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PRITECH ASSESSMENT OF THE CRS/TUNISIA

PN/LAD PROGRAM

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Abbreviations Used

CCD	Control of Diarrheal Disease
CNSS	Comité National de Solidarité Sociale
CRS	Catholic Relief Services
DDM	Diarrheal Disease Management
DSSB	Direction de Soins de Santé de Base
GMP	Good Manufacturing Practices
GOT	Government of Tunisia
IMR	Infant Mortality Rate
INSE	Institute of Child Health
KAP	Knowledge, Attitudes & Practices
MCH	Maternal-Child Health
MOH	Ministry of Health
ORS	Oral Rehydration Salts
ORT	Oral Rehydration Therapy
PCT	Pharmacie Centrale de la Tunisie
PHC	Primary Health Care
PN/LAD	Programme National de Lutte Anti-Diarrhéique
PRITECH	Technologies for Primary Health Care
SSS	Sugar Salt Solution
S&T	Science & Technology
USAID	U.S. Agency for International Development
WHO	World Health Organization

ASSESSMENT SUMMARY

ASSESSMENT OVERVIEW

A PRITECH Assessment Team visited Tunisia from 3 through 25 November to review progress made by the Catholic Relief Services (CRS)/Tunisia CDD project during PRITECH I and to plan any eventual PRITECH support to the Tunisia CDD program under PRITECH II. A detailed scope of work was prepared for the team by CRS/CDD Project Director Dr. Mohamed Mansour, and USAID/Tunisia (see Annex I). Dr. Mansour also assured continuity of input to the team during the assessment as team members were not able to arrive simultaneously. The team consisted of Dr. Bob LeBow, CDD Case Management expert, Mr. Camille Saade, ORS Marketing expert, Ms. Mary Dean Purves, Communications consultant, and Agma Prins, PRITECH Senior Program Manager. This report is a synthesis of the separate reports and observations of the four team members.

During the team's visit, CRS/New York officially announced that the CRS office in Tunisia would be permanently closed as of June 30, 1989, and that all CRS projects, including the CDD project, would be completed by March 30, 1989. This unforeseen circumstance necessitated a complete rethinking of the possible role of PRITECH in Tunisia in the future. Under PRITECH I, all PRITECH assistance to the Tunisia CDD program has been through the CRS project. Various options were discussed in a preliminary way with Dr. Mansour and USAID/Tunisia. However, it was agreed to postpone any detailed planning or decision-making for PRITECH II until the constraints and implications of the new situation become clearer in two or three months time. Initial ideas are discussed in more depth in a later section of this report.

PROJECT OVERVIEW

The CRS Diarrheal Disease Management (DDM) project was designed as a three-year project to start in June 1986. The project is implemented by CRS, Ministry of Health (MOH) and the National Committee of Social Solidarity (French acronym: CNSS). Financial support has come from CRS/New York, USAID/Tunisia and PRITECH (USAID/S&T/HEALTH). The Cooperative Agreement between CRS and USAID/Tunisia (for $724,588) was not signed until December 15, 1987. From June 1986 through June 1987, PRITECH provided $123,691 in "Bridge Funding" to allow the project to start as planned (see Annex 2). An additional $73,240 was supplied by CRS/New York in June 1986 and another $100,000 in April 1987.

The long delay in the signing of the Cooperative Agreement and the uncertainty concerning the level of funding during most of 1986 and 1987 resulted in several project re-designs and delays in implementation of major components (viz. the communications campaign). Full-scale project implementation only started in 1988 after the signing of the Cooperative Agreement. The first year of the project (1986-1987) was largely devoted to the planning and preparation of the educational and communications components of the project. A series of KAP and focus group studies with CNSS and health personnel and parents of children under the age of five were completed; education materials were designed and tested; educational activities were initiated in CNSS centers; communications strategies and materials were prepared (see Annex 3). During this time, PRITECH provided approximately eight person-months of short-term technical assistance (see Annex 4). Approximately two additional months of technical assistance were provided in the first half of 1988.

In 1988, training activities continued and were expanded in the CNSS centers; training (refresher courses) materials were developed for MOH personnel and over 3000 health personnel were trained; an extensive mass media campaign, principally six televised sketches, was planned, produced and broadcast; several evaluative studies were carried out and a number of print, training and educational materials were produced (see Annex 3b and 3c).

PRINCIPAL FINDINGS

1. Tunisia CDD Program Development

The CDD Program in Tunisia has gone through two phases: the first, from 1980-1984, emphasized the training of public sector health personnel; the second and current phase placed greater emphasis on getting the ORT message to the public. The development of these two phases was not actively guided by a long-term CDD strategy. Effective implementation of the second phase was further hampered by prolonged initial uncertainty concerning USAID funding of the activities and by weak leadership of the program from the MOH. Despite these constraints, the PN/LAD program made remarkable progress, during 1988 especially due, in large measure, to the excellent technical and management support provided by the CRS project staff.

2. CDD Morbidity and Mortality

Evidence from numerous small studies indicates that both morbidity and mortality due to diarrheal diseases

have markedly decreased in Tunisia since 1980. An estimated 50% of infant deaths were due to diarrhea at that time, whereas only 5-25% are due to diarrhea now. Cases of severe dehydration are now rare. The principal problem in child diarrhea in Tunisia may be persistent diarrhea linked to malnutrition.

3(a) Diarrheal Disease Case Management

While ORT appears to be widely practiced in public health facilities in Tunisia, prescription of antidiarrheals and antibiotics remains common practice, often in addition to ORS. The common use of sulfaguanidine, manufactured by the Central Pharmacy of Tunisia (PCT), is especially worrisome.

3(b) Case management emphasis has been placed on the administration of sufficient liquids, ORS and home available solutions, during acute diarrhea. Insufficient emphasis appears to be placed on continued and increased feeding, during and after diarrhea, respectively.

4(a) CDD Training

Training materials developed for the training of health professionals appear to be excellent, although the results of training evaluations have yet to be analyzed by the Ministry of Health. More than 30% of public sector physicians have participated in CDD refresher courses. However, private sector physicians, who play a large role in health care in Tunisia, have, for the most part, not yet been reached. Also, CDD education in schools of medicine and public health has been uneven and not always adequate.

4(b) Training materials developed for secondary target audiences (those that train mothers - specifically the CNSS staff) are excellent, complete, flexible and appear well adapted to Tunisian realities. These materials have had a very limited reach however, ultimately touching only a relatively small number of mothers.

5. CDD Communications

Laudable efforts have been made in the area of mass media communications, which have been diverse, multi-channel broadcasts during prime viewing and listening times for many months during the peak diarrhea season. However, the content of these emissions has not always been clear and complete. These efforts have not been

coordinated by an integrated communications plan or strategy. The television promotion of five different home solutions (most of which are essentially adaptations of SSS recipes) on a national scale is potentially confusing to mothers.

6(a) CDD Evaluative Research and Information Systems

A very solid program of evaluative research has been carried out which has allowed for regular assessment of the impact of various program activities, monitoring of progress and revision of approaches and methods.

6(b) The routine information system of the MOH is very complex and should be simplified and supervised. Greater emphasis should be placed on information feedback and application to program operations.

7. CDD Program Management

The management of the CDD program in the Ministry of Health suffers from insufficient personnel. No Ministry staff are currently assigned to the program on a full-time basis. This situation makes adequate follow-up and continuation of CDD activities doubtful after the CRS program closes its doors.

8. ORS Supply and Distribution

The MOH is firmly committed to local production of ORS by the PCT. However, detailed and extensive planning is necessary to make a success of this effort, both in the area of manufacturing procedures, and distribution and marketing of ORS. Extensive use of inappropriate and dangerous antidiarrheals remains a major constraint to good diarrhea care with ORS in Tunisia.

PRINCIPAL RECOMMENDATIONS

1(a) Future CDD Program Direction

The third phase of the CDD (PN/LAD) program should be undertaken to consolidate past gains and to assure the sustained practice of ORT by mothers and private and public sector health personnel. The consolidation phase should emphasize: (a) reinforcing the education of parents concerning ORS plus feeding for diarrhea; (b) the training of private sector health professionals including physicians and pharmacists; (c) the development of a sustainable system of ORS supplies through local production, social marketing of ORS to

the public, promotion of private sector sales, and integration of ORS into the regular public sector drug procurement and supply system.

1(b) This consolidation phase should be managed by the Ministry of Health. To do so adequately, the MOH should assign at least one full-time manager to the CDD program. Future technical assistance to CDD in Tunisia should be integrated into the Ministry of Health CDD (PN/LAD) program and work under the direction of appropriate MOH personnel, guided by a detailed operational plan developed with and officially adopted by the MOH.

2(a) CDD Case Management Policy

The MOH should take immediate steps to reduce the inappropriate and dangerous use of antidiarrheals and antibiotics for the treatment of child diarrheas by banning the importation and local production and sale of antidiarrheals, especially in pediatric formulations, and by issuing clear official guidelines concerning the use of antibiotics in the treatment of diarrhea.

2(b) Both in the training of health personnel and the education of mothers, CDD/Tunisia should place increased emphasis on the necessity for adequate feeding during and after diarrhea. Further, operations research should be conducted to identify the most effective therapy for the combination of persistent diarrhea - malnutrition, and a standardized treatment protocol should be developed for this condition.

3. CDD Training and Medical Education

Curriculum guidelines should be developed and promoted for the professional schools of medicine, public health and nursing. Training courses should be organized for private sector physicians and pharmacists.

4(a) CDD Communications Strategy

Mothers' current knowledge, attitudes and practices concerning the management of acute diarrhea episodes should be evaluated to ascertain the impact of previous educational and communications activities and to assure the development of an appropriate consolidation phase educational strategy for mothers. Special attention should be paid to mothers' ability to prepare and administer at least one safe and effective solution to prevent dehydration -- whether that solution be one of

the five recommended SSS-type formulas or ORS. Mothers' knowledge and practice of good feeding during and after diarrhea should also be assessed.

4(b) Based on this review of current levels of awareness, skill and use of good diarrhea care, an integrated communications plan should be developed for 1989 and 1990. This plan should include mass media and face-to-face components. The educational materials and method used for the CNSS centers should be more widely deployed by expanding the number of participating CNSS centers and by identifying other similar channels, especially those likely to reach dispersed populations who may have less easy access to health services.

5. Private Sector Involvement

To the extent possible, private sector institutions should be involved in all components of the CDD program: delivery of health services, ORS manufacture, distribution and promotion, participation in training (both as trainers and trainees), development and emission of educational messages, etc.

6. ORS Local Production

The interest of the PCT in local production of ORS should be supported and should be accompanied by the development of a marketing plan (including advertising). The ORS packets produced should be sold through private sector pharmacies at a price determined by a "willingness-to-pay" market survey. Sufficient incentives, within legal profit margins, should be provided to pharmacists to encourage them to sell ORS products.

DIRECTIONS FOR THE FUTURE: PRITECH'S ROLE

The first step for any continued CDD activity in Tunisia should be the development of a detailed operations plan for a final CDD consolidation phase. Preparation of this plan should be a MOH responsibility under a full-time CDD program manager, drawing on available sources of technical assistance (local and external) as necessary. If the MOH demonstrates its commitment to the management of this final consolidation phase, USAID/Tunisia and PRITECH should explore modalities for offering limited, well-defined support to this effort in order to promote translation of considerable past investments into sustained good diarrhea care in Tunisia. A first step toward defining such assistance would be a visit by senior PRITECH staff toward the end of the CRS/CDD project in mid-1989.

1. THE MINISTRY OF HEALTH AND THE PN/LAD

Interest in the relationship between diarrhea, dehydration and malnutrition in Tunisia dates from the early 1960's when the then director of the Institute of Child Health (French acronym: INSE) published an article on the subject. By 1974, a brochure had been published by the INSE for use in MCH centers which outlined standard care for acute diarrhea. In 1980, a WHO CDD program was launched in Tunisia in collaboration with the INSE (since disbanded). In late 1985, the MOH Department of Basic Health Care took partial responsibility for the management of the program. This "WHO program" emphasized health personnel training and distribution and use of ORS packets (contributed by UNICEF and WHO) for all cases of acute diarrhea. Rice water, carrot juice and SSS were recommended when ORS packets were unavailable. A 1985 evaluation stated that 100% of public sector health personnel had been trained in ORT, although this finding was based on "subjective judgment" rather than on quantitative documentation. After the completion of the 1980-84 WHO program, CDD activities languished until the start of the CRS-assisted PN/LAD. Then, as now, there was no person within the MOH who was solely responsible for CDD.

The current PN/LAD program was initiated in 1986 with funding from CRS and PRITECH. In December 1987, after long delays and repeated rewriting of the original project proposal in the face of budget reductions, a cooperative agreement providing another $700,000 to the project was signed between CRS and USAID/Tunisia.

The program falls within the MCH division of Primary Health Care (the "Direction de Soins de Santé de Base": DSSB). The MCH Coordinator, Dr. Garbouj, is in charge of 10 other programs besides PN/LAD. Dr. Garbouj told the evaluation team that CRS/USAID project staff (all Tunisian, several of whom are on leave of absence from permanent GOT positions) had not done anything without involving her division. However, despite an increasingly active role developing, implementing and directing CDD activities, the limited staff of MCH is unable to pay as much attention to CDD as would be desirable. CRS/USAID project staff, having more technical resources, did much of the work in putting together protocols, training programs, media messages and other CDD activities.

CONCLUSIONS**

1. Despite a long history, CDD activities in Tunisia have been piecemeal and discontinuous, apparently never actively guided by a program strategy integrating all the various components of CDD systematically and harmoniously over time.

2. The role of the MOH in developing CDD in Tunisia has been inconsistent and relatively weak. The evaluation team feels it is likely that, as long as there is no full-time person within the MOH solely responsible for CDD, the PN/LAD program will falter upon completion of the CRS/USAID sponsored project. While some CDD activities may continue under the current MCH department, only strong central leadership can assure that past gains in CDD will be consolidated and that remaining activities necessary to assure full institutionalization of CDD within PHC/MCH will be effectively carried out.

RECOMMENDATIONS**(MOH Role in Future CDD Activities)

1. The MOH should take full responsibility for the design and implementation of a final consolidation phase of the CDD program in Tunisia. This consolidation phase should aim for integration and institutionalization of all components of CDD into the public and private sector health care systems of Tunisia. (The MOH may need full-time technical assistance to develop and guide the consolidation effort. However, such assistance should take place within the context of a program directed and managed by the MOH).

2. The MOH should assign at least one person full-time to direct and manage CDD activities for a period of three to five years or until full institutionalization is achieved. This point will be reached when ORT is widely and routinely practiced by the majority of concerned public and private sector health care facilities, ORS packets are easily and consistently available in both the public and private sector throughout Tunisia, and most parents use good home management practices for the care of their children who have

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**Conclusions and recommendations are numbered successively throughout the report for ease in referral. The following sections of the report and the resulting conclusions and recommendations are organized by technical subcomponents of CDD. Pertinent policy, organizational and technical recommendations are made under each technical component subheading. Unless otherwise indicated, implementation of the recommendations should be under the responsibility of the CDD program coordinator within the MOH or those persons or departments within the MOH which the CDD coordinator deems most appropriate.

diarrhea. Routine reporting of diarrheal cases to allow reasonably accurate monitoring of diarrheal morbidity and mortality will also be possible.

2. MEDICAL ISSUES PERTINENT TO THE PN/LAD PROGRAM

2.1 IMPROVEMENTS IN DIARRHEAL DISEASE MORBIDITY AND MORTALITY

Despite the sometimes piecemeal and discontinuous nature of CDD activities in Tunisia, there is ample evidence to show that both the morbidity and mortality due to diarrheal disease have been markedly reduced since 1980, even before the beginning of the current CRS/USAID DDM Project. Although Tunisia's health information system does not allow a very accurate assessment of the role of diarrheal disease in infant and child mortality, some findings are well documented (see Annex 5 for details):

1. Less dehydration from diarrhea (especially serious dehydration) is being seen in the health establishment.

2. This trend, along with the decreasing proportion of clinic consultations for diarrhea, began even before the CRS/USAID project.

3. Hospitalized children are rarely dying from dehydration because of improved treatment methods, notably ORT.

It is probable that CDD efforts have contributed to these positive trends, that mothers are providing better home care for children with diarrhea and are bringing their children to clinics earlier when they do get dehydrated, and that many health care workers are providing better case management, including ORS for children who have diarrhea. Other factors may also affect diarrhea rates in Tunisia, however; these include:

- Decreased diarrheal morbidity due to improved living standards. For example, Tunisia has a strong water program which has resulted in safe tapwater in most urban areas

- High immunization coverage, including measles immunizations, (90-95%) which probably contributes to reduced severity of diarrheal episodes.

- Weak community level health programs in Tunisia. Despite an extensive network of health centers (1,400) and "assembly points" (2,300) for mobile (vaccination) teams, and despite 2,200 public sector doctors and 8,000 nurses for a population of seven million (1/3200 and 1/900 respectively), it is possible that rural dispersed populations are not being reached by the health system. Just as 50% of Tunisian children are born at home without attendance by a trained midwife, it is not unlikely that young children are dying of diarrhea and dehydration at home without ever having been seen by the formal medical system.

A national cluster survey of 16,000 children aged 0-5 years is to be carried out in late November 1988 to measure infant mortality and morbidity. This survey may give some insight into the real importance of diarrhea in Tunisia at this time. Complete analysis of survey results may take up to two years or more, however.

2.2 HEALTH PROFESSIONALS AND DIARRHEAL DISEASE

Tunisia is extremely physician-oriented. Only physicians may diagnose and prescribe medications (except for ORS). As of January 1987, there were about 2,200 public and 1,200 private physicians in Tunisia (1 per 2,250 population). Only three to five percent of those trained in Tunisia choose to take electives in community medicine. There is no standard curriculum used within the four medical schools nor even a standard curriculum used with the public health schools. A medical student in Tunisia may or may not learn the importance of ORT, as each professor of pediatrics designs his own program.

Field visits during this evaluation indicated that physicians were not exercising logic in the treatment of diarrheal disease. One physician said he uses aspirin for diarrhea "because the child might become febrile and have systemic illness like fever". He also admitted using anti-motility agents. Another physician defended the use of sulfaguanidine, which is widely prescribed. Even the Director of the Central Pharmacy in Tunis said sulfaguanidine was highly effective (they produce it). Our field visits confirmed the impression that many physicians prescribed antiseptics frequently (up to 90% of the time, according to one health center nurse).

Nurses seem to have the preventive and the menial tasks in the health system. No diagnosing or prescribing is allowed except in the case of ORT. Even for ORT, the official flow chart for the treatment of diarrhea includes a section stating that even for stage I dehydration (none or minimal) patients are to be seen by the physician "if he is present".

Pharmacists follow the practices of doctors. While about 40% of the pharmacies (private sector) have ORS packets supplied to them free of charge through the PCT regular distribution channels, they are generally giving them out along with the polypharmacy.

Health education programs, generally not well-developed, mirror the medicalized, physician-centered nature of the health system. Tunisian television, for example, carried a series of sketches promoting ORT as part of the CRS/USAID project. In November, the TV station televised a more lengthy depiction of a cardiologist doing coronary angiography at a Tunis hospital.

CONCLUSIONS

3. It does appear as if the prolonged efforts in CDD in Tunisia have had a positive impact on child diarrhea mortality and morbidity. The IMR is declining steadily (52/1000 according to a 1985-86 survey); the share of diarrheal diseases in the IMR also appears to be decreasing (to be confirmed by the November 1988 morbidity and mortality study); the proportion of consultations in the formal health system due to diarrhea disease has dropped markedly between 1980 and 1988 (probably from 30% to 10%). In hospitals, most children with diarrhea are reported to be dying from persistent diarrhea with malnutrition, not from dehydration.

4. Improvements in water supply, nutritional status, vaccination coverage and related improvements in the standards of living have probably contributed significantly to the reduced diarrheal disease mortality and morbidity rates.

5. The health sector is heavily physician-dominated contributing to a curative medicine, clinic-oriented system at the expense of community and preventive medicine. Physicians, setting the "standard of practice" for diarrhea and case management, still prescribe many antiseptics, antidiarrheals and antibiotics, although they also prescribe ORS more frequently than was formerly the case.

6. It is possible that rural dispersed populations may not be experiencing the same improvements in diarrheal disease morbidity and mortality as populations with more ready access to the formal health system.

RECOMMENDATIONS

3. Future CDD Strategy re: Case Management and Prevention

The consolidation phase of the national program to control diarrheal diseases in Tunisia should be based on the current factors and circumstances affecting related morbidity and mortality in Tunisia. Continued improvements in water supply, nutritional status and maintenance of high levels of immunization coverage should be promoted. The increasing prescription of and demand for ORS should be encouraged. Specific program weaknesses should be addressed: the continued use of polypharmacy and, especially, pediatric use of inappropriate antidiarrheals and antibiotics for diarrhea; the possible limited access of marginal populations to good diarrhea care including health education and ORS. Greater emphasis should be placed on developing case management proposals and strategies for effective treatment and prevention of persistent diarrhea.

4. Policy and Strategy to Curb Use of Antidiarrheals.

Access to antidiarrheals and inappropriate antibiotics, particularly for treatment of pediatric acute diarrheas, should be severely restricted. Importation and sale of dangerous or useless drugs should be banned. (See Annex 19 for specific WHO recommendations) All physicians should be sent official MOH guidelines for appropriate diarrheal disease case management. Pharmacists should be specifically targetted with information concerning appropriate drug use for diarrheal and incentives (and disincentives) should be developed to encourage pharmacists to make appropriate recommendations to clients.

3. TRAINING AND EDUCATION OF HEALTH PROFESSIONALS

3.1 DESCRIPTION OF IN-SERVICE TRAINING ACTIVITIES

Although 100% of public sector health personnel were reported to have received CDD training during the 1980-1984 WHO-sponsored project, PN/LAD organized refresher courses for health professionals starting in 1988. During this year, approximately 600 physicians and over 2,300 other health personnel participated in CDD training activities. The effort reached 30% of practicing public sector physicians. Training of

private sector physicians and pharmacists is scheduled to occur in early 1989.

The DSSB technical staff contributed to the review and synthesis of the training plan and the four technical modules for the MOH personnel. The training materials benefitted from the input of results from focus group and KAP studies conducted in 1986. The following health personnel training materials were developed:

- a WHO-type treatment chart - adapted to Tunisia
- a national level training guide (to train trainers)
- a regional training guide (to train health personnel)
- a set of four technical training modules (accompanying the training guide for health personnel)
- technical brochures.

The training modules are the core of the training program. The technical information in the modules was reviewed by the physician member of the assessment team as well as by the training and education specialists and was found to be technically sound, simple and well presented. One noted lack was the absence of any discussion concerning the development and management of ORT units. The DSSB plans to address this issue upon return of two MOH staff currently on study tour in Egypt, specifically to participate in training on the organization of ORT units. It was also noted that the modified treatment chart may still be too complex for lower level health workers.

It is unfortunate that actual case management practice during training was not judged possible. However, opportunity was provided for demonstration and simulation activities.

Evaluation (and supervision) of the training is the responsibility of the DSSB. Pre- and post-tests done at all the training sessions, are in the process of being analyzed by the DSSB. In the absence of training evaluation results, it is difficult to assess the effectiveness of these training activities. However, on a field trip to the Kasserine/Gafsa region, the training specialist interviewed 10 health staff workers in five MOH facilities. All 10 were asked to detail

the treatment protocol taught at the training sessions as well as one formula for a home solution. Of 10 responses, only three included all three elements of good diarrhea case management (liquids, breastfeeding and feeding during and after diarrhea). Only one respondent was 100% correct in describing the formula for a homemade solution. All 10 indicated that use of other drugs, in addition to ORS, was standard (prescribed by the attending physician).

Sub-module 4, concerned with record-keeping and reporting, appears to provide adequate explanation and practice for filling out the forms developed by the program. However, it was reported to the evaluation team that many health personnel (especially the nurses, who have principal responsibility for this activity) are having trouble filling out the forms correctly. The forms are quite different from others commonly used in the health system, but the reasons for the difficulties were not immediately apparent. (See Annex 17 for copies of the forms).

3.2 PROFESSIONAL EDUCATION

As already noted, no standardized curriculum exists for diarrheal disease training in Tunisia's medical schools. The MOH "Centre Pedagogique" responsible for professional training in medical schools was not involved in the process of developing the in-service training modules developed by PN/LAD and had not seen them as of November 1988. This is unfortunate, as these modules might serve as a basis for developing a suggested medical school curriculum for CDD.

CONCLUSIONS

7. The CRS/USAID in-service training of health professionals only began in 1988 and reached a large number of professionals. These were almost exclusively in the public sector. Private sector physicians have not yet been reached. Given the importance of the private sector health care system in Tunisia (1,200 private physicians, 1,000 pharmacies-Annex 7), the training of these health care professionals will be crucial to the acceptance and routine practice of good diarrhea case management in Tunisia.

8. The four technical modules for the training of health workers appear excellent: clear, uncomplicated and scientifically sound. However, several practical elements are missing: the organization and management of ORT units, hands-on experience with rehydration during training. Also, there were indications that health workers were having

problems applying and remembering what they had been taught during training: all the components of good diarrhea case management, appropriate use of drugs for diarrhea, use of reporting forms.

9. Medical students and perhaps other health professional students are not receiving adequate training in good diarrhea case management as a rule.

RECOMMENDATIONS

5. Future CDD Training Strategy re: Private Sector Health Care Professionals

To ensure the institutionalization of CDD in Tunisia, a strategy should be developed and implemented to encourage participation of the majority of private sector physicians and pharmacists in CDD education and training activities. Initial contact/training will need to be followed up with periodic reminders/encouragement.

6. Future CDD Training Strategy re: Public Sector Health Care Professionals

Training of public sector health professionals must be evaluated for its actual impact on health worker knowledge and practice. This can be done through supervision and follow-up visits, which can also be the means to correct or reinforce appropriate behavior. Additional or modified training materials may need to be developed to assure effective organization and management of ORT units, appropriate use of drugs and correct use of the reporting systems. Existing training evaluations (pre- and post-tests during training) should be analyzed prior to any revision of the current curriculum.

The treatment poster may need to be further simplified for use by lower-level health personnel. Appropriate field-tests should be conducted to determine the specific need for any changes.

7. Medical Education Curriculum Improvement

The medical and nursing school curriculum need standardization regarding ORT. This should be coordinated with the Centre Pedagogique of the MOH. (WHO and PRITECH have developed a number of model materials for nursing and medical schools which are available upon request to PRITECH.)

4. EDUCATION OF MOTHERS: COMMUNICATIONS/HEALTH EDUCATION

The communications and health education component of PN/LAD has consisted primarily of two largely separate activities: the face-to-face education of mother through the pre-school and mothers education centers managed by the National Committee of Social Solidarity (French acronym: CNSS), and the mass communications activities broadcast through radio and television. Education of mothers at health centers has received less attention, although training in this area is included in the health worker training materials.

4.1 MOTHERS' EDUCATION THROUGH CNSS CENTERS

The objective of the face-to-face education in the CNSS centers has been to improve mothers' ability to treat diarrhea at home. Education sessions started in 1987 after a long period of socio-cultural research using focus group methodology and subsequent materials development. Sessions were conducted with groups of approximately 20 mother at a time in 104 centers in 1987 and an additional approximately 100 centers in 1988 (exact figures for 1988 are not yet available). Total intended beneficiaries of this component were 40,000 mothers. By the end of 1987, 7,392 had participated in CNSS education sessions (see Annex 8). Of this number, only 15% (1,177) were present at all five sequential courses (see below) and, thus, exposed to the full range of messages.

The materials used in the CNSS education sessions consisted of five sets of materials, each dealing with a separate CDD-related theme, each intended to serve for an approximately one-hour session. These are contained in one portable box, distributed to CNSS center managers during the training provided them by the PN/LAD program (see Annex 9 for a more detailed description of the contents of the box). Five hundred such boxes were prepared.

The materials emphasize participatory, experiential learning methods such as open-end stories, role plays, games and problem-solving exercises. All the materials were extensively field tested and revised prior to their finalization. The themes, content and objectives of the materials were determined on the basis of a well defined national policy, local socio-cultural research and review of the scientific technical literature. The result was materials that are attractive and flexible, lending themselves to a variety of different uses. The sequence of activities is easy to grasp and the materials themselves are easy to manipulate. Each

packet includes a facilitator's guide, a monitoring form and a self-evaluation instrument.

During 1987 and 1988, a total of 221 CNSS center managers participated in a one-week training session to learn to use the educational materials effectively. These sessions were organized and facilitated by seven regional coordinators, CRS employees, and 23 provincial CNSS coordinators. The CRS coordinators participated in all phases of project implementation (focus groups, research, materials testing, training). To prepare them for these tasks they participated in monthly training sessions for the period of one year. After 1987, they were reassigned to other CRS activities. Their accumulated skills may well be lost to the GOT as they are not government employees. The 23 provincial CNSS coordinators participated in one- week training programs in 1987 and 1988. According to discussion with four CNSS center managers (two in Tunis and two in Gafsa):

* The method of training was readily accepted and understood and appropriate to the methodology proposed for educating mothers;

* Participants actively practiced necessary skills during training;

* Evaluations were carried out at the end of each day and at the end of training and were used to adjust activities to the needs of the trainees.

There has, to date, been no analysis of available data (see a following section of this report for details on evaluation research) to measure the impact of these activities on the behavior of participating mothers.

4.2 MASS MEDIA ACTIVITIES

The PN/LAD program has made enormous efforts in the area of mass media communication. These efforts have undoubtedly raised awareness about the proper home management of diarrhea throughout Tunisia. However, there has been a lack of consistency and integration of these efforts which has almost certainly limited the effective impact on parents' behavior which was the ultimate purpose of these activities. During 1987, mass media communications activities concentrated exclusively on radio. In 1988, the emphasis switched to television with the launching of a television campaign based on five allegorical sketches (see Annex 12 for a description).

The original intent of the communications component was to develop an integrated multi-channel educational approach guided by the following principals:

* Mass media (radio, television, print promotional materials--posters, flyers, etc.) should complement and complete face-to-face activities (in health centers, in CNSS mothers' groups).

* There should be similar or complementary content in messages emitted through the various channels.

* Multi-media emissions should be coordinated with each other and with the diarrhea season.

* Message content and form should be adapted according to the results of preliminary research conducted with the target audience (focus groups, KAP studies).

* All education materials should be pretested with the target audience and revised prior to finalization.

* Educational/communications activities should be monitored for effectiveness and impact and periodically adjusted, according to the revealed needs of the target population.

What actually happened was the following:

* Radio, television, promotional print and face-to-face educational/communications materials and activities were developed separately with little or no reference to each other. They were broadcast or conducted separately, at different times, with no apparent interaction or complementarity between the different channels. Face-to-face communications were implemented at CNSS centers in 1987 and 1988 according to a fixed program, approximately timed to correspond to the diarrheal season. Radio programming in 1987 took advantage of existing programs to broadcast a wide range of messages (see Annex 10), apparently only coincidentally in harmony with the face-to-face activities. In 1988, only television sketches were broadcast. These broadcasts started in the middle of the diarrhea season as did the radio messages the year before.

* There is little commonality of themes between the face-to-face and television (nor between radio and television) materials.

* The face-to-face education program encapsulated the "five themes", using a storyline with two children, Hayet and Salah, and their mothers as focus points, in a prepared sequence. It appears that the radio programming was a collection of various formats and themes and was not synchronized with either the TV or face-to-face programs. The TV format departed entirely from the face-to-face format and storyline. Two center (CNSS) managers claimed on separate occasions that 1) the TV messages and instruction differed from what they had learned to be correct, i.e., the importance of boiling water, and the measure of salt which they interpreted from the TV as being a whole and not a half teaspoon (see recipes for home solutions: Annex 18); and 2) the TV sketches "sabotaged" their mothers' courses because the mothers felt they didn't need to participate, having watched the sketches.

* No consistent common symbol united the different forms of communications. The TV sketches contained three different identifying symbols, none of which were repeated in any other medium: the wise old man, an animated logo of a child filled with water, a musical theme.

* Only the educational materials used for the CNSS mothers' education sessions appear to have been systematically developed based on pre-program research and pre-testing and revision of all materials and approaches. Radio programs incorporated little of the focus group and KAP information and were not pre-tested. The same is true for the TV materials. As a result, it appears likely that the TV sketches may not be transmitting the intended messages (using and mixing home solutions, feeding etc.) clearly to the target audience. (See Annex 12 for details).

* To date, no monitoring of impact of educational or communications activities has been conducted to determine comprehension or behavioral impact of these materials. It is, therefore, not possible to assess their efficacy, nor to revise existing materials, nor to devise new materials based on the real needs of the population.

There are numerous reasons for the discrepancy between intent and reality. They include the following:

* The long delay between the original conception of the communications approach and the signing of the cooperative agreement meant that plans for materials development and use had to be constantly delayed and readapted to meet current financial and logistical constraints. Thus, the reduced communications activity scope for the 1987 diarrheal season and the late start in the development of TV materials for 1988 - leaving little time for field testing or modification.

* Responsibility for the communications activities was not constant throughout the project. Initially, the project had a communications expert and an education expert who worked independently on the mass media and face-to-face materials respectively. Later, the responsibility for the communications component devolved on the CRS project director and then was taken over by the National Committee for the CDD program. Thus, each media channel (face-to-face, radio, television, print-promotion) was ultimately developed under the supervision of a different person or group of persons, each with their own ideas and approach.

* The production of the TV materials was placed in the hands of a private sector production company. It appears that the form and content of the TV sketches and spots were dictated largely by the artistic objectives of the film producers rather than primarily by the scientific goals of the CDD communications experts.

* No detailed communications strategy covering all media and clarifying message content, themes, objectives, motivational strategies etc. was ever developed. Therefore, communications activities continue to be developed on a piecemeal, ad hoc basis.

Although no impact data are yet available, it is highly probable that this piecemeal approach has limited the impact of the communications component. The following observations are pertinent in this regard.

* Each channel reaches different segments of the target audience (although there is considerable overlap). For example, the CNSS activities are

directed largely at poor rural or semi-rural mothers. However, only 30% of rural families are reported to have television sets and 45% of rural families have radios. In contrast, 80% of urban families have televisions and 66% have radios. It is estimated that approximately 20% of the total population live beyond the range of health centers and thus are beyond those channels of face-to-face communication. In addition, approximately 20% of the population, especially in urban centers, is estimated to turn primarily to the private sector for health care. Each of these sub-populations is thus likely to be reached by a different communications channel and medium or a different combination of channels and media.

It is, therefore, important that the full range of messages be carried by all available channels and that emissions through different channels occur more or less simultaneously, in order to reach all audience segments.

* Different media have different capacities for influencing behavior. For example, face-to-face communication is the best teacher of practical skills (e.g., how to prepare ORS) and, if correctly done, the best motivator for behavior change. Television is strong in the area of raising awareness and interest but details tend to be lost -- only general impressions remain, unless a determined effort is made to focus attention by special techniques (focus, room, freeze-frame, contrast). Posters, leaflets, and other promotional print materials may be effective reminders of lessons learned elsewhere but may not be effective teaching tools, especially for people of poor literacy skills. Therefore, a wide range of media is necessary to achieve all the goals of communications: motivation, awareness raising, instruction, reminding.

* Repetition is key to successful instruction. Repetition of the same sequence under similar circumstances is necessary for accurate retention. This argues for congruence of messages, language (e.g., wording), themes, approaches between different media. It also argues for frequent repetition of the <u>same</u> spot, material, image over a prolonged period of time and avoidance of complicated or multiple message, whether within a single material (spot, poster, etc.) or by a multiplicity of simultaneously used materials

(e.g., five TV sketches broadcast simultaneously). For the TV program in August alone, there were five different sketches with diverse themes, backgrounds, approaches, storylines, broadcast on the average of three per week (see broadcast schedule: Annex 11). This makes 15 impressions in 30 days that a viewer must try to sift through to get to the lowest common denominator, understand, identify with, accept, practice and retain.

CONCLUSIONS

10. The materials developed for the CNSS centers to be used for face-to-face group education sessions with mothers appear appropriate and potentially effective teaching tools. However, their impact on mothers' practices has not yet been determined. The coverage attained by these materials has been very limited, probably less than 10% of the initial target of 40,000 mothers.

11. Radio, television and face-to-face activities were not governed by a common communications plan and strategy. Theme, message content, style of presentation and the scope of information varied and were not always consistent. Radio and television spots were not thoroughly pre-tested. The promotion of five different SSS type solutions on a national scale is potentially confusing to mothers.

12. Despite the lack of overall coordination and integration of communications activities, the tremendous efforts of the LAD program in this area are to be commended. A solid base has been created which can be consolidated to create a strong, effective program.

RECOMMENDATIONS

7. Future Directions for Use of Existing Face-to-Face Materials

Other channels should be sought for the use of the materials developed for the CNSS centers. All community level organizations engaged in mother education activities should have access to these materials and their representatives should be trained to use the materials. Activities in the CNSS centers themselves should be reinforced and expanded.

8. Suggested Elements for Future Communication Strategy

A survey should be conducted to measure current levels of knowledge, attitudes and practices and, peripherally, to estimate the effects of past communications activities.

Existing gaps in knowledge on practices should be identified and targetted by future communications efforts. Special attention should be paid to mothers' ability to prepare safe and effective home solutions.

9. Suggested Elements for Future Communication Strategy

An integrated, comprehensive communications strategy based on the above survey results should be developed (radio, television, print and face-to-face) for 1989 and 1990. The strategy should build on and consolidate past efforts. Previously developed print, radio and television materials should be reused as appropriate. Complementary materials should be developed to fill existing gaps as revealed by the above KAP studies.

10. Suggested Elements for Future Communication Strategy

Key message content should be agreed to in detail prior to the development of any further materials. Attention should be given to the following elements. However, final message content should be determined based on the results of the survey of current attitudes and practices in relation to the real existing diarrheal disease problem.

Liquids:

- which liquids to give (recommend choosing one home solution to emphasize through mass media -- perhaps ORS. Special regional solutions can be promoted through face-to-face communications in each region).
- how much to give (e.g. 1 liter in 24 hours)
- how to give it (with spoon and cup, after each stool)
- when to give it (when diarrhea starts and as many days as diarrhea lasts)
- what to do with unused solution (store in closed container, throw away and start fresh every 24 hours).

Nutrition:

- continue feeding in small quantities at frequent intervals (4-6 times per day) during diarrhea.
- continue breastfeeding
- feed one extra meal each day for at least a week after diarrhea stops

Referral: o go to a health center as soon as you see any "danger signs" e.g., signs of dehydration, bloody stools, prolonged or very frequent diarrhea.

Drugs: o ORS alone is the best treatment for diarrhea. Other drugs are almost always useless and often dangerous.

Prevention:
- o hand washing
- o breastfeeding and weaning
- o personal and domestic hygiene
- o measles vaccination

11. Suggested Elements for Future Communication Strategy

The TV spots which have been prepared but not yet broadcast should be reviewed. Complementary radio or television materials should be developed to fill any gaps. If possible, test these spots with two or three groups of mothers to ascertain what these gaps are from their perspective. (These already produced spots include the following five short spots of one minute each -- not included in original media plan, and not broadcast as yet):

* A woman in a kitchen prepares five different recipes in which she boils water in a casserole pan; displays an appropriate liter size bottle; pours the water from the pan into the bottle then back into the pan; measures sugar/salt or other appropriate ingredient using spoons widely available in Tunisia; stirs the solution; final moment is a still photo of the mother administering the solution to a child.

* Two to three mixed format spots, four animation and real nature: a series of spots on hygiene, breastfeeding and nutrition. Animation is used to explain, in a whimsical fashion, how bacteria enters a baby's system; how antibodies in breastmilk defend against bacteria and disease, and how proper hygiene fights bacteria. There is also a nutrition chart in graphic design, and the physiological process of sugar/salt solution during a diarrheal episode. These scenes are integrated with live action.

12. Suggested Elements for Future Communication Strategy

A single logo symbol should be selected to represent CDD activities. Determine (ask mothers) which of the existing symbols is associated in the minds of the target audience with the LAD program (the old man? the "water-baby" logo? some other symbol?) use this symbol on all LAD communications materials, as possible: posters, ORS packets, radio (e.g., old man talks or water drips or music), TV spots, etc.

13. Suggested Elements for Future Communication Strategy

Target special activities at mothers who use private sector health care. Coordinate this communications component with the production of local ORS packets.

5. RESEARCH, MONITORING AND EVALUATION

The following program research activities have been carried out to date: (see Annex 13 for more information)

- An evaluation in 1987 of the CNSS centers' functional capacity led to the selection of 104 centers for the mother education program, and provided recommendations for bringing centers up to a certain operating standard. A similar, though modified, process was used to select the 105 centers targetted for 1988 training and educational activities. Selection of Phase III, 1989 centers to be targetted, will follow a similar procedure.

- 642 mothers and 371 fathers were interviewed during a three-week focus group field exercise. Findings were analyzed and contributed to the base documents used in the development of the face-to-face education and training materials.

- 221 CNSS center managers (1986) and 159 Ministry of Health personnel (1988) were interviewed for KAP studies; findings formed some of the basis for the development of education and training materials directed at these target populations.

- 483 mothers in 1987 and 483 (plus 152 control) in 1987 were interviewed for KAP studies. A preliminary analysis of a 30% sample contributed as a base document for the development of education and training materials.

- An observational survey was conducted in June 1988 to observe mothers preparing oral rehydration solutions (SSS and ORS). Preliminary results are currently being analyzed.

- A survey instrument on the availability of ORS packets in public/private facilities has been prepared.

Good study procedures were employed in the conducting of these studies:

- Concise and appropriate survey methods and procedure instructions were used for each research activity.

- Scientific sampling methods were employed (clusters).

- Supervision tools were designed and used during the KAP surveys.

- The 1986 KAP mothers' survey was revised to accommodate findings on content formulation and procedure before the 1987 KAP survey was carried out.

An extensive documentation of the pre-program research activities exists. The reader is referred to these documents for more detailed information concerning these activities. It is suggested that these documents (see Annex 14) be synthesized and eventually published as a resource to other LAD (CDD) programs, since they represent an important contribution to the methodological experience in effective use of research for good planning and program development in the area of diarrheal disease and primary health care.

CONCLUSIONS

13. The process of data gathering for pre-program research and for monitoring of on-going activities and the subsequent analysis of that information is commendable. With the arrival of the evaluation specialist, a systematic approach was instituted that facilitated nearly every aspect of the pre-program research instrument design, logistical arrangements, administration and monitoring of surveys, analysis and application of results and pretesting of produced documents. Preliminary hypotheses were established for all surveys. Very little inappropriate generalization was done from any analysis.

The integrity of the results can be trusted, based both on a review of the process and evidence of application of information in the educational materials.

RECOMMENDATIONS

14. Recommended Future Operations Research

It is recommended that the following operations research activities be implemented in the future:

- Pretest the four educational posters destined for health facilities.

- Encourage the MOH to complete the analysis of the health personnel training evaluation, perhaps as a preparatory step to an eventual revision of the training approach or the health personnel training modules, which appear to have been good.

- Execute a performance survey or evaluation of the already broadcast TV and radio spots.

- Retest the DDM record-keeping forms and make revisions to offer the MOH (see training for further details).

6. ORS SUPPLY, DISTRIBUTION, MARKETING AND PRODUCTION

Until 1986, Tunisia obtained ORS supplies from two principal sources:

- UNICEF donations, totalling an estimated 3 million one-liter packets since 1981, and

- Local production by the parastatal Central Pharmacy of Tunisia (PCT) of approximately 100,000 1/2 liter "ORASOL" packets annually.

Due to breakdown of obsolete manufacturing equipment, the production of ORASOL ceased in 1986. The UNICEF packets accumulated, as quantities ordered were based on unrealistically high usage projections. Approximately 243,900 unspoiled packets of the original three million remained as of 16 November, 1988 (DSSB estimate).

6.1 DECISION CONCERNING ORS SUPPLY

In 1988, the DSSB conducted a feasibility study comparing the costs of ORS packets supplied through off-shore purchase and ORS packets locally produced by the PCT. It does not appear as if local manufacturing by other potential private sector pharmaceutical companies (two of which are scheduled to open in 1989: Avicenne and Al Adwya) was considered. Based on the results of this unpublished study (the evaluation team

was unable to obtain a copy), the DSSB initially opted for off-shore purchase. A subsequent revision of cost estimates, however, led to a reversal of that decision in favor of local production. According to verbal communication from Dr. Ghachem (see Annex 20 for decisions resulting from this finding) of the MOH, the production cost of locally manufactured ORS would drop from 125 to 80 millimes if the necessary production equipment was also used for manufacture of other medicinal powders (SORBITOL, DOLIPRANE) when not in use to produce ORS.

The most optimistic estimate of the availability of locally produced ORS is January 1990. To meet needs for 1989, expected to increase due to recent mass media promotion efforts, up to one million additional packets will be needed. The DSSB has already placed an order for 500,000 packets of imported ORS to cover these needs.

6.2 LOCAL PRODUCTION

After an international request for bids, the PCT has received pro-formas for most of the necessary ORS production equipment: the mixer, the dehydrator, the packager, the air conditioners and the weighing scales. A selection of the bids and an order of equipment is expected by December 1988. The purchase will be financed by CRS/USAID ($82,500) and by UNICEF.

Planning for other aspects of renewed local production had not yet been undertaken at the time of the assessment team visit (e.g., preparation of facility, supply of raw materials and packaging). The team ORS specialist discussed these elements with Mr. Ali Naas, Director of Production at the PCT, and produced an action plan and calendar with her (see Annex 15).

Industrial level production is expected to start in September 1989, at the earliest.

6.3 ORS DISTRIBUTION

Pharmaceutical products in Tunisia are distributed by the PCT through two principal channels: the structures of the MOH and the private sector.

In the MOH, distribution occurs through three regional depots (Tunis, Sfax and Sousse) which stock 212 regional and sub-regional hospitals throughout the 23 governates of Tunisia. In turn, the sub-regions ("circonscriptions"), through a regional supervisor and

pharmacist, supply 1,392 health centers. This web is further expanded by mobile health workers ("équipes mobiles"), 300 of whom have already been trained by PN/LAD, who cover 2,246 "assembly points" in peripheral villages and hamlets (these, however, have been primarily concerned with vaccination activities). ORS packets are distributed, free of charge, throughout the MOH network. Despite occasional stock-outs, there do not appear to have been prolonged shortages of ORS supplies in MOH facilities. The distribution system has been strengthened by the introduction of ORS stock-cards.

The private sector distribution system is made up of 900 day pharmacies ("A pharmacies") and 15 night pharmacies ("B pharmacies" - see Annex 7). These are supplied by approximately 40 wholesalesmen. The wholesalesmen, in turn, acquire their supplies from the three private regional depots of the PCT. The Order of Pharmacists supervises the distribution and opening of new pharmacies at a quota of one pharmacy per 1,000 population. This formula encourages establishment of new pharmacies in rural areas rather than in already saturated urban areas. ORS packets are provided free of charge to private pharmacies by the PCT. A survey in 1988 revealed that only 40% of private pharmacies had ORS packets. The DSSB then sent out a reminder to pharmacists to contribute to the PN/LAD program by making use of these free ORS stocks. As mentioned earlier, those pharmacists who stock ORS packets tend to recommend ORS along with other, often less appropriate and costlier, drugs. Mixing instructions are often inexact.

6.4 ORS MARKETING

Demand for ORS has risen dramatically in recent years, probably due, at least in part, to the activities of the PN/LAD program. In 1987, a total of 302,412 packets of ORS were distributed throughout the MOH network. During the first 10 months of 1988, the number of packets distributed rose to 585,100 (including through private pharmacies supplied by the PCT).

However, many inappropriate and even dangerous drugs continue to compete with ORS: anti-bacterials and antiseptics (e.g., Ercefuryl, Intetrix, Questran, Colimycine, Sulfaguanidine), antimotility drugs (e.g., Imodium, Diarseb), absorbants (Actapulgite) and lactobacillius like "Ultralevure". In 1986, 1,125,738 units of these drugs were sold in Tunisia. In 1987,

the total sale increased by almost 4% to 1,166,272 units. The pediatric formulations of these products represented 41% of the total (461,106 units) sold in 1986. In 1987, total sales of pediatric formulations increased by 14% (to 523,707 units), accounting for 45% of total sales of all formulations of antidiarrhea drugs. This increase is especially alarming given the reported decrease in diarrhea cases mentioned elsewhere in this report. By banning pediatric forms of these drugs, the MOH could save the equivalent of more then a million dinars in foreign exchange.

Clearly, ORS faces firmly established competition from other drugs, supported by active promotion of pharmaceutical laboratories. This perpetual handicap is reinforced by the continued lack of acceptance of ORT by both many physicians and the majority of pharmacists.

To date, no active promotion of ORS has occurred the PN/LAD program having emphasized training of medical personnel and promotion of home solutions to mothers. Continued promotion of a range of home solutions may depress the eventual market for ORS packets. Further, the free distribution of ORS, even in private sector pharmacies, probably devalues ORS in the eyes of many mothers and fathers who believe that a more costly product must be more effective.

CONCLUSIONS

14. The MOH appears committed to local production of ORS by the PCT. The process for the realization of this intention should be expected to last at least one year. Locally produced packets will not be available for wide distribution until early 1990, at the earliest. At least one million additional imported packets will be needed to assure adequate local supplies until that time.

15. Planning for local production is still in its earliest stages. While bids have been requested and received for necessary manufacturing equipment, no detailed plans have been made for installing equipment, obtaining raw materials, marketing and promotion of other aspects of the manufacturing process. The PCT has not yet assigned a manager to the proposed activity.

16. An excellent public and private sector distribution network for ORS exists in Tunisia via widely dispersed MOH facilities and private pharmacies. The potential for wide distribution of ORS through the private sector is currently restricted by the attitudes and knowledge limitations of

pharmacists, by the competition from other anti-diarrheal drugs, by ORS pricing policy (free distribution) and by the absence of active promotion of ORS, among other factors.

17. Use of antidiarrheals (to which ORS is sometimes added) is widespread and firmly entrenched in Tunisia. Active promotion of home solutions constitutes additional competition for ORS packets.

RECOMMENDATIONS

15. Local ORS Production and ORS Supply

The local production of ORS packets by the PCT should be supported by donors, if the DSSB and the PCT take appropriate steps to assure the successful manufacture and distribution of the locally produced ORS packets. At the same time, the DSSB must prevent stock-out during 1989 by the purchase of an additional 500,000 ORS packets early in the year. The DSSB should include the purchase of ORS in its annual budget. Money for this purchase could be made available by the banning of pediatric formulations of inappropriate antidiarrheals.

16. Steps to Assuring Successful ORS Manufacture

The DSSB and PCT need to do the following to ensure successful manufacture of ORS:

* Solicit technical advice (WHO or PRITECH) to assist in the selection of suitable manufacturing equipment.

* Prepare a detailed floorplan for the ORS manufacturing unit. The plan should be verified by an ORS production expert and should conform to GMP (good manufacturing practices) as spelled out by WHO (and not yet practiced by PCT). This will be all the more important if the PCT proceeds with plans to export ORT produced in Tunisia.

* An estimate of future ORS requirements needs to be prepared by the DSSB based on current utilization figures and expected future increases in demand. Added to these figures should be PCT estimates of the potential private sector market and the export market so as to arrive at realistic production volumes.

* The PCT should develop a plan to optimize the cost-effectiveness of the production equipment by establishing a production calendar for the different medicines destined to be produced by this same equipment in the ORS production area.

* Develop a Tunisian ORS packet design (see Annex 15) and marketing strategy.

* The PCT should assign a single manager full-time to assure the successful launching of the ORS manufacturing effort.

17. Activities to Ensure Successful ORS Distribution

In order to ensure successful distribution of ORS, the following actions are recommended.

* The DSSB should continue to organize training and education of physicians, especially those in the private sector.

* The DSSB should target pharmacists and pharmacist-assistants for special educational and training activities: mini-seminars, promotional literature, special visits.

* Development by PCT of an ORS marketing plan including

  - pricing of ORS based on a KAP/willingness-to-pay study, at an affordable level which, nevertheless, enhances the value of ORS as a treatment for diarrhea in the eyes of mothers (not just based on production cost);

  - incentives to pharmacists and pharmaceutical middlemen to promote and sell ORS;

  - promotion of ORT through medical and pharmaceutical associations (meetings, journals, direct mailing of promotional materials, etc.);

  - enlisting of pharmaceutical detailmen to promote ORS to physicians and pharmacists;

  - development of promotional material for mailings to complement work of detailmen;

  - publicity in Assaydali, the pharmaceutical journal.

* The DSSB should reinforce the stock control and management system for ORS packets within the MOH network, if possible introducing computerized information systems where appropriate.

* The MOH should encourage health workers to distribute ORS packets to the "assembly points" during their routine vaccination activities.

18. The strategy of promotion of a variety of home solutions should be reviewed by the DSSB as ORS packets become more widely available.

7. PRITECH ASSISTANCE TO PN/LAD

7.1 THE PAST

Short-term technical assistance from PRITECH to PN/LAD took the form of 10 person-months of technical support in the areas of health education, training and communications (see Annex 4). In addition, PRITECH/Washington staff maintained close and regular contact with both the CRS/CDD Project Director and the CRS Country Director.

Extensive documentation exists attesting to the quality and collaborative nature of PRITECH inputs. PRITECH technical assistance appears to have been definitive in orienting the project's baseline information system, in extracting the key elements for a successful face-to-face educational approach and for defining the overall content of the communications activities. However, changes in personnel structure and decision-making (e.g. greater DSSB responsibility for communication), modifications in program plans due to financial delays and shifts in project emphasis led to modifications of the technical assistants' scope of work after their arrival in-country (to more closely meet felt program needs at that time). This was especially true in the communications component (see Annex 16 for details).

In accordance with a joint strategic decision by CRS, PRITECH and USAID/Tunisia at the start of PRITECH activities in Tunisia, all PRITECH technical assistance was provided directly to CRS/CDD staff. There was little or no direct interaction between PRITECH and the MOH. This made sense initially when MOH involvement was slight. But with increasing MOH/CRS collaboration over the course of project implementation, the initial decision should probably have been reviewed. It is unfortunate that PRITECH technical inputs have not contributed more to the strengthening of MOH capacity to take over long-term management of PN/LAD after completion of the CRS project.

7.2 OPTIONS FOR THE FUTURE

Any future technical assistance in CDD in Tunisia should be provided directly to the MOH with the aim of

increasing sustainable capacity for the long-term management of this and other PHC programs within the MOH. Such assistance could only be expected to yield positive results, however, if MOH support for CDD were strengthened, at least by the assignment of one full-time CDD manager within the MOH.

(With the closing of CRS, PRITECH will lose its administrative home in Tunisia, rendering continued assistance much more difficult.) During the assessment visit, the PRITECH team explored alternative modalities to providing continued technical assistance to the MOH.

These were not pursued by the assessment team as there were too many unknowns at the time to make even preliminary decisions: key USAID personnel were out of the country and a new USAID director had just arrived; a new Minister of Health had just been named and his impact on the Ministry had not yet been clarified, the CRS closedown had just been announced and many details remained unclear. It was, therefore, proposed that the issue of future PRITECH assistance to the Tunisia program be postponed for further consideration around the time of the official termination of the CRS/DDM project, between March and June of 1989.

RECOMMENDATIONS

Continued PRITECH Assistance in Tunisia

19. A PRITECH visit should be scheduled to Tunisia between March and June of 1989 for the express purpose of assessing the available options for continued PRITECH assistance to CDD in Tunisia.

20. Continued assistance should be considered only if the MOH demonstrates its commitment to the development and active management of a final consolidation phase of PN/LAD. This commitment should, at a minimum, include the assignment of a full-time CDD manager. The first step of the consolidation phase should be the development of a detailed operational plan by the CDD manager, with appropriate technical inputs from other sources (including PRITECH) as necessary. Any continued long-term PRITECH assistance should be considered with the framework of this plan. It should be carefully defined and specifically limited in scope and duration.

ANNEX 1a

LISTE DES PERSONNES QUI ONT RECU LA LETTRE RELATIVE A L'EQUIPE PRITECH D'EVALUATION

NOM	INSTITUTION	TELEPHONE
Mme Nefissa ZERDOUMI	UNICEF	236 678
Prof. Souad Lamine JOMNI	Ministère des Affaires Sociales	281 128
Ms. Diana PUTMAN	USAID	784 300
Prof. Nacef TAOUFIK	Centre de Recherche Pédagogique	262 425
Prof. Bechir HAMZA	Hôpital d'Enfants	663 461
Prof. Zouhair KALLAL	Institut National de Nutrition	663 781
Prof. Hédi M'HENNI	Office Natinal du Planning Famil.	248 781
Prof. Kamel BOUKEF	Pharmacie Centrale de Tunisie	283 011
Mr. Hamed ZGHAL	Comité Nl de Solidarité Sociale	258 176
Dr. Moncef SIDHOM	Ministère de la Santé Publique (DSSB)	662 161
Dr. Noureddine ACHOUR	Ministère de la Santé Publique (DEP)	662 100
Mr. Mourad GHACHEM	Ministère de la Santé Publique	662 199
Mr. Ahmed Baha Eddina ATTIA	CINETELEFILM	343 684
Mr. Slah DIMASSI	Sté Tunisienne de Conseils	281 984

ORIGIN: AID-2 INFO: AMB DCM ECON

VZCZCTUI
RR RUEHC
DE RUEHTU #8476/01 230 **
ZNR UUUUU ZZH
R 170846Z AUG 88
FM AMEMBASSY TUNIS
TO SECSTATE WASHDC 7339
BT
UNCLAS SECTION 01 OF 02 TUNIS 03476

CLASS: UNCLASSIFIED
CHRGE: AID 05/16/88
APPRV: PM:NTUMAVICK
DRFTD: PM:DPUTMAN:NBS
CLEAR: 1.PM
DISTR: AID
ORGIN: OCR

AIDAC FOR ST/H LLOYD FEINBERG PASS TO PRITECH

E.O. 12356: N/A
SUBJECT: HEALTH: PRITECH I ASSESSMENT

REF: (A) STATE 263308, (B) FEINBERG/PUTMAN TELCON 8/9/88

1. MISSION CONCURS WITH PROPOSED CENTRALLY FUNDED ASSESSMENT OF PRITECH I CDD PROGRAM AND REVIEW FOR POSSIBLE FOLLOW-ON WITH P ITECH II. ALTHOUGH NOVEMBER DATES ARE ACCEPTABLE TO CRS AND MISSION, AS PER TELCON, PUTMAN, WHO MANAGES CDD ACTIVITIES, WILL NOT BE BACK IN-COUNTRY UNTIL MID-DECEMBER.

2. THE MINISTRY OF HEALTH AND CRS SHOULD HAVE AVAILABLE, BY THE TEAM'S ARRIVAL, DATA CONCERNING THE RECENT ORT CAMPAIGN WHICH SHOULD PROVIDE USEFUL INFORMATION FOR THEIR ASSESSMENT. WE SUGGEST THAT THE FOLLOWING PEOPLE AT USAID, CRS, THE MINISTRY OF HEALTH (MOH), CINETELEFILM, MINISTRY OF SOCIAL AFFAIRS, NATIONAL COMMITTEE FOR SOCIAL SOLIDARITY, AND UNICEF BE CONTACTED WHILE THE TEAM IS IN-COUNTRY. OTHER PEOPLE TO MEET FOR POSSIBLE FUTURE ACTIVITIES ARE ALSO SUGGESTE . DR. MANSOUR, OF CRS, CAN ARRANGE APPOINTMENTS AND MR. HAFID LAKHDEAR AT USAID WILL BE THE CONTACT PERSON HERE. WE PRESUME TEAM WILL BE FAIRLY INDEPENDENT AND WILL NOT REQUIRE MUCH SUPPORT FROM THE MISSION. OFFICE SPACE AT CRS WILL BE PROVIDED BUT THEY WILL HAVE TO BE RESPONSIBLE FOR OWN TRANSPORTATION IN-COUNTRY. SECRETARIAL AND TRANSLATION SERVICES SHOULD BE PROVIDED BY THE TEAM.

3. (A) CRS
- MR. AHMED BAGHAT, DIRECTOR
- DR. MOHAMED MANSOUR, MANAGER ORT PROJECT
- CDF TECHNICAL STAFF

- (B) USAID
- MR. GEORGE CARNER, DIRECTOR
- MS. NANCY TUMAVICK, ASSISTANT DIRECTOR FOR
- PROJECT MANAGEMENT
- MR. ABDELHAFID LAKHDHAR, HPN

- (C) MINISTRY OF PUBLIC HEALTH
- MR. MOURAD GHACHEM, INTERNATIONAL COOPERATION
- DR. MONCEF SIDHOM, DSSB (PRIMARY HEALTH CARE)
- DR. GARBOUCE, MANAGER ORT PROJECT

~~ACTION~~	INFO
DIR ✓	
EXO ✓	
PER	
PROG ✓	
TRG	
PM ✓	
CONT ✓	
HPN	
RHUDO	
P. C.	
EMB/ADMIN	
EMS/GSO	
POL	
ECON	
C & R USAID	
CHRON ✓	
RF	

6

- (D) CINETELEFILM
- MR. AHMED BAHA EDDINE ATTIA, MANAGER
- MR. MONCEF DHOUIB, PRODUCER, TV
- MR. NOURI BOUZID, PRODUCER, CARTOONS

- (E) MINISTRY OF SOCIAL AFFAIRS
- DR. SOUAD LAMINE JOMNI, SECRETARY OF STATE, PREVIOUS
- HEAD OF THE PMI - EZZOUHOUR CENTER

- (F) NATIONAL COMMITTEE FOR SOCIAL SOLIDARITY
- MR. AHMED ZGHAL, PRESIDENT
- MR. NACEUR BAMBI, DIRECTOR
- MR. BEN FADHLA, DEPUTY DIRECTOR

- (G) UNICEF
- COUNTRY REPRESENTATIVE

- (H) MOH FOR FUTURE ACTIVITIES
- DR. TAOUFIK NACEF, CENTRE NATIONAL PEDAGOGIQUE
- PROF. BECHIR HAMZA, ASSOCIATION TUNISIENNE DE
- PEDIATRIE, ENSEIGNANT A LA FACULTE DE
- MEDECINE DE TUNIS
- PROF. BEN AYED, DEAN, MEDICAL SCHOOL, TUNIS
- PROF. JEDDI, DEAN, MEDICAL SCHOOL, SFAX
- PROF. BOUKEF, DIRECTOR, PHARMACIE CENTRALE DE
- TUNISIE (PCT)
- MR. ALI NAAS, HEAD, DRUGS, PCT
- MR. SGHARI, DRUGS/MOPH
- DR. BECHIR ZOUARI, CENTRE NATIONAL PEDAGOGIQUE
- (I) NATIONAL OFFICE FOR POPULATION AND
- FAMILY PLANNING
- DR. HEDI M'HENNI, DIRECTOR
- MR. BELTAIEF, INTERNATIONAL COOPERATION

- (J) INSTITUTE OF NUTRITION
- PROF. ZOUHAIR KALLAL, DIRECTOR

4. OBJECTIVES OF TEAM AS STATED IN REF (A) ARE ACCEPTABLE TO MISSION. PRELIMINARY IDEAS WHICH SHOULD BE DEVELOPED INTO A FULLER SOW BY ST/H ARE PROVIDED BELOW.

A. ASSESS SHORT TERM T[illegible] AND USEFULNESS OF THEIR INPUTS

FOR PRE-PROGRAM CDD ACTIVITIES.

B. ASSESS QUALITY AND USEFULNESS OF PRE-PROGRAM RESEARCH STUDIES SUCH AS KAP FOR GENERAL POPULATION, HEALTH WORKERS AND SOCIAL WORKERS. ALSO ASSESS QUALITATIVE WORK DONE WITH FOCUS GROUPS.

C. EVALUATE TRAINING MATERIALS AND PROGRAMS DEVELOPED FOR SOCIAL WORKERS (CNSS CENTER MANAGERS) AND PUBLIC HEALTH PERSONNEL.

D. EVALUATE APPROPRIATENESS OF COMMUNICATIONS/MASS MEDIA STRATEGY DEVELOPED.

E. REVIEW DECISIONS MADE TO DATE CONCERNIING LOCAL PRODUCTION VERSUS PROCUREMENT OF ORS.

F. ASSESS ROLE AND EFFECTIVENESS OF CRS IN IMPLEMENTING PROGRAM ACTIVITIES.

G. ANALYSE INSTITUTIONAL CAPABILITIES OF THE DSSB AND OTHER GOT INSTITUTIONS (PCT, CNSS, ETC) IN UNDERTAKING CDD ACTIVITIES TO DATE AND RECOMMEND STEPS FOR IMPROVEMENT IN THE FUTURE.

H. BASED ON ANALYSIS OF A-G ABOVE AND DISCUSSIONS WITH OTHER ORGANIZATIONS PROVIDE PRELIMINARY SUGGESTIONS CONCERNING FUTURE CENTRALLY FUNDED ACTIVITIES.

I. POSSIBLE FUTURE AREAS OF COLLABORATION WITH THE MINISTRY OF HEALTH INCLUDE:
A. DIARRHEA DISEASE CONTROL (DDC)
- FORMAL TRAINING ON ORT AND OTHER RELATED DDC TOPICS IN MEDICAL AND NURSING SCHOOLS
- EPIDEMIOLOGICAL RESEARCH/ETIOLOGY OF INVASIVE DIARRHEA, STANDARDIZATION OF CASE MANAGEMENT
- ORS PRODUCTION, DISTRIBUTION, MARKETING AND SUPPLY MANAGEMENT

B. INFANT AND CHILD NUTRITION
- PRELIMINARY RESEARCH ON INFANT AND CHILD FEEDING PRACTICES
- PROMOTION OF BREAST FEEDING AND PROPER WEANING PRACTICES
- GROWTH MONITORING/NUTRITION SURVEILLANCE

J. MISSION REQUESTS FINAL CONFIRMATION OF PTA BY MID SEPTEMBER IF POSSIBLE.
DRAFTED BY: PM: DIANA PUTMAN:NBS
APPROVED BY: PM: NANCY TUMAVICK
BROWN

BT
#8475

NNNN

88/924 Tunis le 18 Octobre 1988

Professeur Zouheir Kallal
Directeur de l'Institut National
de Nutrition et de Technologie Alimentaire
Bab Saadoun
TUNIS

OBJET : Visite d'un groupe de consultants Pritech pour l'évaluation de la participation de Pritech au projet CRS/USAID//LAD du 3 au 16 Novembre 1988.

Monsieur le Directeur,

Pritech se propose d'envoyer un groupe de consultants pour évaluer la participation de Pritech au projet CRS/USAID de lutte anti-diarrhéique. Cette évaluation pourrait aussi servir de base au développement d'une collaboration future de Pritech (phase II) à d'autres activités avec le Ministère de la Santé Publique. Initialement prevue au mois de Juin, retardée pour Septembre et finalement confirmée pour la période du 3 au 16 Novembre 1988, cette visite d'évaluation aura deux objectifs essentiels :

- Revoir les actiités entreprises en collaboration avec Pritech, examiner dans quelles mesures les objectifs projetés du projet ont été réalisés et identifier les leçons à tirer pour l'engagement de Pritech II.

- Développer un plan/une stratégie de Pritech II si nécessaire.

L'équipe d'évaluation sera composée de quatre membres dont les tâches sont définies comme suit :

- Agma Prins, chef du groupe. Elle s'intéressera aux questions relatives à la planification et à la conception des activités.

- Mary Dean Purvis, spécialiste d'information/éducation - communication s'intéressera à l'évaluation des activités de formation, d'éducation et de communications.

- Camille Saade, spécialiste de marketing examinera les questions se rapportant à la stratégie de distribution et de marketing des SRO ainsi que celles se rapportant à la production (en se basant sur les résultats des études techniques faites par Fabricant et la PCT)

- Dr. Robert Lebow, medecin, s'intéressera aux aspects cliniques de la prise en charge de la diarrhée à domicile et dans les centres de santé.

Dr. Mohamed Mansour du projet CRS/LAD sera designé pour accompagner l'équipe dans ses réunions et déplacements divers. Mr. Hafidh Lakhdhar, assurera la coordination avec l'USAID.

Le programme provisoire des réunions et des déplacements suivants est proposé pour discussion :

CRS	: Mr. Ahmed Bahgat	, Directeur
	Dr. Mohamed Mansour	, Chef du projet CRS/LAD
	Staff technique du projet	
USAID	: Mr. George Carner	, Directeur
	Mrs. Nancy Tumavick	, Assistante du directeur
	Mr. Hafidh Lakhdhar	, Santé/Population/Nutrition

Ministère de la Santé Publique

Mr. Mourad Ghachem	, Coopération Internationale
Dr. Moncef Sidhom	, Direction des Soins de Santé de Ba
Dr. Ben Abdallah	, " "
Dr. Garbouj	, " "
Dr. Toumi	, Direction des médicaments
Dr. Noureddine Achour	, Direction des Etudes et de la Planification

Office National de la Famille et de la Population

Prof. Hédi M'henni	, Directeur
Mr. Ahmed Beltaïef	, Coopération Internationale

Pharmacie Centrale de La Tunisie

Dr. Kamel Boukef	, Directeur de la PCT
Dr. Ali Naas	, Directeur de l'usine de fabrication de la PCT
Dr. Belgacem Hizaoui	, Chef de Service, PCT

Centre National Pédagogique

Prof. Taoufik Nacef, Directeur

Institut National de Nutrition

Prof. Zouheir Kallal, Directeur

Doyens et Enseignants des Facultés de Medecine

Prof. Hassouna Ben Ayed, Doyen de la Faculté de Medecine de Tunis
Prof. Jeddi , Doyen de la Faculté de Medecine de Sfax
Messieurs les doyens des Facultés de Medecine de Sousse et de Monastir.

Prof. Béchir Hamza , Société Tunisienne de Pédiatrie

Ministère des Affaires Sociales/Comité National de Solidarité Sociale

Prof. Souad Lamine Jomni , Secrétaire d'Etat
Mr. Ahmed Zghal , Président du CNSS
Mr. Naceur Bamri , Directeur
Mr. Abdelkader Ben Fadhla, Sous-Directeur

Unicef

Mme. Néfissa Zerdoumi , Représentante Résidente

Cinetéléfilm

Mr. Ahmed Baha Eddine Attia, Directeur

Société Tunisienne de Conseils

Autres

Mr. Slah Dimassi

Très prochainement, Dr. Mohamed Mansour vous contactera pour choisir le jour et l'heure qui vous conviendrait pour rencontrer certains ou tous les membres du groupe, selon votre souhait. En attendant, je vous prie d'agréer, Monsieur le Directeur, l'expression de ma profonde considération pour la collaboration fructueuse entre nos deux institutions.

Ahmed Bahgat
Directeur

ANNEX 2a

TABLE 1
SUMMARY BUDGET

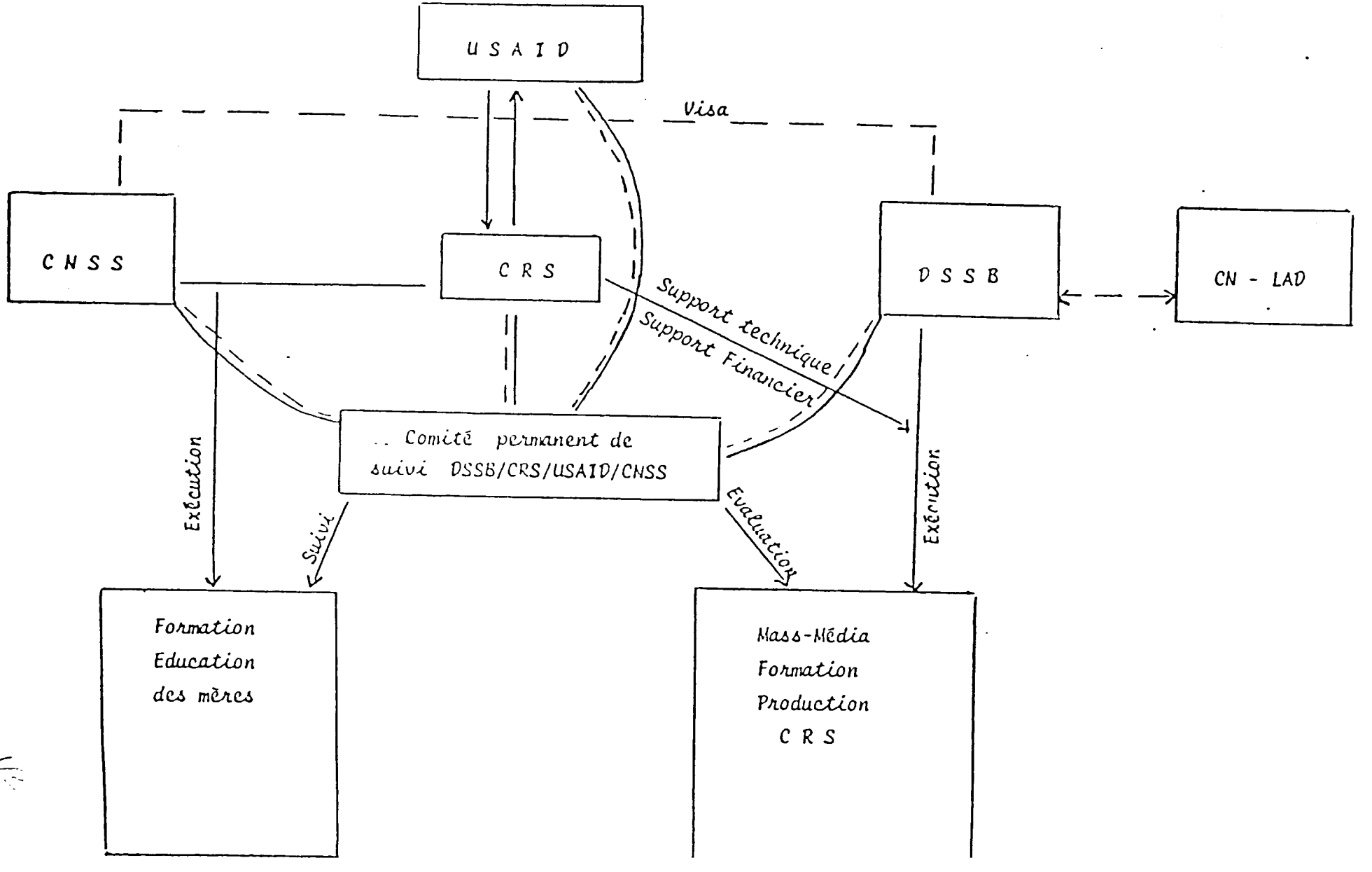
1.	Mass Media Development	US$ 111,125
2.	Education/Training Materials	US$ 59,194
3.	Training and Education	
	a. MOPH	US$ 57,900
	b. CNSS	US$ 56,135
	c. Health Educators (2)	US$ 32,805
	Sub-Total	US$ 146,840
4.	GOI Vehicles	US$ 125,000
5.	MOPH/CNSS Center Equipment	
	a. MOPH Equipment	US$ 93,750
	b. CNSS Center Equipment	US$ 45,314
	Sub-total	US$ ~~136,313~~ 139 064
6.	ORS production/procurement	US$ 82,500
7.	Evaluation and Supervision	US$ 31,250
8.	CRS Overhead (8.5% excluding vehicles and equipment)	US$ 29,615
	TOTAL USAID	US$ 724,588
	TOTAL CRS	US$ 189,000*
	TOTAL PRITECH	US$ 150,000**
	TOTAL DONOR ASSISTANCE	US$1,063,588 (58%)
	TOTAL GOT CONTRIBUTION (in kind)	US$ 769,000 (42%)

*The initial CRS commitment of $73,240 was made at the start of the project on June 12, 1986. The second contribution of $100,000 was made available on 7 April 1987. The remaining $15,760 will be made available over the remaining life of the project. The total amount of CRS contribution is $189,000.00.

**In addition to the 17 person months (approximately $10,000 per person month) of technical assistance, ST/Health has also provided CRS with bridge funding in the form of $123,691 of operational support for its DDM activity. This grant, channeled through PRITECH, covered the period from June 1986 to July 1987.

ANNEX 1

ORGANIGRAMME DES RELATIONS FONCTIONNELLES
ENTRE LES DIFFERENTS INTERVENANTS DU PROJET USAID/CRS/LAD



ANNEX 2b

PRITECH FUNDING

1 9 8 6

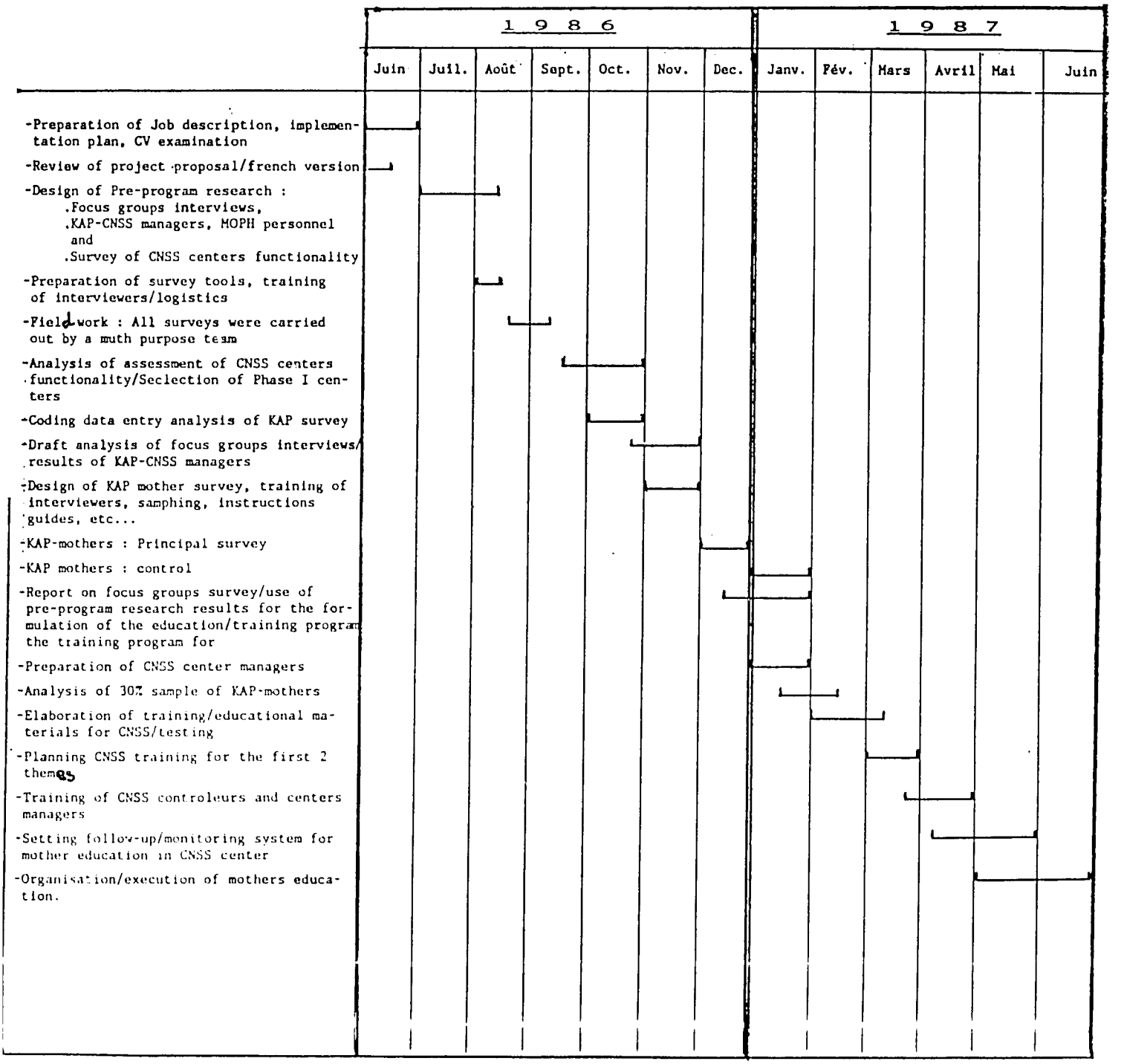
LINE ITEM	BUDGET AMOUNT	JUILLET	AOUT	SEPTEMBRE	OCTOBRE	NOVEMBRE	DECEMBRE
Projet Director							
Salary	15,336.00	1,786.45	2,450.02	2,167.03	1,720.67	1,729.59	1,757.11
Perdiem	2,000.00		850.56	1,021.49			
Admin. Officer							
Salary	14,000.00	1,750.00	1,754.12	1,577.06	1,570.78	1,578.91	1,604.04
Perdiem	4,200.00						
7 Reg. Coordinators							
Salary	23,259.00		15,363.85		754.06		5,257.96
Perdiem	13,660.00						
2 Health Educators							
Salary	7,692.00						
Perdiem	9,825.00		392.57				957.28
Graphic Artist	1,000.00		392.57	881.76			
Secretary	3,859.00	505.33	506.52	363.09	426.34	505.46	440.96
Driver							
Salary	3,096.00		342.86	235.29	299.14	368.66	390.48
Perdiem	800.00			31.76	38.67		
Research/Eval/Spec.							
Salary	4,525.00			366.00	739.53	800.65	813.43
Perdiem	4,000.00		392.57				143.59
Communication Spec.							
Salary	7,971.00	557.05	864.57	717.14	821.17	60.24	1,682.30
Perdiem	2,800.00		314.05	63.53	28.12		
Survey Team	4,060.00		1,177.70	2,035.88			379.92
TOTAL	123,691.00	4,590.83	24,809.96	9,460.03	6,390.48	5,043.55	13,427.07

1 9 8 7

LINE ITEM	JANVIER	FEVRIER	MARS	AVRIL	MAI	JUIN	TOTAL
Projet Director							
Salary	1,858.76	1,818.03	1,807.06	1,799.10	1,771.10	655.4	21,328.32
Perdiem		50.19					1,930.24
Admin. Officer							
Salary	1,696.84	1,659.65	1,649.64	1,642.37	1,616.81		18,100.02
Perdiem							
7 Reg. Coordinators							
Salary			5,239.08		6,597.52		33,212.47
Perdiem					5,470.99		5,470.99
2 Health Educators							
Salary	253.16	222.86	246.12	2,719.92	723.60	1,387.34	6,510.36
Perdiem							392.57
Graphic Artist			615.32				1,881.65
Secretary	764.27	456.25	451.77	737.30	443.15	475.10	6,025.20
Driver							
Salary	632.12	404.02	399.05	642.56	392.27	338.04	4,445.29
Perdiem	105.06	116.38					291.87
Research/Eval/Spec.							
Salary	860.50	841.63	836.56	832.87	819.91		6,911.12
Perdiem							536.16
Communication Spec.							
Salary	1,610.51	911.82	905.08	1,566.43	886.97		10,503.28
Perdiem		100.28					505.98
Survey Team	531.64	157.24	163.27	15.31	60.31	185.51	4,706.78
TOTAL	8,312.86	6,746.35	12,313.75	9,955.94	18,782.71	3,041.47	122,031.100

ANNEX 3a

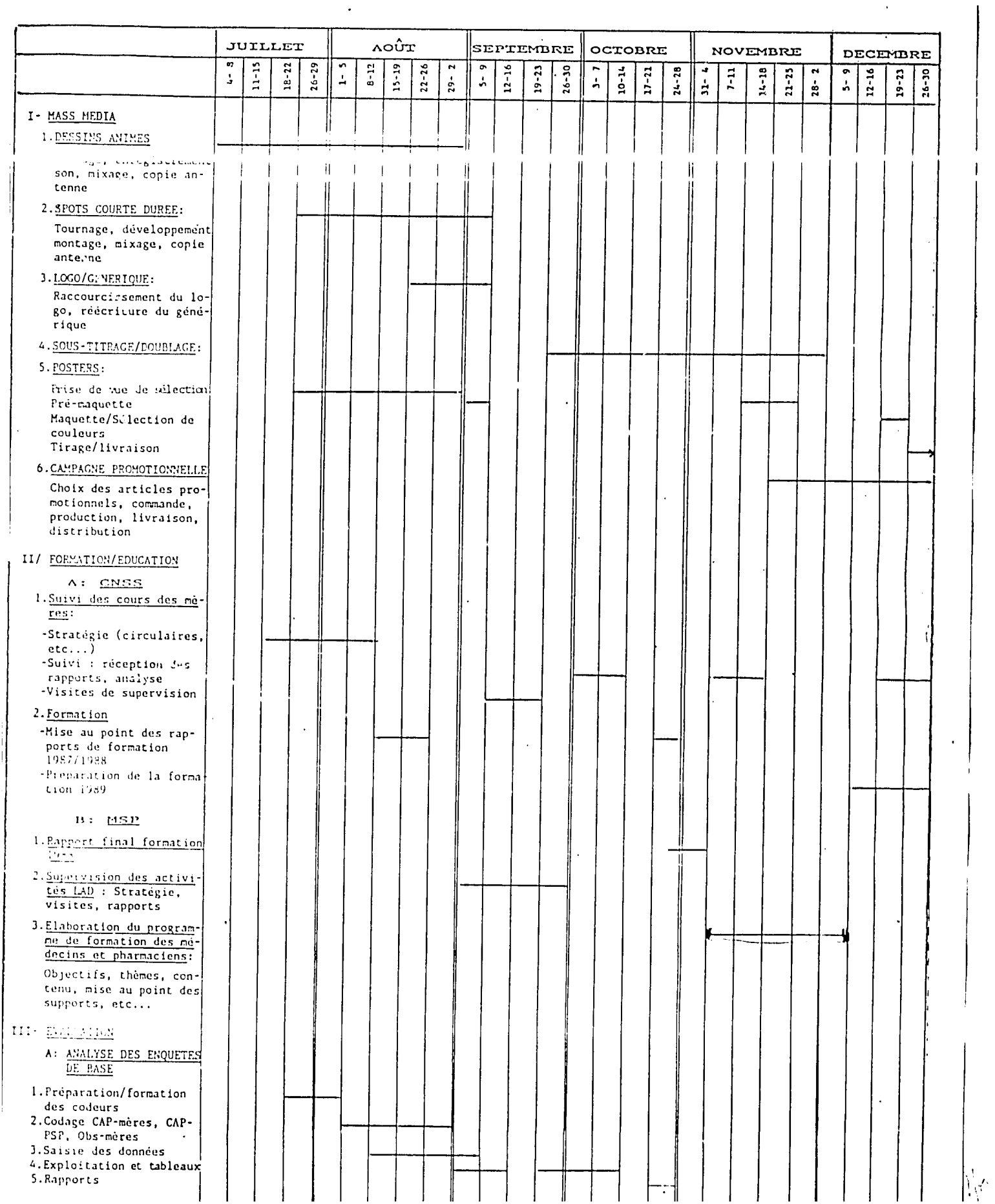
PRINCIPAL ACTIVITIES UNDERTAKEN DURING THE PERIOD COVERED BY PRITECH BRIDGE FUNDING



ANNEX 3 b

PLAN D'ACTION DES ACTIVITES DE MASS-MEDIA, DE FORMATION/EDUCATION ET D'ACHAT D'EQUIPEMENT ET DE MATERIEL AUDIO-VISUEL

JUILLET - DECEMBRE 1988



ANNEX 3C

PROJECT ACTIVITIES
THROUGH JULY, 1988

Training: In 1987, only CNSS personnel was trained since the project was not yet signed with the MOPH. In 1988 both CNSS and health personnal were trained.

		Quality	Nbre	Duration of training
CNSS:	1987 (trainees)	CNSS centers managers	121	7 days
		National Coord.	7	1 week/month
		Regional Coord.	23	7 days
	1988	CNSS centers managers	100	6 days
		Regional Coord.	23	6 days

41

				Total pers/ day
MOPH	1988	Trainers	196	
		Trainees	2726	6428
		M.D's	426	
		Health Personal	1755	
		Misced	545	

EDUCATION

a-CNSS:

500 educational boxes were produced in 1987 for the whole duration of the project

1987 : 104 centers carried education

Number of educational sessions : 1650
Number of mothers attendancies : 22431
Average prt session : 13.59 mothers

b-MOPH (material production)

-Technical Chart produced	5000
-Natoinal training guide	70
-Regional training guide	275
-Technical training modules	275 x 4 = 1100
-Posters (4)	in process
-Technical brochures	3500

MASS MEDIA

1987 : Micro mass media campaign
TV : 2 programs
Radio: 11 spots through "Dr. HAKIM" and Monastir/Sfax radio station
Several interviews with CN-LAD members and doctors in all three radio station

1988 : TV: 6 sketches produced/broadcast
4 sketches in process
5 spots in process
Radio: 10 spots in process

RESEARCH/MONITORING/EVALUATION

a/ Pre-program research

* Mother Focus groups interview : 61 groupes (642)

* Father Focus group interview : 55 groupes (371)

* KAP-Health Personnel : 159

* KAP-CNSS Center Managers : 221

* KAP-mothers 1986: 483
  1987: 483 + 152 (control)

b/ Monitoring/Supervision

CNSS : -Pre and Post training evaluation

-CNSS center mangers training skills

-Mothers attendance

MOPH : -Local training seminars

-Number of trainees

-Supervision of diarrhea case management

c/ Evaluation

-KAP-health personnel (190)

-Observational studies of ORS mixing skills of 203 mothers

-KAP-mothers 1986
1987
1989 (in november)

-Mass media in process of planning

-ORS packets availability (distribution : in process of planning)

ANNEX 4

PRITECH TECHNICAL ASSISTANCE

	1986							1987												1988					
	Juin	Juil.	Août	Sept	Oct.	Nov.	Déc.	Janv	Fév.	Mars	Avril	Mai	Juin	Juil.	Août	Sept	Oct	Nov	Déc.	Janv.	Fév.	Mars	Avril	Mai	Jui
PRITECH TECHNICAL ASSISTANCE																									
I/ PRE-PROGRAM RESEARCH (Judi Aubel)	15			15																					
-Collaboration in the design of focus groups and KAP interviews -Collaboration in the design of the assessment of CNSS centers management -Field supervision of surveys -Collaboration in the report on focus groups with recommandatins for mother education activities																									
II/ EDUCATION/TRAINING (Judi Aubel)					4				15																
1-Planning education/training at CNSS sites -Collaboration in the development of baseline KAP mothers -Planning training sessions for national coordinators -Collaboration in the identification of behavioral objectives, educational themes and materials -Collaboration in																									
2-Supervision of CNSS training/draft design of MOPH training										5 15															
-Supervision of CNSS managers training on the first 2 educational themes -Participation in curriculum development for MOPH personel																									
3-Planning training of MOPH personnel																				11		4			
-Collaboration in the development of curricula and other training materials for MOPH personnel -Collaboration in the planning of this training																									
III/ COMMUNICATION (Agma Prins)							4 15																		
-Review and Evaluation of existing operational plans -Participation in the formulation of a global communication strategy -Report of the consultant																									
IV/ORS PRODUCTION/DISTRIBUTION (S.Fabricant)				15	4																				
-Assessment of the economic and technical capacity of the PCT to produce ORS locally -Assessment of the Tunisian needs of ORS packets																									

Annex 5

EPIDEMIOLOGY OF DIARRHEAL DISEASE IN TUNISIA

When Tunisia's prior national diarrheal disease program (1980-84, sponsored by WHO) began in 1980, Tunisia's infant mortality rate (IMR) was estimated at 80, with over half of these deaths being attributed to dehydration from diarrhea. It was also documented that in 1980 over 30% of the consultations in the health system were due to diarrheal disease.

An (as yet) unpublished national health survey done in 1985-86 shows an IMR of 52, with diarrheal disease (verbal communication only) accounting for about 25% of this total. Based on this downwards trend and confirmatory evidence from scattered hospital and health center data, it is estimated that the real IMR in 1988 would be in the range of 42-45.

The marked decrease in the number of hospital and health center consultations for diarrhea and dehydration as well as deaths from dehydration has been documented in numerous small studies. Data from the Mellassine MCH Center in Tunis from 1981 to 1987 show this downward trend in children aged 0-5 years:

Year	1981	1982	1983	1984	1985	1986	1987
Consultations for diarrhea	4282	3674	3145	3598	2429	2280	1521
As % of total consultations	13.0%	12.4%				9.2%	7.4%
Cases of dehydration	134	45	76	41	51	29	27
% of cases of diarrhea with dehydration	3.1%	1.2%	2.4%	1.1%	2.1%	1.3%	1.8%

At the same large per-urban health center with about 2000 pediatric visits a month, in the first 10 months of 1988, only 36 cases of dehydration from diarrhea were seen. These were graded as follows: 20 with stage I (mild or none), 15 with stage II (moderate) and only one with stage III (severe).

At the large Ezzouhour MCH Center (also peri-urban Tunis), 31.9% of the pediatric consultations in 1980 were for diarrhea. This percentage feel to 14.8% in 1983 and 8.6% in 1984. Since 1984, the percentage has remained at about 8%. A discussion with the center personnel revealed that cases of dehydration were rare there, "maybe 2 or 3 a month".

There is a seasonality in the incidence of diarrhea with a peal in the summer (June through October). Data for 1988 at the Ezzouhour Center showed that during January and February, only about 2% of the consultations were for diarrhea, whereas in June and July, the proportion rose to about 15%.

Data from the summer of 1988 in the mostly (80%) rural Sidi Bouzid region in central Tunisia show a greater prominence of diarrheal disease. This data was gathered through the use of a new information system put in place with the help of the CRS/USAID project. In the four month period between June and the end of September, 1988, 32% of the age 0-5 consultations in the region were for diarrhea. (This figure contrasts with the 1987 whole year proportion of about 10% for the same region).

The following calculations represent a "worst case" exercise to try to estimate the contribution of dehydration from diarrheal disease to the IMR as a whole:

The total population of the Sidi Bouzid region is about 316,000. A rough calculation of the 0-1 population would be 9000. During June through September 1988 (the peak season), there were reported 6845 cases of stage I dehydration (95.5% of the total), 304 stage II cases (4.2% and 21 stage III cases (-.3%). Although these numbers include all ages 0-5, if we assumed that (1) half the stage III dehydration cases were age 0-1, that (2) this peak season total represented only half the total for the year, and (3) all the stage III dehydration cases died (worst case, not true, but an extreme), then the most that these cases of dehydration from diarrhea could add to the IMR in this rural region would be:

> 21/900 x 100 = 2.3 of an estimated IMR of 45 for all Tunisia, or, in this "worst case" scenario, only about 5% of the total IMR.

Data from the Medjez El Bab Hospital (Pediatric Service)show the following trend:

Year	1981	1982	1983	1984	1985	1986
Cases of dehydration	78	32	25	18	27	41
Deaths from dehydration	13	6	4	3	0	0

Interviews with Drs. Bechir Hamza and Bechir Bennaceur at the Principal Pediatric Hospital in Tunis as well as visits to a small number of MCH centers and primary health care centers have confirmed the impressions that (1) cases of serious dehydration secondary to diarrhea are becoming much rarer than in the past and are, in fact, very infrequent, and (2) children who enter the hospital with even severe dehydration from diarrhea rarely die.

Dr. Bennaceur noted that on his pediatric service, he has about 150 deaths a year. Of these, 50 deaths are in children with diarrhea, but they are not dying from dehydration. He says they are dying instead from persistent diarrhea associated with malnutrition. Dr. Hamza also identified persistent diarrhea as the major problem he sees in diarrheal disease mortality in Tunisia.

There are some seeming inconsistencies in the data and empirical findings vis-a-vis survey results from as late as 1985 which indicate that 50% of the IMR is from diarrheal diseases.

There have been several studies done in Tunisia on the etiology of diarrheal disease. The most recent is a study by N. Gueddana et al published in the Archives of French Pediatrics 1988; 45: 207-11, entitled "Etiologic Study of Acute Gastroenteritis in Children in Tunisia." (See Anne 6). In this study, the major pathogens that were found were rotavirus, enteropathogenic E. Coli, and Giardia.

ANNEX 6

Etude étiologique des gastroentérites aiguës de l'enfant en Tunisie *

N. GUEDDANA, S. SAFFEN, R. BEN AISSA, F. KHEMIRI, A. CHAKER, A. AROUJI, A. HAMMAMI, S. LAMINE-JOMNI

Résumé. *L'objectif de l'étude est d'identifier l'importance relative des différents agents responsables de gastroentérite, et de contribuer à la détermination de l'étiopathogénie de cette maladie. Quatre cent deux prélèvements de selles d'enfants malades et 209 de témoins, tous âgés de moins de 3 ans ont fait l'objet d'examens bactériologiques, parasitologiques et virologiques. Une étiologie entérale de la gastroentérite a été reconnue chez la moitié des enfants. Il s'agit de bactéries entéropathogènes dans 11 % des cas, de rotavirus dans 29 % des cas, et de l'association des deux dans 9 % des cas. La différence est significative entre les malades et les témoins pour l'infestation bactérienne (p <0,0001) et virale (p <0,00001). Les bactéries les plus fréquemment isolées sont surtout des* Escherichia coli. *87 souches d'*Escherichia coli *isolées ont été testées pour leur appartenance au groupe des* Escherichia coli *entérotoxinogènes (facteur d'attachement, toxines thermolabiles); 4 souches portaient le facteur d'attachement (E.A.F.) et 14 étaient toxinogènes. Shiga-like toxine (ou vero toxin) a été détectée chez 4 souches séro-groupables. Le* Campylobacter *a été isolé avec la même fréquence chez les malades et les témoins, il a été souvent associé à d'autres bactéries ou au* Rotavirus. *Le portage des parasites et des* Candidas *n'a pas été trouvé significativement différent entre malades et témoins. Le* Giardia intestinalis *est le parasite le plus fréquemment isolé.*

Etiology of acute gastroenteritis in Tunisian children

Summary. *This study was aimed at identifying the relative importance of the various agents responsible for gastroenteritis and to contribute to the etiopathogeny of this condition. Four hundred and two samples of stools of patients and 209 of control subjects, all under 3 years of age, were submitted to bacteriological, parasitologic and virologic examinations. An enteral etiology of gastroenteritis was found in 50 % of the children. It consisted of enteropathogenic bacteria in 11 %, rotaviruses in 29 % and both associated in 19 % of cases. There was a significant difference between patients and controls for bacterial (p<0.0001) and viral (p<0.00001) infestation. The most frequently isolated bacteria consisted overall of Escherichia coli. Eighty-seven isolated strains of E. Coli were tested for their enterotoxinogenic capacities. Four strains were bearing the attachment factor (EAF) and 14 were toxinogenic. Shiga-like toxin (or vero toxin) was detected in 4 strains. Campylobacter was isolated as frequently in patients as in controls and was often associated with other bacteria or rotaviruses. The presence of parasites and candidas was not significantly different in patients and in controls. Giardia intestinalis was the most frequently isolated parasite.*

Key-words : *Gastrointestinal diseases; Diarrhea infantile; Bacterial infections; Virus diseases; Parasitic diseases; Epidemiology; Infant; Child.*

Le rôle des bactéries entéropathogènes, des *Rotavirus* et, dans une moindre mesure des parasites, dans la pathogénie des gastroentérites aiguës (GEA) est actuellement bien établi. L'objectif de la présente étude est surtout d'identifier l'importance relative de chaque germe en comparant les malades à un groupe témoin et de contribuer à la détermination de l'étiopathogénie des gastroentérites.

MATÉRIEL ET MÉTHODES

La population de base est domiciliée dans un quartier péri-urbain (Sidjoumi) du gouvernorat de Tunis. Elle est constituée de deux groupes d'enfants :

- Le premier groupe représente *les malades* : 402 enfants âgés de moins de 3 ans. Ils constituent 15 % des enfants se présentant, au cours de l'année 1985, à la consultation du Centre de Protection Maternelle et Infantile (PMI), pour diarrhée aigue isolée ou associée à d'autres symptômes.
- Le deuxième groupe représente *les témoins* : 209 enfants bien portants du même groupe d'âge, se présentant au cours de la même année au centre de PMI pour vaccination.

Pour chaque enfant un questionnaire a été rempli et porte des indications sur : l'âge, le sexe, les indicateurs socio-économiques, le diagnostic, l'évolution et les données épidémiologiques. Les prélèvements de selles effectués dans le groupe d'enfants diarrhéiques et dans le groupe des témoins ont été soumis aux examens suivants : 1) Examens bactériologiques visant la recherche de *Salmonella*, de *Shigella*, d'*Escherichia coli* entéropathogènes et d'*Escherichia coli* entérotoxinogènes. La recherche d'entérotoxines d'*Escherichia coli* a été effectuée par immunohémolyse radiale et par ELISA pour la toxine LT et par sonde nucléique pour les

* Travail du Centre PMI Zouhour, rue 4203, Cité Zouhour IV, Tunis 2052, de l'Institut Pasteur, Tunis et du Centre Hospitalo-Universitaire Habib Thameur, Tunis, accepté le 7 décembre 1987.

Tirés à part : N. Gueddana, PMI Zouhour (à l'adresse ci-dessus).

toxines L[illegible] et S.T. 2) [illegible] kit diagnostique rotazym[illegible] visant la recherc[illegible] 3) La recherche de par[illegible] dont l'isoleme[illegible] outre l'examen direct, l'ut[illegible] de cultures [illegible] et Laidlaw), de techniq[illegible] d'enrichissem[illegible] (Faust et [illegible]) et une coproculture [illegible] milieu gélosé. [illegible] Enfin, chaque [illegible] a fait l'objet d'une rec[illegible] ne de mycose.

[illegible] l'O.M.S., et ceci [illegible] étiologie, toute diar[illegible] la [illegible] tibiothérapie en cas [illegible] telle thérapeutiq[illegible]

RÉSU[illegible]

Caract[illegible] des gastroentérites

89,3 % des enfants présentant une diarrhée n'ont pas reçu de médicaments avant de se présenter au centre de santé. Le délai moyen de consultation par rapport au début de la diarrhée est de [illegible] jours. Le nombre moyen de selles par jour est de 5,[illegible].

Les caractéristiques des selles ont pu être identifiées pour 1[illegible] enfants présentant une gastroentérite. Il s'agit de selles liquides [illegible] 18 selles par 24 h[illegible] ou plus sans sang ni pus dans 34 cas (31 %), [illegible] selles glaireuses avec sang et/ou pus dans 7[illegible] cas (69 %). La diarrhée est isolée ou accompagnée seulement de fièvre dans 60 % des cas. Dans les 40 % des cas restants, les signes extra-digestifs sont faits surtout d'infections respiratoires des voies aériennes. Le délai moyen de guérison, depuis les premiers symptômes reconnus par l'interrogatoire, est de 4 jours.

L'état d'hydratation des enfants malades le 1er jour de la consultation, est correct dans 95 % des cas. Vingt-et-un enfants présentent une déshydratation aiguë, parmi eux 17 ont une déshydratation classée comme légère (stade I) selon la classification de Fortin (1) et 4 une déshydratation modérée (stade II). Après 5 jours d'évolution, il persiste 5 cas de déshydratation aiguë classés comme suit : 1 cas au stade I, 2 cas au stade II et 2 cas au stade III.

Résultats biologiques

Bacteriologie

Le taux de portage des bactéries est de 45,4 % pour les malades et de 26,6 % pour les témoins ($p < 0,000$). Dans ces taux sont inclus tous les types de colibacilles. Si nous considérons les colibacilles entéropathogènes seulement (ECEP), ces taux passent à 20 % pour les malades et 11 % pour les témoins ($p < 0,01$).

Les bactéries isolées chez les enfants malades et chez les témoins sont les suivantes : 51 *Escherichia coli* entéropathogènes, 16 *Campylobacters*, 9 *Salmonella*, 9 staphylocoques dorés, 3 vibrions cholériques non 01 et une *Shigella flexneri*. Six bactéries, dont la responsabilité dans la diarrhée aiguë n'est pas bien établie, ont été isolées dans les selles d'enfants malades; il s'agit de bactéries suivantes : *Proteus*, *Enterobacter*, *Providencia*, *Alcalescens dispar*, *Citrobacter* et pyocyanique.

TABLEAU I. [illegible] *e des bactéries isolées dans les selles des* [illegible]

[illegible]ture des bac[illegible]es	Malades		Témoins	
	Effectif	%	Effectif	%
[illegible]*coli* entér[illegible]thogène	42	11,93	9	4,76
[illegible]*jejuni* [illegible]*coli*	8	2,27	8	4,23
[illegible]s (Munche[illegible] Vien, [illegible]*enterica*)	7	1,98	2	1,05
[illegible]dore	5	1,42	4	2,11
[illegible] non [illegible]	3	0,85	—	—
[illegible]	1	0,28	—	—
[illegible]	0	—	1	0,52
[illegible]	5	1,42	—	—
[illegible]	1	0,28	—	—
[illegible]	2	0,56	—	—
[illegible]	1	0,28	—	—
[illegible]ocyanique	1	0,28	—	—
Négatifs	276	78,40	165	87,30
Total	*352*	*100*	*189*	*100*

Les trois dernières bactéries n'ont été trouvées associées à des *Rotavirus*. Le *tableau I*, donne l'incidence des bactéries isolées dans les selles des malades et des témoins.

La présence d'entérotoxines a été mise en évidence chez 18 souches d'*Escherichia coli* sur un total de 87 souches étudiées.

La toxine ST a été détectée chez 8 souches dont deux sérogroupables (O_{86} B_7 et O_{125} B_{15}). La toxine LT a été mise en évidence sur une seule souche. Cinq souches d'*Escherichia coli* sont porteuses à la fois de toxines LT et ST. Shiga-like toxine (ou vero-toxin) a été détectée chez 4 souches sérogroupables (2 souches O_{128} B_{12}, 1 souche O_{55} B_5 et 1 souche O_{127} B_8). Le facteur d'attachement E.A.F. a été rencontré chez 4 souches d'*Escherichia coli* entéro-pathogènes dont 3 de sérogroupe [illegible] B_{14} et une de sérogroupe O_{114} B_4.

Parasitologie

Pour les parasites, le taux des positifs est de 22 % pour les malades et de 27 % pour les témoins, la différence n'est pas significative. Le *tableau II* donne l'incidence des différents parasites.

On observe la nette prédominance des flagellés en particulier des *Giardias* présents dans près d'une selle sur cinq.

Le polyparasisme est rencontré dans 9 selles de malades et 2 selles de témoins, la différence n'est pas significative. Les associations parasitaires sont les suivantes : pour les malades : *Giardia* et *Dientamaeba fragilis* (2 cas), *Trichomonas intestinalis* et *Chilomastix mesnili* (1 cas), *Dientamaeba* et *Endolimax nana* (1 cas), *Giardia* et *Trichomonas intestinalis* (4 cas), *Entemaeba histolytica*, *Chilomastix* et *Giardia* (1 cas). Pour les témoins, on retrouve les *Giardias* associés une fois au *Trichomonas intestinalis* et une autre fois aux oxyures. Nous remarquons dans ces associations, la relative fréquence des *Giardias*.

TABLEAU II. — *Incidence des parasites isolés dans les selles des malades et des témoins.*

Parasites	Malades		Témoins	
	Effectif	%	Effectif	%
Flagelles				
- *Giardia intestinalis*	55	17,4	21	22,58
- *Chilomastix mesnili*	3	0,95	—	—
- *Trichomonas intestinalis*	5	1,58	1	1,07
Total	*63*	*19,93*	*22*	*23,65*
Amibes				
- *Dientemaeba fragilis*	4	1,26	—	—
- *Endolimax nana*	1	0,31	—	—
- *Entemaeba histolytica*	1	0,31	2	2,15
Total	*6*	*1,88*	*2*	*2,15*
Coccidies				
- *Isopora belli*	1	0,31	—	—
Helminthes				
- Oxyures	—	—	2	2,15
Négatifs	246	77,85	67	72,04
Total général	*316*	*100*	*93*	*100*

Virologie

L'étude virologique a permis l'isolement du rotavirus 142 fois chez les malades soit un taux de positivité de 37 % et 10 fois chez les témoins soit un taux de 5 %. La différence est très significative ($p < 0,001$).

Le *Rotavirus* a été fréquemment associé aux bactéries suivantes : *Campylobacters* (5 fois), colibacilles entéropathogènes (20 fois), staphylocoques dorés (3 fois), vibrion cholérique non O1 (2 fois) et *Salmonella munchen* (1 fois).

Mycologie

Le *Candida albicans* est la mycose la plus fréquemment isolée chez 18,2 % des malades et 15,38 % des témoins. Cette différence n'est pas significative.

Au total : l'analyse permettant une étude de la responsabilité respective des bactéries, des parasites ou des virus a permis de dégager les résultats suivants :

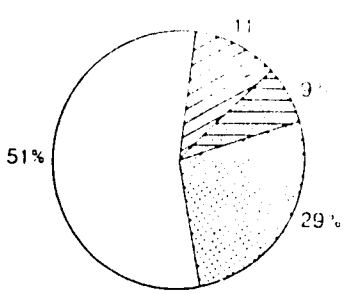


FIG. 1. — *Etiologies des gastroentérites aiguës.*
- Bactéries 20 % (11 % uniquement de bactéries et 9 % bactéries + *Rotavirus*).
- Rotavirus 38 % (29 % de *Rotavirus* seuls et 9 % de *Rotavirus* + bactéries).
- Gastroentérites d'autres origines 51 %

11 % des malades, sont porteurs de bactéries uniquement; 29 % des malades, sont porteurs du *Rotavirus* uniquement; 9 % des malades, sont porteurs à la fois du *Rotavirus* et de bactéries. Ainsi, une étiologie entérale a été reconnue dans 49 % des cas *(fig. 1)*.

Les parasites et les *Candida* n'ont pas été retenus dans l'étiologie, leur portage étant aussi fréquent chez les malades et les témoins.

Données épidémiologiques

Répartition saisonnière des agents pathogènes

L'étude de la répartition saisonnière de l'infestation bactérienne montre une prédominance des bactéries aux mois chauds (juillet-août) et une augmentation de l'excrétion du *Rotavirus* aux mois les plus froids (novembre à avril). Cette répartition est illustrée par la *figure 2*.

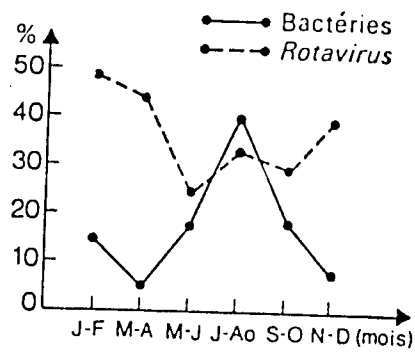


FIG. 2. — *Répartition des bactéries et du rotavirus selon les saisons.*

On observe que l'excrétion virale reste relativement élevée tout le long de l'année puisqu'on la trouve dans au moins 1 selle sur 5, toutes saisons confondues.

Données démographiques

Le *Rotavirus* est présent avec la même fréquence pour les 4 tranches d'âge : 1 à 6 mois, 7 à 12 mois, 13 à 24 mois et 25 à 36 mois.

Les malades de sexe féminin éliminent plus fréquemment le *Rotavirus* que les malades de sexe masculin (42,2 % contre 31,6 %) ($p < 0,0386$). Il n'y a pas de différence selon l'âge et le sexe pour le portage des bactéries chez les malades et les témoins. Le portage des parasites augmente avec l'âge. Dans la tranche d'âge 25 à 36 mois, plus d'un enfant sur deux est porteur de parasites.

L'infestation parasitaire touche plus souvent les enfants de sexe masculin, en effet, sur 100 garçons, on trouve 26,5 % de positifs et sur 100 filles, on en trouve 17,2 % ($p < 0,03$). Ce résultat peut être attribué aux modes de jeux des garçons qui seraient plus souvent en contact avec la terre.

Mode alimentaire

Le régime alimentaire a été groupé selon 3 catégories : allaitement maternel, allaitement mixte et allaite-

ment artificiel. La diversification alimentaire [illegible] ant faire partie ou non de chacun de ces modes [illegible] taires. La comparaison entre malades et témoins selon le régime alimentaire montre que la prévalence du lait maternel est plus élevée chez les témoins ([illegible],2 % contre 36,4 %, p <0,013). Un autre regroupement du régime alimentaire selon que l'enfant est alimenté au biberon ou non a permis de trouver que le portage des bactéries est significativement plus important ([illegible]) chez les enfants diarrhéiques alimentés au biberon âgés de 6 à 12 mois. Pour les autres tranches d'âge, on n'a pas été trouvé de différence. Le portage des virus et des parasites est indépendant du mode alimentaire.

Autres données épidémiologiques

Il n'a pas été trouvé de relation significative entre les enfants diarrhéiques contaminés par les bactéries et les cas de diarrhée dans l'entourage familial, de même qu'entre le portage des germes et la durée de la diarrhée avant le prélèvement des selles. Enfin, l'association de pneumopathies aux gastroentérites à *Rotavirus* n'a pas été trouvée significative.

DISCUSSION

Trois germes prépondérants ont été isolés au cours de cette étude : le *Rotavirus*, l'*Escherichia coli* et les *Giardia*. Si les deux premiers germes prédominent nettement chez les enfants présentant une diarrhée aiguë, le troisième est aussi fréquemment rencontré chez les malades et les témoins. Ces résultats sont ceux habituellement relevés par d'autres auteurs surtout en ce qui concerne le *Rotavirus*. En effet, une incidence d'infection au *Rotavirus* proche de 37 % a été signalée par de nombreux auteurs (2, 3). Chez les témoins, le *Rotavirus* a été isolé dans 5 % des cas. Ce résultat a été aussi rapporté par les auteurs précités. Cependant, dans une étude hospitalière, Champsaur (4) a trouvé un taux élevé de portage du *Rotavirus* (48 %) chez des enfants ne présentant pas de diarrhée. Une contamination hospitalière asymptomatique pourrait être à l'origine de ces observations.

Par ailleurs, la nature des bactéries prédominantes n'est pas celle habituellement signalée. En effet, dans notre étude une bactérie isolée sur deux est un *Escherichia coli* entéropathogène, alors que d'autres études en particulier tunisiennes rapportent la prédominance des salmonelles (5).

Cependant Brethes (6) en Nouvelle-Calédonie rapporte la même proportion d'*Escherichia coli* entéropathogène (11 %) que celle retrouvée dans notre étude et Guptan en Inde (7) signale la prédominance des colibacilles dans les selles de 343 enfants diarrhéiques âgés de 0 à 3 ans.

L'identification des toxines, sur 18 souches d'*Escherichia coli* a permis d'évoquer la responsabilité des *Escherichia coli* entérotoxinogènes dans l'étiologie des gastroentérites, et de confirmer par ailleurs, l'hypothèse que certains *Escherichia coli* entéropathogènes peuvent acquérir la propriété de sécréter une toxine.

Germany (8) a, lui aussi, isolé une toxine, mais sur la souche [illegible] 6/B16. L'étude [illegible] des caractéristiques cliniques des malades porteurs [illegible] *Escherichia coli* entérotoxinogènes montre que seule la consistance des selles est caractéristique de l'origine [illegible]que de la diarrhée : il s'agit dans tous les cas de selles liquides. Alors que les autres caractéristiques cliniques (nombre moyen de selles, durée de la diarrhée, complications) sont comparables à [illegible] retrouvées pour [illegible] les enfants diarrhéiques.

La deuxième bactérie isolée par ordre d'importance est le *Campylobacter*. Deux remarques relatives à ce germe sont à faire : 1) une incidence semblable entre les malades et les témoins (2[illegible] % contre 4,23 %, χ^2 non significatif); 2) une association fréquente à d'autres bactéries.

L'association fréquente du *Campylobacter* à d'autres bactéries surtout chez les malades a été peu signalée dans la littérature. En revanche, le portage des *Campylobacters* chez des sujets non diarrhéiques a déjà été signalé par d'autres auteurs [illegible]; l'importante étude réalisée par [illegible]wers *et al.* (10) sur 22 000 échantillons de selles [illegible] que ce germe est présent dans 1,3 % des selles [illegible]ales.

L'étude [illegible] Georges-Courbot *et al.* (11) signale que certaines souches de *Campylobacter* sont plus fréquemment associées à des diarrhées. Le *Campylobacter jejuni* aurait été trouvé plus fréquemment chez les témoins ([illegible] contre 56 %). L'importance du portage du *Campylobacter* aussi bien chez les malades que chez les témoins de notre série témoigne de la fréquence des contaminations dans cette zone de recrutement et suggère l'hypothèse que la dose infectante de *Campylobacter* doit être importante pour provoquer une diarrhée.

Par ailleurs, l'utilisation des antibiotiques a été évaluée dans les cas où les bactéries ont été incriminées. Il ressort que l'évolution concernant la déshydratation ainsi que la prise pondérale pendant le suivi n'ont pas montré de différence statistiquement significative dans le lot ayant reçu des antibiotiques et le lot des enfants ne les ayant pas reçus.

Pour les résultats parasitologiques, l'étude n'a pas montré de différence significative entre malades et témoins. La prédominance des *Giardia intestinalis* en Tunisie a déjà été signalée par [illegible] autres auteurs (12).

L'association de plusieurs parasites n'a pas été trouvée significativement plus fréquente chez les malades et les témoins. Ce résultat soulève le problème de la responsabilité des parasites au cours des diarrhées aiguës, surtout des *Giardias* qui représentent 70 % des positifs. En effet, de nombreuses études et des mises au point de l'O.M.S. signalent que *Giardia intestinalis* est un agent responsable des diarrhées aiguës. C'est sans doute l'importance de l'infestation qui est déterminante dans la modification du transit.

CONCLUSION

Dans un pays comme la Tunisie, à forte prévalence de maladies diarrhéiques (30 % de consultations de P.M.I.), une détermination régulière des germes en

cause serait d'un apport considérable pour la réalisation du programme national de lutte antidiarrhéique.

REMERCIEMENTS. Nous remercions l'organisme de coopération Tuniso-Allemande G.T.Z. pour son aimable contribution dans la réalisation de ce travail.

De même, nos remerciements s'adressent à Monsieur Le Minor pour avoir effectué les recherches des toxines, à l'Institut Pasteur de Paris.

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Les diarrhées aiguës du nourrisson en Tunisie

Béchir HAMZA, B. BENNACEUR *

La maladie diarrhéique est très fréquente dans le monde en développement. Les statistiques de l'OMS [1] font état de 1 500 millions d'épisodes par an, qui affectent 500 millions d'enfants de moins de 5 ans, et d'une mortalité de 5 à 10 millions d'enfants par an [1].

En Tunisie, les diarrhées aiguës sont fréquentes ; elles constituent la première cause de mortalité infantile et restent la préoccupation majeure des équipes de santé et des autorités sanitaires qui ont entrepris à cet effet un programme de lutte antidiarrhéique.

L'enquête nationale de morbidité-mortalité infantile, les diverses enquêtes régionales, et les enquêtes hospitalières révèlent la fréquence de la maladie et sa gravité essentiellement chez l'enfant malnutri.

Les différentes études menées dans les centres de Protection maternelle et infantile et dans différents services de Pédiatrie, nous donnent une idée de l'importance du problème [2] : c'est ainsi que dans les centres de PMI le symptôme diarrhée est le deuxième motif de consultation après les infections respiratoires.

Les différentes études de mortalité infantile par gastroentérite pratiquées de manière ponctuelle dans différents services de pédiatrie [3] de Tunisie donnent un taux qui varie de 18 % à 26 % [3]..

L'analyse des décès chez le nourrisson deshydraté trouve de manière constante quatre éléments de mauvais pronostic qui sont : le jeune âge, l'arrêt précoce de l'allaitement maternel, l'hypotrophie staturo-pondérale et le niveau socio-économique bas [4, 5, 6].

Les différentes études étiologiques pratiquées en Tunisie sont pauvres en renseignements en raison des insuffisances des laboratoires de bactériologie et de virologie.

Lors d'une enquête réalisée par A. Boujnah et coll. portant sur la recherche systématique de germes pathogènes lors des diarrhées du nourrisson, les bacilles ont été retrouvés dans une proportion de 26,6 %. Les germes les plus fréquemment retrouvés sont les Salmonelles, les Shigelles, et certaines souches de Colibacilles.

Dans l'étude de Bennour [5], portant sur 101 cas d'enfants, pour la plupart hypotrophiques, les coprocultures ont été positives dans 22 % des cas. Les Salmo-

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nelles, colibacilles, Shigelles ont été isolés. Sur une étude relative à plus de 30 000 recherches de Salmonelles pratiquées à l'Institut Pasteur de Tunis, c'est la Salmonelle Wien qui occupe le devant de la scène depuis 1971. La prédominance de la Salmonelle Wien (50,26 %) persiste encore [7]. Actuellement d'après une étude pratiquée au Centre national de Salmonelles de l'Institut Pasteur de Tunis 1715 souches de Salmonelles ont été identifiées [7].

Les études virologiques ont également été pauvres en renseignements : A. Boujnah trouve 4,4 % de virus dans les cas de diarrhées aiguës de l'enfant. N. Gueddana [8] a recherché une étiologie virale chez 183 enfants d'âge préscolaire, atteints de diarrhées aiguës. Le Rotavirus a été retrouvé dans 19 % des cas, alors que les bactéries dites entéropathogènes ont été retrouvées dans 9 % des cas. La démonstration d'une infection à Rotavirus a été faite de façon indirecte par la mise en évidence d'une conversion sérologique.

Si la parasitose intestinale est un facteur de gastroentérite dans des pays tropicaux, les différentes études réalisées en Tunisie pour rechercher une étiologie parasitaire sont négatives. Certes, la lambliase intestinale a été retrouvée non pas dans les selles, mais surtout lors d'examens de biopsies duodéno-jéjunales pratiquées pour explorer les diarrhées chroniques par carence d'apport, ou par malabsorption. C'est ainsi que la lambliase a été retrouvée dans 25 % des cas [9] dans une première étude, et la proportion de 30 % chez des enfants atteints de maladie coeliaque [10]. Il est probable que la parasitose intestinale en entraînant les lésions entérocytaires, augmente le processus diarrhéique [11].

Si les recherches bactériennes et virologiques sont pauvres en renseignements, les diarrhées aiguës du nourrisson sont sûrement infectieuses. En effet, nombreuses sont les constatations qui nous amènent à penser que les diarrhées aiguës du nourrisson sont dues à des germes transmissibles : le caractère saisonnier estival, l'alimentation au lait de vache non stérilisé ou lait modifié préparé dans de mauvaises conditions d'hygiène, la mauvaise qualité de l'eau potable dans les zones rurales. A titre d'exemple, une étude bactériologique faite à titre systématique a révélé que dans les zones rurales 71 % de l'eau des puits est contaminée. Par ailleurs, les mauvaises conditions de vie, d'alimentation, d'habitat, d'évacuation des eaux usées plaident également en faveur d'une cause infectieuse.

La principale complication des diarrhées aiguës étant la deshydratation sévère, nous avons utilisé jusqu'à ces dernières années, comme beaucoup d'autres auteurs, la réhydratation intraveineuse, le maintien du jeûne prolongé et la réalimentation très progressive, à base d'aliments absorbants (caroube, carottes) puis de babeurre, soupe de babeurre, jusqu'à arriver très progressivement à une alimentation normale. Cette méthode, si elle reste valable chez l'enfant eutrophique, aggrave l'état nutritionnel des enfants dénutris, les expose à la diminution de leurs moyens de défense et à des infections systémiques et iatrogènes.

C'est pour essayer de démontrer que la réhydratation orale et la rénutrition précoce sont indiquées, aussi bien chez l'enfant eutrophique que dénutri, que nous avons entrepris une étude prospective. Cette étude porte sur 68 nourrissons

atteints de deshydratation par gastroentérite âgés de 11 jours à 14 mois (Tableau I), 53 % de ces enfants ont une hypotrophie du 3e degré, 17 % ont une hypotrophie du 2e degré (Tableau II).

Leur état de deshydratation est apprécié par un score, qui est adopté à l'échelle de tout le pays et qui porte sur 7 paramètres (Tableau III).

Si le score est inférieur à 8, l'enfant est réhydraté par voie orale. Si le score est supérieur à 8, avec collapsus ou précollapsus, l'enfant est réhydraté alors par voie IV. Dès que le score devient inférieur à 8, le relais est pris par la réhydratation orale.

TABLEAU I

68 NOURRISSONS DESHYDRATÉS

AGE

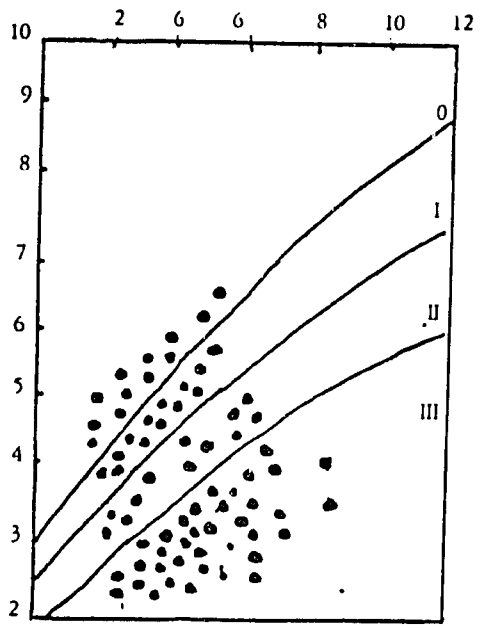
11 % < 1 MOIS

1 MOIS < 72 % < 6 MOIS

6 MOIS < 15 % < 12 MOIS

98 % < 12 MOIS

TABLEAU II



MOIS (AGE EN MOIS)

0 = P/PM 90 %

I = P/PM 90 75 %

II = P/PM 75 60 %

III = P/PM 60 %

DEGRÉ D'HYPOTROPHIE
68 NOURRISSONS

TABLEAU III

	2	1	0	
A — LANGUE	sèche	un peu desséchée	humide	A
B — GLOBES OCULAIRES	très enfoncés	légèrement enfoncés	normaux	B
C — FONTANELLE	très déprimée	légèrement déprimée	plate	C
D — EXTRÉMITÉS	froides et violacées	refroidies	normalement chaudes	D
E — ÉTAT NEUROLOGIQUE	apathique ou très agité	plaintif	normal	E
F — RESPIRATION	ample	rapide 40/mn	calme 30/mn	F
G — PLI CUTANÉ	persistant	pâteux	absent	G

La solution de réhydratation utilisée est la solution de l'OMS. (Tableau IV).

Dès que l'état d'hydratation est corrigé totalement ou partiellement et en tout cas avant la 24e heure, la réalimentation est introduite. Si l'enfant est au sein, la réalimentation est maintenue dès le premier jour; dans le cas contraire, le mode de rénutrition tient compte du régime antérieur de l'enfant ; il est administré soit à dose maximale ou rapidement progressive pour arriver à 150 Kcal/kg/jour, voire plus.

L'état d'hydratation est contrôlé toutes les 6 heures par le score et le poids ; il n'est pas tenu compte de la fréquence des selles : un apport complémentaire de la solution hydratante est apporté en cas de nécessité.

Quant à l'antibiothérapie, elle n'est utilisée que s'il y a une infection systémique, un état de choc infectieux ou des selles purulentes et sanglantes pouvant être en rapport avec une diarrhée invasive.

Cette méthode de réhydratation-renutrition brièvement exposée, quels sont les résultats ?

— 65 % des enfants ont bien répondu à ce schéma.

TABLEAU IV

SOLUTION DE REHYDRATATION

(OMS)

CHLORURE DE NA	: 3,5 G	100 CC EAU
CHLORURE DE K	: 1,5 G	
BICARBONATE DE NA	: 2,5 G	
GLUCOSE	: 20 G	

— 10,25 % n'ont pas supporté le schéma de réalimentation par intolérance acquise aux protéines du lait de vache et au lactose et ont bien répondu à une alimentation par le lait de soja, la réalimentation normale a été réintroduite par la suite.

— Dans 10,25 % il y a eu intolérance aux protéines du lait de vache, au lactose et aux protéines du soja, et ils ont donc été soumis à une diète semi-élémentaire à base d'hydrolysat de caséine/Dextrine maltose et triglycérides à chaines longues.

Si l'on analyse les décès (14,5 %) on constate que 80 % ont un âge inférieur à 6 mois et que 90 % ont une hypotrophie majeure (degré III de Gomez).

Les décès sont survenus soit très rapidement avant réhydratation par choc infectieux, (50 %), soit après échec des diètes semi-élémentaires. Le taux de décès reste donc élevé, mais il est inférieur à nos séries précédentes où le taux variait entre 18 et 26 %.

Les nouvelles conceptions physiopathologiques de la diarrhée sont à la base des nouvelles prises en charge de la maladie diarrhéique de l'enfant. L'entérocyte a une double fonction (figure I) : absorption d'eau, d'électrolytes, de nutriments, et une fonction de sécrétion active de sodium, chlore, et d'eau.

Les régulations intra-érythrocytaires de sécrétion sont sous la dépendance de différents facteurs. L'AMP cyclique qui stimule les processus sécrétoires de l'entérocyte, le calcium intracytosolique qui active la calmoduline et stimule les processus sécrétoires de l'entérocyte [1-13].

— Différents facteurs extraentérocytaires stimulent la sécrétion. Ce sont les sécrétagogues agissant par l'intermédiaire de l'AMP cyclique :

— La VIP : vasoactive intestinal peptide.

— Les prostaglandines : synthétisées dans la muqueuse intestinale.

— D'autres sécrétagogues n'agissant pas par l'intermédiaire de l'AMP cyclique, ce sont la sérotonine qui inhibe l'absorption du sodium-chlore, augmente le calcium cytosolique et l'acétycholine qui augmente l'influx intraentérocytaire du calcium.

D'autres facteurs stimulent les fonctions de résorption et il faut citer en premier lieu le glucose qui augmente la perméabilité de la bordure en brosse et donc augmente l'absorption de l'eau, du sodium et du chlore ; cette constatation physiopathologique fondamentale est à la base de l'utilisation des solutions de réhydratation orale [1].

L'absorption de l'eau est réalisée dans sa presque totalité au niveau de l'intestin grêle et du colon.

La diarrhée apparaît lorsque le flux iléo-cœcal dépasse les capacités de réabsorption du colon. Quand le colon est atteint, la diarrhée apparaît de toutes les façons, qu'il y ait défaut de réabsorption colique, ou hypersécrétion colique [13].

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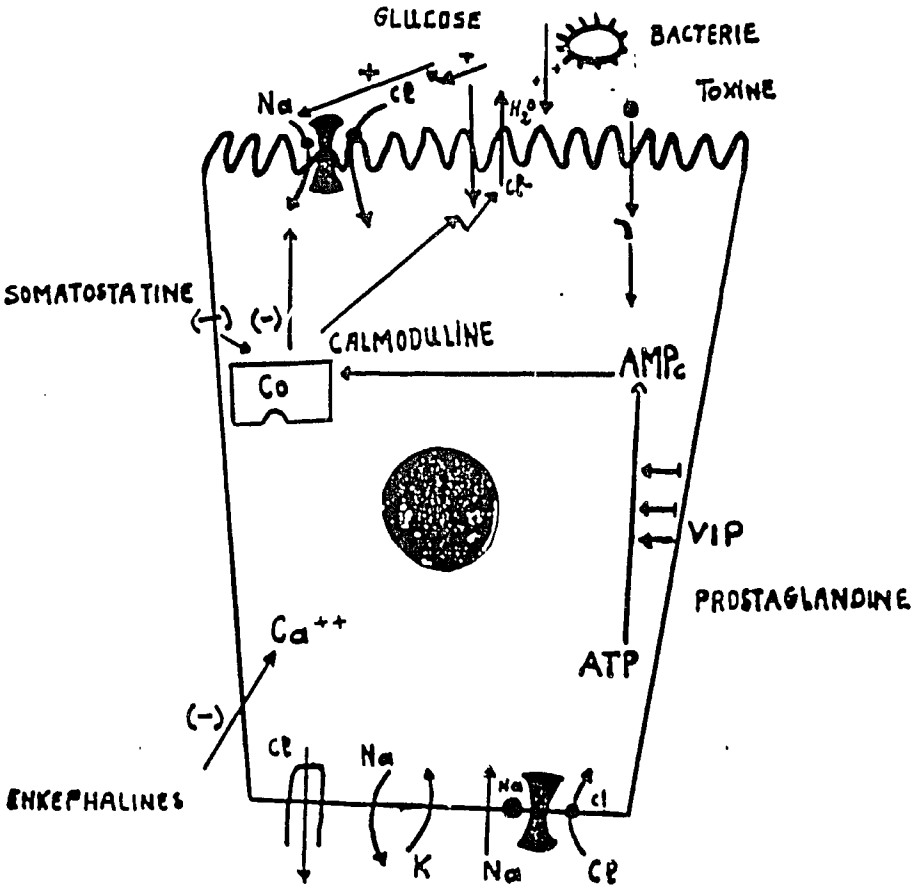
FIGURE I



Le bilan négatif peut être dû à trois causes :

— un défaut d'absorption au niveau de l'intestin grêle : la diarrhée virale se traduit par un excès de liquide iléal dû au défaut d'absorption, et un excès de contenu en fluide intestinal et en nutriments.

— Les entérotoxines bactériennes dont le premier exemple connu est la toxine cholérique, stimule la production intra-entérocytaire d'AMP cyclique. Les processus sécrétoires sont emballés et responsables d'un afflux de liquides dans le grêle, et les capacités de récupération colique sont dépassées laissant apparaître une diarrhée hydroélectrolytique majeure.

Les diarrhées à germes invasifs entraînent une altération de la muqueuse colique avec apparition de sang, et de glaires dans les selles, diminuent de manière

importante les capacités de réabsorption colique et sont responsables de pertes hydriques. Certains germes agissent par deux mécanismes :

— Sécrétion d'une toxine entéropathogène
— Prolifération dans la muqueuse colique.

L'intestin dispose d'une batterie de moyens de défense contre les agents infectieux qui sont l'acidité gastrique, la sécrétion biliaire, le péristaltisme intestinal, le développement d'une flore intestinale saprophyte, l'élimination spécifique des agents pathogènes, et les systèmes de défenses immunitaires locales et générales de l'enfant [1].

Chez l'enfant malnutri, qui constitue la majorité de nos malades diarrhéiques, la prise en charge est rendue plus difficile à cause des multiples problèmes métaboliques, immunologiques, histologiques qu'ils posent. Le malnutri fait souvent des diarrhées trainantes qui résistent aux médications et aux mesures diététiques habituellement efficaces chez le nourrisson eutrophique [5].

L'étude de Rezgui [14] montre que la biopsie duodéno-jéjunale du malnutri est souvent altérée : dans 75 % des cas, elle est atrophique (photo I), à des degrés divers, ou hypotrophiques, et dans 25 % des cas normale (photo II).

Khadraoui [15] a montré que si les fonctions de l'immunité humorale sont normales chez le malnutri, il n'en est pas de même pour l'immunité cellulaire qui est souvent altérée.

Viteri [16] a montré qu'il existe une hypoacidité gastrique qui réduit les résistances de l'organisme vis à vis des agents infectieux. Cependant, des travaux récents [17] (Colloque Diarrhée du Jeune, Paris ; mars 1984) montrent qu'il persiste un transport actif du glucose, du sodium par l'épithélium intestinal altéré de l'enfant malnutri [17], et que la réhydratation et la réalimentation précoce simultanées du nourrisson diarrhéique et malnutri, avec des diètes naturelles contenant des protéines du lait de vache et du lactose sont possibles. De même Bennour [5] a montré que le lait de vache donné aux concentrations habituelles peut être toléré chez l'enfant dans une proportion importante.

Plusieurs auteurs ont montré les avantages de la réhydratation orale qui peut être aussi efficace que la réhydratation IV et qui peut rétablir des désordres électrolytiques dans un délai équivalent à la réhydratation intra-veineuse. Le problème discuté est celui de la concentration en sodium : la solution de l'OMS contient 90 millimoles alors que d'autres contiennent moins, selon les zones géographiques d'action, les étiologies prédominantes, l'état nutritionnel, la perte sodée dans les selles, les besoins sont variables. La composition de la solution hydratante a fait, et fait encore l'objet de nombreuses discussions.

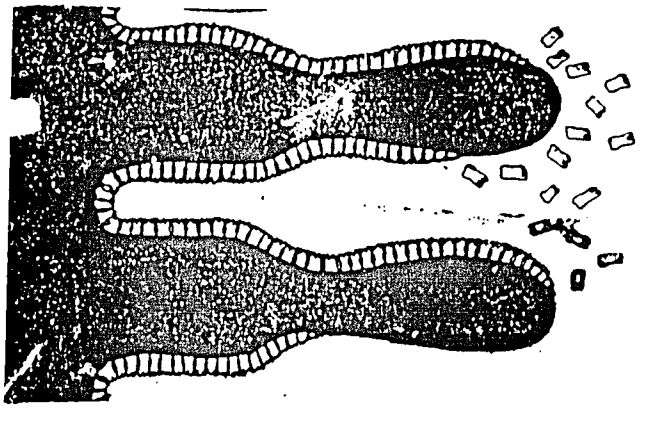
Le deuxième problème physiopathologique important est celui du maintien de l'alimentation pendant l'épisode diarrhéique.

Là aussi, les connaissances nouvelles ont permis de mieux comprendre les mécanismes d'absorption des nutriments au décours des diarrhées aiguës. L'on

sait maintenant que le jeûne diminue l'activité des enzymes digestifs de l'intestin et peut retarder la réparation de la muqueuse intestinale altérée. La vitesse de régénération et la migration des cellules épithéliales au sommet des villosités sont nettement diminuées après déplétion protéique et jeûne total.

L'on sait aussi que les rotavirus envahissent les cellules épithéliales villositaires, provoquant un raccourcissement des villosités et une dégradation des enzymes de la bordure en brosse, notamment la lactase (figure II).

FIGURE II



En ce qui concerne le problème de l'intolérance au lactose, Viteri montre [16] l'aggravation de l'état clinique de l'enfant lors de la réintroduction du lait de vache.

Lifshitz [18] montre que le lait de vache, utilisé dans le protocole de traitement des gastroentérites de l'enfant prolonge significativement la maladie, et cet auteur préconise l'utilisation de préparations ne contenant pas de lactose.

Cependant, les investigations biologiques (dosage de la lactase) et histologiques chez des enfants malnutris et présentant une diarrhée sont peu concluantes : Brown [19] retrouve une activité lactasique réduite en relation avec d'importantes modifications histologiques.

Donc la question restée sans réponse précise à l'heure actuelle est la suivante :

La réduction de l'activité lactasique retrouvée chez un enfant malnutri diarrhéique est-elle décisive pour le retrait du lait ?

Différents auteurs [17] montrent que malgré la fréquence de l'intolérance au lactose, celle ci est rarement assez grave pour empêcher l'alimentation lactée.

A la lumière de notre expérience sur la rénutrition précoce, il ressort qu'il faut réaliser un apport énergétique et azoté suffisant chez tout enfant présentant

une diarrhée aiguë que
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une diarrhée aiguë quelle que soit l'évolution du syndrome diarrhéique et a fortiori si l'enfant est dénutri.

Le problème qui s'est posé pour nous est le suivant. Comment réalimenter l'enfant diarrhéique antérieurement nourri au lait de vache ?

Nous avons vu que dans 20,5 % des cas, nous avons dû avoir recours soit à l'alimentation à base d'hydrolysat de caséine soit à base de protéines de soja. Or les tentatives itératives de rénutrition des malnutris lorsqu'elles sont suivies d'échec risquent de prolonger l'état de dénutrition.

Aussi, à la lumière des résultats obtenus et de l'analyse des décès, on peut décrire un type d'enfant pour lequel il faut d'emblée proposer un schéma de réalimentation très précocément suffisant, en calories, réalimentation donnée sous forme de nutriments facilement résorbables, sans protéines du lait de vache et sans lactose, et sans protéines de soja.

Cette attitude nous paraît justifiée lorsqu'il s'agit de nourrissons jeunes, nourris artificiellement, hypotrophiques, ayant eu des antécédents de diarrhée et ayant une diarrhée depuis plus de 7 jours avec des signes cliniques ou biologiques d'intolérance au lactose et aux protéines du lait de vache.

Cependant, la thérapeutique et la diététique des diarrhées prolongées avec deshydratation chez l'enfant malnutri, est difficile, longue et coûteuse. Elle nécessite de longs séjours hospitaliers, et reste grevée d'une forte mortalité.

Aussi, des actions sur le plan de la prévention de la malnutrition et de la diarrhée/deshydratation ont-elles été entreprises.

En ce qui concerne la prévention de la malnutrition, nous avons opté pour 3 principaux objectifs : promotion de l'allaitement maternel, fabrication industrielle des aliments de sevrage, et éducation nutritionnelle.

Différentes actions ont été menées à tous les niveaux en faveur de l'allaitement maternel : enseignement dispensé aux étudiants et aux agents de santé mettant l'accent sur les avantages de l'allaitement au sein, séminaires organisés à l'intention des organismes féminins, cours dispensés au niveau des futures mères, films télévisés, participation des mass media, émissions radiophoniques et enfin adoption d'une loi en mars 1983 réglementant la distribution des substituts du lait maternel conformément au Code international de l'Organisation Mondiale de la Santé. La presse écrite a également participé à cette promotion, des affiches ont également stigmatisé l'effet néfaste des biberons.

Par ailleurs, toutes les enquêtes ponctuelles, menées en Tunisie ont montré qu'à partir du 5e ou 6e mois, l'allaitement maternel ne suffit plus dans la majorité des cas, à couvrir les besoins énergétiques, aussi deux solutions ont-elles été adoptées : la première est la supplémentation à partir du 5e mois, par un aliment préparé industriellement dit « aliment de sevrage », préparé à partir de protéines végétales disponibles dans le pays et à un coût acceptable. L'aliment de sevrage en Tunisie est fait à partir de blé dur, lentilles, pois-chiches, enrichi par 10 % de lait écrémé et par des vitamines.

La deuxième solution est l'éducation nutritionnelle par la préparation de recettes, composées d'aliments disponibles et faisant partie du plat familial et d'un prix accessible et dont la démonstration est faite dans les centres de PMI.

En ce qui concerne la prévention de la deshydratation, un programme national de lutte antidiarrhéique est mené en collaboration avec l'OMS et l'UNICEF depuis 1980 et se poursuit actuellement [4].

Ce programme a pour objectif de diminuer la mortalité par deshydratation par la réhydratation orale et sa principale complication, la malnutrition. Pour mener ce programme de lutte diarrhéique, une stratégie a été adoptée. Le pays est divisé en 3 zones géographiques I, II, II. Dans chaque zone, le programme se déroule en 2 phases : la phase I qui est la phase d'information, de sensibilisation, et d'application limitée de la réhydratation orale, la phase II, la phase de généralisation et d'intensification.

Le personnel médical et paramédical a été initié au score de deshydratation. Toute plainte doit être considérée comme potentiellement grave et doit être prise en charge. Tous les malades qui se trouvent dans le stade I ou II de deshydratation sont réhydratés dans les centres de santé, ceux qui ne s'améliorent pas ou ceux qui sont d'emblée dans un stade sévère de deshydratation sont évacués vers les centres d'hospitalisation.

Parallèlement à la réhydratation orale, l'alimentation habituelle du nourrisson est maintenue et dans tous les cas l'alimentation au sein est poursuivie.

Il ne faut pas cependant perdre de vue que toute action de lutte antidiarrhéique doit avoir pour objectif l'évacuation des eaux usées, l'hygiène du lait, la lutte contre les vecteurs, mais surtout l'approvisionnement en eau potable. A cet effet, un grand effort a été réalisé aussi bien dans les zones rurales qu'urbaines. Dans les villes, la desserte en eau potable est de 90 % ; dans les zones rurales elle n'est encore que de 25 %, dans ces zones un programme de traitement des eaux de puits par le chlore est entrepris.

En attendant que ces grands objectifs soient réalisés, il importe de mieux cerner le problème de la diarrhée en Tunisie par des études sur le rôle des rotavirus, afin de justifier la nécessité éventuelle d'un vaccin anti-rotavirus dans les programmes de santé publique. Dans ce domaine et grâce aux recherches qui se poursuivent, des espoirs sont permis.

MOTS-CLÉS : Diarrhées infantiles. Tunisie.

KEY-WORDS : Diarrhea, infantile. Tunisia.

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Bull. Acad. Nat. Méd., 1984, *168*, n° 7-8, 971-974, séance du 20 novembre 1984

Nous vous redisons, à tous les quatre, notre joie de vous accueillir en cette Académie nationale de médecine. Nous aimons y recevoir les confrères qui viennent d'au-delà de nos frontières, et très spécialement ceux de pays qui, comme le vôtre, ont une place privilégiée en nos cœurs.

Bull. Acad. Nat. Méd., 1984, *168*, n° 7-8, 959-970, séance du 20 novembre 1984

DISCUSSION

M. MANDE : Je tiens à souligner l'importance de l'ensemble de l'œuvre de M. Hamza et à rappeler le rôle que la pédiatrie tunisienne a joué au cours de ces vingt dernières années dans la définition, puis la mise en œuvre des programmes recommandés par l'UNICEF avec laquelle le professeur Hamza a constamment travaillé. Depuis quelques années, cette collaboration a porté particulièrement sur le rôle de la malabsorption orale dans le traitement des diarrhées aiguës du nourrisson. Pour tous ceux qui s'intéressent au développement de l'action de l'UNICEF, l'ensemble de l'œuvre réalisée par le professeur Hamza et ses collaborateurs est exemplaire.

M. LAPLANE : Je tiens à féliciter le professeur Hamza dont l'intéressant exposé nous a montré l'importance et l'efficacité de l'action entreprise en Tunisie dans la lutte contre les gastro-entérites du nourrisson. Mais il témoigne aussi de la connaissance qu'il a des données les plus récentes qui ont été mises en évidence dans ces maladies : rôle essentiel des rotavirus, possibilité d'une intolérance secondaire aux protéines du lait de vache, importance de l'état nutritionnel dans les défenses immunologiques.

M. GOUNELLE de PONTANEL : Nous avons été heureux d'entendre Madame le Ministre et nos collègues tunisiens nous faire part des résultats déjà obtenus dans leur pays, résultats déjà fort tangibles et encore plus prometteurs pour un proche avenir. L'importance des parasitoses et la lutte nécessaire contre elles est un des premiers devoirs du médecin de Santé Publique. En ma qualité d'ancien expert et consultant de nutrition des Nations Unies en pays du tiers monde, j'ai à de multiples reprises souligné que le combat contre la dénutrition passait également et d'abord par celui contre les parasitoses ; quel gaspillage de nutriments les affections parasitaires n'entraînent-elles pas ?

Bull. Acad. Nat. Méd., 1984, *168*, n° 7-8, 971-974, séance du 20 novembre 1984

Remerciements et quelques commentaires

Raymond BASTIN *

En cet instant, je perçois fort bien l'honneur qui m'est fait de venir à cette tribune pour remercier nos amis tunisiens et commenter quelques-uns seulement des nombreux enseignements que comportent les très belles communications que nous venons d'entendre.

Vous me permettrez, Madame le Ministre, de commencer par évoquer les exposés des Professeurs Mongi Ben Hamida, Amor Chadli et Béchir Hamza.

Successivement, ils ont attiré l'attention et suscité d'intéressantes discussions sur des chapitres de la neurologie, de la pathologie infectieuse et de la pédiatrie, mais, chacune de ces disciplines n'étant que partie du vaste domaine dont vous avez la responsabilité, il m'apparaît logique d'aller du particulier au général.

La communication du Professeur Ben Hamida met l'accent sur une forme particulière de dystrophie musculaire progressive et primitive, qui ressemble étrangement à la paralysie pseudo-hypertrophique de Duchenne de Boulogne, mais qui affecte les deux sexes, la maladie de Duchenne n'intéressant que les garçons.

Après avoir noté la variabilité de la répartition de l'atteinte musculaire et la variabilité chronologique évolutive, nous devons reconnaître que de telles particularités cliniques sont déjà attribuées à d'autres dystrophies musculaires, génétiquement liées au chromosome X, comme les maladies de Duchenne, mais ayant un phénotype différent. Nous faisons ici allusion aux dystrophies de type Becker et de type Emery-Dreifuss.

L'originalité des faits aujourd'hui rapportés porte donc bien sur la place que semble prendre ici le mode de transmission récessif autosomal. La très forte consanguinité des parents explique, en grande partie, la relative fréquence en Tunisie.

Les difficultés rencontrées pour différencier cliniquement cette dystrophie musculaire primitive de la maladie de Duchenne mettent en lumière l'intérêt que prennent ici les études histo-enzymologiques de la fibre musculaire.

La communication du Professeur Amor Chadli commença par une rétrospective de la brucellose qui réveilla tout de suite le souvenir de l'illustre prédécesseur de notre Collègue en cet Institut Pasteur de Tunis, le nobélien Charles Nicolle. Combien seraient grandes son admiration et sa satisfaction s'il pouvait aujourd'hui constater le recul de l'infection, tant humaine qu'animale, lui qui la désigna « maladie d'avenir ».

* Membre de l'Académie nationale de médecine.

Des tableaux récapitulatifs que vous nous avez projetés, nous retenons que, grâce à l'interdiction du libre élevage des chèvres et au strict contrôle des troupeaux existant encore dans les fermes pilotes, la brucellose caprine est devenue très rare en Tunisie. Nous retenons aussi que les pourcentages de séro-agglutination pour les brucelloses bovine et ovine oscillent entre 1 et 2 %. Ce sont là magnifiques acquisitions lorsqu'on se souvient qu'il y a une trentaine d'années, certains de ces pourcentages (pour les bovins en particulier), atteignaient jusqu'à 25 %.

Quant à l'infection humaine, il faut se réjouir qu'elle ait connu même régression puisqu'elle évolue parallèlement à l'infection des animaux. Les pourcentages de 0,25 à 1 % de la séropositivité chez les sujets fébriles témoignent de cette évolution favorable de l'endémie brucellienne.

L'ensemble de ces résultats atteste l'efficacité du travail accompli simultanément, en Tunisie, par tous les services des principaux secteurs sanitaires intéressés.

Le Professeur Béchir Hamza a traité de la première cause de mortalité infantile dans votre pays. Il est bien prouvé que les facteurs de mauvais pronostic sont le très jeune âge, l'hypotrophie majeure, l'arrêt précoce de l'allaitement maternel, une alimentation souvent contaminée par les substituts du lait maternel.

L'expérience clinique du Professeur Hamza le conduit à préconiser une réhydratation orale ou veineuse très courte, une réalimentation sous forme de produits facilement résorbables, sans protéines du lait de vache, sans lactose. C'est là une diététique difficile à réaliser et coûteuse. Aussi l'accent est-il surtout mis sur la prophylaxie :

- amélioration de l'hygiène et des conditions socio-économiques dans la population où se recrutent surtout ces nourrissons atteints de diarrhées aiguës ;
- développement des sources d'eau potable ;
- prévention de la malnutrition protéino-calorique ;
- promotion de l'allaitement maternel ;
- diversification précoce du régime et utilisation de farines de sevrage.

Madame le Ministre,

Vous avez eu la délicatesse de rappeler dès le début de votre communication les liens très étroits qui unissent la médecine tunisienne et la médecine française, nul doute que ce rappel n'ait fait vibrer bien des cordes affectives. Comment en serait-il autrement ?

Très vite vous avez souligné l'écart qui sépare trop souvent les moyens dont peuvent disposer des responsables de la santé, des buts qu'ils visent pour que leur politique corresponde aux souhaits et aux exigences que formulent souvent les

populations. C'est là un écueil auquel n'échappe aucun responsable de la santé en quelque pays que ce soit.

Malgré ce handicap, les résultats obtenus en Tunisie depuis une vingtaine d'années sont brillants. Nous devons vous féliciter ainsi que vos prédécesseurs et tous les collaborateurs qui participent à cette immense tâche.

J'ai retenu quelques chiffres : une mortalité infantile qui passe, en un peu plus de 20 ans, de 180 pour 1 000 à 80 pour 1 000. Un taux global de mortalité qui va de 18 pour 1 000 à 10 pour 1 000, au cours de la même période.

Vous nous avez ensuite détaillé ce qu'est aujourd'hui (numériquement parlant) le corps médical en Tunisie et ce que sont les structures d'accueil des malades, d'une façon générale ce qu'est l'équipement sanitaire. Au passage, vous n'avez pas manqué d'insister sur la difficulté que représente le caractère très irrégulier et hétérogène de cette dotation, suivant que l'on considère les centres urbains ou les régions rurales.

Est venue ensuite l'analyse précise de ce que j'appellerais la stratégie de votre politique sanitaire actuelle. J'ai retenu toute l'importance que vous donnez aux soins ambulatoires de base, dispensés par des équipes multi-disciplinaires où apparaissent à côté des médecins, des infirmières, des infirmiers, des kinésithérapeutes, des éducateurs sanitaires etc. Ici l'un de vos soucis et l'une de vos principales difficultés est d'insuffler à ces équipes un esprit communautaire, afin qu'elles perçoivent l'environnement social pour mieux dispenser les soins correspondant à une pathologie de groupe.

Toujours dans la même perspective stratégique, il est important de retenir que vos hôpitaux sont maintenant répartis selon 3 niveaux : celui de la circonscription, celui de la région et celui des hôpitaux universitaires. Combien est sage la décision de prévoir, à côté de ces derniers, les instituts spécialisés dans lesquels la recherche trouvera son épanouissement.

Dans la dernière partie de votre exposé est venu le groupement des mesures plus générales qui concernent l'éducation sanitaire, la médecine scolaire et professionnelle et la planification des naissances.

L'ensemble représente un travail de tous les instants, car la tâche est lourde et je comprends que vous ayez pu avoir, comme vous avez bien voulu nous le dire, une certaine appréhension, lorsque, prenant votre fonction il y a un peu plus d'un an, vous perceviez le rude labeur qui vous attendait.

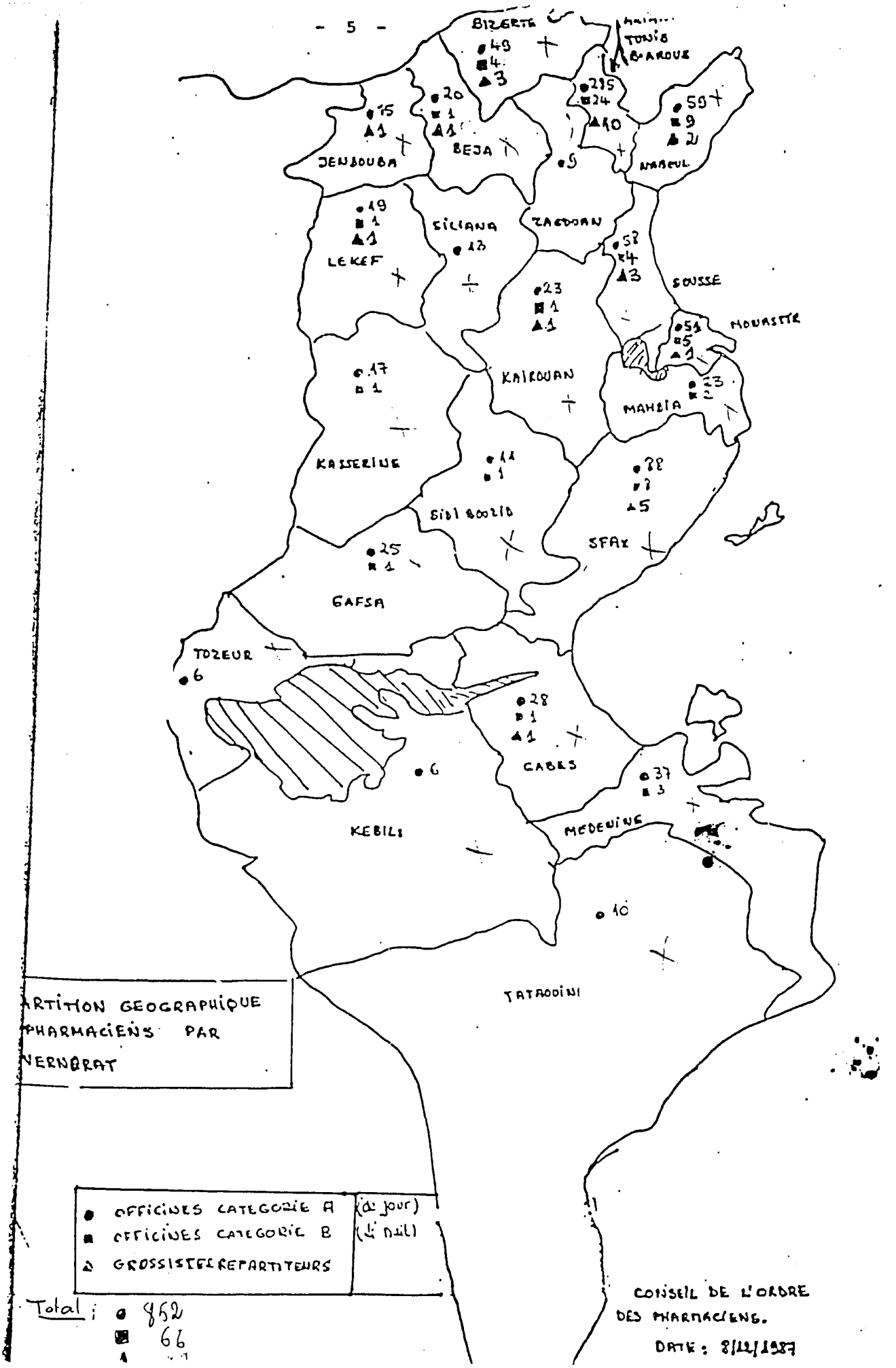
Au nom de mes collègues, nous vous félicitons pour tout ce qui a déjà été accompli et nous vous remercions de la très précise et instructive documentation que vous nous avez fournie.

Pour achever ce rapide parcours, nous vous prions, Madame le Ministre, d'accepter les vœux que nous formons pour la rapide guérison du Président Bourguiba.

ANNEX 7

	Pharmacies de jour	Pharmacies de nuit	Grands repartiteurs
Tunis	285	14	10
Nabeul	59	3	2
SOUSSE	58	4	3
Monastir	51	5	1
Mahdia	23	2	
SFAX	[illegible]	[illegible]	5
GABES	28	1	1
Medenine	37	3	
Bizerte	41	4	3
Beja	20	1	1
Siliana	13		
Kairouan	23	1	1
Sidi Bouzid	11	1	
Jendouba	15		1
Le KEF	19	1	1
Kasserine	17	1	
GAFSA	25	1	
Tozeur	6		
KEBILI	6		
TATAOUINE	10		
Total	846	66	29

912 pharmacies



ARTITION GEOGRAPHIQUE
PHARMACIENS PAR
NERNORAT

● OFFICINES CATEGORIE A	(au jour)
■ OFFICINES CATEGORIE B	(1er Nov)
▲ GROSSISTES REPARTITEURS	

Total : ● 852
■ 66
▲ [illegible]

CONSEIL DE L'ORDRE
DES PHARMACIENS.

DATE : 8/12/1987

ANNEX 8

PROGRAMME DE LUTTE ANTI-DIARRHEIQUE

BILAN DES SEANCES D'ANIMATION DANS LES CENTRES CNSS 87.

GVRNRT	CENTRES	INSCRIPTION AU PROGRAMME ET BENEFICIE DES Sces SOCIAUX					NOMBRE DE MERES BENEFICIAIRES DE LA					NIVEAU DE PARTICIPATION ET DE PRESENCE								
												Mère de enfants ayant bénéficié								
		MERES BENEFICIAIRES CNSS	MERES NON BENEFICIAIRES	STATUT NON INDIQUE	TOTAL MERES INSCRITES	TOTAL DE LEURS ENFANTS < 5ans (estimation)	LA SEANCE "sensibilisation"	LA SEANCE "liquides"	LA SEANCE "Oralyte"	LA SEANCE "Allait-Alim."	LA SEANCE "Prévention"	UNE SEULE SEANCE	DEUX SEANCES SEULEMENT	TROIS SEANCES SEULEMENT	QUATRE SEANCES SEULEMENT	LES CINQ SEANCES	TOTAL MERES BENEFICIAIRES IAD	NOMBRE DE COURS DONNES	TOTAL PRESENCES ENREGISTREES	BALANCE MOYENNE PAR COURS
ARIANA	3	117	21	19	157		121	91	95	101	104	31	20	12	34	54	151	30	529	18
BEN AROUS	3	135	34	3	169		125	65	62	53	33	51	41	28	22	7	149	36	345	10
BEJA	4	158	40	2	200		118	92	77	68	54	38	28	27	21	34	148	42	520	12
JENDOUBA	6	319	76	4	399		279	202	160	190	206	72	91	75	69	56	363	75	1153	15
BIZERTE	3	187	59	1	247		151	136	81	35	54	58	76	44	16	11	205	41	482	12
NABEUL	5	335	81	137	553		377	346	294	305	314	69	119	118	146	74	526	109	1723	16
ZAGHOUAN	4	183	68	11	262		169	115	84	121	136	60	65	47	47	21	240	69	728	11
SILIANA	4	142	70	18	230		148	72	118	122	108	15	39	48	42	33	177	72	710	10
LE KEF	5	150	58	109	317		232	213	220	203	210	40	27	35	56	132	290	97	1256	13
KASSERINE	5	411	49	1	461		241	246	300	281	273	52	79	118	94	85	428	99	1403	14
KAIROUAN	6	401	65	16	482		259	231	371	366	356	32	58	182	79	114	465	106	1722	16
SFAX	9	703	142	11	856		257	180	549	532	488	149	187	299	79	57	761	138	2142	16
SOUSSE	5	160	39	234	433		205	172	351	325	352	18	61	155	49	124	408	84	1449	18
MONASTIR	3	221	20	32	275		90	84	87	104	95	69	57	30	33	10	197	50	497	10
MAHDIA	5	195	22	58	275		95	101	65	46	60	61	54	32	18	7	172	37	379	10
SIDI BOUZID	5	257	123	163	543		237	238	246	217	207	138	144	135	44	30	491	87	1208	14
TOZEUR	4	150	44	166	360		282	264	205	203	158	48	71	38	55	118	330	78	1213	16
GAFSA	7	452	136	131	719		421	358	364	406	443	121	169	106	114	159	669	124	2109	17
KEBILI	3	199	30	60	289		126	64	53	80	59	100	68	40	5	0	213	40	403	10
TATAOUINE	5	411	132	4	550		162	116	118	171	83	179	89	58	33	12	371	91	835	9
MEDENINE	5	337	197	2	536		141	105	130	173	216	128	97	58	34	27	344	97	853	9
GABES	5	515	241	1	557		190	86	62	113	115	151	54	29	37	12	283	48	672	14
TOTAL		6141	1744	1185	9069		4426	3577	4092	4235	4224	1620	1[illegible]	1714	1121	1177	3921	1650	22431	13

Contrôle

Annex 9

Description of CNSS materials for Mother Education

The following is a description of the education packet : A portable box that has 5 large imprinted envelopes containing individual lesson materials.

Envelope 1 : Sensitization theme

- instructions to educator
packet of non-serialized 17 pictures
objectives in knowledge, behavior
medical principles on DDM, ORT

Envelope 2 : Liquids theme

- instructions to the educator
- objectives
- card game (25 cards), a game board
- 2 puppets

Envelope 3 : ORS theme

- instructions to the educator
- objective
- packets of serialized 16 pictures
- packets of ORS

Envelope 4 : Breasfeeding/nutrition theme

- instructions to the educator
- objectives
- role play visual aids (puppets)
- packet of non-serialized 8 pictures

Envelope 5 : Prevention of Diarrhea

- instructions to the educator
- objectives
- packet of 30 non-serialized pictures
- card game

ANNEX 10

MASS MEDIA ACTIVITIES DURING THE DIARRHEAL SEASON 1987

RADIO TUNIS

Coordinator/moderator

Mr. Fourat DRIDI
Mr. Bechir RAJEB
Mme Melika BEN KHAMSA

A= Interviews

1/"We and the Radio"
Dr. HAMZA
Dr. MEDDEB

2/"Direct"
Dr. MEDDEB

3/"Contact"
Dr. JOMNI

B= Family Planning/women's Magazine

Zohra AZLOUK (14 broadeasts)

C= Dr. Hakim's spots

* 11 spots based on messages drawn from guidelines distributed to journalists and media professionals and the DDM Protocol

Diffused 62 times from July 15 - August 30 and less frequently in the following months until october 1987

RADIO SFAX

Coordinator/moderator

Dr. HACHICHA
Dr. HRIZ
Dr. MANSOUR
Mr. Fethi BEN AMOR

A= Interviews

1/"The family Doctor"
Dr. HACHICHA
Dr. REKIK

2/"The Happy Home"
Dr. MANSOUR
Fethi BEN AMOR

3/"Good morning"
Dr. MANSOUR

B= Family Planning programs

Zohra AZLOUK and other guests

C= Radio spots

Fethi BEN AMOR
Similar to Dr. HAKIM's spots, based on messages drawn from guidelines and instructions prepared for Journalists and radio moderators

B= Children Programs
-"Roubaiat El Atfel"
-"Kariat El Atfel"
-"Jannet El Atfel"
-"Contest and prize distribution

RADIO MONASTIR

Coordinator/moderator

Dr. RADHOUANE
Dr. MANSOUR
Mr. Naceur GHDIRA

A= Interviews

1/"Rinbow"
Two times
Answering listeners' questions on diarrhea severity, deshydratation symptoms, ORT, feeding, etc...

B= Radio spots

Naceur GHDIRA
Similar to Dr. HAKIM's spots, based on messages drawn from guidelines and instructions prepared for Journalists and radio moderators

TV/ NEWS'PAPERS

Coordinator/moderator

Mr. Fourat DRIDI
Mr. Habib GHRIBI
Mr. M-H.TRIKI

1/"With the Doctor"

Mohamed Hédi TRIKI
Dr. JERRAYA
Bi-monthly TV pogram
content : causes, severity of accute diarrhea, deshydratation, ORT, feeding, etc...

2/"Our world at large"
Habib GHRIBI
Dr. HAMZA
Mr. ATALLAH
Weekly TV program
content : Special adaptation of the WHO film

"5 million lives" followed by interviews of Dr. HAMZA and Mr. ATALLAH, both from the National Committee to Combat Diarrhea

NEWS PAPERS

Coordinator
Mr. Fourat DRIDI

* 2 journal articles published in arabic and french version in daily news papers and in two weekly news papers
* Content: Epidemiology of diarrhea, mortality due to diarrhea in the world and in Tunisia, ORT, presentation of the objectives and components of the National Program (see copy of a journal article)

ANNEX II

REPUBLIQUE TUNISIENNE
MINISTERE DE LA SANTE
DIRECTION DES SOINS de SANTE de BASE.

PROJET DE DIFFUSION A LA TELEVISION DES DEUX PROGRAMMES DE MOBILISATION LAD et PNV

LAD ▨ — PNV ☒

AOUT 1988

	L 1	M 2	M 3	J 4	V 5	S 6	D 7	L 8	M 9	M 10	J 11	V 12	S 13	D 14	L 15	M 16	M 17	J 18	V 19	S 20	D 21	L 22	M 23	M 24	J 25	V 26	S 27	D 28	L 29	M 30	M 31	J	V	S	D	
الشباح من الماء						▨						▨												▨												4x/[illegible]
جريان الجوف								▨								▨										▨			X							الحصبة
ماء الملح والسكر		▨								▨									▨									▨								3x/[illegible] حلقي باس عالنت
ماء السفنارية														▨									X													4x/[illegible] الفحل
ماء البروز											X							▨							X											المرمة
ماء البسباس				▨											X		/					▨					X									1x/[illegible] الدم المتحركة
																	X																			1x/[illegible] الصور المتحركة
													X								X										X					الرزنامة
																																				الكيزاز

SEPTEMBER 1988

	L	M	M	J 1	V 2	S 3	D 4	L 5	M 6	M 7	J 8	V 9	S 10	D 11	L 12	M 13	M 14	J 15	V 16	S 17	D 18	L 19	M 20	M 21	J 22	V 23	S 24	D 25	L 26	M 27	M 28	J 29	V 30	S	D	
الشباح من الماء						▨					X			▨																X						1x/[illegible] الحصبة
جريان الجوف																▨				X																2x/[illegible] حلقي باس عالنت
ماء الملح والسكر							X			▨								▨																		2x الفحل
ماء السفنارية				▨																		X														1x المرمة
ماء البروز								▨	X																			X								1x الدم المتحركة
ماء البسباس												▨					X																X			1x الصور المتحركة
					X																				X											الرزنامة
															X																					الكيزاز

	L	M	M	J	V	S	D	L	M	M	J	V	S	D	L	M	M	J	V	S	D	L	M	M	J	V	S	D	L	M	M	J	V	S	D
						1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
الشياح من الماء															X																					
جريان الجوف																																				
ماء الملح والسكر																								X												
ماء السفنارية																													X							
ماء الروز																				X																X
ماء البسباس																						X														
الزرنامة																											X									
الكزان								X																								X				

NOVEMBRE 1988

	L	M	M	J	V	S	D	L	M	M	J	V	S	D	L	M	M	J	V	S	D	L	M	M	J	V	S	D	L	M	M	J	V	S	D
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30				
الشياح من الماء				X																															
جريان الجوف											X																								
ماء الملح والسكر																		X																	
ماء السفنارية																												X							
ماء الروز																					X														
ماء البسباس						X																		X											
الزرنامة															X																				
الكزان									X																						X				

DECEMBRE 1988

	L	M	M	J	V	S	D	L	M	M	J	V	S	D	L	M	M	J	V	S	D	L	M	M	J	V	S	D	L	M	M	J	V	S	D
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
الشياح من الماء								X																										X	
جريان الجوف																														X					
ماء الملح والسكر																											X								
ماء السفنارية																			X																
ماء الروز					X																	X													
ماء البسباس												X																							
الزرنامة										X															X										
الكزان																X													X						

ANNEX 12

TELEVISION CAMEROON: CONTENT OF SPOTS

During 1988 mass media communications consisted almost exclusively of a television campaign composed of five-minute sketches broadcast three times per week each, starting in August. These sketches are united by a common theme of an old wise man telling a young boy about the death of a child with diarrhea, which could have been prevented by simply giving it enough water. In each sketch, the old man appears to intervene in the case of a child with diarrhea. The story lines of the sketches are as follows:

. A fisherman's wife discovers, on a stormy night, that her child has diarrhea. At the same time the storm blows open the windows of her house and the plug to the fish tank comes unstopped, draining the water from the tank. A cat threatens the gasping fish. The mother grabs her baby and without her veil, despite her husband's protestations, runs out of her house and to the hospital where a doctor tells her about ORS. Back at home a maid (?) discovers the leak in the fishtank and fills it up again.

. Due to social obligations imposed by her husband a woman must travel on a train despite her child's illness. Her mother gives her a packet of ORS to prepare for the child, but the woman loses it. The old man, who happens to be sitting on the seat in front of her, tells her how to make SSS for the child. She does this from supplies in her handbag while seated on the train.

. A middle-class (?) couple stops in a drugstore after work to buy medications for their sick child who is currently being treated by a traditional healer brought in by the grandmother. The husband goes to the kitchen to prepare the medication and the apparition of the old man

starts the radio talking to the husband; he engages in a dialogue on diarrhea, and the radio leads the husband through a series of steps to make a rice water solution which the mother administers to the child. The form of presentation is comic.

. A peasant family that lives in a cave is visited by the old man, who, during the course of a meal with the father and children, learns that the youngest child is ill with diarrhea. He calls the wife out, to the distrust of the husband, and instructs her verbally on how to make a carrot solution for the child, which she does and administers in a separate room. The father escorts the old man on his way down the mountain.

. A storyteller is in a village turning a tale with a group of people about a famous Tunisian heroine who has a sick child. He uses the occasion to counsel the people about the general health of their children; Meanwhile, a sick child is crying in a house nearby as the mother tries to cure him of diarrhea. The storyteller is impatient with the interruption and prepares to go lecture the mother. The old man appears and counsels him to continue his story-telling, which he does explaining the recipe for fennel water solution. The story of the child of the heroine ends once the child is cured and the tribe rejoices because now they can travel and continue on their way. During the course of the story-telling, scenes of the mother preparing and administering the solution to her child are shown.

. The purpose of these sketches and their relationship to the behavioral objectives fixed for the LAD program is unclear. Also, there appears to be little thematic correspondence between these television sketches and either the face-to-face educational activities or the radio emissions.

. The sophisticated cinematographic presentation, the complicated allegorical storylines, the overlay of broad ethical message (we are responsible for our children's health, water is the source of life etc.),

the adherence to Tunisian cultural traditions (the old sage, the so try teller etc) make for attractive TV vignettes. These same qualities may, on the other hand, obscure key messages. Bearing in mind that the ultimate test of effectiveness is the comprehension and behavior of the viewer, which can only the ascertained by conducting a unbiased survey of viewer response to these spots, the following observations by the assessment team may serve as a basis for future revision or adjustment of television messages for diarrhea control:

- It appears that one objective of the sketches may be to raise public awareness about the seriousness and danger of diarrheal diseases. The dramatic presentation may achieve this goal. It is also possible that the high drama either obscures the fact that it is diarrhea that is serious (all diarrhea and not just one particular form of diarrhea) rather than any child illness. At the same time, it is possible that for some of the audience, at least, the high drama may trivialize the real serious nature of child diarrhea. This question should be explored in a viewer survey.

- It appears that one objective of the sketches may be to teach various possible home solutions for diarrhea: each spot shows the preparation of a different solution. However, the steps to preparing these mixtures formed a sub-element of the overall story plot. The steps themselves are incomplete in each of the sketches (eg. how to measure a liter, how to measure the sugar, the salt; how to stir the solution; how to give it to the child; how much to give; when to give it; for how long (how many days) to give it; what to do with the leftover solution). The exact measures of the ingredients were passed over only once and very rapidly in the audio portion of the sketches and were either slipped all together or very unclear in the visual part. The measure of 1/2 tsp. of salt especially was unclear. It is highly likely that mothers who learned to prepare the solutions from these sketches only will prepare the soluations incorrectly. They may even prepare hypersaline solutions which could be dangerous to the child. This, too, should be tested in an impact study of these sketches.

. The fact of simultaneous broadcasting of five different preparations for home solutions for the treatment of diarrhea may lead to confusion or to disbelief in the adequacy of these treatments.

. The importance of continued feeding and breastfeeding in combination with liquids (and feeding <u>is</u> an <u>integral</u> part of <u>effective ORT</u>!) is practically ignored in the sketches, as is diarrhea prevention.

ANNEX 13

PROGRAMME D'EVALUATION DU PROJET CRS/LAD

ENQUETES EN COURS ET PROJETEES

- 8 Août 1988 -

OBJECTIF DU PROJET	ENQUETE CORRESPONDANTE	POPULATION CIBLE	DATE DE REALISATION	TAILLE DE L'ECHANTILLON	EQUIPE D'ENQUETEURS	ETAPES ET CALENDRIER D'EXPLOITATION		
						SAISIE	ANALYSE	TABLEAUX
1. Progrès dans la connaissance de la TRO: -50% chez les mères CNSS -30% chez les mères en général	CAP-MERES	MERES -CNSS -TEMOINS	-Nov. 1986 -Nov. 1987 -Nov.1988	400 CNSS 400 CNSS 140 témoins	Coord.CNSS " "	15/8/-2/9/88 " " " " (Informatisée)	5-16/9/88 " " " "	Sept.1988 " " " "
2. Progrès dans la promotion de la TRO: -40% chez les médecins, pharmaciens, etc...	CAP-Personnel de Santé	Personnel paramédical, médecins, HLP, pharmaciens	-Mai-Juin 1988 -(Nov-Déc 1988) -(Mars 1989)	200	Questionnaire auto-administré sous la supervision des CSR	15-19/8/88 (Informatisée)	29/8-2/988	Sept.1988
3. Progrès dans la préparation correcte d'une solution de réhydratation orale: -30%	Observations des mères préparant une solution de R.O.	Mères en général	-Mai-Juin 1988 -(Nov-Déc 1988) -(Avril 1989)	210	Surveillants régionaux et autre personnel formé	15-19/8/88 (Informatisée)	29/8-2/9/88	Sept.1988
4. Formation du personnel de santé sur la LAD/TRO: Evolution positive des connaissances	Questionnaire Avant/Après	Membres des équipes régionales de formation	Juin 1988	160	Questionnaire auto-administré sous la supervision des CSR	Manuelle: 8-13/8/88	8-13/8/88	8-13/8/88
5. Aptitude des spots radio/télévisés à atteindre les objectifs assignés à la campagne média	Enquête de performance média	Population exposée à la radio/TV	(Sept-Oct.1988)	A déterminer avec la DSSB				
6. Disponibilité et accessibilité des SRO:	Evaluation des stocks et des circuits d'approvisionnement	Centres de santé Officines	-(Sept-Oct.1988) -(Avril-Mai 1988)	A déterminer avec la DSSB				
7. Prise en charge effective de la diarrhée/déshydratation: -dans les centres de santé -à domicile (mères)	Evaluation finale d'impact	A déterminer par les partenaires du projet : USAID/HSP/CNSS/CRS, peut être aussi PRITECH						

ANNEX 14

DOCUMENTS RELATING TO PN/LAD RESEARCH AND EVALUATION ACTIVITIES

A. Pretesting Communications Materials
   - Guide for implementation procedures

B. Pretesting of visuals
   - Outline of precedures and analysis of tests

C. Pretest of MOH Treatment Chart

C1. Results of pretest

D. Evaluation instrument for CNSS centers-Phase II

E. Choosing the CNSS Centers - Phase I

F. Evaluation of CNSS Centers criteria for selection

G. Questionnaire for the pretesting of visual materials.

1. Focus group questions-fathers
2. Focus group questions-mothers
3. Analysis of focus groups results; purpose and methodology
4. KAP questionnaire CNSS agents
5. KAP survey results CNSS agents
6. KAP questionnaire - Pharmacists
7. KAP questionnaire - Doctors

8. KAP questionnaire - Health personnel, MOH

81. KAP questionnaire - private practice doctors

9. Preliminary study of KAP results - MOH personnel

11. Instructions to interviewers - KAP 86

12. Instructions to interviewers - KAP 87

13. Sampling rationale for control population-Kap 87.

14-16. Questionnaires in arabic

16.1 Working document of problem-solving during KAP study

17. Report/Supervision of KAP survey - 86

18. Supervision by telephone of KAP control survey - 87

19. Memo: Organization and execution of KAP survey - 87

20. 30% sampling of KAP mothers survey - 86

20a. Preliminary analysis of KAP mothers survey - 86

21. Plan of exploitation to use KAP mother survey results

22. Schema on process of KAP health personnel survey

23. MOH KAP survey with focus on ORT

24. Coded Responses on KAP survey-MOH

25a. Crude responses on KAP survey-MOH

26. Work Plan to observe mothers making ORS

27. Arabic instructions for observational study

28. Crude results from observation of mothers making ORS

31. Media performance survey instrument

32. Availability of ORS survey instrument

33. Memo on meeting DSSB/CRS; surveys 31, 32, supervision of LAD activities

ANNEX 15

CONCEPTION DE L'ETIQUETTE DU SACHET DE S.R.O. TUNISIEN

ETAPE	EXECUTANT	88 NOVEMBRE (15)	DECEMBRE	89 JANVIER	FEV
Elaboration des ELEMENTS DE CONTENU destinés à l'Artiste					
Elaboration des PREMAQUETTES ALTERNATIVES	l'ARTISTE				
Choix des MOYENS HUMAINS ET MATERIELS à mettre en oeuvre pour le testing	PARTENAIRES				
Elaboration du questionnaire					
Echantillonnage/Logistique					
Formation des enquêteurs					
Déroulement du testing	ENQUETEURS				
Analyse des RESULTATS					
Elaboration de la MAQUETTE FINALE et du document reproductible	l'ARTISTE et le laboratoire de l'imprimerie				
IMPRESSION	IMPRIMERIE				

ANNEX 16

DESCRIPTION OF TECHNICAL ASSISTANCE

1.1. Judy Aubel. T. A, Pre-program Research; Education/Training

Scope of work. June 15-Sept 15, 1986

- Prepare an assessment of CNSS centers capacity for establishing ORT programs.
- Prepare a KAP study with mothers.
- Identify appropriate methods for educating mothers and training instructors for the education activities at the centers.

Scope of work. October 21 - April, 1987

- Assist 2 project health educators in initial planning for all project training and educational activities.
- Train project health educators and collaborate with them in:

  a. content identification for training for public health personnel, private doctors, pharmacists, center agents.

  b. identification of types of education materials for each training component.

  c. development of educational and media messages.

  d. pretesting and production of training and education materials - particularly mother's education materials.

- Collaborate with telecommunication specialist in development strategies for media compaign and print material for all training and educational activities.

- Coordinate the development of mother's KAP survey with health educators and evaluation specialist. Plan and train interviewers who will conduct KAP survey.

- Plan and coordinate with health educators the training of regional ORT training teams who will in turn train Center Managers (CNSS). Regional training projected for February 1987.

Scope of work. 11 January - 4 March 1988

- Collaborate on the development of a two day DDM training workshop and technical brochure for local health personnel in collaboration with the staff of the DDM project and with MOH Dept. of Community Health staff.

- Assist DDM project health educators and MOH staff with the planning of a three day DDM workshop and trainer's manual for Regional Public Health Training Teams.

- Collaborate with MOH and DDM project staff in planning the objectives and schedule for the national DDM training doctors/pharmacists.

- Obeserve and provide feed-back on initial three-day workshop for Regional Training Teams.

  Upon arrival in Tunis, the terms of reference were modified. The fourth task was omitted due to the fact that this training had been rescheduled to take place later than anticipated and after the consultant's departure. The fourth task was replaced with another item.

- Assist with the planning of the one day "DDM Information Day" for regional medical directors and Heads of Regional Depts of Community Health.

  In addition, a sixth task was added to the scope of work:

- Assist the Project health educator with the preparation of the 3 day training workshop for CNSS controllers who are responsible for supervising the DDM mother education program in the CNSS Centers.

1.2 Activities of PRITECH consultant Judi Aubel with Tunisian DDM Project

June 15 - Sept 15

- Assisted project director in initial planning of training, all project activities for three-year project to include: definition of roles and responsibilities of all project collaborators, implementation plan, and revision of project document.

- Pre-program research

Coordinated preparation of pre-program research activities: focus groups with mothers and fathers, KAP interviews with private pharmacists and doctors, public health personnal, and nutrition center managers to include development of instruments, pretesting, training of interviewers.

* field supervision of focus group interviewers and artist (three weeks)

* collaboration in preparation of questionnaire for assessment of CNSS nutrition center functioning; organization of training of coordinators who conducted center assessment.

* coordination of data analysis of focus group interviews.

* preparation of focus groups final report including recommentations for mother education activities.

* planned and conducted one-week training sessions for regional coordinators in July, Aug. and Sept. relative to their field responsibilities.

Oct 14 - Feb 25

- Collaborated in development of baseline KAP mother survey instrument and in planning of training of interviewers with health educator who carried out this training.

Collaborated with health education in:

* identification of behavioral objectives for each of DDM education themes.

* analysis and synthesis of all community data by DDM education theme for message identification.

* identification of education materials for group education in nutrition centers and patient education in health centers; development of materials and pretesting of same.

* identification of education and training materials for CNSS center managers and regional DDM training teams; development and pretesting of same.

- Planning of training of regional DDM teams.

1.3 Observations on TA Aubel's contribution

Extensive documentation exists attesting to the quality, quantity and collaborative efforts of the TA consultancy. A progressive development occurred of survey instruments and pedagogical tools. Aubel's consultancy appears to have been definitive in orienting the project's baseline data information system and in extracting the key elements for a successful face-to-face education approach. The input appears sustainable. The survey and instruments she left behind have been implemented and analysed (MOH personnel KAP survey/results, observation surveys, pretesting of education materials), and continue to be adapted (media performance survey, availability of ORS survey). The results of these surveys were constructively applied to the development of effective educational and training materials.

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Some discrepancies appear between the scope of work and the activities accomplished:

- There was only one health educator, and not two, necessitating that occasionally TA Aubel worked alone on projects that should ideally have been collaborative efforts.

- Due to financial and organizational circumstances early in the project development, intergration of the health education component and the "telecommunications" component did not occur, resulting in a tendency of the two components to work quasi-independently of one another.

- The KAP study with mothers in the first scope of work was not accomplished until the second consultancy.

- Responsibility for the "DDM information day" was taken over by Dr. Mohamed Mansour.

The focus group activities, while resulting in very useful information which served as a necessary and essential base for the future development of effective educational activities, were very taxing. Focus group interviews need to be tabulated and analyzed by hand on the same day they are conducted in order to retain the integrity of the information collected. The schedule of these activities in the project was such that the interview teams often worked past midnight to accomplish this task. The process of information collection should, on the other hand, not be overly long so as to be immediately applicable to program activities.

The three week duration of the focus group studies was probably optimal. In the future the process might be made less taxing by increasing the number of interview teams or prolonging such a study by a week or so.

2.1 Agma Prins. TA, Communications

Scope of Work - Dec. 14-21, 1986

Upon arriving in Tunisia, the consultant met with the entire CDD team and jointly established the following specific objectivies for the one-week mission:

1. To evaluate the planning to date of the communications component.

2. To discuss and formulate a global communications strategy.

3. To clarify the process of message identification and formulation (with participation of mothers).

4. To clarify the process of identification of appropriate communications materials for transmission of the chosen messages.

5. To review the existing operational plans for the communications component and reformulate those plans as necessary based on the communications strategy developed during the consultancy.

6. To clarify a preliminary evaluation strategy for the communications component of the CDD program.

7. To draft a report synthesizing the results of the week's work and recommending next steps for the implementation of the communications component of the CDD program.

Ms. Prins was designated to work with the "telecommunications" specialist, Mr. Fourat Dridi, who did not stay with the project. However, Ms. Prins input was applied to the development of the communications component of the project, providing solid guidelines, as evidenced in the later produced mass media plan for 1988.

Ms. Prins' T.A. was more developmental than action-oriented as indicated in her scope of work. The communications/mass media component of the project was still in its initial stages of development when Ms. Prins visited. Again, financial and organizational constraints during 1987 resulted in substantial modification of the work resulting form this consultancy.

2.2 Key guidlines developed for the communications/mass media stretegy

- Message content is for activating behavior change, not knowledge for knowledge's sake.

- One or two, not five, fluids for treatment of diarrhea at home should be promoted.

- Standardize the content themes through all of the media channels to simplify preparatory logistics and to assure that messages through different channels complement and reinforce each other.

- Include creativity sessions with mothers to assure that the form of the messages is adapted to mothers' perceptions, needs and level of comprehension.

- Underscore the importance of access for the target audience to the communications materials.

- Five message content phases are the guideline for all educational/media materials.

    - Sensitization (Awareness raising)
    - Liquids
    - Referral to a health system
    - Nutrition during and after diarrhea
    - Prevention

- The communications strategy must take into account the seasonal nature of diarrheal diseases.

- Due to logistics and financial constraints, materials for 1987 should be limited to simple visual aids and uncomplicated radio/TV spots with corresponding story lines and scripts. Keep materials short and simple.

- Two three-week consultancies in early 1987 are recommended for the design/development of visual aids and media.

- A training specialist will need to be added to the staff in 1987 if both CNSS and MOH personnel are to be trained.

- The health educator and communications specialist should work as a team.

- Appropriate monitoring systems to assure feedback information should be developed.

2.3 Application of key guidlines

- The most effective channels for the messages as motivators of behavior change were identified. First face-to-face communications and secondarily TV and radio media (see assessment on communications strategy for more detailed discussion).

- The MOH diarrheal disease committee chose to officially promote five solutions, claiming regional identification with a solution was necessary. The recommendation to standardize content of messages was not systematically followed.

- The Content themes varied from one medium to the next. (see assessment on communications strategy).

- Creativity sessions were held sometime in 1987, but no report could be found, nor is it verified that the results of these sessions were applied to the radio programs for 1987.

- The question of target audience access to the preferred media is discussed in the communications assessment. Evidence in the 1988 mass media plan suggests that some research was done.

- The five phase segmentation was adopted and incorporated into the mother education program, the 1987 radio themes (but not in the same order as the mother education) and the overall TV sketch concept.

- In the 1988 mass media plan, a calendar was prepared to sychronize the 5 themes with the chronolgy of diarrhea season, at least for the face-to-face communications.

- The 1987 mass media program consisted of two TV programs (talk show style) and 11 radio spots from "Dr. Hakim". Content continuity seems to have been maintained around the five general themes.

- Consultancies for mass media/communications in 1987 did not materialize due to delays in the signing of the cooperative agreement with USAID which resulted in delayed requests for consultants.

- In fact, the training for MOH personnel did not occur until 1988 but training consultant Aubel assisted in program development.

- A united effort between the health education and communications components does not seemed to have materialized. With the departure in 1987 of the communications specialist, this program component was absorbed by Dr. Mohamed Mansour. The health educator claimed to have had only peripheral involvement in the mass media activities.

- In the case of the mother education programs, monitoring and supervision were the responsibility of the CNSS. The media activities do not appear to have been formally monitored, although a tracking chart exists in the office of the evalution specialist that attempted to supervise the broadcast of the TV sketches from July-October, 1988. The radio programs in 1987 do not appear to have been monitored. On the whole, Ms. Prins' input was sound, but implementation suffered due to staffing circumstances, the unfulfilled consultancies and administrative and logistical circumstances beyond the control of the project staff.

ANNEX 17

MINISTERE DE LA SANTE PUBLIQUE

DIRECTION DES SOINS DE SANTE DE BASE

PROGRAMME NATIONAL DE LUTTE ANTI-DIARRHEIQUE

RELEVE QUOTIDIEN

FORMULAIRE LAD 1

Structure sanitaire :

Circonscription :

Mois de : 19..

Rempli par :

Rubrique / Jour	Total consultants		Episodes nouveaux *		Total d'enfant diarrhéiques						R.O au centre				R.O à domicile		SRO + Autres **		Référence Hop.			
					ST I		ST II		ST III		Voie Orale		Sonde N.G						Total		Diarrhéi	
	<1 an	1-5 a	<1 an	1-5 a	<1 an	1-5 a	<1an	<1-5	<1 an	1-5 a	<1 an	1-5 a	<1 an	1-5 a	<1 an	1-5 a	<1 an	1-5 a	<1 an	1-5 a	<1 an	1-5 a
Le 1er																						
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8																						
9																						
10																						
11																						
12																						
13																						
14																						
15																						
Total à reporter																						

* Ne compter que les enfants diarrhéiques dont la consultation pour D. remonte à plus de 2 semaines

** Antiseptiques, antibiotiques et anti-diarrhéiques

Rubrique / Jour	Total consultants		Episodes nouveaux *		Total d'enfant diarrhéiques						R.O au centre				R.O à domicile		SRO + Autres **		Référence Hop.			
					ST I		ST II		ST III		Voie Orale		Sonde N.G						Total		Diarrhéi	
	<1 an	1-5 a	<1 an	1-5 a	<1 an	1-5 a	<1an	<1-5	<1 an	1-5 a	<1 an	1-5 a	<1 an	1-5 a	<1 an	1-5 a	<1 an	1-5 a	<1 an	1-5 a	<1 an	1-5 a
REPORT																						
Le 16																						
17																						
18																						
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31																						
TOT.																						

A REMPLIR LE DERNIER JOUR DU MOIS

Stock existant de
-sachets d'Oralyte:.....
-sondes N.G : .....

Nombre de sachets d'Oralyte
-utilisés dans la structure:.....
-remis aux mères : .....
Nbre de S.N.G. utilisées.... ..

* Ne compter que les enfants diarrhéiques dont la consultation pour diarrhée remonte à plus de 2 semaines

** Anti-septiques, antibiotiques et anti-diarrhéiques.

Nom et signature du médecin
.....
.....Date : .....

MINISTERE DE LA SANTE PUBLIQUE

DIRECTION DES SOINS DE SANTE DE BASE

Direction Régionale de S.P. de :

Service Régional de S.S.B. de :

PROGRAMME NATIONAL DE LUTTE ANTI-DIARRHEIQUE

RELEVE MENSUEL

FORMULAIRE LAD 2

Mois de : 19..

Circonscription :

Rempli par :

Rubrique / Structure sanitaire	Envoyant LAD1		Total consultants		Episodes nouveaux		Total d'enfant diarrhéiques						R.O au centre				R.O à domicile		SRO + Autres		Référence Hop.				Stock d'Oralyte restant	Stock de SNG restant
							ST I		ST II		ST III		Voie Orale		Sonde N.G						Total		Diarrhéi			
	Oui	Non	<1 an	1-5 a	<1 an	1-5 a	<1 an	1-5 a	<1an	<1-5	<1 an	1-5 a	<1 an	1-5 a	<1 an	1-5 a	<1 an	1-5 a	<1 an	1-5 a	<1 an	1-5 a	<1 an	1-5 a		
TOTAUX																										

Sachets d'Oralyte utilisés dans les structures :

Sachets d'Oralyte remis aux mères :

Structures ayant recouru à la SNG :

MINISTERE DE LA SANTE PUBLIQUE

DIRECTION DES SOINS DE SANTE DE BASE

Direction Régionale de :

Nbre d'enfants < 1 an :

Nbre d'enfants 1-5 ans :

PROGRAMME NATIONAL DE LUTTE ANTI-DIARRHEIQUE

RELEVE MENSUEL

Mois de : 19..

FORMULAIRE LAD 3

S.R.S.S.B. de :

Rempli par :

Rubrique / Circonscription	Total de struct.sanit	Envoyant LAD1		Total consultants		Episodes nouveaux		Total d'enfant diarrhéiques						R.O au centre				R.O à domicile		SRO + Autres **		Référence Hop.			
								ST I		ST II		ST III		Voie Orale		Sonde N.G						Total		Diarrhéi	
		Oui	Non	<1 an	1-5 a	<1 an	1-5 a	<1 an	1-5 a	<1an	<1-5	<1 an	1-5 a	<1 an	1-5 a	<1 an	1-5 a	<1 an	1-5 a	<1 an	1-5 a	<1 an	1-5 a	<1 an	1-5 a
TOTAUX																									

Sachets d'oralyte utilisés dans la sturcture :

Sachets d'Oralyte remis aux mères :

% des structures ayant recouru à la SNG :

ANNEX 18

CASE MANAGEMENT PROTOCOL

MINISTRY OF PUBLIC HEALTH

COMMITTEE FOR MANAGEMENT OF CHILD DIARRHEAL DISEASE

PRIMARY HEALTHCARE DEPARTMENT

COORDINATING UNIT

FOR DIARRHEAL CONTROL DISEASE MANAGEMENT

I/INTRODUCTION

The National Program for Diarrheal Disease Management 1980-1984 (PN-LAD) has already circulated a technical document which defines the strategy for the treatment of dehydration in the public health hospitals, clinics and other facilities. Concerning the treatment of diarrhea and the prevention of dehydration at home, the National Program has recommended the use of Oral Rehydration Salts (ORS) and of the sugar-salt solution (SSS), but has not specified a clear policy on traditional solutions. In this document, three traditional solutions are suggested to be used at home as soon as diarrhea appears. These are: rice water, carrot water and fennel water. Studies have shown that there are more than thirty traditional solutions used at home. These solutions will be analyzed in collaboration with the National Nutrition Institute and the results will be presented to the Committee in order to make the necessary decisions and take action.

Those solutions are proposed in the following ranking order of priority based on their availability, the easiness of their preparation and their safety.

II/PREVENTION OF DEHYDRATION AT HOME

A/Preparation

1.Oral Rehydration Salts (ORS) or Oralyte packets

- -Measure 1 litre of water and add a glass of water to allow for evaporation
- -Boil for 15 minutes at least
- -Cool, then add the contents of the Oralyte packet to one litre of boiled water
- -Use this solution within 24 hours. Prepare a fresh solution the following day

2. Rice water

-Measure one and a half litres of water

-Soak 1 tablespoon of rice for at least 2 hours

-Boil the water with the rice for at least 30 minutes

-Add one half teaspoon of table salt

-Strain the rice through a filter

-Flavor the rice water as desired with choice of rose, orange blossom or geranium water. The cooked rice may be mashed with a spoon and given to the child adding sugar and/or milk).

3. Carrot water

-Measure one and a half litres of water

-Peel 2 or 3 carrots and cut them into little pieces

-Boil the water and carrot pieces for at least 30 minutes

-Mash the carrots with a spoon then filter the water

-Add one half teaspoonful of table salt and 2 tablespoons of granulated sugar (8 cubes)

-Add lemon if you prefer to enhance the taste

4. Fennel seed water

-Measure one litre of water and add one glass to allow for evaporation

-Add a few seeds of fennel

-Boil for 15 minutes at least

-Cool, then add one half teaspoonful of table salt and 2 tablespoons of fine sugar (or 8 cubes)

-Add lemon if you prefer for flavor

5. Sugar-Salt Solution

-Measure 1 litre of water and add one glass of water to allow for evaporation

-Cool and add 1 half teaspoonful table salt and 2 tablespoons of fine sugar (or 8 cubes)

-Boil for 15 minutes at least

-Add as desired a choice of a few drops of lemon, rose or orange blossom water for flavor

6.Other traditional solutions

As mentioned in the introduction, the list of traditional solutions could be extended following the analyses that will be made on the infusions and concoctions based on the plants, seeds and plant barks presently used by mothers to treat diarrhea at home (examples: fenugreek (trigeonella foerum-graecum), starch, rosemary (rosmarinus officinalis), thyme (thymus capitatus), juneperus communis, artemisia herba, marrubium (marrubium, vulgare), colocynth citrullus colocynthis), sollikh, artemesia campetus, traganum nudatum, ruta, african (leganum harmala), pistacio lentiscus, retama retam, mint, pinus pinaster root, pomegranate bark etc...). These results will be presented to the Committee and studied from the standpoint of their electrolytic, nutritional and other inputs.

B-MEASURING INSTRUMENTS

1. Water measurement

The litre

There are generallY three very common types of bottles with one litre content. These are:

-the soft drink bottles, commonly called family-size, which have screw-on caps, such as Coca Cola, Miranda, Boga and Seven-up types.

-the glass oil or syrup bottles, often green-colored and which close with corks

-the plastic milk bottles.

Before recommending the standard bottle to be used, we must conduct a short survey on the common bottles used and make recommendations based on the survey results. It must be remembered that the Safia (mineral water) bottle, or other similar bottles (bleach, etc.) available, only hold 90 centilitres.

If these are the only ones available, mothers must be told to add half a glass of water to adjust the contents to one litre.

2.Salt measurement

It is very difficult to measure 3.5 grams of salt. A rough estimate is to use a common instrument such as the teaspoon. It has been noted that there is a large variety of teaspoons , the contents of which fluctuate as much as threefold. We must popularize only one type of spoon which is the inexpensive cast-iron teaspoon that is very common in the rural areas. To measure half a teaspoonful, we must use table salt, fill the spoon to the brim (levelling with a knife), then remove half of the contents. This method represents a fairly satisfactory solution until the dual plastic measuring scoop is produced and distributed. This measuring scoop is in the form of a spoon at both ends; one end would be used for measuring salt and the other for measuring sugar.

3. Sugar measurement

To measure 40 grams of fine sugar, we can use the tablespoon. Two tablespoons of granulated sugar are needed. To measure 40 grams, two level tablespoonfuls are needed. Unfortunately, the tablespoons have also different sizes. In the rural areas, the most commonly used tablespoon is the cast-iron spoon. It is that spoon which must be popularized. However, this solution is temporary until the dual plastic measuring scoop is made available. When using sugar cubes, 8 cubes of sugar are needed to measure 40 grams.

C. ADMINISTRATION METHOD

The quantity of recommended liquid is one litre per day. This quantity must be divided up in several doses per day: a glass every time stools are passed and between stools so that all the quantity is drunk within 24 hours. In case a portion of this liquid has not been drunk, it must be thrown away and a fresh solution be prepared for the next day. When administering this liquid, we can use the utensils (a glass, spoon, etc.) normally used when giving the child something to drink. The utensils must be washed and rinsed beforehand.

D. NEED FOR EDUCATING MOTHERS

It is not easy to teach the mothers how to measure a litre of water, 3.5 grams of salt and 40 grams of sugar. It is also not easy to teach them how to boil water for 15 minutes and how to administer the entire quantity within 24 hours. To circumvent these difficulties and complications, a strong, planned and well-implemented educational component is needed. The National Program will resolve these issues through the training, education and mass media activities.

II. BREASTFEEDING AND CHILD NUTITION DURING DIARRHEAL

In case of diarrhea, though fluids are extremely important to prevent dehydration, these provide few or no nutrients. A child with diarrhea must eat normally, otherwise he could be exposed to malnutrition which will in turn cause his health to deteriorate.

The breastfed child must continue to be breastfed normally or even more frequently than usual because mother's milk nourishes, dehydrates and even prevents diarrhea. If the child eats varied foods with or without breast milk, the child must continue to be given the same foods he usually eats.

For the child fed on cow's milk, there are two possibilities:

-the volume of milk may be mixed with an equivalent volume of boiled water during the first two days of diarrhea, then normal feeding may be resumed.

-the same volume of milk may also be given with no changes. Normal feeding of the child should continue regardless of how bottle feeding is conducted.

III. REFERRAL TO HEALTH CARE FACILITIES IN CASE OF DIARRHEA

It is not necessary to take a diarrheic child to the health center if the mother knows and practices the correct procedure for treating diarrhea at home. If, despite the mother's efforts to give the child fluids, to breastfeed him and to feed him normally, his health condition does not improve and diarrhea persists, the mother must take him to the nearest health center on the third day, while continuing to rehydrate the child.

The child must also be taken to the health center as soon as the first symptoms of dehydration appear such as thirst, dry mouth, sunken eyes and loss of skin elasticity.

In case of diarrhea with stools containing blood or pus, or with frequent vomiting, it is recommended to take the child to the health center without waiting until the third day.

ANNEX 19

Regional Office
for the Eastern Mediterranean
ORGANISATION MONDIALE DE LA SANTE
Bureau régional de la Méditerranée orientale

المكتب الاقليمي
لشرق البحر المتوسط

CDD.8/8
ICP/CDD/001 RES

Le 16 août 1988

Monsieur le Ministre,

J'ai le plaisir de vous écrire à propos du Programme de lutte contre les maladies diarrhéiques (LMD) et de me référer plus particulièrement à la quatrième réunion interpays des administrateurs des programmes LMD nationaux, qui s'est tenue récemment au Caire, du 25 au 29 juin 1988. Au cours de cette réunion, on a longuement débattu de la question des antidiarrhéiques.

Je tiens à porter à votre attention l'avis de l'OMS en ce qui concerne l'utilisation d'antidiarrhéiques dans le traitement des cas de diarrhée aiguë.

Il est vivement recommandé:

- de décourager l'homologation de toute combinaison de médicaments antidiarrhéiques;

- d'annuler l'homologation de tous les médicaments antipéristaltiques (par exemple, lopéramide, diphénoxylate, diphénoxine) et de décourager leur utilisation chez les enfants de moins de cinq ans. Aucune firme ne devrait être autorisée à commercialiser toute préparation de ces médicaments destinée aux enfants;

- d'annuler l'homologation des préparations à base d'hydroxyquinoléines étant donné qu'elles ont toutes été liées à de graves effets secondaires;

- d'annuler l'homologation de préparations à base de furazolidone comme préparations antidiarrhéiques, car l'on ne connaît aucune cause bactérienne de diarrhée pour laquelle ces composés peuvent être recommandés.

- Il en est de même pour les préparations liquides contenant de la streptomycine à prendre par voie orale.

Nous comptons sur votre concours et espérons que vous prendrez les mesures appropriées au niveau national pour interdire les médicaments qui sont inefficaces et peuvent être nocifs dans le traitement de la diarrhée aiguë.

Veuillez agréer, Monsieur le Ministre, les assurances de ma haute considération.

Dr Hussein A. Gezairy
Directeur régional

S.E. le Ministre de la Santé publique
Cité Mahrajène
Rue Sadiqui
Tunis
TUNISIE

Vu le 29.9.88
A/ RESSADI

Prière de faire une liste des produits concernés.

S.E. le Ministre de la Santé publique
Tunis

CDD.8/8
ICP/CDD/001 RES

Copie envoyée à : S.E. le Ministre des Affaires étrangères, Tunis
Chef de la Division de la Coopération internationale, Ministère de la Santé publique, Tunis
Monsieur le Représentant permanent de la Tunisie auprès de l'Office des Nations Unies à Genève

ANNEX 2D

UNITED STATES OF AMERICA

Mission Spéciale Américaine
de Coopération Economique
et Technique en Tunisie

Special Mission for Economic
and Technical Coopération
28, Rue Suffex - Notre Dame
Tunis, Tunisia

البعثة الامريكية الخاصة للتعاون
الاقتصادي والفني
تونس

OCT 28 1988

Monsieur Habib Ben Yahia
Serétaire d'Etat auprès du
Ministre des Affaires Etrangères
Ministère des Affaires Etrangères
Place du Gouvernement
Tunis

Objet: Projet A.I.D. No. 664-0331
Projet de Planning Familial et de Développement
de la Population
Lettre d'Exécution de Projet No. 12

Monsieur le Secrétaire d'Etat,

J'ai l'honneur de vous aviser que la Condition Préalable 4.2.c. de l'Amendement No. 5 à l'Accord de Don pour le Projet sera satisfaite dès que le Gouvernement Tunisien aura contresigné la présente Lettre d'Exécution de Projet.

Nous avons reçu la lettre MSP 58/DSSB datée du 25 août 1988 concernant la décision du Ministère de la Santé Publique de produire les Sels de Rehydratation Oraux (SRO) en Tunisie, accompagnée d'une analyse de faisabilité et de la justification économique de cette décision.

Le Ministère, l'USAID et CRS ont eu des entretiens à ce sujet depuis l'année passée et nous sommes satisfaits que le Ministère ait pris cette décision. Les besoins projetés sont raisonnables et se fondent sur l'expérience acquise dans le cadre de la campagne anti-diarrhéique en cours. Bien que nous soyons disposés à engager les fonds programmés pour ce volet du projet, nous voudrions souligner certaines questions qui nous préoccupent et qui devront être résolues avant tout engagement de fonds.

Le projet de la Pharmacie Centrale de Tunisie concernant la production des SRO en Tunisie prévoit le démarrage de la production en mars 1989 pour que des stocks puissent être constitués et distribués aux régions en juin, avant la campagne d'été. Selon les indications fournies par le Ministère, des stocks minimals de qualité acceptable resteront disponibles à la fin de la campagne 1988. Les activités de la prochaine saison dépendront donc entièrement de la capacité de la fabrique de commencer la

110

production à la date prévue. En raison des possibilités de retard dans l'acquisition de l'équipement ainsi que des risques de retards imprévus pendant l'installation et les premières phases de production, il sera nécessaire de disposer d'une seconde source de SRO dans le pays en juin prochain. Nous prions, par conséquent, le Gouvernement Tunisien de s'engager à garantir le financement, à partir d'autres sources, de l'importation de la quantité nécessaire de SRO pour assurer la campagne anti-diarrhéique de l'été 1989. Comme vous le savez, même si la fabrique commence la production à la date voulue, des stocks suffisants pour une année (1 million de paquets environ) doivent être disponibles pour faire face aux besoins en cas de catastrophe naturelle ou d'une demande exceptionnelle.

En outre, nous voudrions suggérer que des mesures soient prises pour renforcer les systèmes d'approvisionnement et de distribution des SRO tenant compte de l'accroissement de la demande que ne manquera pas d'entrainer le succès de la campagne médiatique. Il est particulièrement important d'assurer la disponibilité des SRO avec le concours des pharmacies publiques et privées.

Avec votre engagement de financer la disponibilité des stocks de SRO suffisants pour la campagne 1989, la Condition Préalable précitée aura été remplie, dans son fonds et dans sa forme, d'une manière satisfaisante à l'AID.

Mes collaborateurs et moi-même restons à votre entière disposition pour toutes questions que vous pourriez avoir sur ce qui précède.

Veuillez agréer, Monsieur le Secrétaire d'Etat, l'expression de ma considération distinguée.

P.S.: Ci-joint copie de la lettre No. MSP/3728/DSSB engageant le Ministère de la Santé Publique à l'acquisition de 500.000 sachets SRO pour compléter le stock nécessaire au bon déroulement de la campagne 1989.

Jonathan Sperling
Directeur par interim

Habib Ben Yania
Serétaire d'Etat auprès du
Ministre des Affaires Etrangères
Ministère des Affaires Etrangères

25 NOV 1988

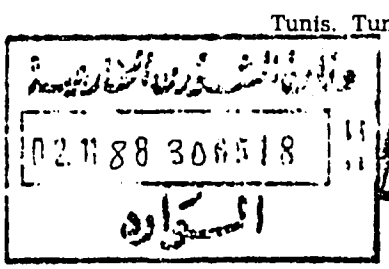
Date

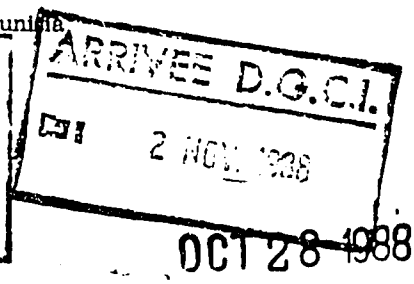
664 331
(Implementation letter)

Mission Spéciale Américaine
de Coopération Economique
et Technique en Tunisie

UNITED STATES OF AMERICA
Special Mission for Economic
and Technical Coopération
28, Rue Suffex - Notre Dame
Tunis, Tunisia

البعثة الامريكية الخاصة للتعاون
الاقتصادي والفني
تونس





OCT 28 1988

RECEIVED IN CTR
11/25/88

Action	Information
DCI	

Mr. Habib Ben Yahia
Secretary of State to the
Minister of Foreign Affairs
Ministry of Foreign Affairs
Place du Gouvernment
Tunis

SUBJECT: Project A.I.D No. 664-0331
Family Planning and Population Development Project
Project Implementation Letter No. 12

~~Action~~	IN
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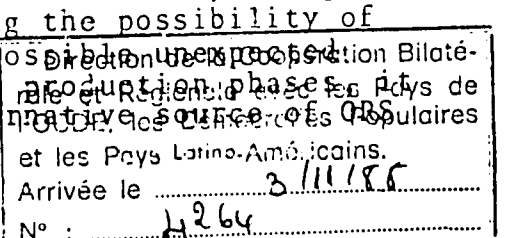
Dear Mr. Ben Yahia,

The purpose of this Project Implementation Letter (PIL) is to notify you that, when this PIL is countersigned by the Government of Tunisia, the Condition Precedent 4.2.c. of the project Grant Agreement Amendment Number Five has been met. We have received letter MSP 58/DSSB dated 25 August 1988 providing the Ministry of Public Health's decision to produce Oral Rehydration Salts (ORS) in-country with an accompanying analysis of the feasibility and economic rationale for this decision.

The Ministry, USAID and CRS have had many discussions with regards this topic over the last year and we are pleased that the Ministry has made a decision. The projected requirements are reasonable and are based on experience with the current Diarheal Disease Control campaign. Although we are prepared to release the programmed funds for this component of the project we would like to raise some concerns which need to be addressed prior to availability of funds.

The proposal by the Tunisian Central Pharmacy to develop local manufacturing capacity for ORS proposed a start-up date for production by March 1989 so that stocks could be made available and distributed to the regions by June in advance of the summer campaign. Information provided by the Ministry indicates that there will be minimal stocks of acceptable quality left at the end of the 1988 campaign so, in essence, next season's activities will be entirely dependent on the factory being able to begin production on time. Recognizing the possibility of delays in procurement of equipment and possible unexpected delays during installation and the early production phases, it will be necessary to ensure that an alternative source of ORS



be available in country by June. We request, therefore, that the Government of Tunisia commit itself to financing through other sources the importation of the necessary ORS quantity (approx. 1 million packets) to insure the 1989 summer anti-diarrheal campaign. As you know, even if the factory begins production on time, it is generally acknowledged that one year's supply should be on hand in case of a natural disaster or occurence of an exceptional demand.

We would like to suggest, in addition, that measures be taken to strengthen the supply and distribution systems for ORS in order to take into account the increased demand generated as a result of the successful media campaign. Of particular importance is ensuring that ORS be available through both the public sector and private sector pharmacies.

With your commitment to finance adequate supplies of ORS for the 1989 campaign, we would like to inform you that the above-mentioned Conditions Precedent is met in form and substance satisfactory to AID.

Should you have any questions, please do not hesitate to contact either myself or my staff.

P.S. Attached is letter No. MSP/3728/DSSB committing the Ministry of Public Health for the acquisition of 500,000 packets of ORS to complete the necessary stock for a successful campaign.

Sincerely yours,

Jonathan Sperling
Acting Director

cc. Mr. M. Ghachem, Min. of Health
Dr. M. Sidhom, Min. of Health
Mr. A. Bouhaouala, Min. of Plan
Dr. H. M'Henni, ONFP

Habib Ben Yahia
Secretary of State to
the Minister of Foreign Affairs
Ministry of Foreign Affairs

25 NOV 1988
Date

CRS

Monsieur Habib Ben Yahia
Serétaire d'Etat auprès du
Ministre des Affaires Etrangères
Ministère des Affaires Etrangères
Place du Gouvernement
Tunis

Objet: Projet A.I.D. No. 664-0331
Projet de Planning Familial et de Développement de la Population
Lettre d'Exécution de Projet No. 12

Monsieur le Secrétaire d'Etat,

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partir d'autres sources, de l'importation de SRO (1 million de paquets) pour la campagne anti-diarrhéique de l'été 1989. Même si la fabrique commence la production à la date voulue, des stocks suffisants pour une année doivent être disponibles pour faire face aux besoins en cas de catastrophe naturelle ou d'une demande exceptionnelle.

En outre, nous voudrions suggérer que des mesures soient prises pour renforcer les systèmes d'approvisionnement et de distribution des SRO tenant compte de l'accroissement de la demande qui ne manquera pas d'entrainer le succès de la campagne médiatique. Il est particulièrement important d'assurer la disponibilité des SRO avec le concours des pharmacies publiques et privées.

Avec votre engagement de financer la disponibilité des stocks de SRO suffisants pour la campagne 1989, la Condition Préalable précitée aura été remplie, dans son fonds et dans sa forme, d'une manière satisfaisante à l'AID. Nous continuerons à suivre la réalisation de ce volet du projet en collaboration avec le Ministère de la Santé.

Mes collaborateurs et moi-même restons à votre entière disposition pour toutes questions que vous pourriez avoir sur ce qui précède.

Veuillez agréer, Monsieur le Secrétaire d'Etat, l'expression de ma considération distinguée.

Jonathan Sperling
Directeur par interim

Habib Ben Yahia
Serétaire d'Etat auprès du
Ministre des Affaires Etrangères
Ministère des Affaires Etrangères

Date

PM:DPutman:nbs
10/03/88

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