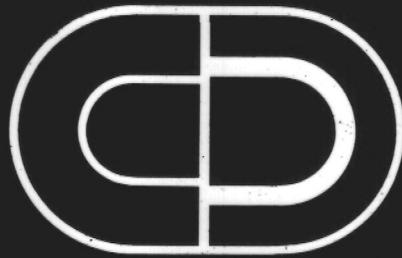


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for control
of diarrhoeal
diseases

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REPORT 1992

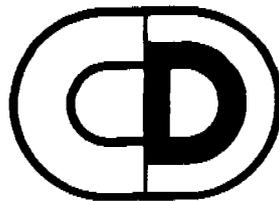


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Programme
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Introduction

This interim report covers the activities of the WHO Programme for the Control of Diarrhoeal Diseases (CDD) during 1992, the first year of the current biennial budget and planning period.

The year brought important progress in national CDD programmes around the world. Training activities, a major priority of the Programme, were further accelerated and decentralized through the introduction and active promotion of additional training materials.

Programme reviews were conducted in countries, all leading to replanning of national programmes with specific activities aimed at overcoming identified constraints. Household surveys of diarrhoea case management in the home were carried out in 15 countries, while 12 programmes examined the performance of health workers through health facility surveys.

Access to oral rehydration salts (ORS) continued to increase overall, although several countries were unable to sustain production. An approach to improving the performance of pharmacists and drug sellers was finalized, and shows promise. A number of countries took action to restrict the availability and use of ineffective, and sometimes harmful, antidiarrhoeal drugs.

All WHO Regional Offices continued to provide strong support to the Programme's activities, particularly through the CDD medical and technical officers and the communicable disease or maternal and child health (MCH) advisers who supervise them. Improvements were seen in programme planning and management at this level, and in the quality and analysis of information collected from the countries.

Many advances were also made in the Programme's global research and development activities. A distance learning course on diarrhoea case management was completed and field-testing started; a five-day course on breastfeeding counselling was also finalized. Key evaluation methodologies for programme reviews and household and health

facility surveys were prepared or completely updated and field-tested.

A training course for health workers on interpersonal communication skills was completed and the development of materials on the use of radio in CDD initiated.

Research studies supported by the Programme continued to address clinical and operational aspects of diarrhoea case management and prevention, particularly with respect to the treatment of persistent diarrhoea and dysentery, the use of rice-based ORS, feeding during and after diarrhoea, and improving breastfeeding and weaning practices.

At the global level, the Programme experienced important changes. Collaboration with UNICEF was intensified through frequent consultations, notably a meeting on CDD of UNICEF Representatives from 10 of the largest developing countries. Also of major significance was the initiation, in collaboration with UNICEF and under the Programme's coordination, of a training course that incorporates diarrhoea into an integrated approach to management of the sick child. This also covers acute respiratory infections, measles, malaria and malnutrition. Close collaboration with other relevant programmes within WHO in this initiative has led to encouragingly rapid progress.

In response to concerns expressed over many years about the Programme's need to link its research, development and programme implementation activities more closely together, the Headquarters component of the Programme was reorganized in 1992. To complement the national programme implementation activities, four research and development working groups were formed. These address, respectively: case management in health facilities, home care for diarrhoea, prevention of diarrhoea, and national programme management. Initial experience suggests that these groups will ensure that research and development activities address key issues of programme implementation and are modified by experience in national programmes.

Despite this generally positive assessment of the Programme's most recent completed year of work, the perspective for the future remains somewhat uncertain. Most critically, the Programme has, for the first time since its inception, experienced a faltering in financial support. While support over the 13 years of the Programme's existence has been generous and consistent, and significant progress has been made, it would be wrong to conclude that

continued support is no longer needed. Diarrhoea continues to be a leading cause of - mostly preventable - death in children. National CDD programmes are all too often fragile and in need of further support; the battle to achieve the Programme's objectives is far from won. The Programme is counting on renewed financial assistance and the strong political commitment needed at all levels to consolidate and build upon the gains made to date.

Health Services

Planning and implementation

The year 1992 saw certain countries making greater political commitment to the control of diarrhoeal diseases. Many countries revised their national CDD plans following programme reviews, or during review and planning meetings, while several countries in the American Region prepared new CDD plans, policy and targets (see map page 4).

Increased efforts were made in the European Region to strengthen existing CDD national programmes and to establish new ones. An inter-country meeting was organized in Belarus for the countries of the Commonwealth of Independent States (CIS) to introduce global CDD strategies, plans and policies. During collaborative WHO/UNICEF missions to CIS, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan expressed a strong interest to develop CDD programmes to reduce the high child mortality rate in these countries.

Interagency collaboration, in particular collaboration with UNICEF in support of national CDD programmes, was strengthened during joint programme reviews and planning activities in all regions in at least 14 countries. The CDD regional programme managers' meetings held in 1992 in Bolivia, Ghana, India, Morocco and Niger continued to be an important forum both for the exchange of country experiences, and for discussing new programme strategies and indicators to achieve the goals of the World Summit for Children.

In 1992, greater attention was given to the close monitoring and follow-up of Programme implementation in the largest countries with the highest diarrhoeal diseases burden, with visits made by Headquarters and regional staff to almost all of these countries.

The reorganization of the Programme at Headquarters in 1992, with formalization of the work-

ing groups on case management at health facilities, home management of diarrhoea, prevention of diarrhoea and national programme management, greatly improved the Programme's ability to focus on important issues and to guide developmental efforts. In addition to performing developmental tasks and country monitoring, Headquarters staff continue to collaborate with national CDD programmes, together with WHO regional and country staff, in particular in the areas of planning, training, evaluation and communications. Specialized support is also provided on breastfeeding promotion, ORS production and supply, improving the rational use of drugs and strengthening medical education.

Training

Training continued to be one of the highest priority activities in 1992 for the global Programme and for most national CDD programmes. Decentralization of case management training was pursued, through wide use of the *Guidelines for conducting clinical training courses at health centres and small hospitals*¹. The Programme continued to support national training courses for programme managers in the largest countries. A training package and approach for strengthening CDD teaching in medical schools, and a package for improving teaching in nursing schools were finalized and preparations were made for their wide distribution in 1993 (see the section Training in medical schools).

Countries continued the adaptation and translation of CDD materials into local languages. For example, Yemen translated *Guidelines for conducting clinical training courses at health centres and small hospitals*. The *Training course for programme managers* was translated into Indonesian, the *Supervisory skills training course* was translated into Burmese, Chinese, Laotian, Mongolian, Nepalese and Vietnamese. The CDD diarrhoea management chart and the popular training module *Management of*

¹ Document CDD/SER/90.2, Rev.1 (1992).

WHO CDD staff in the field

Box 1

The WHO CDD Programme provides technical assistance to countries through the Organization's regional and country offices.

In all six regional offices, a WHO medical officer is responsible for coordinating programme activities. In four offices, this staff member is responsible exclusively for CDD; in two regions, responsibilities also cover ARI. In one office, a second medical officer post is also dedicated to CDD and in two regions short-term medical officer posts provide additional support.

Following a decision taken in 1988 to assign medical officers to a number of priority countries, seven such staff are now in Bangladesh, Brazil, Ethiopia, Indonesia, Nigeria, Pakistan and Peru. In Mexico, a joint post is funded mainly by the PRITECH Project. In Bolivia, a WHO local staff member combines CDD and MCH responsibilities. A post created in India is yet to be filled; a post in the United Republic of Tanzania is under consideration.

In addition to these staff, the Programme continues to benefit greatly from the Organization's Associate Professional Officer (APO) scheme. Through the generous support of a number of donor countries (see the section Collaboration with other international and bilateral agencies) in 1992, 12 APOs assisted national programmes, and three were employed at regional or subregional level, working either in CDD alone or in combination with ARI or EPI responsibilities.

In four regions, further strength is provided by technical officers working full-time (three regions) or half-time for CDD.

Together, at regional, subregional and country level these personnel total 36.

To support national programmes, a total of 60 person-months of Geneva Headquarters staff time was spent in countries in 1992, providing input to specific activities.

In 1993, the Programme will continue to support the training of senior health managers, giving priority to those countries where evaluation (see the section Programme reviews) has shown the need to strengthen further the management component of the programme. It is planned that at the end of 1993, the Programme will proceed with the revision of the current course so as to include the latest developments and priorities in diarrhoeal disease control.

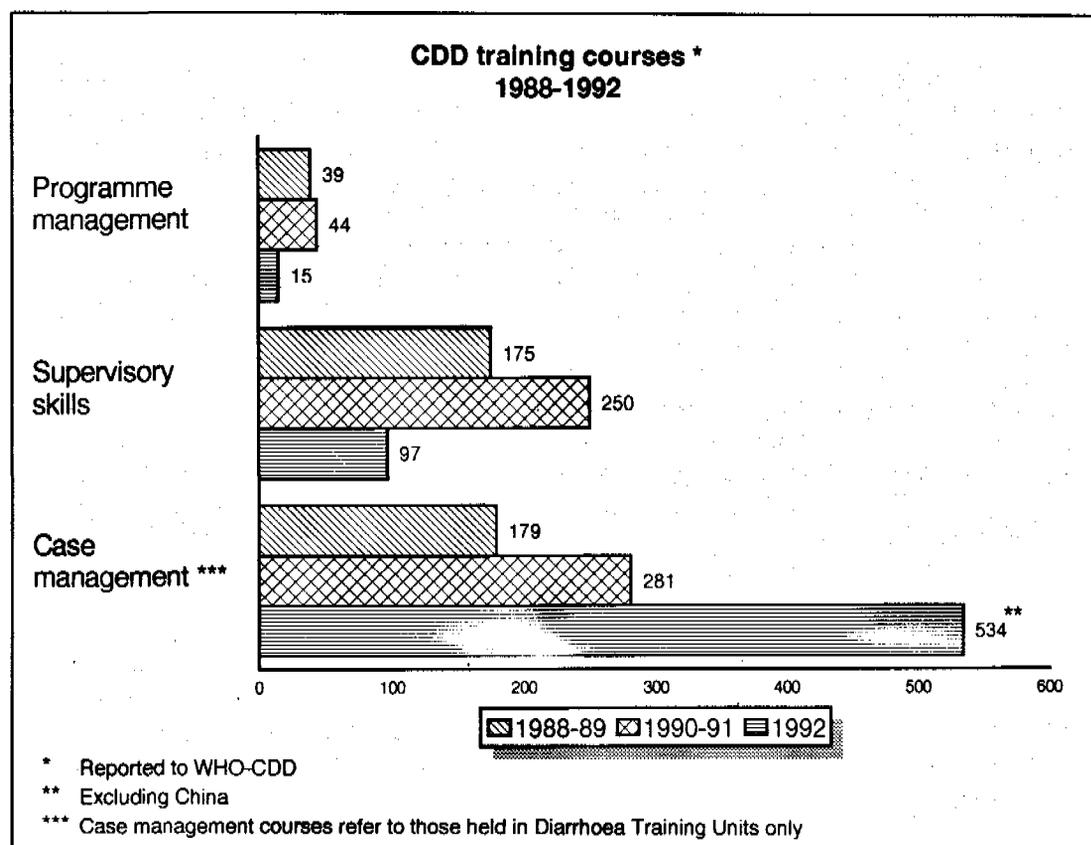
Supervisory skills training

In 1992, countries continued to use extensively another of the Programme's long-established training packages for first-level supervisors, the CDD *Supervisory skills training course*. Almost 100 CDD supervisory skills training courses were reported to the Programme as having been conducted in 1992 (Figure 1), representing only a small part of the ongoing training activities using this popular set of training materials. Although the great majority of

CDD supervisory skills training courses were conducted as national courses, this training package was also used during intercountry training (for participants from e.g., Angola, Guinea-Bissau, Mozambique and Sao Tome). Selected modules from this course, namely *Management of the patient with diarrhoea*, *Prevention of diarrhoea*, *Community involvement* and *Training* have become part of routine training programmes for first-level managers in many countries of the world.

Since its introduction in 1983, the supervisory skills course has been held nearly 800 times, and attended by about 24 000 first-level supervisors. As in the past, the Programme supported the use of the CDD *Supervisory skills* modules in combination with the *Supervisory skills* modules of the Programme for the Control of Acute Respiratory Infections (ARI) and modules from the Mid-level managers' course of the Expanded Programme on Immunization (EPI). Some countries have developed combined courses which teach all components of primary health care, including CDD.

Figure 1



It is estimated that at the end of 1992, 34% of health staff with supervisory responsibilities had been trained in the 126 countries for which data were available.

In 1993, the Programme will assist countries in improving their estimation of the target groups for supervisory skills training, and in ensuring close links between supervisory activities and decentralized training in diarrhoea case management. An extensive revision of the course - through its incorporation into a course on an integrated approach to the management of the sick child - is to be undertaken in 1993-1994.

Training in diarrhoea case management

Training in diarrhoea case management was the Programme's main priority in 1992. At least 500 formal training courses were planned and implemented in 1992 in countries with operational CDD programmes (Figure 1). Most of these courses were conducted in the more than 300 diarrhoea training units (DTUs) established in 80 countries worldwide. The Programme provided its technical support to countries in upgrading existing DTUs and establishing new ones.

During 1992, the revised *Guidelines for conducting clinical training courses at health centres and small*

hospitals, introduced in 1991, was widely used by national CDD programmes for the first time. As a reflection of the Programme's emphasis on decentralization and acceleration of case management training, more than 40 courses for trainers were conducted in 32 countries. Six of these courses were intercountry (in Côte d'Ivoire, Ethiopia, Fiji, India, Sierra Leone and Swaziland) and the rest national. To facilitate the training of trainers, the Programme prepared and distributed *Notes on training of trainers*³ for use with *Guidelines for conducting clinical training courses at health centres and small hospitals*. These *Notes* describe the objectives of the training of trainers (TOT) course, and the criteria for selection of the participants and site for this course. As described in the *Notes*, an important part of the course is the exercise in which the future trainers plan their "post"-training activities. This approach allows countries to: involve trainers from the peripheral level in training activities; move training from the central level to peripheral health facilities; and bring the planning process to the district level. Some countries (e.g., Egypt, the Islamic Republic of Iran, Morocco and Yemen) have already reported on case management training started in 1992 by the participants of the TOT courses.

³ Document CDD/SER/91.3.

The Programme made certain minor improvements to *Guidelines for conducting clinical training courses at health centres and small hospitals*, as a result of feedback from their use in 1991 and 1992. For the convenience of participants the *Participant manual* and the module *Management of the patient with diarrhoea* were merged into one document, entitled *Participant manual*⁴. In addition to the wall chart *Management of the patient with diarrhoea*, a pocket-sized chart of the same name is now available for easy reference during clinical training and beyond.

In 1992, three countries (Bangladesh, Philippines, United Republic of Tanzania) successfully incorporated the Programme guidelines *Advising mothers on home management of diarrhoea* into *Guidelines for conducting clinical training courses at health centres and small hospitals* (see the section Communication). This allowed them to strengthen the interpersonal communication skills of health workers during clinical practice with patients.

These formal training courses, as reported to the Programme in 1992, were only part of ongoing clinical training activities. As a result of training efforts undertaken, it is estimated that the proportion of staff responsible for diarrhoea case management who have been trained in the 126 countries for which information was available at the end of 1992, was 24%.

Distance learning

In 1992, the Programme started to field-test its distance learning training package *Clinical skills: A self-instructional course*. This is for health workers unable to attend formal training courses at DTUs or at small hospitals. Two training methods are being tested with this training package: one involves working with tutors/supervisors and has been tested in Egypt and Zambia; the other is entirely by correspondence, and is being tested in the Philippines and Sri Lanka. In 1993, the course will be completed and distributed to the countries.

Training in medical schools

The Programme has continued its efforts to assist interested countries in strengthening the teaching of medical students about diarrhoeal diseases. This effort seeks both to introduce into medical schools, especially departments of paediatrics, concepts of diarrhoea case management and prevention that accord with the policy of national programmes,

and to prepare students to manage diarrhoea cases effectively through planned and supervised, "hands-on" practice with patients. It is hoped that by strengthening the teaching of diarrhoea case management to medical students, the need for extensive in-service training of doctors will be reduced.

During 1992, the training materials used in this initiative were field-tested during a workshop in India, then revised and printed. The full set of materials is now available and consists of:

- *Readings on diarrhoea*⁵, a manual for medical students;
- An *Instructor manual*⁶, which describes a variety of activities for teaching students about diarrhoeal diseases;
- A set of *References on diarrhoea*, which contains selected original articles related to the treatment and prevention of diarrhoea;
- A *Guide to student evaluation*⁷, which describes approaches to assessing both knowledge and skills of students in relation to the control of diarrhoeal diseases;
- A *Workshop director guide*⁸, for use by people who lead workshops at which medical school teachers develop plans to strengthen the teaching of diarrhoeal diseases at their schools; and
- A *Workshop participant manual*⁹, for workshop participants.

Readings on diarrhoea is being published by WHO, making it available through the Organization's global distribution network. This manual describes in detail the key aspects of management and prevention of diarrhoeal diseases, following WHO guidelines, and links these with basic knowledge of the epidemiology, pathogenesis and pathophysiology of diarrhoea. Chapters in the manual may be assigned to students as individual reading, making it possible to use classroom time previously devoted to lectures for other teaching activities in which students can participate more actively. Ideally, each medical student should have a personal copy of this manual.

⁵ Publication ISBN 92 4 154444 9.

⁶ Document CDD/SER/93.1.

⁷ Document CDD/SER/93.2.

⁸ Document CDD/SER/93.4.

⁹ Document CDD/SER/93.3.

⁴ Document CDD/SER/90.3 Rev.1 (1992).

Box 2

**Strengthening the teaching of diarrhoeal diseases
to medical students in Viet Nam**

In 1990, 18 paediatric faculty staff from the nine medical schools in Viet Nam participated in workshops at which they reviewed the current concepts of diarrhoea case management and prevention based on WHO guidelines, read the CDD student manual *Readings on diarrhoea*, took part in a variety of interactive teaching activities, and practised management of cases in a DTU. They then developed workplans to improve the content of diarrhoeal disease teaching in their schools, increase their use of interactive teaching methods, establish or strengthen a DTU in their school's teaching hospital, and train other paediatric faculty and key hospital staff in the WHO approach to case management and diarrhoeal disease teaching. For most participants, this was their introduction to the strategy for diarrhoea case management and prevention being promoted by the national CDD programme.

Following the workshops, the national CDD programme translated *Readings on diarrhoea* into Vietnamese and arranged for 5000 copies of the manual to be printed and distributed to the medical schools for use by students. Some schools printed additional copies to ensure an uninterrupted supply. Many students purchased the book at cost, which was less than US \$1.00 per copy.

In 1992, a review was made to evaluate progress in implementation of the workplans and to identify problems that required further attention; seven of the nine schools were visited. Some of the schools' main achievements were:

- Implementation of the workplans was given high priority by hospital directors; conferences had been held to review the content of the workshops with other faculty and hospital staff.
- DTUs or ORT units had been established in most teaching hospitals; these were generally open 24 hours a day, seven days a week; they were adequately staffed and most staff had received formal training in diarrhoea case management.
- Students spent one week in the DTU during year 3/4 and again during year 5/6; all students had first-hand experience in case management; clinical experience and the development of clinical skills were monitored using a checklist introduced at the workshops.
- Teachers were using *Readings on diarrhoea* as a source of teaching material, which helped to update and standardize what was being taught; slide sets used were based on material in the student manual; increased use was being made of discussions, written case studies and supervised clinical practice.

Some problem areas identified were:

- The supply of patients was variable; in the low diarrhoea-incidence season, a student might have only one patient for clinical practice.
- The provision of food to all patients in the DTU was difficult.
- Video players had not yet been provided to the schools.

In 1992, a workshop was held in India to assist teachers in the departments of paediatrics and of preventive and social medicine in five medical schools, to plan ways to strengthen the teaching of diarrhoeal disease control to their students. This brings to five the number of countries, and to

more than 75 the number of medical schools, that have taken part in this initiative to date.

During the coming year, this initiative will be extended to a greater number of countries and medical schools. A task force of experienced medical

A manual for instructors of nurses and other health workers

Box 3

The training package *Strengthening the teaching of diarrhoeal diseases in basic training programmes: A manual for instructors of nurses and other health workers* comprises the following sections:

- CDD curriculum: a sample course including topics, learning objectives, schedule, materials and student assessment activities.
- Methods: a description of a variety of teaching methods to help students to learn the topics listed in the CDD curriculum chart.
- Lesson plans: a sample lesson plan to illustrate how to use the course modules in the class-room, and guidance on how to use active learning methods given different conditions such as large classes and minimal equipment.
- Course modules: two student modules from the CDD *Supervisory skills training course*, namely, *Management of the patient with diarrhoea* and *Prevention of diarrhoea*, and the module *Advising mothers*, for strengthening interpersonal communication skills.
- Field visits: guidelines on how to prepare and carry out field visits to enable students to practise case management and health education activities.
- Methods to assess the student's knowledge and skills: a checklist to evaluate performance of clinical skills, and examination questions on diarrhoeal disease to use in course work and in professional certification examinations.
- Field-work placements: guidelines on how to organize field-work placements and so provide practical experience in diarrhoea case management.
- References: background materials for instructors to use on topics not fully covered in the modules.
- Teaching materials: among other items, the wall chart *Management of the patient with diarrhoea*, two slide sets and a videotape on how to assess dehydration.

educators will be trained to lead workshops in individual countries that wish to take part. Four or five workshops will be held, involving about 30 medical schools in 10 countries. Reviews will also be organized to assess progress made by medical schools that have participated in previous workshops.

Training in nursing and paramedical schools

The training package *Strengthening the teaching of diarrhoeal diseases in basic training programmes: A manual for instructors of nurses and other health workers* was completed in 1992. It will become widely available in mid-1993, and will be used, whenever appropriate, together with EPI materials in an increasing number of countries. A review of nursing curricula and workshop planning to strengthen the teaching on diarrhoeal diseases was conducted by the Programme in Ethiopia and Swaziland

in 1992. The progress of nursing curricula activities was also evaluated in Viet Nam as part of one of the priority topics of the focused programme review conducted in 1992. Box 3 outlines the contents of the package.

The package is the result of several years' experience, during which CDD/EPI training materials have been introduced into institutions that train nursing and other health workers in a number of countries, e.g., Malaysia, Nepal, Papua New Guinea, Philippines, Sri Lanka and Viet Nam. The overall objective of this effort is two-fold: to improve students' theoretical and practical knowledge of the management and prevention of diarrhoea, and to improve their skills in the management of children with diarrhoea.

A planning visit is required some months before the initial workshop. During the workshop, mech-

anisms on how to introduce CDD concepts into the curriculum are discussed and developed. Follow-up visits are required to assess whether the plan of work developed during the initial workshop has been implemented.

The Programme is planning to expand its resource base of expertise to assist countries in the planning, implementation and follow-up of training in nursing and paramedical schools, so as to improve pre-service training.

Training of pharmacists and drug sellers

For several years the world health community has recognized the influential role of pharmacists and other drug sellers in the management of diarrhoea - regrettably, often in *inappropriate* management. As reported in previous years, the Programme is working on an approach to this issue, and is developing a *Guide for improving the diarrhoea treatment practices of pharmacists and licensed drug sellers*. This is being carried out through a contract with the firm Management Sciences for Health, Boston, USA, and the Department of Social Medicine of Harvard Medical School, USA.

The *Guide* comprises three stages. Stage 1 assesses how drug sellers treat diarrhoea and why. To this end, the drug retail system is studied, an appropriate target audience chosen, drug sellers' current knowledge and practices ascertained, and factors influencing drug sellers' practices identified. In stage 2 a training intervention is designed and planned, and entails decisions on intervention, the development of a workplan and printed materials, the training of staff, and a pilot test of the intervention. Stage 3 describes how to carry out the intervention and evaluate results, by developing a monitoring and evaluation plan, and by implementing and assessing the intervention.

During 1992, the *Guide* was field-tested in Indonesia and Kenya; results will be available in 1993. In Indonesia, a series of short seminars was the primary intervention, while in Kenya visits to individual pharmacies were used. Both countries adopted a combination of one-to-one and group methods. The field-tests demonstrated the feasibility of the developmental methods employed: these included provider surveys using both direct questioning and simulated clients, interviews with key informants, and carefully prepared focus group sessions.

Preliminary evaluation results of the impact of this - limited - effort in Kenya are very encouraging. The challenge still remains, however, to

expand the activity to cover an entire country with only modest levels of technical support.

Evaluation of training and performance

With the Programme's main objective being the reduction in mortality due to diarrhoeal diseases, the Programme has, since its inception in 1980, emphasized the training of health workers in correct diarrhoea case management.

Given that health facility survey findings frequently demonstrate less than optimal assessment, treatment and counselling of children with diarrhoea, the Programme has increasingly recognized that training is a necessary but on its own insufficient prerequisite for improving the quality of care in health facilities. There is a need to identify factors beyond training that influence health workers' performance and that modulate the impact of training. For this reason, the Programme collaborated with PRITECH and the Quality Assurance Project to develop a methodology to evaluate training and other factors influencing quality of care; this was field-tested in the Philippines in 1991-1992 (see Box 4).

The evaluation demonstrated the feasibility of developing a standardized methodology for evaluating training courses which could be used for self-evaluation, simplified for monitoring training or used as part of periodic training evaluations. It also demonstrated the difficulty in following up graduates of training courses as part of a prospective performance evaluation. Finally, the evaluation showed that case simulations offer a promising means for competency-testing during and after training, and as a training method. Simulations may be particularly useful when there is a lack of diarrhoea cases, either during training or during evaluation, or during supervisory visits to health facilities.

Integrated management of the sick child

Globally, pneumonia, diarrhoea, malaria, measles and malnutrition cause more than three-quarters of deaths in children under 5 years of age. Feasible case management interventions exist for all of these illnesses. Consequently, in 1992 WHO and UNICEF began developing an integrated approach to managing the main life-threatening diseases of childhood, including a training package *Management of childhood illness - A training course on case manage-*

Evaluating diarrhoea case management training in the Philippines

The Philippines national diarrhoeal disease control programme (NCDDP) of the Department of Health has actively trained physicians and nurses in diarrhoea case management since the establishment of a diarrhoea training unit (DTU), the National Rehydration, Treatment and Training Center (NRTTC), in Manila in 1985. Since then, nine other national and regional DTUs have been established. In 1991, the Department of Health initiated an evaluation aimed at improving the quality of training and case management performance. A joint team from the Department of Health, WHO, and the USAID-funded PRITECH and Quality Assurance Projects developed a two-part evaluation methodology to assess the quality of training, the competence of course graduates, and the quality of case management performance in their health facilities. This methodology also examined a variety of factors beyond training which may contribute to the quality of case management performance including supervision, supplies and materials, facility procedures and staffing, caseload, and motivational factors. In the first phase, an evaluation of two DTU courses in progress was conducted. In the second phase, a modified health facility survey was conducted in five regions in January-February 1992.

Using pre- and post-course tests and five case simulations, the knowledge and competence of the participants were assessed. Participants in the course with more patients available for practice scored better on assessment and treatment. The other course, with fewer patients, but more time spent on role-playing of counselling resulted in better counselling skills.

In a five-region survey of health staff, physicians who had received DTU training and those who had not were compared by both observation and case simulations. Both groups did well in history, clinical assessment, and treatment, and poorly in counselling of mothers regarding home management of diarrhoea. The overall excellent performance on assessment and treatment, and the lack of difference between DTU-trained and other physicians, can be explained by the fact that 83% of DTU graduates had trained others on the job, and 67% had organized echo training, thus passing on their learned skills and knowledge. Two-thirds of DTU graduates felt that training had prepared them to train others, and had been provided with training materials.

Health workers who had had adequate hands-on practice with diarrhoea cases during their DTU training did consistently better on assessment than those who had not.

The factors beyond training found to be associated with the quality of performance included internal supervision by a senior supervisor in the health facility, and the proportion of all health workers treating children with diarrhoea who were trained. Aspects of internal supervision including whether the supervisor was trained, the occurrence of regular staff meetings, and the perception that internal supervisors were helpful in implementing post-training plans were all positively associated with quality of performance. It is particularly notable that external supervision (a visit by a supervisor from outside the health facility) was not associated with the quality of performance. This may be due to the infrequency of external supervisory visits and the fact that they were directed towards health facility conditions rather than improving the quality of health worker performance.

These findings suggest that on-the-job training and support are crucial for maintaining performance levels. Results of this training and performance evaluation have been utilized by the Philippines Department of Health to improve training procedures. A consultative meeting of policy-makers and hospital administrators has been held, and ways of better advising mothers on home case management incorporated into DTU training.

ment and the organization of work at health centres. The relevant programmes and units at WHO and UNICEF are working together to combine their clinical and operational advice.

The training package will be the first phase of a broader approach to integrating the control of these major causes of childhood death. This approach is based on integrated clinical guidelines which focus the health workers' training and attention not on one but on all of the leading killers of young children that can be effectively managed. Independent, disease-specific clinical guidelines and training activities leave the difficult task of integration to the health worker in the encounter with the child and caretaker. Additionally, a young infant with a life-threatening illness commonly presents with non-specific clinical signs, which makes a disease-specific approach difficult. The integrated materials address both these issues.

The integrated clinical guidelines for sick children aged 2 months to 5 years will be summarized on four case management charts. The first is entitled *Assess the child*. Emphasis is placed on a rapid assessment for danger signs of severe disease, and the caretaker is then asked a series of key questions; depending on the answers, the child is examined for additional signs of specific diseases. The child's immunization and nutritional status are assessed. All of this information is used on the second chart, *Classify the illness*, which prompts the health worker to use the clinical signs to determine the severity of the illness. This classification leads to specific treatment instructions summarized on a third chart, *Treat the child*. The fourth chart, *Advise the mother*, displays the key elements of home care of the sick child that should be explained to the caretaker.

The course will include the following:

- Instructional material on case management at health centres and on case management at home. Available in the second half of 1993, this will contain:
 - Fully integrated case management charts (as described above) serving as both learning and job aides.
 - Training modules, to instruct health workers on the use of the case management charts, and on communicating with families on home care.
 - Visual training aides to improve health worker recognition of important clinical signs, including videos, photographs and line drawings.

- Guides for course facilitators and clinical instructors to ensure that trainees gain the necessary hands-on clinical practice in assessment, classification and treatment.

- Instructional material on the organization of work at a health centre and the support required from the district level to deliver effectively the integrated case management services. Available in late 1994, this will include, in addition to guidelines for course facilitators, training modules on:

- Identification and description of the population to be served.
- Planning and work scheduling.
- Supplies and materials, including stock control.
- Monitoring and evaluation of performance, output and effectiveness.

These materials will allow several programmes in a ministry of health to collaborate at district level in health worker training and supervision, and in health centre management and logistical support, with significant potential savings in staff time and other costs.

Management of diarrhoea in the home

Most episodes of acute diarrhoea can be treated satisfactorily at home by giving the child more fluid than usual and continuing normal feeding, including breastfeeding. The objectives of early home therapy are to prevent dehydration and to avoid nutritional damage. When early home therapy is given correctly, it is estimated that fewer than 10% of acute diarrhoeal episodes require care by a health worker.

However, results of household surveys indicate that only a relatively small proportion of diarrhoea episodes are managed by an increase in fluid intake. It has proved especially difficult and expensive to persuade mothers to give fluids prepared using special recipes, such as sugar-salt solution, in most settings. In fact, most episodes do not need such specially prepared fluids; plain fluids, including water, together with food, are adequate. The Programme has tried to resolve this problem by developing guidelines for early home therapy which emphasize increasing the total

Principles of fluid and food management of diarrhoea in the home

Box 5

If possible, one selected fluid should normally contain salt. Some examples are salted rice water or a salted soup; ORS solution may also be given, if available. Teaching mothers to add salt (about 3 g/l) to an unsalted soup or drink is also possible, but requires a substantial and sustained educational effort, which may not be cost-effective.

Salt-free fluids should also be given. These include plain water and common drinks such as weak tea (plain or slightly sweetened), rice water or yoghurt-based drinks. Certain fluids, such as very sweet drinks, stimulants, diuretics and purgatives, should be avoided.

When the approach described above is combined with continued feeding, including if possible foods that normally contain some salt, the child will receive enough carbohydrate and protein to promote the absorption of the ingested salt. This, together with increased water taken in drinks and food, will prevent dehydration in most episodes of diarrhoea.

intake of fluids, and using fluids that are available in most homes and that most mothers consider acceptable for a child with diarrhoea. The guidelines will be used to strengthen efforts to promote the early use of increased fluid intake and continued feeding during diarrhoea episodes at home. It is intended that acceptable fluids will be identified by the focused ethnographic study, currently under development by the Programme.

ORS production and supply

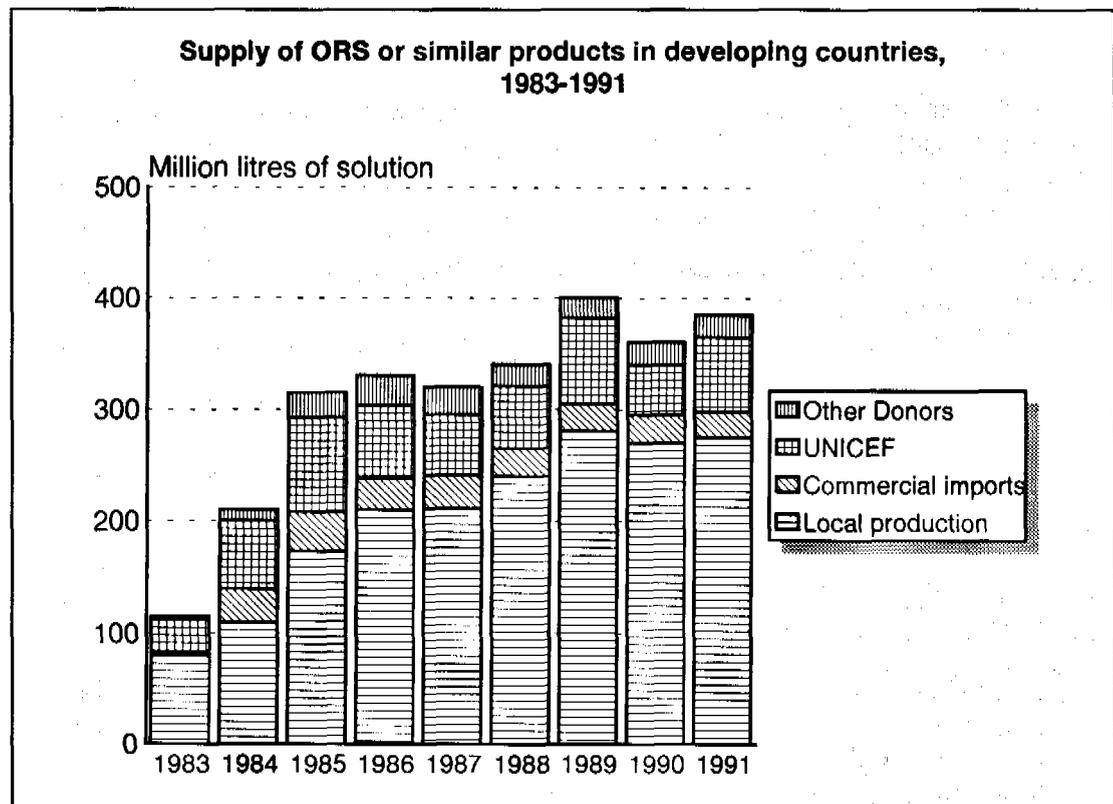
As reflected in the Programme's targets for 1995 and 2000, a commitment remains to ensuring access to ORS for as many of the developing world's children as possible. Consequently, the Programme continued to monitor the situation in 1992 and to collaborate with UNICEF in improving the situation. In addition to assisting countries and ORS manufacturers with technical problems related to production and quality control, the Programme received a greater number of requests for assistance in cases where the sustainability of local ORS manufacture was at risk. One of the reasons for such situations is the high cost of local production, which has led some local authorities and international agencies to seek to obtain the ORS on the international commercial market. For this reason, but also due to the outbreak of cholera in Latin America, the ORS provided by UNICEF rose from 45 million packets in 1990 to 67 million packets in 1991 (the last full year for which figures are available). The Programme has attempted to prevent trends towards increased dependency on donors' supplies by analysing specific situations and by evaluating possible solutions, in e.g., the Dominican Republic, Ethiopia, Mexico, and Peru. The causes of such problems are usually lack of funds for local procurement of ORS, restricted availability of foreign currency for imports of nec-

essary raw materials, excessive import duties, high overheads, and inadequate planning and coordination between manufacturer and client. Where appropriate, the Programme encouraged negotiations between the parties involved so as to prevent local production of ORS being reduced or abandoned. Despite these efforts, owing to political instability and economic constraints, ORS production was suspended in the following countries: Afghanistan, Albania, Somalia, and Sudan. As a result, the number of developing countries producing ORS decreased to 60 by the end of 1992.

The annual survey of ORS distribution and local production continues to be one of the main sources of information on ORS availability for a country. It allows for identification of countries where the supply of ORS has decreased or does not meet needs, investigation into the reason for it, and suggestions for possible solutions. The ever-greater amount of information has also allowed the table of global ORS availability to be revised (see Figure 2). In 1991, the supply of ORS or similar products in developing countries was sufficient for around 385 million litres of solution.

The quantity of ORS produced in 1991, with a different composition from that recommended by WHO/UNICEF, remained almost the same as in 1990; these 50 million packets represent approximately 13% of the total amount of ORS available in developing countries. Since its introduction, ORS has remained a product primarily available in the public health system and given free or at low cost to the patient. For this reason, and the fact that, in many countries, local authorities only allow the manufacture of the WHO/UNICEF recommended formula, and because of relatively low profit margins for the pharmaceutical industry, the industry has often shown limited interest in the commercial manufacture of ORS. In 1992, some

Figure 2



manufacturers decided to reduce or even stop manufacture. This occurred at a time of growing global financial constraints when in some countries, the commercial availability of ORS was sometimes the best source of sustainable supply. The Programme therefore felt it important to explore how the availability of ORS in the commercial sector could be more effectively promoted. Through discussions with ORS manufacturers, in India for example, it became clear that the existence of a single authorized ORS formula would discourage those potential manufacturers who consider a distinctive product important when marketing in the commercial sector. The Programme therefore agreed to define criteria for helping local drug administrations to determine whether ORS products proposed for commercial sale have formulations that are safe and efficacious. These criteria and other issues (e.g., flavouring/colouring) are covered in a new document entitled *Notes on acceptable limits for the composition of ORS*, which became available in March 1992. This document allows local drug administrations to verify whether a product is within the indicated limits in countries where formulas other than that recommended by WHO and UNICEF are allowed. The WHO/UNICEF recommended formula remains the only composition so far demonstrated to be effective for the correction of dehydration and maintenance therapy in all types of diarrhoea (including cholera).

The WHO/UNICEF ORS production engineer provided on-site technical assistance in the following countries in 1992: China, Colombia, Cuba, Dominican Republic, Ethiopia, Guatemala, India, Kenya, Mexico, Morocco, Myanmar, Peru, Sri Lanka and Yemen. In Ethiopia and Kenya, he took part in focused programme reviews. Problems relating to ORS were identified as critical during the first phase of these reviews. During the second phase, potential solutions were identified and selected for implementation.

Promoting the rational use of drugs

*The rational use of drugs in the management of acute diarrhoea in children*¹⁰, published by WHO in 1990, has been well-received by national CDD programmes and other interested institutions and individuals. Fifteen thousand copies of the publication, which reviews the efficacy and safety of medicines commonly used to treat diarrhoea, have been printed, and it has been translated into Bengali, French, Spanish, and Vietnamese; it will be translated into Chinese in 1993. Since the booklet was published, several countries have banned or restricted the use of antidiarrhoeal drugs (see Table 1 for countries that have taken regulatory action during the period 1990-1992).

¹⁰ Publication ISBN 92 4 1561 42 4.

Towards rational drug use in Pakistan

Box 6

Pakistan's problems with drugs are typical of those of many developing countries. While hospitals and health centres often lack essential drugs, virtually any medicine is available over the counter, including many with little or no efficacy. Commonly used medicines are marketed under many different brand names, making it difficult for both doctors and consumers to distinguish between them and to judge their quality and value. Doctors typically prescribe and dispense several medications for a simple ailment, as do chemists and untrained and unlicensed practitioners. A study conducted by the Pakistan Paediatric Association revealed that more than 90% of general practitioners and 80% of paediatricians used antibiotics and antidiarrhoeal drugs in addition to ORS for diarrhoea. In CDD household surveys conducted in each of Pakistan's four provinces the ORS use rate was 21% to 40% while the drug use rate ranged from 65% to 80%. With a literacy rate of 35%, patients are poorly equipped to make decisions about drugs, and seek the advice of doctors and chemists who in turn rely on representatives of pharmaceutical companies for information about a drug's efficacy. Misleading drug advertising fosters the belief in both practitioners and consumers that a cure exists for every ailment, that new, expensive and imported drugs are the most effective, and that generic drugs are inferior.

Despite these obstacles, progress has been made towards rational drug use in Pakistan. Paediatric formulations of loperamide, a popular antimotility drug, were withdrawn from the market in 1989 following worldwide publicity about the deaths from paralyticileus of several infants who had received the drug.

The activities planned by the CDD programme should aid efforts by other organizations in Pakistan working towards similar goals. In June 1992 the Ministry of Health presented the preliminary draft of a national drug policy at a National Workshop on Essential Drugs sponsored by the Pakistan Child Survival Project and USAID; additionally, WHO's Action Programme on Essential Drugs plans to hold a workshop in Pakistan in May 1993 to discuss the inclusion of rational drug use in the curricula of medical and pharmacy schools.

The National Drug Committee of the Philippines, which deregistered loperamide and diphenoxylate in 1991, now requires that drug companies applying for registration for new antidiarrhoeal drugs submit results from randomized, placebo-controlled studies establishing the drug's safety and efficacy in acute diarrhoea.

In 1992, a field-test version of a *Guide to improve the rational use of drugs in acute diarrhoea in children* prepared by the Programme for country-level preparations was used in Cameroon, Pakistan (see Box 6) and Sri Lanka during CDD focused programme reviews. Interagency "working groups" analysed the causes of inappropriate drug use and proposed activities to tackle the problem, including regulatory actions, training and educational activities, and communications for health care providers and mothers. A list of activities was then incorporated into the country's plan of action. The *Guide* underwent further revision in 1992, and will be finalized in 1993.

In the Philippines, the *Guide* was used during a workshop organized by the Association of Philippine Medical Colleges in conjunction with the National Drug Policy Program and WHO/CDD to help professional groups and NGOs to prepare individual action plans to promote rational drug use in the management of diarrhoeal diseases. In the ensuing months, plans were made to strengthen teaching on this topic in medical curricula and to include it in seminars for community pharmacists and for members of the Philippine Medical Association. The Department of Health is also planning to disseminate a newsletter on the rational use of drugs.

Rational drug use has been a priority area in CDD programmes in the EMRO region. In 1992, the CDD programmes in Egypt, the Islamic Republic of Iran, Morocco, Pakistan and Yemen included plans for rationalizing the use of drugs into their plans of action for 1993. Table 1 lists regulatory actions in this Region and elsewhere.

Table 1

Regulatory actions concerning antidiarrhoeal drugs for use in children as reported to the World Health Organization Programme for the Control of Diarrhoeal Diseases in 1990-1992

| Country | Drugs affected | Action | Date |
|---------------------------|--|--|----------------|
| France | Brand-name paediatric product containing loperamide | Restriction on use in children | August 1991 |
| India | Fixed-dose combinations of kaolin-pectin with absorbable drugs | Sale and manufacture banned | February 1991 |
| Indonesia | Paediatric formulations of loperamide | Banned | November 1990 |
| | 94 brand-name antidiarrhoeal products containing antibiotic mixtures, hydroxyquinolines, non-absorbable sulfonamides, and other substances | Deregistration of solid and liquid formulations | October 1991 |
| Lebanon | All products containing loperamide, diphenoxylate, diphenoxine and furazolidone. | Restriction on use in children, deregistration and banning of products | August 1991 |
| | All liquid forms of streptomycin | | |
| Libyan Arab Jamahiriya | 10 brand-name antidiarrhoeal products, which include substances like antimotility drugs, antimicrobials, and adsorbents | Use in children banned | May 1990 |
| Mexico | 5 brand-name paediatric products, containing loperamide and diphenoxylate | Deregistered | December 1990 |
| Nepal | Liquid preparations of diphenoxylate and loperamide, several combination drugs used as antidiarrhoeals | Import and export banned | August 1991 |
| | | Production and sale banned | February 1992 |
| Pakistan | 3 brand-name combination drugs used as antidiarrhoeals | Deregistered | 1989-90 |
| | Drop and syrup forms of loperamide, diphenoxylate and pipenzolate | Banned and withdrawn from market | June 1990 |
| Peru | Paediatric formulations of loperamide | Deregistered | October 1990 |
| Philippines | Loperamide and diphenoxylate | Deregistered | September 1991 |
| Republic of Korea | Loperamide | Restriction on use in children | May 1991 |
| Sri Lanka | Syrup formulations of loperamide | Deregistered | November 1990 |
| Thailand | Liquid preparations of diphenoxylate | Deregistered | February 1992 |
| | Liquid preparations of loperamide | Deregistered | March 1992 |
| Turkey | Drop and syrup formulations containing loperamide | Banned | September 1991 |

Communication

One of the joint targets set in 1992 by WHO and UNICEF for global CDD programmes is that by 1995, 80% of mothers of children under 5 years old should be able to state the three rules of home case management (increase fluid intake, continue feeding, and seek medical care when needed); for the year 2000, this target is 100%. Despite well-implemented clinical management training in many

countries, advising a mother on how to care for her child's diarrhoea at home remains the weakest element of case management. Results of health facility surveys show that the proportions of mothers correctly advised range from 1% to 10%.

To tackle this important problem, the CDD Programme in 1992 focused on the development, testing and application of a training guide called *Advising mothers*. This guide, which comprises a series of practical exercises, teaches basic skills

Advising mothers

Advising mothers may be the most difficult part of clinical management. Health workers often give advice at the end of a consultation, when they are in a hurry to finish. Health facilities are often crowded, and health workers may not feel that advising is a productive use of their time. Most important, it is not always clear to the health worker just how to advise a mother. There are a number of possible explanations for this. The assessment and management procedures which health workers are trained to carry out follow a systematic process, whereas the method of advising is left to each health worker's discretion. Furthermore, much clinical training has traditionally focused on rehydrating children with some or severe dehydration, while in most outpatient settings up to 95% of the diarrhoea cases a health worker sees are not dehydrated; the health worker must advise these mothers on home treatment. Unlike most other treatments, which are carried out directly by the health worker, home management of diarrhoea is entirely the responsibility of the mother or other caretaker. How well she does it depends partly on how well she is advised.

The CDD Programme has therefore developed and produced a training guide called *Advising mothers*. This guide outlines a process and skills that will help health workers to advise mothers effectively.

The suggested process, summarized as *Ask - Praise - Advise - Check*, will help the health worker to do several things. First, it will help to *limit* the information given to the mother. Second, the process will help the health worker to *structure* the conversation. Third, the process will help the health worker to *focus* on what the mother already does and knows. It enables the health worker to *praise and encourage* what the mother does correctly, and to help correct what she does wrong.

and a process (Ask-Praise-Advise-Check) for health workers to follow when they advise mothers on home case management. *Advising mothers* is a training tool which, ideally, should be used during a clinical management training course. It may also be used as a "refresher course" for health workers previously trained in clinical management. In Bangladesh and in Viet Nam, where the health education departments and UNICEF are developing integrated strategies for interpersonal communication in primary health care, *Advising mothers* may serve as the CDD module, and as a model for other programmes as they develop their contributions.

After testing in Gambia and subsequent revision, the training exercises have been applied in Bangladesh, the Philippines, and the United Republic of Tanzania. In the United Republic of Tanzania, where training in interpersonal communication skills began in 1991, *Advising mothers* was modified to include examples of local relevance, and previously developed exercises on the use of national programme materials. In both Bangladesh and the United Republic of Tanzania, the exercises were used in the context of clinical management training courses. Based on these experiences, sample agendas for integrating *Advising*

mothers into clinical management training were developed. Any future revisions of clinical management training materials will include *Advising mothers* as part of standard training.

To help reach the families who do not come to health facilities, and to reinforce the messages that health workers give about home case management and prevention, the Programme - in collaboration with HEALTHCOM - has made substantial progress on the development of a guide for national programme managers on the effective use of radio. The first draft of this document has been completed; revisions and field-testing are scheduled to be carried out in the first quarter of 1993. Several national programmes and local UNICEF offices have expressed an interest in participating in the field-testing.

The number of programmes which have identified communication as a priority area for their focused programme reviews bears witness to the continued need for communication assistance and to the interest of national programmes in planning and implementing communication activities. In 1992 these countries were: Cameroon, Egypt, Ethiopia, Morocco, Niger, Pakistan and Viet Nam. Each review resulted in the development of a

Box 8

Follow-up of a focused programme review: Bangladesh

In 1991, the Bangladesh national CDD programme held a two-phase focused programme review (FPR). One of the four priority areas identified for review was communication, which had not until then been a significant part of national programme activities. Household surveys had confirmed that mothers had a high awareness of correct case management, but that practice rates were low.

Some of the problems identified by the review, and the actions taken based on the recommendations of the review, were as follows:

| Problem | Action taken |
|--|---|
| <p>Numerous organizations involved in CDD communication, leading to dissemination of conflicting messages.</p> | <ul style="list-style-type: none"> ■ A communication committee comprising CDD programme staff and representatives of related agencies was established; it meets regularly. ■ A workshop was held by the national CDD programme and its partners to develop and agree upon a set of standardized messages, based on national CDD programme policy and on existing community studies. ■ A study on past communication experiences in CDD in Bangladesh was finalized and the results disseminated. |
| <p>Health workers communicating ineffectively with mothers.</p> | <ul style="list-style-type: none"> ■ A group of trainers was trained in the <i>Advising mothers</i> methodology; the exercises were successfully integrated into clinical management training. ■ The <i>Advising mothers</i> exercises were adapted and translated into Bengali for use in basic health worker training. |
| <p>Very low profile of national CDD programme messages and materials.</p> | <ul style="list-style-type: none"> ■ A programme logo, to improve programme identity, was developed and pre-tested, and will be disseminated in 1993. ■ A local social marketing company developed and produced scripts for television and radio spots. |

It is notable that, out of a total of 20 recommendations to improve communication activities, over half were implemented within one year of completion of the review.

comprehensive national plan in which the communication component was integrated and coordinated with other programme activities. Egypt, Ethiopia, and Viet Nam, based on these reviews, plan to integrate *Advising mothers* into clinical management training in 1993. In Viet Nam, where training in interpersonal communication skills is already a major component of the national pro-

gramme, *Advising mothers* will take a form carefully adapted to the existing situation.

The Programme continues to recognize the need for a comprehensive, varied approach to communication. With the two principal tools of *Advising mothers* and the radio guide nearing completion, the Programme is redirecting its attention to the

development of broader strategies and planning guidelines for national programmes. Additional strategies aimed at gaining sustainable high-level support for communication activities need to be considered.

Assessing diarrhoea case management in the home

During 1992, 18 household surveys of diarrhoea case management were conducted in the following 15 countries: Bhutan, China, Egypt, India, Indonesia, Mongolia, Nigeria, Pakistan, Sudan, Tunisia, Thailand, Uruguay, Viet Nam, Yemen and Zambia. This brings the total number of surveys conducted to at least 88 in 36 countries since 1989, when the case management survey became available. Using this survey, national programme managers are able to collect data on the quality of diarrhoea case management in the home by interviewing caretakers of children who have had diarrhoea in the previous 24 hours. This survey also provides information on seven of the 13 indicators that national programmes use to assess progress.

Table 2 gives results of the surveys that have been conducted during the three-year period 1990-1992. Globally, perhaps because of the aggregated data, the median results have remained similar: approximately one-fifth of diarrhoea episodes receiving ORS, one-third an increased fluid intake, and two-thirds continued or increased feeding. Overall, there may have been some decrease in drug use, although 43% of episodes still receive at least one drug, usually unnecessarily. One rate that appears to be increasing is the proportion of episodes that receive ORS and/or a recommended home fluid (RHF); the current median is 60%. This increase is probably a reflection of two things: the greater emphasis that national programmes have put on increased use of home fluids to prevent dehydration; and the Programme's revision of the strategy for home-based ORT during the last biennium (see the section Management of diarrhoea in the home). The latter has led to numerous countries considering many fluids as suitable home fluids, even water, and not just those made from a special recipe.

Some countries find it difficult to carry out national household surveys, although several have now done more than one regional survey. Some surveys identify important regional differences, while in one country, Pakistan, surveys conducted in four provinces revealed consistent results. They all showed that despite intensive training efforts (36% of doctors and 20% of other health workers

were trained) there were serious gaps in the communication of CDD messages by workers to mothers. This was attributed partly to insufficient supervision, a problem that was studied and addressed in the subsequent focused programme review of November 1992.

Integrated household survey

In 1992, in response to country requests for an integrated survey, with the assistance of ACT International, Atlanta, USA, the Programme proceeded with the development of a household survey which incorporated questions on diarrhoeal disease, acute respiratory infections (ARI), and breastfeeding. The survey methodology was field-tested in Zanzibar (United Republic of Tanzania) and in the Philippines. A survey in Sri Lanka was used to train 10 consultants and two regional office staff.

As with the previous methodology, data are collected through interviews with caretakers of children under 5 years of age who are identified using a cluster sampling methodology. The survey focuses on children with diarrhoea and cough or difficult breathing in the two weeks preceding the survey. The survey gives information on the following:

- mothers' knowledge of home management of diarrhoea and when to seek care;
- use of ORS and recommended home fluids and their preparation;
- fluid intake and feeding during diarrhoea;
- exclusive, predominant and continued breastfeeding;
- use of drugs in management of diarrhoea and ARI;
- maternal knowledge of where to seek care for ARI;
- careseeking for ARI needing assessment.

A community investigation conducted in conjunction with the survey also gives information on ORS access.

Using this survey, three of the four WHO/UNICEF indicators of CDD programme progress can be measured. The results for these indicators for the three countries in which this survey was conducted are presented in Box 9.

Table 2

Results of household surveys of diarrhoeal case management in 1990-1992

| | Number of surveys ^a | Site of survey | ORS use | Correct ORS preparation | ORS and/or RHF use ^b | Increased fluids | Continued feeding | Increased fluids and continued feeding ^c | Correct knowledge of care-seeking | Drug use |
|------------------------|--------------------------------|----------------|---------|-------------------------|---------------------------------|------------------|-------------------|---|-----------------------------------|----------|
| Bangladesh | 4 | 4 divisions | 10.7 | 37.3 | 23.8 | 26.3 | 87.7 | 23.1 | 22.3 | 42.2 |
| Bhutan | 1 | national | 34.7 | 36.7 | 84.9 | 33.6 | 94.6 | 31.8 | 14.6 | 28.2 |
| Botswana | 1 | national | 44.8 | 77.7 | 73.0 | 44.0 | 95.0 | 41.8 | 84.0 | 5.0 |
| Brazil | 2 | 10 states | 22.3 | 34.7 | 62.2 | 39.0 | 59.7 | 23.3 | N/A | N/A |
| Burundi | 1 | national | 40.8 | 53.0 | 49.1 | 34.4 | 43.4 | 14.9 | 54.3 | 54.7 |
| Cameroon | 2 | 2 provinces | 4.9 | 50.0 | 88.4 | 39.4 | 76.6 | 30.2 | 36.8 | 43.3 |
| China | 6 | 3 provinces | 0.8 | N/A | 53.3 | 16.7 | 78.5 | 13.1 | 12.7 | 63.5 |
| Ecuador | 1 | 1 province | 6.5 | 23.1 | 70.1 | 22.7 | 68.6 | 15.6 | 12.5 | 53.2 |
| Egypt | 1 | 2 governorates | 23 | 76.0 | 34.0 | 24.0 | 70.0 | 16.8 | 45.0 | 54.0 |
| India | 2 | 2 states | 12.6 | 19.5 | 36.6 | 35.7 | 84.2 | 30.1 | 32.0 | 42.9 |
| Indonesia | 5 | 11 provinces | 27.5 | 81.1 | 46.0 | 14.3 | 97.5 | 13.9 | N/A | 34.2 |
| Iran (Islamic Rep. of) | 1 | 1 province | 51.0 | N/A | 74.0 | 68.0 | 43.0 | 29.2 | N/A | 57.0 |
| Jordan | 1 | national | 39.0 | N/A | 85.0 | 56.0 | 62.0 | 34.7 | N/A | 49.0 |
| Kenya | 6 | 6 districts | 18.2 | 30.0 | 80.0 | 16.0 | 71.4 | 11.4 | 31.5 | 41.8 |
| Korea (Rep. of) | 4 | 4 regions | 41.8 | 67.7 | 69.6 | 57.6 | 78.0 | 44.9 | 94.8 | 73.3 |
| Malaysia | 1 | 1 state | 37.5 | 12.1 | 46.6 | 88.4 | 67.0 | 59.2 | 35.2 | 32.9 |
| Mexico | 1 | 11 states | 17.1 | 60.0 | 63.2 | 29.9 | 59.8 | 17.9 | 12.5 | 53.2 |
| Mongolia | 1 | national | 22.2 | 48.6 | 64.9 | 54.6 | 79.5 | 43.4 | 53.6 | 63.2 |
| Morocco | 1 | national | 8.0 | 74.4 | 13.5 | 30.5 | 67.4 | 20.6 | 21.9 | 22.6 |
| Myanmar | 1 | 1 division | 16.7 | 5.9 | 19.3 | 11.9 | 79.2 | 9.4 | 19.3 | 67.5 |
| Nepal | 2 | 2 regions | 9.2 | 27.1 | 14.1 | 18.4 | 67.9 | 12.5 | 22.3 | 22.6 |
| Nigeria | 1 | 1 state | 1.5 | 66.0 | 79.8 | 21.9 | 72.3 | 15.8 | 19.2 | 75.1 |
| Pakistan | 5 | 6 districts | 31.3 | 77.4 | 32.0 | 29.4 | 74.4 | 21.9 | 40.4 | 74.2 |
| Philippines | 1 | 1 region | 17.0 | 50.0 | 24.9 | 31.2 | 66.3 | 20.7 | N/A | 40.2 |
| Sri Lanka | 1 | 1 municipality | 20.8 | 71.0 | 58.4 | 27.7 | 41.5 | 11.5 | 29.2 | 57.0 |
| Sudan | 1 | 1 province | 13.2 | 82.0 | 27.5 | 20.1 | 46.8 | 9.4 | 51.5 | 40.0 |
| Syria | 1 | national | 17.0 | 69.7 | 90.5 | 61.6 | N/A | N/A | N/A | 67.0 |
| Tanzania (U. Rep. of) | 2 | 6 regions | 36.9 | 49.6 | 77.5 | 12.5 | 78.2 | 9.8 | 26.7 | 25.4 |
| Tunisia | 1 | national | 8.2 | 58.3 | 21.8 | 35.9 | 45.0 | 16.2 | 54.0 | 30.3 |
| Uruguay | 1 | 4 departments | 56.0 | 60.0 | N/A | 29.8 | 47.9 | 14.3 | 33.3 | 42.0 |
| Vanuatu | 1 | 12 islands | 20.3 | N/A | 66.7 | 29.8 | 53.4 | 15.9 | 55.0 | 12.2 |
| Viet Nam | 4 | 4 provinces | 39.2 | 64.0 | 57.3 | 45.2 | 81.0 | 36.6 | 57.6 | 71.2 |
| Zambia | 1 | national | 24.1 | 26.2 | 89.6 | 29.5 | 67.6 | 19.9 | 25.0 | 26.5 |
| Minimum | | | 0.8 | 5.9 | 13.5 | 11.9 | 41.5 | 9.4 | 12.5 | 5.0 |
| Maximum | | | 56.0 | 82.0 | 90.5 | 88.4 | 97.5 | 59.2 | 94.8 | 75.1 |
| Median | | | 20.8 | 53.0 | 60.3 | 29.8 | 69.3 | 18.9 | 32.0 | 43.1 |

^a Median rates are reported if more than one survey was conducted in a country.

^b In past years this has been reported as the ORT use rate. However, the policy with respect to ORT now gives greater emphasis to increasing the amount of fluid with less emphasis to the type of fluid given. A definition of ORT requiring an increase in total fluid intake will be used from 1993. Note that ORS and/or RHF rates are not directly comparable between countries owing to differences in the definitions of a recommended home fluid.

^c This rate is not measured directly but is an estimate of the percentage of diarrhoea episodes that received increased fluid and continued feeding.

N/A = not available

CDD/ARI breastfeeding surveys in the Philippines, Sri Lanka and the United Republic of Tanzania

During 1992, the Programme began the development of the CDD/ARI household survey. This survey was field-tested at three sites, in Sri Lanka, the Philippines and Zanzibar (United Republic of Tanzania). Among the many rates which are obtainable from this survey are the following three WHO/UNICEF indicators:

- Proportion of mothers of children under 5 years who can state the three rules of home case management (increase fluid intake, continue feeding, and seek care when needed).
- Proportion of diarrhoea episodes receiving ORT (increased fluid) and continued feeding.
- Access to ORS, i.e., proportion of population with a regular supply of ORS available in their community.

The results for these indicators and their corresponding components are illustrated on the following page.

The majority of caretakers in all three countries know to increase fluid intake and to continue feeding during diarrhoea. However, fewer of them know the signs or symptoms indicating that a child with diarrhoea should be taken to a health worker. With respect to correct case management, it is also evident that there is some discrepancy between what mothers know and what they actually practise. This is particularly so in Sri Lanka where 78% of mothers know that children with diarrhoea should receive increased fluids, but only 37% gave increased fluids during their child's episode of diarrhoea. The discrepancy between knowledge and practice regarding feeding is much less marked.

With respect to the indicator on ORS access in the Philippines and Sri Lanka, the methodology considered the cluster population to have access to ORS if a regular provider of ORS was available within a reasonable distance. A "reasonable distance" was defined for each cluster based on interviews with key informants, and visits were made to interview potential providers. Rates using this definition were higher than those in the United Republic of Tanzania where access was defined as having a source of ORS within the cluster boundaries.

Assessing case management in health facilities

During 1992, health facility surveys were conducted in the following 12 countries: Burundi, China, Colombia, Congo, Dominican Republic, India, Malaysia, Mexico, Panama, Rwanda, Sudan and Turkey. The activities in 1992 bring the total number of surveys supported by the Programme to at least 21 in 20 countries since the methodology became available in 1990. The survey is designed to collect qualitative and quantitative information related to case management. In addition, the survey also provides information on four of the CDD Programme's 13 original key indicators. A summary of the available findings of surveys from 1990 to 1992 is found in Table 3. It should be noted that the results are not representative of the coun-

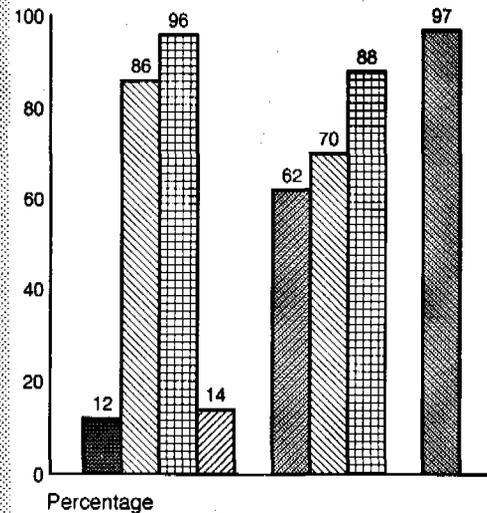
tries as a whole because the facilities surveyed were not randomly selected.

Another reason for the great variation in the results seen in Table 3 is because programmes are at different stages of development. The median rates based on observation of case management tend to be rather low for three of the four indicators. For the proportion of cases correctly assessed the rate is only 16%, although the majority of health workers asked about the duration of diarrhoea and presence of blood in the stool. The poor overall performance of health workers in assessing children with diarrhoea is explained by the low scores for asking about or examining for the required 8 out of 12 signs and symptoms listed on the diarrhoea treatment chart. The median rate for the proportion of diarrhoea cases correctly rehydrated is also low (18%). Incorrect selection of

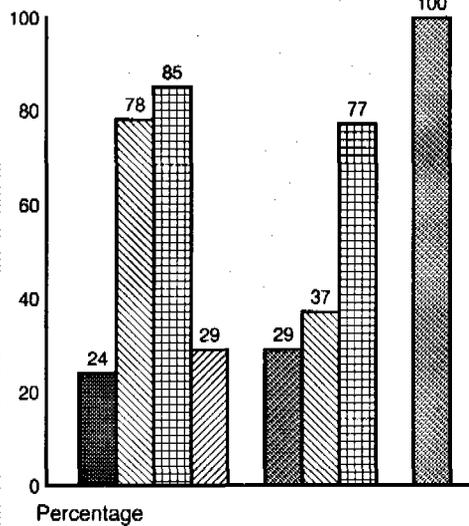
Results for WHO/UNICEF indicators, CDD/ARI survey

- Maternal knowledge
- ▨ Increased fluids
- ▩ Continued feeding
- ▧ Signs for careseeking
- ▦ ORT plus feeding
- ▤ Increased fluids
- ▣ Continued feeding
- ▢ ORS access

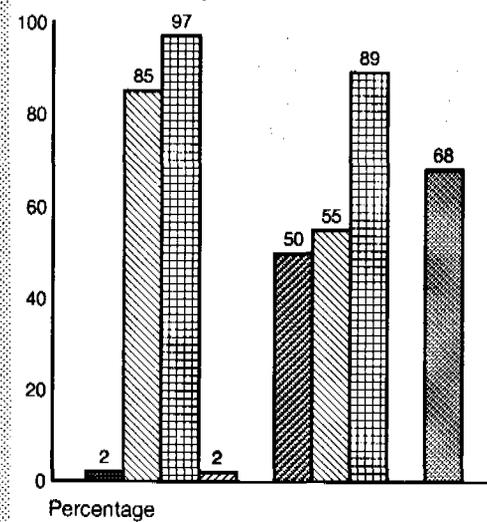
Philippines



Sri Lanka



United Republic of Tanzania



treatment plan and incorrect amounts of fluid ordered contributed equally to this overall low performance. Health workers often choose to send cases with some dehydration home rather than keep them in the facility for supervised rehydration. The poor results for the proportion of cases correctly advised are due in part to the very demanding criteria requiring that the health worker give correct advice not only on the treatment of the diarrhoea but also on its prevention; however, the results confirm that health workers' skills in advising mothers need to be improved. In general, dysentery management with appropriate antibiotics is better than other aspects of treatment.

In 1992, a review of the Programme's experience with the health facility survey was undertaken so as to revise and strengthen the manual and methodology. In addition, a revision was made to accommodate the new treatment chart introduced after 1990 and to measure a new programme indicator developed in conjunction with UNICEF. These changes were initiated in the last half of 1992, in collaboration with the International Health Program Office of the Centers for Disease Control (CDC), Atlanta, USA.

The WHO Regional Office for the Americas was particularly active in supporting health facility surveys in 1992. A survey in Panama was used to

Table 3

Indicator results from health facility surveys 1990-1992 ^{a, b}

| Country | Year of survey | Correctly assessed | Correctly rehydrated | Correctly advised | Correctly treated for dysentery |
|------------------------|----------------|--------------------|----------------------|-------------------|---------------------------------|
| Bangladesh | 1990 | 3 | 4 | 1 | 46 |
| Burkina Faso | 1990 | 4 | 8 | 0 | 0 |
| Viet Nam | 1990 | 73 | 84 | 46 | 83 |
| Ecuador | 1991 | 70 | 35 | 0 | 5 |
| Egypt | 1991 | 10 | 34 | 2 | 25 |
| Iran (Islamic Rep. of) | 1991 | 0 | N/A | 0 | 0 |
| Pakistan | 1991 | 16 | 18 | 6 | 62 |
| Tanzania (U. Rep. of) | 1991 | 7 | 10 | 6 | 62 |
| Uganda | 1991 | 5 | 8 | 0 | 67 |
| Viet Nam | 1991 | 52 | 55 | 18 | 54 |
| Burundi | 1992 | 2 | 13 | 3 | 45 |
| China | 1992 | 47 | 0 | 38 | 0 |
| Colombia | 1992 | 30 | 48 | 12 | 33 |
| Congo | 1992 | 8 | 15 | 4 | 33 |
| Dominican Republic | 1992 | 6 | 27 | 3 | 4 |
| Malaysia | 1992 | 33 | 37 | 12 | 20 |
| Mexico | 1992 | 39 | 37 | 11 | 33 |
| Panama | 1992 | 38 | 0 | 10 | 25 |
| Rwanda | 1992 | 16 | 74 | 11 | N/A |
| Turkey | 1992 | 24 | 0 | 3 | 50 |
| Minimum | | 0 | 0 | 0 | 0 |
| Maximum | | 73 | 84 | 46 | 83 |
| Median | | 16 | 18 | 5 | 33 |

^a Results given as percentage of diarrhoea cases under 5 years old whose case management in health facilities was observed.

^b Results are not directly comparable between countries owing to differences in sampling procedures.

N/A = not available

train national consultants from Guatemala, Honduras, Nicaragua, and Panama. Additional questions concerning the cost-effectiveness of case management were added to the health facility protocol and field-tested during the survey in Mexico. This addition of a cost component stemmed from the growing concern over the excessive costs of inappropriate care, particularly for cholera patients (i.e., unwarranted drugs, intravenous therapy and long hospital stays) and the perceived need to provide programme managers with quick estimates of costs of routine diarrhoea and cholera treatments. A report of the outcomes of this field-test is found in Box 10.

Measuring childhood mortality

The mortality reduction goals set at the start of the Programme, and reaffirmed at the World Summit for Children, committed the Programme to try to measure mortality reduction. It has continued in its efforts to develop and test a simple, reliable method to measure diarrhoea-specific mortality. In 1992, in collaboration with UNICEF and the London School of Hygiene and Tropical Medicine, a mortality survey in Viet Nam was conducted and analysed (see Box 11); surveys were conducted in Bangladesh and Indonesia (the results are still to be analysed). A mortality survey was

Box 10

Cholera cost analysis as part of the health facility survey: Mexico field-test

As a result of the CDD programme managers' meeting held in Santa Cruz, Bolivia in May 1992, the CDD Programme of the WHO Regional Office for the Americas (AMRO) and the PRITECH II Project developed a proposal to integrate a cost assessment component into the WHO/AMRO health facility survey protocol. With a grant from the Latin America Bureau of USAID, AMRO and PRITECH carried out a field-test of the modified health facility survey in Mexico. The principal aim of the field-test was to assess how well the inclusion of cost questions into the health facility survey instruments worked with regard to the data collection process. The general finding was that the instrument designed for assessing quality of care could be adapted to include a cost component, and although there were originally concerns about sampling issues, the field-test concluded that it was appropriate to use the same sampling approach and sample size which is considered sufficient for judging quality of treatment.

also undertaken in Bolivia in collaboration with the World Bank and UNICEF. These surveys have been used to look at the merits of simple verbal autopsies to identify diarrhoeal and ARI deaths and the validity of the preceding birth technique (PBT). This experience proved valuable to a WHO/UNICEF informal consultation on the measurement of overall and cause-specific mortality in infants and children, held in December 1992, and supported by the CDR Division. Although the recommendations of this meeting still have to be finalized, the preliminary conclusions are that current survey methodologies for measuring patterns of cause-specific mortality are not adequate for demonstrating mortality reductions, at least not on a routine basis. Countries and individual programmes cannot be expected to measure such changes, except through expensive special studies or high quality mortality surveillance systems, which only a few countries can currently afford.

Considering the outcome of this consultation and the Programme's concern with the cost-effectiveness of such surveys, less emphasis will be placed on mortality surveys in the future, although the Programme will continue to seek ways to estimate the number of diarrhoea deaths and trends in diarrhoeal mortality.

Programme reviews

In 1991-1992, the Programme developed a new review method, the focused programme review (FPR). This is a more data-based, problem-specific and action-oriented process than the comprehensive programme review (CPR) which had been used by national CDD programmes previously.

It is essential for an FPR, that there is a pre-existing plan of operation specifying previous activities. An FPR also requires data collected through

household case management and health facility surveys and through prior programme monitoring activities.

The review is a two-phase process: Phase 1 lasts one week, during which an examination of existing information is made to determine progress towards targets and subtargets. The status of implementation of activities, as outlined in the plan of operation, is assessed. In this way, the programme's achievements and constraints are identified. Phase 1 is normally carried out by a small team (6-8 people) of national programme staff with the coordination of an experienced facilitator.

In Phase 2 (two weeks) the review team focuses on a few priority issues identified in phase 1 - hence focused programme review. The objective of Phase 2 is to analyse these issues, to identify their causes, and to develop specific and feasible solutions. These solutions are activities which are integrated into the overall workplan of the national programme, when appropriate. In this phase the review team (12-15 people) of programme staff, and local and external resource people, uses simple qualitative assessment methods to collect specific additional information that may help to better understand and solve the problems being addressed.

The FPR was field-tested in Bangladesh in 1991 (see Eighth Programme Report 1990-1991¹¹) and then successfully conducted in nine countries during 1992: Cameroon (see Box 12), Egypt, Ethiopia (Box 12), Kenya, Morocco, Niger, Pakistan, Sri Lanka (Box 12) and Viet Nam. All of these reviews were conducted with the participation of national programme staff, representatives of WHO and UNICEF, or bilateral and nongovernmental

¹¹ Document WHO/CDD/92.38.

Mortality survey in Viet Nam

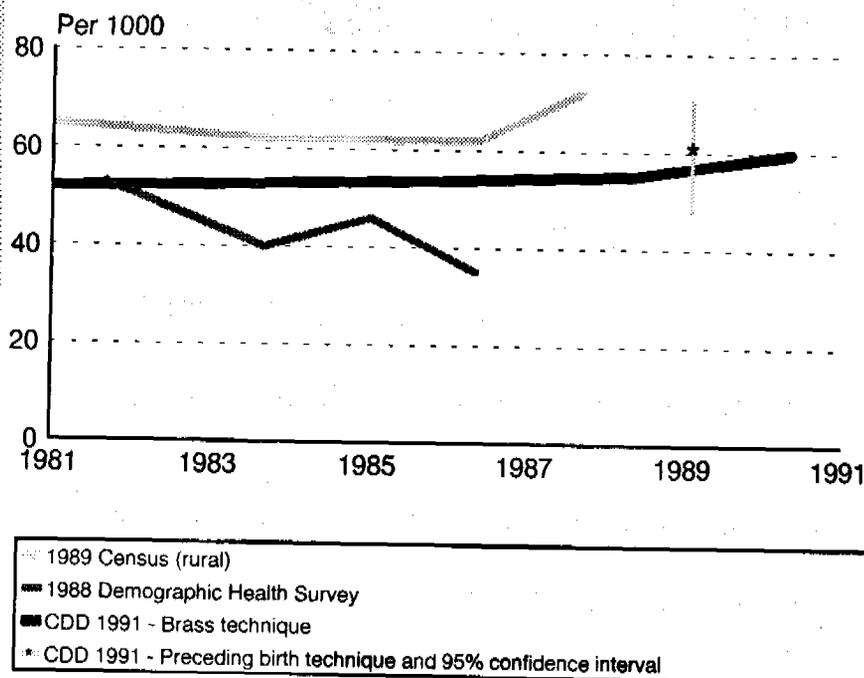
A joint Government, UNICEF and WHO household mortality survey was conducted in the province of Yen Bai, northern Viet Nam, from October 1991 to January 1992. The intention of the survey was to provide baseline data on mortality of children under 5 years and on diarrhoea-related deaths, prior to the expansion of the CDD Programme to the province.

The methodology used was indirect estimation of mortality by the Brass and preceding birth techniques. Additional questions were directed towards determining the proportion of deaths that were diarrhoea related.

A total of 10 195 households were identified through cluster sampling by probability proportionate to population. This yielded 12 998 women between the ages of 15 and 49 years. The conclusions of the survey were that the most recent estimate of mortality of children under 5 years is 58 per 1000 (95% confidence interval = 47-69 per 1000). The date of this estimate was centred around two-and-a-half years before the survey. The estimate for infant mortality was 41 per 1000. Mortality of children under 5 years in Yen Bai did not appear to have changed markedly over the period 1977 to mid-1989, the period to which the most recent estimate referred. The results of the CDD survey were consistent with results from other sources, including a census in 1989 and a demographic health survey (DHS) in 1988. (See the figure below).

The percentage of all deaths that were diarrhoea related among children under 5 years was 19%. This figure was based on deaths in the two years before the survey for which the mother reported the existence of diarrhoea in the week before death. As the level of mortality in Viet Nam is low overall the number of diarrhoea deaths identified was quite small and confidence intervals are correspondingly wide. The resulting estimate of diarrhoea-related mortality in children under 5 years was 11 per 1 000 (95% confidence interval = 6-18 per 1000).

Comparison of under-5 mortality estimates from different sources, Viet Nam



Box 12

Focused programme reviews

Cameroon

A two-phase focused review of the CDD programme in Cameroon was carried out from May to July 1992 by the Ministry of Health, in collaboration with WHO, PRITECH and UNICEF.

In Phase 1, the review team identified major programme achievements of the previous five years, such as the formulation of a national CDD policy and a plan of operation, the training of some 25% of medical doctors and 20% of nurses in diarrhoea case management, the development and distribution of educational materials for caretakers of children with diarrhoea, the successful implementation of various evaluation activities, the adoption of a national breastfeeding policy, and ongoing efforts to enhance intersectoral collaboration with other departments and ministries dealing with CDD-related issues. Five areas were identified as requiring improvement: programme management; supervision; ORS production and distribution; rational use of drugs; and information-education-communication (IEC). These were analysed during Phase 2 with additional relevant information collected, as necessary, through interviews with key informants and site visits to health facilities.

Among the team's proposals, particular emphasis was placed on: strengthening existing collaboration with provincial authorities to develop comprehensive, integrated, decentralized CDD action plans based on needs identified at the district level; clear definitions of responsibilities related to CDD activities at all levels; the adoption of a standardized integrated checklist for supervisory visits; training of staff with supervisory responsibilities in required skills; activities to improve the distribution and monitoring of ORS; emphasis on the rational use of drugs in all training activities; regulatory measures to control the availability of antidiarrhoeal drugs; and more effective distribution of existing IEC materials.

These activities were integrated into a plan of operation for 1992-1997 together with revised programme targets, subtargets and strategies.

Ethiopia

An FPR of the national CDD programme in Ethiopia was carried out by the Ministry of Health in October 1992, with the participation of experts on planning and programming, training and drug procurement and representatives from WHO and UNICEF.

During the first phase, data from household surveys, knowledge-attitude-practices (KAP) studies and other programme documents were analysed and the following priority areas identified: programme planning, administration and funding; communications strategies, activities and materials; teaching in nursing and health assistant schools; and ORS production, procurement and distribution.

Among the major achievements of the national programme were the adoption of its policy, objectives and operational plans; the assignment of additional staff; the establishment of national and regional diarrhoea training units; household surveys carried out in all regions up to 1989; operational research on breastfeeding; and the translation of training materials, the treatment chart and guidelines.

In Phase 2 the team identified constraints to programme progress in relation to the four priority areas under review, including possible reasons for the low priority given to CDD, and factors related to ORS availability, pricing and demand. Weaknesses in teaching methodologies and content were assessed by one team, and problems concerning different target groups, channels and sources of information were reviewed by the communications team.

The review led to a revised plan of action, and modified targets. Some of the main recommendations of the FPR were:

- better incorporation of CDD within the organizational structure of the Ministry of Health;
- a revised policy on ORS importation and pricing;
- regional CDD programme management skills courses followed by development of regional and district plans;
- evaluation of the ongoing decentralized integrated training courses;
- research to better define home case management according to different ethnic beliefs and practices;
- development of a new communications strategy;
- improving the teaching on diarrhoeal diseases in curricula with emphasis on advising mothers on home case management.

Sri Lanka

The national CDD programme of Sri Lanka conducted an FPR in 1992. In May, progress towards national objectives and targets was reviewed. Major achievements included: the reduction in the diarrhoeal case fatality rate in major hospitals; the translation of the case management chart into local languages; the efficient distribution network for Jeevaneer (ORS); the extensive knowledge of ORS among health workers and the population generally; wide use of home fluids; and measles vaccination coverage of 82%.

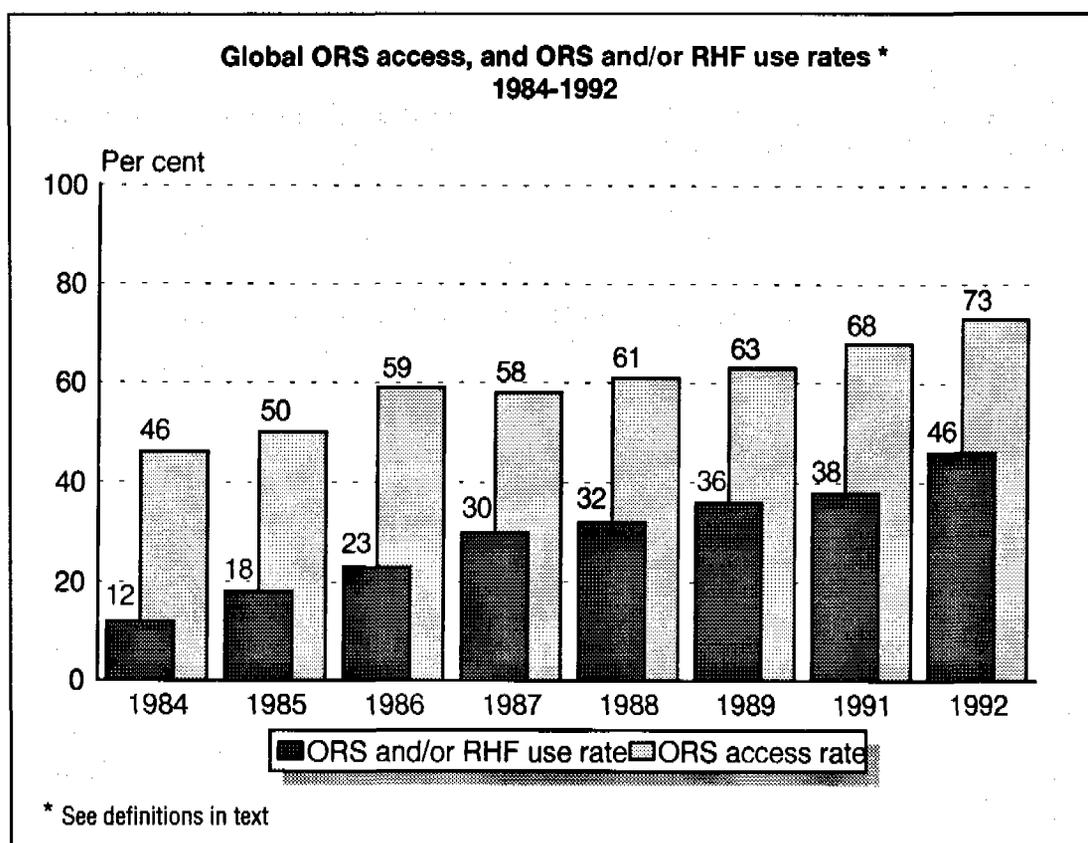
The team selected five issues for the review: prevention of diarrhoea, with special emphasis on breastfeeding, and on water and sanitation; training and follow-up supervision of health workers at the peripheral level; quality of case management; inappropriate use of drugs, mainly antibiotics; and the lack of functioning diarrhoea training units (DTUs).

In June, five teams comprising national, UNICEF and WHO staff, analysed the factors that had contributed to limited progress in these five areas. Given the scarce information available on case management in the community and preventive practices, the team suggested a household survey. The survey was completed in December 1992, and the results will now be used by the programme to plan interventions, such as expanding exclusive breastfeeding practices, training medical staff in government facilities and general practitioners to discourage the inappropriate use of drugs, and promote correct preparation and advice on ORS.

Seven hospitals were visited as prospective sites for DTUs. The staff in these hospitals were found to be well motivated, but physical facilities in some hospitals were inadequate for the establishment of DTUs. Three hospitals where the conditions were most favourable were chosen as sites for DTUs. In Colombo, action has already been taken to transform the existing ORT centre into a DTU, and the other two hospitals will soon follow. The staff of the three DTUs will be trained in 1993.

The targets for 1995 were revised during the year, and a workplan was developed for the implementation and monitoring of feasible solutions to programme constraints. The implementation of those interventions will continue during 1993 and 1994 to achieve the targeted 25% diarrhoea mortality reduction by 1995.

Figure 3



organizations. The reviews produce detailed work-plans for the forthcoming planning period and specify the activities necessary to overcome the constraints to programme implementation.

In addition to nine focused programme reviews, seven other countries conducted either comprehensive or desk reviews in 1992: Burkina Faso, two provinces in China, Ghana, Lebanon, Liberia, Samoa and Yemen. Aspects of the CDD Programme were also reviewed during a Primary Health Care Review in Swaziland in 1992.

ORS access, and ORS and/or RHF use rates¹²

The estimated ORS access, and ORS and/or RHF use rates for developing countries, by WHO region and globally, are presented in Figure 3 and Table 4. Country-specific data are given in Annex 1.

The global estimates for these rates are based primarily on figures reported by national CDD programmes to the WHO regional offices using CDD Country Programme Profiles, and on estimates made by the regional offices. In 1992, 74 countries completed Country Programme Profiles and regional offices provided estimates for an additional 16 countries. For the remaining 30 countries estimates were made using other reliable sources such as programme documents or survey results, or in the absence of any new information the estimates for 1991 were used.

At the end of 1992 the global ORS access rate was estimated to be 73%, a 5% increase since the end of the 1990-1991 biennium. The major contributor to this global increase was the South-East Asian Region with India reporting an increase in ORS access from 60% to 77%. Given the size of the population of India, this resulted in a significant increase in both the regional and the global estimates. However, all other regions also reported small increases in

¹² The terms used in this section are defined as follows:

ORS access rate: The proportion of population with a regular supply of ORS in their community. The previous WHO definition required that the ORS provider be trained in the use of ORS but few countries applied this definition.

ORS and/or RHF use rate: The percentage of diarrhoea episodes in children under 5 years of age that received ORS and/or a recommended home fluid. In past years this has been reported as the ORT use rate. However, the Programme now gives greater emphasis to increasing the amount of fluid a child receives with less emphasis on the type of fluid. A definition of ORT requiring an increase in total fluid intake will be used from 1993.

Table 4

Estimated ORS access, and ORS and/or RHF use rates in children aged 0-4 years, 1983-1992, by WHO Region and globally

| Region | ORS access rate | | | | | | ORS and/or RHF use rate | | | | | |
|------------------------------|-----------------|------|------|------|------|------|-------------------------|------|------|------|------|------|
| | 1983 | 1985 | 1987 | 1989 | 1991 | 1992 | 1984 | 1985 | 1987 | 1989 | 1991 | 1992 |
| Africa | 5 | 22 | 38 | 52 | 57 | 59 | 4 | 8 | 19 | 36 | 40 | 54 |
| Americas | 9 | 44 | 62 | 68 | 68 | 70 | 12 | 10 | 39 | 48 | 54 | 56 |
| Eastern Mediterranean | 30 | 54 | 69 | 70 | 75 | 77 | 21 | 22 | 40 | 47 | 40 | 38 |
| South-East Asia | 43 | 69 | 64 | 64 | 68 | 79 | 14 | 25 | 29 | 19 | 20 | 35 |
| Western Pacific ^a | 29 | 45 | 57 | 69 | 82 | 84 | 27 | 32 | 34 | 39 | 34 | 33 |
| Global ^a | 24 | 50 | 58 | 63 | 68 | 73 | 12 | 18 | 30 | 36 | 38 | 46 |

^a Developing countries. Excluding China.

the ORS access rate and by the end of 1992 all regions had access rates of over 70% except for the African Region which continues to have the lowest rate at 59%. Twenty countries reported increases in ORS access rates.

In 1992 the global ORS and/or RHF rate was estimated to be 46%. This is an increase of 8% over the rate in 1991 and can be attributed to increases in two regions: the South-East Asian and the African Regions. In the South-East Asian Region the ORS and/or RHF rate almost doubled from 20% at the end of 1991 to 35%, a result almost entirely due to the increase in use of RHF's in India, although there were also reported increases in Bhutan and Thailand. In the African Region the ORS and/or RHF rate also increased significantly over the year from 40% to 54%, a reflection of substantial increases in two countries with large populations (Nigeria and Ethiopia) which revised their policy on home fluids to include a greater variety of fluids, thereby resulting in higher RHF rates. Following the trend for recent years, the ORS and/or RHF rate in the Region of the Americas increased modestly from 54% to 56%. The rate in the Western Pacific Region remained stable at 33%. The Eastern Mediterranean Region decreased slightly after taking into consideration the results of CDD household surveys conducted in 1992 in Egypt, Sudan and Tunisia. In all three countries the survey findings indicated that ORS use rates were much lower than had been previously reported.

Progress towards global programme targets

Since the UNICEF and WHO meeting of April 1991, when it was agreed to develop a joint strategy for CDD, including monitoring and evaluation,

the Programme has continued to work closely with UNICEF to refine the definitions and methods of measuring the four key indicators which were agreed at that time. This has required revisions, which will be finalized in 1993, in the two key evaluation tools, the household and health facility surveys, and the preliminary development of monitoring indicators and tools.

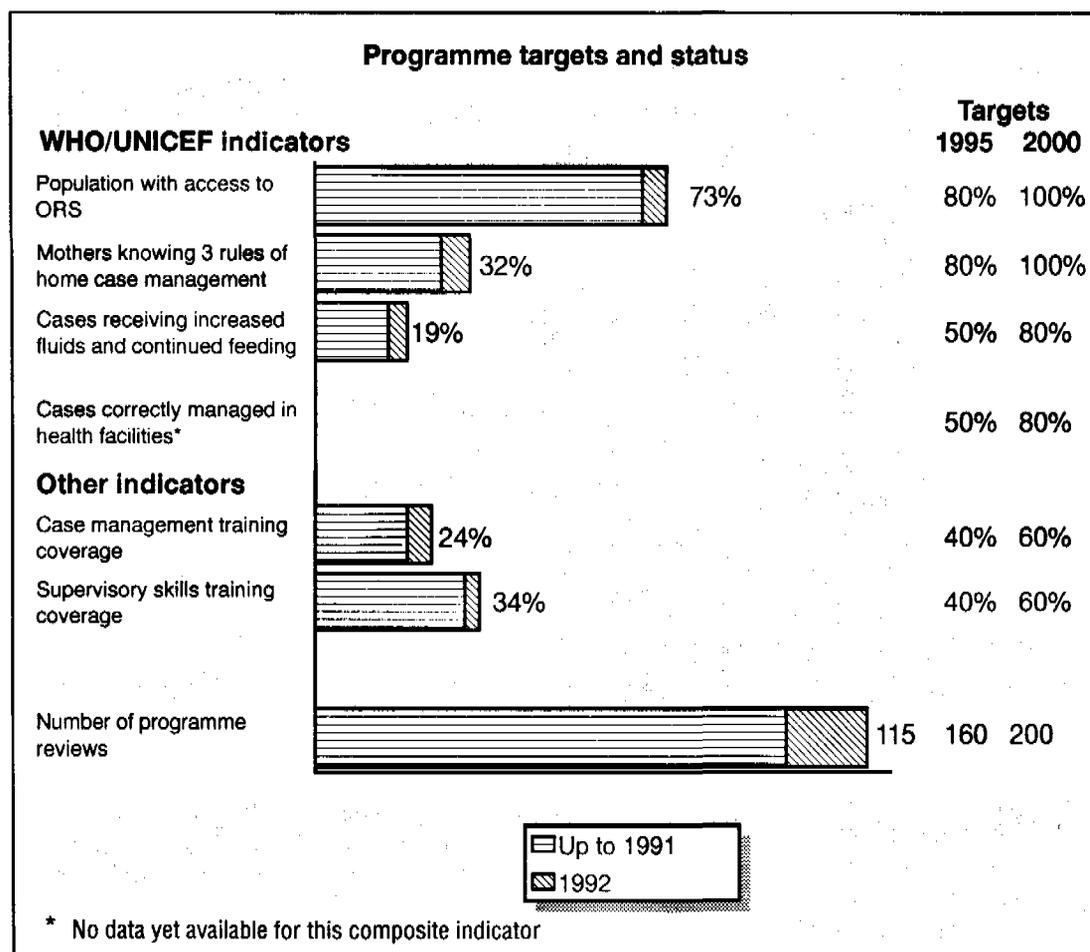
The Programme has also participated closely with other divisions of WHO and UNICEF in their efforts to develop a set of standard indicators which countries can use to assess their progress towards the goals of Health for All and those set at the World Summit for Children in 1990.

During the 1980s, the Programme emphasized ORS access, ORT use rates, and training coverage as the Programme's main indicators in progress. While continuing to measure these rates, and monitoring training coverage, the Programme will progressively shift the accent in the 1990s to monitoring progress towards targets set for the WHO/UNICEF indicators (see Figure 4). The Programme believes that if the targets for these four indicators can be achieved, the mortality reduction goals set by the World Summit for Children can be reached.

For the end of 1991 and 1992, the status of the indicators and the Programme targets for 1995 and year 2000 is shown in Figure 4.

The ORS access rate has steadily risen from 50% in the mid-1980s to 73% in 1992. However, it should be noted that these access figures are those reported by countries or estimates made by regional offices for countries based on records. These reported ORS access rates, high in relation to training coverage, suggest that most national programmes are reporting the proportion of the population with

Figure 4



physical access to ORS without necessarily considering whether access is provided through a trained provider (a criterion in the 1980s' definition of ORS access). The definition of the WHO/UNICEF indicator on ORS access does not include the training of the provider of ORS, but refers only to physical access in the community, as measured through a survey. With this change in definition and approach to measurement, the targets have also changed, and are now 80% and 100% by 1995 and the year 2000, respectively.

Because the surveys for measuring the remaining WHO/UNICEF indicators are under revision, the 1991 and 1992 estimates for these indicators are extrapolated from results using the current household and health facility surveys.

For 1992, the proportion of mothers knowing the three rules for case management in the home is estimated to be 32%; the proportion of diarrhoea cases receiving increased fluid intake and continued feeding is estimated to be 19%. Consequently, achievement of the 1995 and year 2000 targets (see Figure 4) will require a significant increase in activities to promote correct case management in the home.

The Programme's survey instrument for evaluating case management in health facilities is being revised in order to measure the composite indicator "the proportion of diarrhoea cases managed correctly in health facilities", and measurement of this indicator will begin in 1993. However, if the target is to be reached, national programmes must continue to improve case management in health facilities by improving the quality of training and supervisory activities, and by ensuring adequate stocks of ORS, antibiotics and other necessary supplies and equipment.

The ongoing emphasis on training activities is reflected in the increases in training coverage from 31% in 1991 to 34% of health staff with supervisory skills responsibilities, and from 19% in 1991 to 24% of health workers responsible for case management (see Figure 4). However, even though the reported rates show that the Programme is progressing towards the targets for supervisory skills and case management training, the Programme will need to continue to strengthen its efforts, particularly if the high turnover rates of health workers are taken into consideration.

Breastfeeding counselling: a training course

Box 13

It is recognized that health workers' support and counselling to lactating mothers can significantly influence breastfeeding practices. To address the need for training materials targeted at health workers who deal with mothers and children, the programme initiated the development of a training package in 1991. An external consultant was recruited for this purpose. The package - field-tested in January 1993 - and called *Breastfeeding counselling: A training course*, is aimed at midwives, MCH and community health nurses, and doctors in contact with pregnant and lactating women.

The training course is divided into two parts: five days' training for four to five facilitators under the direct supervision of a course director; then five days' training for 15 to 20 participants. The course includes lectures, class-work and demonstrations, with an emphasis on clinical practice. It is envisaged that through such courses a core group can be trained as future trainers, and a group of health workers trained in lactation counselling. The training course also provides a basic tool to fulfil the training requirements of the Baby Friendly Hospital Initiative.

A first pretest of the course was carried out in the Philippines in 1991, and a second pretest in Jamaica in 1992. Following these positive experiences, the Programme conducted a thorough internal review of the course materials in August 1992. Changes to the structure of the course were made; the final field-test is to be held in Bangladesh in February 1993. It is anticipated that the course will be available in English thereafter. Initially, support for training courses will be given by the Programme to selected countries. Translation of the course materials into French, Spanish and Portuguese is planned for 1993.

The Programme continues to carry out an average of 10 programme reviews per year (see section Programme reviews) and thus a target of 200 reviews by the year 2000 remains appropriate.

Overall, the Programme continues to believe that the targets presented in Figure 4 are achievable. However, they will only be reached through continued commitment in those countries with effective CDD programmes and renewed commitment where programmes are not yet adequate. This will require increased financial input at both national and international level. The Programme feels confident that the alliance of WHO and UNICEF in supporting countries to achieve the four key programme indicators will result in an acceleration of global progress.

Protection, promotion and support of breastfeeding

Among interventions for the prevention of diarrhoea, the promotion of breastfeeding continues to be given special emphasis. There is now conclusive evidence that breastfeeding confers significant protection against illness and death associated with diarrhoea, and minimizes its adverse nutritional effects. The present recommendations are

exclusive breastfeeding for the first 4-6 months of life, and continued breastfeeding up to the age of 2 years or beyond in addition to adequate complementary foods.

In concerted global efforts to protect, promote and support breastfeeding, the health care system has a special role. It has been shown that a coherent approach to breastfeeding by health workers has a major impact on the initiation and sustaining of breastfeeding. In view of this, the development of a training package on lactation management for health workers was started by the Programme in 1991. It was completed in 1992 for field-testing early in 1993 (see Box 13).

Visits to several countries were made by Programme staff and consultants to assist in the planning and implementation of activities related to breastfeeding (see Box 14).

As part of the programme's cooperation with the WHO/UNICEF Baby Friendly Hospital Initiative, the staff member responsible for breastfeeding activities attended the training of trainers meeting for master trainers/assessors in February at Wellstart, San Diego, USA. The meeting included a review of the use of the hospital assessment documents and modification of training materials for hospitals wishing to become "Baby Friendly".

Box 14

Support for breastfeeding promotion in selected countries

■ **Bolivia**

A presentation on the breastfeeding counselling training package under preparation by the Programme was given at a regional CDD programme managers' meeting held in June 1992 in Santa Cruz, and elicited many expressions of interest in, and need for, training of this kind. The meeting also provided an opportunity to discuss breastfeeding activities in Bolivia.

■ **Brazil**

Visits were made to evaluate the Lactation Training Centre (LTC) at Santos, established with support from the Programme, and to strengthen other activities of the breastfeeding programme. Frequent training courses on lactation management are provided by the LTC for health workers from different parts of Brazil and from different backgrounds. The national authorities consider the LTC as a model for the possible establishment of two other LTCs in the north-east of the country.

At the 20th International Congress of Pediatrics held in Rio de Janeiro in September 1992, a Programme consultant coordinated a symposium on breastfeeding.

■ **Colombia**

A staff member visited Bogota to review breastfeeding programme activities, particularly in relation to the UNICEF/WHO Baby Friendly Hospital Initiative, and to identify areas for possible collaboration. During the visit a draft of the national code of marketing of breastmilk substitutes and communications activities related to breastfeeding promotion were reviewed. In addition, a review of the manual on breastfeeding for health workers was completed.

■ **Islamic Republic of Iran**

Following a Programme-sponsored visit by a WHO legal adviser in 1991 to assist in national adaptation and implementation of the International Code of Marketing of Breastmilk Substitutes, a request for assistance with lactation training was received in 1992. This activity is planned to take place early in 1993.

■ **Philippines**

Lactation training courses are conducted regularly at the José Fabella Memorial Hospital, Manila, which serves as a regional training centre for the Western Pacific Region (WPRO). Support is given by the Programme to selected participants from the region. An intensified effort to promote exclusive breastfeeding and implement the Baby Friendly Hospital Initiative is ongoing as an integral part of MCH activities, with assistance from the CDD programme.

■ **United Republic of Tanzania**

In February 1992 Programme staff participated in the development of the training component of national efforts to promote breastfeeding. A proposal for a five-year programme on infant and young child nutrition, especially breastfeeding and weaning, was reviewed and revisions suggested. The establishment of an LTC at Muhimbili Medical Centre was discussed, as well as the development of a national code of marketing of breastmilk substitutes. Support for these activities was provided in collaboration with the WHO Nutrition programme.

■ **Viet Nam**

In September 1992, a joint visit was made by a CDD consultant and a WHO legal adviser. A draft of a national code of marketing of breastmilk substitutes was prepared and activities related to implementation of the code were discussed. The visit also included participation in a workshop on the same theme, held with financial support from the Programme. Assistance was also given to developing a training plan on breastfeeding for health workers.

Given that multisectoral action is needed to improve breastfeeding practices, collaboration among the programmes and agencies involved is crucial. Within WHO, the Director-General has established the Working Group on Infant Feeding under the Task Force on Nutrition to ensure coordination among the various WHO programmes that play a key role in promoting adequate nutrition among young children. The recently launched newsletter *Facts about infant feeding* (produced in English, French and Spanish) is a new medium through which the working group will convey the results of its collaborative activities to both the international health community and the general public. In 1992, the Programme prepared the first issue of *Facts* on the subject of "Breastfeeding and the use of water and teas". The topic of the second issue was "Breastfeeding and child-spacing". At least four newsletters per year are envisaged, with production coordinated by the Programme.

As a follow-up to the informal interagency meeting held in June 1991 in which a set of indicators for breastfeeding practices at household level was formulated, a second informal, interagency meeting (involving UNICEF, USAID, the Swedish International Development Authority [SIDA] and WHO) was convened in June 1992 to reach a consensus on proposed indicators for breastfeeding-related practices in health facilities. An instrument to measure these indicators needs to be developed and subsequently field-tested by the international agencies concerned.

Cholera control

During 1992, the CDD Programme continued to coordinate the work of the Global Task Force on Cholera Control, a group formed by the Director-General in January 1991 in response to the spread of the current pandemic to Latin America and the resurgence of cholera in Africa. In addition to the coordinator and several other members of the CDD Programme staff, the Task Force consists of representatives from the Community Water Supply and Sanitation unit (CWS), the Food Safety programme (FOS), the Strengthening of Epidemiological and Statistical Services unit (SES), the Office of Information (INF), the Microbiology and Immunology Support Services unit (MIM), the Office of External Coordination (ECO), the Division of Health Education (HED), the Division of Emergency Relief Operations (ERO), and the Action Programme on Essential Drugs (DAP). A staff member from UNICEF regularly contributes to the work of the Task Force.

The objectives of the Task Force are to reduce mortality and morbidity associated with cholera,

and to reduce the social and economic consequences of cholera. Efforts to achieve these objectives fall within six principal components of the Task Force's plan of action:

- intensify cooperation in national cholera control activities;
- enhance information exchange;
- review and revise policy;
- intensify research efforts;
- mobilise financial resources;
- activate a global technical resource network.

Although cholera is one of the most studied and best understood of the diarrhoeal diseases, efforts to control its occurrence and to minimize its impact are frequently complicated by the persistence of outdated beliefs and practices. One of the roles of the Task Force is to demystify cholera by providing rational advice to Member States on how to develop and implement cholera control activities.

Notable achievements in this regard during 1992 include the development and wide distribution of a number of important policy documents including the following:

*WHO guidance on formulation of national policy on the control of cholera*¹³

*Guidelines for cholera control*¹⁴

*Management of the patient with cholera*¹⁵

Because of the tendency of some countries to restrict unnecessarily the importation of food products from countries which report cholera cases in accordance with the International Health Regulations, the Director-General circulated a *note verbale, Cholera and international trade in food*¹⁶ to all Member States and Associate Members of WHO. Improved surveillance of cholera has been promoted and the level of reporting has increased considerably. Reported cases and deaths are published weekly and a regular update in graphic form tracing the development and course of the current pandemic is issued periodically.

Other documents, leaflets and information sheets have also been prepared for both professional and

¹³ Document CDD/SER/92.16 Rev.1.

¹⁴ Document CDD/SER/80.4 Rev.4 (1992).

¹⁵ Document WHO/CDD/SER/91.15 Rev.1 (1992).

¹⁶ C.L.17.1992.

Box 15

Cholera control in Zambia

Zambia was one of the countries affected by cholera during 1992, having officially reported more than 11 000 cases and approximately 1200 deaths. As is frequently the case, outbreaks of cholera had a substantial impact beyond the health sector.

The Ministry of Health adopted a comprehensive approach to the control of epidemic cholera, with the assistance of the national CDD programme and national, bilateral and international agencies. The WHO CDD Medical Officer (Associate Professional Officer) is a member of the National Cholera Surveillance Committee, and assisted in the organization of cholera control activities.

Most notably, three training workshops for district health staff in areas with (or at-risk for) cholera epidemics were organized. Instruction in planning and budgeting resulted in the development of district plans for the prevention, early detection, and response to the occurrence of cholera. These plans were finalized at the end of the year and will be presented to a meeting of the local donor community to solicit support for their implementation.

The Ministry of Health, with the assistance of the NCDDP, also developed emergency supply kits to be distributed to cholera-affected areas, and developed guidelines for health workers on cholera case management. To ensure high quality management of cholera outbreaks, the establishment of a Rapid Response Group was initiated, whose duties included the monitoring and supervision of cholera treatment centres in epidemic areas.

Finally, the Ministry of Health of Zambia played a role in the development of rational cholera reporting and management procedures in the Southern African subregion, and experience has been shared with other countries; the United Republic of Tanzania and Uganda planned stronger and more coordinated responses to outbreaks of cholera with the technical support of the Programme.

lay audiences. These include *Cholera - basic facts for travellers*, and *Cholera vaccine - update*.

Furthering the process of dissemination of sound information as widely as possible, ministers of health from both South America and Africa have issued regional declarations recognizing that cholera is a shared problem which does not respect national boundaries. In addition, most have designated national cholera control commissions which have prepared plans for preparedness and response for actual or potential cholera outbreaks (see Box 15). These plans call for coordinated activities to strengthen the capabilities of countries in case management, surveillance, outbreak investigation and control, food safety, health education, and long-term prevention including improved water supply and sanitation.

Resources have been allocated from the WHO Director-General's development fund for hiring a medical officer to continue the coordination of WHO's cholera control efforts. Limited extrabudgetary funds have also been identified and plans

for 1993 include workshops for improving epidemic preparedness at the district level in several regions, the promotion of research into the preventive aspects of cholera control, the production of two films intended to improve public knowledge regarding cholera, as well as continued support to countries facing serious cholera control problems.

In the Region of the Americas, significant efforts have been made to raise and use public awareness of cholera to promote messages on hygiene and sanitation (see Box 16).

One of the underlying principles of the Task Force is that the best way to control cholera is to have the strongest possible national CDD Programme. During 1993, ways of further incorporating cholera control activities into national programmes will be explored. Similarly, long-term prevention of cholera can only be achieved by major improvements in water supply and sanitation programmes, and well-applied food safety measures.

Communication for cholera control in Latin America

In response to the introduction of cholera into the Americas in 1991, the Office of Information and Public Affairs of the WHO Regional Office for the Americas, with technical assistance from the Regional CDD Programme and with funding provided by the Netherlands, is implementing a two-year Cholera Communication Project. Under the auspices of this project, activities are being conducted in 10 Latin American countries. Eight of these are briefly described below:

Belize: "Social Communication for Cholera Prevention and Control"

Target population:

Refugees; remote Mayan communities; south-western border communities.

Aim:

Design, implement, and evaluate a cholera prevention communications strategy for areas isolated by language barriers, remoteness, and poor infrastructure.

Activities:

Mass media, audiovisual and print material, and public events to promote cholera awareness.

Guatemala: "Comunicación Social sobre el Cólera a Nivel Local"

Target population:

At-risk groups in both rural and urban areas.

Aim:

Reduce the incidence of all diarrhoeal diseases, including cholera.

Activities:

Training of health promoters, production of communications material, street theatre.

Ecuador: "Proyecto de Educación Sanitaria para el Control y Prevención del Cólera"

Target population:

80,000 indigenous people.

Aim:

Reduce the incidence of all diarrhoeal diseases, including cholera.

Activities:

Bring about a closer relationship between the health teams of local Catholic churches and the communities.

Peru: "Proyecto de Comunicación Social para la Prevención del Cólera"

Target population:

High-risk individuals and groups in and around Lima.

Aim:

Ensure regular health coverage by Peruvian mass media

Activities:

Courses for journalists; weekly newspaper supplements; distribution of educational materials to teachers.

Peru: "Proyecto Educativo sobre Programación y Difusión"

Target population:

Indigenous communities, native tribes and mestizo groups in Iquitos and Yurimaguas.

Aim:

Broadcast educational programs to the poorest sections of the Amazon.

Activities:

Distribution of graphic material for use in conjunction with radio programmes.

Nicaragua: "Radio Revista -- Amigos de la Salud"

Target population:

Nationwide.

Aim:

Creation of a national radio programme dedicated to health matters.

Activities:

Cholera will be a subject of a radio news magazine.

Honduras: "Red de Informadores sobre el Cólera"

Target population:

400,000 people in the two southern departments.

Aim:

Training of teachers, mayors, radio announcers, local NGOs, and water committee members.

Activities:

Instruction in general hygiene and cholera prevention.

Colombia: "Hablemos sobre el Cólera"

Target population:

Inhabitants of 11 coastal departments.

Aim:

To develop a coordinated, integrated communication strategy.

Activities:

Training of health workers, use of media, community empowerment.

Suriname: "Social Communications for the Prevention and Control of Cholera"

Target population:

Riverside villages, a rural district, a squatter slum near the capital.

Aim:

Involve community leaders, teachers, and trainers in cholera preparedness.

Activities:

Development of a health education kit, and locally prepared printed and audio-visual materials.

Venezuela: "Los Medios Masivos y la Comunicación Alternativa Participativa"

Target population:

Residents of 11 coastal departments.

Aim:

Implement a coordinated, integrated communication strategy.

Activities:

Training of health workers, use of mass media for education, community empowerment.

Collaboration with other international and bilateral agencies

In 1992, the Programme continued its close collaboration with UNICEF. At global level, Programme staff participated in a meeting with UNICEF representatives from the largest developing countries in New York. The main objective of this collabora-

tive effort is to find ways of accelerating country activities, within the context of primary health care, to achieve the goals of the Programme and the World Summit for Children. UNICEF and WHO have agreed on indicators to evaluate progress, and are now developing a set of monitoring indicators to strengthen the ongoing, regular supervision of programme activities. UNICEF continues to be an important partner at country level, in particular in support of communications

activities, in increasing the availability of ORS, by participating in focused programme reviews and other evaluation activities, and, importantly, in its increasingly active support for case management training. Interagency coordination committees, including bilateral agencies such as USAID, and WHO and UNICEF, play an important role in the American Region and in many countries in other regions. In Bangladesh, the World Bank is supporting an increasingly active national CDD programme. A full-time CDD medical officer ensures constant WHO technical input.

At global and national levels, the Programme has continued its collaboration with several technical projects funded by USAID. A collaborative effort to evaluate case management training was carried out with PRITECH and the Quality Assurance Project, and the Programme is working with HEALTHCOM on the development of a guide for the use of radio in communications. The International Health Program Office, of the Centers for Disease Control (CDC), Atlanta, has been assisting the Programme in the revision of the health facility survey and in other developmental and country support activities. Collaboration with CDC in the control of diarrhoea outbreaks (cholera and shigella) has been important in several countries in 1992, in particular in the African Region.

Nongovernmental organizations (NGOs) are increasingly participating in the regular briefings of NGO staff at the CDR briefing courses in Geneva, and

the Programme participates on request in NGO training courses. A special meeting was held in 1992 with UNICEF, NGOs and CDR staff in support of ARI and CDD in sub-saharan African countries, at the Istituto per l'Infanzia "Burlo Garofolo" Trieste, Italy. Fifteen NGOs working in health care delivery in sub-saharan Africa took part. In addition to improving interagency communication and developing an informal network, an outcome of the meeting was the preparation of proposals for country-specific joint support to ARI and CDD in three countries.

In 1992, Associate Professional Officers (APOs) were made available to work in national programmes by: the Swedish International Development Authority (SIDA) for Guinea-Bissau, the Lao People's Democratic Republic, Viet Nam and Zambia; the Danish International Development Agency (DANIDA) for Ghana; the Finnish International Development Agency (FINNIDA) for Papua New Guinea; the Government of Germany for Angola; the Government of Belgium for Haiti; the Government of the Netherlands for Jamaica, Kenya and Pakistan; and the Government of Norway for Namibia; and at regional level by the Government of Austria for the Regional Office for African Sub-Region III in Zimbabwe; and by DANIDA and FINNIDA for the WHO Regional Office for the Western Pacific in the Philippines. At Headquarters, breastfeeding promotion has been strengthened by an APO made available by the Government of the Netherlands.

Research

In 1992 the Programme continued to support research aimed at the development and evaluation of new or improved approaches for the treatment and prevention of diarrhoea. Increased emphasis was placed on developing research activities related to programme implementation, assessing the effectiveness of selected interventions for diarrhoeal disease control and identifying the key factors that determine their success.

Following the recommendations of the Programme's Technical Advisory Group (TAG) at its thirteenth meeting (Geneva, 16-20 March 1992) a functional reorganization of the Programme at Headquarters became effective in August 1992. The former services and research components of the Programme were replaced by four research and development working groups to address the major processes of national control programmes. These are: (i) case management in health facilities, (ii) case management in the home, (iii) prevention of diarrhoea, and (iv) national programme management. Each group includes staff with a variety of skills from the two former components. Development and management of research within each of these areas is the responsibility of the respective working group. In the few months since its implementation, the new structure has forged a greater collaboration of Programme staff in the identification of research priorities and opportunities for project development, particularly in the area of implementation research.

An informal consultation was held in May 1992 organized jointly by the Programme and WHO's Community Water Supply and Sanitation Unit (CWS) to review the available information on hygiene behaviours and risk of diarrhoea, to identify key behaviours that should be promoted in the context of educational interventions, and to recommend appropriate methodologies for the design of such interventions and research priorities.

Support was awarded to 19 new projects in 1992, bringing the total number of projects supported by the global Programme to 437. Of these, 51 are in progress. The topics of the new projects, which are

being implemented in nine countries, are summarized in Table 5. Ninety per cent of the new projects supported by the Programme are in developing countries.

Table 5

New projects supported during 1992, by major topic

| Topic | No. of new projects |
|--|---------------------|
| Case management by health providers and at community level | 6 |
| Rational use of drugs | 2 |
| Infant feeding and hygiene | 9 |
| Zinc supplementation | 1 |
| Evaluation of programme impact | 1 |

The following sections summarize information that has emerged from studies completed in 1992, and highlight ongoing and planned projects of particular importance.

Case management research

During 1992, the Programme continued to focus on improved methods for the treatment of diarrhoea. Highest priority was given to developing improved ORS formulations, defining appropriate dietary regimens for acute and persistent diarrhoea, and assessing the usefulness of antibiotics in the management of persistent diarrhoea and shigellosis. Case management by health care providers and at community level was also a topic of research. The rational use of drugs in the treatment of diarrhoea was added to the implementation research priorities during 1991.

Improved ORS formulations

Research on this topic is aimed at developing improved ORS formulations that will appreciably

reduce the volume and duration of diarrhoea while efficiently correcting dehydration and maintaining hydration.

The results of a meta-analysis organized by the Programme of 13 randomized clinical trials comparing the effects of standard WHO-recommended glucose-based ORS solution and a rice-based ORS solution containing 50-80 g/l of rice powder was published in early 1992. Its conclusions at the time were that the benefit of rice-based ORS solution for cholera patients was sufficiently great to warrant its use, where practical, for such patients. However, for acute non-cholera diarrhoea in infants and young children, the effect was substantially smaller and needed to be more precisely defined before its practical value could be judged.

The additional clinical trials that were undertaken for this purpose have now been completed and analysed, and are discussed below.

An outpatient study conducted in Bangladesh to compare the effect of treatment with rice-based and glucose-based ORS solutions on total stool output and duration of diarrhoea in young children with acute non-cholera diarrhoea showed no differences between the two treatment groups with regard to the main outcome variables. However, children treated with standard WHO ORS solution had a significantly greater weight gain than the children treated with rice-based ORS solution. Further analysis of this data set is under way to better explain this observation.

Two large studies, conducted in Egypt and Pakistan, compared the efficacy of standard WHO ORS solution and rice-based ORS solution among children with acute dehydrating diarrhoea who were also fed a rice-based diet as soon as rehydration was completed. The results of these studies are summarized in Table 6. Both concluded that standard WHO ORS solution is as efficacious as rice-based ORS solution for the treatment of diarrhoea in infants and children, when feeding with a

rice-based diet is started as soon as possible after dehydration has been corrected.

In the absence of any clinical advantage for rice-based ORS solution in the treatment of patients with acute diarrhoea, there is no justification for changing the WHO recommendation of glucose ORS as the standard. The studies have, in fact, emphasized the importance of early feeding, once dehydration has been corrected.

Feeding during and after persistent diarrhoea

The recognition that medium-chain fatty acids are better absorbed than fatty acids with longer carbon chains has suggested that the use of foods that are rich in medium-chain fatty acids may help to increase fat absorption and to reduce faecal losses of fat and energy during persistent diarrhoea, with a resultant improvement in nutritional status. Preliminary analysis of a study conducted in Bangladesh to evaluate this issue showed no beneficial effect of a diet rich in medium-chain fatty acids on fat absorption, energy intake and nutritional status. These results indicate that this approach has no advantage in terms of nutrient absorption or weight gain in patients with persistent diarrhoea.

An outpatient study is being developed to examine the impact of zinc supplementation on the clinical course of persistent diarrhoea and on the subsequent incidence of diarrhoeal and respiratory illnesses during a six-month follow-up.

An algorithm for the clinical management of persistent diarrhoea, which was developed at a meeting held in Mombasa, Kenya, in 1991, is now being tested in a multi-centre study conducted in six countries (Bangladesh, India, Mexico, Pakistan, Peru and Viet Nam). Data collection started in April 1992 and should be completed in April 1993. It is expected that the results will be available in late 1993 and should help to direct the development of standard guidelines for the management of persistent diarrhoea.

Table 6

Total stool output (g/kg) in infants and children with acute diarrhoea treated with rice-based ORS solution and in patients treated with glucose-based ORS solution

| Study | Number of patients | Stool output (g/kg) | |
|----------|--------------------|------------------------|-------------------|
| | | Rice-based ORS | Glucose-based ORS |
| Egypt | 460 | 287 (303) ^a | 239 (285) |
| Pakistan | 158 | 362 (414) | 300 (317) |

^a Figures in brackets are the standard deviation.

Drugs in the management of diarrhoea

The Programme continued to support studies to evaluate the efficacy of new antibiotics for the treatment of shigellosis. A study evaluating the efficacy of pivmecillinam in the treatment of dysentery in young children (Guatemala) has been completed and fully analysed. Results indicate that pivmecillinam is as effective as cotrimoxazole in the treatment of shigellosis in children and offers a good alternative in the event of resistance of *Shigella* species to cotrimoxazole.

The new fluoroquinolones have been shown to be active against *Shigella in vitro* and effective for the treatment of shigellosis in adults. Concerns about the safety of these antibiotics have so far prevented their evaluation as treatment of shigellosis in young children. However, nalidixic acid, which shares all the toxicity of the fluoroquinolones, is widely recommended - and in some areas routinely used - for this purpose without reports of significant adverse effects. For this reason the Programme considered that there was an urgent need to determine the safety and efficacy of fluoroquinolones for the treatment of shigellosis in children. A study is being developed in Peru to determine the efficacy of a 2-day course of norfloxacin.

Diarrhoea case management in health facilities and in the community

An important component of case management in health facilities is advising mothers on feeding their children during and after an episode of diarrhoea. Unfortunately, health workers usually perform poorly in this area. A study conducted in Cebu, the Philippines, showed that while 80% of trained health workers were skilled in oral rehydration therapy, only 15% provided appropriate feeding advice during diarrhoea consultations. A study is now under way at the same site to assess what feeding advice health workers give during consultations for diarrhoea and acute respiratory infections, and during well-baby clinics, and to identify the determinants of, and constraints to, appropriate advice-giving. Findings will be used to develop interventions to improve health worker practices in this regard.

Community oral rehydration units (CORUs) were first developed in Cali, Colombia, in 1984, to promote the use of ORT at the community level and to improve access to correct case management of diarrhoea by a trained provider. The CORU model has now been adopted in a number of settings, mainly in Latin America, but there have been very

few evaluations of its performance and contribution to increased rates of ORT and ORS use. A study is now under way to assess the operational characteristics, quality of care, and community acceptance of the CORU programme in Cali. Findings from this study are expected in 1993.

Studies on the use of ORT at home commonly report low rates of correct use, which consists of prompt initiation of ORT, administration of an adequate volume of fluid, and continuation of ORT until the end of the episode. Surveys also demonstrate a substantial difference between the proportion of mothers who have ever used, or currently use, ORT. For example, results of the 1987-1988 Bangladesh Diarrhoea Morbidity and Treatment Survey (DMTS) indicate that more than two-thirds of urban and rural mothers in Bangladesh report prior use of ORT for the treatment of childhood diarrhoea, but that children were given ORT in fewer than 30% of recent diarrhoea episodes. Analysis of this data set shows that ORT use for recent episodes was associated with certain characteristics of the child (age and breastfeeding status) and of the diarrhoeal episode (clinical type and severity). Further analysis of the DMTS data has been conducted, with Programme support, to identify determinants of repeated and sustained use of ORT, and of correct use. The findings so far suggest that characteristics of mothers, their exposure to interpersonal communications on ORT, and their perceptions of the mode of action of ORT, influenced initial use of ORT. However, other cues, including greater episode severity, were important in use of ORT for all episodes.

Preliminary findings of a community-based 1988-1990 study in Cebu, the Philippines, indicate that ORS use increased substantially during the two years of the study. Further analysis of the data is under way with Programme support to examine the patterns in ORS use rates over time, and the determinants of ORS trial and its continuous and correct use.

Similarly, household surveys conducted in the north-east of Brazil have shown that ORT use rates increased from 24% to 48% between 1988 and 1990, and data from various studies in the same region suggest a concomitant decline in diarrhoea-associated hospital admissions and mortality. The Programme is supporting a study to investigate the role of ORT in this decline.

Household surveys carried out in 36 countries since 1989 have demonstrated, with few exceptions, that the proportion of diarrhoea episodes receiving an increased fluid intake is low, as shown

Box 17

Focused Ethnographic Study

WHO training materials on diarrhoea case management contain advice for mothers on treating diarrhoea at home. The three standard rules of home treatment are: (i) give the child more fluid than usual to prevent dehydration; (ii) give the child plenty of food to prevent malnutrition; and (iii) take the child to the health worker if the child does not get better within three days or develops danger signs during the episode. However, in their standard form, these recommendations require that mothers make a number of interpretations. For example, what kinds of fluids and foods are appropriate? How much? What locally recognized symptoms do the danger signs refer to?

It is generally recognized that more specific recommendations, using local terms and concepts and taking local conditions and constraints into consideration, are better understood and are more likely to be put into practice. CDD has given priority to the development of a Focused Ethnographic Study (FES) protocol to assist in the development of effective home care advice and to identify factors influencing the correct home treatment of diarrhoea.

This protocol will follow the model of the FES that has been developed by the Programme for the Control of Acute Respiratory Infections (ARI). The CDD protocol will be applied to generate descriptive data on beliefs and practices related to diarrhoea for use in the implementation of national programmes. Of particular importance are:

- the identification of the most appropriate and acceptable home fluids for the prevention of dehydration;
- the development of effective ways to encourage the use of recommended home fluids in increased quantity during diarrhoea;
- the identification of potentially harmful practices, including inappropriate feeding practices, that should be discouraged;
- the identification of local terms that can be used to communicate more effectively with mothers, particularly on the subject of when a child should be seen by a trained health care provider.

The protocol will be developed for use by social scientists and other researchers who have experience with community-based research and qualitative data collection methods. The study will utilize a variety of data collection methods, including both unstructured and structured interviews. It is anticipated that one social scientist and two or three research assistants will be able to conduct the study in approximately 6-8 weeks.

in Table 2. It is clear that more attention must be given to persuading caretakers to give a greater volume of fluid during diarrhoea episodes (see Box 17).

The Programme is currently planning studies in Pakistan and the Philippines to explore the determinants of fluid-giving behaviour. In particular, these studies will identify the major, modifiable constraints to increasing fluid intake during diarrhoea. Results from these studies will be used to develop specific programme recommendations.

Ongoing studies in Kenya and the Philippines are assessing the appropriateness of promoting cereal-

based fluids for use during diarrhoea. In many countries, gruels and porridge made from staple cereals such as rice and maize meals are given to young children during the weaning period. Promoting diluted versions of these foods as rehydrating fluids may not accord with local perceptions and practices concerning the administration of fluids and foods during diarrhoea, and may interfere with advice concerning continued feeding. Study results will be used to help define policy regarding the choice of foods and fluids to recommend for the home treatment of diarrhoea, and to develop approaches for promoting them.

In addition, efforts are being made to develop valid and reliable measures of fluid-giving behav-

ious and fluid intake during diarrhoea episodes. A protocol is being prepared for a study to compare the use of (i) observation, (ii) questionnaires with 24-hour recall, and (iii) questionnaires with 2-week recall. The amounts and types of fluids offered or ingested during illness and health will also be examined.

Caretakers are encouraged to seek help from a trained health worker if their child has blood in the stool, or if the diarrhoeal illness persists, as dysentery and persistent diarrhoea account for a substantial proportion of diarrhoeal deaths. Little is known, however, about how caretakers recognize, classify and respond to dysentery and persistent diarrhoea, and delays in careseeking are common. In Peru, secondary analysis of data from completed studies is under way to examine these issues.

Rational use of drugs

The Programme is supporting research to find effective approaches for implementing regulatory, managerial and educational interventions that will assure the appropriate use of drugs in the treatment of childhood diarrhoea; studies will also examine the performance and impact of ongoing programme efforts in this area.

In Guatemala, an ethnographic study has documented patterns of drug use during childhood diarrhoea, sources of advice and supply, and drug costs, in addition to assessing the influences on drug use of Western and indigenous concepts of diarrhoeal disease and their treatments.

A project is under way in Nepal to develop approaches for improving the dispensing practices of licensed drug retailers with regard to diarrhoeal diseases and acute respiratory infections. Formative research is currently being carried out to define the dispensing practices of retailers and the factors influencing them. In southern Brazil, a study is being initiated to design, implement and evaluate an intervention for improving the prescribing behaviours of physicians treating childhood diarrhoea at public health centres.

The experience of selected countries in regulating the use of anti-diarrhoeal drugs is also being examined, both to determine the most feasible and sustainable regulatory approaches and to identify the factors that maximize their impact. In Pakistan, an in-depth review of the country's experience in the deregistration of paediatric antimotility drugs is being prepared. A small-scale investigation of the current availability of the drugs in question will

also be conducted, to help to assess the longer-term effectiveness of the intervention.

Nutrition research

Studies have been completed or are under way to develop and test approaches to promote improved infant feeding practices and nutrition. The following three sections outline these in greater detail.

Research on breastfeeding

Epidemiological studies supported by the Programme and other sources have shown that exclusive breastfeeding in the first 4-6 months of life and continued breastfeeding until at least the end of the first year are the feeding practices associated with the lowest incidence of diarrhoea, severity of episodes and mortality.

Several approaches for the promotion of breastfeeding, such as the training of staff in lactation management and the introduction of rooming-in, have been shown to increase rates of exclusive breastfeeding among mothers who deliver in maternity facilities.

An evaluation is being conducted of the lactation management training centre, supported by the Programme, in Santos, Brazil (see box 14). The evaluation was designed as a controlled trial, and comprises three parts: an assessment of the training process; an examination of changes in the policies, procedures and routines related to breastfeeding at maternity facilities to which teams trained in Santos return; and a measurement of the changes in the prevalence and duration of breastfeeding in the first 6 months of life among mother-infant pairs attending the intervention facilities. The first part was completed in May 1992, and the remainder is under way. Another evaluation of the effects of lactation management training is taking place in the nearby island of Guarujá, where a team of professionals trained in the Santos programme has established two lactation management centres, and has reported an unusually high prevalence of exclusive breastfeeding among the mother-infant pairs attending these centres. Follow-up of mother-infant pairs, one and six months after delivery, will examine the determinants of attendance and non-attendance by mother-infant pairs at the centres and compare their patterns of breastfeeding.

Information from the Lactation Management Clinic (LMC) of the Children's Hospital in Islamabad, Pakistan, suggests that it has been successful in

improving breastfeeding practices among mother-infant pairs who attend the hospital for the treatment of childhood illnesses and who are found to have non-optimal breastfeeding practices. In particular, a number of mothers who had recently stopped breastfeeding were able to relactate after they were counselled in the LMC, and others who had already introduced supplementary feeds to their young infants were able to return to exclusive breastfeeding. A study has therefore been supported to examine in more detail the operational characteristics of the LMC and its impact on referred mother-infant pairs.

It is probable, however, that health facility-based interventions, have limited impact on breastfeeding practices in settings where a substantial proportion of deliveries occurs in the home or where, despite already high rates of breastfeeding initiation, early supplementation or early termination of breastfeeding are highly prevalent and contact with health facilities is limited. For this reason, studies have been supported in Peru and the Philippines to measure the efficacy of community-based approaches to promote breastfeeding.

In Peru, the effects of promoting exclusive breastfeeding by health personnel with the assistance of community leaders was evaluated in 10 peri-urban communities. Posters were used to inform the community that mothers could learn how to produce enough milk for their infants - a particular concern identified in the formative phase of the study. Mobile signs, placed at key meeting points in the community, reinforced the motivational message that breastfeeding leads to healthier babies. Group sessions, including use of videos, were organized with women of fertile age (particularly those who were pregnant or lactating) with the assistance of community associations. The preliminary results of the evaluation indicate a significant increase in the prevalence of exclusive breastfeeding during the first 4 months of life, mainly owing to a reduction in the proportion of mothers who offered water and teas to young infants aged 2-4 months. The rate of exclusive breastfeeding in the first month, approximately 50%, remained essentially unchanged.

The role of voluntary neighbourhood mother-counsellors in promoting improved infant feeding was assessed in peri-urban Manila, the Philippines. Pregnant women were visited at home from the second trimester of pregnancy until delivery and within 3 days of delivery both to reinforce earlier messages that encouraged frequent and exclusive breastfeeding, and to provide assistance in dealing with problems. Home visits were made weekly during the first month after delivery, decreasing thereafter if progress was satisfactory. From the

fourth month, mothers received information on how to prepare and offer weaning foods to infants while continuing with breastfeeding. Preliminary data from this randomized controlled trial show a significant increase in knowledge of breastfeeding in the intervention group. Infants in this group tended to be breastfed more often and to be given fewer bottle feeds, although these differences were not statistically significant. The intervention highlighted certain problems: first, the turnover of community volunteers was very high, which both necessitated constant training of new workers, and disrupted the continuity of advice given to mothers; second, the intervention had very little impact on working mothers. Mothers who worked away from home tended to introduce artificial milks early and use the feeding bottle frequently despite the intervention. The greater the number of hours the mother worked away from home and the longer the distance between home and the workplace, the greater was the frequency of bottle feeding. Specific strategies to address these important constraints are required.

Health workers' perceptions that the use of soothers or pacifiers has the potential to negatively affect the establishment and duration of breastfeeding has led to a recommendation against their use in WHO/UNICEF's "Ten steps to successful breastfeeding". A study, recently completed in Brazil, provides the first evidence to support such advice. Infants who used pacifiers at the age of 1 month were found to be three times as likely to be weaned during the subsequent months, as non-users of the same age. The frequency of pacifier use by the infant was directly related to the likelihood of early termination of breastfeeding. Identifying the nature of the association - whether pacifier use simply identifies a group of children at higher risk of early termination of breastfeeding or whether it is a causal factor in early termination - will be the object of a future study.

Adequate planning for the protection, promotion and support of breastfeeding requires a clear understanding of local feeding patterns for infants, and their determinants. A method being developed to assess these entails qualitative evaluation of different practices related to infant feeding, identifying common terms used to describe them, and exploring the educational, sociocultural and situational factors that influence these practices. The second phase of the method uses a household survey to measure the prevalence of key breastfeeding practices, to identify the most common determinants of these practices, and to assess exposure to channels of information that may influence, or support, breastfeeding. The information collected will allow national authorities to define optimal interventions. A study of this kind

is under way in Ethiopia, and another is planned for China.

In recent years, follow-on milks have emerged as a new product for infants over 6 months of age, and they are often marketed aggressively. This is of concern because of their high retail cost, and their association with feeding bottles, and because their use can undermine efforts to promote continued breastfeeding and correct weaning practices. A study of the content and impact of media presentations of follow-on milks has just been completed in the Philippines. Mothers and health workers seemed to distinguish follow-on milks from preparations intended as substitutes for breastmilk in infants under 6 months of age. This appears to be a positive effect of the national Philippine code for the marketing of breastmilk substitutes which imposes a number of restrictions on advertising to the public and to health professionals of all milk products intended for infants in the first year of life. A disturbing finding, however, was a clearly perceived need among health workers and mothers for follow-on milks in infants from the age of 6 months. Most of the health workers interviewed prescribed follow-on milks; the endorsement of these products by health professionals seems to be an important factor in promoting their use. Recall of television advertisements promoting follow-on milks was high and the majority of mothers expressed the desire to buy them for their children (despite their high cost). Future studies should therefore focus on the development of approaches to discourage the use of follow-on milks.

Weaning

Epidemiological studies have indicated that protein-energy malnutrition is an important determinant of the severity, duration and, possibly, incidence of diarrhoea in infancy and childhood. Case-fatality rates for diarrhoea are also several times higher among severely malnourished children than among moderately malnourished or well-nourished children.

Available information suggests that promotion of improved weaning practices can halve the proportion of children who are below 75% mean weight-for-age - the children who are likely to have a diarrhoeal mortality rate twice as high as other children - and lead to reductions in mortality from diarrhoea of up to 12%. Poor weaning practices commonly include early introduction of non-food supplements (such as water and teas), using foods of low energy and nutrient density, late introduction of weaning foods, and using unclean feeding utensils.

A review of available information on the timing of supplementation was completed by the Programme in 1992. It indicates, in agreement with previous recommendations by WHO, that the time to start supplementation lies between the fourth and sixth months of life. Although greater precision might be desirable, the data do not warrant making a more specific recommendation. To address this gap in information, the Programme is now supporting, in collaboration with the Thrasher Research Fund, UNICEF and USAID, a randomized, controlled trial in Honduras that will measure the effects of introducing supplementary foods to exclusively breastfed infants at 4 or 6 months.

Inadequate dietary intakes may result from giving foods of low energy and nutrient density, or from giving them infrequently or in inadequate amounts. Two randomized trials are under way to examine the combined effects of different strategies for increasing the total energy intake among malnourished infants: increasing the energy density of weaning foods and the frequency of feeding (in Peru); and increasing the energy density and varying the viscosity of weaning foods (in Jamaica).

Preliminary results now available from a study in Peru (its breastfeeding component is described on page 44) indicate that the proportion of the population aged 6-12 months who received, in addition to breastmilk, energy-dense weaning food preparations twice a day, increased from 15% to 28% ($p=0.05$) following the intervention. In a study in the Philippines (its breastfeeding component is described on page 44) promotion of improved weaning was associated with an increase from 69% to 78% in the proportion of mothers starting supplementation with semi-solids at an appropriate age ($p=0.03$) and feeding more protein-rich foods by the age of 7 months (68% to 81%, $p=0.001$).

In rural Guatemala, an intervention is to be tested that promotes improved energy and nutrient intakes for young children during diarrhoea, during convalescence and in health. The formative phase of the study showed that, although the energy density of the weaning foods tended to be adequate, feeding frequency was low. Through a variety of media, mothers of children 6-24 months of age will be advised to increase the frequency of feeding to five meals per day. For reinforcement of messages, educational activities will be carried out in schools, while health centres will provide printed materials.

In 1992 the Programme printed a literature review examining the potential role of traditional technologies, such as fermentation and malting, in increasing the energy density of weaning foods. Fermentation may increase the bacterial safety of

Box 18

Preventing contamination of weaning foods: a study in Brazil

A recently completed study in north-eastern Brazil examined the safety of prevalent infant feeding practices in a poor, peri-urban population, and identified specific practices that decreased the risk of bacteriological contamination of weaning foods. Four specific practices were chosen for promotion and their acceptability tested through behavioural trials: handwashing before food preparation; boiling the water used for preparing formula; feeding with a cup and spoon (rather than with a bottle); and not storing gruels and formula at room temperature. All mothers in the trial started practising the proposed behaviours. However, by the end of one month, only 50% of the mothers reported feeding with cup and spoon, 70% reported handwashing before food preparation and 80% boiling the water used for preparing formula and not storing gruels and formula at room temperature. The two practices with the highest reported adoption were also the practices that best matched the local perception of how a "careful" mother ("mae cuidadosa") would look after her child. In addition, mothers reported having fewer difficulties in implementing them compared with the other recommended behaviours. Recommendations for increasing the safety of weaning foods, based on this study, have been presented to the local government and plans are being developed for their testing in the context of an educational intervention.

weaning foods, but is unlikely to have a substantial effect on energy density. Malting has the potential to increase the energy density of weaning foods, but whether it improves the energy intake of young children has not yet been determined. Its costs in terms of time, labour and space, and the association of malting with the brewing of alcoholic drinks, may be important constraints to the successful promotion of this technology at the community level.

Inadequate preparation, storage and handling of weaning foods lead to their contamination with bacteria and are important risk factors for diarrhoea. Little is known, however, about the determinants of practices associated with a high risk of contamination of weaning foods, and, more importantly, how unsafe practices might be modified (see Box 18).

Ogi, a fermented cereal paste, is commonly used for the preparation of weaning foods in Nigeria. The low pH of *Ogi* limits bacterial growth. However, before feeding it to children, mothers usually modify *Ogi* by cooking and diluting, a practice that may reduce its bacteriological safety. A recent study examined the pH of cooked *Ogi* and whether it still inhibited bacterial growth. The pH tended to remain acidic after cooking and the *Ogi* mixture had a considerable inhibitory effect on bacterial growth, particularly on enteropathogenic *E. coli*, during storage for 24 hours at room temperature.

Vitamin A and micronutrient supplementation

In 1990 the Programme supported the implementation of two randomized, double-blind, placebo-

controlled trials of vitamin A supplementation in areas where vitamin A deficiency was prevalent. The effects on diarrhoea and respiratory infections of two approaches to vitamin A supplementation were evaluated: periodic distribution of large doses of vitamin A at the community level; and selective administration of large doses of vitamin A to children attending a health facility for the treatment of diarrhoea.

In north-eastern Brazil, 1200 children aged 6-36 months were supplemented with 100 000-200 000 IU of vitamin A, or a placebo, every four months and followed prospectively for one year through thrice-weekly home visits. In India, 900 children aged 12-36 months attending a health facility for the treatment of diarrhoea received 200 000 IU of vitamin A or a placebo and were followed for 90 days after the end of the episode through twice-weekly home visits. Preliminary results show that Vitamin A supplementation had no impact on the incidence, duration or severity of diarrhoea in India. However, in Brazil supplementation was associated with a significant reduction in the incidence and prevalence of severe episodes. Its effects on respiratory infections also differed between the sites. In Brazil, preliminary results show no difference between supplemented and control children in the incidence or prevalence of signs and symptoms of respiratory infections. In India, however, the prevalence of signs of respiratory infection was significantly higher among children supplemented with vitamin A. Some of the preliminary findings from India are summarized in Table 7.

A consultation was held in Geneva in November 1992, jointly organized by the CDD and ARI Con-

Table 7

Childhood morbidity and vitamin A supplementation (India, 1992)

| Morbidity | Vitamin A (n=381) | Placebo (n=372) | RR ^a (95% CI) ^b p | Significance |
|---------------------------------|----------------------|--------------------|--|--------------|
| Days with pneumonia | 1666 | 1446 | 1.13 (1.05-1.22) | < 0.001 |
| Days with cough | 9452 | 8707 | 1.08 (1.05-1.12) | < 0.001 |
| Days with lower chest indrawing | 149 | 108 | 1.35 (1.04-1.74) | < 0.01 |

^a Relative risk^b Confidence interval

trial Programmes to examine the impact of vitamin A supplementation on the incidence and severity of respiratory infections and to identify priorities for future research.

A randomized, double-blind, placebo-controlled trial on zinc supplementation was started recently in India, jointly supported by the Thrasher Foundation. The trial will examine the impact of supplementing children with diarrhoea attending a health facility in terms of the incidence, duration and severity of subsequent diarrhoea and respiratory infections, and in terms of growth. Results from this trial are expected to be available in 1994.

Hygiene research

Hygiene promotion can reduce the incidence of diarrhoeal diseases by 14-48% among children under 5 years old in certain settings. Interventions to change hygienic practices, however, have been infrequently documented, and little information is available on their design, implementation and behavioural impact.

A consultation was held by the Programme on 18-20 May 1992, jointly with WHO's Community Water Supply and Sanitation Unit with the objective of identifying key water-related hygiene behaviours for the prevention of diarrhoea and of reviewing the available information on the approaches for the promotion of behavioural change. Three sets of hygiene behaviours, listed below, were identified as being of highest priority:

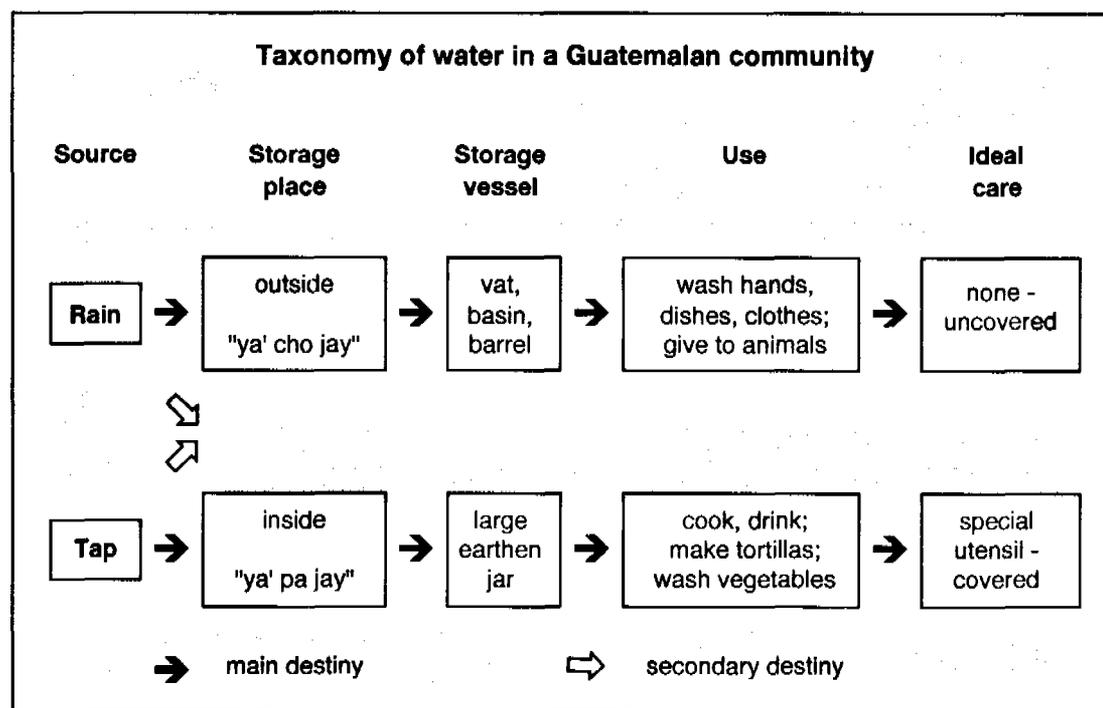
- Sanitary disposal of faeces (with emphasis on faeces of young children and babies, and of people with diarrhoea);

- Handwashing (after defecation, after handling babies' faeces, before preparing food, and before feeding and eating).
- Maintaining drinking water free from faecal contamination (in the home and at the source).

Results from a study conducted in peri-urban Lima, Peru, to test the efficacy of changing specific hygiene behaviours in reducing the rates of diarrhoea and infections with *Shigella* and *Campylobacter sp.* have recently become available. Three sets of behaviours were tested in this randomized, controlled trial: handwashing with soap before eating, before cooking and after defecation; reducing the contact of young children with human and animal faeces by using playpens and corralling animals; and reducing the contamination of the external water reservoir and indoor water containers. In a fourth group, the combination of the three sets of behaviours was tested. Of the three sets tested, only handwashing (in isolation or in combination with the other sets) had a significant effect on reducing the incidence of diarrhoea. This result suggests that in highly contaminated environments, with multiple routes of transmission of pathogens, frequent handwashing with soap, even in the absence of other changes in hygiene behaviour, can still reduce the incidence of diarrhoea, but that other interventions may not lead, when applied in isolation, to measurable health benefits.

In many areas of the world, economic constraints reduce the access of the poorest families to soap. In such areas, alternative agents such as ashes, sand or mud may be used for handwashing. A study in Bangladesh examined the efficacy of these agents in reducing hand contamination under field conditions. Soap users had better handwashing

Figure 5



practices in terms of washing both hands, rubbing more frequently and using larger volumes of rinsing water than those using soil or just water. Eighty percent of the non-soap users stated that they would have used soap if they had been able to afford it. In terms of decontaminating hands after defecation, however, the existing practices were inadequate, irrespective of the agent used (including soap). When hands were rubbed three times and rinsed with 1 litre of water, the three agents - soil, ash and soap - showed similar efficacy in removing faecal coliforms. Plans for an educational intervention are now under way to promote correct handwashing making use of this information.

Water availability is a major factor in facilitating improvements in hygienic practices, as suggested by studies of the impact of water and sanitation projects on the incidence of diarrhoea. In rural Guatemala, in a setting where water is scarce, a project to develop and evaluate an intervention to promote improved hygiene before feeding young children was recently completed. As water was central to the research, a taxonomy (see Figure 5) was prepared to describe the cultural domain of "kinds of water" and identify subcategories within that domain. The taxonomy shows, in addition, the relationship between these categories and the source of water, the water storage vessels, and the uses of and the ideal care of each type of water. The intervention, described in detail in the Eighth Programme Report 1990-1991¹⁷, promoted handwashing before children younger than 3 years were

given food. As water was scarce in the communities, tippy-taps - water containers adapted to deliver a thin stream of water when tipped - were recommended for handwashing. Following intense interpersonal communications through health promoters - including home visits to the mothers, home visits to fathers and monthly meetings with older children - tippy-taps were adopted by all intervention households. The arrival of cholera in the community, in October 1991, led to the early termination of the study, as the study team became engaged in the promotion of preventive actions to all community families. Data collected before the arrival of cholera was used to evaluate the impact of the intervention. Mothers in intervention families showed greater competence in "correct" handwashing, but their knowledge on when to wash their hands and the hands of young children did not differ significantly from mothers in the control group. The incidence of diarrhoea tended to be lower in the intervention than in the control group (3.6 vs 4.1 episodes/child-year), but the difference was not statistically significant ($p=0.16$). An interesting observation, in line with anecdotal information from other settings, was that the incidence of diarrhoea in the community declined sharply with the arrival of cholera, to levels that were less than half of those measured in previous years (2.5 vs 5.8 episodes/child-year). No cholera cases occurred in households participating in the study and only 11 cases, as compared with the 250 expected by the Ministry of Health, occurred in the community.

¹⁷ Document WHO/CDD/92.38.

Vaccine evaluation research

The Programme has continued to support research related to the evaluation of promising candidate vaccines for the most important causes of acute diarrhoea. These include rotavirus diarrhoea, cholera, shigellosis and disease caused by enterotoxigenic *Escherichia coli*. Since 1991, Programme support has focused on field trials that evaluate vaccine safety, immunogenicity and efficacy, and on epidemiological studies required to prepare for such trials. Research of a more basic nature, aimed at the development of new candidate vaccines for these diseases, is now supported within WHO by the WHO/UNDP Programme for Vaccine Development (PVD), which will also support any future trials of typhoid fever vaccine. Programme efforts on vaccine development are closely coordinated with those of the PVD and with the recently developed Children's Vaccine Initiative.

Rotavirus vaccines

The objective is to develop a vaccine that is safe and effective when given to infants under 6 months of age, before most episodes of rotavirus diarrhoea occur. The vaccine should protect against illness, especially severe illness, caused by all four of the important human serotypes of rotavirus. Efficacy should be demonstrated among high-risk populations in developing countries.

All vaccines evaluated to date have been attenuated live virus vaccines based on bovine or rhesus rotaviruses. Although several have evoked substantial protection among infants in developed countries, such as Finland and the USA, none has yet proven to be reliably protective in developing countries.

During 1992, the Programme supported several trials with reassortant vaccines consisting of a rhesus rotavirus (RRV) host with incorporated RNA that encodes production of the VP7 surface protein of human rotavirus.

Single serotype rhesus-human rotavirus vaccine

Previous studies of single serotype rhesus-human rotavirus vaccines had shown that a single dose (10^4 PFU) of serotype-1 or serotype-2 reassortant vaccine or RRV given at 2-3 months of age provided 40-80% protection against rotavirus diarrhoea for one to three years in Finland and the USA. A trial of similar design has been supported by the Programme in Peru. The vaccines were well tolerated, but evoked very low serotype-specific neu-

tralizing antibody responses. Surveillance was conducted for 24 months during which most episodes of rotavirus diarrhoea were caused by serotype-1 rotavirus. RRV caused 29% protection against rotavirus diarrhoea. Neither reassortant vaccine evoked significant protection. The most likely explanation for the low level of observed protection was the poor rate of serotype-specific seroconversion following immunization. Possibly, this reflected interference with vaccine "take" by maternal antibodies present in infants at the time of immunization. No further studies are planned with this immunization schedule in developing countries.

RRV-tetravalent vaccine

Recent studies have focused on the RRV-tetravalent vaccine, which contains rhesus-human reassortant viruses corresponding to serotypes 1, 2 and 4, and RRV for serotype 3.

A trial in Brazil is evaluating the safety and efficacy of three doses of RRV-tetravalent vaccine (4×10^4 PFU per dose) given during the first six months of life. Surveillance, conducted for two years following immunization, has detected 149 cases of rotavirus diarrhoea among study participants, 70% caused by serotype-1 rotavirus. Analysis of the results of this trial will be completed during 1993.

Studies in Israel and Venezuela have shown that seroconversion following immunization with RRV-tetravalent vaccine increases significantly, to more than 50%, when the vaccine dose is increased from 4×10^4 to 4×10^5 PFU, but shows no further increase with a dose of 4×10^6 PFU. In an effort to improve vaccine efficacy, especially in developing countries, additional studies have evaluated the vaccine in a dose of 10^5 PFU.

In Myanmar, a trial is evaluating the safety and efficacy of three doses of RRV-tetravalent vaccine (4×10^5 PFU per dose) given at the age of 15 days, 3 months and 5 months. Surveillance has been conducted for the two years since immunization, but the number of detected cases of rotavirus diarrhoea has been low, a total of 35 cases. The results of this trial will be analysed during 1993.

A trial was initiated during 1992 in Venezuela to evaluate the safety and efficacy of three doses of RRV-tetravalent vaccine (4×10^5 PFU) given at 2, 3 and 4 months of age. The study will include 3500 infants and cases will be detected among children with diarrhoea who present at a treatment facility. This design will enhance the ability to assess protection by the vaccine against serious episodes of rotavirus diarrhoea. The trial is supported by the

Programme, by USAID and by the vaccine manufacturer (Wyeth-Ayerst Laboratories).

In Thailand, a study has sought to determine whether simultaneous immunization of infants with RRV-tetravalent vaccine (4×10^4 PFU per dose) and trivalent oral polio vaccine (OPV) would interfere with the immunogenicity of either vaccine. Infants were immunized at 2, 4 and 6 months of age. The results showed that co-administration of OPV reduced the rate of seroconversion to three doses of rotavirus vaccine from 67% to 44%. In contrast, rotavirus vaccine had no effect on seroresponses to polio vaccine serotypes 2 or 3, but may have had a modest suppressive effect on responses to serotype-1 polio vaccine. These studies should be repeated with a higher dose of RRV-tetravalent vaccine to determine whether enhanced seroresponses to rotavirus can be achieved without interfering significantly with the immunogenicity of OPV, especially serotype 1.

Cholera vaccine

The aim is to develop a cost-effective vaccine for preventing cholera and for controlling the spread of *V. cholerae* O1 when used in conjunction with other control measures. During 1992, efforts continued to be focused on the field evaluation of the two most promising candidate oral vaccines.

Killed whole-cell/recombinant B-subunit (WC/rB) cholera vaccine

Using recombinant DNA techniques, strains of *V. cholerae* O1 have been developed that produce very large amounts of B subunit, but no holotoxin. These have made possible the production of WC/rB vaccine at appreciably lower cost than its predecessor, the WC/B vaccine, in which B subunit was derived from holotoxin. Studies among volunteers in Sweden and the United States have shown that WC/rB vaccine is safe and has immunogenicity comparable to that of WC/B vaccine (as reported in the Eighth Programme Report 1990-1991).

The Programme has collaborated with the WHO Regional Office for the Americas in planning and supporting studies in Colombia and Mexico to assess the safety and immunogenicity of WC/rB vaccine. The study in Colombia involved 1300 people aged 12 months to 64 years who received two doses of vaccine with a two-week interval. There were no side-effects related to the vaccine. Immune responses appeared to be somewhat lower than in previous studies with either WC/B or WC/rB vaccine: 27% of persons developed four-

fold or greater rises in serum vibriocidal antibody and the mean rise in serum antitoxin was about two-fold. Efforts are being made to develop a trial of vaccine efficacy in Colombia, but this depends upon first determining that there are sufficient cases in the proposed trial area. It is also hoped to evaluate efficacy of the vaccine in Peru with support from another source.

Live cholera vaccine CVD-103-HgR

This live oral vaccine candidate consists of a strain of *V. cholerae* O1 that lacks the genes which encode the toxic A subunit of cholera toxin; production of B subunit, however, is normal. Vaccine safety and immunogenicity have been studied in trials in North and South America and Asia, some of which were supported by the Programme. These show that a single dose of 5×10^9 CFU is safe and immunogenic in both non-immune people and in those with some degree of immunity as a result of previous natural exposure to *V. cholerae* O1. Studies in volunteers have shown that single-dose immunization evokes a high level of protection against experimental cholera; protection is established within eight days of immunization and lasts for at least six months. Immunized volunteers are also substantially protected against shedding virulent *V. cholerae* O1 in their faeces, suggesting that the vaccine might help to interrupt the spread of infection by people with asymptomatic infection, so-called "healthy carriers".

The Programme, in collaboration with the vaccine manufacturer (Swiss Serum and Vaccine Institute) is helping to develop and support the first field trial of efficacy of this vaccine in Indonesia. The trial is expected to begin in 1993, would involve at least 65 000 participants, and would run for at least three years.

Shigella vaccines

Several candidate shigella vaccines are under development with support from other sources. These include both live oral vaccines, based on attenuated strains of *Shigella* or hybrid *E. coli* that express important shigella antigens, and a parenteral vaccine consisting of shigella polysaccharide antigen linked to a protein carrier. Some studies have been carried out to assess the safety and immunogenicity of these vaccines, and an efficacy trial of one or more vaccines may be conducted among adults in Israel in 1993. The Programme is monitoring progress in this area and intends to work to develop field trials in children for any vaccine that appears to be safe and effective in adults.

Enterotoxigenic *Escherichia coli* (ETEC) vaccines

The Programme has supported efforts in Sweden to develop a killed oral ETEC vaccine. The vaccine contains formalin-killed *E. coli* that produce important colonization factor antigens (CFAs) and purified B subunit of cholera toxin. This composition is based on evidence that immunity to ETEC diarrhoea is mediated by intestinal antibodies to CFAs, B subunit and probably the *E. coli* O antigen. Studies of Swedish volunteers have shown that the vaccine is safe and immunogenic: about 80% of volunteers developed intestinal antibody responses to the CFAs and B subunit after two doses of vaccine. Plans are being developed to evaluate efficacy of the vaccine in travellers and children.

Typhoid fever vaccines

The Programme has previously supported field trials in Chile and Indonesia to evaluate the efficacy of the live oral typhoid fever vaccine, Ty21a. Results of these trials are summarized in the Seventh Programme Report, 1988-1989¹⁸.

A single dose of purified Vi antigen vaccine has previously been shown to induce about 70% protection against typhoid fever for at least two years in people aged 5-44 years. The Programme has supported trials to determine the safety and immunogenicity of this vaccine in Indonesian infants and children under 5 years of age, among whom the highest attack rates are seen. These trials are now finished and are being analysed. The results will be useful for determining the youngest age at which the vaccine could be given, and for designing a trial of vaccine efficacy in young children.

Descriptive studies on severe diarrhoea

Risk and prognostic factors for dehydration

A case-control study in Bangladesh highlighted the importance of maternal behaviours in preventing dehydration in infants and young children with diarrhoea. Withdrawal of breastfeeding during diarrhoea was associated with a risk of dehydration five times as great as continued breastfeeding. Lack of ORT use at home was associated

with a nearly 60% higher risk of dehydration when compared with home use of adequate amounts of ORT.

Risk factors for shigellosis

Identifying and developing interventions for the prevention of shigellosis are among the Programme's priorities for research, given the severe morbidity and significant mortality associated with *Shigella* infections, and the difficulties encountered in providing effective treatment, especially for infections due to antibiotic-resistant strains. A longitudinal study to evaluate risk factors for symptomatic *Shigella* infections among young children exposed to known shigellosis patients was recently completed in rural Bangladesh. Some of its findings are summarized in Box 19.

Research training and strengthening

In 1992 the Programme carried out the following research strengthening activities, with the aim of enhancing the capacity of institutions in developing countries to conduct high quality research in priority topics.

- One workshop was held in Turkey, in collaboration with the Institute of Child Health, Istanbul, to assist 20 developing country researchers to design proposals for priority intervention-related research projects. Fourteen proposals resulted from the workshop of which five have already been submitted to the Programme for funding.
- Continued research strengthening support was provided to six institutes in Brazil, India, Peru and the Philippines with the aim of improving their facilities and their capacity to conduct research on the management and prevention of diarrhoea. All these institutes are presently conducting research with support from the Programme.
- Programme staff participated in a workshop in the Philippines that presented results of CDD-supported research to the Ministry of Health and to staff of nongovernmental organizations. The aim was to interpret the study's findings, to identify areas for further analyses, and to feed the new information into the development of future programme activities.

¹⁸ Document WHO/CDD/90.34.

Box 19

Breastfeeding and shigellosis

Little information is available on the risk of shigellosis during the weaning period. A study was supported by the Programme to examine such risks among a cohort of 1085 rural Bangladeshi children younger than 3 years. Children who were exposed to *Shigella* in their residential neighbourhoods were identified during a period of 24 months. Each child was followed for one month by home visits. The relationship between feeding and the risk of shigellosis was examined by relating antecedent dietary histories to the subsequent occurrence of confirmed or presumptive shigellosis. In the analysis, 268 children who developed shigellosis were compared with the 817 control children who did not develop it.

Compared with breastfed children, non-breastfed children were at twice the risk of shigellosis (odds ratio (OR)=2.0, 95% confidence interval (CI)=1.3-2.9, $p<0.001$). This increased risk was largely attributable to a substantially higher risk in the first three months following the termination of breastfeeding (OR=6.6, 95% CI=2.9-14.6, $p<0.001$). This early post-termination risk was particularly high among the severely malnourished children (OR=10.2, 95% CI=3.1-33.3, $p<0.001$).

This substantial, but brief, increase in the risk of shigellosis immediately after the termination of breastfeeding highlights the importance of (i) promotion of sustained breastfeeding, particularly as complications arising from shigellosis, including persistent diarrhoea and death, decline in frequency after infancy, and (ii) intensified hygiene education efforts to prevent infection, focusing on the period of termination of breastfeeding.

Research documents

Documents produced by the Programme during 1992 included the following:

- A review of the role of traditional technologies in increasing the energy density of weaning foods¹⁹;
- an editorial for the British Medical Journal presenting the results of a literature review on the role of waters and teas in infant feeding during the first 6 months of life²⁰;
- a paper presenting the results from a meta-analysis of clinical trials on the impact of rice based ORS on diarrhoea²¹; and
- a review on the timing of the introduction of weaning foods²².

International collaboration

In its coordination and support of research activities, the Programme collaborates with institutions and individuals in many countries. A panel of study advisers makes recommendations to the Programme on the design and funding of individual projects. The Programme collaborates closely with the Applied Diarrhoeal Disease Research Project and the International Centre for Diarrhoeal Disease Research, Bangladesh. Under the coordination of USAID, Programme staff meet with representatives of these two institutions twice a year to discuss respective research priorities and plans. In preparation for the trial of a cholera vaccine in Latin American (see page 50), the Programme is collaborating with the Swedish International Development Authority.

¹⁹ Ashworth A and Draper A. The potential of traditional technologies for increasing the energy density of weaning foods. Document: WHO/CDD/EDP/92.4.

²⁰ Martines JC, Rea M, de Zoysa I. Breast feeding in the first six months: no need for extra fluids. *BMJ* 1992; 304:1068-1069.

²¹ Gore SM, Fontaine F, Pierce NF. Impact of rice based oral rehydration solution on stool output and duration of diarrhoea: meta-analysis of 13 clinical trials. *BMJ* 1992; 304:287-291.

²² Lutter C. Recommended length of exclusive breast-feeding, age of introduction of complementary foods and the weaning dilemma. Document: WHO/CDD/EDP/92.5.

Programme Management and Financial Resources

Meetings of management and review bodies

The Programme's organizational structure continues to involve three annual review meetings. The Technical Advisory Group, composed of leading scientists and public health administrators from outside WHO, is responsible for scientific and technical review of the Programme. Review of the overall management of the Programme is entrusted to a Management Review Committee made up of representatives of four United Nations organizations and specialized agencies (UNDP, UNICEF, World Bank, WHO). The deliberations of these two bodies are considered once a year by the Meeting of Interested Parties, which is attended by representatives of governments and agencies that are current or potential contributors to the Programme, and representatives of the governments of developing countries that have national CDD control programmes.

The three bodies met on the following dates in 1992:

| | |
|-------------------------------|-------------|
| Technical Advisory Group | 16-20 March |
| Management Review Committee | 6 April |
| Meeting of Interested Parties | 2-3 July |

Financial status of the Programme

The resources available to the Programme by source of funds for the periods 1978-1985, 1986-1987, 1988-1989, 1990-1991, and 1992-1993 are presented in Table 8. During 1992, contributions were received from or pledged by 17 countries and agencies.

Table 9 is a summary of the actual obligations of the Programme for 1988-1989 and 1990-1991, and revised estimated obligations for 1992-1993. While obligations decreased by 0.8% over the last two bienniums, an increase of 6% is expected between 1990-1991 and 1992-1993.

The Programme's financial position at the beginning of 1993 is shown in Table 10.

Table 8

Financial resources: 1978-1992
Status at 31 December 1992

| SOURCE | 1978-1985 | 1986-1987 | 1988-1989 | 1990-1991 | 1992-1993 | |
|---|-------------------|-------------------|-------------------|-------------------|-------------------|------------------|
| | | | | | Available | Pledged |
| REGULAR BUDGET | US\$ | US\$ | US\$ | US\$ | US\$ | US\$ |
| Global and interregional Regions | 2 948 454 | 979 951 | 1 090 897 | 1 203 888 | 1 453 900 | |
| | 4 631 457 | 1 419 610 | 1 812 133 | 1 724 583 | 1 577 200 | |
| TOTAL REGULAR BUDGET | 7 579 911 | 2 399 561 | 2 903 030 | 2 928 471 | 3 031 100 | |
| OTHER SOURCES | | | | | | |
| Australia | 700 877 | 268 442 | 418 665 | 505 570 | 223 350 | |
| Belgium | 163 916 | 24 390 | | | | |
| Canada (CIDA) | 856 100 | 441 088 | 501 536 | 312 109 | 211 865 | |
| China | 100 000 | 50 000 | 50 000 | 50 000 | 25 000 | |
| Denmark (DANIDA) | 1 969 513 | 1 241 628 | 1 294 292 | 770 826 | 157 808 | |
| Finland | 402 050 | 727 049 | 940 797 | 1 204 948 | 235 018 | |
| France | 139 000 | 90 833 | 97 984 | 664 070 | 70 840 | |
| India | 60 000 | | | | | |
| Italy | | 101 062 | 632 830 | 245 009 | | |
| Japan | 425 000 | 300 000 | 300 000 | 150 000 | 50 000 | |
| Kuwait | 10 000 | | | | | |
| Morocco | 7 475 | | | | | |
| Netherlands | 1 855 433 | 910 617 | 971 829 | 1 170 641 | 346 821 | |
| Nigeria | 6 680 | | | | 1 419 | |
| Norway | 189 884 | 276 507 | 299 406 | 1 780 980 | 773 994 | |
| Sweden (SIDA/SAREC) | 3 256 809 | 1 139 690 | 945 354 | 949 079 | 1 512 647 | 522 388 |
| Switzerland | 1 101 732 | 901 108 | 520 833 | 1 729 685 | 405 329 | 353 741 |
| United Kingdom | 1 019 380 | 330 320 | 1 200 977 | 1 653 775 | 947 750 | |
| United States of America | 1 574 300 | 3 200 000 | 2 153 450 | 2 076 223 | 1 250 000 | 1 000 000 |
| Pan American Health Organization | 49 695 | | | | | |
| United Nations Children's Fund | 1 734 238 | 866 945 | 705 837 | 771 973 | 363 880 | 96 150 |
| United Nations Development Programme | 7 546 111 | 2 177 004 | 2 055 500 | 3 143 659 | 728 750 | 667 000 |
| Arab Gulf Programme for United Nations Development Organizations (AGFUND) | 2 500 000 | | 1 000 000 | | | |
| International Development Research Center (Canada) | 754 291 | 162 016 | 184 594 | | | |
| Rotary International | | 5 000 | | | | |
| Sasakawa Research Fund | 56 135 | 23 436 | | | | |
| Thrasher Research Fund | 20 000 | | | | | |
| Ciba-Geigy | 757 576 | 2 579 365 | 2 650 970 | | | |
| Special Account for the Cholera Programme | 433 990 | | | | | |
| Special Account for Miscellaneous Designated Contributions | 333 707 | 732 653 | | | | |
| Other | 5 640 | 549 | 800 | 154 | 4 950 | |
| Interest | 1 624 035 | 717 490 | 1 059 760 | 963 390 | 182 590 | |
| TOTAL OTHER SOURCES | 29 653 567 | 17 307 192 | 17 985 414 | 18 043 091 | 7 492 011 | 2 639 279 |
| TOTAL | 37 233 478 | 19 706 753 | 20 888 444 | 20 971 562 | 10 523 111 | 2 639 279 |

Table 9

Summary of actual obligations incurred in 1988-1989, 1990-1991,
and revised estimated obligations for 1992-1993

| Programme Component | Actual obligations 1988-1989 | Actual obligations 1990-1991 | Revised estimated obligations 1992-1993 | % |
|--|---------------------------------|---------------------------------|--|--------------|
| | US\$ | US\$ | US\$ | |
| I. ADVISORY AND MANAGEMENT MEETINGS <i>Global and interregional</i> | 170 063 | 182 575 | 198 000 | 0.9 |
| II. HEALTH SERVICES <i>Global and interregional</i> | 3 395 454 | 4 318 768 | 4 924 000 | 22.1 |
| <i>Regional</i> | 9 294 352 | 10 048 478 | 10 800 000 | 48.5 |
| Subtotal | 12 689 806 | 14 367 246 | 15 724 000 | 70.6 |
| III. RESEARCH <i>Global and interregional</i> | 6 882 227 | 4 240 044 | 4 650 000 | 20.9 |
| IV. PROGRAMME MANAGEMENT AND SUPPORT <i>Global and interregional</i> | 1 340 171 | 2 120 512 | 1 695 000 | 7.6 |
| TOTAL <i>Global and interregional</i> | 11 787 915 | 10 861 899 | 11 467 000 | 51.5 |
| <i>Regional</i> | 9 294 352 | 10 048 478 | 10 800 000 | 48.5 |
| TOTAL | 21 082 267 | 20 910 377 | 22 267 000 | 100.0 |

Table 10

Financial position as at 1 January 1993

| | US\$ |
|--------------------------------------|-------------------|
| Balance available on 1 January 1992 | 4 716 880 |
| Amount received since 1 January 1992 | 10 523 111 |
| Amount pledged since 1 January 1992 | 2 639 279 |
| Total available and pledged | 17 879 270 |
| Estimated obligations 1992-1993 | 22 267 000 |
| Estimated shortfall 1992-1993 | 4 387 730 |

Annex

WHO CDD estimates of ORS access and ORS and/or RHF use rates
by country and region, 1992*

| | Population <5 years x 1000 | Estimated episodes per child <5 years per year | Estimated total diarrhoea episodes <5 years x 1000 | Total ORS reported produced or imported (litres) x 1000 | ORS access rate % | ORS use rate % | ORS and/or RHF use rate % |
|-----------------------------|--------------------------------------|--|---|--|--------------------------------|-----------------------------|---|
| Algeria | 4 044 | 3.1 | 12 536 | 3 468 | 84 a | 19 a | 27 a |
| Angola | 1 948 | 2.0 | 3 896 | 1 100 | 60 a | 32 a | 48 an |
| Benin | 954 | 4.7 | 4 484 | 458 | 75 an | 45 cn | 45 cn |
| Botswana | 274 | 3.2 | 877 | | 95 an | 56 an | 64 an |
| Burkina Faso | 1 728 | 4.6 | 7 949 | 580 | 65 cn | 15 cn | 15 cn |
| Burundi | 1 095 | 1.3 | 1 424 | 1 005 | 90 an | 41 ab | 49 ab |
| Cameroon | 2 469 | 2.4 | 5 926 | 209 | 50 an | 7 ab | 84 ab |
| Cape Verde | 71 | 4.8 | 341 | 164 | 81 cn | 5 cn | 5 cn |
| Central African Republic | 588 | 3.9 | 2 293 | 167 | 49 cn | 13 cn | 24 cn |
| Chad | 1 038 | 7.6 | 7 889 | 1 794 | 65 a | 15 an | 15 an |
| Congo | 460 | 6.6 | 3 036 | 404 | 75 a | 15 ab | 67 ab |
| Comoros | 114 | 4.0 | 456 | 6 | 84 a | 13 a | 70 a |
| Côte d'Ivoire | 2 634 | 7.1 | 18 701 | 8 | 26 an | 4 an | 16 an |
| Equatorial Guinea | 64 | 1.9 | 122 | 200 | 80 an | 35 an | 40 an |
| Ethiopia | 9 915 | 4.8 | 47 592 | 3 723 | 50 a | 22 a | 68 a |
| Gabon | 200 | 3.3 | 660 | 5 | 70 an | 20 a | 25 a |
| Gambia | 163 | 4.2 | 685 | 161 | 80 an | 15 an | 48 an |
| Ghana | 2 930 | 4.5 | 13 185 | 1 417 | 78 a | 25 a | 44 a |
| Guinea | 1 193 | 4.6 | 5 488 | 1 180 | 30 an | 37 an | 65 an |
| Guinea-Bissau | 167 | 5.3 | 885 | 400 | 80 a | 6 a | 6 a |
| Kenya | 5 091 | 4.3 | 21 891 | 3 795 | 65 n | 26 n | 69 n |
| Lesotho | 322 | 8.8 | 2 834 | 30 | 54 a | 36 a | 78 a |
| Liberia | 509 | 4.0 | 2 036 | 464 | 30 a | 10 a | 15 a |
| Madagascar | 2 336 | 4.8 | 11 213 | 227 | 62 a | 14 a | 29 a |
| Malawi | 1 950 | 6.0 | 11 700 | 2 512 | 56 an | 14 an | 14 an |
| Mali | 1 935 | 4.0 | 7 740 | 68 | 95 an | 14 an | 41 an |
| Mauritania | 392 | 7.0 | 2 744 | 114 | 30 an | 13 an | 54 an |
| Mozambique | 2 934 | 4.7 | 13 790 | 1 724 | 30 an | 14 an | 30 an |
| Niger | 1 650 | 7.2 | 11 880 | 923 | 65 a | 10 ab | 17 ab |
| Nigeria | 22 350 | 4.3 | 96 105 | 3 390 | 60 an | 2 b | 80 b |
| Rwanda | 1 565 | 4.0 | 6 260 | 11 | 80 a | 8 an | 26 an |
| Sao Tome & Principe | 24 | 2.5 | 60 | 25 | 100 a | 50 a | 50 a |
| Senegal | 1 389 | 4.8 | 6 667 | 302 | 16 an | 5 an | 27 an |
| Sierra Leone | 805 | 3.2 | 2 576 | 142 | 55 an | 55 an | 60 an |
| Swaziland | 165 | 4.0 | 660 | 225 | 90 an | 15 an | 85 an |
| Togo | 694 | 5.3 | 3 678 | 302 | 60 an | 11 an | 33 an |
| Uganda | 4 235 | 5.0 | 21 175 | 5 538 | 30 an | 18 an | 30 an |
| United Republic of Tanzania | 6 055 | 3.5 | 21 193 | 1 690 | 75 an | 39 ab | 83 ab |
| Zaire | 7 074 | 5.9 | 41 737 | 929 | 50 an | 16 an | 45 an |
| Zambia | 1 893 | 5.1 | 9 654 | 1 271 | 89 an | 24 b | 90 ab |
| Zimbabwe | 1 806 | 3.9 | 7 043 | 65 | 70 an | 1 an | 77 an |
| AFR | 97 223 | 4.5 | 441 059 | 40 196 | 59 | 15 | 54 |

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| | Population <5 years x 1000 | Estimated episodes per child <5 years per year | Estimated total diarrhoea episodes <5 years x 1000 | Total ORS reported produced or imported (litres) x 1000 | ORS access rate % | ORS use rate % | ORS and/or RHF use rate % |
|-----------------------------|--------------------------------------|--|---|--|--------------------------------|-----------------------------|---|
| Antigua & Barbuda | 7 | 3.0 | 21 | | 100 n | 50 n | 50 n |
| Argentina | 3 246 | 3.0 | 9 738 | 1 960 | 60 n | 36 n | 70 n |
| Bahamas | 28 | 3.0 | 84 | | 98 a | 45 a | 54 a |
| Barbados | 20 | 3.0 | 60 | | 85 n | 15 n | 15 n |
| Belize | 30 | 1.5 | 45 | | 100 an | 65 cn | 65 cn |
| Bolivia | 1 333 | 3.0 | 3 999 | 1 644 | 58 n | 35 n | 63 n |
| Brazil | 19 094 | 4.0 | 76 376 | 23 157 | 68 cnb | 13 cnb | 63 cnb |
| Chile | 1 491 | 1.5 | 2 237 | 1 462 | 80 a | 10 cn | 10 a |
| Colombia | 4 191 | 5.0 | 20 955 | 6 256 | 62 cn | 31 cn | 40 cn |
| Costa Rica | 396 | 4.6 | 1 822 | 370 | 90 n | 73 n | 78 n |
| Cuba | 907 | 1.0 | 907 | 2 649 | 100 n | 80 n | 80 n |
| Dominica | 9 | 3.0 | 27 | 7 | 100 n | 50 n | 50 n |
| Dominican Republic | 988 | 7.0 | 6 916 | 204 | 13 cn | 25 cn | 35 cn |
| Ecuador | 1 560 | 4.1 | 6 396 | 3 370 | 55 n | 25 n | 70 n |
| El Salvador | 884 | 4.1 | 3 624 | 3 173 | 84 a | 45 an | 45 an |
| Grenada | 13 | 3.0 | 39 | | 100 n | 70 n | 70 n |
| Guatemala | 1 680 | 5.2 | 8 736 | 6 393 | 40 an | 23 a | 24 an |
| Guyana | 92 | 3.0 | 276 | 2 | 100 n | 15 n | 15 n |
| Haiti | 1 030 | 7.0 | 7 210 | 3 181 | 52 cn | 15 cn | 20 cn |
| Honduras | 908 | 3.0 | 2 724 | 981 | 65 n | 40 n | 70 n |
| Jamaica | 274 | 1.0 | 274 | | 90 an | 8 an | 10 an |
| Mexico | 11 715 | 4.5 | 52 718 | 32 200 | 90 an | 17 ab | 63 ab |
| Nicaragua | 719 | 2.0 | 1 438 | 1 790 | 75 n | 40 n | 40 n |
| Panama | 303 | 3.0 | 909 | 500 | 80 a | 45 c | 55 cn |
| Paraguay | 680 | 2.5 | 1 700 | 276 | 91 an | 39 an | 52 an |
| Peru | 2 914 | 5.0 | 14 570 | 5 515 | 28 a | 20 ab | 31 ab |
| Santa Lucia | 18 | 3.0 | 54 | | 100 n | 60 n | 75 n |
| St Vincent & Grenadines | 17 | 3.0 | 51 | | 100 n | 98 n | 98 n |
| St Kitts & Nevis | 5 | 3.0 | 15 | | 100 n | 5 n | 5 n |
| Suriname | 53 | 2.0 | 106 | | 66 a | 46 n | 47 n |
| Trinidad & Tobago | 155 | 1.6 | 248 | 8 | 100 n | 66 n | 70 n |
| Uruguay | 260 | 0.7 | 182 | 210 | 84 an | 58 a | 96 cn |
| Venezuela | 2 787 | 3.0 | 8 361 | 3 054 | 95 cn | 70 cn | 80 cn |
| AMR | 57 807 | 4.0 | 232 796 | 98 360 | 70 | 23 | 56 |
| Bangladesh | 19 932 | 3.5 | 69 762 | 32 377 | 75 an | 15 a | 24 a |
| Bhutan | 244 | 3.9 | 952 | 250 | 85 an | 35 ab | 85 ab |
| Dem. People's Rep. of Korea | 2 517 | 1.5 | 3 776 | | 100 n | 45 n | 72 n |
| India | 118 544 | 1.7 | 201 525 | 58 549 | 77 c | 12 ab | 37 ab |
| Indonesia | 23 102 | 0.7 | 16 171 | 6 675 | 92 an | 28 anb | 44 anb |
| Maldives | 34 | 0.7 | 24 | | 100 an | 18 an | 27 an |
| Mongolia | 355 | 1.7 | 604 | 165 | 70 an | 22 ab | 65 ab |
| Myanmar, Union of | 5 778 | 1.3 | 7 511 | 1 725 | 57 c | 15 an | 19 an |
| Nepal | 3 150 | 3.3 | 10 395 | 4 107 | 80 an | 9 an | 14 an |
| Sri Lanka | 1 802 | 0.9 | 1 622 | 1 424 | 95 an | 27 b | 76 ab |
| Thailand | 5 610 | 1.3 | 7 293 | 5 988 | 90 an | 26 ab | 65 ab |
| SEA | 181 068 | 1.8 | 319 634 | 111 259 | 79 | 14 | 35 |

| | Population <5 years x 1000 | Estimated episodes per child <5 years per year | Estimated total diarrhoea episodes <5 years x 1000 | Total ORS reported produced or imported (litres) x 1000 | ORS access rate % | ORS use rate % | ORS and/or RHF use rate % |
|---------------------------------|----------------------------------|--|---|--|----------------------------|-------------------------|---------------------------------------|
| Afghanistan | 3 448 | 3.8 | 13 102 | 529 | 32 n | 12 n | 26 n |
| Bahrain | 66 | 2.9 | 191 | | 100 an | 60 an | 73 an |
| Cyprus | 61 | 2.5 | 153 | | 35 n | 4 an | 4 an |
| Djibouti | 79 | 2.8 | 221 | 95 | 80 an | 47 an | 56 an |
| Egypt | 7 588 | 3.4 | 25 799 | 7 000 | 95 an | 23 ab | 34 ab |
| Iran (Islamic Republic of) | 8 480 | 2.1 | 17 808 | 19 655 | 85 a | 39 ab | 85 ab |
| Iraq | 3 611 | 3.8 | 13 722 | 11 523 | 100 n | 58 n | 70 n |
| Jordan | 737 | 1.3 | 958 | 632 | 95 an | 39 an | 77 an |
| Kuwait | 269 | 2.7 | 726 | | 100 a | 10 an | 10 an |
| Lebanon | 392 | 3.6 | 1 411 | 111 | 95 a | 27 ab | 45 c |
| Libya | 921 | 3.0 | 2 763 | | 80 a | 60 a | 80 a |
| Morocco | 3 863 | 8.0 | 30 904 | 2 074 | 70 an | 8 ab | 13 ab |
| Oman | 311 | 2.5 | 778 | 600 | 100 n | 19 n | 19 n |
| Pakistan | 23 595 | 4.1 | 96 739 | 33 549 | 85 an | 32 ab | 34 ab |
| Qatar | 53 | 2.7 | 143 | | 75 an | 20 an | 20 an |
| Saudi Arabia | 2 777 | 2.0 | 5 554 | | 100 a | 45 a | 45 a |
| Somalia | 1 497 | 4.3 | 6 437 | 491 | 31 n | 12 n | 78 n |
| Sudan | 4 781 | 4.5 | 21 515 | 5 605 | 22 n | 13 b | 28 b |
| Syria | 2 568 | 2.0 | 5 136 | 1 553 | 95 a | 21 a | 95 a |
| Tunisia | 1 117 | 2.8 | 3 128 | 1 400 | 100 an | 8 ab | 22 ab |
| United Arab Emirates | 167 | 2.0 | 334 | | 95 n | 77 n | 81 n |
| Yemen | 2 554 | 2.7 | 6 896 | 1 948 | 16 n | 6 n | 6 n |
| EMR | 68 935 | 3.7 | 254 418 | 86 765 | 77 | 26 | 38 |
| Cook Islands | 2 | 1.2 | 2 | | 58 n | 8 n | 8 n |
| Fiji | 93 | 2.5 | 233 | | 100 n | 16 n | 16 n |
| Kampuchea | 1 366 | 4.5 | 6 147 | 1 007 | 25 n | 6 n | 6 n |
| Kiribati | 8 | 3.5 | 28 | 484 | 100 a | 40 a | 85 a |
| Lao People's Dem. Rep. | 746 | 3.4 | 2 536 | 1 | 65 an | 11 a | 30 an |
| Malaysia | 2 592 | 1.3 | 3 370 | 952 | 95 c | 38 ab | 47 a |
| Papua New Guinea | 457 | 3.3 | 1 508 | | 95 an | 15 an | 46 an |
| Philippines | 9 875 | 3.0 | 29 625 | 2 507 | 85 an | 17 an | 25 an |
| Samoa | 24 | 1.5 | 36 | 5 | 50 a | 15 a | 50 a |
| Solomon Islands | 59 | 3.5 | 207 | | 92 an | 13 ab | 60 ab |
| Tonga | 17 | 4.1 | 70 | | 95 an | 30 a | 30 a |
| Vanuatu | 27 | 3.8 | 103 | 15 | 95 an | 30 a | 66 a |
| Viet Nam | 9 466 | 2.0 | 18 932 | 4 500 | 88 a | 45 a | 52 a |
| WPR (excluding China) | 24 732 | 2.5 | 62 796 | 9 471 | 84 | 25 | 33 |
| China | 116 769 | 1.8 | 210 184 | na | 25 a | 1 b | 22 c |
| Global (excluding China) | 429 765 | 3.0 | 1 310 703 | 346 050 | 73 | 19 | 46 |

^a National CDD Programme estimate (made in 1992) as reported in CDD Country Programme Profile.

^b Based on household surveys (CDD household surveys, demographics health surveys and others).
If more than one survey, median rate is used.

^c Estimate from WHO regional office.

ⁿ Estimate from 1991 or earlier in absence of more recent and reliable data.

* Estimates for total ORS produced or imported are for 1991.