efforts in these areas, some of which represent relatively new directions. As the sub-committees are only now meeting for the first time, it is not yet clear whether the new review process will introduce significant delays between submission and implementation of successful proposals. Alternatively, because the sub-committees are smaller and have only one subject area to consider, the review process may be expedited. An efficient review process is of particular concern in the light of the short time remaining to the Project.

9.2.2 Research responsibilities of other NCDDP units

Although the Research Unit has the major responsibility for the formal NCDDP research programme, other units within the Project have also initiated studies within their own areas of responsibility (Annex 15). To date the Training and Communications Units have carried out research for planning, testing and/or evaluating particular programme activities, while the Evaluation Unit has mounted a series of double round cluster surveys, both to provide baseline data and to monitor diarrhoea morbidity, child mortality, breast feeding and the use of ORS. Initially the Research Unit supported a number of operational research studies to help design the ORT programme. However, now that the NCDDP is in the implementation phase, the responsibility for initiating operational research studies has apparently shifted to the units charged with the management of Project operations, i.e., the Coordination and Implementation Unit, and the ORS Production and Distribution Unit.

9.3 Research priorities

Much of the early research was quite naturally directed towards finding answers to questions of programme design. Ethnographic studies identified health care beliefs and practices related to diarrhoea and other illness for input to training programmes and media messages. Marketing studies and focus groups helped to select the Project logo, packet size, type of packet and box, and the appropriate container for mixing. Studies of children treated with ORS provided information on the number of packets to produce.

With the shift to implementation and the continuing need to establish credibility with a conservative scientific and medical community, studies began to give greater attention to the epidemiology and etiology of diarrhoea and to the efficacy and safety of ORT in clinic and home, including the risks of hypernatraemia. Research grants have gone to hospital units and university medical and biomedical researchers, who have tested the use of ORT in newborns, the effect of ORT and antiemetics, the most effective IV solution, etc.. With the exception of the depot holder study, relatively little attention has been given to research on how best to get ORS to the remote areas, manage ORS stocks at the health unit, or how to organize, supervise, or follow up ORS services in clinic or community in the most cost-effective fashion. Until recently, a focus on the case management strategy of the Project has limited research related to prevention of diarrhoea.

Research plans for 1986-1987 appear to reflect a shift away from a focus on medical care and case management towards nutrition, personal hygiene, water and sanitation, health education and the like, along with continuing epidemiological studies and efforts to improve the ORS formula. These new priorities correspond to those of four of the sub-committees of the Scientific Committee. Research plans do not as yet reflect those of the sub-committee on health services management.

94

Short-term, highly focused problem-solving studies have great potential for helping to resolve the kinds of operational difficulties which arise in the implementation and management of any complex ongoing programme. The need for such studies will become even more important as ORT services are integrated into the ongoing Ministry of Health services. Although the Research Unit can facilitate design and implementation of these studies, the responsibility for identifying the operational problems lies with the operating units themselves, i.e., the Coordination and Implementation, and ORS Production and Distribution Units. The experience of the communication and Training Units in carrying out small studies to resolve their operational problems, with the cooperation of the Research Unit, is a good model. Because the operational units have little experience in research, it would be useful if the Research Unit were to take the initiative in orienting these units to the potential of such a problem-solving approach and to stimulate such studies. If necessary, the Research Unit might seek technical assistance in health services management/operational research.

9.4 Research studies: a cumulative listing

The May 1984 First Joint Review described the research undertaken to that date under three headings: epidemiological, socio-cultural, and applied research on operational topics. Using this same three-way division for comparability, Table 9.1 represents a cumulative listing, from those studies which appeared in the First Review report to those ongoing or planned for 1986-1987. Table 9.2 lists research undertaken (1985) or planned (1986-1987) by units other than the Research Unit, indicating those in which the Research Unit will also play a role. Research undertaken in response to topics recommended in the May 1984 review are indicated in these tables. The Research Unit is to be commended for its response to the suggestions made in that review.

Table 9.1: Cumulative listing of research studies of the NCDDP

	Prior to May 1984 Review	May to December 1984	1985	Ongoing or or planned 1986-1987
<u>I. Epidemiological research</u>				
o Taxonomy study I	X	X	X	
o Taxonomy study II				X
Etiology of diarrhoea	X	X	X	X
Etiology of diarrhoea urban vs rural		X	X	X
o Incidence of hypernatraemia			X	X
o Etiology of hypernatraemia				X
Repeat of 1980 mortality studies (2)				X
Rotavirus assay system			X	X
<u>II. Socio-cultural research</u>				
Ethnographic studies (series)	X	X		
Anthropological studies on illness (series), KAP	X	X	X	X
Media habits (2)	X	X		
Media message testing	X	X	X	X
Logo, boxes, packet colours	X			

	Prior to May 1984 Review	May to December 1984	1985	Ongoing or or planned 1986-1987
<u>III. Health services research</u>				
<u>Diarrhoeal disease therapies:</u>				
IV solution	X	X	X	
Antiemetic study	X	X	X	
Comparative study: ORS-90 vs ORS-65				X
o Improved rice-based formula			X	X
o Rice-based formula for 4 mos.				X
Amount of ORS to rehydrate	X			
Follow-up of ORS-treated children			X	
ORS for newborns	X	X	X	
<u>ORS preparation in home:</u>				
Container study	X			
Mixing studies with standard cup	X			
Packet opening trial		X		
<u>Distribution of ORS packets, information:</u>				
Pharmacists' knowledge, stocking patterns (2)	X		X	
Pharmacist/customer interaction		X		
Incorporating ORT in primary, secondary curricula			X	
Use of schoolchildren	X	X	X	X
Information dissemination by mothers	X	X	X	
ORS depot holders system	X	X	X	
<u>Prevention: Nutrition:</u>				
Composition of traditional fluids, semi-solids	X	X	X	
o Traditional fluids, foods in diarrhoea				X

	Prior to May 1984 Review	May to December 1984	1985	Ongoing or or planned 1986-1987
Milk feeding after fast dehydration	X			
o Weaning food practices (Tax II)				X
o Contamination of weaning foods			X	
o Impact of diarrhoea on nutrition				X
o Longitudinal nutrition/ health education study			X	
<u>Prevention: Immunization:</u>				
Measles immunization study				X
<u>Prevention: Hygiene and sanitation:</u>				
Water quality	X			
o Simple water/sanitation interventions (Tax II)				X
o Effect of personal hygiene/ hand washing (Tax II)				X
o Topic areas recommended for study in the First Joint Review, May 1984				

Table 9.2: Research activities based in other NCDDP units
1985-1987

	Evaluation		Implementation		Communication		Production/ Distribution		Research	
	1985	1986-87	1985	1986-87	1985	1986-87	1985	1986-87	1985	1986-87
*Double round Census surveys	X	X								
Report of 1980 mortality surveys	-	X								-
KAP survey of mothers	X	X								X
KAP survey of providers	X	X								
*Cost effectiveness analysis	-	X								
Analysis of national and local statistics	X	X	X	X						
Analysis of register statistics	X		X							
Physician trainee follow-up	-		X							
*Community outreach: depot holders			X	X						X
Community outreach: SRHD			X	X						X
Community outreach: MOM/UNICEF days			-	X						
*Media health education kits	-	-			X	X				
Media message testing	X	X			X	X				
Logo, boxes, packet colours	-	-			X	X				
*Improved rice-based formula							-	X	X	X
IV solutions							-	X	X	-

*Topics recommended for study in First Report/Evaluation, May 1984

9.5 Key Issues

9.5.1 The recent institution of a review of research protocols by five scientific sub-committees, while important in addressing specific priorities, may introduce additional delays in the review process.

9.5.2 The increased research priority to be given to issues of health services management, through the Scientific Sub-Committee on Management has not yet been translated into an appropriate agenda for management studies and operations research.

9.5.3 The responsibilities of the Research and Evaluation Units are not always clear, nor is the appropriate role of the Research Unit in stimulating and assisting the operational units to conduct focused problem-solving studies.

9.5.4 The volume of research undertaken by collaborating institutions has made it difficult for the NCDDP staff to monitor the research closely.

9.5.5 Although the newsletter and recent scientific seminars have been helpful, given the variety and volume of research sponsored by the project, it has been difficult to ensure adequate dissemination of information between the project and the Ministry and within the scientific community.

9.6 Recommendations

- Rec.49 A variety of carefully planned and implemented research and evaluation studies should continue to be undertaken. Priority areas of research include the effective use of ORT, diarrhoea-preventing interventions and health services management, as well as infant and child mortality, especially that part attributable to dehydrating diarrhoea.
- Rec.50 The Scientific Review Committee, with the assistance of the Research Unit Coordinator, should develop an explicit set of procedures and timetables to ensure an expeditious flow of the research protocol review process.
- Rec.51 The Research Unit and the members of the Scientific Sub-Committee on Management Research should continue to work closely with the Coordination and Implementation and ORS Production and Distribution Units and Project management, to develop appropriate management and operations research priorities, particularly related to the peripheral levels. Information about these priorities should be distributed to local research institutions.
- Rec.52 Further efforts should be made to exchange scientific and technical information with others working in related fields, and with the Ministry of Health.
- Rec.53 The Research Unit should take the lead in acquainting project staff, including key operational personnel at peripheral levels, through workshops or other activities, with techniques of rapid, focused, problem-solving research. Such an approach will be important for on-going activities and for determining how best to implement many of the recommendations of this review. Examples of question which could be resolved in this way include:

- o What are the most relevant items of information necessary for action at each level of the system, and how can collection of these be effectively integrated into the current information system?
- o What is the best strategy to follow in introducing task-based training to physicians, and how should the impact of that training be assessed?
- o What would the effect be of stopping the distribution of anti-diarrhoeal drugs through the government health services?
- o What is the best strategy for training pharmacists? By re-instituting the P.S.R. system? By training pharmacy inspectors? Other strategies?
- o What is the best system for estimating demand for ORS at each level?

10. PROJECT EVALUATION

10.1 Evaluation strategy

A detailed strategy was defined by the project in relation to 1984 targets. It identified components in each critical link in the planned chain of events and, for each component, several key indicators, appropriate instruments and the frequency of measurement. Although this has provided the conceptual framework for evaluation activities, the evolution of current values for each of the key indicators can only be traced, with some effort, by reference to a variety of Project documents. For some components, evaluation has not been as rigorous as the original strategy implied.

The key links in the chain of events underlying the evaluation strategy are listed below:

- o Campaign elements of good quality
- o Potential present for exposure by target groups to the campaign elements
- o Awareness of target groups
- o Correct knowledge by the target audience created by the elements
- o Correct action taken by the target groups based on their knowledge
- o Reduction in diarrhoea severity and mortality
- o Sustainability of the new knowledge, action, and outcome

10.2 Major evaluation methods

A variety of supplementary methods of evaluation have been applied with different frequencies to complement the data gathering through the routine data collection system. The most important of these are listed below with brief descriptions of the methods and findings. They are all fully documented in various NCDDP documents, a list of which appears in Annex 4.

10.2.1 Double-round census of diarrhoea morbidity and mortality

This activity, undertaken by a specialist contractor, commenced in 1984. It has involved 2 cycles at six-monthly intervals in both 1984 and 1985, and 2 cycles are planned in 1986. Each cycle has covered cluster samples of 10,740 children aged less than 24 months and under in 8 selected governorates (4 in Lower and 4 in Upper Egypt). A similar survey was also conducted in Cairo covering 6350 children 24 months and below and supervised by Cairo University Staff and the NCDDP.

The findings of this study in relation to mortality are discussed elsewhere in the report (see section D11). Other findings are summarized in table 10.1.

10.2.2 Survey of mothers' KAP in relation to diarrhoea and its treatment

In both 1984 and 1985 sub-samples of the households covered by the double-round censuses were surveyed for mothers KAP in relation to diarrhoea and its treatment. In each year around 400 mothers in Cairo, 500 in Upper Egypt, and 600 in Lower Egypt were interviewed. The findings of the 2 surveys are summarized in table 10.2.

The levels of knowledge and reported use of ORS are impressive (and compatible with those found during the field visits of this Joint Review). In 1985, the rate of use of ORS for the case of diarrhoea was 58% with 11% of mothers reporting giving ORS "as the first action for diarrhoea", i.e. before seeing a physician. Levels of reported continued breast-feeding and solid feeding during diarrhoea are also high.

TABLE 10.1: SELECTED FINDINGS FROM DOUBLE ROUND CENSUS SURVEYS, 1984 AND 1985

	<u>FIRST CYCLE</u>	<u>SECOND CYCLE</u>
<u>Demographic and socioeconomic characteristics of study households</u>		
Mean no. of live children	2.9	3.1
% with one or more child deaths	22%	20%
Mean age of mother	28.4	29.2
Mean age of father	35.5	35.5
Illiteracy mother	54%	*
Illiteracy father	43%	*
Mother housewife	34%	32%
Father skilled job	*	54%
Father unskilled job	43%	34%
Indoor water supply	93%	72%
Sewage disposal	64%	46%
Refuse disposal	45%	37%
 <u>Diarrhoea incidence and ORS use</u>		
Total diarrhoea incidence	35%	40%
% ORS use of children who had diarrhoea:	63%	70%
% of children breastfed before diarrhoea who were breastfed during diarrhoea		89%

(*data is not available or variable has 10% missing values)

TABLE 10.2: NATIONAL SURVEY OF MOTHERS' KNOWLEDGE,
ATTITUDE AND PRACTICES (KAP)
REGARDING DIARRHOEAL DISEASE, REHYDRATION AND ORS
1984-1985

Variable	1984 Survey (N = 1500)	1985 Survey (N = 1500)
Illiterate	69%	74%
Knew of dehydration	81%	94%
Knew of oral rehydration	94%	98%
Heard of ORS from:		
Health care providers	40%	66%
Television	50%	79%
Relatives/neighbours	-	11%
Ever used ORS	50%	64%
Used ORS in last episode (during summer)	-	58%
ORS users advised by:		
Private physician	15%	70%
Health unit physician		16%
Self/spouse	75%	3%
Mass media	5%	5%
Relatives/neighbours	4%	3%
Pharmacist	1%	1%
Gave ORS as first action for diarrhoea	4%	11%
Understand that ORS is to replace lost fluids	16%	19%
Correctly mixed ORS	53%	73%
Project cup used to mix ORS	19%	22%
Soft drink bottle used to mix	23%	45%
Continues breast feeding during diarrhoea	68%	83%
Continues regular feeding of bottle-fed children	43%	44%
Continues regular feeding of children on solid food diet	46%	68%
Reasons for not breast feeding:	(n=687)	(n=444)
Breast feeding worsens diarrhoea.	66%	54%
Physician advised to stop	27%	41%

10.2.3 Survey of health care providers' KAP in relation to diarrhoea and its treatment

In the same 8 governorates covered by the studies mentioned above 100 doctors and 100 pharmacists were interviewed in 1984 and 1985 on diarrhoea-related KAP. The findings of these surveys are presented in table 10.3. (The findings concerning doctors and pharmacists should be compared with those of the Review detailed in sections D6.8 and 6.9).

10.3 Other evaluation activities

Other activities aimed at evaluating the Project process and impact have also been undertaken. These include:

- o examination of routine death registration data, discussed in section D11
- o some simple cost-effectiveness analysis, discussed in section D13
- o evaluation of the mass media communications campaign, discussed in section D4
- o the First Joint NCDDP/USAID/UNICEF/WHO Review of NCDDP activities in May 1984

A number of projects conducted under the coordination of the Project's Research Unit have also contributed to evaluation. They are mentioned in Section D.

TABLE 10.3: SUMMARY OF FINDINGS FROM KAP SURVEYS OF 100 PHYSICIANS, 100 NURSES AND 100 PHARMACISTS*

ITEMS	1984	1985	ITEMS	1984	1985
<u>Statistically significant change in rate</u>			<u>Items measured in only one survey</u>		
Physicians who had attended an ORT training	37	61	Physicians satisfied with ORS TV commercial	-	76
Physicians recommending breastfeeding during diarrhoea	78	91	Pharmacists claiming to have explained ORS production to client	-	97
Physicians recommending light food during diarrhoea	60	84	Pharmacists prescribing, for diarrhoea:		
Nurses who had attended an ORT training course	36	76	- ORS alone	19	-
Nurses knowing correct volume of water for	57	94	- ORS	-	76
Pharmacists' sources of information on ORS:			Antidiarrhoeals	-	-
- mass media	19	46	ORS plus drugs	73	-
- drug company	18	39	Pharmacists with ORS cups available	-	68
Pharmacists prescribing antibiotics for diarrhoea	3	2			
Pharmacists with 5.5 gm ORS packets available	34	94			
<u>No significant change in rate</u>					
Physicians prescribing ORS for diarrhoea	100	100			
Physicians satisfied with ORS	97	100			
Physicians knowing correct volume of water for mixing ORS	100	100			
Physicians who had seen ORS TV commercial	94	98			
Nurses recommending breast feeding during diarrhoea	90	95			
Nurses who had seen ORS TV commercial	96	99			
Pharmacists who had attended an ORT training course	0	0			
Pharmacists knowing correct volume of water for mixing ORS	94	96			

* To compare these findings with those of interviews with 30 private practitioners and 52 pharmacists during the Review, refer to sections D6.8 and 6.9.

994

10.4 Current evaluation activities

The 1986-1987 Project workplan identifies the following priorities for evaluation:

- o a third cycle of the diarrhoea morbidity and mortality census
- o a third mothers' KAP study
- o a third health providers' KAP study
- o a repetition of the 1980 mortality studies in Menoufia and Dakahleya governorates
- o cost-effectiveness analysis
- o further analysis of national and local statistics
- o evaluation of physician training

10.5 Key issues

10.5.1 In some instances evaluation activities undertaken by contractors have not been adequately monitored by the NCDDP staff. Direct observation of field activities and access to raw data would enhance Project confidence in figures presented in final reports.

10.5.2 The statistical methods utilized in some project studies are inappropriate or are poorly documented.

10.5.3 There is no link between Project evaluation activities and those undertaken by the Ministry of Health.

10.6 Recommendations

Rec.54 Evaluation activities carried out by contractors should be closely monitored. This will be facilitated by the newly-formed Scientific Committee and its sub-committees, however, in view of the large amount of quantified, statistically-based evaluation and research being undertaken, consideration should be given to employing a skilled epidemiologist/statistician to ensure appropriate statistical design and analysis.

Rec.55 All evaluation activities should be undertaken in closed consultation with the Research Unit, other NCDDP Units and appropriate sections of the Ministry of Health.

Rec.56 The NCDDP should more actively involve the governorate and district level personnel in the evaluation of project activities and share with them the results.

11. MEASURING THE IMPACT ON INFANT AND CHILD MORTALITY

11.1 Introduction

Although the ultimate aim of any child health intervention including ORT is to reduce childhood mortality rates, the causal link between programme activity and improved child survival in the short term is difficult to demonstrate, even where accurate statistics are maintained. One problem is that even in large populations there is frequently a good deal of inter-annual fluctuation in childhood death rates attributable to a large number of simultaneous effects. Hence, significant departures from an overall trend can rarely be detected by comparing data from just two single years. The difficulties of interpretation are much greater when the mortality statistics are inaccurate. The plot of the registered infant death rates for upper and lower Egypt, Cairo and Alexandria from 1962-76 (Figure 11.1) illustrates very effectively the difficulty in composing data from two single years. A second problem is the difficulty of isolating the independent effect of one factor, in this case an ORT programme, from the set of factors which influence child survival. This is the most common sort of problem faced by every similar scientific enquiry and there are a variety of ways of approaching a solution. It is not enough to show that within the life of a health project, mortality rates improved by a certain percentage and to claim, therefore, that the project was successful. Much more evidence is needed on the whole system of causes and effects, demanding a more detailed examination of possible external sources of mortality change. The effects of the NCDDP's activities on child survival may in any case be apparent only in years to come.

The research the Project has undertaken so far is not an adequate basis for the measurement of short-term changes in infant and childhood mortality. Secondly, the kind of detailed scientific research needed to separate out programme effects from other factors of change is also lacking. Whilst there is general agreement that ORT properly administered reduces substantially the risk of children dying of dehydrating diarrhoeas, the presentation of the Project's impact on infant and child mortality as it appears on pp. 25-29 of the Three Year Status Report (February 1986) seems premature. Partly because of these claims and also because of the broader interest in the assessment of the likely effects of ORT programmes on child mortality, this Review has examined closely the available child mortality data for Egypt and particularly those generated by the Project.

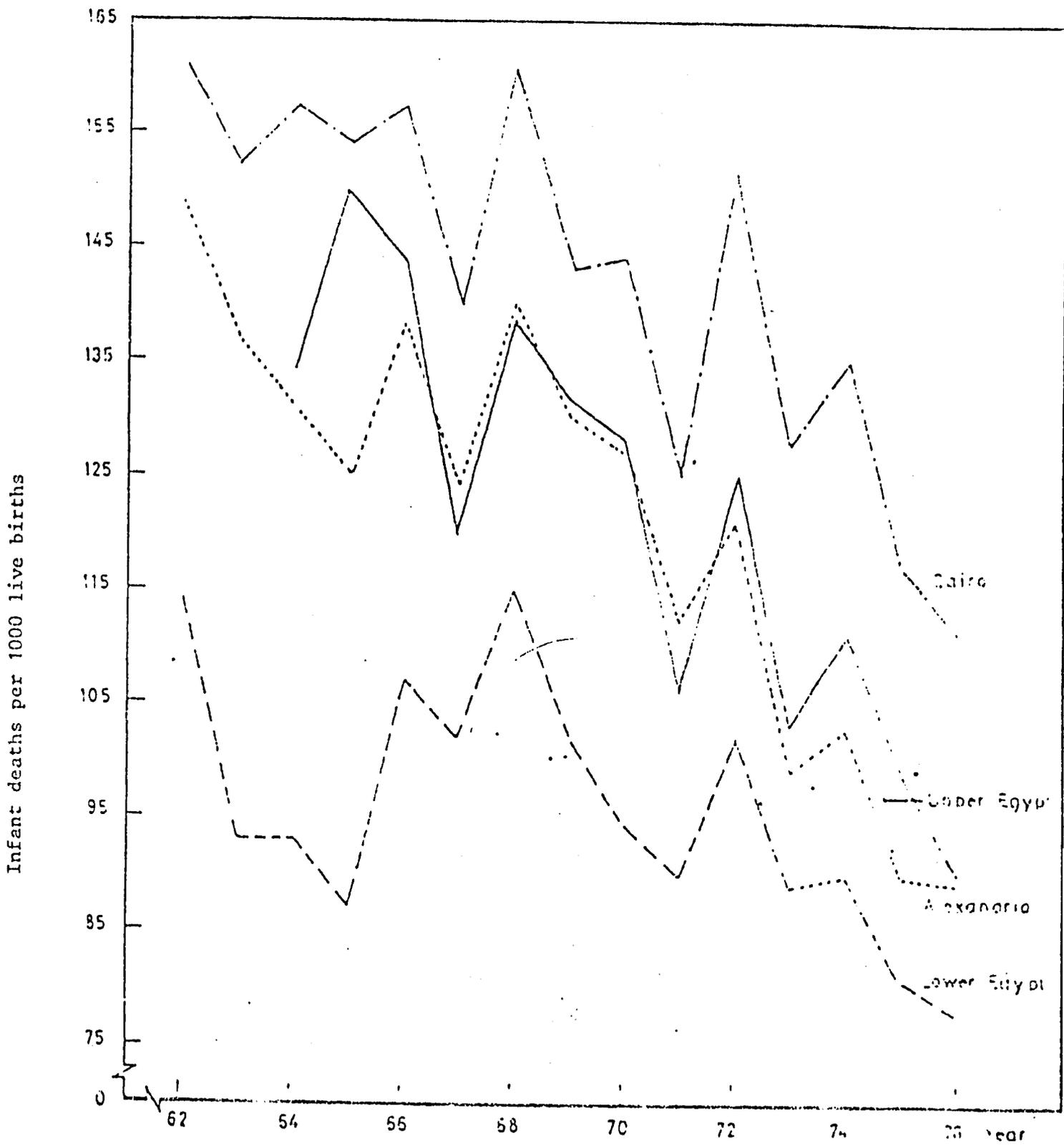


FIGURE 11:1 Infant Mortality Rates for Cairo, Alexandria, Lower and Upper Egypt

11.2 Child mortality in Egypt

Long-term mortality trends in Egypt have been the subject of three recent publications which form the basis for this section:

- US National Academy of Sciences (1982) "The estimation of recent trends in fertility and mortality in Egypt".
- Hoda Rashad (1981) "Evaluation of completeness of mortality registration in Egypt". Regional Paper, The Population Council, Cairo.
- Birgitta Bucht and M.A. el-Badry (1986) "Reflections on recent levels and trends of fertility and mortality in Egypt". Population Studies 40 (1): 101-113.

Whilst the exact degree of under-registration of births and infant deaths is still a matter for some discussion, there is general agreement that there has been a steady improvement in infant mortality (with minor inter-annual variations) since 1945 (see Figures 11.2 and 11.3). (The slight discordance in the series 1961-62 is due to a change in registration practice). As Table 11.1 shows, infant mortality rates adjusted for under-registration have fallen from about 250 per thousand in 1942-46 to around 100 per thousand during 1982-86. Bucht and el-Badry also note that the mortality rates for children aged 1-4 have fallen even faster over the same period. It seems too that since the early 1970's, the rate of change of infant mortality has quickened (see Figure 11.3). Some recent data kindly provided by Dr Badry el-Masri and Dr Gamal Abdul Aziz of the Ministry of Health indicate that the NCDDP activities began just after a small rise in infant and child mortality in 1982 (Table 11.2).

TABLE 11.1: Summary of adjusted vital rates: 1932-86 (per thousand)

Period	Minimum adjusted rates			Period	Adjusted rates		
	Crude birth rate	Crude death rate	Infant mortality rate		Crude birth rate	Crude death rate	Infant mortality rate
1932-36	49.7*	36.3*	250	1962-66	45.4	21.2	178
1937-41	48.0	33.8	248	1967-71	40.5	19.3	173
1942-46	46.0	34.9	249	1972-76	39.5	16.1	142
1947-51	49.1	25.8	207	1977-81	41.7	13.9	114
1952-56	47.3	22.7	201	1982-86	39.0	11.9	100
1957-61	45.5	20.9	177				

Notes: Adjustments based on comparison with rates estimated from censuses and surveys. See Bucht and el-Badry (1986) op.cit., p 89 for details

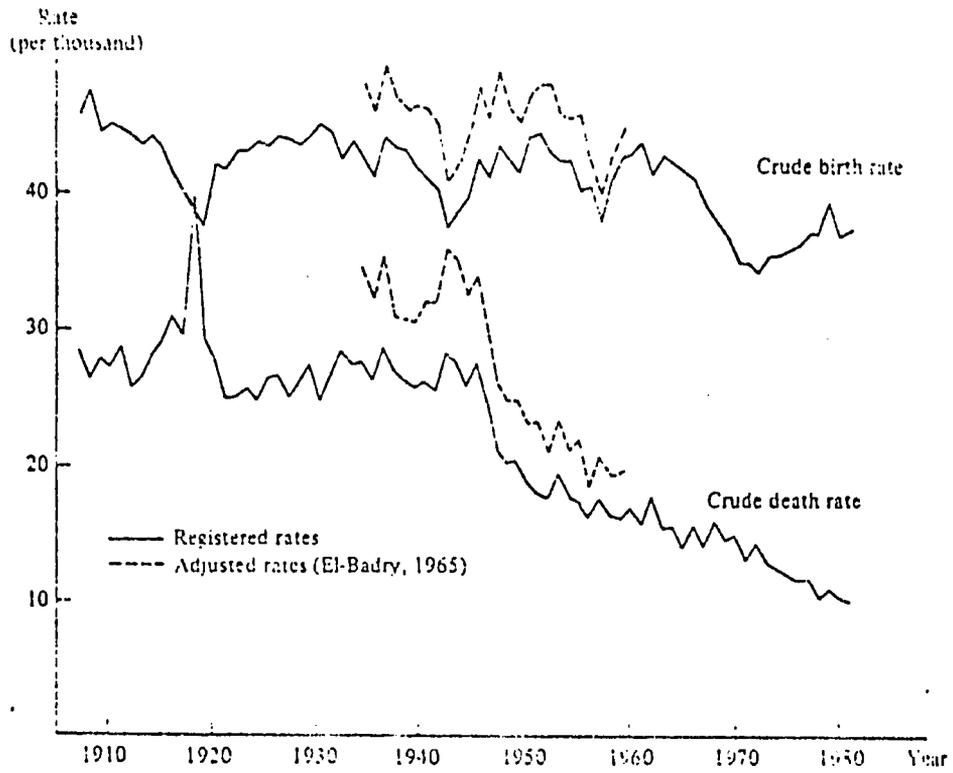


FIGURE 11.2: Crude birth and death rates, Egypt, 1907-81

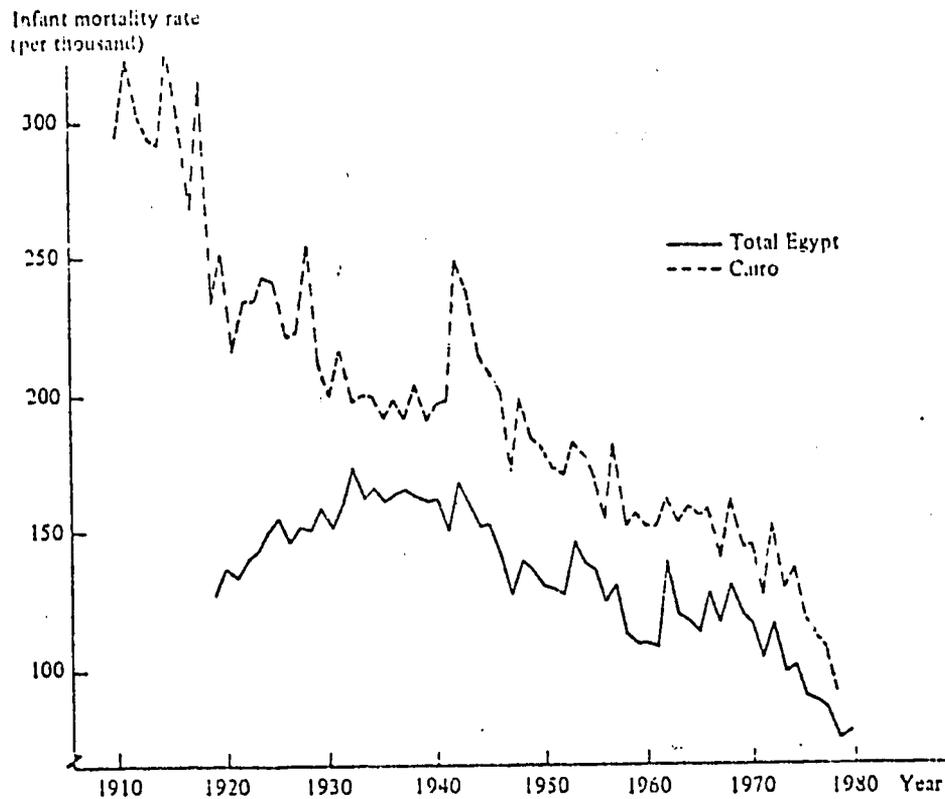


FIGURE 11.3: Registered infant mortality rates, total Egypt and Cairo, 1910-80

TABLE 11.2 Provisional Birth and Death Statistics for Egypt 1981-1985

A. <u>Numbers</u>					
	Births	Deaths	Infant deaths	Death 1-4y	Mid-year population ^a
	(1000)	(1000)	(1000)	(1000)	(1000)
1981	1660.1	444	113.3	49.8	43503.5
1982	1652.6	462	117.1	59.2	44698.6
1983	1691.3	457	103.4	43.5	45926.5
1984	1742.2	393.9	98.6	45.3	47188.1
1985	1753.4	391.7	97.7	43.9	48484.4

B. <u>Rates per 1000</u>					
	Crude birth rate	Crude death rate	Infant death rate	1-4y death rate ^b	Adjusted infant death rate ^c
1981	38.2	10.2	68.3	11.4	109
1982	37.0	10.3	70.9	13.1	114
1983	36.8	9.9	61.2	9.4	98
1984	36.9	8.3	56.6	9.5	91
1985	36.2	8.1	55.7	8.8	89

Source: Director, Statistics Department, Ministry of Health

^a The mid-year population projected from CAPMAS estimates using an average rate of increase of 2.71% per year.

^b Death rate for children aged 1-4 assuming that 13% of the population are in this age group, as in 1976.

^c Adjusted infant death rates calculated assuming a true rate of 100 per 1000 for 1982-86. The adjustment factor is 100/62.4, where 62.4 is the unadjusted mean for 1981-85.

These data also show that the unadjusted or adjusted infant death rates were virtually constant between 1984 and 1985. Rashad's work shows that the long-term improvements in infant and child mortality were quite widespread, affecting rural and urban, upper and lower Egypt to about the same degree although of course the absolute levels of child mortality vary widely. In the mid-1970's, infant mortality in rural upper Egypt was 1.6 times higher than the level in urban lower Egypt.

11.3 NCDDP estimates of infant and child mortality

In the NCDDP Three Year Status Report, two main sources of infant and child mortality data are cited. One source is the two double-round follow-up surveys conducted in rural and urban parts of eight governorates by Sinai Consultation, and in 30 neighbourhoods of Cairo chosen by CAPMAS to represent low socioeconomic groups, supervised by Dr Mervat el-Rafei in 1984-85 and 1985-86. The other is an analysis of the recent registration statistics on infant deaths by month for twelve governorates for which data were available. Together these two sources are said to form "a satisfactory means of estimating impact on mortality". Other smaller studies are referred to in the Status Report and two other relevant reports are entitled "Notes to mortality data and analyses" and "The clinical epidemiology of diarrhoeal disease in Egyptian children". These studies will be briefly examined later.

11.4 The two NCDDP double-round surveys

a) Study design and sampling

The basic idea behind these surveys was to enumerate a sample of mothers with children 24 months and under before the peak of the summer diarrhoea season and to re-enumerate the same mothers six months later to ascertain the number of children dead, dividing their deaths between diarrhoea-related and all other causes. The first cycle took place in June 1984 with the re-interview in January 1985; the second cycle followed in June 1985, with the re-interview in January 1986. Although the same children were followed between the two rounds of each year, a different set of households was chosen each June using the cluster sampling technique recommended by WHO (CDD/8.5). The households were selected randomly from within clusters. The sample frame was restricted to 8 governorates, judged to be representative of upper and lower Egypt. Cairo was the subject of a separate survey, Alexandria had been represented in the pilot study. Cluster populations were provided by CAPMAS based on unadjusted 1976 census data. Sample size was calculated on a theoretical basis of the need to detect a 25% annual drop in under two mortality with a probability of 0.8. The total calculated number of clusters was distributed across the eight governorates (Sharqiya, Dakhaliya, Gharbeya, Beheira, Assiut, Qena, Minia and Sohag) in proportion to their total population size. Within each governorate, there was further stratification by urban-rural residence, using the proportion urban or rural from the 1976 census. Households within clusters were chosen using a random starting point, and by working in one randomly chosen direction through the cluster. The quota of 30 households per cluster, each with at least one child under 2, was filled up by enquiry in the succession of neighbouring households. Only one mother per household was selected, and only one mother per building. These decisions, despite the attempt to select households at random, probably meant that only accessible mothers were chosen since interviewers were allowed to substitute households when any difficulties or resistance were encountered. The sample design as a whole, with its restricted universe, means that the results may not automatically be nationally representative. The use of the 1976 census to select cluster populations would tend to over-represent rural areas and thus provide a more conservative bias against finding reduced diarrhoea associated mortality.

b) Interviewing

Some 180 data collectors were recruited, each responsible for just 60 households in two clusters. They were generally health workers from the local health unit or centre who were introduced to mothers by a local nurse with long service in the community. The work of the data collectors was supervised by one field supervisor and two assistance supervisors per governorate, responsible to an overall director of fieldwork. Two "logistical co-ordinators" were also provided per governorate. This number of interviewers does seem excessive for a simple interview schedule which can only have taken 10 minutes to complete. With such a large labour force, it is often difficult to ensure that the same interviewing procedures are maintained throughout the sample. The consultant's report does not mention a training manual nor a reference document for data collectors to ensure consistency. Further, the exact form of the question to be asked does not appear on the questionnaire.

c) Questionnaires

The same interview schedule used for both rounds of each cycle consisted of one 21.5 x 33 cm sheet folded in half with some identifying information and socio-economic questions on the front. On the three remaining pages, an identical set of questions were to be asked about each child under two, allowing for a maximum of three in this age group (see details in the Sinai Consultation Group's reports). On the first visit in each cycle during June, after completing page 1, the top half of each succeeding page was completed for each eligible child. On a second visit in the following January, the bottom half of each page was completed. If a child was alive at round two, no further questions were to be asked. If dead, the interviewers had a set of 7 questions to ask, and in addition, were asked to return to the health centre to see if the dead child's death had been officially registered. Thus, much less work was required if the child was alive at round 2. Indeed, as interviewers were instructed to ask to see the living children, it would not have been strictly necessary to see the mothers at all as no further questions were to be asked when the child was still alive.

d) Comparisons between cycles

The data from the two first round surveys in 1984 and 1985 are not exactly comparable as the two samples were independently drawn. Nonetheless, it seems that as the same clusters were used in both cycles and as the clusters were small, some proportion of households may be the same in both cycles. Comparing the socio-economic characteristics of the two cycles, the populations appear slightly similar with a slight bias toward lower status groups in the first cycle (more farmers, fewer with inside taps, more with no latrine). More serious is the different age distribution of the living children (Table 11.3). Probabilities of dying in the under twos are strongly related to age. As an illustration of the possible effect of the age distribution of the children on the mortality estimates, simply multiplying the numbers of children by age from the 1985 round by the 1984 age-specific death rates of the children 6-23 months of age (see Table 11.3) would substantially increase the number of deaths from 81 in this age range to 136 ($136/81 = 1.7$).

e) Results

The data of interest here are the mortality rates which were not calculated by Sinai Consultation but by the Project. The main source is the paper entitled "Notes to mortality data and analyses". Before discussing these rates, it should be pointed out that the data on the age of the living children or their age at death are of very poor quality. As the key significance of these variables in calculation of mortality rates had not been recognized, the surveys did not put any special effort into obtaining accurate age data (e.g. by asking month and year of birth). As a result, age heaping is severe. For example, in 1984, 34% of the sample of living children are shown as either age 12 or 24 months (21% in 1985). Whilst age heaping is known to be a problem in all developing country surveys, the effects in this case, when subtle changes in narrow age groups are being sought, are serious.

There is a further problem with the death rates for infants in the NCDDP reports. With the data available, infant death rates cannot be calculated directly, as at the second round, questions were asked only about the survival of the children already alive at round one. Children born between the two rounds and the deaths of these children were not recorded. Hence, death rates for the under ones can only be estimated indirectly from the death rates for the one to two year olds, although the proportion of the 0-11 month old population surviving to the second round could in future be obtained by cross-tabulating the age of the children in months at round 1 against deaths in months between the rounds. All the published NCDDP death rates and estimates of change between 1984 and 1985 thus require recalculation.

The correctly calculated age-specific death rates are shown in columns 6 and 7 of Table 11.3 for all deaths and for those which are diarrhoea-related. Simply doubling these six-month rates (which is an over-estimate of the annual rate due to the concentration of deaths in the summer months) gives overall death rates for the one year olds of 23.2 per 1000 for 1984 and 20.9 per 1000 for 1986. The rates and percentage differences fluctuate widely due to small numbers, and the serious misreporting of age.

TABLE 11.3 Age-Specific Death Rates from the double round surveys in eight governorates

Age Groups (Months) Usual	NCDDP	Deaths July-Dec		Children:	6-month death Rates per 1000	
		All	Diarrhoea	Round 1	All	Diarrhoea
<u>1984</u>						
(1)	(2)	(3)	(4)	(5)	(6)	(7)
0-5	1-6	60	36	2631	*	*
6-11	7-12	71	49	3197	22.2	15.3
12-17	13-11	35	21	2255	15.5	9.3
18-23	19-24	<u>22</u>	<u>11</u>	<u>2656</u>	8.3	4.1
		188	117	10739		
<u>1985</u>						
0-5	1-6	43	30	2773	*	*
6-11	7-12	37	21	3748	9.9	5.6
12-17	13-11	33	18	2515	13.1	5.6
18-23	19-24	<u>11</u>	<u>4</u>	<u>1702</u>	6.5	2.3
		124	73	10738		

- Notes: (1) Deaths are tabulated by the age of the child at death whereas the age distribution of the children is as estimated in June of each year.
- (2) No death rates for the 0-5 month old children are shown (*) as deaths before the age of sixth months were not properly enumerated between the two rounds.

TABLE 11.4 Annual Age-Specific Death Rates for Age Groups 6-23 and 12-23 months - 1984-85

Age Group (Months)		1984	1985	% change
6-23	All deaths	31.6	20.3	- 36
	Diarrhoea deaths	20.0	10.8	- 46
	Non-diarrhoea deaths	11.6	9.5	- 18
12-23	All deaths	23.2	20.9	- 10
	Diarrhoea deaths	13.0	10.4	- 20
	Non-diarrhoea deaths	10.2	10.5	+ 3

f) Discussion

Although the results in Table 11.4 do indeed show a faster decline in diarrhoea-related child mortality than in overall mortality between 1984 and 1985, the numbers of deaths by category are much too small to be significant. For example, re-classification of cause of death, a difficult classification in any circumstances especially in retrospective surveys, for some of the diarrhoea-related deaths amongst children aged 6-23 months in 1985 would change the six-month death rates quite significantly. When taken together with all the other evidence concerning the quality of the age and age at death data, the contrasting age composition of the two samples of children, and the inevitable difficulties in ascertaining cause of death, the rates in Table 11.4 cannot be accepted as a basis for claiming significant reductions in diarrhoea-related mortality. Comparisons between the two surveys are difficult because of the differing age composition of the samples.

In conclusion, we note that the overall death rates for the one-year olds from the survey match quite closely the death rates obtained from model life table with infant mortality around 60 per 1000. Using Brass's General Standard life table and the logit system, the age one year death rates correspond with infant mortality rates of 66 per 1000 for 1984 and 60 per 1000 for 1985. These are of course far below the adjusted rates (see Table 11.2), so that the surveys probably under-counted all deaths to one year olds by at least 40%. This seems to indicate that the data collectors failed to trace many children who had died between rounds. As explained earlier, the design of the study made it more convenient for the data collectors to record children as living during the second round. An additional piece of evidence suggesting misreporting of survival status at round 2 is the surprisingly low rate of loss to follow up between rounds. Only 44 children were lost between the two rounds of the first cycle (1984), and none during the second cycle (1985).

Finally, it should be noted that calculating changes in age-specific death rates is not the best way to analyze such data. Some matching of mothers and children and calculation of relative risks of dying with and without ORT would be a much more fruitful approach, provided of course that data of acceptable quality can be gathered.

11.5 Other NCDDP sources on mortalitya) The Cairo 2-round surveys

Surveys of broadly the same type were conducted in selected poor neighbourhoods of Cairo by medical students from Cairo University working under the direction of Dr Mervat El-Rifai. Data on about 6300 children were collected at both rounds. No written reports on these surveys could be located but some raw data were provided from which annual age-specific death rates for 1984 only could be calculated. The rates for Cairo and the eight governorates are as follows:

TABLE 11.5 Annual Age Specific Death Rates per 1000
from the double round surveys in 1984

		Usual Age Groups	
		<u>6-11</u>	<u>(Months)</u> <u>12-23</u>
All deaths	Cairo	20.7 (12)	12.8 (18)
	8 Governorates	22.2	23.2
Diarrhoea- related	Cairo	13.8 (8)	6.2 (9)
	8 Governorates	15.3	13.0

N.B. Number of deaths recorded in Cairo in six months in brackets.

Although the rates for Cairo and the governorates are broadly comparable, the absolute numbers of deaths in Cairo are too small for analysis of the rates. No 1985 mortality data could be located from the Cairo surveys.

All the reservations about the 8 governorate surveys apply to these Cairo data. Since no data on changes between 1984 and 1985 could be located, there is little point in further examination of this source.

b) The "numerator analysis" data

The NCDDP began collecting mortality data for children directly from the health authorities in each governorate in 1983. The reports include information on diarrhoea-related and all other deaths by age (0, 1-4, 5-9 years) and by calendar month. In a paper first circulated in 1985 and in some more recent tables presented to the Review Group, it was shown that the absolute numbers of infant deaths due to diarrhoea were declining and that the concentration of infant deaths in the summer months (May-August) was being reduced, coincident with the life of the NCDDP. Before proceeding further, it is important to indicate that the national recorded infant death rates, calculated from the same source as the numerator analysis data, have fallen only very slightly during 1983-85 (see Table 11.2, panel B). In these circumstances, only some very brief comments are necessary.

By governorate (data for only 12 have been presented), the trends in registered infant deaths are quite uneven.

- o In one governorate, the number of 1985 infant deaths was 1.6 times the 1984 total (see figure 11.1 for illustration of the typical inter-annual fluctuation in rates).
- o Generally, the data show the date of registration of the death and not the date of occurrence. The pattern of shifting is unknown in Egypt.
- o Under-reporting of infant deaths varies widely in Egypt and inter-annual variability is high.

More interesting are the data on deaths by month. This could be a useful diagnostic tool for the measurement of summer diarrhoea-related deaths. It is likely, however, that the long-term decline in infant and child mortality has meant a steady reduction in diarrhoea-related mortality anyway, so any trend analysis should be done with this in mind. The necessary data on infant deaths by month and year for the pre-1980 period could not be located so this point could not be checked.

c) Other studies

Some valuable intensive survey work in places like Menoufia and Dakahleya governorates produced good quality data which could serve as an excellent baseline for subsequent evaluations. Rather than making crude comparisons of child mortality in these studies with rates from other sources, as is done in the "Notes to mortality data and analyses", the sites where the original studies were carried out could be carefully re-surveyed in the near future and some more valid comparisons drawn.

11.6 Recommendations

Rec.57 Death registration statistics

It is recommended that a systematic analysis of the published death registration data for Egypt be undertaken following the lines of the work by Dr Rashad in 1983. Analysis of the more recent data, looking at details on age at death, season of death and rural and urban rates within governorates would provide a valuable context in which to examine some possible effects of the NCDDP.

In particular, the trend in the concentration of deaths in the summer months should be examined with special reference to possible seasonal concentrations of registered births.

In the assessment of trends based on the death registration data, reference will need to be made to independent sources of mortality information (both censuses and surveys).

Rec.58 The two NCDDP double-round surveys

It is recommended that the existing two-round survey data be re-examined, combining both the 1984 and 1985 rounds if possible. Analysis of the relative risks of dying for sub-groups, controlling for obvious factors such as age and socio-economic status, might help the project obtain more definite results than the calculation of death rates.

The questionnaire for the third cycle of the double-round survey should be improved, and more effort should be made to collect accurate data on age.

Closer supervision of fieldwork during the second round is needed to avoid omission of some deaths.

107

Rec.59 Assessing programme impact

- o A more sophisticated and rigorous research programme should be developed to isolate possible Project effects from all the other variables affecting child survival.
- o A re-survey of areas already studied before the main impact of the Project (in the Menoufia and Dakahleya) should be undertaken. Similar studies in upper Egypt are also recommended.
- o Analysis of survey data for areas of "high" or "low" programme activity should be considered (e.g. an analysis for areas with the Depot Holders schemes, versus areas without). Linking of data from the KAP studies on ORT with mortality data is also recommended.

12. SUMMARY OF ECONOMIC, FINANCIAL AND FISCAL CONSIDERATIONS

This section summarises a longer document presented as Annex 13

12.1 Introduction: A conceptual framework for cost analysis of ORT projects of the NCDDP type

However difficult it may be to successfully implement a project such as the NCDDP, conceptually it represents a rather simple and straightforward enterprise. NCDDP aims to change the way in which diarrhoea is managed in Egypt, both by mothers and health care providers of all kinds. For evaluation of NCDDP, an important question is how long it will be necessary to maintain project-type inputs and at what scale to sustain the behaviour changes produced by the project. Evidence has not been assembled to answer this question. Indeed, some experimentation over the remaining life of the project with successive attenuation of project inputs will be necessary to make a determination on this score.

Meanwhile, it will be most informative to assess the implications of two limiting hypotheses in this domain, viz:

Hypothesis one : Once the behaviour has been effectuated (in the sense that householders and providers routinely respond to diarrhoea by appropriate use of ORT) it will be self perpetuating, without need for continued project-type inputs and costs. That is, just as in pre-ORT times, mothers passed on to their daughters inappropriate, non-ORT wisdom on the management of diarrhoea, now in post-project times they will pass on ORT wisdom.

Hypothesis two: To sustain the behaviour changes produced by the project it will be necessary to maintain indefinitely a program for this purpose which uses project-type inputs on the scale used by NCDDP.

Of these two hypotheses one appears to be, prima facie, the more plausible such that we may initially explore the implication of it. After all, in pre-ORT times, cultural transmission of non-ORT wisdom did not depend upon mass media campaigns. There would seem to be no good reason to suppose that in these newer times continued cultural transmission of ORT wisdom will require mass media campaigns. Assuming that it is not barred by technical consideration (ORT is low tech) or cost considerations (ORT is low cost), this kind of cultural transmission of ORT practice is a likely enough outcome to call for analysis of its implications. What this means for cost analysis is that most of the improved health-status yield to the resource committed to NCDDP will be realised, and manifest in the years following the termination of the project prima facie (and without any continuing NCDDP-type program).

Assuming the hypothesis one outcome, perhaps the best way to approach cost analysis for ORT projects of the NCDDP type is to divide the analysis into two rather than different parts. The first question would be: What does it cost to effectuate the intended changes in the health services system? That is, what does it cost to change the way in which diarrhoea is managed in Egypt, by both mothers and health care providers of all kinds? Here, the output unit to be costed, so to speak, is "health care system change" so that total project costs "to date", i.e. to the date observations are being made on the extent to which changes have been achieved in the way in which diarrhoea is managed in Egypt, represents the relevant costs. That is, this part of the analysis regards most project expenditure as "development" (capital) expenditure, as an investment in health service system change.

The second part of the analysis would address the question: Is the project expenditure necessary to effectuate the system changes "worth it"? Pursuant to answering this question, we might attempt to analyze expected future costs and benefits (future health services and health status events) in the period after the project has terminated, comparing this to what would have been expected had the system change not been effectuated. Such longer-run analysis is not undertaken here. We do try, however, to take a more proximate look at some of the implications of system change effectuated to date, attempting in the next section to apply the conceptual framework just sketched to two important elements of system change effectuated by NCDDP.

12.2 The cost of two important system changes: mothers' knowledge about ORT dehydration and improved access to ORT

According to the Project, by the end of 1985, 98% of mothers knew about ORT and dehydration. (This has been supported by the findings of the household survey component of the NCDDP evaluation which found that 96% of the 161 mothers in the sample recognized the ORS packet and knew what it was for): These knowledgeable mothers include at least 7.5 million women (between ages 15 and 35 years) whom we shall be regarding as mother-beneficiaries of the Project).

This mothers' knowledge output should be regarded as an important project output in its own right (i.e. in addition to whatever significance it may have as a so-called "indicator" of other health status and health service events). For one thing, it is a necessary, if not also sufficient, condition for achieving the health status and health services impacts which are the stated purpose of the project. In addition, this knowledge output can be considered responsive to a kind of moral imperative in this domain. The dehydration consequences of diarrhoea are believed to cause a high rate of mortality among children here. There exists a simple, inexpensive treatment regimen - namely, ORT, by means of which mothers can save the lives of their children. Surely we can agree that the health services system is under an obligation to get this word out to these mothers.

In analysing the costs of effecting this change, we take account of total project expenditure to 31 January 1986 for the following budget items: Staff Office and related JSI costs, Research and Evaluation, Mass Media and Training, and Conferences, and the Breastfeeding Project. With some adjustment to earlier expenditures to reflect inflation, the total for these budget items is about LE 0.6 million - or about LE 0.80 per beneficiary for the 7.5 million women in the target beneficiary group.

To characterize these expenditures on the mothers' knowledge account means that they were all incurred pursuant to, and presumably contributed to, this result. This does not imply that mothers' knowledge was the only output secured by these expenditures. Indeed, these expenditures produced also another important system change, namely, improved access to ORS through an improved supply system. (Mothers-knowledge and improved ORS supply system are joint products of these expenditures, i.e. not to be partitioned to each.)

Improving the supply and supply system for ORS and thereby improving access to ORS should, like mothers' knowledge output, and for much the same reason, be regarded as an important project output in its own right. The total additional expenditure to effectuate the improved-access system change is about LE 2.7 million. This brings total system change costs to about LE 8.7 million - or in round (and hence more memorable) numbers, a little more than LE 1.0 per mother beneficiary for the women in the target beneficiary group.

12.3 Were the development expenditures to effectuate a system change worth it?

This is, of course, the question we would like to be able to answer. One way economic analysis would approach this question is to appeal to a willingness-to-pay criterion, i.e. would the beneficiaries themselves have been willing to pay for the programme to secure the programme benefits? For the purpose of this kind of market test, the households which include the heretofore identified mother beneficiaries (i.e. rather than just the mothers themselves) should be thought of as the beneficiaries. Survey research might assemble direct evidence on the willingness-to-pay question. At this writing, no such evidence is available. Since, however, this question is central to the economic analysis of a project such as NCDDP, we may seek some perspective by performing a kind of intellectual experiment. (Economists will recognise that the experiment proposed is very much in the spirit of applied welfare analysis).

Suppose that, pursuant to our intellectual experiment, we address the following question to representative household beneficiaries:

"Suppose that for a little more than LE 1.0 you could "buy in" (so to speak) to a health care system in which you would be given sound knowledge about ORS, ORT and dehydration, and in which ORS would readily be available at a cost of about LE 0.15 per episode of diarrhoea treated. You understand that the knowledge and access provided by this system may well enable you to prevent grave consequences to, even the death of, your children owing to dehydration. Moreover, if because of this knowledge and access, you managed even one episode of diarrhoea without resort to frequently prescribed non-ORS medications, you could thereby recover the entire price of your admission to the system. Would you be willing to pay LE 1.0 to join this system?"

It is hard to imagine that the answer of an informed household to this question could be anything but a resounding "yes".

More generally, the conceptual framework for evaluation set out foregoing - i.e. regarding most NCDDP expenditures as essentially development expenditures on system change account, recognizing mothers' knowledge output and improved access output as important outputs in their own right, the implication of the intellectual experiment on willingness to pay is the most meaningful way, at this stage of project development and with the information available, to draw attention to the relative costs and benefits of the NCDDP programme. From this point of view, we should reach the conclusion that NCDDP expenditures have been very much worth it in terms of gains achieved. Indeed, given the generally acknowledged difficulties health projects typically experience in achieving any significant yield to resources committed, one must be the more impressed by NCDDP achievements.

The foregoing results have been reached under the assumption of hypothesis one - namely, that total project expenditures to date (to January 31, 1986) had produced behaviour changes which were now self perpetuating. It will be recalled that hypothesis two (taking the other limiting position) assumed that to sustain the behaviour changes produced by the project it would be necessary to maintain a program for this purpose which used project-type inputs on the scale used by NCDDP. The total project expenditures utilized for the above exercise took place over a 2.5 year period or at an annual rate of about LE 0.40 per beneficiary household. To reflect the assumptions of hypothesis two, we would need to change the last sentence of the query addressed to our household respondents to read:

"Would you be willing to make a yearly payment of a little more than LE 0.40 to join this system?" (A similar change would be made in the first sentence of the query.)

Again it is hard to imagine that the answer of an informed household to this question would be other than "yes".

Ongoing experience with NCDDP may yield an answer to the question what rate of continued resource commitment, if any, would be necessary to sustain the behaviour changes produced by the project. The actual state of affairs may turn out to lie somewhere between the limits assumed by the two limitational hypotheses explored here. What the foregoing exercise has shown, however, is that for the approach to evaluation we have adopted so far, the conclusions are not very sensitive to whatever the findings on this score.

12.4 Cases Treated with ORS and cost per case treated

The analysis developed to this point has entailed only a very selective accounting for project outputs. By itself, it understates the yield to resources committed to the project. Thus, for example, in health-services (physical) units, it would be appropriate to include as part of the yield, the increase in the number of cases of diarrhoea that are now being appropriately managed and will in future years be appropriately managed owing to the interventions of the project (and the same for the decrease in the number of cases inappropriately managed.) Hard data on these dimensions of system performance are not available, even on a current basis.

However, there are data to suggest large scale use of ORT to manage diarrhoea. Although subject to some controversy, the Project's estimate that some 14.0 million cases of diarrhoea were treated with ORS in 1985 is plausible in light of independent evidence on the amount of ORS apparently utilized by consumers in 1985. According to NCDDP, about 90% of these cases were treated at home. Thus it is clear that households in Egypt made larger-scale therapeutic use of the opportunities afforded to them by the project (in the form of knowledge about and easy access to ORS). And, of course, these cases treated should also be recognized as among the benefits in a comparison of Project costs and benefits.

Which of the various approaches to calculation of cost per case for treatment with ORS would make sense depends, to a large extent on the hypothesis used.

Under the assumptions of hypothesis one - namely, that project expenditures will produce behaviour changes which are self perpetuating - project-historical unit costs which reflect total project expenditures (among others) are of little or no interest, i.e. most of these costs are regarded as an investment in system (behavioral) change, not as ongoing operating costs for the ORT delivery system put in place by the Project. Under hypothesis one assumptions, what will be the regular ongoing operating costs per case for treatment with ORS for the 90% of cases treated at home? One component of these costs will be the cost of the ORS itself now selling in commercial outlets for LE 0.45 a ten pack (say US \$ 0.52). Since, according to Project findings, an average of 3.5 of these 5.5 gram packets are required per episode, we arrive at an ORS cost of about US\$0.18 per case. (It appears that at least 60% of the ORS used in Egypt moves through commercial outlets,

leaving about 40% delivered by the MOH system, free of charge to the consumer. We assume that the commercial retail price represents a reasonable measure of the economic cost - distinguish MOH budget cost - of ORS supplied by the MOH.) For home treatment, we should add to the ORS cost the cost of provider (physician and other) consultations sought by the households - from both the private market and the MOH system. (The latter services will be free to the consumer, but, generally speaking, should be reckoned as an economic cost of the nation's ORT delivery system.) Data to measure these consultation costs have not been assembled. What about costs for the 10% of cases treated in MOH facilities? These will also include an ORS cost of about US\$ 0.18 per case, plus additional costs for MOH personnel time and facility use. Again, data have not been assembled to measure these additional costs. (Research on this question should distinguish MOH budget costs and economic costs and would probably find that the latter are very small.)

Under the assumptions of hypothesis two - namely, that to sustain the behaviour changes produced by the Project, it will be necessary to maintain a program for this purpose which uses project-type inputs on the scale used by NCDDP - project historical costs which reflect total project expenditures (among others) are of more interest. Most of these costs are regarded as necessary, ongoing operating costs for the ORT delivery system that were put into place by the project. One component of these costs will be, as in hypothesis one, the ORS cost about US\$ 0.18 per case treated. We need to add to this NCDDP Project costs. Since we are calculating unit costs for the 14 million cases treated in 1985, we might take project costs for 1985. For various reasons, however, it is probably better to take average annual project costs to date. USAID expenditures have averaged US\$ 4.4 million per year to date which comes to about US\$ 17.0 million equivalent contribution, virtually all in kind (personnel services, facility services) over the five-year life of the project, a rate of US\$ 3.4 million on average per year which comes to about US\$ 0.24 per case. As with the analysis under hypothesis one, we have no estimate for the cost of provider consultations utilised by the household. The various findings foregoing may be summarised as follows:

Cost per case for treatment with ORS, 1985

Taking the assumptions and perspective of hypothesis one
US\$ 0.18 plus the cost of provider consultations

Taking the assumptions and perspective of hypothesis two
US\$ 0.73 plus the cost of provider consultations

Even under the assumptions of hypothesis two, the estimate of US\$ 0.73 is probably biased on the high side as a measure of economic (distinguish nominal budget) cost, e.g. taking the imputed value of the GOE contribution in kind at face value added US\$ 0.24 to the cost per case. The reader may feel that the actual state of affairs will turn out somewhere between the limits assumed by the two limitational hypotheses explored here, so that our findings may be regarded as upper and lower limits.

12.5 The question of cost effectiveness

The analysis has so far reached the conclusion that when comparing costs and benefits it is fair to say that the NCDDP has achieved a great deal of benefit for modest expenditure. This is not to say that NCDDP has maximized output with the resources allocated to the Project's programme. Nor is it to say that more output could not have been achieved had the resources used by NCDDP been deployed in some alternative programme. This question of cost-effectiveness cannot be answered on the basis of information available. Whatever might be taken as the NCDDP output for purposes of cost-effectiveness analysis, e.g. mothers' knowledge, improved access, diarrhoea cases treated, deaths averted, it is not really possible to do such analysis because there has been no experience here with alternative nation-wide programmes to achieve the purpose of the NCDDP. Hence, no data are available on the cost of such alternatives.

Related to this question, however, there is some testimony in the record that the NCDDP might have achieved whatever it has achieved with a smaller expenditure than that incurred, i.e. in the area of communications/mass media. More generally, NCDDP has operated with a very loose budget constraint - indeed the funding available to the project has enabled it to budget for whatever programme components project management thought would yield benefits commensurate with the commitment of resources. This circumstance may be reflected in the fact that during FY 1985, the project in fact expended only 50% of what had been budgeted for that year.

The loose budget constraint suggests that, had project management been motivated by a tight budget constraint to contain costs, cost savings might have been realised without a significant diminution in project output.

12.6 Fiscal-burden implications of NCDDP: An aspect of sustainability

Central to the question of sustainability is the fiscal burden that would be imposed to carry out a satisfactory ORT program in Egypt after the Project has terminated and these outside funds are no longer available. Here again, the conclusions one reaches depend very much upon whether the analysis takes the assumptions of hypothesis one or those of hypothesis two.

Under the assumptions of hypothesis two, it would be informative to compare the NCDDP budget with the fiscal capacity of the GOE, in terms of the GOE's budget for health. Project expenditures to date have amounted to about 1.2% of total GOE current expenditures for health over this same period. Even if the GOE had to go on in post-project years committing resources to its ORT program at the same rate that resources were committed by the NCDDP, the resulting fiscal burden would represent a very small part of the GOE's total fiscal effort in the health account.

The perspective of hypothesis two, however, gives us a "worst-case" view of the sustainability issue. Under the assumptions of hypothesis one, what MOH resources would be required to maintain the MOH's share of a full-scale ORT program in Egypt after the NCDDP has terminated? At present, no definitive answer can be given to this question. However, illustrative calculations for major inputs will give helpful perspective.

A major such input would be the ORS used in MOH facilities, on location and given to mothers to take home. Assuming that this requirement would be, say, in the order of 20 million 5.5 gm packets, the tab, were the MOH to buy these supplies, would come to about 0.2% of the 1985/86 current (budgeted) expenditure for health. Put this way, a miniscule fiscal burden indeed. But this may not be the best way to put it if we are seeking to assess sustainability. For this purpose, perhaps a better comparison would be with the MOH's budget just for drugs, since this is, presumably, the budget ORS would make a claim upon. We do not have a current figure for the MOH drug budget available. We know, however, from an earlier study, that in 1978, the MOH budget provided only LE 0.26 drugs per capita for the population as a whole. And there is reason to suppose that there is still very little available in the MOH system for drugs. The ORS expenditure assumed foregoing would come to about LE 0.015 per capita, a small amount, but still apt to be more than a fraction of 1% of the drug budget. For example, assuming a 15% annual inflation rate over the period, if the MOH 1978 drug budget had been maintained in real terms, it would now be about LE 0.67 per capita, of which the ORS expenditure would be about 2%.

One might contend that a, say, 2% loading on the MOH drug budget should not be regarded as ominous from a sustainability point of view, and this judgement might indeed be the correct one. There is no guarantee, however, that however small the ORS loading on the drug budget might be that it would be accommodated by those who make decisions about allocation of the MOH drug budget.

It is important to note that failure of the MOH to budget for ORS at NCDDP rates would not necessarily imply failure to sustain a full-scale ORT program in Egypt. A distinctive and crucial feature of the ORT program put in place by NCDDP is that it is demand driven. Moreover given the very small amount of funding available in the MOH system for drugs, most patients have to rely upon drugs obtained from private pharmacies. ORS is perhaps a particularly good candidate for distribution in this way since out-of-pocket costs to households would comprise a miniscule fraction of the total income of those at the lower end of the income distribution.

It may with good reason be contended that calculations such as those set out above no doubt overstate the fiscal burden implications of the MOH's share of a full-scale ORT programme in Egypt because they neglect the fact that ORT is expected to, in a large part, supplant other more expensive diarrhoea case management strategies, notably, hospital based, IVs/drug regimens. For example, according to Professor Mahmoud El-Mougi, prior to the development of a large scale ORT programme in Bab-el-Shareya University Hospital, the hospital had costs of about LE 22,500 per season for IV management of the diarrhoea case load. There is now virtually no IV case load. ORT has taken over for a total expenditure of about LE 4000 for the large number of cases managed during 1985 - a considerable saving with a much higher case load.

All in all, it is perhaps a fair conclusion that government budget constraints need not be regarded as a major bar to the continuation of a full-scale ORT program in Egypt after the NCDDP has terminated. This sanguine view does not, of course, guarantee that these budget constraints will not prove a bar.

Nor does this mean that there may not be other problems for the sustainability of an ORT programme in Egypt. Indeed, from this point of view, the prospect for various kinds of organisation failure should probably be regarded as more ominous than constraints imposed by fiscal capacity. One aspect of the NCDDP programme which needs critical examination from this point of view is the system for production and distribution of ORS. This matter is discussed elsewhere in the report of this evaluation.

PART E: FULL LIST OF RECOMMENDATIONS OF THE REVIEW

- Rec. 1 The NCDDP should be extended for at least two years beyond September 1987. The current administrative structure should be maintained in the short term, but planning for phased transfer of administrative responsibility for all Project activities to relevant sections of the Ministry of Health should be initiated as soon as possible.
- Rec. 2 NCDDP staff meetings should be conducted regularly and attendance be required. The NCDDP National Steering Committee should also meet regularly and give priority to discussions on the phased integration of project activities into appropriate sections of the Ministry of Health, and to the decentralization of the Project.
- Rec. 3 The Governorate Coordinators' meeting should be strengthened, and more effectively used to resolve key issues and develop future plans. The Project should more actively involve governorate and district personnel in the planning, evaluation and follow-up of Project activities.
- Rec. 4 Priority should be given by the administration to securing additional personnel to assist the Project. The Review team suggests that priority consideration be given to the following appointments, to strengthen key areas: a medical scientist in the Research Unit, a statistician/epidemiologist in the Coordination and Implementation Unit, a full-time contract officer in the Administration Unit, secretarial support for the Training Unit and field personnel for supervision and training.
- Rec. 5 As it will be unlikely to have a full-time NCDDP Director, given the staffing policies of the Ministry of Health, it is recommended that a full-time Deputy Director be appointed and given authority to make many of the routine administrative decisions. All Unit Coordinators should devote adequate time to NCDDP activities.
- Rec. 6 The procedure manual should be revised and expanded, to be more comprehensive, and its approval expedited.
- Rec. 7 The payment of incentives to health personnel should be linked to objectively evaluated performance. To this end, the incentive system should be reviewed with the involvement of district level personnel. Non-financial incentives should also be considered.
- Rec. 8 The whole system of supervision should be revised to find better ways to monitor performance, and achieve prompt problem solving.
- Rec. 9 Supervisors need to be trained in supervisory skills (see also Recommendation 17).

- Rec.10** Use of the newly designed task oriented checklist for performance assessment should be widely implemented following appropriate training in its use.
- Rec.11** The role of the central supervisory team should be revised to coordinate the activities of, and receive information from supervisors at the governorate level. The Coordination and Implementation Unit staff should be increased to strengthen supervision activities.
- Rec.12** A coordinated training and media plan with clearly stated objectives, strategies, targets, timetable and key indicators should be developed.
- Rec.13** Implementation of the task-based curriculum should be accelerated by:
- establishing formal linkages with the responsible units/officers of the Ministry of Health, the Ministry of Higher Education and the universities; and
- Facilitating incorporation of curriculum into the medical education, nurses' training and pharmacy education, e.g., by joint workshops in curriculum development and incorporation.
- Rec.14** Guidelines on training methodology should be finalized, produced and distributed, including a model plan of activities and emphasizing "hands-on" task-based training, and the health education component of case management. Monitoring and evaluation tools (e.g., checklists and course evaluation protocols) should be used at all training courses.
- Rec.15** Priorities should be set for health professionals in need of training or refresher training:
- Priority (1): Interns, medical students, nursing students and pharmacy students through appropriate curricula modifications. The pre-service training should include practical case management.
 - Priority (2): Practising physicians and nurses, particularly at rehydration centres, who need refresher training.
 - Priority (3): Practising pharmacists should be informed of diarrhoea case management. The NCDDP's Professional Sales Representative programme should be evaluated and, if appropriate, reinstated and the training of pharmacy inspectors should continue.

- Rec.16 Priority should be given to the approval and endorsement of the production and printing of training materials by the Administration Unit. Distribution and utilization of training materials should be monitored.
- Rec.17 The Project should consider increasing the secretarial support to the Training Unit to improve information collection and dissemination and record keeping.
- Rec.18 All potential resource persons should be involved in the supervision of training:
- (1) Model training centre staff: Guidelines for training centres should include supervisory plans to follow-up training activities in other decentralized training centres, to give support and get feedback.
 - (2) Governorate/district supervisory staff.
 - (3) All NCDDP staff, not only those in the Training Unit.
- Rec.19 Supervisory Skills training courses for governorate and district supervisors should be conducted using modified WHO/CDD modules and a core of facilitators should be trained.
- Rec.20 A study on the impact of different methods of training in case management skills on practices of health professionals should be carried out.
- Rec.21 Having effectively created public demand for ORS, the NCDDP should direct attention towards its correct use, feeding during diarrhoea and the prevention of diarrhoea. While maintaining mass media communications, health education through health facilities should be strengthened, particularly by improving the communications skills of health staff.
- Rec.22 The content of TV messages to mothers should include key information needed for them to take appropriate decisions on:
- o when to start ORS;
 - o how often to give ORS;
 - o what to do about feeding and fluids during diarrhoea; and,
 - o what to do about common problems like child's refusal to take the solution.

- Rec.23 Attention should be given to communicating to mothers that in most cases of diarrhoea, ORT is the appropriate and adequate treatment, not an adjunct to drug therapy.
- Rec.24 The attention being directed towards prevention of diarrhoea should be carefully monitored to ensure that it is not at a cost to maintenance of high levels of effective ORT.
- Rec.25 ~~Mixing of the 5.5 g ORS packet should be demonstrated to mothers in health facilities even when ORS mixed in bulk from 27.5gm packets is in use.~~
- Rec.26 The likely impact of the eventual termination of the Project on the price of ORS should be examined. A course of action which ensures its continued availability free in government health services and at an affordable price in the private sector should be defined. The following two recommendations may have a bearing on this issue.
- Rec.27 The quality control of ORS performed by NODCAR, should be maintained to complement that undertaken by the manufacturer.
- Rec.28 The 27.5 g packets of ORS currently in stock in peripheral units should be recalled and either:
- destroyed if spoiled, or
 - used in large ORT units for preparation of ORS solution in bulk.
- Rec.29 The need for plastic cups and spoons for ORT should be re-examined with a view to either:
- phasing out their production, or
 - improving the distribution system.
- Rec.30 In training courses for health staff related to ORT or supervisory skills, attention should be given to logistics such as calculation of ORS requirements.
- Rec.31 A plan for equipping ORT units should be implemented which is more sensitive to the real needs of individual facilities.
- Rec.32 Advice to mothers on feeding during diarrhoea and on prevention of diarrhoea should be emphasized in all health facilities and in all training in case management.

- Rec.33 The guidelines for establishing and operating rehydration units should be finalized and widely distributed. The guidelines for management of acute diarrhoea in children, revised as necessary, should be made available in all health facilities, (see also Rec.32), rehydration, indications for additional drugs and health education. (See also Recommendation 14).
- Rec.34 Efforts should be undertaken to limit the inappropriate use of drugs in the treatment of diarrhoea. These may include:
- guidelines for health care providers on the correct indications for the use of antibiotics;
 - restrictions on the registration of inappropriate drugs, particularly multi-component "antidiarrhoeal" drugs; and
 - stopping the distribution of inappropriate drugs through the government health services.
- Rec.35 Rice-based ORS should not be included in the national programme until further research in this subject has been conducted. Studies should include various formulations, palatability, preparation and acceptability.
- Rec.36 The depot holder programme should be expanded, following a phased strategy of implementation. Initial expansion should be in the governorates where the responsible officials are already familiar with the programme. Priority for subsequent extension could be considered for more remote rural areas.
- Rec.37 Expansion of the depot holder system should be implemented by the NCDDP. Once implemented, adequate provisions should be made to transfer control to the appropriate section of the Ministry of Health as soon as possible.
- Rec.38 Responsibility for the depot holder programme at the health unit should be formally assigned to a medical officer who would control the ORS supply. Either a doctor or nurse should regularly supervise the depot holder's work with householders. Such supervision should be added to the job description of the person chosen, and compensation paid in the form of overtime rather than less clearly defined incentives. Current orientation programs for newly assigned doctors should incorporate information about the depot holder-system, where appropriate.
- 121

- Rec.39 Depot holders should be chosen from among respected community residents; experience suggests selection of individuals, male or female, who work in the health unit, or those who carry other community responsibilities.
- Rec.40 The depot holder should be supplied with the ORS packets and cups free of charge and should not sell them.
- Rec.41 A small operational research study should be carried out to determine the feasibility of expanding the role of the depot holder to provide education to mothers about weaning and hygiene, in addition to distributing ORS.
- Rec.42 The objectives and structure of the management information system (MIS) should be reviewed and clearly redefined.
- Rec.43 The register for recording of information on diarrhoea cases should be redesigned to include only the essential variables, to render the MIS more manageable at all levels.
- Rec.44 A sample of health facilities should be selected as sentinel reporting sites and staff trained in the rationale and methods of reporting and in simple data analysis (e.g., use of preprinted bar graphs to record cases treated monthly with ORS) and self-evaluation.
- Rec.45 Supervisory staff at all levels should be trained in supervision and monitoring of reporting, in simple data analysis and in feedback. A greatly reduced number of sentinel reporting sites would make supervision of reporting feasible. (See also Rec.19).
- Rec.46 Centrally, consideration should be given to microcomputerization of the MIS to allow a more sensitive monitoring of Project activities and more timely feedback. Computerization is not recommended for other levels and should not be attempted without prior revision of the MIS.
- Rec.47 The appropriate sections of the Ministry of Health should be involved in future development and implementation of the MIS, with the ultimate objective of integrating it with the routine information system of the MOH.
- Rec.48 Feedback in the form of a periodic pamphlet could be sent to all ORT units presenting simple information on NCDDP activities throughout the country.

- Rec.49 A variety of carefully planned and implemented research and evaluation studies should continue to be undertaken. Priority areas include the effective use of ORT, diarrhoea-preventing interventions and health services management, as well as infant and child mortality, especially that part attributable to dehydrating diarrhoea.
- Rec.50 The Scientific-Review-Committee, with the assistance of the Research Unit Coordinator, should develop an explicit set of procedures and timetables to ensure an expeditious flow of the research protocol review process.
- Rec.52 The Research Unit and the members of the Scientific Sub-Committee on Management Research should work closely with the Coordination and Implementation and ORS Production and Distribution Units and Project management, to develop appropriate management and operations research priorities, particularly related to the peripheral levels. Information about these priorities should be distributed to local research institutions.
- Rec.52 Further efforts should be made to exchange scientific and technical information with others working in related fields, and with the Ministry of Health.
- Rec.53 The Research Unit should take the lead in acquainting project staff, including key operational personnel at peripheral levels, through workshops or other activities, with techniques of rapid, focused, problem-solving research. Such an approach will be important for on-going activities and for determining how best to implement many of the recommendations of this review. Examples of questions which could be resolved in this way include:
- o What are the most relevant items of information necessary for action at each level of the system, and how can collection of these be effectively integrated into the current information system?
 - o What is the best strategy to follow in introducing task-based training to physicians, and how should the impact of that training be assessed?
 - o What would the effect be of stopping the distribution of anti-diarrhoeal drugs through the government health services?
 - o What is the best strategy for training pharmacists? By re-instituting the P.S.R. system? By training pharmacy inspectors? Other strategies?
 - o What is the best system for estimating demand for ORS at each level?

- Rec.54 Evaluation activities carried out by contractors should be closely monitored. This will be facilitated by the newly-formed Scientific Committee and its sub-committees, however. In view of the large amount of quantified, statistically-based evaluation and research being undertaken, consideration should be given to employing a skilled epidemiologist/statistician to ensure appropriate statistical design and analysis.
- Rec.55 All evaluation activities should be undertaken in closed consultation with the Research Unit, other NCDDP Units and appropriate sections of the Ministry of Health.
- Rec.56 The NCDDP should more actively involve the governorate and district level personnel in the evaluation of project activities and share with them the results.
- Rec.57 Death registration statistics

It is recommended that a systematic analysis of the published death registration data for Egypt be undertaken following the lines of the work by Dr Rashad in 1983. Analysis of the more recent data, looking at details on age at death, season of death and rural and urban rates within governorates would provide a valuable context in which to examine some possible effects of the NCDDP.

In particular, the trend in the concentration of deaths in the summer months should be examined with special reference to possible seasonal concentrations of registered births.

In the assessment of trends based on the death registration data, reference will need to be made to independent sources of mortality information (both censuses and surveys).

- Rec.58 The two NCDDP double-round surveys

It is recommended that the existing two-round survey data be re-examined, combining both the 1984 and 1985 rounds if possible. Analysis of the relative risks of dying for sub-groups, controlling for obvious factors such as age and socio-economic status, might help the project obtain more definite results than the calculation of death rates.

The questionnaire for the third cycle of the double-round survey should be improved, and more effort should be made to collect accurate data on age.

Closer supervision of fieldwork during the second round is needed to avoid omission of some deaths.

Assessing programme impact

- o A more sophisticated and rigorous research programme should be developed to isolate possible Project effects from all the other variables affecting child survival.
- o A re-survey of areas already studied before the main impact of the Project (in the Menoufia and Dakahleya) should be undertaken. Similar studies in upper Egypt are also recommended.
- o Analysis of survey data for areas of "high" or "low" programme activity should be considered (e.g. an analysis for areas with the Depot Holders schemes, versus areas without). Linking of data from the KAP studies on ORT with mortality data is also recommended.

Control of Diarrhoeal Project (263-0137)
Key Evaluation Questions

1. To what extent has the project succeeded in making ORT services and materials available on a national scale? Is the project meeting targets for training of health professionals, establishment of health centres and production of ORS? Has the expansion of services and ORS production kept pace with demand? What, if any, are the remaining gaps in the ORT delivery system and/or constraints to implementation of a nationwide programme? What specific actions should be taken to address them?
2. To what extent has the project increased the utilization of ORT services and materials? What evidence is there of improved awareness and knowledge of ORT among the general public and among health personnel? What evidence is there of improved treatment of diarrhoea in children both in the home and by health service providers? Are project IEC activities addressing the appropriate target? What adjustments in the project's IEC strategies, if any, might be appropriate in the final phase of implementation?
3. What evidence is there that the project is contributing to a reduction in child diarrhoeal mortality on a national scale? Does the objective of a 25% decrease in diarrhoeal mortality in the under-five age group by 1987 appear attainable? If not, should the project be extended? For how long? What activities should be emphasized under an extension to ensure that the project purpose is achieved within this period?
4. What progress has been made towards institutionalization of ORT in health service delivery systems in Egypt? Is the current organizational structure of the project effective? How important is the structure for the continued momentum of ORT activities? How should this structure fit into plans for long-term institutionalization of ORT within existing health systems? What are the implications of the project's multi-sectoral approach for the institutionalization of project activities?
5. What additional inputs, if any, will be necessary to maintain the momentum of the ORS programme beyond the current phase of USAID assistance? What are the recurrent cost implications of activities needed to sustain the achievement of the current project? What steps need to be taken prior to the conclusion of the current project to ensure the availability of funds for these activities?
6. What is the appropriate future role of the CDD Project vis-à-vis the new Child Survival Project, or should it remain an independent Project? Discuss the relative advantages and disadvantages of the two options from both the USAID and GOE perspectives.
7. To the extent the ORT programme has been a success, to what programme elements, singly or as a package, can this success be attributed? The USAID CDD project is part of a multi-component project, employing a variety of strategies to achieve project objectives. Which of these components and strategies appear to have been effective in the development of the national ORT programme? Have any programme elements been proven ineffective? What elements of project success appear transferable to efforts in other countries to develop and to implement ORT programmes on a national scale? What lessons have been learned from the CDD Project which have implications for future USAID/Cairo project design and management?

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NCDDP Catalogue of Information, Education, Communication and Training

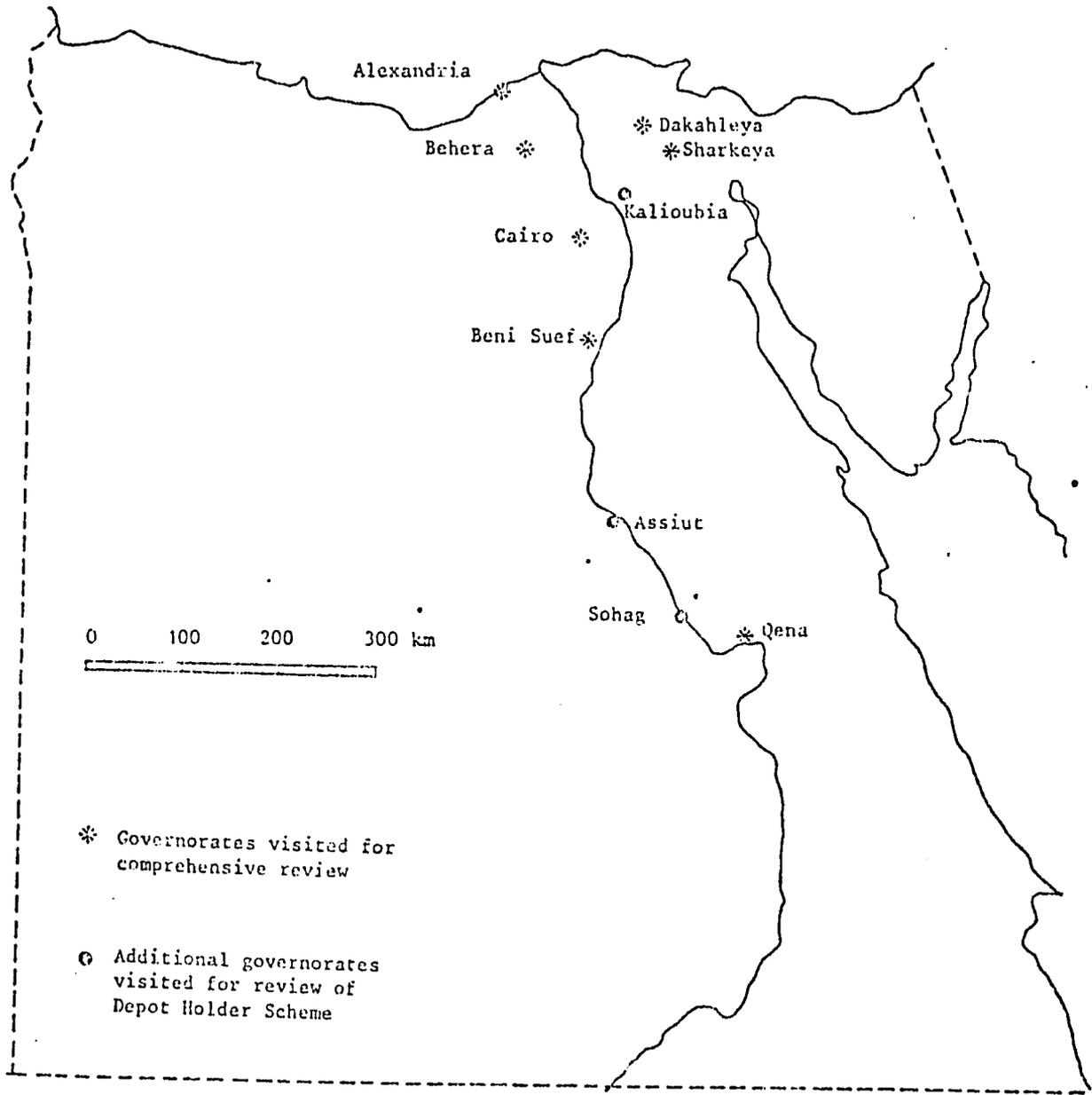
Materials on Diarrhoea and Dehydration

(Slide sets, posters, video-tapes, wall charts, training packages, etc.) developed by the NCDDP.

NCDDP Information Service for Professionals screens journals and important new articles related to diarrhoea and circulates them to its mailing list.

NCDDP Information Service for the General Public makes available photocopies of articles on diarrhoea and dehydration that have appeared in newspapers and magazines.

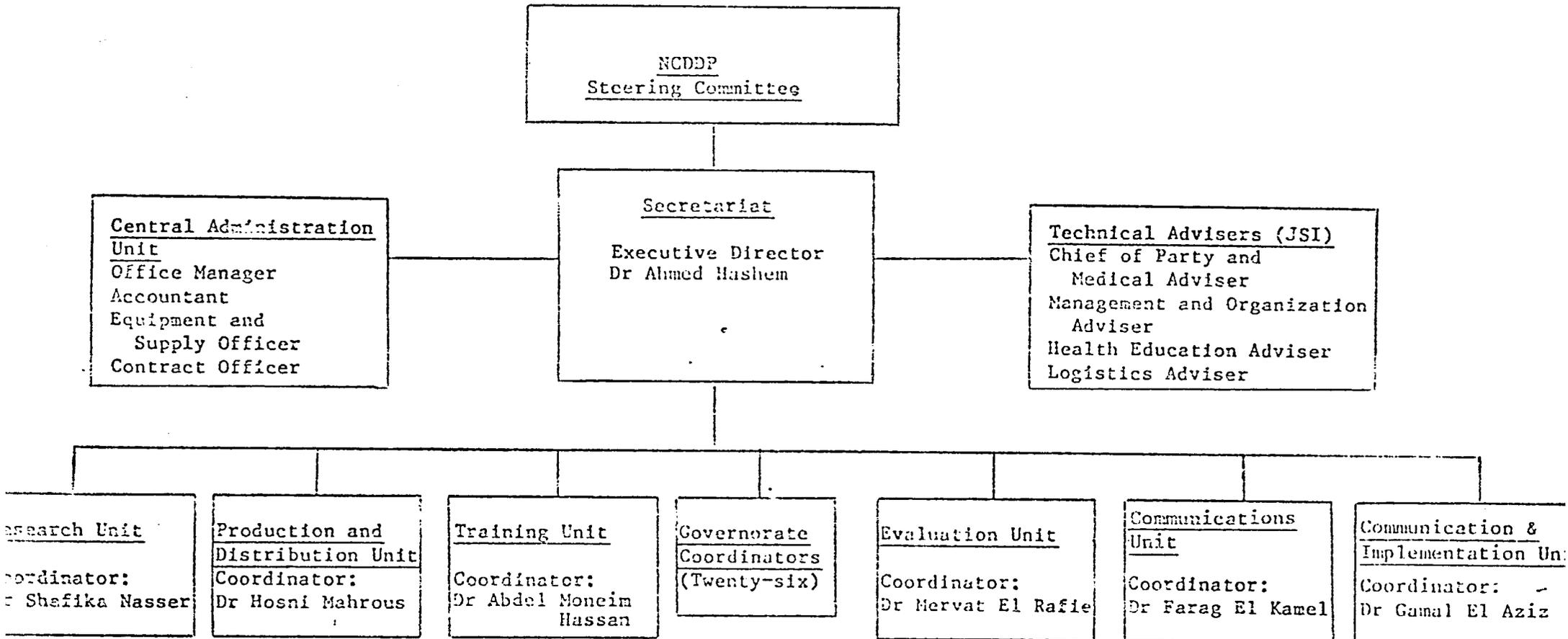
Governorates visited during the Second Joint Review
of the NCDDP in Egypt
15 June - 3 July 1986



NATIONAL CONTROL OF DIARRHOEAL DISEASES PROJECT

Annex 6

Organizational Structure



158

Findings of visits to seven diarrhoea training centres1. Training objectives, strategies and methods

The general objective of the current training activities is to train health workers to manage acute diarrhoea cases. Specific objectives for doctors include: to assess cases of mild, moderate and severe dehydration, to prepare ORS, to administer ORS, to educate mothers and to follow up cases until discharge. The specific objectives for nurses exclude history taking and patient examination but specify the administration of ORS by spoon-feeding. The currently used training methods at training centres are lectures, group discussions, audio-visual methods and clinical rounds with relative emphasis on theory for doctors and practicals for nurses. The commonly used schedule for training of physicians in 6 day training courses allocates about 15 hours to lectures and 12 hours to clinical rounds which are usually conducted in the afternoons.

Comments

- 1) The plan of action for training courses should meet the objectives, which are to attain skills and confidence in the management of diarrhoea. A change in the attitudes and performance of health professionals in this regard will depend on gaining experience and confidence through actual practice. The current training courses provide minimal opportunity for supervised practice in case management. The 2 hours of clinical rounds daily do not provide opportunity for participants to assess, rehydrate, monitor, reassess and discharge patients. The physicians are given little possibility to administer ORS and manage problems associated with ORS administration such as vomiting and persistent purging and can thus not be expected to leave these training courses fully confident in handling cases, and convinced that ORS works. They can be expected to prescribe other drugs routinely, and to remain unclear on the health education messages that need to be communicated. These were common findings during the Review.
- 2) The clinical observation sheet currently used by course participants does not include clinical status at 2 hours' interval, enabling regular monitoring of cases.
- 3) All the visited rehydration centres received most patients in the mornings and most patients were discharged by noon, which further reduces the opportunity for participants to take part in the rehydration of cases, since the clinical practicals are scheduled for the afternoons.
- 4) The 15-16 hours of lectures could be reduced to 5 hours focusing on essential topics such as:

- o Principles of clinical management of acute diarrhoea
- o Details of case management
- o Pathogenesis of acute diarrhoea
- o Epidemiology of acute diarrhoea
- o Prevention of diarrhoea

The hands-on activities should be scheduled for at least 4 hours daily in the mornings, to meet the objectives of training in clinical management.

5) The training in case management should emphasize all diarrhoeal disease control strategies. Health education in nutrition, environmental hygiene and sanitation, breast feeding and weaning practices should be among the tasks performed by each participant. The messages to be given and the methods to be used should be clearly stated in the training plan.

2. Guidelines for training centres

The NCDDP has designed various materials for in-service training, including an activities plan, a course evaluation plan, a task analysis for providing quality rehydration services, worksheets for task analysis, and other forms for assessment of performance. A workshop to train trainers of personnel working in rehydration centres in training skills was conducted in June, 1986.

There are no guidelines or training manuals available at the training centres visited, except the 6 day training course model being used in most training courses.

The roles of nurses and physicians are outlined in another draft document, "Guidelines for establishing and operating a rehydration centre".

Comments

1) All the documents listed above provide a basis for good quality training. They require finalizing, printing and distribution to training centres preferably in connection with refresher training and/or training of trainers to up-date training skills and methods and to introduce the new task-based training methodology widely as is urgently needed.

2) The rationale for having different roles and duties of nurses and physicians at rehydration centres should be examined in the light of the fact that nurses are always present to assess, rehydrate and reassess cases, and knowing that practical experience is equally important in changing attitudes and increasing confidence in appropriate treatment for both doctors and nurses.

3) Guidelines should also include a policy on antibiotics, antiemetics and antidiarrhoeals, which at present are either supplied routinely or prescribed at both ORT training centres and oral rehydration units, visited by the review team.

3. Recruitment of Trainers

It was observed during the field visits that the criteria for recruitment of trainers and the success in obtaining the services of good trainers varied greatly.

Comments

- 1) Trainers should be carefully selected based on specific criteria such as:
 - o experience in ORT (at least 6 months' experience treating diarrhoea cases)
 - o commitment to and conviction in the use of ORT
 - o availability for adequate time to undertake the training (including during hours when diarrhoea cases are available)
 - o desire to be an instructor
 - o adequate training skills in participatory learning
- 2) A set of criteria for trainers should be decided on and distributed to all training centre directors, to avoid biases in selecting trainers and to improve the quality of the training.

4. Selection of participants

The numbers of health manpower trained in ORT in Egypt are presented earlier in this report. The special pre-service training of new medical graduates lasts 2 days, however, sometimes only 2 hours is allotted for diarrhoea case management.

Comments

Priority has to be given to certain categories of health workers to achieve the maximum impact of training. It was suggested by training directors that the following categories require special attention:

- o medical and nursing students before graduation and interns before further employment in government service
- o pharmacists, using a different training design and plan
- o nurses and physicians at ORT centres who need refresher training

5. Supervision of training

The field visit indicated that the decentralized training centres were rarely supervised by the model training centres or the NCDDP Training Unit. The training centres do not follow standard treatment policies, norms depending on individual physicians.

The governorate coordinators and other governorate supervisory staff do not have the supervisory skills to supervise training in management of acute diarrhoea and to monitor performance of ORT.

Comment

- 1) If the current supervisory staff at governorate and district level were trained in the CDD/WHO supervisory skills training courses, they would be better prepared to provide valuable supervision in training and performance of ORT. A core of facilitators could be trained at national level and then conduct training courses adapting and using the modules already available in arabic.
- 2) The established training centres need follow-up by the NCDDP to review their performance and to provide support and feedback.

6. Monitoring and evaluation of training

Monitoring of participants during training courses using a standardized check-list is not practised at present. Pre- and post-testing is done, but activity checklists and end of-course questionnaires which provide the trainers with information on perceptions and feelings of the participants are not widely used.

Comment

Based on the analysis carried out by the NCDDP Training Unit, such monitoring and evaluation tools could easily be introduced and used by training directors to improve training activities.

Report on field visits to Rehydration Units at
two University Teaching Hospitals

1. Abou Reesh Hospital

Abou Reesh Hospital of Cairo University is the largest pediatric hospital in Egypt and has changed considerably in the last few years. Previously as many as 2,500 outpatients visited daily. With the recent addition of a new hospital built nearby by the Japanese, the old (1937) facility is now used exclusively for isolation ("fever") and diarrhoea cases. The latter are under the direction of Dr Ibrahim Fayyad who organized a rehydration clinic in March, 1985.

Patients are seen 6 days per week in a general screening clinic. All patients with diarrhoea are supposed to be referred to the rehydration clinic, and other patients elsewhere. In practice, some diarrhoeal patients, presumably without dehydration, are given ORS packets and instructions and are sent directly home.

In the adjoining rehydration clinic consisting of 3 large rooms, all patients with diarrhoea are evaluated clinically for signs of dehydration. If lacking such signs, patients are again given packets and sent home. A daily log is used to record pertinent identifying information on such patients who, at a glance, would appear to number in the hundreds during the last 5-6 weeks. It would not seem that this information is summarized or analyzed.

If children have mild-moderate dehydration, they are given ORS by cup and spoon. Nurses mix ORS in bulk using 27.5 gm packets and dispense the fluid in 200 ml cups. During the visit, there were 20 patients being fed by mothers seated in chairs around the periphery of the room. Patients are kept for 4-6 hours. At noon, a doctor or nurse gives mothers 30 minutes of instructions in ORT. Patient characteristics are recorded in Arabic and summarized monthly. Children with more serious dehydration are treated in a third room, either by nasogastric or intravenous route.

The most serious cases are admitted to hospital. These children are quite sick, often with complications such as malnutrition and pneumonia. Mortality is high, perhaps 10-20%, although no figures were readily available. During the visit, there appeared to be more resident physicians and nurses than there were in-patients.

Since opening in March, 1985, 13,405 dehydrated patients have been treated in the rehydration clinic. These are exclusive of patients treated only in the general clinic, those seen in the rehydration clinic but without dehydration, and those hospitalized. Peak visits in 1985 were in June-August. Visits have increased, with 84% more cases in March-May, 1986, than in the previous comparable period. The increase could represent an annual variation in incidence, the general phenomenon of increased usage after the opening of a new facility, or a response of the public specifically to ORT and its television campaign.

The majority (77%) of patients are less than 1 year old. This has remained fairly constant throughout, except for a marked and unexplained decrease in the last 4 months of 1985. Over 90% of all dehydrated patients have received treatment orally by the cup and spoon method. There has been a puzzling fluctuation, however, in usage of intravenous fluids, from as few as 0.1% of patients in April 1986, to as many as 17.1% in October, 1985. Whether this has actually occurred or is a result of errors in tabulation, is unknown.

The clinical operation is supplemented by biochemistry and microbiology laboratories. There is an IBM PCXT desktop computer for data analysis.

At present Dr Fayyad and his lieutenant, Dr Ahmed Yusef, are conducting research on ORS, containing 65 and 90 milliequivalents of sodium, given in double blind fashion. So far, 105 admissions with moderate dehydration have been studied. All are being rehydrated with fluids equal to 10% of initial body weight. There is no provision for a specific final number of patients to be included, suggesting that no allowance has been made for the possibility of beta error in subsequent statistical analysis.

2. Bab El Shariya Hospital

The ORT unit in Bab El Shariya Pediatric Hospital, Al Azhar University, was started by its director, Dr M. El Moug, in May 1983. Patients with diarrhoea are referred to the unit where assessment of dehydration and treatment is undertaken. Those with more severe illness and/or complications are admitted for further care.

The results of the first 37 months of observations were presented to the Review team. The average monthly number of patients is highest in July (619) and lowest in January (174). Approximately 4,000-5,000 patients are seen each year.

From 10.1% to 15.4% of patients were classified as having moderate-severe dehydration during the 3 years of observation. This percentage demonstrated a definite seasonal variation with a peak of 17.2% in August and a nadir of 5.7% in December. The ratio of moderate or severely dehydrated patients to all diarrhoea cases has increased over the years, 9.3% in 1983 (8 months), 11.6% in 1984, 16.8% in 1985, and 34.3% in 1986 (5 months).

The percentage of cases admitted to hospital has averaged 4.1% and has remained fairly constant over the years. A greater proportion of patients are admitted during the hot summer months than in the cooler winter.

The percentage of those receiving fluids by other than the oral route has averaged 2.2% and has not varied appreciably over the years. Nasogastric tube administration is somewhat preferred to the intravenous route.

There have been a total of 60 deaths during 3 years. The fatality/case ratio has averaged 0.44 deaths per 100 patients and 13.2 per 100 admissions with no particular trends on an annual basis. The ratio of deaths per 100 patients is higher in the summer.

The average number of ORS packets used per patients has tended to increase during the last 10 months for which data are available.

145

Composition of 15 antidiarrhoeal compounds found in a single pharmacy

Components Brand name	Kaolin	Pectin	DI-Iodohydroxyquinoline	Phthalylsulphathiazole	Streptomycin sulphate	Sulphadimidine	Sulphaguanidine	Neomycin sulphate	Tinc. belladonna	Bismuth (bi-/oxy-)carbonate	Homatropine methylbromide	Diloxanide furate	Others
Enteroquin compound	⊙		⊙	⊙		⊙				⊙	⊙		⊙
Diamycin suspension	⊙	⊙	⊙		⊙			⊙					
Diapec-S	⊙	⊙					⊙				⊙		
Enteroguanil			⊙				⊙		⊙	⊙			⊙
Pectokal	⊙	⊙											
Pectokal N	⊙	⊙					⊙	⊙	⊙				
Kapect	⊙	⊙											
Kapect compound	⊙	⊙											⊙
Gabion forte			⊙	⊙									
Pasamibe			⊙										⊙
Furazol											⊙	⊙	⊙
Furamide											⊙		
Fudizol	⊙		⊙	⊙	⊙	⊙							⊙
Streptophenicol				⊙	⊙								⊙
Dlakan	⊙								⊙			⊙	⊙

Suggestions concerning studies to monitor the incidence
of hypernatraemia among diarrhoea cases

The international health community concerned with ORT has extensively discussed and researched the issue of the sodium concentration of ORS. This has in general resulted in an acceptance of the WHO recommended formula ORS, yielding 90 mEq of sodium per litre of solution, as a suitable therapy, when used correctly, for all dehydrating diarrhoeas.

In Egypt, suggestions that the standard ORS formula may result in an unacceptably high incidence of hypernatraemia have provoked much discussion and some research studies.

The Review team suggests that the period of monitoring for hypernatraemia be extended for one year and that the following points be considered:

1. Ensure that participating hospitals are able and willing to comply with a standard protocol which is designed adequately to determine incidence and risk factors of hypernatraemia.
2. Employ a statistician, preferably with an epidemiologic background, from the beginning in order to determine the number of patients to be included, to review the appropriateness of the research questions asked, and to devise a proper coding format for data analysis.
3. Restrict the age of patients to those under 24 months and analyze results by smaller sub-sections of age groupings. It is in the very young that hypernatremia is to be expected most frequently.
4. Before the results of serum sodium determination are known, carefully obtain from the mother, and record, the pre-admission feeding history, (including any period of imposed starvation) and especially the details of mixing and use of ORS and other fluids.
5. Maintain the same personnel throughout the research period.
6. Consider not restricting the research to just those patients who are dehydrated and require hospitalization.

Depot Holder SystemEstimated programme costs per district for initial 5 month period¹Egyptian pounds

1.	<u>Steering Committee</u>	
	21 members x 5 meeting x LE5	<u>525</u>
	<u>Total</u>	525
2.	<u>Training</u>	
	- Incentives for outstanding Depot Holder performance 20 DH x LE10	200
	- Incentives for trainees' trainers 15 physicians x 2 days x LE 10	300
	- Incentives for DH trainees 100 trainees x 3 days x LE2	<u>600</u>
	<u>Total</u>	1775
3.	<u>Incentives/Overtime</u>	
	- Outstanding DH performance 20 DH x 5 mos. x LE2 ²	200
	- District Nursing Supervisor 5 mos x LE10	50
	- Driver 5 mos x LE10	50
	- Nurses (supervisorys of DHs) -- overtime 45 x 5 mos x LE5 (average)	<u>1125</u>
	<u>Total</u>	1425
4.	<u>Miscellaneous</u>	
	- Cupboards 100 x LE 7	700
	- Stationery	100
	- Publicity	<u>200</u>
		1000
	<u>GRAND TOTAL</u>	<u>4725</u>

¹ Adapted from Depot Holder Action Plan, May 1986² LE5 in Action Plan

KEEPING RESEARCH RELEVANT

RESEARCH AND THE NATIONAL CONTROL OF DIARRHEAL DISEASES PROJECT

One of the unique aspects of the Egyptian National Control of Diarrheal Diseases Project (NCCDP) was its regular use of research in order to obtain the information required for policy and management decisions. The NCCDP questioned virtually everything before making important decisions. It questioned through appropriately designed and executed research studies. Although there were many research studies supported by the NCCDP, the emphasis was on low budget, fast turn-around studies. It was not primarily academic research, but was research designed to obtain the information required to implement an effective and efficient national rehydration program.

The types of research supported included double-blind clinical trials, studies of media habits, anthropological investigation of cultural factors in the care of children with diarrhea, market research using small focus groups and national cluster sample mortality surveys. Qualitative research was as important as the collection of statistically reliable data. The emphasis in the NCCDP was on reducing diarrheal related mortality in young children. Research was one tool used to accomplish this objective.

Listed below are many of the research studies supported by the NCCDP. Selected findings are shown, along with the programmatic implications and decisions made as a result.

<u>Research Study</u>	<u>Major Findings</u>	<u>Programmatic Implication</u>
1. Container Study	<ul style="list-style-type: none"> -No concept of how much one liter is; -No liter measure available; -200cc cup most common size used for feeding babies; -When asked to "fill" the cups, they averaged only 125cc of water; 	<ul style="list-style-type: none"> -Made ORS sachets in 5.5 gram size (200 cc equivalent); -Produced and made available 200 cc plastic cups. -Used these cups and 200cc soft drink bottle to show mixing in the T.V. commercials.

2. Packet Opening Trial.

- Found that mothers had difficulty opening the large 27.5 gram (UNICEF) packets;
- Nurses did not like to demonstrate use because packets were hard to open;
- Mothers said, "We want something we can open and use quickly;"
- Mothers thought their babies could not drink a liter of fluid.
- Introduced easy-to-open foil packets bonded on one side to polyethylene and on the other to Kraft paper.
- Reinforced decision to use 5.5 gram (200cc equivalent) packets.

3. Ethnographic Studies

- Identified vocabulary used by mothers regarding diarrhea, dehydration and nutrition;
- Learned the mothers' knowledge, attitudes and practices regarding diarrhea and dehydration;
- Learned mothers' color and design preferences for children's medicines;
- Identified mothers' system of classification for stages of and types of diarrhea.
- Used to write and prepare the mass media messages;
- Used to prepare training materials;
- Used to design the ORS packets and display boxes.

4. Pharmacist/Customer Interaction

- Brand loyalty on part of customers creates brand loyalty on part of pharmacist (pharmacists stock items the customers request);
- Pharmacists have little time to teach, but do give advice on dosages;
- Pharmacists rely heavily on doctors' prescriptions and on products requested by the customers, seldom suggesting alternative products.
- Project decided to concentrate on demand creation among doctors and public;
- Project emphasized correct mixing in training for pharmacists.

5. Media Surveys and Focus Groups on Media Preferences
- Radio was less influential than T.V.;
 - 70% to 80% of mothers watch T.V. regularly;
 - Preference for specific messages rather than long ones or dramas;
 - Messages on billboards and posters were not recalled;
 - Mothers listened to radio in the mornings and watched T.V. in the evenings;
 - Positive reinforcements for being a good mother was perceived as implying criticism;
 - Mothers preferred direct information on what to do.
- Emphasize television, but use other media for specific target audiences and very specific purposes;
- Used preferences to determine length and type of messages;
- Kept messages short, explicit and instructive;
6. Intravenous Fluid: Tested 3 Different Acceptable Solutions
- Determined the best one for general use.
- Selected the best I.V. solution and contracted with local pharmaceutical company to begin production. Distributed solution to all hospitals for use with severely dehydrated children who could not be orally rehydrated.
7. Taxonomy Study: Epidemiology of Diarrheal Diseases
- Determined most vulnerable group was <18 month children;
 - Learned severity of diarrhea in homes:
 - 20% dehydrated
 - 65% watery diarrhea
 - 6.5 days duration
 - Learned prevalence by month;
 - Found day-point prevalence up to 45% in Summer;
 - Found urban/rural differences;
- Made decision to use the <2 year olds as primary target group;
- Messages and media images focused on <2 year olds;
- Determined ORS production requirements and schedule (June-December highest requirement);
- Annual mortality survey designed based on findings from Taxonomy Study.
- In mass media campaign, stressed continued and adequate feeding during diarrhea.

- Found male/female differences;
- Observed mothers' practices in treatment of diarrhea.
- Identified mothers' decision points: what symptoms or signs she used to make various decisions on care and treatment.
- Watery diarrhea, inactivity and vomiting are key decision points for mothers:
- Found that "starvation" not common as treatment of diarrhea, but feedings were reduced.

- | | | | |
|-----|---|---|--|
| 8. | Follow-up of Clinic Patients to Determine Effective ORS Use | -Learned how much ORS was used per child in the clinics and during 5 days afterwards (i.e., how much ORS is used during one serious episode of diarrhea) | -Production levels based on average daily requirement of 350 cc for 5 days. This gave us the maximum production requirement. |
| 9. | ORS Use With Low Birth Weight Neonates | -ORS was safe and effective | -Training of physicians included this information. |
| 10. | Various In-Hospital Rehydration Studies Using ORS | -Confirmed WHO ORS formula as safe and effective rehydration fluid. | -Policy decision to manufacture and use the WHO formula ORS. |
| 11. | Depot Holder | -Found that every community has people they trust for child care advice;
-Found these people could be trained in ORT;
-Found their involvement could increase ORS use and lower child mortality | -Began program to establish depot holders in all areas remote from health facilities. |

- Depot holder areas had better knowledge of ORS and its use.
 - Depot holder program strengthened primary health care referral system.
12. Focus Group on Disease Concepts
- Public had no concept of dehydration, but lumped its symptoms with severe diarrhea.
 - Project "invented" the disease of "gaffaf" (dehydration). People needed a label in order to understand the instructions for treatment.
13. Study of Mothers' Use of Foods During Diarrhea
- Determined electrolyte content of these foods.
 - Breastfed children had shorter duration of diarrhea.
 - Media messages stressed use of most appropriate locally used foods, such as rice, potatoes, yogurt and breastmilk.
 - Demonstrated traditional fluids which had no salts.
14. Study of Rice Powder-Based ORS
- Confirmed that rice powder ORS results in shorter duration of diarrhea.
 - Decision to investigate feasibility of manufacturing pre-cooked rice powder based ORS.
15. Mothers' Communication Study
- Neighbors of mothers with intensive ORS training learned about ORS from these mothers.
 - Emphasize quality teaching of mothers in clinics.
16. Hypernatremia Tracking and Mixing Trials
- Found that mothers tended to make many mistakes in mixing.
 - Hypernatremia was more related to mis-mixing than to use of ORS, per se.
 - Strengthened mixing messages on T.V. and found that hypernatremia incidence and levels were reduced.
 - Decided to initiate double blind trial of WHO formula and ORS with lower sodium content (results not yet in)
17. Double-Blind Clinical Trials of Anti-Diarrheals and Anti-Emetics
- Both made diarrhea and vomiting worse
 - Began training doctors to not use or to reduce use of these preparations.

Economic, Financial and Fiscal Considerations

1. Introduction

To evaluate NCDDP (or any other project) we require success criteria against which to measure project performance. In its log frame, the NCDDP Project Paper itself sets out a number of such criteria for each of the levels of project performance identified therein (i.e. goals, purposes, outputs). For example, for Project Purposes, we find these criteria:

1. Diarrhoea mortality in under fives reduced by at least 25%.
2. 90% of mothers aware of ORT. 75% understand its use.
3. More than 50% of serious cases seen by health system receive ORT.
4. Hospital diarrhoea mortality rates fall to 5%.

For various reasons, project performance should be measured against such "internal" criteria. However, for external evaluation such as this, appeal only to such internal criteria is not enough. Thus, from the point of view of economic, financial and fiscal considerations, to measure project success, we should, at least in principle, seek to determine not only if the project achieved its purpose, but also whether it did so in a cost effective, cost-worthy and equitable way, and whether the project meets various "sustainability criteria".*

The foregoing qualification "... at least in principle..." recognizes that, in practice, any attempt to evaluate ORT projects such as NCDDP in these terms (cost effective, cost-worthy) confronts a number of fundamental, peculiar difficulties.¹

^{#1} As applied to evaluation of NCDDP (or other project), concepts such as cost-effective and cost-worthy can be defined operationally in various particular ways, depending upon, say whether the project as a whole, or one or more of its component parts is at issue and upon what, from either perspective, is taken to be the relevant output for evaluation purposes. There is no need to rehearse these various possibilities here. However, an example or two may assist our understanding of these concepts.

For the purpose of this illustrative exercise, let us assume that the overall purpose of committing resources to health sector interventions is to reduce infant and child mortality. Let us further assume that reduction in diarrhoea-related mortality (DRM) is regarded as the relevant success criterion of NCDDP.

With these assumptions, NCDDP might be considered cost effective if the resources used by it resulted in at least as large a reduction in DRM as would have resulted from allocation of these same resources to an alternative programme to reduce DRM (e.g. a differently designed or differently implemented ORT project or a non-ORT project). A project such as NCDDP may fail to achieve cost effectiveness, if (1) the basic design is flawed, e.g. choice of ineffective communications strategy, or (2) there is so called "X-inefficiency" (general organization slack and the like), even though the basic project design may be cost effective.

And with the foregoing assumptions, NCDDP might be considered cost-worthy (in an intra-sector sense) if the resources used by it resulted in at least as large a reduction in overall infant and child mortality as would have been the reduction in infant and child mortality had these same resources been allocated to alternative programmes designed to reduce such mortality.

Fundamental difficulties in cost analysis of ORT projects such as NCDDP

Cost analysis of any kind of project confronts various difficulties, e.g. difficulty in assembling relevant cost data and the like. Also, cost effectiveness analysis entails comparison of the cost of two or more alternative activities or programmes to achieve a given outcome - say, reduction in DRM. Typically in health project evaluation, however, and as in the instant case, data will not be available on the performance of alternative programmes because there will have been no experience with the performance of such alternatives, at least in the same setting.*

In addition to difficulties of these kinds, cost analysis of ORT projects confronts difficulties of a more fundamental kind. The main problem is lack of the usual temporal association between when the cost of inputs to the project are incurred and when the intended results (outputs-health-status-impacts) of the project are manifested.²

However difficult it may be successfully to implement a project such as NCDDP, conceptually it represents a rather simple and straightforward enterprise. NCDDP aims to change the way in which diarrhoea is managed (treated) in Egypt - by both mothers and health care providers of all kinds. Once the change has been effectuated (in the sense that householders and providers routinely respond to diarrhoea by appropriate use of ORT), it will presumably be self-perpetuating, so to speak, without need for continued project activities and costs.³ That is, just as in olden times (before ORT), mothers passed on to their daughters inappropriate, non-ORT wisdom on the management of diarrhoea, they will now pass on ORT wisdom. In olden times, this kind of cultural transmission of non-ORT wisdom did not depend on mass media campaigns and the like. From the provider side, ORT wisdom will supplant non-ORT wisdom in medical school and other provider curricula and ORT will be generally recognized as the best therapeutic practice, etc.³

Assuming that it is not barred by technical considerations (ORT is low-tech) or cost considerations (ORT is low-cost), we should surely expect this kind of cultural transmission of ORT practice to take place.*

What all of this means for cost analysis is that most of the improved health status yield to the resources committed to the project will be realized and manifest in the years following termination of the project per se (more

*2 Sometimes comparisons with programmes implemented in other settings may be useful in helping to inform judgements about cost effectiveness.

*3 When such a point may be reached is, of course, an issue for project evaluation. Some experimentation with successive attenuation of project activities may be necessary to make a determination on this score.

generally, termination of the kind of programme that was the project). One implication of this for the present purposes is that it raises questions about how to interpret and use cost findings such as those calculated and presented by the NCDDP which are based on direct temporal association of costs and benefits.⁴

For example, the NCDDP has estimated that for 1985, the cost per case treated with ORS was \$ 0.43 and per death averted from \$ 83.52 - \$92.12. These numbers were arrived at by comparing total cases treated and deaths averted in 1985 with total project expenditures in 1985. What is the investigator to do with these findings?⁵ For example, might they help to inform important judgements about project performance or, more generally, judgements about the commitment of resources to ORT programmes? The answer to these questions is "probably not". For example, these findings cannot be said to represent the rate of return (in terms of cases treated and deaths averted) to the resources committed to the project in 1985 - after all, most of the health services and health status events properly to be attributed to 1985's resource commitment (and that of prior years) have yet to take place in that year. Again for example, these findings cannot be said to represent the budget cost to the project of securing the 1985 in health services and health status events - after all, project expenditures in 1983 and 1984 were necessary to build the demand for ORS and to build the supply system for ORS both of which are decisive for 1985's performance. More generally, it is far from clear just what use the investigator might make of findings of this genre.

⁴ The reader will appreciate that this is a very different kind of situation than that which is obtained for the usual health project, say the typical basic health services project. Unlike NCDDP, such a project is itself a health services delivery programme, albeit on a small or "pilot" scale. In order for the health status impacts of this kind of project to be generalised to the system as a whole and over future time, the programme represented by the project must itself be replicated over time. That is, most of the programme costs which were incurred to secure results during the term of the project will continue to be incurred to secure these results in future years, e.g. for health manpower, supplies, etc. In this kind of case, unit costs, say calculated on the basis of project performance during the term of the project may represent a good estimate of longer run costs for these results in the future.

*⁵ We here neglect such questions as whether the findings in question measure true economic cost (distinguish project budget cost), etc., and whether "cases treated" and "deaths averted" have been properly measured, etc.

Perhaps the best way to approach costs analysis for ORT projects of the NCDDP type is to divide the analysis into two rather different parts. The first question would be: what does it cost to effectuate the intended change in the health services system? That is, what does it cost to change the way in which diarrhoea is managed (treated in Egypt - by both mothers and by health care providers of all kinds?). Pursuant to answering this question, the investigator would assemble information on cases (properly) treated with ORS (and possibly, but not necessarily, reductions in DEM) in order to measure the extent to which the project has changed the way in which diarrhoea is managed in Egypt. (Note that this is the reason for assembling such data, rather than to use it to calculate unit costs for these outputs during the term of the project). Here the output unit to be costed, so to speak, is "health-care-system change" such that total project costs "to date", i.e. to the data observations are being made on the extent to which changes have been achieved in the way in which diarrhoea is managed in Egypt, represent the relevant costs, that is, part one of the analysis in effect regards (most) project expenditures as "development" (capital) expenditures - to be amortized (expensed) over the coming post-project years during which their output consequences will be manifest.⁶

In the second part of the analysis the question would be: is the project expenditure necessary to effectuate the system change (determined by analysis addressed to the first question) "worth it"? Pursuant to this question, we would attempt to analyze expected future costs and benefits (future health-services and health status events) in the period after the project has terminated - comparing this to what might have been expected had the system change not been effectuated.

Some during project term cost experience will be relevant for these estimates of future cost events, e.g. production, distribution and administration costs for ORS versus the same for IV/drug regimens. Generally, however, calculating during project term unit costs on the basis of total project costs would be considered relevant for judgement about whether project expenditures were worth it only if a very special and probably unrealistic assumption were being made - namely, that to realize the benefits in future years will require maintaining in future years resource commitments of the kind and at the rates featured by the project.

⁶ Whatever the terminology employed (e.g. "communication" a large part of the NCDDP budget goes for the education of mothers, other householders and providers. We are reminded that economists characterize and analyse expenditures on education as "investments" in "human capital".

As an analytical framework, the approach to costing outlined foregoing (albeit not without some difficulties of its own) would appear to be a reasonable and logical way to conceptualize the costing problem for a project such as the NCDDP. We undertake in the next section of this report to apply this conceptual framework to some important elements of system change effectuated by the NCDDP - namely, enhanced mothers' knowledge about ORT and dehydration and improved access to ORS.

2. The cost of two important system changes, mothers' knowledge about ORT and dehydration and improved access to ORS

According to the project (see Three Year Status Report) by the end of 1985, 98% of others knew about ORS, ORT and dehydration, say, some 7.5 million women, at least.⁷ This should be regarded as an important project output in its own right (i.e., in addition to whatever significance it may have as a so-called "indicator" of other health-impact or health-services events). For one thing, it is a necessary, if not also sufficient, condition for achieving the health-status and health-services impacts which are the stated purpose of the project. In addition, this knowledge output can be considered responsible to a kind of moral imperative in this domain. The dehydration consequences of diarrhoea cause a high rate of mortality among children here. There exists a simple, inexpensive threatment regimen - namely, ORT by means of which mothers themselves can save the lives of their children. Surely we can agree that the health services system is under an obligatio to get this word out to these mothers.⁷

In reckoning what it has cost to effectuate this system change, we should take account of total project expenditure to 31 January 1986 for the following budget items:

Staff office and related JSI costs:

These are necessary organization overhead expenses for implementation of the project to achieve its various outputs, including the instance knowledge output.

Research and Evaluation

The distinction between these categories of expenditure has not always been clear. In any event, some of the information assembled in this way has been used to inform project policy and operating decisions. Beyond this, these expenditures can be regarded in good part as necessary for building the total organization effort, e.g. as by helping to get certain important constituencies "on board" for the ORT enterprise.

⁷ This is an estimate of the number of women aged 15-35 years, based on the 1976 Population and Housing Census sex and age distribution of the population data (reported in Statistical Yearbook, 1952-1983, p.20) adjusted to reflect current total population.

Mass Media

The bearing of this item is straightforward.

Training, conferences, and the breast feeding project

What are called training expenditures have been directed to providers, not mothers. However, providers are supposed to be an important source of ORT information for mothers, so that the mothers' knowledge output we observe may well be to some extent owing to these expenditures.

The following table exhibits these various expenditures, viz:

<u>Budget Item</u>	NCDDP expenditures ⁸
	<u>1.9.83 - 31.1.86 - LE (000)</u>
Statt office and related and JSI costs	2,477
Research and Evaluation	847
Mass Media	1,263
Training, conferences and the breast feeding project	<u>924</u>
Total	LE 5.5 million

⁸ This table was compiled from data in the NCDDP summary Certified Fiscal Reports showing total expenditures from 1.9.83 to 31.1.85 and 1.2.85 - 31.1.86. JSI expenditures do not appear in these reports. They have been estimated from data supplied by USAID and converted to LE equivalent.

If we adjust the earlier expenditures to reflect inflation (to arrive at 1985 LEs) the total is about LE 6 million or about LE 0.80 per beneficiary for the 7.5 million women in the target beneficiary group.

To characterize the foregoing budget item expenditures as on mothers' knowledge account means just that they were all incurred pursuant to and presumably contributed to this result. This mothers' knowledge was not the only output secured by these expenditures. Indeed, they also produced another important system change - namely, improved access to the ORS supply system.⁹ The NCDDP has improved the ORS supply system, and thereby improved access to ORT in various ways, e.g. 5.5 gm (rather than prior 27.5 gm packets), comprehensive coverage (supplies regularly available in some 9,000 public and private outlets), and a more reliable distribution system.

Improved supply and supply system for ORS and thereby improved access to ORS should, like mothers' knowledge output, be regarded as an important project output in its own right. Like mothers' knowledge output, it is a necessary, if not also sufficient, condition for achieving the health status and health services which are the purpose of the project. And, as with mothers' knowledge output and for the same kinds of reasons, improved access output can be considered responsive to a kind of moral imperative in this domain.

In reckoning what it has cost to effectuate this aspect of system change, we should take into account some costs in addition to those set out foregoing - namely, these additional budget items:

ORT equipment for Governorates and local services.

The bearing of this item is straightforward. Expenditures on this account 1.9.83 - 31.1.86 came to about LE 2.2 million (source as for table foregoing)

ORT production and distribution.

We are looking at system status as of 1985, i.e., resulting from system change effectuated to that date. What is relevant to system performance status in 1985 on ORT supply account would seem to be that ORS which was in and moved through the system in that year. The project costs for this include production costs for the MOH's share and the 12% distribution cost for the ORS moving through the private pharmacies. A rough estimate of the total of both these costs is LE 0.490 million.

⁹ Mothers' knowledge and the improved ORS supply system are joint products (outputs) of these expenditures, i.e. not to be partitioned to each.

Thus, the total additional expenditure to effectuate the improved-access system change is about LE 2.7. This brings total system change costs to about LE 8.7, or, in round (and hence more memorable) numbers, a little more than LE 1.0 per beneficiary for the women in the target beneficiary group.

3. Were the development expenditures to effectuate system change worth it?

This is, of course, the question we would like to be able to answer. There are various ways to approach an answer to this question, and none of them are perhaps very satisfactory, given the information available at this point.

It will pay us to seek some overall perspective by performing a kind of intellectual experiment. However a given programme may be financed, (e.g. by general tax revenues) in evaluation of whether the resource commitment to the programme was worth it, economists frequently appeal to a willingness-to-pay criterion, i.e. would the beneficiaries themselves be willing to pay for the programme to secure the programme benefits?¹⁰

Suppose that, pursuant to our intellectual experiment, we address the following hypothetical question to a representative hypothetical mother-beneficiary respondent:

"Suppose that for a little more than LE 1.0, you could "buy in" (so to speak) to a health care system in which you would be given sound knowledge about ORS, ORT and dehydration and in which ORS would be readily available. You understand that the knowledge and access provided by this system may well enable you to prevent grave consequences, even death, owing to dehydration. Moreover, if because of this knowledge/access you managed even one episode of diarrhoea without resort to frequently prescribed non-ORS medications, you could thereby recover the price of admission to the system. Would you be willing to pay LE 1.0 to 'join the system?'"

¹⁰ This kind of analysis belongs to the domain of what economists call formal welfare analysis. Suppose that we are to implement a given programme to be financed out of general tax revenues to deliver benefits to some sub-set of the population, the beneficiaries. If the beneficiaries gain enough from the programme to be able to compensate the "losers" (the general tax payers) for their share of the programme cost and still have something left over, the resource commitment is regarded as worth it (although compensation will typically not actually be paid).

The intellectual experiment proposed in the text is not literally an instance of applied welfare analysis - but it is very much "in the spirit" of such analysis. In the case of health programmes such as ORT the division of participants into "gainers" and "losers" is artificial, in that to the extent that the programme serves general social values, everybody is a gainer.

It is hard to imagine that the answer of an informed, representative hypothetical mother-beneficiary to this question could be anything but a resounding "yes".

The conceptual framework for evaluation set out foregoing - i.e., regarding most NCDDP expenditures as essentially development expenditures on system-change account, recognizing mothers' knowledge output and improved access output as important outputs in their own right, the implications of the intellectual experiment on willingness to pay - is the most meaningful way, at this stage of project development and with the information available, to draw attention to the relative costs and benefits of the NCDDP programme. From this point of view, we should reach the conclusion that NCDDP expenditures have been very much worth it in terms of gains achieved. Indeed, given the generally acknowledged difficulties health projects typically experience in achieving any significant yield to the resources committed, one must be the more impressed by the NCDDP achievements.

4. Cases treated with ORS

The analysis as developed to this point has entailed only a very sensitive accounting for project outputs and, by itself, understates the yield to resources committed to the project. After all, a purpose of the project is to have a favourable impact on health status and health services events, such that we would like ultimately to be able to measure the yield to resources committed to the project in terms, say, of the number of cases of diarrhoea appropriately managed. Hard data on this dimension of system performance are not now available. Nevertheless, there are data to suggest large-scale use of ORT to manage diarrhoea and this output should be recognized as part of our effort to compare costs and benefits.

According to NCDDP, in 1985 1,464,000 cases of diarrhoea in children aged 0-4 years were treated in MOH facilities. This finding appears to be based upon reports from MOH facilities to CDDP (See Programme for the Control of Diarrhoeal Diseases (CDD), Management Information System form, for completion at national level, p.2). And, according to the NCDDP, in 1985, 111,020 diarrhoea cases in children under two were treated at home with ORS. This finding is based on an estimate of the prevalence of diarrhoea episodes (from Diarrhoea Taxonomy Study) and an estimate from a project survey which showed in 1985 that 78% of under two year olds who had diarrhoea in the week prior to the survey received ORS. How hard these findings are is the subject of some controversy.¹¹ However, independent evidence on the "disappearance" of ORS may help to suggest whether these case load figures are plausible, at least. According to figures supplied by the project, in 1985, about 30 million 5.5 gm packets were distributed via the Middle East and Egydrug to the private pharmacies and presumably sold by them (assuming that the pharmacies who were ordering from these distributors maintain their usual inventories). In addition, about 10 million 5.5 gm packets were used in the MOH system. This would make a total of 40 million packets which at, say 3.5 packets per case, would be enough to treat 11.4 million cases. In addition, in 1985, there

11 This finding is from Incidence of diarrhoea-associated illness in children aged two years and under in eight Egyptian Governorates. Final report, 1985. First Round Census of Children, Sinai Consultation Group, January 1986, p.26 reports "of the 4493 children who had diarrhoea during the previous week, 3616 or 78.3% were given ORS ".

Another survey of 1985 experience comes up with somewhat different findings. See Evaluation of National Control of Diarrhoeal Diseases Project, National Campaign Knowledge, Attitudes and Practices of Mothers, Social Planning Analysis and Administration Consultants (SPAAC) Cairo, January 1986.

Table (14) page .. of this study reports cases of children sick with diarrhoea during the summer of 1985 who took ORS and who did not give reasons for not giving ORS. The finding here for 1140 cases is that 58% gave ORS.

Table (4) page .. of this study reports first and second actions of mothers to child diarrhoea - "gave ORS" adds up to 16% for both. The difference between the table (14) and the table (4) findings is apparently owing to the role of physicians' advice in use of ORS. Thus, as a first action, 40% of mothers sought physician treatment and as a second action 82% of mothers sought physician treatment. Thus the additional ORS was presumably administered on the advice of physicians (in health facilities or private practice).

was considerable utilization of UNICEF 27.5 gm packets by the health facilities (see 1985 Summary Report which notes that stocks of these packets have decreased "remarkably"). All in all, the information on utilization of ORS suggests that the estimate of about 14 million cases of diarrhoea treated with ORS in 1985 is plausible, i.e. probably a good approximation to reality.

Not all of this utilization of ORS can be regarded as owing to the ministrations of the NCDDP, there having been a history of ORT prior to the project. For example, from 1980 through 1983, it appears that an average of about 5.7 million or 5.5 gm packets per year of "Rehydran" were moved through the pharmacies. Thus the 1985 utilization rate would represent about a five-fold increase so that by far the greater part of the 1985 utilization can be attributed to the project. It is clear that a very large increase in the number of diarrhoea cases treated with ORS must be counted among the significant achievements of the NCDDP.

5. Out of pocket cost to consumers of managing diarrhoea

Generally speaking, the terms upon which consumers have access to care are an important consideration in evaluating health care programmes and projects. The money cost of health care services is one important term for access (other important terms include time cost and travel cost). From an equity point of view, money costs should not be such that an unacceptable burden is imposed upon those at the lower end of the income distribution. And, from the point of view of achieving the desired health status impact, this cost should not be such that utilization of medically-needed services is discouraged.

Judged by these standards, the NCDDP might be expected to make a major contribution to consumer welfare. ORS is available in MOH facilities free of charge to the consumer. However, it would appear that at least 60% of the ORS utilized will move through the private pharmacies at a charge of LE 0.45 a ten pack to the consumer. Is the cost of ORS from this source apt to be a burden? According to project data, the average number of diarrhoea episodes is about six per child and the average number of 5.5 gm packets required per episode is about 3.5 on the basis of these assumptions, the average yearly household outlay for ORS would be about LE 0.90 per child under two - a miniscule proportion of household income even for most of those at the lower end of the income distribution in Egypt.

The ORS outlay compares very favourably with alternative treatment regimens where commonly prescribed non-ORT remedies may cost on the order of LE 1.0 per treatment. Thus, if the consumer relied solely upon ORS, substituting it for other remedies, there would be considerable savings. If, however, the consumer utilizes ORS in addition to and as a supplement to other treatment regimens, this benefit is lost. To evaluate this aspect of the NCDDP programme, good information is required on the extent to which the greatly enhanced utilization of ORS is substituting, versus supplementing other treatment regimens.

6. Health status impact of the NCDDP

It is a plausible supposition (hypothesis) that the greatly increased utilization of ORT in Egypt owing to the NCDDP programme has had a significant and favourable impact on health status - notably, a significant decrease in diarrhoea-related morbidity and mortality (DRM). One might seek to test this hypothesis by direct observation on changes in DRM. A great problem with this approach, however, is the problem of making reliable observations on changes in DRM over any given short run period. Alternatively, this supposition might be affirmed or rebutted by good information on the extent to which ORT is being correctly (medical standards) administered by mothers and providers. This is so because there appears to be a tight "engineering" (medical-technical) relationship between correctly administered ORT and reduced DRM.

The project has sought to collect information on correct administration of ORT. According to project sponsored surveys a large and increasing proportion of mothers "know correct ORS use" - from 53% in January 1985 to 90% in November 1985. (See A Three Year Status Report, p.23). Pending more extensive investigations on this score, findings such as these must be regarded as at least very encouraging.

7. The question of cost effectiveness

The analysis has so far reached the conclusion that when comparing costs and benefits, it is fair to say that NCDDP has achieved a great deal of benefit for modest expenditure. This is not to say that NCDDP has maximized output with the resources allocated to the project's programme. Nor is it to say that more output could not have been achieved had the resources used by the NCDDP been deployed in some alternative programme. This is the question of cost-effectiveness, one which cannot be answered on the basis of information available. Whatever might be taken as the NCDDP output for purposes of cost-effectiveness analysis, e.g. mothers' knowledge, improved access, diarrhoea cases treated, deaths averted, it is not really possible to do such analysis because there has been no experience here with alternative nation-wide programmes to achieve the NCDDP purposes. Hence, of course, no data are available on the cost of such alternatives.

Related to this question, however, there is some testimony that the NCDDP might have achieved whatever it has achieved with a smaller expenditure than that actually incurred. For example, according to an in-passing comment by Dr Farag El Kamel (session on communications/mass media), exclusive of the cost of air time, an expenditure of about LE 100,000 would have produced most of the effect produced by the project's communications programme, a considerable saving compared with the LE 400,000 plus spent on communications (exclusive of air time). Kamel's assertion does not tell us how or where the savings might have been achieved. A good part of this, however, appears to be the LE 200,000 spent on billboards - there appears to be general agreement that not much was gained with this communication strategy.

More generally, the NCDDP has operated with a very loose budget constraint - indeed, the funding available to the project has enabled it to budget for whatever programme components project managers thought would yield benefits commensurate with the commitment of resources. This circumstance may be reflected in the fact that during FY 1985, the project in fact expended only 50% of what had been budgeted for that year. Some at least of this failure to implement the planned budget can be traced to such factors as CID's failure to produce the quantity of ORS contracted for.

Adequate funding is, of course, necessary to the success of any project although it is not also sufficient for such success and NCDDP represents no exception to this general proposition. More particularly, for NCDDP, generous funding, albeit helpful, cannot properly be regarded as the major factor in project success. The question that is raised by the loose budget constraint is the extent to which, if at all, the project was characterized by some organization slack, so called "X-inefficiency" - less productivity from the various inputs that might have been achieved. Suppose hypothetically that the NCDDP had operated under a tight budget constraint such as that project management had and was motivated to run a "lean, mean" shop (as the argot of the say would have it). Might this have resulted in significant cost savings without significant diminution of project output? Whatever the answer to this question, it is of some relevance for thinking about costs of future enterprises of this kind.

8. Fiscal burden implications of the NCDDP: an aspect of sustainability

It is frequently remarked that the NCDDP has a very large budget (compared to what?) - an implication of this being that there may be problems sustaining an ORT programme in Egypt after the project has terminated and project funds are no longer available. As has been explained foregoing, would we not anticipate that continuing ORT activities in Egypt would require a continuing resource commitment of the kind represented by the project. Nevertheless, it may help to gain some perspective on the size of the NCDDP budget to compare it with total Government of Egypt current expenditures for health over the project period to date.

According to USAID, from January 1983 to April 1986, the NCDDP has disbursed \$14.7 million. At the agreed project exchange rate (US \$1.0 equals LE 0.83), this represents about LE 12.2 million.¹² During this same period, GOE total government current expenditures for health came to LE 1052.0 million. (See Table 1 following for GOE budget data from which this figure has been calculated). Thus, project expenditures to date have amounted to about 1.2% of total GOE current expenditures for health over this same period. Since most NCDDP costs are paid by USAID, the project does not represent a burden on the GOC fisc. However, had the GOE picked up the tab for the project, the resulting fiscal burden would have been small. Or, looked at another way, as a kind of "worst case" for sustainability - if, after the project terminates, the GOR were to go on making resource

¹² According to NCDDP accountants, from June 1982 to April 1986, cash receipts from AID were LE 11.3 million. And expenditures from June 1982 to 31 May 1986 were LE 10.1 million. Although the NCDDP technically began earlier, there is general agreement that project activities did not really get underway until January 1983. The USAID account includes some direct payments in dollars (e.g. to JSI) which do not appear in the project budget.

commitments to ORT at the same rate, the fiscal burden implied would be small. Another way to look at this matter is in terms of project costs per capita for the population of Egypt. Over the project period to date, project expenditures have been at the rate of about LE 3.7 million per year. For an Egyptian population of 48.6 million, this works out to about LE 0.08 per capita or about LE 0.40 per household assuming five persons on average per household.

TABLE 1: GOE CURRENT EXPENDITURE: HEALTH AND TOTAL (LE millions)

<u>FY</u>	<u>Health</u>	<u>Total</u>	<u>% health of total</u>
1980/81	141	3906	3.6
1981/82	213	5240	4.1
1982/83	248	6306	3.9
1983/84	282	7697	3.7
1984/85	312	8881	3.5
1985/86	350	10182	3.4

Source: IMF 1980/81 - 1983/84 actual expenditure
1984/85 - preliminary actual expenditure
1985/86 - budgeted expenditure

The NCDDP resources include a US \$17.0 million equivalent contribution from the GOE (in addition to the USAID \$26.0 million budget). There is a question of how to treat this GOE contribution for purposes of calculations such as the foregoing. Except for a couple of very small items (mainly base pay for 30 MOH employees assigned to the project and POL for a few vehicles), the GOE \$17.0 million equivalent contribution does not entail cash outlays - it represents the imputed value of MOH personnel and facilities which are regarded as inputs to the project, personnel and facilities that are already in place as a regular part of the MOH system. Thus, the GOE contribution does not directly entail any increase in fiscal burden for the GOE and it would appear appropriate to neglect it for purposes such as the calculations foregoing.¹³

¹³ Whether the GOE contribution should be regarded as entailing an indirect increase in fiscal burden or on general terms. An economic cost of the NCDDP is discussed in another place.

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The foregoing way of looking at this matter may contribute some perspective on the matter of the size of the NCDDP budget - thus the size of that budget relative to the GOE's own fiscal commitment to health is relevant to this purpose. It is not, however, very directly relevant to the question of sustainability. This is for the reason that, as explained foregoing, we would not anticipate that continuing a full-scale ORT programme in Egypt after the project has terminated would require a continuing resource commitment of the kind and at the rate represented by the NCDDP. That is, the sustainability question is not whether a NCDDP-like programme can be sustained, but whether a satisfactory ORT programme can be sustained. What MOH resources would be required to maintain the MOH's share of a full-scale ORT programme in Egypt after the project terminates? At present, no definitive answer can be given to this question. However, a few illustrative calculations for major inputs may give some helpful perspective.

One such input is the ORS used in MOH facilities, on location and for giving to mothers. How much ORS would be required would depend upon the MOH's share of the national ORT case load. It is difficult to estimate what this might be. We do know (see prior discussion) that in 1985 the MOH system used about 10 million 5.5 gm packets and some unknown but significant number of UNICEF 27.5 gm packets, say, a total of the equivalent of 20 million 5.5 gm packets. (Since in 1985 about 30 million 5.5 gm packets were distributed through the private pharmacies, this assumption would yield the 40% MOH to a 60% private pharmacies split, which the project has seemingly contemplated.) If the MOH were to buy these packets at the prices now paid by the project, the tab would come to LE 720,000 - or about 0.2% (i.e. two-tenths of 1%) of the 1185/86 GOE current (budgeted) expenditure for health.

Put this way, the fiscal burden implied by ORS requirements for a full-scale ORT programme appears to be miniscule, as indeed it is compared with the total fiscal effort on health account. This may not be the only relevant comparison, however. A more relevant comparison for some purposes might be with the MOH's budget for supplies and more particularly for drugs, since this is, presumably, the budget ORS would make a claim upon. We do not have a current figure for the MOH drug budget available. We know, however, from an earlier study, that in 1978 the MOH provided only LE 0.26 for drugs per capita for the population as a whole.¹⁴ And there is reason to assume that there is still very little available in the MOH system for drugs.¹⁵ The ORS expenditure assumed foregoing would come to about LE 0.015 per capita - a small amount, but still apt to be more than a fraction of 1% of the drug budget. For example, assuming a 15% inflation rate, if the MOH 1978 drug budget had been maintained in real terms, it would now be about LE 0.67 per capita, of which the ORS per capita expenditure would be about 2.0%.

One might content that a, say 2.0% loading on the MOH drug budget should not be regarded as ominous from a sustainability point of view - and this judgement might indeed be the correct one. There is no guarantee, however that however small the ORS loading on the drug budget that it would be accommodated by those who make decisions about allocation of drug budgets.

It should also be noted that our assumption that on the order of 20 million 5.5 gm packets of ORS would be "required" by the MOH system for its share of a full-scale ORT programme may be quite wrong on the high side. After all, given the very small amount of funding available in the MOH system for drugs, many patients most of the time have to depend upon drugs obtained from the private pharmacies (MOH facility physicians give patients prescriptions to be filled outside). ORS is perhaps a particularly good candidate for distribution in this way since, as has been pointed out, out of pocket costs to the household for ORS would amount to only a miniscule fraction of incomes even for most of those at the lower end of the income distribution.

Additional longer-run (after the project has terminated) ORT programme expenses might be considered from a sustainability point of view, but not much that is definite is apt to be yielded by such an exercise. What about additional personnel costs? According to the project, about 1.5 million cases were treated with ORS in MOH facilities in 1985, or an average of 500 cases for each of the 3,000 ORT centres established by the project. For a 120 day diarrhoea season, this would come to an average of about 4 cases per centre per day, seemingly a small additional claim on staff time (unless ORT centre staff have been "dedicated" to these services only). What about ORT equipment and the like? The project has spent about LE 2.2 million for ORT equipment, etc. Whether this is represented by real capital which needs to be maintained intact for a successful ORT programme is unclear. If so, what life should be assumed for it? Assuming, say, 10 years, this would allocate an average of about LE 200,000 a year to expenses - very small compared even to the projected ORS requirements estimate.

14 See MOH, Health Profile of Egypt, Study on Health Financing and Expenditure in Egypt, Publication No. 10, April 1980. The data reported in this study are for 1978.

15 The FY 85/86 current budget for Shoubra District, Cairo, appears to provide only about LE 0.29 per capita for drugs for the population of the district. If this is representative for the MOH system as a whole, it would imply a drastic cut in the MOH drug budget in real terms since the findings of the 1980 study. We are much in need of good information on this and other aspects of the MOH budget in order to gain some perspective on the implications of expenditures for ORT.

All in all, the somewhat sanguine view of the fiscal burden problem implied by comparison of ORT programme costs with total GOE current expenditures for health does not appear to be greatly altered by these additional considerations. Moreover, it may with good reason be contended that calculations of the kind set out foregoing no doubt overstate the fiscal burden implied by NCDDP induced by otherwise maintained ORT programme activities. This is so because ORT is expected to in a large part supplant other more expensive diarrhoea case management strategies - notably, hospital-based, IV/drug regimens. Thus, the average cost of case management can be expected to go down. On the other hand, the total number of cases managed can be expected to go up (increased demand for, and access to ORT). The net impact on the total cost of managing the government health system's share of diarrhoea cases in Egypt will determine the fiscal burden. Data such as that displayed in Table II (following) will be relevant to reckoning these costs. According to Professor Mahmoud El-Mougi, prior to development of the large scale ORT programme, the University Hospital had an average IV/drug case load of from 5.10 cases per day during the 120 day diarrhoea season, i.e. a total of about 900 such cases during the season. He estimates the cost of managing each such case at LE 25.0 on average - for a total outlay of about LE 22,500 for the season. The average cost of ORT management in this hospital is estimated at LE 1.0, or a total of about LE 4,000 for the cases managed during 1985 - a considerable saving.

TABLE II: Attendance Data for the DDRRC of the Bab-El-Shareya University Hospital

Year	1983 ¹	1984	1985
Degree of dehydration (%)			
Mild	84.5	89.8	89.2
Moderate	14.0	9.4	10.1
Service	1.5	0.8	0.6
Method of rehydration (%)			
C&S ²	97.9	98.1	97.7
NGT ³	1.2	1.2	1.6
IV ⁴	0.9	0.7	0.7
Period of Stay (%)			
6 hours	94.5	97.7	94.9
6 hours + ⁵	5.5	2.3	5.1
No. of deaths	14	18	24
CFR ⁶ (per 1000 children)			
Attending	4.2	3.4	6.0
Admitted	89.7	155.1	113.7
Total children			
Attending	2843	5010	4139

1 Data for May to December only

2 Cup and spoon

3 Nasal-gastric tube

4 Intravenous solution

5 Those who remain more than 6 hours are considered admissions

6 Case fatality rate

Various of the foregoing calculations relating to the fiscal burden implied by the NCDDP programme (or successor ORT programmes) are rather rough and ready in various ways. Nevertheless, they give a good sense of the fiscal burden problem in general terms, such that the yield to attempt to fine-tune these calculations might be very small. It is perhaps a fair conclusion from these findings that government budget constraints need not be regarded as a major bar to sustaining an ORT programme in Egypt.

This, of course, does not mean that there may not be other important problems for the sustainability of ORT programmes in Egypt, e.g. the prospect for various kinds of "organization failure". One aspect of the NCDDP programme which needs critical examination from this point of view is the system that has been put in place for production and distribution of ORS.

9. ORS production and distribution: some economic and sustainability considerations

Description of system

The NCDDP contracts each year with CID company (a parastatal) for the production of the forthcoming year's project ORS supply. The current price paid by the NCDDP to CID (fixed by the National Organization for Drug Control) is LE 0.36 a ten pack (of 5.5 gm packets).

Distribution of packets to MOH facilities is characterized in project descriptions as "through CID" or CID may be characterized as a "distribution channel" for MOH facilities. It is not entirely clear what these arrangements are. In part, this system seems to rely upon MOH vehicles and the regular MOH supply distribution system to pick up ORS at the CID warehouse, to get it to governorate and sub-governorate level stores and ultimately to the MOH facilities of which there are some 4000 (some of which now have ORT centres). This system appears to be supplemented to some extent by CID vehicles and project vehicles. (The extent and precise nature of this needs to be determined).

There are reported to be some 5000 private pharmacies in Egypt. Distribution of project ORS to these outlets is accomplished through two channels. The project sells ORS to the Middle East Chemical Company (a private pharmaceutical distributor) which then sells to the pharmacies. The arrangement provides 12% paid by the NCDDP to cover these distribution costs (such that the project recovers 12% less from sales to pharmacies that it pays to CID for the product). In addition, approximately 20% (now said to be 30%) of the ORS is sold to Egydrug (a parastatal) which maintains regional warehouses.¹⁶ Pharmacists can buy from these warehouses if they prefer. Again, the NCDDP picks up a 12% tab to defray the cost of this distribution system.¹⁷ The pharmacies sell the ORS to consumers at LE 0.45 a 10 pack - a price fixed by the drug control authorities, which is supposed to yield a 20% margin for the pharmacies.

- 20 -

It is very important for the success of the CDD programme in Egypt, both during the term of the project and over the years after the project has terminated, that a stable, robust system for the production and distribution of ORS be put in place and maintained. The existing system (briefly described foregoing) raises some questions on this score, particularly, perhaps, from the point of view of sustainability. We may turn to some of these concerns.

Is CID a reliable contractor?

According to the 1985 Summary Report NCDDP Activities (p.5), in 1985 the NCDEP contracted with the CID company for production of 80 million 5.5 gm packets, 48 million of these were intended for the private pharmacies, 32 million for the MOH facilities. Overall, CID achieved only 54% of this contract, 70% of the order for the private pharmacies and 32% of the order intended for the MOH facilities. CID's failure to meet its 1985 ORS contract obligations is rather disquieting. What accounts for this malfunction? And why the relatively greater under-production of MOH ORS?

Part of the problem may have been that the initial order was too large. Thus, although only 70% of the ORS ordered for the private pharmacies was produced, there were no ORS shortage reports from the private sector pharmacies. The shortfall in production for MOH facilities was covered by the UNICEF 27.5 gm packets available in the MOH facilities. (See 1985 Summary Report which notes that stocks of these packets have decreased "remarkably".) One factor which may have accounted particularly for the shortfall in MOH ORS production, I have been told, is that ORS intended for the MOH was piling up in the CID warehouse creating a storage-space problem. It is not clear why the MOH distribution system was not collecting these supplies more promptly.

16 I am told that Egydrug is empowered by law to requisition up to 20% of any pharmaceutical distributed in Egypt for distribution by itself. Thus, if Egydrug wants to distribute up to 20% of project ORS, the project has no choice in the matter.

17 Although the arrangement does not appear to have been contemplated by the project, three of the four pharmacies contacted (to date), by the Cairo field evaluation team, report that they are getting their ORS directly from CID (as well as from the Near East) along with CID deliveries of other products.

Will the MOH ORS distribution system prove reliable?

Apparent problems with MOH collection of ORS supplies from CID (see distribution foregoing) raise this question. It may be that these events reflect a rational response to a glut of 27.5 gm packets in the MOH system during the latter part of 1985.¹⁸ Or, there may have been other problems. More generally, it appears that the project has in various ways been supplementing and facilitating the MOH distribution system, e.g. additional vehicles for transport of supplies, prompting supply responses to reports of shortages, and so on. It is a very important question for post-project performance of the ORT system in what ways, if any, the regular MOH distribution system will need to be assisted and supplemented to ensure a reliable supply of ORS to the facilities.

Will the ORS distribution system to the private pharmacies prove reliable?

CID produces hundreds of products which it delivers to pharmacies all over Egypt. Presumably, the NCDDP could have elected to rely on this system for distribution of ORS. Instead, however, it elected to bypass this system in favour of arrangements with the Middle East and Egydrug. The reason for this, as I understand it, was the project's perception that CID could not be counted on to achieve comprehensive distribution to all pharmacies in Egypt, i.e. some locations would not be well served. It appears that the Middle East distribution arrangement is to be terminated by the project. It is contemplated that CID will take over distribution of ORS to the private sector (supplemented, presumably, by Egydrug). It is a very important question how well this system will work. Thus, is there good reason to suppose that the reasons that caused the project to bypass this arrangement in the first place are no longer valid? If not, what longer-term arrangements will accomplish reliable distribution to the private outlets?

¹⁸ According to the 1985 Summary Report as of the end of September 1985, there were a total of 1.2 million 27.5 gm packets in the 26 governorate storehouses and an unknown (though possibly large, presumably) number of these packets in the 155 district storehouses and the 4000 health facilities.

175

- 22 -

Will a continuing subsidy of CID ORS production be necessary?

In the normal course of business events, CID picks up the tab for the cost of distributing its various products to the outlets it serves around the country. In the case of ORS, however, NCDDP was paying CID the fixed price of LE 0.36 a ten pack (the price that would have been paid by the outlets) and then paying a 12% distribution fee to alternative distribution channels. Thus, it would appear, CID ORS production has been subsidized to the extent that CID has not incurred the usual costs for distributing it. To what extent, if at all, has this arrangement provided a necessary incentive to make the supply system work? What does the answer to the previous question suggest about future arrangements?

Is there a possibility for more competition on the supply side of the ORS market?

Various features of the ORS production/distribution system can be traced to monopoly on the supply side of the market - i.e. it appears that CID has been granted a legal monopoly on the production of ORS. The facts of life seem to be that NCDDP has had little or no bargaining power in this particular market domain and hence is in a position of doing business pretty much the way CID wants to do business. It appears that there are a number of other pharmaceutical companies in Egypt that could and would be happy to produce ORS. The NCDDP has attempted, albeit unsuccessfully, to promote arrangements under which there would be more competition on the supply side of this market. The consumers of ORS throughout Egypt would be well served by such a development. Meanwhile, however, the project can scarcely be faulted for its inability to change the way in which the GOE prefers to arrange ORS production and distribution.