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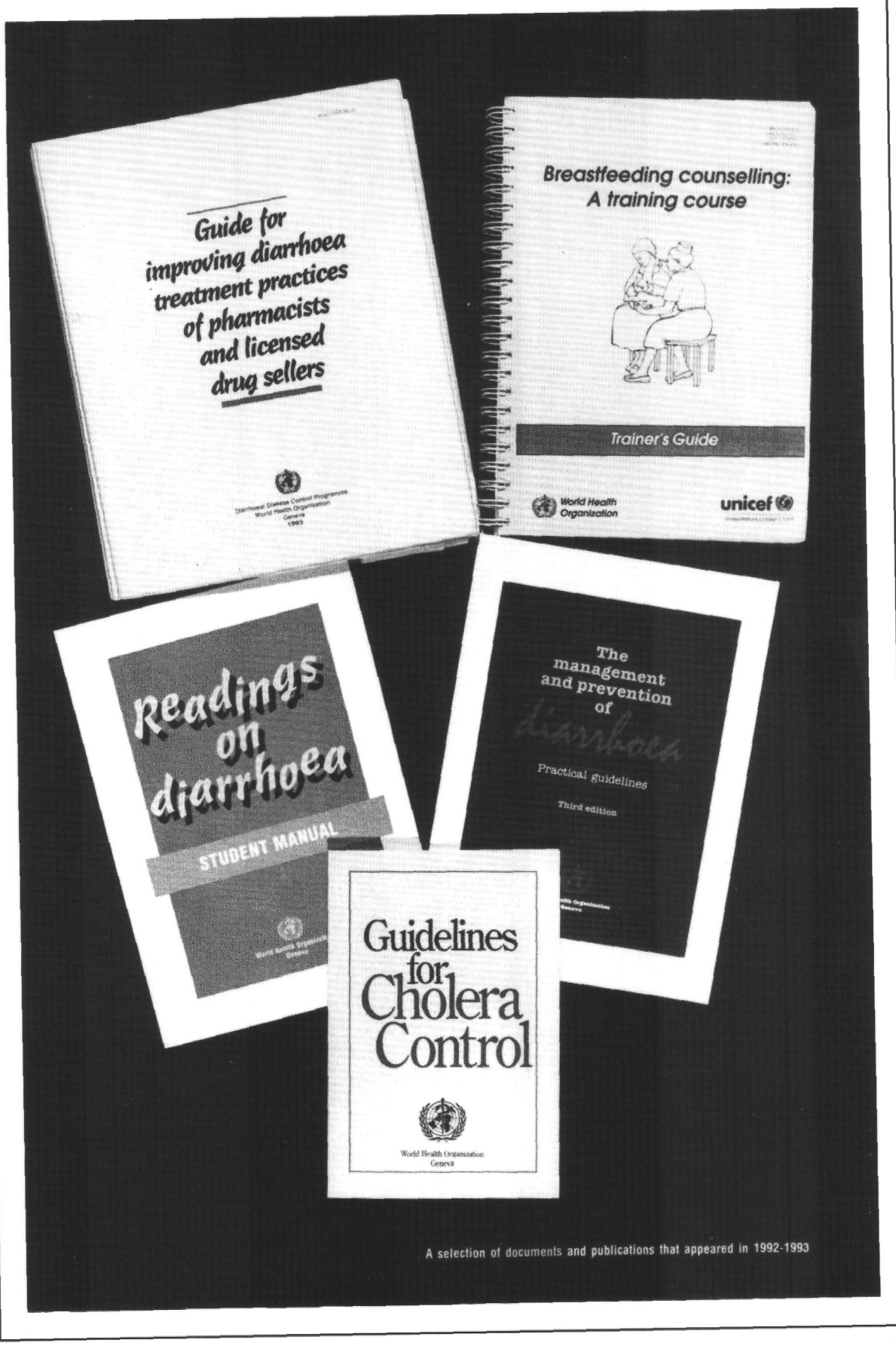
Programme for control of diarrhoeal diseases

NINTH PROGRAMME REPORT 1992-1993

World Health Organization



A selection of documents and publications that appeared in 1992-1993

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Contents

CHAPTER 1

Introduction

This report covers the activities of the WHO Programme for the Control of Diarrhoeal Diseases (CDD) during 1992 and 1993.

For the first time in recent years the demand for the Programme's technical and financial cooperation outstripped its resources. This was particularly true in Africa, where a surge of activity in a number of countries put heavy demand on the Programme. This coincided with a slight fall in funding to the Programme, compared with the amount received in 1990-1991. This conjunction of increased demand and diminished resources led to a number of requests for assistance being turned down and the cancellation of activities which had been scheduled to receive programme support. Nevertheless, the Programme continued to provide global leadership in diarrhoeal disease control and important progress was made towards achieving its targets. In addition to providing continued cooperation to a large number of countries in the implementation of their national programmes, the Programme made many advances in research and development activities.

Training activities, a major priority of the Programme, were further accelerated and decentralized through the introduction and active promotion of additional training materials. Five important sets of training materials were finalized during the biennium to add to the range of materials already available. These included packages for medical and other health professional schools, a distance learning course on diarrhoea case management, a five-day breastfeeding counselling course and a course for health workers on interpersonal communication skills.

Programme reviews were conducted in 19 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 20 countries, while 16 programmes examined the performance of health workers through health facility surveys. Methodologies for programme reviews and household and health facility surveys were prepared, or completely updated, and field-tested.

Access to oral rehydration salts (ORS) continued to increased 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.

In the prevention of diarrhoea, emphasis continued to be placed on the protection, promotion and support of breastfeeding.

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.

Cholera continued to be a problem in many countries and concern was heightened by the occurrence of epidemics of cholera in Asia caused by a new organism *Vibrio cholerae* O139 (Bengal). Epidemics of dysentery due to *Shigella dysenteriae* type 1, notably in southern Africa, also added to the complexity of diarrhoeal disease control efforts. The Global Task Force on Cholera Control, which also addressed the problem of epidemic dysentery, continued its activities under the coordination of the CDD Programme and in collaboration with the WHO regional offices.

At the global level, the Programme experienced important changes. Collaboration with UNICEF was intensified through frequent consultations, notably at two meetings on CDD of UNICEF Representatives and staff 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 childhood illness. This also covers acute respiratory infections, measles, malaria and malnutrition. Close collaboration with other relevant programmes within WHO, and with a number of other institutions, in this initiative has led to encouragingly rapid progress.

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 and low osmolarity ORS, feeding during and after diarrhoea, and improving breastfeeding and weaning practices. The Programme also continued support to field trials of promising candidate vaccines against common causes of diarrhoea.

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 addressed respectively: case management in health facilities, home care for diarrhoea, prevention of diarrhoea, and national programme management. Experience with these groups was very positive and ensured that research and development activities addressed key issues of programme implementation and were modified by experience in national programmes.

In conclusion, and as stated in the Interim Programme Report, 1992,[1] although significant progress has been made by the CDD Programme since its inception, and its aim and approaches now widely accepted, 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 working to secure the sustainability of diarrhoeal disease control activities, and to ensure that they contribute to strengthen health services more generally, by their incorporation into an integrated approach to childhood illness. The Programme is counting on renewed financial assistance and the strong political commitment needed at all levels to develop further this approach and to consolidate and build upon the gains made to date.

[1] Document WHO/CDD/93.40

CHAPTER 2

Health Services

Planning and implementation

National CDD programmes encountered a range of new challenges during the 1992-1993 biennium, such as structural changes within ministries of health, decentralization, and moves towards integration at different levels of the health care system. This required a redefinition of the roles and functions of national programmes in some countries. Many national CDD programmes faced reduced funding, at the same time as trying to accelerate and decentralize programme activities to meet the child mortality and morbidity goals of the decade. Epidemics of diarrhoeal diseases and other national emergencies added to demands on some programmes.

In this changing context, 1992-1993 nevertheless saw encouraging steps in certain countries towards renewed political commitment to the control of diarrhoeal diseases. Many countries revised their strategic and operational workplans to achieve the goals to which they are committed, while tackling constraints to progress — often identified during focused programme reviews.

Planning and replanning of national programmes often followed programme reviews (Cameroon, Congo, Egypt, Ethiopia, Kenya, Morocco, Niger, Pakistan, Sri Lanka, Sudan, Viet Nam, Zimbabwe) or national managerial skills training courses (Kazakhstan, Turkey, Uzbekistan). Countries that started the development of national CDD programmes during the biennium were Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan.

New or revised national policies, strategies and targets were developed as part of the planning exercises. Provincial or regional level staff were involved in policy-making and planning in several countries, such as China, Egypt, Indonesia, Nigeria, Pakistan, Philippines and Zambia. In 1993, the Programme at Headquarters started the development of a guide for planning of training, to facilitate the preparation of more realistic plans using available information; it is likely to lead to higher implementation rates. Guidelines for the development of a national policy on home fluids were finalized in the biennium and used by several countries in the revision of their home case management policy (see the section, Management of diarrhoea in the home). National CDD programmes played an important technical role, often through their staff participating in national epidemic control task forces, and establishing epidemic control policies and guidelines. Countries where this occurred included Bangladesh, Bolivia, Burundi, Cambodia, the Lao People's Democratic Republic, Malawi, Mexico, Mozambique, Peru, Rwanda, Viet Nam, Zambia and Zimbabwe.

To assist national managers, and to improve interagency collaboration in countries, a medical officer was assigned to Nigeria. This was in addition to the medical officers already posted in Bangladesh, Brazil, Ethiopia, Indonesia, Peru and the Philippines.

At country level, collaboration with other international agencies — notably UNICEF, the International Federation of Red Cross and Red Crescent Societies, and the World Bank — bilateral agencies and nongovernmental organizations improved, particularly through active participation and support to joint review and planning activities (see the section, Collaboration with other agencies and organizations). In 1992, regional meetings were held in Bolivia, Ghana, India, Morocco and Niger. No such meetings were held in 1993, partly because of funding constraints and partly because of a move to biennial meetings in some regions. Intercountry meetings are planned for 1994 in the African, Eastern Mediterranean, South-East Asian and Western Pacific Regions.

Collaboration between the two Programmes of the Division of Diarrhoeal and Acute Respiratory Disease Control strengthened during 1992-1993, through joint developmental and country support activities. Where appropriate, recommendations were made to countries on how best to coordinate activities of the two Programmes. The number of Associate Professional Officers (APOs) with

responsibilities for both CDD and ARI, and in some cases also for breastfeeding promotion, rose during the biennium; Headquarters and regional offices began to change existing CDD positions in countries to combine CDD and ARI programme functions.

Training

Health staff training remained vitally important for the global CDD Programme and for most national CDD programmes. The global Programme placed heavy emphasis on strengthening case management skills of health workers through wide use of the WHO CDD package *Guidelines for conducting clinical training courses at health centres and small hospitals*[2] and through support of intercountry and national training of trainers (TOT) courses to create a core of proficient trainers. The Programme also trained a group of consultants both to assist countries in organizing case management courses and to strengthen health workers' communication skills. The latter was achieved by incorporating into the package a two-volume module on communication skills *Advising mothers on management of diarrhoea in the home*[3] (see Box 8). The Programme also continued to support training of national CDD staff in programme management and supervisory skills. In 1993, the Programme completed and started to use its two training packages for pre-service training *Strengthening the teaching of diarrhoeal diseases in medical schools*[4] and *Strengthening the teaching of diarrhoeal diseases in basic training programmes: A manual for instructors of nurses and other health workers*.[5] Their wide use should ensure that health workers have the needed skills before they go into service, thereby reducing the need for retraining.

The Programme continued to provide assistance to countries in their efforts to adapt and translate WHO CDD materials into local languages. For example, the *Programme managers' training course* was translated into Indonesian and Russian and adapted for use in the newly independent States (NIS) of the former USSR. China and Yemen translated the *Guidelines for conducting clinical training courses at health centres and small hospitals*. The popular *Supervisory skills training course* was translated into Chinese, Laotian, Mongolian and Vietnamese; many countries translated the *Diarrhoea management chart* and the training module *Management of the patient with diarrhoea*. The 1992 revision of the module is now available in Portuguese, in local languages in Cambodia and Myanmar, and in many other languages.

In 1992, the Programme evaluated clinical skills training and its impact on health workers' performance; these and other Programme experiences were used in the development of a new global training strategy, described below.

A new global training strategy

Knowledge, skills and attitudes are among the basic determinants of health workers' performance. Training can influence these factors and consequently help to improve health workers' effectiveness. Because the quality of care and health workers' performance need to be significantly improved over the decade, in 1993 the Programme critically reviewed its training component, following an evaluation of case management training in 1992 in the Philippines and a review of training activities in Yunnan province in China in 1993. Supervisory skills training had already been evaluated by an independent consultant in the 1990-1991 biennium. These evaluations and other Programme experiences have shown that such factors as the *training of more than one health worker per facility*, the *training of an internal supervisor* together with the health worker, the preparation during training of *plans of action that are followed up*, and *hands-on practice during training*, are all important factors in effective training. Also important to reinforce skills acquired through training are *monitoring* and *supervision*. A new global training strategy was developed in 1993 by the headquarters Working Group on National Programme Management, which recognizes the need to improve case management of all categories of providers of care in the *public* and *private health care system*. Innovative methods need to be explored to reach private health care providers, following such models as the *Guide for improving diarrhoea treatment practices of pharmacists and licensed drug sellers*[6] that was finalized during the biennium (see Training of pharmacists and drug sellers, page 11).

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

3 *A guide for health workers*, document CDD/93.1; *Instructions for facilitators*, document CDD/93.2.

4 Documents CDD/SER/93.1-93.4; publication ISBN 92 4 1544449.

5 Document CDD/94.2.

6 Document WHO/CDD/93.43.

Box 1

Planning training activities

A guide for planning training activities, drafted in 1993, comprises three steps: obtaining an overview of the system and the denominators for training; planning training activities using a worksheet; and writing a plan of action. The approach was tested in collaboration with the Western Pacific Regional Office in 1993. When training is planned, major target groups are prioritized, taking into account such factors as the stage of programme development, and which types of provider treat most cases and have the most influence on treatment practices. The planning process may also entail activities such as the development and maintenance of DTUs, monitoring visits, training-related communication activities, availability of oral rehydration salts (ORS) and other essential drugs, coordination and integration with other training activities, collaboration with professional medical associations, and evaluation activities. Budgeting and identifying funding are also critical if training activities are to be planned successfully.

The above guide for planning training will be used on its own, or as part of the overall planning guide currently under development by the Programme.

The process used to develop *comprehensive training plans* at national level can also be applied at regional and district levels to address country-specific training needs and target groups. In 1993, the Programme produced a draft guide for planning training to meet these needs (see Box 1). Training denominators are very large at the national level and often difficult to estimate, making planning and target-setting difficult. The Programme defined new training indicators, and included approaches for measuring some of them into the revised health facility survey.

In the next biennium, increased attention will be given to the *monitoring of performance* at health facilities; this will lead to on-the-job training and other problem-solving feedback. Monitoring must be an integral part of training planning and implementation. In 1993, the Programme at Headquarters initiated the development of an approach to, and tools for, monitoring that can be adapted for use in countries.

The Programme will continue to encourage countries to use the wide range of existing CDD training materials — adapted and translated to meet local requirements. New materials, such as combined CDD and ARI training courses, and the new integrated training on the management of the sick child (see the section, Integrated management of the sick child), will be introduced in a well-planned manner, appropriate for the stage of programme development of each specific country.

The Programme reviewed the various target groups needing training, and scheduled a revision of existing materials and the development of new methods and courses for 1994-1995 and beyond. The target groups considered in the new global training strategy are programme managers, mid-level supervisors, facility supervisors, health workers treating cases at health facilities and at teaching units, community health workers, medical students and other health professional trainees, pharmacists and other drug vendors, private doctors and traditional healers. Table 1 shows the training materials available at the end of 1993. The self-instructional course, the packages on strengthening the teaching of diarrhoeal diseases in medical schools and in basic training programmes, and the breastfeeding counselling course were all completed during the 1992-1993 biennium.

Programme managers' training

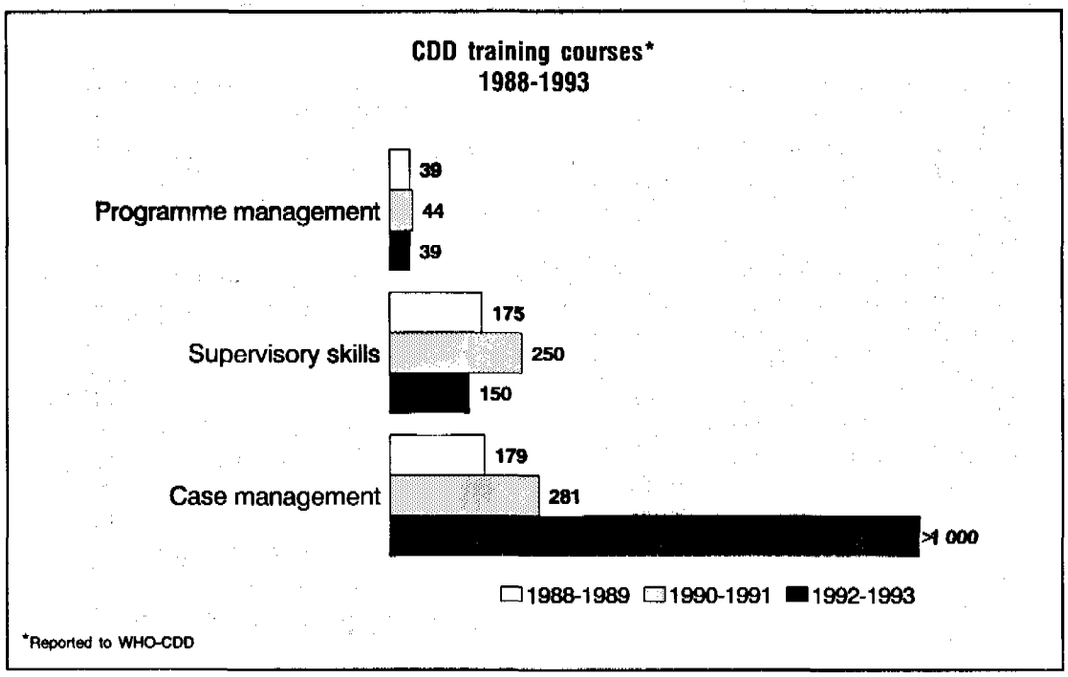
During the biennium, 39 programme managers' training courses were conducted in 25 countries. Thirty-three of them were national, and six intercountry courses. The total number of programme managers' training courses conducted since 1987, when the current version of the course was produced, now totals 122 (see Figure 1). As during the previous biennium, most of the courses were national, a reflection of many countries' wishing to strengthen the managerial capacity of their regional and provincial staff by providing them with the knowledge and skills needed to effectively plan national and regional CDD activities, set realistic targets and subtargets, and monitor and evaluate progress. In some countries,

Table 1

Training materials available to national CDD programmes

Target group	Training materials	Usual venue for training
	In-service training	
	Training of health staff in management and supervision	
National and provincial/regional staff	CDD programme managers' course	Training centre or hotel
Provincial and district-level supervisors	CDD supervisory skills course	Training centre or other suitable location
	Training of health staff responsible for case management	
Staff of diarrhoea training units (DTUs), senior physicians and paediatricians	Diarrhoea training unit: Director's guide and teaching materials	DTU
Trainers (from DTUs, district hospitals, health centres)	Guidelines for conducting clinical training courses at health centres and small hospitals	DTU
Health workers managing cases at hospitals or health centres	Guidelines for conducting clinical training courses at health centres and small hospitals	Provincial/district hospital or health centre with ORT corner
Health workers without access to any of the above courses	Clinical skills: A self-instructional course	Peripheral health facilities (health centres)
	Training of health staff responsible for counselling of pregnant women and mothers	
Health workers responsible for counselling of pregnant women and mothers	Breastfeeding counselling: A training course	Provincial/district hospital or health centre, MCH clinic
	Training of other health care providers	
Pharmacists and licensed drug sellers	Guide for improving diarrhoea treatment practices of pharmacists and licensed drug sellers	Training centre or other suitable location
	Pre-service training	
Medical students and their trainers	Strengthening the teaching of diarrhoeal diseases in medical schools	Medical school or other appropriate location
Students in nursing and in other schools for health workers and their instructors	Strengthening the teaching of diarrhoeal diseases in basic training programmes: A manual for instructors of nurses and other health workers	Nursing school or school for other health workers, and diarrhoea training unit, or health centre with ORT corner

Figure 1



e.g. Indonesia, the Lao People's Democratic Republic, Nigeria, and the United Republic of Tanzania, managerial training courses were followed by planning sessions during which trainees developed CDD plans for their respective health areas. In other countries, e.g. Kazakhstan and Turkey, the participants of managerial courses were trained to act as future trainers in their health areas.

In close collaboration with UNICEF, the Programme translated its programme managers' training modules into Russian. After conducting a workshop to adapt the translated materials, the Programme supported the first intercountry CDD programme managers' course for Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan.

To incorporate new developments in case management, the Programme updated the *National policy* module from the programme managers' course, and by the end of 1993 had updated the full course.

Supervisory skills training

The Programme maintained cooperation with national CDD programmes during 1992-1993 in the supervisory skills training of local health staff, with priority given to district-level supervisors. A course held in Mozambique and attended by the other Portuguese-speaking countries in Africa was among the approximately 150 courses reported to the global Programme in 1992-1993 (see Figure 1); many other supervisory skills training activities were not reported. The modules *Management of the patient with diarrhoea, Prevention of diarrhoea, Training* and *Community involvement* are a permanent part of the routine training of mid-level supervisors in many countries.

It was estimated that, at the end of 1993, 37% of health staff with supervisory responsibilities had been trained in the more than 120 countries with CDD programmes for which information was available.

Training in diarrhoea case management

Training in diarrhoea case management remained a cornerstone of the Programme's training efforts. The decentralization and acceleration of case management training were stressed, as was the creation of self-sufficient national training teams through the promotion of training of trainers (TOT)courses. The WHO CDD *Guidelines for conducting clinical training courses at health centres and small hospitals* was used to train trainers in more than 40 countries worldwide. *Notes on training of trainers*, written during the biennium, was used by national programmes to ensure the quality of such training. Altogether more than 80 TOT courses were reported to the Programme, including 72 national courses and eight inter-

country courses, in e.g. Côte d'Ivoire, Ethiopia, Fiji, India, Sierra Leone and Swaziland. In addition to the development of clinical and teaching skills, participants of TOT courses — namely, the future trainers — prepared plans of action. In certain countries, national CDD staff then monitored the implementation of the plans.

The Programme continued to work on improving training materials for case management training. In addition to the *Management of the patient with diarrhoea* wall chart, a pocket-sized chart of the same name is now available in English, French, Spanish, Russian and Vietnamese. This is used for easy reference during clinical training and as a job aid. At the end of 1993, the Programme started updating its widely used training package *Diarrhoea training unit: Director's guide and teaching materials*. A more extensive revision is planned for 1994-1995. In 1993, the Programme integrated the communication module *Advising mothers on management of diarrhoea in the home* into the four-day clinical training course (see also the section, Communication). Some national CDD programmes (in e.g. Bangladesh, the Philippines, United Republic of Tanzania) adapted this module to include it in their own diarrhoea clinical training.

In addition to TOT courses, national CDD programmes continued to train health staff in more than 400 DTUs in over 80 countries. During the biennium almost 1000 courses were reported, which represent — as with supervisory skills training — only a small proportion of ongoing training activities. These courses bring the total number of clinical cases reported to the Programme since 1988 to more than 2000. More than 40 000 health workers in countries with operational CDD programmes attended formal training in diarrhoea management. In addition, a large number of health workers received less comprehensive training through orientation seminars and on-the-job training.

It was estimated that, at the end of 1993, 27% of health staff responsible for diarrhoea case management had been trained in the more than 120 countries with CDD programmes for which information was available.

Responding to the increasing demand for experienced consultants both to help countries conduct case management training and to train national training teams, in 1993 the Programme organized the training of a core of CDD consultants. Consultants from eight countries participated in a special training course in Calcutta on conducting clinical training courses, preparing training plans and establishing DTUs. They also received training in communication skills (see also the section Communication).

Distance learning

In 1993 the Programme finished developing and field-testing its distance learning training package *Clinical skills: A self-instructional course*. This is the first course designed specifically for health workers unable to attend a training course away from their place of work, but with responsibility for managing cases of childhood diarrhoea.

The package consists of eight instructional chapters, an audiocassette, a course summary and study guide, a booklet of answers to chapter tests, and guides for programme managers and instructors.

The course incorporates individual work with self-instructional chapters and actual practice in treating diarrhoea patients. Those taking the course read the information and work through written exercises on their own, taking as much time as necessary and fitting their work into their own schedules. They take a self-administered test at the end of each chapter and a summary test after completing all the chapters. They are also asked to treat at least three diarrhoea patients and record the treatment details on diarrhoea case records, which are reviewed by a tutor or a course manager. To receive a certificate of successful course completion, learners must pass the written summary test and complete three diarrhoea case records correctly.

The course can be given using either a "tutor method", in which learners receive support from a supervisor or tutor, or a "correspondence method", in which learners receive support by mail and telephone from a course manager in a central office.

Training in medical schools

The Programme continued its effort to assist interested countries to strengthen the teaching of medical students about diarrhoeal diseases. This effort seeks to introduce into medical schools, especially departments of paediatrics and community medicine, concepts of diarrhoea case management and prevention that accord with the policies of national programmes, and to prepare

Box 2

CDD training in Nigeria

Despite large-scale efforts to prepare trainers to conduct diarrhoea case management courses in Nigeria since 1991, monitoring by national programme staff has revealed that few districts have developed operational diarrhoeal disease control programmes. The reasons include:

- Trainers frequently failed to carry out additional case management training for first-level workers as intended by the Programme; this was because of a lack of suitable training materials, their own lack of confidence as trainers, or a shortage of funds.
- Training materials for trainers seemed poorly adapted to the Nigerian situation.
- CDD supervisors were unavailable to monitor and assist the few basic health workers who were in fact trained (no supervisory training had been conducted in Nigeria since 1989).

After these problems were identified, a new training approach was adopted in January 1993, for testing in five states.

- Diarrhoea case management training was preceded by supervisory skills training in each area. This was carried out at local government area (LGA, or district) headquarters, so that local health area maps were on hand to demonstrate how to calculate access to services, and so that local clinics and water sources could be visited. To cover Nigeria's vast population, courses were held simultaneously at multiple sites, after combined facilitator training. The courses used WHO training materials adapted for Nigeria.
- Case management training courses for trainers were linked immediately to courses for first-level health workers. On the final day of training, all facilitators and recently trained trainers were reorganized into small training teams which then travelled to LGAs, where diarrhoea case management training was carried out for first-level health workers from basic health clinics. A newly completed three-day "hands-on" case management course and trainer's guide adapted from WHO materials were used. In 1993, 11 simultaneous courses (for 197 supervisors) were held.

When these courses are completed in 1994, there will be about 360 supervisors trained in case management, in addition to nearly 1800 first-level health workers trained in case management in 90 LGAs, all of which will have at least one trained supervisor. There will also be a large group of trainers for both supervisory skills and case management throughout Nigeria. It will then be the responsibility of each state's CDD manager to continue training activities. Depending on the results of routine national programme monitoring and a health facility survey at the end of 1994, training will be extended to the remaining regions of the country.

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 and costly in-service training of doctors will be reduced, and that such training will be more effective when it is required.

During the biennium, the training materials prepared for teachers and students were field-tested, revised and then printed. These consist of:

- *Readings on diarrhoea,*[7] a manual for medical students;
- An *Instructor manual,*[8] which describes a variety of methods and activities suitable for teaching students about diarrhoeal diseases and other clinical subjects;

[7] Publication ISBN 92 4 154444 9.

[8] Document CDD/SER/93.1.

- A set of *References on diarrhoea*,[9] which contains selected original articles related to the treatment and prevention of diarrhoea; and
- A *Guide to student evaluation*,[10] which describes approaches to assessing both knowledge and skills in relation to the control of diarrhoeal diseases.

Additional materials have also been prepared for use during workshops which introduce medical-school teachers to a variety of teaching methods; the teachers then develop plans to use these methods to strengthen the teaching of diarrhoeal diseases in their schools.

Readings on diarrhoea has been published by WHO in English and French, making it available through the Organization's global distribution network. The manual describes 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 for teaching in which students participate more actively, rather than for lectures. Ideally, each student should have a personal copy of this manual.

During the biennium, workshops were held in Egypt and India to assist teachers in the departments of paediatrics and community medicine to plan ways to strengthen the teaching of diarrhoeal disease control to their students. This brings to six the number of countries, and to more than 80 the number of medical schools, that have taken part in this initiative to date. A workshop was also held in Viet Nam both to review progress made by medical schools that took part in workshops in 1990, and to introduce additional teaching materials and methods. Evaluation of progress made in implementing new teaching methods and materials was carried out in Indonesia (see Box 3), Philippines and Viet Nam.

Workshops were also held in the Dominican Republic and Zambia during which a task force of experienced medical educators was trained to lead workshops in individual countries. This will make it possible to extend this initiative to a greater number of countries and medical schools.

In 1994, at least six workshops will be held, involving about 35 medical schools in eight to ten 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

Appropriate pre-service training of students remains an important approach to establishing correct diarrhoea case management practices among nurses, midwives and other health workers. During the biennium, the Programme finalized a training package *A manual for instructors of nurses and other health workers*, which constitutes the technical resource basis for curriculum-strengthening activities. Simple guidelines on how to conduct the preparatory visit and the initial workshop in a country have also been developed. During the 1994-1995 biennium, these guidelines will serve to train a core of resource people to assist countries in planning, implementing and monitoring these activities.

At country level, activities were carried out in collaboration with the Expanded Programme on Immunization (EPI) for improved teaching, entailing planning visits then workshops attended by decision-makers from training institutions. During the workshops, decisions are taken on feasible modifications of the curriculum to strengthen its CDD and EPI components, and implementation plans prepared. Monitoring visits are made a year after the workshop, and they help to identify achievements and constraints related to the implementation of the revised curriculum.

In 1993, Ethiopia and Swaziland updated the CDD curriculum in basic health worker training schools. A preparatory visit was made to the United Republic of Tanzania, where the workshop for the revision of the curriculum will be held early in 1994. Follow-up visits were made to Nepal and Viet Nam. By the end of 1993, 15 countries had organized CDD/EPI workshops with WHO cooperation, and monitoring visits had been made to five countries. CDD focused programme reviews evaluated the experiences in Ethiopia and Viet Nam during the biennium.

Evaluation to date suggests that several positive changes flow when curricula are updated. First, faculty staff and students become familiar with the concept of a standard case management

[9] Geneva, WHO, 1993.

[10] Document CDD/SER/93.2.

Box 3

Strengthening the teaching of medical students about diarrhoeal diseases in Indonesia

The initial CDD training materials for medical students were developed jointly by WHO and PRITECH. These were introduced to 25 of the 26 government and private medical schools in Indonesia during workshops for teachers of paediatrics held in 1989, 1990 and 1992. As with more recent workshops, the objectives were to develop workplans to improve the content of diarrhoeal disease teaching in the schools, increase the use of interactive teaching methods and supervised clinical practice, establish an ORT corner or DTU in each school's teaching hospital, and train other paediatric faculty and key hospital staff in the WHO approach to case management and diarrhoeal disease teaching. All training materials were translated into Bahasa Indonesia and made available to workshop participants and their schools. The student manual was often photocopied by students — a common local practice.

In 1993, a review of 18 schools was carried out to assess progress in implementing workplans and to identify problems that required further attention. Some of the main achievements ascertained were:

- Hospital directors and faculty deans were generally very supportive; conferences had been held to review the content of the workshop with other faculty and hospital staff.
- ORT units or DTUs had been established in all teaching hospitals but one; their staffing was adequate and all DTU directors had received formal training in diarrhoea case management.
- Many of the teaching methods and most of the content introduced during workshops had been adopted. Students were routinely managing diarrhoea cases in the ORT unit or DTU.
- Student knowledge of diarrhoeal diseases and skill in case management appeared to have improved substantially. In one school, this was assessed before and after implementation of the workplan. This showed:

	Performance adequate (%)	
	Before	After
Knowledge	41	66
Patient assessment	33	63
Diagnosis/treatment plan	26	78
Effective communication	6	31

However, some of the problems encountered were:

- It was difficult to establish uniform diarrhoea case management practices among all hospital staff.
- ORS supply was not entirely reliable; food was not provided to outpatients in the DTUs.
- Unnecessary antibiotic use was still prevalent.

approach to improving the quality of essential services. Second, they see the value of hands-on practice in learning the principles on which the WHO CDD training materials are based. Third, such students are more capable of advising mothers and other caretakers on diarrhoea case management in the home; the new graduates who have received the pre-service training in CDD practices and procedures will require less in-service training and reorientation. It is also hoped that in the future, with a higher proportion of health workers having skills in proper diarrhoea case management, staff turnover will affect the quality of patient care less. This should contribute to improved sustainability of programme activities.

Training of pharmacists and drug sellers

When trying to improve management of diarrhoea, it is important to work with all providers of care, not just those in the government health system. In most countries, private sector pharmacies and over-the-counter drug stores are a common source of advice on health matters.

Box 4

Working with pharmacies in Kenya

Anywhere between 10 and 100 customers a day with health problems — but no doctor's prescription — may visit a typical urban retail pharmacy in Kenya. In small towns with fewer doctors, the number may be even greater.

In 1992-1993, Kenya's CDD programme used the WHO Guide for improving diarrhoea treatment practices of pharmacists and licensed drug sellers to carry out a training programme to improve advice given by pharmacists and their assistants about managing diarrhoea. From the start, the programme involved the Pharmaceutical Society of Kenya, the Kenya Medical Training Centre and the University of Nairobi.

Nairobi and five other towns were chosen as sites for the training programme. Their range of training methods included: one-to-one discussions with an opinion leader within a pharmacy (e.g. the pharmacy owner); one-to-one discussions with pharmacists; and small group training sessions for pharmaceutical assistants. Four types of printed material were used after pretesting: two pamphlets for pharmacy staff (one on ORS and one on antidiarrhoeals); a general pamphlet for customers; and a wall poster.

Small group training sessions were found to be the most effective method because, unlike large seminars, attention could be paid to individual needs. Importantly, small groups allowed for a discussion of constraints to applying recommendations. Role plays on advising customers were performed.

The pilot phase of the training was completed in 1993: 162 pharmaceutical assistants in 90 pharmacies received training. Initial evaluation shows promising results: questionnaires given to participants before and after training showed that training increased overall knowledge; purchase surveys in five towns showed that ORS sales increased by 24-32%, while sales of antidiarrhoeals decreased by 6-12%.

Several lessons can be learned from Kenya's experience.

- It is important to find out why drug sellers behave as they do. In some cases, drug sellers may have adequate knowledge, but motivation may be the problem. It is also crucial to work out the sort of training that will best meet the needs identified.
- Pharmacy staff prefer training from an independent and credible organization - such as WHO or UNICEF. Such training should not appear as a threat. It is also important to involve the national professional association of pharmacists, and other organizations and individuals outside the CDD programme.
- Producing printed materials is one of the most expensive parts of the intervention. Therefore, only one or two carefully designed printed materials should be used to reinforce the training messages.

Indeed, they are usually more numerous than public health facilities and often the first source of advice when parents or their children are sick.

However, advice on diarrhoea and the products sold is usually inappropriate, and occasionally dangerous. Ineffective antidiarrhoeal drugs are often recommended instead of oral rehydration therapy. The reasons for this include lack of knowledge; availability of inappropriate drugs; consumer demand for inappropriate drugs; inappropriate prescribing by doctors; higher profit margins for antidiarrhoeal drugs than for ORS; and weak or poorly enforced drug regulations.

Ideally, national CDD programmes should tackle all these factors, but many countries do not have the resources for such a comprehensive strategy. However, as a first step, the WHO Programme has designed a training approach which focuses on one key area — improving drug sellers' knowledge. The approach combines face-to-face communication (trainers meet drug sellers individually or in small discussion groups) with the distribution of pamphlets and posters promoting correct practice.

A training manual *Guide for improving diarrhoea treatment practices of pharmacists and licensed drug sellers* has been field-tested in Kenya (see Box 4)

and Indonesia. It provides a step-by-step guide to setting up a local training programme.

The guide suggests the following steps:

- Learn about how drug sellers treat diarrhoea and why.
  - Study the system for drug sales: identify drug outlets and sellers; identify the best selling ORS and antidiarrhoeal drugs.
  - Choose a target audience: identify which type of drug outlet and geographical area to target.
  - Use a survey to learn about drug sellers' knowledge and practices.
  - Identify factors that influence drug sellers' practices: consult local experts such as the pharmacists' association, the ministry of health, and pharmaceutical manufacturers; use this information and the survey results to devise key questions and carry out focus group discussions with the target audience.
- Design and plan a training intervention.
  - Decide on an intervention: form a working team; use the research already done to work out which key behaviours to change; choose the most appropriate type of educational intervention (e.g. one-to-one visits, small group discussions).
  - Develop a workplan, including a time schedule.
  - Develop printed materials: choose the principal messages based on earlier research, and design and pretest materials.
  - Train the trainers and pilot-test the educational intervention.
- Carry out the intervention and evaluate results.
  - Develop a plan for the monitoring and evaluation of the training.
  - Implement and assess the intervention.

The two field-tests showed that lack of knowledge and skills are important reasons for drug sellers' behaviour. Training that changes their knowledge and skills can change behaviour, at least initially. The Programme plans to expand the training intervention to include drug use for acute respiratory infections.

Integrated management of childhood illness

Globally, pneumonia, diarrhoea, malaria, measles and malnutrition cause nearly three-quarters of deaths in children under five 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 management 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. Also, the majority of children present with more than one complaint, and young infants with a life-threatening illness commonly present with non-specific clinical signs; both of these issues, which make a disease-specific approach inappropriate, are addressed by the integrated materials.

The integrated clinical guidelines for sick children aged two months to five years are summarized on three case management charts. The first summarizes how to *Assess the child and classify the illness*. 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. This information is used to classify the illness using a colour-coded triage system. This classification leads to specific treatment instructions summarized on a second chart, *Treat the child*. The third chart, *Advise the mother*, displays the key elements of home care of the sick child that should be explained to the caretaker. Guidelines for the young infant are summarized on a separate chart.

Box 5

Principles of fluid and food management of diarrhoea in the home

Several fluids should be identified that are readily available, considered acceptable by mothers, and that do not have adverse effects for children with diarrhoea. If possible, one selected fluid should normally contain salt. Some examples are: salted rice water, a salted soup, and ORS solution. Mothers may also be taught to add salt (about 3g/l) to an unsalted soup or drink, but this requires a substantial and sustained educational effort, which may not be cost-effective.

Salt-free fluids should also be selected. These include common drinks such as weak tea (plain or slightly sweetened), rice water, yoghurt-based drinks, and plain water. Certain fluids should be avoided, such as soft drinks, coffee, or those with diuretic or purgative effects.

The fluids selected above should be given in increased amounts up to as much as the child wants to drink, and along with continued feeding. Breastfeeding should be maintained. Children taking infant formula or animal milk should continue to receive it at full strength. Children eating solid foods should continue to take them, including, if possible, one that normally contains some salt.

When this approach is followed, the child will receive enough carbohydrate and protein to promote the absorption of ingested salt. This, together with increased water taken in drinks, will prevent dehydration in most episodes of diarrhoea.

The course will include the following:

- Instructional material on case management at health centres and on case management at home. Available in 1994, 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.
- In addition, training material will be prepared on subjects related to the support required to permit staff trained in case management to function optimally, such as:
  - — Drug availability and management at the health facility and district levels.
  - — Monitoring of health worker and facility performance and outputs.

These materials will allow several programmes in a ministry of health to collaborate in health worker training and 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 successfully at home by giving the child increased fluids 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, an estimated 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 costly in most settings to persuade mothers to give fluids prepared using special recipes, such as sugar-salt solution. In fact, most episodes do not need such specially prepared fluids. Most fluids normally used as drinks, including water, together with food, are adequate, although their efficacy is improved if the fluids or food contain some salt.

The Programme has tried to resolve this problem by developing guidelines for early home therapy that emphasize increasing the total intake of fluid, using fluids that are available in most homes and that most mothers consider acceptable for children with diarrhoea. A document on this topic, *The selection of fluids and food for home therapy to prevent dehydration from diarrhoea: Guidelines for developing a national policy*,[11] was finalized and distributed in

[11] Document WHO/CDD/93.44.

Box 6

Home fluid policy in the Philippines

The Department of Health (DOH) of the Philippines organized a meeting in April 1993 to review the status of the national CDD programme and to draft a new "directional plan" for 1993-1998. Central and regional staff of the DOH, WHO, UNICEF and the Child Survival Project supported by USAID participated in the review and planning exercise. The directional plan has been endorsed by the management committee of the DOH, and will be used as the basis for operational planning. One item in the new directional plan is the home fluid policy which was drafted using the guidelines produced by the WHO CDD Programme. The policy is as follows:

Give the child more fluids than usual

Start giving extra fluid as soon as diarrhoea starts. Give the following fluids:

— fluids that contain salt, such as ORS solution, rice water or soups with salt;

— fluids that do not contain salt, such as water, rice water or soups without salt, or coconut water.

Do not give soft drinks, sweetened fruit drinks, sweetened teas, or coffee. Continue to give extra fluid until diarrhoea stops.

Infants under six months of age who are exclusively breastfed should continue breastfeeding and be given ORS. If ORS is not available, give plain water. Other fluids should not be given.

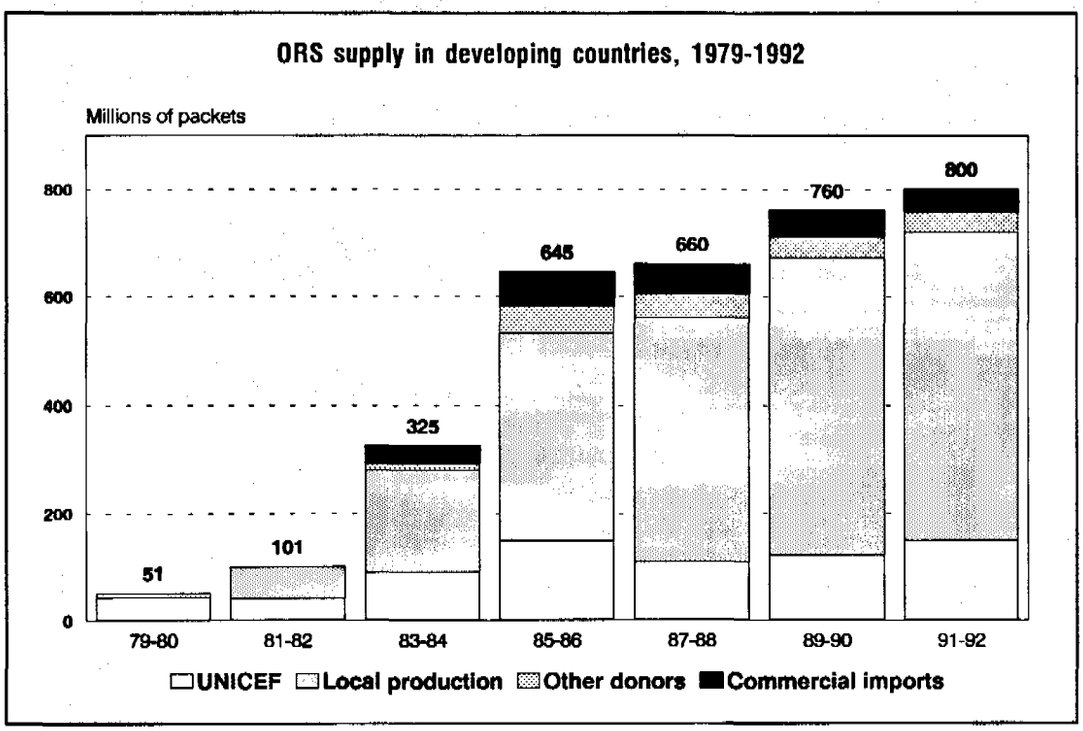
1993. These guidelines will be used to strengthen efforts to promote the early use of increased fluids and continued feeding during diarrhoea episodes at home. Acceptable home fluids will be identified using the focused ethnographic survey, currently under development by the Programme. Other methods may also be used. The principles of this approach are presented in Box 5 and an example of its use in the Philippines in Box 6.

ORS production and supply

The availability of sufficient quantities of ORS has remained one of the Programme's concerns during the biennium. With the information obtained through the annual survey of ORS distribution and local production, the periodical assessment and analysis by country was maintained. This enabled the Programme to focus efforts, in close collaboration with UNICEF, on those countries where the lack of ORS was identified as being most critical. In addition to assessing foreign donation and commercial import of ORS and assisting with local government production, the Programme has turned its attention to other aspects of ensuring ORS availability. This has included closer collaboration with national drug administrations, national pharmacists' associations and countries' pharmaceutical industries. These efforts are aimed at progressively reducing countries' dependence on donors' support.

The price of locally produced ORS is often viewed as excessive in comparison with the world market price or that of UNICEF-supplied ORS. This has led some local authorities, and international agencies, to consider procurement of ORS from cheaper sources abroad. The reasons for high costs of ORS are commonly: high import duties on raw and packaging material; high sales tax on the finished product; excessive overheads related to inefficient production; high financing costs (often due to delays in payments); rush orders which require overtime (caused by poor planning of clients); high depreciation on infrastructure, equipment and buildings; and restricted availability of foreign currency, forcing the manufacturer to obtain it in the parallel market at a higher rate. The Programme has assisted countries in addressing these problems by analysing the country-specific situation and by seeking possible solutions, in e.g. the Dominican Republic, Ethiopia, Mexico and Peru. The Programme has often 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 during the biennium in Afghanistan, Albania, Somalia and Sudan. As a result, the number of developing countries producing ORS decreased to 60 by the end of 1993.

Figure 2



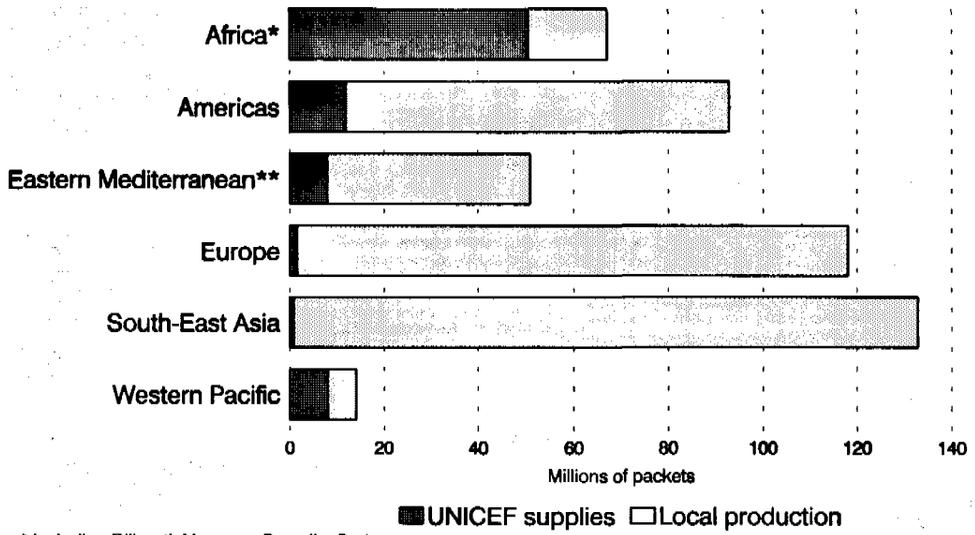
It is estimated that a total of 410 million packets were produced in 1991, and 390 million in 1992 (see Figure 2). In both years, around two-thirds of these packets were produced locally. The quantity of this ORS which had a different composition from that recommended by WHO/UNICEF decreased further in 1992 to around 45 million packets, or approximately 11.5% of the total amount of ORS available in developing countries.

In 1991, the amount of ORS provided by UNICEF rose to 67 million packets (compared with 45 million packets in 1990). The primary reason for this increase was the outbreak of cholera in Latin America. The demand for ORS further increased in 1992, with UNICEF providing 82 million packets (see Figure 3). Sixty per cent of these packets were shipped to countries on the African continent where UNICEF supplies accounted for three-quarters of all available ORS. By contrast, in Asia, UNICEF supplies accounted for less than 1% of available ORS. UNICEF also began supplying ORS as part of its collaboration with some Eastern European countries and the newly independent States of the former USSR.

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, the private pharmaceutical industry has often shown limited interest in the commercial manufacture of ORS. In 1992, some private 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 and colouring) are covered in a document entitled *Notes on acceptable limits for the composition of ORS*, which became available in March 1992. This document allows local drug administrations in countries where formulae other than that recommended by WHO and UNICEF are allowed, to verify whether a product's composition is within acceptable limits. The

Figure 3

Comparison by Region of amounts of ORS supplied by UNICEF and produced locally, 1992



* Including Djibouti, Morocco, Somalia, Sudan
** Excluding the above four countries

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 the biennium: China, Colombia, Cuba, Dominican Republic, Ethiopia, Guatemala, India, Kenya, Mexico, Morocco, Myanmar, Nigeria, Pakistan, Peru, Philippines, Sri Lanka, Sudan 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. In addition to these visits the engineer provided an ever-greater amount of technical advice by correspondence to both the public and private sectors of the industry.

Promoting the rational use of drugs

During the biennium, the Programme continued to promote the rational use of drugs in the management of diarrhoeal diseases in children. To complement the review of antidiarrhoeal drugs which was conducted in 1990, the Programme started a review of the rationale for its guidelines on the assessment and treatment of dysentery, including the correct use of antibiotics. The review will be finalized and made available in 1994. The guidelines *Management of the patient with cholera*[12] were also revised; a paper on the correct case management of diarrhoea, including the use of drugs, was published in 1993,[13] primarily addressed to developed countries.

The WHO publication *The rational use of drugs in the management of acute diarrhoea in children*,[14] prepared by the Programme, continues to be widely referred to and used in educational and regulatory efforts to reduce the availability and use of antidiarrhoeal drugs. By the end of 1993, WHO had published 15 000 copies in English and 4 000 in French, and it has been translated into Bengali, French, Spanish, and Vietnamese, with a Chinese translation under way. The booklet is also printed in a local version in India.

During the biennium, many countries reviewed their drug policies and took regulatory action to restrict the use of antidiarrhoeals in the case management of children with diarrhoea. Table 2

[12] Document WHO/CDD/SER/91.15, Rev.1 (1992).

[13] Richards L, Claeson M, Pierce NF. Management of acute diarrhoea in children: Lessons learned. *Pediatr Infect Dis J*, 1993, 12:5-9.

[14] Geneva, WHO, 1990.

Table 2

Regulatory actions concerning antidiarrhoeal drugs for use in children, as reported to the World Health Organization

Programme for the Control of Diarrhoeal Diseases in 1990-1993

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 94 brand-name antidiarrhoeal products containing antibiotic mixtures, hydroxyquinolines, non-absorbable sulfonamides, and other substances	Banned Deregistration of solid and liquid formulations	November 1990 October 1991
Lebanon	All products containing loperamide, diphenoxylate, diphenoxine and furazolidone. Liquid formulations of streptomycin	Restriction on use in children, deregistration and banning of products	August 1991
Libyan Arab Jamahiriya	10 brand-name paediatric products containing loperamide, diphenoxylate, hydroxyquinolines, or pectin	Withdrawn	May 1990
Malaysia	66 brand-name products containing loperamide, diphenoxylate, kaolin, pectin, activated charcoal, attapulgite	Restriction on use in infants and children	January 1992
Mexico	5 brand-name paediatric products containing loperamide and diphenoxylate	Deregistered	December 1990
Nepal	Liquid preparations of loperamide and diphenoxylate. Several combination drugs used as antidiarrhoeals	Production and sale banned Import and export banned	August 1991 February 1992
Norway	Loperamide	May only be dispensed on prescription	January 1992
Pakistan	3 brand-name combination drugs used as antidiarrhoeals	Deregistered	1989-1990
	Paediatric formulations of loperamide, diphenoxylate, diphenoxine and pipenzolate	Banned and withdrawn from the market	June 1990
Peru	Paediatric formulations of loperamide	Deregistered and withdrawn	October 1990
	All paediatric preparations containing diphenoxylate, streptomycin, hydroxyquinolines and kaolin/pectin	Deregistered and withdrawn	March 1991
Philippines	All paediatric formulations containing loperamide and diphenoxylate. Large group of antimicrobials containing antidiarrhoeal drugs	Deregistered	September 1991
Rep. of Korea	Loperamide	Restriction on use in children	May 1991
Sri Lanka	Paediatric formulations of loperamide, kaolin, pectin	Deregistered	November 1991
Thailand	Paediatric formulations of loperamide and diphenoxylate	Deregistered	February and March 1992
Turkey	Paediatric formulations of loperamide	Banned	September 1991

shows the actions taken in 1990-1993, as reported to WHO. Of particular global interest are the reviews of the marketing of antidiarrhoeal drugs, ongoing in large developing and developed countries, such as those initiated in 1993 by the Federal Drug Administration of the USA and the drug regulatory body in India; the outcomes of these reviews are not yet known to the Programme.

Medical professional groups in many countries play a critical role in the promotion of correct case management and the rational use of drugs (e.g. India, Pakistan, Philippines, USA). With the coordinated efforts of policy-makers, programme managers, medical professional groups and consumer groups, it is anticipated that the regulatory actions taken by some countries in the biennium, and other educational and communication activities undertaken, will contribute to a more rational use of drugs over the decade.

In 1993, the Headquarter's working group on home case management reviewed the Programme's research and developmental activities in the promotion of the rational use of drugs, and revised its research priorities and activities. In the 1994-1995 biennium, the Programme will: assess the results of the ongoing studies supported by the Programme in the 1992-1993 biennium; try to better assess the relationship between inappropriate drug use and correct case management; seek opportunities to evaluate rational use of drugs efforts as part of the Programme's ongoing implementation and evaluation of case management activities; and continue to collaborate with other divisions and agencies concerned with the rational use of drugs.

The Programme assisted certain countries, including Cameroon, Congo, Egypt, Pakistan and Sri Lanka to assess their drug use problems and to identify solutions to these problems as part of focused programme reviews. The draft guide to improve the rational use of drugs in acute diarrhoea in children was used in these reviews.

Communication

In 1992 WHO and UNICEF agreed on a set of global targets for CDD. One of the key targets is that by 1995, 80% of mothers of children under 5 years of age will be able to state the three rules of case management in the home (increase fluid intake, continue feeding, and seek medical care when needed). Global communication efforts have thus concentrated on assisting national programmes towards meeting this target. Continuing the direction begun in 1991, the Programme has during the biennium developed a set of simple tools to assist national programmes to implement effectively a limited number of interventions, in particular face-to-face communication between health worker and mother, and the use of radio to reach a broader population.

Based on the information from health facility surveys that the proportion of mothers correctly advised by health workers ranges from 1% to 10%, the first half of the biennium focused on the development, testing, and application in national programmes of the training guide *Advising mothers on management of diarrhoea in the home*. This guide, intended to help health workers improve their communication practices, comprises a series of practical exercises to teach basic skills and a process for health workers to follow when advising mothers on home case management. Data from an evaluation carried out in Viet Nam show that after practical training in interpersonal communication skills, health workers utilized the new skills, and their advising practices as reported by caretakers improved considerably (see Box 7). Training in the advising mothers methodology has been applied in Bangladesh, China, Egypt, the Philippines, United Republic of Tanzania, and Viet Nam; workshops for national CDD programme staff have been held in Ethiopia and Sudan. The materials have been translated into French and will be ready for distribution in the first quarter of 1994. *Advising mothers* itself has been translated into many languages, including Arabic, Bangla, Chinese, Swahili and Vietnamese. It has now been integrated into clinical training in at least 11 countries.

Although the *Advising mothers* guide may be used as a discrete training activity, it is preferable that it be applied in the context of a clinical management course (see Box 8). The Programme made a firm commitment to helping countries incorporate advising skills into clinical management training by holding the first integrated training course for consultants. This course, held at NICED, Calcutta in April 1993, was conducted by the CDD Headquarters staff responsible for clinical management training and for communication; participants were clinical trainers from various countries including Belgium, Egypt, France, Germany, India, Russian Federation, Sweden, and the USA. As a result, national programmes now have access to a pool of qualified consultants and to a thoroughly tested

Box 7

Viet Nam national CDD programme: Selected data on health worker performance in interpersonal communication skills

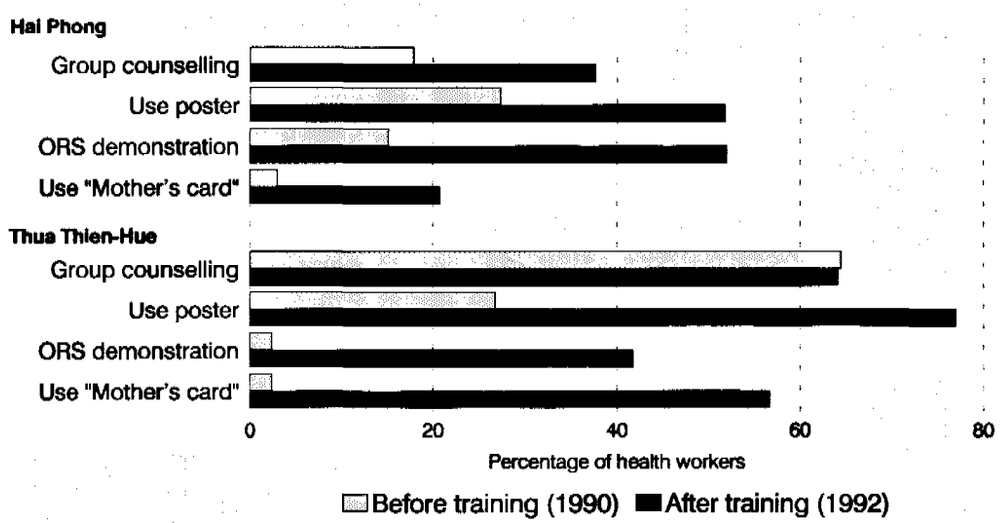
In 1990, the Viet Nam national CDD Programme began training health workers in interpersonal communication skills (IPC), including one-to-one and small group advising, the use of simple language, asking checking questions, using printed materials effectively, and conducting demonstrations preparing ORS and rice water. Health workers in six sentinel provinces are monitored regularly by national or regional CDD programme staff to assess, by observation, their performance during a consultation. Questions were added to household surveys in two provinces to assess caretakers' exposure to CDD programme educational materials and to assess their perception of health workers' communication practices. The data presented in the following table and figure were compiled during the 1992 focused programme review, and show a positive trend in health worker performance both as observed by national programme staff and as perceived by caretakers.

Characteristics of CDD patient counselling based on 124 observations of 103 health workers during the year following training in IPC

(some health workers observed more than once)

Characteristic	%
Used simple language	91
Asked open questions to verify understanding	75
Used visual aids	76
Used correct technical content	85
Advice given realistic for patient's situation	71
Patient repeated advice accurately	71
Patient participated in discussion	50

Health worker CDD communication practices in two provinces before and after training in IPC



Source: Household surveys

Box 8

Integrating *Advising mothers* into clinical management training

Clinical management training has usually focused on teaching participants to assess cases and to treat dehydrated children, following the guidelines for treatment plans B and C. In fact, the majority of the cases of diarrhoea in children seen by health workers are mild, without signs of dehydration; for these, treatment Plan A consists mainly of advising the mother. Nevertheless, training in communication skills has often been neglected, or at best conducted separately from other, more "clinical" training.

For this reason the Programme is recommending use of the *Advising mothers* training materials in clinical management training courses. Training in the *Advising mothers* methodology now begins on the first day of training in clinical management. Participants are prepared to apply the new communication skills and process as soon as they begin clinical observation and practice on day two of the course. Gaining skills in advising mothers or other caretakers is given as much importance as learning assessment and treatment.

One great advantage of the clinical management training course is that it is conducted in less than one week. In the integrated version, *Advising mothers* exercises are inserted whenever Plan A is discussed as participants work through the modules on the management of the patient with diarrhoea. A few homework assignments are given, and practice on advising is carried out in the time already allocated for clinical practice. Integration is complete, and the one-week time limit and sufficient time with patients are both maintained.

A course to train consultants in the integrated methodology of clinical management and advising mothers was held at the National Institute of Cholera and Enteric Diseases, Calcutta in May 1993. The 10 participants were clinicians with experience in national CDD programmes and in clinical settings. All recognized the need for increased emphasis on good interpersonal communication skills, and the need for practical training in this area. It was a surprise, then, that at the beginning of this particular course the participants expressed resistance to the simplicity and the structured nature of *Advising mothers.*

In the clinical practice sessions of the course, however, the participants saw that the structure proposed in *Advising mothers* was useful in helping to build on the mothers' answers and to present the essential information in a simplified way. The mothers were interested, but when faced with the worry over their child, compounded by the immense heat of the clinic, there was a limited amount of information that they could absorb. They needed to be encouraged to give the ORS spoonful by spoonful. They needed to discuss the essential advice about what to do at home. They appreciated being asked questions, such as what their child liked or was able to eat. When one participant practised conducting a demonstration on the preparation of ORS solution, his newly learned skills and process attracted the attention of all the mothers in the DTU. By the end of the course and after many hours of clinical practice, participants were enthusiastic about the fundamental concepts, skills taught and simplicity of the *Advising mothers* process.

agenda for the integrated training course. Consultants from this group were active in 1993, introducing *Advising mothers* in training courses in China, Egypt, the Central Asian Republics and Kazakhstan.

The second half of the biennium was devoted to the diffusion of *Advising mothers,* and to the development of a guide for national programmes on the effective use of radio (see Box 9). This guide will be ready for distribution and use in its final form in the first quarter of 1994.

Both global and national communication activities during the biennium were marked by substantial interagency collaboration. During the February 1993 meeting for WHO and UNICEF country officers from 10 countries, global communication issues were selected as a priority topic for presentation and discussion. In local activities, UNICEF/Dhaka supported and participated in the development and testing of both the *Advising mothers* and radio materials; UNICEF/Brasilia, Cairo, Dar es Salaam, Hanoi, Manila, Mexico, and Rabat are among the offices which provide staff

Box 9

Testing the CDD radio guide in Bangladesh

Bangladesh was selected as the site for the first test of the guide to effective use of radio in national CDD programmes for a number of reasons. Radio is an important medium in Bangladesh, and the national programme was interested in systematizing and improving its use. In addition, recent quantitative and ethnographic data on which messages could be based were readily available, and finally, UNICEF/Dhaka was willing to help organize, participate in, and support local costs of the activity.

An interdisciplinary team was created for this work. Members included two medical officers from the national CDD programme, three representatives from Radio Bangladesh, one staff of the social marketing company responsible for ORS promotion, and one communication officer from UNICEF. This team first worked together with CDD Headquarters and HEALTHCOM consultants for a two-week period in May 1993 to analyse available data, to define an appropriate target audience for radio messages, to select a limited number of message areas, to define the approach and emotional appeal of the messages, and to write draft scripts. Actual spots were recorded in June, and one consultant returned to Bangladesh in July to participate in the pretest of the spots.

Analysis of the data turned up a few unexpected facts. First, although the national programme had wanted to use radio to teach mothers, the data showed that men are much more likely to have access to and listen to radio. Second, the programme had intended to teach the list of recommended home fluids; however, the studies showed clearly that these fluids are already known and used, and that the real problem concerns the quantities that are given. Third, despite the team's impression that the word "saline" was commonly used to refer to all fluids given for diarrhoea, pretest data showed that people understand this to mean only ORS or lobon-gur (salt-sugar) solution. Thus a series of spots was developed which target men, which encourage the use of fluids in increased quantities, and which avoid the use of the term "saline" in a generic fashion. The results of broadcasting these spots in a systematized, intensive manner will be evaluated in 1994.

and major levels of financial support to national CDD programme communication activities. HEALTHCOM (USAID) has been an equal partner in the development and testing of the radio guide. Finally, with the BBC World Service Education Project the Programme is engaged in active dialogue regarding the development of the radio guide and the BBC's health-related broadcast materials.

Assessing diarrhoea case management at home

The protocol for the diarrhoea case management survey became available for use in countries in 1989. This survey allows national programme managers 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 several programme indicators used by national programmes to assess progress.

During the biennium, 31 household surveys of diarrhoea case management were conducted in the following 20 countries: Bhutan, Burkina Faso, China (2 surveys), Egypt, Gambia, Guinea-Bissau, India (2 surveys), Indonesia (4 surveys), Mexico, Mongolia, Myanmar (4 surveys), Nigeria, Pakistan (3 surveys), Sudan, Thailand, Tunisia, Uruguay, Viet Nam (2 surveys), Yemen and Zambia.

In addition to the above-mentioned surveys, the programme conducted six integrated CDD/ARI household surveys during the biennium (see the section Integrated household survey).

Table 3 and Figure 4 provide selected results of 76 surveys conducted in 36 countries since 1989. The median rates reflect aggregated data from national programmes at different stages of development and in various parts of the world. Globally, perhaps because of the aggregated cumulative data, median results have remained relatively stable over the last few years:

Table 3

Results of household surveys of diarrhoeal case management in 1990-1993

	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
Burkina Faso	1	national	13.4	73.7	15	41.8	73.1	30.6	27.3	30.5
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
Gambia	1	national	40.4	37.4	50.9	44.2	N/A	N/A	N/A	N/A
Guinea-Bissau	1	national	23	66.6	25.8	54.5	50.8	27.7	16.8	45
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 & nat.	27.7	63.8	74.9	35.5	65.6	23.3	28.1	59.3
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	5	4 divisions	23.9	68.7	34.0	17.9	79.2	14.2	38.1	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	6	7 districts	31.6	76.4	52.6	27.2	74.8	20.3	43.6	73.4
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
Syrian Arab Rep.	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	6	6 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
Total no. of countries	36									
Total no. of surveys	76									
Minimum			0.8	12.1	13.5	12.5	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			22.7	59.2	57.3	32.4	69.3	20.5	32.0	43.1

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

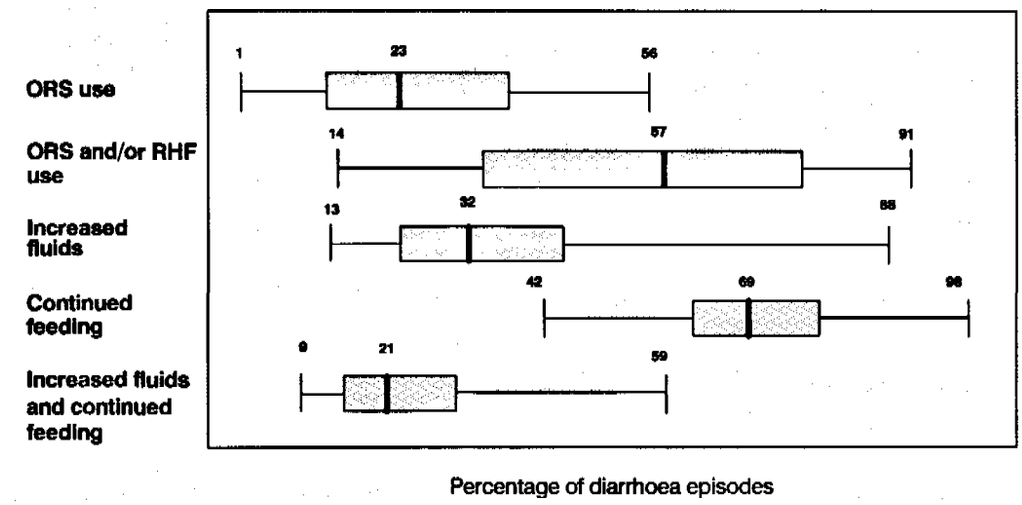
[b] In past years this has been reported as the ORT use rate. However, the policy with respect to ORT now gives greater emphasis to increasing the amount of fluid with less emphasis to the type of fluid given. A definition of ORT requiring an increase in total fluid intake will be used from 1993. Note 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

Figure 4

Indicator results from household surveys 1990-1993



The central box covers the middle 50% of data values, between the upper and lower quartiles. The centre line is the median. The lines extend out to the minimum and maximum values.

Source: 76 CDR household surveys in 36 countries.

- almost one-quarter (22.7%) of diarrhoea episodes receive ORS,
- one-third (32.4%) are reported by their caretakers to have been given increased fluids, and
- two-thirds (69.3%) are reported to have received continued or increased feeding during the diarrhoea episode.
- 43% of episodes receive at least one drug, usually unnecessarily.

One rate that appears to be increasing is the proportion of episodes reported to receive ORS and/or a recommended home fluid; the current median is 57.3%. This increase may be a reflection of two factors: the greater emphasis that national programmes have put on increased use of home fluids to prevent dehydration; and the global Programme's promotion of a revised strategy for home-based ORT during the biennium. The latter has led to numerous countries accepting many fluids as suitable home fluids, even water, and not just those made from a special recipe.

Country experiences with the assessment of case management at home are presented in Boxes 10 and 11.

Integrated household survey

In response to country requests for an integrated survey, the Programme proceeded with the development of a household survey that incorporates questions on diarrhoeal disease, acute respiratory infections (ARI), and breastfeeding. The questionnaires are included in a manual, which also contains explanations of the questions and guidelines on setting up and supervising survey activities, training surveyors, and analysis of results. The manual is a modification of the current CDD manual, which was last revised in 1989, and is being developed with the assistance of ACT International, Atlanta, USA. The survey methodology was field-tested in Zanzibar (United Republic of Tanzania), the Philippines, and Sri Lanka. The Sri Lanka survey was also used to train 10 consultants and two regional office staff.

As with the previous version of the 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:

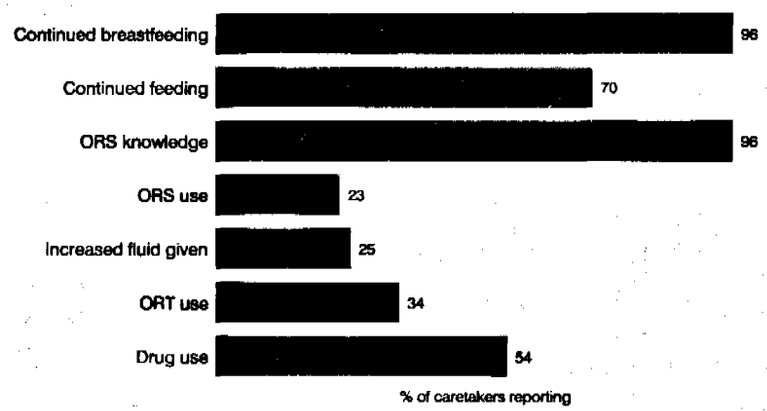
Box 10

Household case management survey, Egypt

In 1992, the Government of Egypt decided to carry out a household survey to evaluate the impact of previous interventions, including training, ORS production and distribution, and mass communication activities. Three topics of special interest to the Ministry of Health were: measuring caretakers' knowledge and practices in the home treatment of diarrhoea; estimating the prevalence of the use of drugs during diarrhoea; and collecting information on breastfeeding practices in children aged two. The survey was conducted in three districts in each of two governorates in the central part of the Delta region of Lower Egypt. A total of 9711 households and 11 032 children under 5 years of age were included in the survey. The survey documented an estimated seasonally adjusted annual incidence of 3.8 episodes per child per year.

Encouraging survey findings included the high percentage of children who continued to be breastfed during diarrhoea episodes (96%), and the fact that 70% of children were reported to have received "about the same" or "more" food during the diarrhoea episode. A striking survey finding was that while knowledge about ORS was very high among caretakers (96%), less than one out of four caretakers (23%) reported that they had used ORS to treat the current diarrhoea episode. Caretakers of 25% of cases reported that they had increased the total volume of fluids offered to the child during the episode, and the ORT use rate[1] was 34%. The drug use rate was very high (54%), often involving multiple drugs and injections. Children were seven times more likely to be given drugs without ORS than to be given ORS without drugs. The main sources of advice recommending administration of drugs were private practitioners (50%) and government providers (23%).

Home case management in Egypt, 1992



Source: Household case management survey, Ministry of Health, Egypt

The survey results suggest that the high levels of caretaker awareness that have been achieved are not sufficient to sustain the higher rate of ORT use reported in the previous three years. One reason offered for the discrepancy between ORT knowledge and reported use was that ORS and ORT use may not have been sufficiently encouraged by health workers during their interactions with caretakers.

The survey conclusions and later discussions with ministry of health staff suggested that despite the progress made, wider support was required to improve and sustain appropriate diarrhoea case management practices. Interventions to build this support should include active participation by health workers. They should also promote a more positive attitude towards appropriate case management and retrain both physicians and health workers where needed.

The Ministry of Health has now established a detailed plan of activities for the next three years designed to further improve the home case management of diarrhoea.

[1] Defined for this survey as ORS and/or increased amounts of fluids.

Box 11

Household surveys in Zambia: Progress and constraints, 1986-1992

In 1992, the Zambian national CDD programme repeated a national household survey of 1986 with WHO, UNICEF and PRITECH support in the same locations as before, making it possible to review trends and to identify achievements and constraints. The surveys show that the magnitude of the diarrhoeal diseases problem (as reflected in diarrhoeal episodes) has remained unchanged. However, there was an increase in the ORS use rate from 32% to 53% in the urban population and from 22% to 37% in rural areas. This can be attributed to a broad range of CDD activities, including improved ORS production and distribution, community-based interventions and training of health staff.

One important finding was a reduction in inappropriate drug use between 1986 and 1992. In particular, use of antidiarrhoeals fell from 42% to 6% in urban areas, and from 32% to 1% in rural areas. One important factor that may have contributed was the removal of antidiarrhoeal drugs from the National Formulatory in 1978.

Another notable finding of the 1992 survey was the high prevalence of persistent diarrhoea and dysentery, which may be related to rising rates of malnutrition and HIV infection in the country.

The significant improvements reflected in the survey findings (e.g. increases in ORS use, decreases in inappropriate drug use) indicate that the programme has successfully implemented planned activities. Future programme plans include a continued emphasis on the training of health workers and other health providers (including traditional healers), and an increased emphasis on communication and community-based interventions designed to sustain and further improve existing practices at the household level.

- mothers' knowledge of home management of diarrhoea and ARI;
- careseeking for ARI and diarrhoea needing assessment;
- use of ORS and recommended home fluids and their preparation;
- fluid intake and feeding during diarrhoea;
- use of drugs in the management of diarrhoea and ARI; and
- exclusive, predominant and continued breastfeeding.[15]

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

The survey has been used in six countries (including field tests, in which the results were used to review and improve national programmes): Lao People's Democratic Republic, Papua New Guinea, Philippines, Sri Lanka, United Republic of Tanzania and Uganda. Selected results of these surveys are available in Table 4. These results have not been combined with those of the earlier CDD household surveys (see Table 3), because improvements in question wording, presentation, or recall periods for some questions preclude strict comparison of the results. One advantage of the integrated methodology is that recent revisions in global and programme indicators have been incorporated into the instruments and analysis. As an example, Figure 5 presents results for three CDD indicators: the proportion of diarrhoea episodes in which the caretaker reports that the child received increased fluids; the proportion of episodes for which the caretaker reports continued feeding; and the proportion of episodes for which both increased fluids and continued feeding are reported.

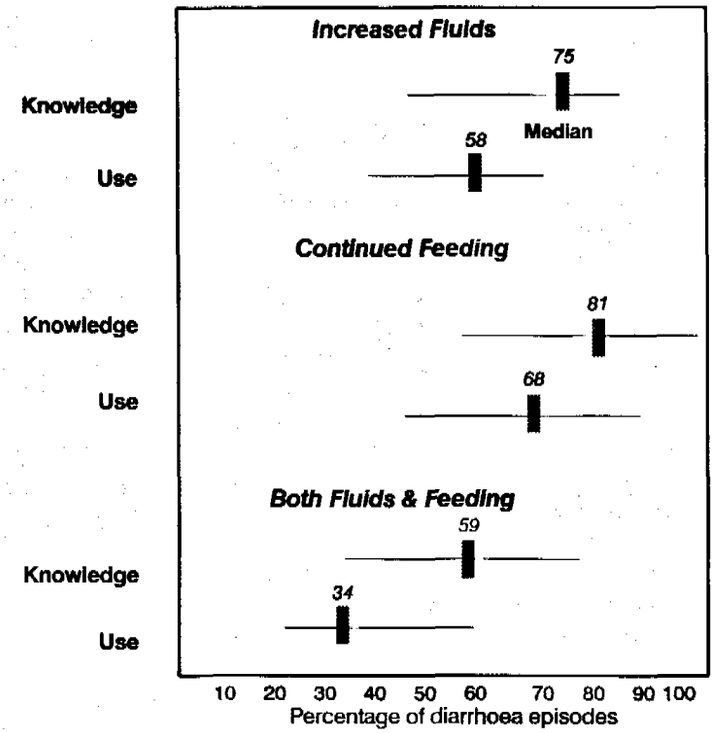
[15] *Exclusive breastfeeding*: the infant has received only breastmilk from his/her mother or a wet nurse, or expressed breastmilk, and no other liquids or solids with the exception of drops or syrups consisting of vitamins, mineral supplements or medicines.

Predominant breastfeeding: the infant's predominant source of nourishment has been breastmilk. However, the infant may also have received water and water-based drinks (sweetened and flavoured water, teas, infusions, etc.); fruit juice; ORS solution; drop and syrup forms of vitamins, minerals and medicines; and ritual fluids (in limited quantities). With the exception of fruit juice and sugar-water, no food-based fluid is allowed under this definition.

Continued breastfeeding: children within a specific age group who have been breastfed in the last 24 hours.

Figure 5

Knowledge and reported use of increased fluids and continued feeding



Source: Household surveys in Lao People's Democratic Republic, Papua New Guinea, Philippines, Sri Lanka, United Republic of Tanzania, Uganda, 1992-1993.

Table 4

Results of integrated household surveys, 1992-1993

Country	Caretaker's knowledge of 3 rules				Caretakers' practice			Drug use	ORS access rate
	Careseeking	Increased fluids	Continued feeding	All 3 rules	Increased fluids	Continued feeding	Both		
Lao People's Dem. Republic	20.0	42.0	77.0	9.0	62.0	49.0	31.0	88.0	85.0
Papua New Guinea	14.0	71.0	72.0	8.0	62.0	58.0	37.0	59.0	N/A
Philippines	13.3	85.8	96.0	12.3	69.8	88.2	62.5	N/A	97.5
Sri Lanka	29.0	78.0	85.0	23.0	37.0	77.0	29.0	71.0	100.0
United Republic of Tanzania	3.4	82.3	96.8	3.0	54.3	89.5	49.3	58.2	N/A
Uganda (rural)	54.0	62.0	57.0	25.0	48.0	41.0	23.0	52.0	68.0

N/A = not available.

Figure 5 also presents data comparing "knowledge" and "use", and as expected, the proportion of caretakers who have knowledge of correct home case management is higher than the proportion who report actually practising these behaviours when their child has diarrhoea.

Initial reports from country programmes indicate that the integrated survey methodology provides useful information, and reflects an improvement in the overall survey methodology. One national report on the survey experience is summarized in Box 12.

Assessing case management practices in health facilities

In 1990, the Programme developed a survey manual to assist national CDD programmes in collecting and analysing qualitative and quantitative information about the quality of diarrhoea case management in health facilities, and to help them detect and describe problems. In addition, this health facility survey provides information on CDD programme indicators.

Between 1990 and 1993, 29 health facility surveys were conducted in 28 countries. Three of these surveys were based on a revised methodology explained below, and results are not yet available for two others. Results of the remaining 24 surveys in 23 countries are summarized in Table 5 and Figure 6 for four key elements of correct case management at health facilities: the proportions of diarrhoea episodes that were correctly assessed, correctly rehydrated, and for whom the caretaker was correctly advised; and the proportion of cases diagnosed as dysentery that were correctly treated. Treatment of dysentery was found to have the highest performance level among these four aspects of case management, with a median of 33% of diarrhoea cases treated correctly across the 24 surveys.

The percentages of cases correctly assessed (median 16%) and correctly rehydrated (median 20%) are low, with only a few surveys reporting values above 50%. The poor overall performance of health workers in assessing children with diarrhoea is explained by the low percentage of health workers asking about or conducting an examination for the required signs and symptoms of dehydration. Poor performance in rehydration reflects both incorrect treatment selection and incorrect specification of the amount of ORS or IV fluids to be administered.

Lowest performance levels were documented for the indicator on advising caretakers, with a median of only 6% of mothers found to be correctly advised on home case management for their children with diarrhoea. This finding may be due in part to the demanding criteria used for indicator measurement. Health workers were considered to have performed correctly only if they provided the mother with information on ORS preparation and administration, home treatment, and prevention of diarrhoea, *and* if her comprehension of the instructions was assessed. Nevertheless, performance levels for each of the component criteria were below acceptable standards and further efforts are needed to improve and maintain appropriate case management of diarrhoea in health facilities.

In response to country requests for more guidance on sampling, and to permit measurement of revised indicators, a major review and revision of the CDD health facility survey was conducted in the biennium. The revised survey methodology was field-tested in Indonesia, Jordan and Malawi. The results are included in a special section at the bottom of Table 5. Summaries of three countries' experience using both the original (Brazil) and revised (Jordan and Malawi) survey methods are available in Box 13.

Major improvements in the revised health facility survey manual include:

- the inclusion of detailed guidance on survey sampling;
- an expanded section on the training of surveyors;
- changes in the survey instruments to delete items not found feasible for measurement or useful for programme management (for example, items related to signs of dehydration that are no longer listed in the treatment chart);
- the addition of new items related to the WHO/UNICEF indicator on correct case management and the determinants of health worker behaviour;
- more comprehensive forms for hand-tallying of results; and
- the addition of a data entry and analysis package for those countries wishing to use microcomputers rather than, or in addition to, the hand-tally system.

Box 12

Household integrated CDD/ARI survey in the Lao People's Democratic Republic

The combined CDD/ARI household case management survey was used to conduct a survey in the Vientiane Municipality of the Lao People's Democratic Republic in April and May 1993. The objectives of the survey were: 1) to obtain information on where families seek care for their children with diarrhoea and/or ARI as a basis for the design of health education messages; 2) to assess breastfeeding practices in children under 4 months of age; and 3) to develop national technical capabilities to carry out similar health surveys in the future. Data were collected through interviews with caretakers of children under 5 years of age using the standard cluster sampling technique outlined in the draft WHO survey manual.

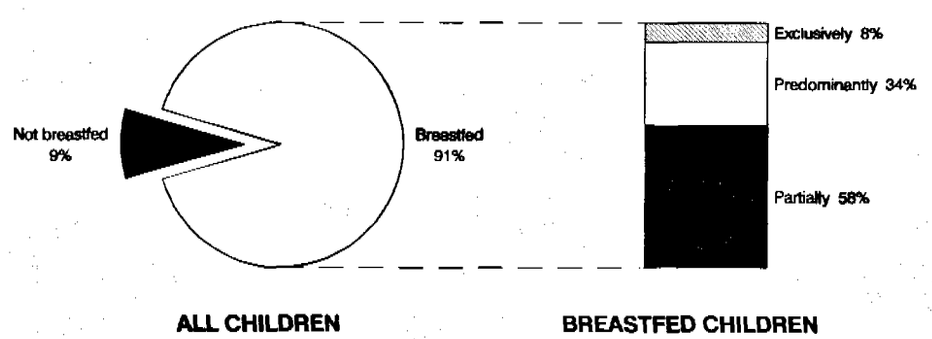
A total of 2593 households were surveyed, including 4111 children under 5 years of age. Among these children, 7% were reported to have had diarrhoea in the past two weeks. After adjustment for seasonality, this yields an annual incidence rate of approximately 1.3 episodes of diarrhoea per child. A total of 22% of children were reported to have had cough in the past two weeks, and 3% were reported to have had cough with difficult or fast breathing (suggesting pneumonia).

Patterns of careseeking were found to be similar for diarrhoea and ARI. Only approximately one in five mothers correctly identified the signs that indicate they should seek care for their child with diarrhoea or ARI from a health care provider. Both CDD and ARI programmes need to focus on informing caretakers about when to take their children to health care providers. This could be achieved by emphasizing more the communication component during training courses and by developing country-specific, appropriate communication messages.

The survey results suggest that national programme efforts to promote ORS use have been successful, with ORS and ORT use rates of 40% and 55%, respectively. In contrast, the extremely high rates of unnecessary drug use in treating diarrhoea and ARI indicate a serious problem in home case management. As many as 88% of the children received one or more drugs for diarrhoea, and 25% of children with ARI were given a drug by their mother that was judged by the national programme to be harmful. This also implies a problem in the quality of care provided by both public and private health care sectors. Both CDD and ARI programmes should give high priority to efforts to reduce inappropriate drug use.

In children under 4 months of age, 91% of mothers reported breastfeeding but only 8% of this group reported exclusive breastfeeding. Thirty-nine per cent of children were reported to be bottle fed, and this proportion is likely to increase given active marketing efforts of infant formula manufacturers in the country.

Breastfeeding practices for children under 4 months
Vientiane Municipality, Lao People's Democratic Republic



Source: CDD/ARI integrated household survey, 1993.

At the close of the survey, the national CDD programme manager and a WHO staff member presented the survey findings, conclusions and recommendations to a meeting of the directors of various sections of the Ministry of Health and representatives from UNICEF and NGOs. A summary version of the report was translated into Lao and distributed widely by the Ministry of Health. The survey was successful in mobilizing increased support for the CDD and ARI programmes, and national technical capabilities in survey implementation were developed.

Table 5

Indicator results from health facility surveys 1990-1993[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[c]	0	0
Pakistan	1991	16	18	6	62
Tanzania, United 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	64
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
Bolivia	1993	24	22	11	33
Brazil	1993	8	6	1	24
Peru	1993	22	44	8	59
Minimum		0	0	0	0
Maximum		73	84	46	83
Median		16	20	6	33
Using revised methodology					
Indonesia	1993	43	25	16	35
Jordan	1993	63	7	14	64
Malawi	1993	21	51	1	14

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

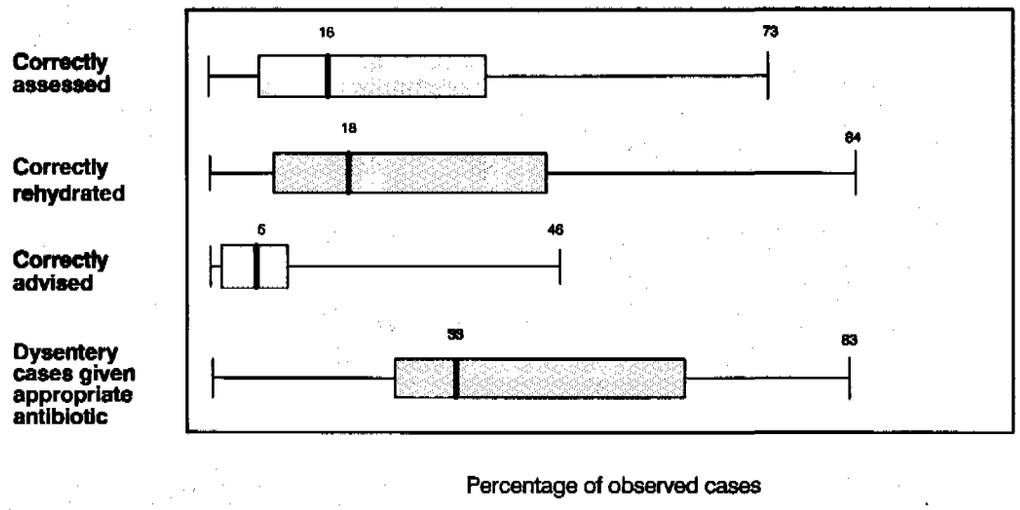
[b] Results are not directly comparable between countries owing to differences in sampling procedures.

[c] Definition used for "correct rehydration" is not comparable with that used by other countries.

N/A = not available

Figure 6

Indicator results from health facility surveys 1990-1993



The central box covers the middle 50% of data values, between the upper and lower quartiles. The centre line is the median. The lines extend out to the minimum and maximum values.

Source: 24 surveys in 23 countries.

Throughout the revision process, the Programme has carefully tried to ensure that the CDD health facility survey is compatible with the ARI health facility survey, to facilitate future integration. The revised CDD manual will be finalized and available to national programmes in 1994.

Focused Programme Reviews

The Focused Programme Review (FPR) is a standard method that WHO currently recommends to national programmes for assessing the status of programme activities and progress towards predefined targets, and for identifying and proposing solutions to constraints to programme implementation. The method was developed in 1991 and field-tested in Bangladesh (see Eighth Programme Report[16]). The FPR is conducted in two phases. Phase I assists national CDD programmes in identifying achievements and issues in implementation. In Phase II, a small number of priority issues (five at the most) are examined in greater detail, and specific solutions are developed and integrated into a plan of action.

[16] Document WHO/CDD/92.38.

FPRs are most meaningful when they are conducted towards the end of an implementation cycle, so that the workplans developed in the context of the review allow improved programme delivery and guide the implementation of carefully selected activities.

FPRs were completed in 12 countries during the biennium. Including the field test, the 13 countries that have conducted FPRs are: Bangladesh, Cameroon, Congo, Egypt, Ethiopia, Kenya, Morocco, Niger, Pakistan, Sri Lanka, Sudan, Viet Nam, and Zimbabwe (see Box 14). In addition, Indonesia completed Phase I in late 1993, with Phase II planned for early 1994.

A critical review of the FPR experience in 13 countries was undertaken in 1993. The major findings for each of the two Phases are summarized below.

For Phase I

- In the majority of countries, adequate information was available to support the FPR. Sources of data included: household and health facility surveys; other surveys (e.g. mortality surveys, or knowledge, attitude and practice surveys) information from routine reporting systems; and special studies.

Box 13

Assessing and improving the quality of CDD case management in health facility surveys

Three surveys carried out in 1993 illustrate the range of information that can be generated and its usefulness for programme management.

Sample characteristics	*Brazil* (nine state capitals)	*Jordan* (national)	*Malawi* (national)
Facilities visited	475	140	129
Caretakers interviewed	192	60	62
Diarrhoea cases observed	474	138	129
Health personnel interviewed	463	175	178

Key findings	— 1% of caretakers given correct advice — 6% of dehydrated cases (n=71) correctly rehydrated — 24% of cases with bloody stools treated appropriately — 34% of cases received unnecessary drugs — 53% of health workers reported some training in CDD; only 6% trained in course based on WHO guidelines	— health workers (physicians) reached correct conclusion about dehydration for 88% of cases — among 13 dehydrated cases observed only 1 was correctly rehydrated — ORT corners were functioning in only 5 of the 60 facilities surveyed — 47% of general practitioners and 70% of paediatricians believe that dehydrated children should be seen in health facilities	— health workers asked about blood in stools for only 24% of cases — 66% of cases diagnosed with some dehydration received ORS within 30 minutes of diagnosis — while 78% of health workers could identify the correct treatment for children with dehydration only 31% could specify the *amount* of ORS needed — only 2 health workers had received training on diarrhoea case management in the previous 3 years
Programme response	— two-year operational plans of action developed at state level — interventions developed to improve training quality	— increased emphasis on practical training — identified need to revise medical and nursing school curricula — ORT corners to be established in all government health facilities	— recommended that training efforts be expanded, with emphasis on hands-on training — recommended that CDD focal person be identified at regional and district levels

Box 14

Focused programme review in Zimbabwe

In 1993, a focused programme review (FPR) was carried out by the Government of Zimbabwe. Phase I took place in February, and Phase II in May. External participants included representatives of WHO, UNICEF and Gesellschaft für Zusammenarbeit (GTZ).

In Phase I, relevant programme documents were reviewed and available data used to identify the progress that had been made towards programme targets.

The major achievements identified included the development of practical guidelines for case management, a training manual, and a diarrhoea case management chart; routine conduct of clinical skills training in three Diarrhoea Training Units (DTUs); the establishment of ORT corners in 60% of health facilities; and almost universal awareness among mothers of the home fluid recommended for the treatment of children with diarrhoea by the national CDD policy in Zimbabwe.

In Phase II, priority areas were chosen for in-depth review, and the review team divided into four working groups to collect information for each area and to develop recommendations. For *training*, the FPR team recommended that the national CDD programme continue to emphasize training activities at all levels, including among village community workers. To ensure quality, greater emphasis should be placed on actual practice with patients during training activities related to clinical management and effective communication with caregivers. Training efforts directed at traditional practitioners were also recommended, as these providers play an important role in diarrhoea management in Zimbabwe.

For the priority area of *supervision*, the working group recommended training in supervisory skills, the development, implementation, and support of well-planned supervisory schedules, and identified the need for sufficient resources to conduct timely and effective supervisory visits.

The working group responsible for *case management at the household level* suggested that alternative home fluids be explored on a provincial basis to account for cultural variations and differences in the availability of ingredients. This led to the finalization of a national CDD policy on appropriate home fluids.

For information, education and communication (IEC), the working group recommended that existing materials be reviewed, that collaboration among various sectors in the development of new methods and materials be improved, that an IEC campaign be organized with an increasingly strong emphasis on preventive aspects of diarrhoea, and that a better distribution and monitoring system be developed for IEC materials.

The review led to a detailed workplan for 1993-1995. The workplan specified areas for close collaboration between the national CDD programme, WHO, and UNICEF.

- In all countries, available information was interpreted and used both to quantify progress towards programme targets and as the basis for problem identification and analysis.
- The priority issues identified in Phase I of the FPRs are summarized in Table 6. Although a variety of programme issues emerged, there were four issues that together accounted for nearly 75% of all issues taken to Phase II. These issues were programme management, training, supervision, and information-education-communication (IEC).

Table 6

Priority issues identified in Phase I of FPRs in 13 countries

Training	23%	(13/57)
Supervision	21%	(12/57)
IEC	18%	(10/57)
Programme management	12%	(7/57)
Rational drug use	10%	6/57)
Case management	7%	(4/57)
ORS logistics	7%	(4/57)
Prevention	2%	(1/57)

For Phase II

- Country review teams used a wide variety of data collection strategies to obtain additional information regarding the priority issues under review in Phase II. Examples are key informant interviews, document reviews, health facility record reviews, small-scale surveys targeting various groups of respondents (e.g. health care providers, mothers, pharmacists, supervisors), focus group discussions and structured site visits (e.g. health facilities, pharmacies, ORS manufacturers). The national CDD programmes showed ingenuity and flexibility in adapting or developing methods to gather specific data.

- The involvement of external resource people (from WHO, UNICEF, and bilateral donors) was common in all FPRs, and provided a good opportunity for workplans to be developed jointly by national programmes and involved donor agencies.

- Regular monitoring of the implementation of activities planned in FPRs is essential. Monitoring should be included as an integral part of the workplans resulting from future FPRs, and monitoring visits should be scheduled at the close of Phase II. Follow-up visits by WHO staff have been carried out in Egypt, Morocco, Pakistan, Sudan and Viet Nam.

In conclusion, experience with the use of the FPR to date has been positive. The method has provided national CDD programmes with a cost-effective method for evaluating programme progress and examining a limited set of programme issues in detail. Through a systematic review of existing information and focused data collection, effective and feasible solutions have been incorporated into national plans of action. The experience in 13 countries indicates that the objectives initially set for the development of the method — to make the programme review and planning process data-based, problem-specific, action-oriented, and structured — have been met.

In addition to the FPRs, seven other countries conducted either comprehensive or desk reviews in 1992 (Burkina Faso, two provinces in China, Ghana, Lebanon, Liberia, Samoa, and Yemen), while one country (Sierra Leone) carried out a desk review in 1993.

Measuring childhood mortality

The Programme has directed considerable efforts to the development and evaluation of simple, reliable methods to measure diarrhoea-specific mortality. In collaboration with the London School of Hygiene and Tropical Medicine, three surveys were conducted between 1991 and 1993 to evaluate the ability of country programmes to produce high quality mortality estimates for both overall and diarrhoea-specific mortality.

The retrospective household surveys were conducted in a single province in Viet Nam (1991), three provinces in Indonesia (1992), and in a national sample of households in Bangladesh (1992-1993). Cluster sampling methods were used within the survey areas, based on probability proportional to population size. The approaches to mortality estimation that were evaluated included the preceding birth technique, and verbal autopsies were used to identify causes of death.

All three surveys yielded overall mortality estimates that were plausible, internally consistent and compatible with estimates derived from other sources where they were available. The indirect methods used to estimate recent mortality levels (the Brass method and the preceding birth technique) provided reasonably valid estimates of recent deaths. The results suggest that country programmes can use these methods to monitor overall mortality levels and trends, although considerable expert assistance would be required in most settings.

Cause-specific mortality estimates, however, were found to be impractical for calculation by countries or programmes by means of a household survey. The technical expertise in survey design and analysis required to carry out such a survey is beyond that available to most national programmes, and sample size requirements are prohibitively large. While the findings of the three surveys suggest that it may be possible (although difficult) to obtain baseline data on broad cause of death categories that may be useful for programme planning, the information will not be sufficiently precise to evaluate programme impact.

These findings lend further support to the conclusions and recommendations of a joint informal WHO/UNICEF consultation on the measurement of overall and cause-specific mortality in

infants and young children.[17] The conclusions of both the surveys in the research programme and the informal consultation are that countries and individual programmes will not be able to measure changes in cause-specific mortality on a routine basis. Consequently, the Programme will place less emphasis on mortality surveys in the future, although efforts to identify and develop simple ways to estimate the number of diarrhoea deaths and trends in diarrhoea mortality will continue.

ORS access and reported use of appropriate fluids

The ORS access rate is the proportion of the population with a regular supply of ORS in their community. Until 1991, the definition also required that the ORS provider be trained in case management, but few countries applied this criterion.

In the past, the ORT use rate was defined as the percentage of diarrhoea episodes in children under 5 years of age reported to have received ORS and/or a recommended home fluid. Based on programme experience, this definition has now been changed to emphasize the *volume* of fluids received by the child. The current definition of the ORT use rate is *the proportion of diarrhoea episodes for which the caretaker reports an increase in total fluid intake by the child.* The country programme profiles used for the global estimation of indicators do not yet include the information needed for the revised ORT use rate. Current global estimates for this indicator are based on the results of household case management surveys in countries where they have been conducted, and are reported above in the section Assessing diarrhoea case management at home. Data reported below are based on the earlier definition, reflecting the number of episodes reported to have received ORS and/or a recommended home fluid (RHF).

Biennial estimates of the ORS access rate and the proportion of diarrhoea episodes reported to have received ORS and/or a recommended home fluid are presented in Table 7 and Figure 7. Country-specific estimates are available in Annex 1.

The global estimates are for developing countries, and are based primarily on figures reported by national CDD programmes to the WHO regional offices using CDD country programme profiles. These profiles were completed by 80 countries in 1993. For the remaining countries, estimates were calculated in collaboration with regional offices, based on other reliable sources such as programme documents or survey results. As will be seen below, estimates are weighted to reflect population size, so highly populous countries will have greater impact on regional and global estimates than less populous countries.

Table 7

Estimated ORS access, and ORS and/or RHF use rates in children aged 0-4 years, 1983-1993, by WHO Region and globally

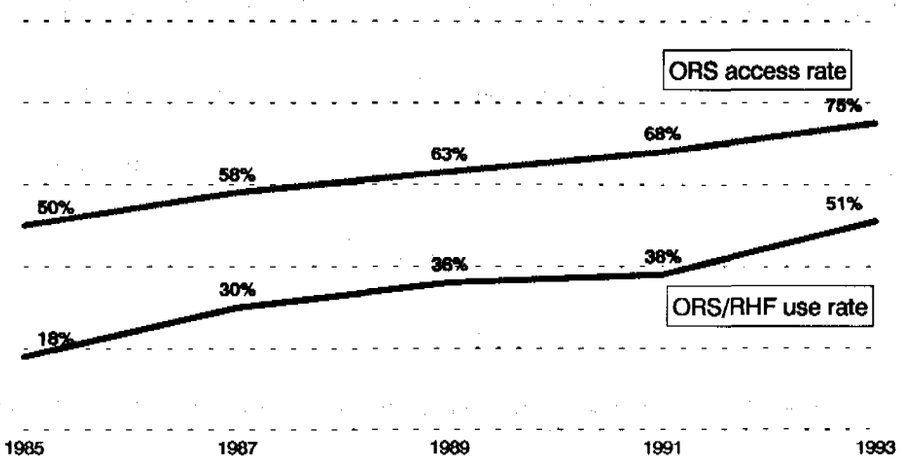
	ORS access rate						ORS and/or RHF use rate				
Region	**1983**	**1985**	**1987**	**1989**	**1991**	**1993**	**1985**	**1987**	**1989**	**1991**	**1993**
Africa	5	22	38	52	57	63	8	19	36	40	57
Americas	9	44	62	68	68	70	10	39	48	54	59
Eastern Mediterranean	30	54	69	70	75	80	22	40	47	40	50
South-East Asia	43	69	64	64	68	79	25	29	19	20	38
Western Pacific[a]	29	45	57	69	82	85	32	34	39	34	50
Global[a]	**24**	**50**	**58**	**63**	**68**	**75**	**18**	**30**	**36**	**38**	**51**

[a] Developing countries. Excluding China.

[17] *The measurement of overall and cause-specific mortality in infants and children.* Report of a joint WHO/UNICEF consultation, 15-17 December 1992. Document WHO/ESM/UNICEF/CONS/92.5.

Figure 7

Estimated global ORS access, and ORS and/or RHF use rates* 1985-1993



* Definitions available in text. The ORS and/or RHF use rate is not equivalent to the current "ORT use" indicator.

The global ORS access rate was estimated to be 75% at the end of the biennium, compared with 68% in 1991. Among the 121 countries in the Programme Profile database, 70 (58%) had achieved an ORS access rate of at least 80%. All regions reported an increase in ORS access during this period. The major contributor to this global increase was the South-East Asian Region, where ORS access increased from 68% to 79%, and in particularly India, which reported an increase from 60% to 77%. The African Region also reported a substantial increase (from 57% to 63%), reflecting increases in a number of countries including Benin, Chad, Congo, Ghana, Guinea, Guinea-Bissau, Mozambique, Uganda, Zambia and Zimbabwe. The Western Pacific Region continues to have the highest access rate (85%) with 10 out of 13 countries reporting rates of over 80%.

By 1993, the global ORS and/or RHF use rate was estimated to be 51%, compared with 38% in 1991. With the exception of the Region of the Americas, all regions showed marked increases (at least 15%) in this indicator. Due to its vast population, India's reported increased use of recommended home fluids contributed greatly to increases in both the regional and global rates. Other countries in the South-East Asian Region also reported substantial increases, including Bhutan, Indonesia, Myanmar and Thailand.

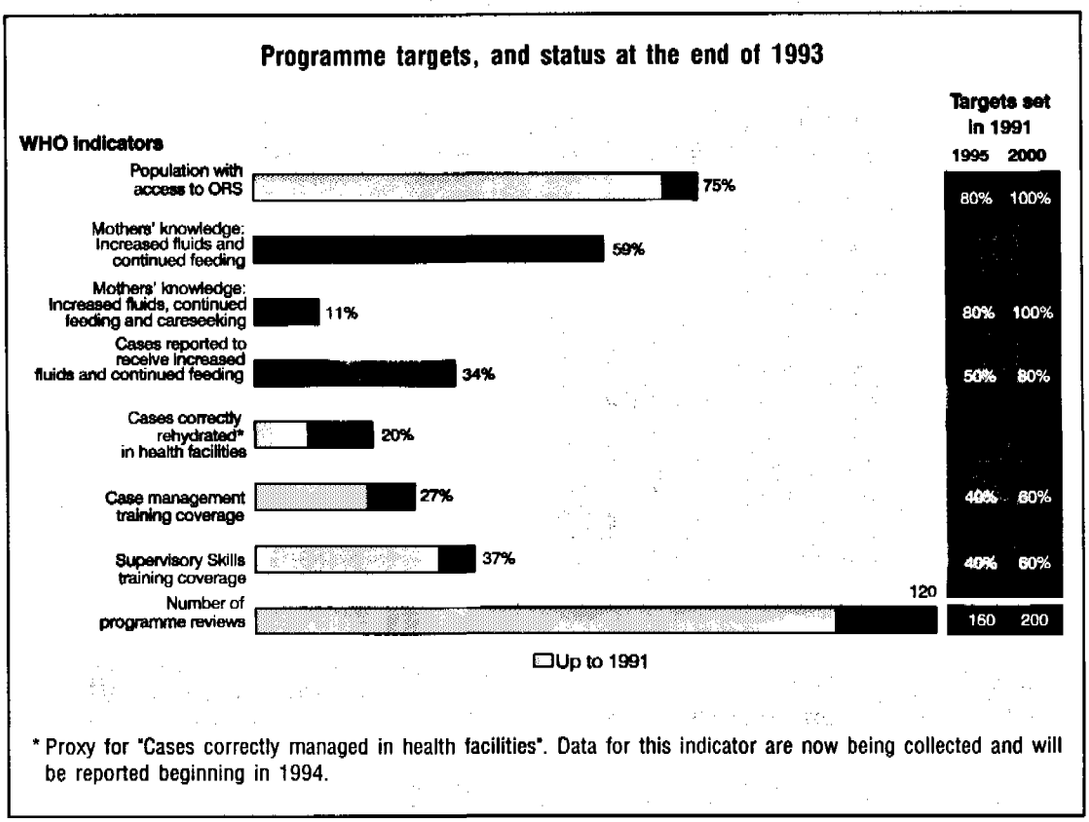
In the Western Pacific Region, the ORS and/or recommended home fluids rate rose from 34% to 50%, owing primarily to an increase in the Philippines. Substantial increases were also reported in the Lao People's Democratic Republic and Papua New Guinea.

The rate in the Eastern Mediterranean Region decreased slightly in 1992, because CDD household surveys conducted that year in Egypt, Sudan and Tunisia indicated that ORS use rates were much lower than had been previously reported. The regional rate rose substantially for the biennium, however, from 40% at end of 1991 to 50% at the end of 1993. This increase is due largely to Pakistan, where a variety of home fluids, including water, was added to the definition of acceptable fluids.

In the African Region, the ORS and/or RHF rate also increased significantly over the biennium, from 40% to 57%. This reflects substantial increases in two countries with large populations (Ethiopia and Nigeria) which broadened their policies on home fluids. Increases were also reported in a number of other countries, including Benin, Guinea, Guinea-Bissau, Malawi and Uganda.

Consistent with the trend since 1987, the ORS and/or RHF rate in the Region of the Americas increased modestly, from 54% to 59%.

Figure 8



* Proxy for "Cases correctly managed in health facilities". Data for this indicator are now being collected and will be reported beginning in 1994.

While these increases certainly reflect a broadening of the definition to include a wider range of recommended home fluids, it seems justified to attribute at least part of the increase to successful CDD programme activities, both in communities and in health facilities.

Global programme targets and status

In 1991, WHO and UNICEF agreed to develop a joint strategy for CDD in the 1990s, including a coordinated approach to monitoring and evaluation. Four key indicators were selected, and targets set for 1995 and the year 2000. These 1991 targets were defined on the assumption that an intensive worldwide effort, with associated resources, would be directed at the control of diarrhoeal diseases in the 1990s. This has not occurred, and the progress made to date could be considered remarkable considering the resources that have been committed.

The current status of the indicators relative to the targets set in 1991 is presented in Figure 8. Targets and status for three additional Programme indicators on training and programme reviews are also presented.

Both the household and health facility survey guidelines were revised during the biennium to provide reliable measurement of key indicators. However, to date few surveys have been conducted using the revised methods.

Rates presented here for the population with access to ORS continue to reflect the best available estimates drawn from country programme profiles, although in the future these estimates can be validated through comparison with the results of the community investigation of ORS access developed as part of the revised household survey.

The ORS access rate has risen steadily from 50% in the mid-1980s to 75% in 1993. Seventy countries report having achieved the 80% target set for 1995. On a regional level, the Western Pacific Region has already succeeded in meeting the 80% target and the South-East Asian Region is very close (79%).

Data on two key indicators measured through the revised household survey method are available for the first time in this report. Despite being based on only six surveys conducted using the new methodology, these estimates are judged more valid than those based on the previous household survey method, in which *mothers'*

knowledge of home case management and the *proportion of cases reported to receive increased fluids and continued feeding* required the *post hoc* calculation of combined estimates. The new survey guidelines allow direct and precise measurement of the indicators.

The proportion of mothers reporting correct knowledge of the need to provide increased fluids and to continue feeding a child with diarrhoea is currently estimated to be 59%. A third aspect of home case management is mothers' ability to describe the signs that indicate a need to take the child to the health facility, often referred to as careseeking. As presented in Table 4, mothers' knowledge of when to seek care is considerably lower than their knowledge of the need for increased fluids and continued feeding. When the third component is included in the calculation of this indicator, the 1993 estimate based on the medians of the six surveys is only 11%.

The current estimate for the proportion of diarrhoea cases reported to have received increased fluids *and* continued feeding is 34%, relative to a 1995 target of 50% set in 1991, and a revised target of 80% by 1995 set since that time. Continued and intensified efforts to communicate with mothers and other caretakers will be needed to maintain and accelerate progress towards this goal.

The revised health facility survey guidelines will provide supporting data for the key WHO/UNICEF indicator on diarrhoea case management in health facilities. To date, results are available from only three such surveys. For this report, therefore, results are presented for an interim proxy indicator, the *proportion of diarrhoea cases with at least some dehydration who are correctly rehydrated*. Based on the medians obtained in 23 earlier health facility surveys conducted between 1990 and 1993, the rate for this indicator is 20%. There was an increase in the proportion of cases correctly rehydrated from 9% in the 10 surveys conducted in 1990-1991 to 22% in the 13 surveys conducted during the 1992-1993 biennium.

The ongoing programme emphasis on training activities is reflected in the increases in training coverage for health workers responsible for case management from 19% at end 1991 to 27% at end 1993, and for health staff with supervisory responsibilities from 31% at end 1991 to 37% at end 1993 (see Figure 8). Although the reported rates indicate progress towards training targets, the Programme will need to continue to strengthen its efforts, particularly if the high turnover rates of health workers are taken into consideration.

An improved method for conducting programme reviews was developed during the biennium, and the Programme is moving rapidly towards the achievement of the 1995 target of 200 reviews while simultaneously improving the quality of the review process.

The Programme is currently questioning whether the targets set in 1991 continue to be useful for programme planning and as a source of motivation for health staff. While it appears that several targets may be achieved, others will almost certainly not. Continued progress towards the Programme's targets will require renewed commitment and resources. In addition, however, it may be productive to re-examine the selection of indicators and the target-setting process, and to draw on the experiences of the biennium to ensure that these are used in such a way that they contribute to global progress in diarrhoeal disease control.

Breastfeeding — entering a new phase

The Innocenti Declaration of 1990 states that:

All governments should develop national breastfeeding policies and set appropriate national targets for the 1990s. They should establish a national system for monitoring the attainment of their targets, and they should develop indicators such as the prevalence of exclusively breastfed infants at discharge from maternity services, and the prevalence of exclusively breastfed infants at four months of age.

National authorities are further urged to integrate their breastfeeding policies into their overall health and development policies. In so doing they should reinforce all actions that protect, promote and support breastfeeding within complementary programmes such as prenatal and perinatal care, nutrition, family planning services, and prevention and treatment of common maternal and childhood diseases. All healthcare staff should be trained in the skills necessary to implement these breastfeeding policies.

These are the challenges to which the Programme, whose staff participated in the meeting which produced and adopted the Innocenti Declaration, has continued to respond in the 1992-1993 biennium, working towards the integration of breastfeeding training and assessment into programmes concerned with the management of common childhood diseases. This is the essential next step, taking breastfeeding support beyond the maternity facility and into general and community health services.

Box 15

Support for breastfeeding promotion in selected countries

— Bangladesh

The field test of the materials *Breastfeeding counselling: A training course* in early 1993 prepared five local trainers who are continuing to work with the national breastfeeding programme. Twenty participants were trained in the skills of breastfeeding counselling. One counsellor trained according to the method used in the course is conducting research into the effectiveness of counselling on breastfeeding, supported by the Programme.

— Brazil

Continued support has been provided to the training activities of the Lactation Training Centre in Santos, Sao Paulo. With support from UNICEF, two Angolan nationals participated in a course in 1993.

— China

Discussions have been held about the possibility of introducing the course in China, and materials have been sent for review and to be considered for translation.

— Egypt

A preparatory visit was made to Cairo by a staff member from Headquarters, accompanied by a staff member from the Eastern Mediterranean Regional Office, to discuss with the national programme manager, staff from UNICEF, representatives of the Ministry of Health, and members of the Egyptian Society of Breastmilk Friends, the possible relevance of the course for Egypt. Considerable interest was expressed, and an introductory course is under discussion.

— Fiji

A full set of materials was provided for a training course for trainers on breastfeeding promotion in Fiji, in December 1993. The Western Pacific Regional Office arranged for the course to be conducted under the direction of a consultant from the Philippines.

— India

A set of materials was sent at the request of UNICEF in New Delhi, to be adapted for use in locally developed training materials. Members of the team who are preparing the Indian materials helped to test the exercises and presentations at an early stage of the development of *Breastfeeding counselling: A training course.* An Indian version of the book *Helping mothers to breastfeed*, which serves as a companion to the course materials, has already been published.

— Newly independent States of the former USSR

Programme staff co-directed a series of three high-level workshops in Saint Petersburg for 40 senior health professionals from a number of the newly independent States of the former USSR, to introduce the BFHI and new concepts of lactation management. This course took place at the invitation of the Healthy Cities Project, and was conducted by the European Regional Offices of WHO and UNICEF with support from WHO Headquarters Nutrition Unit and CDD Programme, Wellstart San Diego, and the World Alliance for Breastfeeding Action. Further workshops to follow up this initiative, and to introduce breastfeeding counselling skills, are planned for 1994.

— Viet Nam

The Vietnamese authorities have shown keen interest in introducing the Breastfeeding counselling course. Materials have been sent to the national authorities for translation into Vietnamese. A course will be conducted in 1994 with the technical support of WHO staff.

Box 16

Breastfeeding counselling: A training course

The materials for this course were completed by the end of 1993, and are ready to be introduced into countries.

The package consists of the following:

Director's guide[18]	Set of 50 overhead transparencies
Trainer's guide[19]	Set of 50 35mm slides
Participants' manual[20]	Story cards
Overhead figures (flipchart)[21]	Forms and checklists
	Answer sheets

The course design is based on experience of teaching about breastfeeding in countries in Africa, Asia, Europe and South America. The materials have been developed with guidance of experts in both breastfeeding and educational materials development, and related fields such as nutrition and child health. They have been extensively field-tested and revised.

The course aims to develop participants' skills. It includes eight hours of clinical practice, in addition to more than 10 hours of practice sessions and exercises which take place in the classroom. It aims to enable participants to support optimal breastfeeding practices, and to help mothers to overcome difficulties in both hospital and health centre settings.

The course takes five full days, or 40 hours, with an additional preparatory period of similar length for trainers. During a course, in addition to 20 participants receiving training in breastfeeding counselling, five trainers learn how to conduct a course, and will in many cases be able to conduct future courses without the need for additional external assistance.

Training on breastfeeding

The 1992-1993 biennium was one of continued development. The package of materials *Breastfeeding counselling: A training course*[22] was completed, following the field tests in the Philippines in 1991, Jamaica in 1992, and Bangladesh in early 1993 (see Box 16). The package was produced jointly with UNICEF, as part of the Programme's cooperation with the WHO/UNICEF Baby Friendly Hospital Initiative (BFHI), and the course is equally suitable for training in the BFHI and in child health programmes. The materials are fully compatible with other materials developed for the BFHI.

The first course was conducted in the Islamic Republic of Iran in December 1993 (see Box 17), and will be introduced in all WHO regions during the next biennium. It is hoped that it will be supported by various programmes and organizations, and that it will make a major contribution to national infant feeding initiatives.

Discussions have been held with UNICEF in Europe about the possibility of adapting the course, under continued guidance from CDD, to use in the European BFHI.

Support in the form of advanced-level training in breastfeeding and lactation management for senior health professionals, on a four-week course at the Institute of Child Health, London, was given to 11 developing countries (Bangladesh, Brazil, Djibouti, Ghana, Jordan, Malaysia, Mauritius, Saudi Arabia, United Republic of Tanzania, Venezuela, and Yemen). The course was directed by a staff member from the Programme. Former participants from the course have acted as trainers both in Bangladesh and in the Islamic Republic of Iran, and have been key persons for the introduction of the course.

[18] WHO/CDR/93.3-UNICEF/NUT/93.1.

[19] WHO/CDR/93.4-UNICEF/NUT/93.2.

[20] WHO/CDR/93.5-UNICEF/NUT/93.3.

[21] WHO/CDR/93.6-UNICEF/NUT/93.4.

[22] Four documents WHO/CDR/93.3-UNICEF/NUT/93.1 to WHO/CDR/93.6-UNICEF/NUT/93.4.

Box 17

Breastfeeding training course in the Islamic Republic of Iran

The first course with the finalized course materials was held in Teheran in December 1993. The book *Helping mothers to breastfeed*[23] and the *Participants' manual* from the counselling course had already been translated into Farsi by the national breastfeeding committee. Two staff members from Headquarters acted as co-directors together with the local course director. Discussions took place with officials of the national breastfeeding committee, the Ministry of Health and UNICEF about the need to include more clinical and counselling skills in the country's very active breastfeeding training programme. The possibility of translating and adapting the complete course package for the country, and of introducing the course more widely in the country's 25 provinces, was discussed at a meeting to consider possible future developments. The importance of increasing the number of skilled trainers, and of deciding the appropriate level for this kind of training in the primary health care network, were also discussed. Follow up is planned.

Breastfeeding indicators

In addition to the indicators for assessing breastfeeding practices at household level which were developed in 1991, a second set of indicators has been developed for assessing health facility practices that affect breastfeeding. These indicators were agreed upon during an informal WHO/UNICEF meeting, convened in June 1992.[24] The indicators for assessing breastfeeding practices at household level are widely accepted, and are now being used by a number of agencies which are collecting information on breastfeeding. They are incorporated into the WHO databank on infant feeding, which has recently been upgraded.

Collaborative activities

The biennium was also a period of greater collaboration between the CDD Programme and other programmes within WHO in the field of infant feeding. The Working Group on Infant Feeding, which was set up in 1988 under the Task Force for Nutrition, continues to ensure coordination of their activities. Members of the group include representatives from the Divisions of Food and Nutrition (FNU) and Family Health (FHE), the Special Programme of Research, Development and Research Training in Human Reproduction (HRP), as well as from CDR.

During 1993, the Working Group drafted *Infant and young child feeding: A global approach*, as part of the follow-up the International Conference on Nutrition, held in Rome in December 1992. The *World declaration and plan of action for nutrition*,[25] which resulted from that conference, specifies the promotion of breastfeeding as one of its themes, calling upon governments and concerned parties to:

Ensure that health and other care providers receive high quality training in breastfeeding issues, using updated training material, and that they are informed about relevant national marketing regulations or policies.

The global approach is currently being discussed with the WHO regions and with the Advisory Committee on Coordination (ACC) Subcommittee on Nutrition.

In the Region of the Americas, responsibilities for the regional breastfeeding activities were assigned to the Expanded Program for the Control of Diarrheal Disease of the Special Program on Maternal and Child Health (HMP/EPCDD). To effectively promote, protect and support breastfeeding activities in that Region, HMP/EPCDD, in collaboration with other AMRO programmes, UNICEF, USAID, Georgetown University Institute for Reproductive Health, and Wellstart International developed a "Strategic plan for the promotion of breastfeeding in Latin America and the Caribbean". The plan proposes eight strategic actions: coordination, information, training, promotion, protection, support, research, and evaluation and monitoring. An operational plan for breastfeeding was also initiated in 1993.

[23] Savage King F. *Helping mothers to breastfeed*, revised ed. Nairobi, African Medical and Research Foundation, 1992.

[24] *Indicators for assessing health facility practices that affect breastfeeding.* Report of the joint WHO/UNICEF informal interagency meeting, 9-10 June 1992, Geneva. Document WHO/CDR/93.1—UNICEF/SM/93.1.

[25] FAO/WHO, 1992.

Control of cholera and epidemic dysentery

The Global Task Force on Cholera Control, formed by the Director-General in April 1991 in response to the spread of the seventh pandemic of cholera to the Western Hemisphere, continued to support activities aimed at improving the capacity of affected countries to prepare for and to respond to epidemics of cholera and other epidemic diarrhoeal diseases, especially bacillary dysentery.

The total number of cases of cholera officially reported to WHO during the biennium declined from the peak of 594 694 cases reached in 1991, to 461 783 in 1992 (a decline of 22%) and, further, to 342 985 in 1993 (an additional 25.7% decrease).[26] Still, the number of cases and deaths remains at a far higher level than that reported prior to 1991.

The global figures do not reflect important regional differences. The Region of the Americas, which has been the source of the majority of reports for the last three years, has also registered the largest decline in incidence between 1992 and 1993. On the other hand, Africa continues to report a substantial number of cases and deaths, especially in the southern part of the continent. This Region accounted for 25.7% of the global total in 1991, 19.7% in 1992, and 20.4% in 1993 (for data received by 17 February 1994). In Asia, official reports of cholera more than doubled in 1993 over 1992. A large outbreak in war-torn Afghanistan accounted for a substantial part of the increase and reinforces the notion that when populations are displaced by civil strife or natural disaster, epidemic diarrhoea frequently becomes a major public health problem.

Further complicating the situation in Asia is the emergence, in late 1992, of a new bacterium as a cause of cholera. The new organism has been designated *Vibrio cholerae* O139 (Bengal). This previously unidentified serogroup of *V. cholerae* has spread very rapidly through a number of South and South-East Asian countries (Bangladesh, China, India, Malaysia, Nepal, Pakistan) and has caused unusually high mortality, even in adults. In some places, the new organism essentially replaced *V. cholerae* O1 during a number of months, raising the fear that it might replace *V. cholerae* O1 El Tor just as the latter replaced the classical *V. cholerae* from the mid-1960s onwards. However, recent observations, to be confirmed by careful epidemiological monitoring, seem to show that the epidemics caused by *V. cholerae* O139 are followed by an endemic situation in which *V. cholerae* O1 reappears. Fortunately, it has not been necessary to change the recommendations for the case management of cholera as the clinical presentation of patients infected with *V. cholerae* O139 is identical to that of cholera and the treatment is the same.

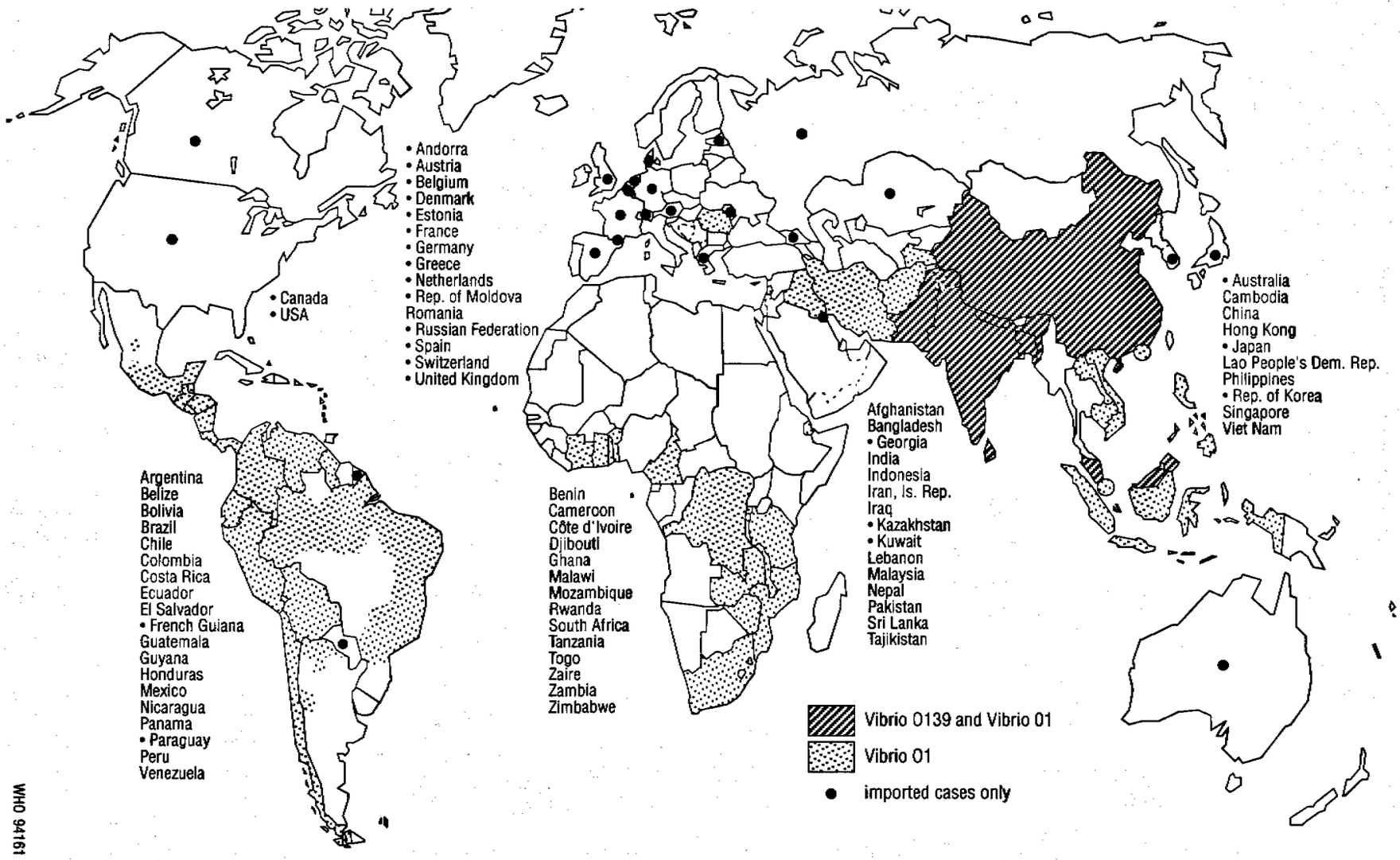
To disseminate information about this new organism, the Task Force has published an article in the WHO *Weekly Epidemiological Record*. In conjunction with the WHO South-East Asian Regional Office, the Task Force has facilitated the production and distribution of specific antiserum necessary for the confirmation of *V. cholerae* O139 infection. This Regional Office has distributed antisera to selected priority countries. Task Force members also attended a meeting held in Dhaka, Bangladesh, in October 1993 to discuss the implications of *V. cholerae* O139 for vaccine development. Preliminary plans have been made to participate in the formulation and evaluation of combined *V. cholerae* O1-*V. cholerae* O139 vaccines, when they are ready for testing.

A second major area of activity for the Task Force has been the development and implementation of an initiative for improving preparedness and response to cholera and other epidemic diarrhoeal diseases in southern Africa (see Box 18). Under its auspices, a team consisting of an epidemiologist, a water and sanitation engineer, and an administrative officer will coordinate activities in Malawi, Mozambique, Swaziland, Zambia and Zimbabwe, countries which have reported a large proportion of cases in Africa during the past years.

Priority areas identified for assistance under this initiative, in addition to improving case management and epidemic preparedness, are food safety and environmental sanitation. In late 1993, a preliminary assessment of the food safety situation in Zambia was undertaken by the Food Safety Programme with a view to assisting national authorities to develop and implement an integrated national food safety programme. Likewise, with a view to drawing up comprehensive national programmes for improved environmental sanitation, a rapid assessment of the situation with regard to water supply and sanitation in Malawi, Mozambique, Swaziland, the

[26] Reports of cases occurring in 1993 will continue to be received in WHO through to April of 1994, but it is already clear that the 1993 total will represent a substantial reduction from 1992's figure.

Countries, or areas within countries, reporting cholera in 1993 (as at 14 February 1994)



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Box 18

Improving preparedness and response to cholera and other epidemic diarrhoeal diseases in southern Africa

This initiative, developed by the WHO Global Task Force on Cholera Control in April 1993 in conjunction with the African Regional Office and the Subregional Office in Harare, Zimbabwe, has four objectives:

- to reduce case-fatality through improved case management;
- to enable front-line health staff to respond rapidly to epidemics;
- to minimize the economic impact of epidemic diarrhoeal diseases;
- to identify future needs.

With generous funding from Australia, Italy, and Switzerland, the Task Force was able to carry out a number of activities in 1993. These included:

- assigning a medical officer as overall coordinator;
- providing technical cooperation to Malawi, Mozambique, Swaziland, Zambia and Zimbabwe for the development of national plans for the control of epidemic diarrhoeal diseases;
- participating in Zimbabwe in the development of a plan for improved water and sanitation systems;
- facilitating a course for national and regional laboratory personnel in Swaziland to improve their ability to confirm cholera and dysentery epidemics and to monitor antimicrobial sensitivity patterns;
- providing a consultant to Mozambique to investigate an outbreak of *S. dysenteriae* type 1 infection in Tete Province;
- beginning the development process for a national food safety programme in Zambia;
- conducting a diarrhoeal disease case management course in Lusaka for participants from Burundi, Malawi and Zambia;
- initiating the development of a course in outbreak preparedness and control for district-level personnel working in districts with international borders;
- conducting a one-week course for approximately 20 Swiss nationals (physicians, nurses, laboratory personnel, water engineers and administrators) who serve as consultants to the initiative;
- printing *Fact Sheets on Environmental Sanitation for Cholera Control.*

Detailed annual workplans are currently being drawn up for each of the participating countries. A desirable outcome of the initiative would be for policies and procedures for cholera and dysentery control to be in place in every at-risk district in southern Africa.

United Republic of Tanzania, Zambia and Zimbabwe was carried out by the Community Water Supply and Sanitation unit in collaboration with government representatives. A project document has been prepared identifying major lines of action to be followed.

To further the achievement of the objectives of the initiative, the Task Force will work in close collaboration with Swiss Disaster Relief Unit (SDR), an agency of the Swiss Department of Foreign Affairs. Under a three-year agreement drawn up in 1993, SDR will provide technical and financial assistance to the project.

The success of the Southern Africa Initiative has resulted in a request from Central African countries, including Burundi, Rwanda, Uganda and the United Republic of Tanzania, for the Task Force to develop a similar project in that area.

Epidemics of bacillary dysentery due to *Shigella dysenteriae* type 1 (Sd1) have been responsible for hundreds of thousands of cases and tens of thousands of deaths during the early part of this decade in these countries. The control of these epidemics has been complicated by increasing resistance of Sd1 to affordable antibiotics, by civil unrest in a number of countries which has resulted in the political destabilization of the area and created more than one million refugees and displaced persons, and by the dearth of scientific knowledge regarding the transmission and risk factors for infection with this organism. The Task Force has supported the development of a laboratory surveillance system for monitoring drug resistance in Burundi and Rwanda and has assisted these countries in the procurement of nalidixic acid, currently indicated as the antimicrobial of choice for the treatment of Sd1 infection.

On a global level in collaboration with the Centers for Disease Control and Prevention (CDC), Atlanta, USA, the Task Force has extensively revised the existing WHO CDD Programme document, *Guidelines for the control of epidemics due to Shigella dysenteriae type 1*, the new edition of which will be printed in early 1994.

Collaboration with other international and bilateral agencies

During 1992-1993, the Programme continued its close collaboration with UNICEF in support of national CDD programmes. At global level, programme staff participated in a meeting in 1992 with UNICEF representatives from the largest developing countries, and a meeting for UNICEF and WHO country staff in these countries was held in Geneva in 1993 to discuss and plan how to further improve the joint support to national programmes. Programme staff went to a meeting in New York to plan activities to increase the availability of ORS at community level in countries. The regional CDD programme managers' meetings are organized jointly with UNICEF in most regions, and other interested agencies also participate.

Important developmental tasks are carried out in close consultation with UNICEF. The counselling course on breastfeeding finalized in 1993 is a joint WHO/UNICEF document and the training course on integrated management of childhood illness is also being developed in collaboration with UNICEF.

The Programme has been able to assist in the development of diarrhoeal disease control activities in the Central Asian Republics and Kazakhstan thanks to the close collaboration with the regional UNICEF office, and in other newly independent States with the support of the International Federation of Red Cross and Red Crescent Societies (IFRC). In 1993, as a result of this collaboration, the translation into Russian and adaptation of managerial skills training materials and other key documents and tools were carried out, training in managerial skills of high level managers was implemented, cholera control activities were planned, and the Programme assisted in ORS production. The ultimate aim of these collaborative efforts is the development of national CDD programmes in order to reduce child mortality in the newly independent States of the former USSR.

At country level, review and planning activities provide important opportunities to strengthen interagency collaboration in the support of priority CDD activities. UNICEF and other agencies participated in focused programme reviews; for example, Save the Children UK in Sudan, the World Bank in Bangladesh, GTZ in Zimbabwe, USAID/PRITECH in Kenya, Niger and Pakistan, and the Canadian International Development Agency (CIDA) in Pakistan.

At global and national levels, the Programme has continued its collaboration with several technical projects funded by USAID. As examples, evaluation of case management training was conducted with PRITECH and the Quality Assurance Project, and the Programme worked with HEALTHCOM on the development of a guide for the use of radio in communication. CDC in Atlanta assisted the Programme in the revision of the health facility survey, the preparation of the Shigella dysentery guidelines and in cholera control activities.

Staff of NGOs participate regularly in the CDR briefing courses held 4-5 times per year in Geneva. A meeting was held in 1992 of UNICEF, NGO and CDR staff working in support of CDD and ARI in sub-Saharan countries at the Istituto per l'Infanzia "Burlo Garofolo", Trieste, Italy. As part of the follow up of country-specific joint support, the Programme participated in a review of CDD in Sierra Leone with the IFRC. The NGOs involved in the meeting have subsequently reported to WHO on their activities in ARI and CDD.

Collaboration with multilateral and bilateral agencies plays a key role in many countries: in

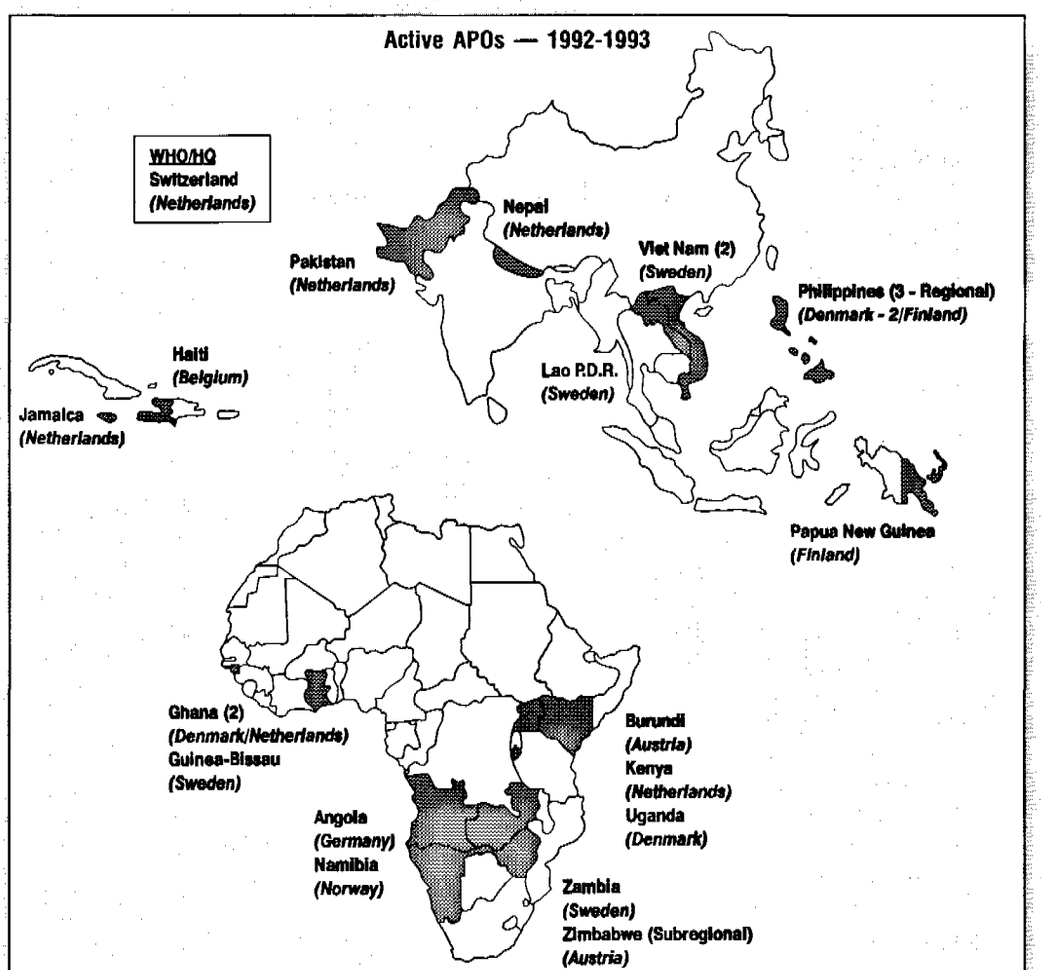
Box 19

Associate Professional Officers at CDD

In 1984, the first eight Associate Professional Officers (APOs) for the CDD Programme were actively involved in developing countries. Since then 48 APOs, sponsored by nine donor countries have contributed to the control of diarrhoeal diseases in over 30 developing countries. At the close of the 1992-1993 biennium, an additional 11 APOs were still involved with their assignments in the field, bringing the total to 67.

WHO's APO Programme, which is administered through the Office of Personnel, benefits all those involved in it. The donor country invests in its own young medical officers by providing them with the means to gain valuable experience in developing country settings. Just as important, the APO experience provides a cross-cultural learning opportunity for its participants. The recipient country is provided with much-needed assistance in carrying out its CDD-related activities. The APO Programme helps meet the CDD Programme's field-based staffing needs. It also increases CDD's pool of experts upon which it can draw in the future — after their APO assignments, seven APOs have joined the Programme as fixed-term staff members, either at WHO Headquarters or at regional or country levels. For instance, one APO who played a key role in coordinating programme action against cholera and dysentery in Zambia, took up a position during the biennium as CDD/ARI Medical Officer in Bangladesh. Many others have served and continue to serve as short-term consultants.

The contribution made by APOs to the CDD Programme is an important one and they form an integral part of the Programme's global staff. They are generally very welcome in the recipient countries, and in many instances an APO's contribution to a country's efforts to control diarrhoeal diseases has made a lasting impression. It is hoped that there will be many more APOs in the future.



Bangladesh, the World Bank is supporting a rapidly expanding CDD programme; in 1993, the Programme strengthened its collaboration with the Swiss Government through the Swiss Disaster Relief Unit (SDR) in support to epidemic control activities in southern Africa and with the Australian International Development Assistance Bureau (AIDAB) in these same activities and in support to CDD in China.

Towards the end of the biennium agreement was reached with the Austrian Government for collaboration in diarrhoea (and ARI) control in Mozambique. This agreement complements the addition of Austria as a global Programme donor in 1993. Luxembourg also became a contributor to the Programme in the biennium.

During the biennium, Associate Professional Officers (APOs — see Box 19) were made available to work in national programmes by: the Swedish International Development Authority (SIDA); the Norwegian Agency for International Development (NORAD); the Danish International Development Agency (DANIDA); the Finnish International Development Agency (FINNIDA); and the Governments of Austria, Belgium, Germany and the Netherlands, to work with national programmes in the regions and at Headquarters.

CHAPTER 3

Research

During the 1992-1993 biennium, the Programme continued to support research aimed at the development and evaluation of new or improved approaches for the treatment and prevention of diarrhoea. Emphasis was placed on research related to programme implementation, on assessing the effectiveness of selected interventions for diarrhoeal disease control, and on identifying the key factors for intervention success.

Following the functional reorganization of the Programme at Headquarters in August 1992, research and developmental activities were managed within four working groups that address the major processes of national control programmes: case management in health facilities, case management in the home, prevention of diarrhoea, and national programme development. Each group includes staff with a variety of skills coming from the Programme's two former components, implementation and research.

Two consultations were organized to obtain the recommendations from external advisors on research priorities. A consultation was held in May 1992, organized jointly by the Programme and WHO's Community Water Supply and Sanitation Unit, 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. Another consultation was held in May 1993, organized jointly by the Programme and WHO's Nutrition Unit, to review the available information on interventions to promote improved complementary feeding practices and identify priorities for research and development.

Provision of programme support to research projects was based on recommendations from 85 external advisers, representing more than 14 areas of expertise. Support was awarded to 18 new projects in 1992 and 16 in 1993, bringing the total number of projects supported by the global Programme to 452 (Figure 9). Of these, 84 are in progress. The topics of the new projects, implemented in 16 countries, are summarized in Table 8. Ninety-four percent of the new projects supported by the Programme are in developing countries.

Figure 9

Number of research projects supported by the global Programme

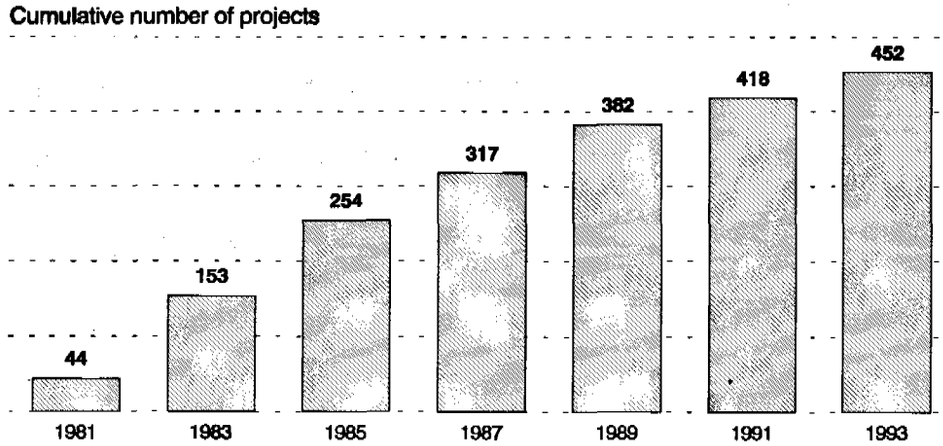


Table 8

New projects supported during 1992-1993, by major topic

Topic	No. of new projects
Case management by health providers and at community level	9
Rational use of drugs	3
Infant feeding	12
Vitamin A and zinc supplementation	4
Hygiene	2
Vaccine testing	2
Evaluation of programme impact	2

The following sections summarize information that has emerged from supported studies and highlight ongoing and planned projects of particular importance.

Diarrhoea case management

During 1992-1993, support was maintained for projects focusing on improved methods for the treatment of diarrhoea. Highest priority was given to completing a long-term research effort on improved ORS formulations, defining appropriate dietary regimens for acute and persistent diarrhoea, and assessing the usefulness of anti-diarrhoeal drugs and antibiotics in the management of persistent diarrhoea and shigellosis. Case management by health care providers and at community level, as well as the rational use of drugs, were also topics of research.

Rice-based ORS

Research on this topic coordinated by the Programme since 1983 was aimed at developing improved ORS formulations that would appreciably reduce the volume and duration of diarrhoea while 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 50-80g/l of rice powder were published in early 1992. They indicated 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 less 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.

Two large studies, conducted in Egypt and Pakistan, compared the efficacy of standard glucose-based 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 9. Both concluded that standard WHO-recommended 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. Results of the study conducted in Egypt were recently published in the Lancet.[27]

An outpatient study conducted in Bangladesh to compare the effect of treatment with rice-based and glucose-based ORS solutions on total stool frequency and duration of diarrhoea in young children with acute diarrhoea showed no differences between the two treatment groups with regard to the main outcome variables. However, children treated with standard glucose-based ORS solution had a significantly greater weight gain than the children treated with rice-based ORS solution.

The results of the additional clinical trials conducted in infants and young children with acute diarrhoea and comparing the standard WHO-recommended glucose-based ORS solution

[27] Fayad IM, Hashem M, Duggan C, et al. Comparative efficacy of rice-based and glucose-based oral rehydration salts plus early reintroduction of food. *Lancet*, 1993, 342:755-756.

Table 9

Total stool output in g/kg of body weight 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	
		Rice-based ORS	Glucose-based ORS
Egypt	480	287 (303)[a]	239 (285)
Pakistan	158	362 (414)	300 (317)

[a] Figures in brackets are the standard deviation.

with a rice-based ORS solution were included in a revised meta-analysis of stool output in the first 24 hours in children with diarrhoea not associated with cholera whose results are summarized in Figure 10. This figure shows the mean percentage reduction in 24-hour stool output of children with non-cholera diarrhoea given rice-based ORS solution compared with those receiving standard glucose-based ORS solution in nine studies. We are now able to conclude that rice-based ORS solution has no significant advantage over standard glucose-based ORS solution in the management of diarrhoea in children.

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, however, emphasized the importance of early feeding, once dehydration has been corrected.

Low osmolarity ORS

Results from a pilot study conducted in Egypt suggest that a small but significant proportion of dehydrated patients, who present with transient glucose malabsorption during acute diarrhoea, might benefit from using a low osmolarity ORS solution in which glucose concentration has been slightly reduced. To investigate this observation further, a multicentre clinical trial comparing the standard WHO ORS formulation (311 mmol/l) with a low osmolarity ORS solution (240 mmol/l) was conducted in four countries (Brazil, India, Mexico and Peru). Data collection was completed in all four centres and a preliminary analysis performed. Results show that stool output and the proportion of patients requiring additional IV infusion during the course of rehydration are reduced in the group of patients treated with the low osmolarity ORS solution. However, in both the pilot and the multicentre studies, serum sodium concentrations decreased significantly and urine output increased significantly in patients receiving the low osmolarity ORS solution. These results suggest that patients treated with the low osmolarity ORS solution (containing 60 mmol/l of sodium) received more "free" water than required, and that they would have done even better with a solution containing a slightly higher sodium concentration (e.g. 75 mmol/l), but not a higher osmolarity.

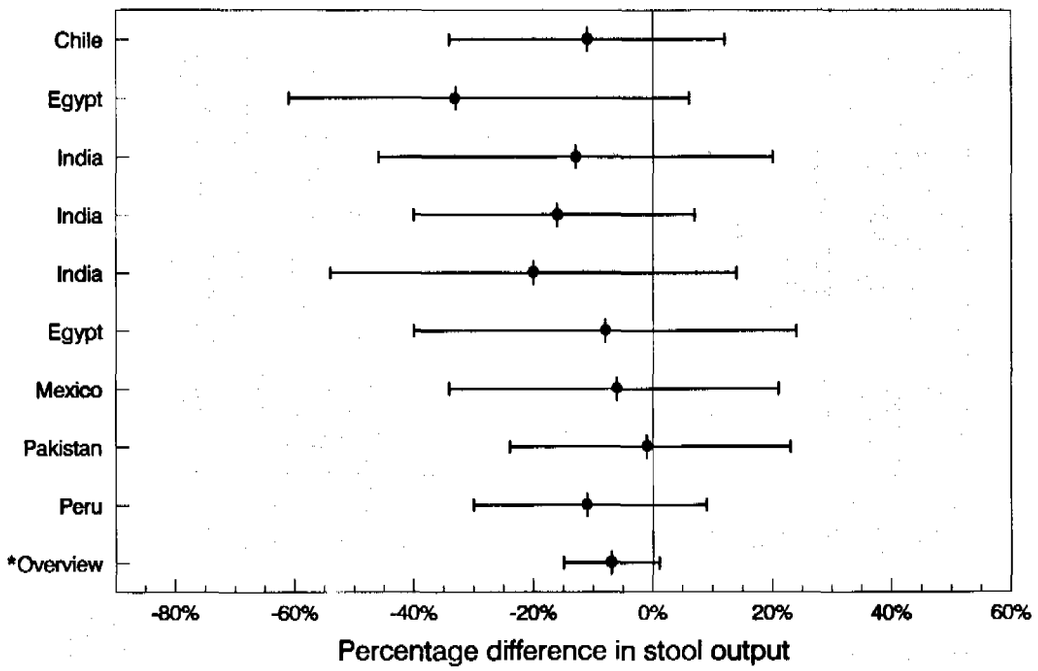
A clinical trial was, therefore, started in Egypt, to evaluate the efficacy of a low osmolarity ORS formulation containing 75 mmol/l of sodium in infants and young children with acute non-cholera diarrhoea. In cholera cases, however, the amount of sodium lost through the stool is higher than in non-cholera diarrhoea. Therefore, an ORS solution containing 75 mmol/l of sodium instead of 90 mmol/l contained in the standard ORS solution recommended by WHO might not allow full replacement of the sodium loss and might lead to an increased need for IV therapy and ORS intake. To evaluate the safety and efficacy of the low osmolarity ORS formulation in adult cholera patients, a clinical trial was undertaken in Indonesia. Results from these two clinical trials should be available in 1994.

Feeding during acute diarrhoea

It has been well established for some time that full-strength cow's milk formula is safe and nutritionally beneficial in non-breastfed children older than 6 months of age with acute diarrhoea.

Figure 10

Mean percentage difference in 24-hour stool output: Rice ORS compared with glucose ORS



* The pooled (weighted) estimate of percentage reduction in mean stool output (95% confidence interval) from 9 studies is shown under Overview.

A recently published article,[28] presenting the results of a study supported by the Programme, showed that this feeding approach is also safe in infants under 6 months of age receiving exclusively or mainly animal milk. However, many other studies have reported increased failure rates in patients receiving lactose-containing non-human milks or formulas. To assess more precisely the effects of continued feeding of non-human milks or formulas to young children during diarrhoea, the Programme, in collaboration with the Applied Diarrhoeal Diseases Research Project (ADDR), undertook a meta-analysis from all available clinical trials that compared (i) lactose-containing milk or formula diets with lactose-free regimens, and (ii) undiluted lactose-containing milks with the same milks offered at reduced concentration. A total of 29 acceptable studies with a total of 2215 patients were identified for inclusion in this meta-analysis; it compared treatment failure rates, stool frequency and amount, duration of diarrhoea, and change in body weight by type of therapy provided. The conclusions of this meta-analysis, soon to be published,[29] are that the vast majority of young children with acute diarrhoea who are taking non-human milks can be successfully managed without diluting these feeds. Routine dilution of milk or routine use of lactose-free milk formula are not justified, especially when oral rehydration therapy and early feeding (in addition to milk) form the basic approach to the clinical management of diarrhoea in infants and children.

[28] Chew F, Penna F, Perret Filho LA, et al. Is dilution of cows' milk formula necessary for dietary management of acute diarrhoea in infants aged less than 6 months? *Lancet*, 1993, 341:194-197.

[29] Brown KH, Peerson JM, Fontaine O. Use of non-human milks in the dietary management of young children with acute diarrhoea: A meta-analysis of clinical trials. *Pediatrics* (in press).

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 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. Results 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 (Table 10). Therefore, this feeding approach offers no advantage in terms of nutrient absorption or weight gain in patients with persistent diarrhoea.

A randomized clinical trial has been started in Peru to examine the impact of zinc supplementation, given to children coming to an outpatient facility with persistent diarrhoea, on the clinical course of the episode and on subsequent incidence of diarrhoeal and respiratory illnesses during a six-month follow-up. Results from this trial are expected in 1995.

An algorithm for the management of persistent diarrhoea, which was developed at a meeting held in Mombasa, Kenya, in 1991, has been tested in a multicentre study conducted in six countries (Bangladesh, India, Mexico, Pakistan, Peru, Viet Nam) and jointly supported with the ADDR. The bases of this algorithm are:

- fluid therapy according to WHO CDD guidelines;
- initial dietary therapy with low milk- or yoghurt-based diets (lactose load less than 3 g/kg/day) containing locally acceptable, available staples, such as rice, with some oil or sugar (diet A);
- in those responding poorly, clear indications for changing to a diet based on chicken, egg or other locally available protein source with carbohydrates, such as a mixture of rice and glucose, glucose alone or sucrose with added oil (diet B);
- vitamins and trace elements;
- antibiotics for systemic infections and bloody diarrhoea or when Shigella is isolated in stools.

Data collection started in April 1992 and ended in June 1993. A workshop was held in Cuernavaca, Mexico, in November 1993 to review and analyse the combined data from the six centres.

A total of 485 patients were admitted in the six centres. On admission, 85% of the patients had second or third degree malnutrition, 40% had signs of moderate or severe dehydration, 16% had clinical signs of pneumonia and 10% had clinical signs of septicaemia.

Table 10

Impact of medium-chain fatty acid diet on clinical outcome of persistent diarrhoea and nutrient coefficient of absorption. Mean (SD).

	Control N = 35	Medium-chain fatty acid diet N = 39
Weight gain in %	0.08 (0.25)[a]	-0.01 (0.27)
Duration of diarrhoea in days	4.4 (2.3)	4.0 (2.1)
Coefficient of absorption		
Fat	0.53 (0.36)	0.62 (0.22)
Protein	0.28 (0.25)	0.33 (0.20)
Carbohydrates	0.60 (0.32)	0.61 (0.34)

[a] Figures in brackets are the standard deviation.

Box 20

Using research findings to improve diarrhoea case management guidelines

The diarrhoea management chart summarizes programme guidelines on the assessment and management of patients with diarrhoea reaching a health facility. The first chart became available in 1980. Since then, Programme-supported research has led to progressive improvements in the charts. The following boxes show how this research modified the advice given to mothers on how to feed and give fluids to their children with diarrhoea.

Diarrhoea case management chart feeding advice

Influential research findings	Chart revision
1980-1987	**1987**
▪ Complementary foods offered to children with diarrhoea are commonly of low energy and nutrient density: it is important to increase their energy and nutrient density to achieve higher intakes during and after diarrhoea. ▪ Absorption of animal fats or vegetable oil is preserved during diarrhoea. ▪ Promoting improved feeding during diarrhoea and into convalescence will reduce the negative effects of the episodes on nutritional status and will not cause diarrhoea symptoms to worsen. ▪ Continued breastfeeding reduces the severity of the episode of diarrhoea, accelerates recovery and prevents further episodes. ▪ Promoting food safety is important in preventing diarrhoea.	▪ Give freshly prepared foods. Recommended foods are mixes of cereal and beans, or cereal and meat or fish. Add a few drops of oil. ▪ Give fresh fruit juices or bananas to provide potassium. ▪ Cook and mash or grind food well so it will be easier to digest. ▪ After the diarrhoea stops, give one extra meal each day for a week, or until the child has regained normal weight. ▪ Give breastmilk or milk feeds prepared with twice the usual amount of water.
1988-1990	**1990**
▪ Malnutrition is a significant risk factor for diarrhoea mortality. ▪ Breastmilk represents a high proportion of the nutritional intake of infants with diarrhoea. Frequent breastfeeding increases milk production and has positive effects on the total duration of breastfeeding. ▪ Locally appropriate cereal-milk mixtures can provide safe alternatives to milk for the dietary management of diarrhoea in older infants and young children. ▪ Milk feeds do not need to be diluted in feeding infants 6 months or older. ▪ Maternal encouragement may be important in improving the food intake of children with diarrhoea. ▪ Improved complementary foods should continue to be offered after the end of the diarrhoea episode. ▪ Persistent diarrhoea, i.e. episodes lasting 14 days or longer, can represent up to 20% of diarrhoea episodes and have a considerable negative effect on nutritional status.	▪ Give the child plenty of food to prevent malnutrition. ▪ Continue to breastfeed frequently. ▪ If the child is not breastfed, give the usual milk. If the child is less than 6 months old and not yet taking solid foods, dilute milk or formula with an equal amount of water for 2 days. ▪ If the child is 6 months or older, or already taking solid foods: also give cereal or another starchy food mixed, if possible, with pulses, vegetables, and meat or fish. Add 1 or 2 teaspoonfuls of vegetable oil to each serving. ▪ Encourage the child to eat; offer food at least 6 times a day. ▪ Give the same foods after diarrhoea stops; and give an extra meal each day for 2 weeks. If the child has persistent diarrhoea: ▪ dilute any animal milk with an equal volume of water or replace it with a fermented milk product, such as yoghurt; ▪ assure full energy intake by giving six meals a day of thick cereal and added oil, mixed with vegetables, pulses, meat or fish; ▪ bring the child back in 5 days; if the diarrhoea has not stopped refer to hospital.

continued ➤

Continued from previous page.

Influential research findings	Chart revision
1991-1992	**1992**
▪ A randomized trial led to the conclusion that full strength milk feeds can be given to non-breastfed infants younger than 6 months during diarrhoea. They provide greater nutrient intake and do not adversely affect the symptoms of diarrhoea.	▪ The recommendation for the dilution of milk for infants younger than 6 months with acute diarrhoea was removed from the chart.

Further revision of the chart may take place in the near future to reflect the findings of a multicentre trial evaluating guidelines for the management of persistent diarrhoea.

In spite of the very severe presentation of the patients admitted in the study, the above-described algorithm performed very well with an overall treatment success rate of 88.2% (95% CI = 84.9-91.5%).

Further analysis of this data set is under way to better explain these results and to identify predictive factors associated with treatment failures. These final results will be available in early 1994.

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 in Guatemala has been recently completed. 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.

A double-blind trial evaluating the efficacy of cotrimoxazole (trimethoprim-sulfamethoxazole), an absorbable combined antibiotic, in the treatment of persistent diarrhoea has recently been completed in Peru. A preliminary analysis of the data collected in this study indicates that there are no statistically significant differences between treatment groups with regard to the main outcome variables (treatment success/failure rate, stool output, duration of diarrhoea). However, these results show a 15% higher treatment success rate in the group receiving cotrimoxazole. Further analysis of this data set is under way to better define this observation.

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 for treating shigellosis in young children. However, nalidixic acid, which has a similar toxicity to the fluoroquinolones, is widely recommended — and in some areas routinely used — for this purpose without significant adverse effects having been reported. 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 has been developed and approved in Peru to determine the efficacy of a two-day course of norfloxacin.

Diarrhoea case management in the community

Determinants of ORT use

Studies on the home use of ORT 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). Survey results often demonstrate substantial gaps between use at any time and current use of ORT. Efforts to increase and maintain high ORT use rates stimulated the Programme to sponsor the analysis of data from a national survey in Bangladesh carried out in 1987-1988, in order to identify factors associated with ORT use. The Bangladesh Diarrhoea

Morbidity and Treatment Survey (DMTS), was a household survey of more than 12 000 households which had been selected using multistage cluster sampling techniques to represent urban and rural households all over the country. Early survey results indicated that more than three-quarters of urban and more than two-thirds of rural mothers in Bangladesh reported prior use of ORT for the treatment of childhood diarrhoea, but fewer than 30% of recent diarrhoea episodes in children were treated with ORT. Further analyses, conducted with Programme support, suggested that mothers' exposure to interpersonal communications on ORT, and their perceptions about its mode of action, were influential for initial trial of ORT. Use of ORT for a particular episode was significantly associated with the severity of the episode, as indicated by mothers' unprompted reporting of weakness, vomiting, number of stools, and stool volume. ORT use was also significantly higher among children with watery diarrhoea.

Another secondary data analysis is under way to examine the patterns and determinants of ORS use. Data from a study conducted in 1988-1990 in Cebu, Philippines, are being analysed to identify the determinants of early or late trial of ORS, and of its continuing and correct use.

Displacement of food intake by fluids

In many countries, gruels and porridge made from staple cereals such as rice and maize are commonly given to young children during the weaning period (see Box 21). There has been some concern that the promotion of dilute solutions made from these gruels for the management of diarrhoeal episodes might lead to their continued use, as food, after the end of the episode, thereby leading to continued low energy intakes and malnutrition.

Assessing changes in fluid intake

Increasing the fluid intake of children with diarrhoea is a key element of correct case management in the home. Assessing how well these changes are recorded through the existing household survey instrument and, if necessary, identifying ways to improve the validity of the measurement, have been identified as a research priority. A protocol is being developed to examine this issue in Bangladesh and Brazil in studies to be implemented in 1994.

Careseeking

Caretakers are encouraged to seek help from a trained health worker if their child has blood in the stools, or if the diarrhoeal illness persists, because dysentery and persistent diarrhoea account for a substantial proportion of diarrhoeal deaths. However, little is known about how caretakers recognize, label and respond to dysentery and persistent diarrhoea, and delays in careseeking are common. In Peru, an analysis of secondary data from completed longitudinal studies examined the patterns of case management and careseeking behaviour during such episodes. The study indicates that mothers do not have specific criteria in terms of symptoms or characteristics of the stools that identify persistent diarrhoea. However, mothers see the persistence of an episode as an indication that it has become "complicated", suggesting "infection" or a greater degree of severity. The maternal interpretation of possible causes does not differ from those identified for acute episodes, and neither careseeking practices, nor home case management, were found to be different for persistent and acute diarrhoea episodes.

The CDD focused ethnographic study (FES)

Ethnographic data is required by national CDD programmes when identifying home fluids to be promoted, developing effective home care advice messages, and adapting training materials. Specific recommendations which take local conditions and constraints into consideration are better understood and more likely to lead to better practices than generic messages.

The Programme has supported the development of a tool, the FES, to answer a set of questions on the case management of diarrhoea at the household level. This provides information likely to be needed by programme managers, working with communication experts, to develop the health education component of their programmes. The FES uses a variety of techniques, such as unstructured, semi-structured and structured interviews, household observations, and case simulation. The FES manual contains complete guidelines for conducting the ethnographic study, including instructions for data collection and analysis, and preparation of the final report. The draft tool is now being finalized after field tests in El Alto (Bolivia) and in four sites in Mexico.

Box 21

Cereal-based fluids in Kenya

The use of cereal-based fluids during diarrhoea is being examined in a study in Kenya. The study includes a household survey, interviews with mothers at health centres, key informant interviews, and focus group discussions. Uji (a porridge made with maize, millet or sorghum flour) is a common food which varies somewhat either because of the different ingredients used or, more important, because of the way it is prepared: as a thick, medium or thin solution.

Uji prepared as a thin solution was mentioned in 86% of the households surveyed as a food to give to children with diarrhoea. Fluids, such as teas, water and sugar-salt solution, were mentioned much less frequently. ORS was mentioned by 41% of the caretakers, although 84% of them knew of it, and more than 60% had used it in diarrhoea episodes. Research on feeding practices during diarrhoea suggest that some food items are withheld during diarrhoea (e.g. sweet potatoes, beans, cabbages and fried meats), while others are encouraged (e.g. mashed sweet bananas mixed with wheat flour and rice). In general children are given "softer" or "lighter" foods during diarrhoea. Nearly half the mothers reported that they would breastfeed their children less than usual during diarrhoea, while 36% said they would breastfeed more. Data analysis now under way will examine whether diluted Uji is perceived as a fluid and offered to children with diarrhoea in increased volume and whether foods return to their normal consistency after the end of the episode. Further results from the study will be available in 1994.

The issue of foods being displaced by fluids is also being examined in the Philippines, where rice-based gruels are used as weaning foods and rice-based solutions are used in the home treatment of young children with diarrhoea. Results from this study will be available in 1994.

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 treatment. The findings will be written up by the end of 1994.

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 to define the dispensing practices of retailers and the factors influencing them has recently been completed. A few results from this research, focusing on diarrhoeal disease treatment, are summarized below:

- while more than 80% of the drug retailers have a good knowledge of ORT and ORS, ORS packets are prescribed in only a very few cases;
- confidence in ORS in the community appears to be very low as doctors and health workers usually prescribe other drugs than ORS for the treatment of diarrhoea;
- drug retailers expressed concern about giving advice different from that given by doctors or health workers. This is how drug retailers justify prescribing ORS infrequently while favouring antimicrobial-antidiarrhoeal combinations that are the treatment most prescribed for diarrhoea by health workers and doctors.

Based on a complete analysis of this data set, an intervention is being developed to modify drug retailers' prescribing practices.

In southern Brazil, a study is under way to design, implement and evaluate an intervention for improving the prescribing behaviours of physicians treating childhood diarrhoea at public health centres. The first part of this study has recently been completed and analysed:

Box 22

Regulatory intervention in Pakistan — A case study of the deregistration of paediatric antimotility drugs

The national CDD Programme in Pakistan began in 1982 with the aim of reducing the morbidity and mortality of children under 5 years of age. The primary strategy was improved case management. In 1988, the national CDD policy stated that no antidiarrhoeal drugs should be used for children under 5 years of age. In June 1990, following a multifaceted campaign inspired by the recorded deaths of children due to overdose of loperamide drops, all paediatric antimotility drugs were deregistered in Pakistan. This case study attempted to determine the specific factors that led to this successful regulatory intervention in a developing country.

A combined methodology was used, involving reviews of documentation and quantitative data, and interviews with key informants.

The study identified six crucial elements that led, eventually, to a successful regulatory intervention:

- the personal motivation of a few individuals;
- the availability of quantitative data showing the dramatic consequences of the misuse of loperamide drops;
- the active support of international organizations;
- the mobilization of the media, both locally and internationally;
- the presence of a government responsive to public pressure;
- the decision to focus the campaign for deregistration on specific antidiarrhoeal drugs.

The combination of the above elements appears to have been important in overcoming the resistance or indifference of the pharmaceutical companies and of the professional medical associations.

The following also seem necessary for success:

- medical professionals and researchers must recognize quantitative data as an instrument for change rather than a mere academic tool;
- networking between all individuals and organizations capable of playing an active role in a campaign is vital to: broaden the campaign's base; raise in both quantitative and qualitative terms the pressure on manufacturers and regulatory authorities; ensure good communication and an effective sharing of information; and facilitate rapid and accurate responses to the latest developments in the campaign;
- the use of the media, if possible also at an international level, is essential for bringing the campaign into the public eye, thereby challenging both the pharmaceutical companies and the regulatory authorities, and raising political pressure.

- physicians showed good knowledge of the importance of dehydration as assessed through observations of history-taking and examination for signs of dehydration;
- ORS was commonly prescribed (in 85% of cases); however, it was often prescribed as a "second-class" medicine (physicians might say "get ORS from the nurse");
- when physicians were asked about "difficult" mothers, they described mothers who were either too aggressive or too passive; some physicians reported taking more time with these mothers to explain treatment, while others physicians reported prescribing more drugs to get rid of them;
- physicians reported very poor access to new medical information;
- during observation, 19% of the mothers asked for a specific drug (medication requests may have been underestimated because of the presence of the observer);

- mothers showed a good knowledge of ORS and dehydration; however, they expressed a constant desire to somehow "cut off" the diarrhoea after a certain point (usually 2-3 days).

As with the study in Nepal, an intervention to modify physicians' prescribing behaviours is being developed, based on the results of the first phase of the study.

A study is under way in Peru to test a two-phase integrated intervention to reduce the inappropriate use of drugs during childhood diarrhoea. The first phase is a community-based educational and motivational intervention aimed at increasing caretakers' knowledge of ORT, and at modifying caretakers' expectations of physicians' treatment of childhood diarrhoea. The second phase of the intervention will be directed at physicians in order to: provide them with the correct information on drug management of childhood diarrhoea; promote a continuous pattern of adequate diagnosis and treatment through the use of a clinical record instrument; and cultivate a receptive atmosphere in the community which supports physicians' proper management of diarrhoea. Results from this study are expected in early 1995.

The experience of selected countries in regulating the use of antidiarrhoeal 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 antimotility drugs has recently been completed (see Box 22).

Diarrhoea prevention

During 1992-1993 support was provided to projects that focused on the development and testing of approaches to promote breastfeeding and improved complementary feeding practices, and on the evaluation of vitamin A supplementation, zinc supplementation and vaccines.

Promotion of breastfeeding

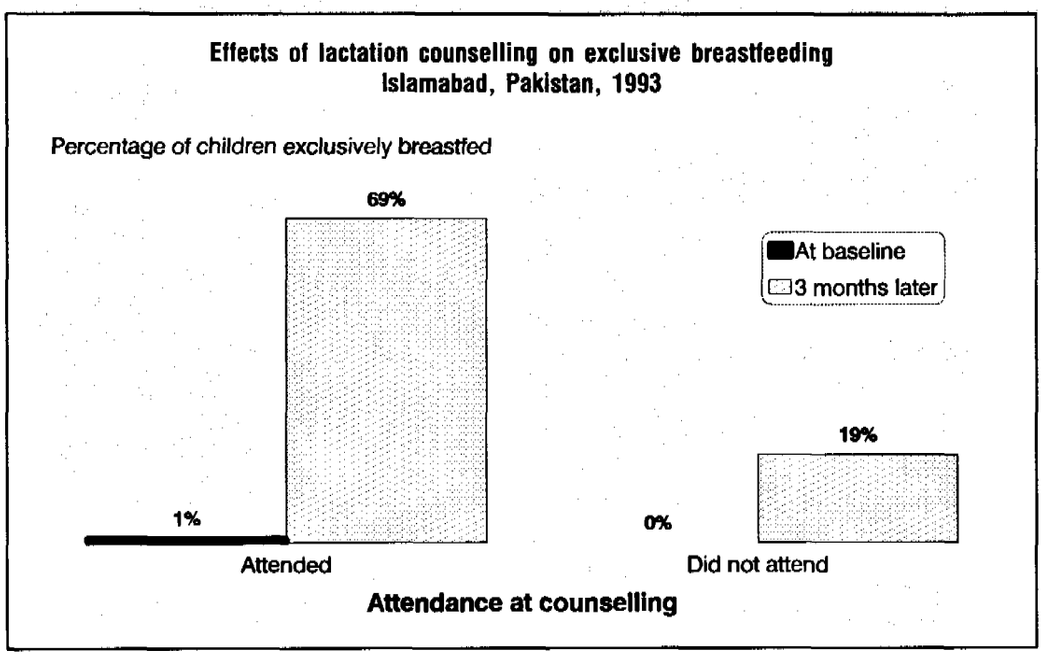
Evaluation of lactation management training

Exclusive breastfeeding in the first four to six months of life and continued breastfeeding until at least the end of the first year are the infant feeding practices associated with the lowest risks of diarrhoea incidence, severity of episodes and mortality. Available evidence suggests that training of health staff in lactation management and improving their counselling skills can lead to significant improvements in the rates of exclusive breastfeeding among mothers who deliver in maternity facilities or whose children are treated by trained health workers in outpatient clinics. The Programme has supported research to confirm this effect, to measure its magnitude and to identify successful approaches to implementation.

An evaluation was conducted of the lactation management training programme in Santos, Brazil. The evaluation comprised three parts: (a) an assessment of the training process, (b) an examination of changes in the policies, procedures and routines related to breastfeeding at maternity facilities to which teams trained in Santos had returned compared with control facilities, and (c) a measurement of the changes in the prevalence and duration of breastfeeding in the first six months of life among mother-infant pairs attending the intervention facilities compared with those attending control facilities. Lactation management training was associated with significant improvements in trainees' knowledge, improved compliance of the trainees' institution with the WHO/UNICEF *Ten steps to successful breastfeeding*, the creation of outpatient lactation support clinics and, finally, increases in the median duration of breastfeeding, namely five days of exclusive breastfeeding, 13 days of predominant breastfeeding and 30 days of any breastfeeding in the first six months of life. The median duration of breastfeeding remained unchanged in the control facilities. Institutional response to the training was varied. New initiatives, such as the creation of the lactation support clinics, were more often implemented than changes to long-held institutional routines such as starting breastfeeding in the delivery room. The trainees' difficulties in changing their institutional routines suggest that greater attention needs to be given in the course to providing them with the skills to deal with the most common resistance points. A workshop is planned for 1994 to present and discuss the study findings with state and national authorities.

An evaluation of the effects of lactation management training outside the maternity hospital setting is under way in the nearby island of Guarujá, where a team of professionals trained in the Santos programme has established two lactation support clinics. Mother-infant pairs from the island's main maternity hospital and referred

Figure 11



to the lactation support clinics are followed up in their homes one and six months after delivery. Results from the preliminary analysis indicate that 54% of mother-infant pairs who were referred attended the clinics within four months of delivery (median age at attendance 16 days). Mothers attending the clinics were significantly younger — 29% vs 19% were under 20 years old. More of them reported receiving information on breastfeeding during pregnancy (49% vs 37%) and fewer of their infants used pacifiers (46% vs 63%). Attendance was associated with significantly greater prevalence of exclusive breastfeeding at 1 month (54% vs 31%) and 4 months (43% vs 18%). The most important benefits of attending the clinics, as reported by mothers, were increased motivation and information on breastfeeding (69%) and resolution of specific problems (18%). Mothers who did not attend the clinics referred to them as "unnecessary" (38%), complained of pain in caesarean or episiotomy scars (21%) or indicated choosing other services (12%) as the main reasons for non-attendance. Further data analysis is under way, and results will be available in 1994.

Preliminary results have become available from the evaluation of the Lactation Management Clinic (LMC) of the Children's Hospital in Islamabad, Pakistan. Of 100 mother-infant pairs who attended the hospital for the treatment of childhood illnesses and were referred to the LMC because of non-optimal breastfeeding practices, 77 attended the clinic. "Insufficient milk" was reported by 39% of the mothers as their main feeding problem, followed by problems with the breasts (19%), such as engorgement and cracked or sore nipples. The lactation counsellor diagnosed poor attachment of the infant to the breast as the most frequent underlying problem (41%), followed by complementary feeding with a bottle ("nipple confusion" — 22%) and improper feeding technique, such as breastfeeds that were infrequent, scheduled or very short (21%). Figure 11 presents the breastfeeding rates among infants who attended the LMC and those who did not attend, both at recruitment into the study (baseline) and three months later. Although rates of exclusive breastfeeding were similar at recruitment (1% vs 0%), they were significantly higher three months later among the group who consulted at the LMC than among the non-attenders ($p < 0.001$). A description of the LMC is given in Box 23. Results of the complete study will be available in 1994, including information on the cost of the intervention.

Other interventions to improve breastfeeding

The Programme is supporting a randomized, controlled trial in Bangladesh to explore whether lactation counselling interventions can be effective when their delivery is targeted at the mothers of infants at high risk of diarrhoea mortality. Lactation counselling is being given to mothers of partially breastfed infants less than 12 weeks old who are admitted to a hospital for the treatment of diarrhoea. Intervention effects on

Box 23

The Lactation Management Clinic at the Children's Hospital, Islamabad, Pakistan

The clinic is held in a large room decorated with posters promoting breastfeeding and with photographs of infants who have come to the clinic and been successfully re-lactated.

Patients are seen from 9:00 to 14:00 six days a week. The usual consultation begins with a brief greeting to the mother and an invitation to sit on a chair close to the lactation counsellor. The first part of the consultation consists of history-taking, asking the mother details about any feeding problems and weighing the mother and child. The counsellor then asks the mother to breastfeed the child in her usual way and observes them. This is followed by specific advice related to the breastfeeding problem, general advice to promote and support breastfeeding, and a demonstration of any particular skills required (such as improved positioning or milk expression). A leaflet in Urdu with messages on breastfeeding is given to the mother to take home.

The counsellors have been observed to be supportive and respectful in their treatment of the patients. They attempt to put the mothers at ease, obtain the relevant information, provide practical and detailed advice, and motivate the mother to follow the advice and to return to the clinic for follow up, if necessary. Counselling sessions with first-time patients last, on average, 27 minutes (range 18-37). Breastfeeding observations and demonstration of skills range from 2 to 7 minutes while counselling and advice-giving average 10 minutes (range 6-16). Follow-up visits are significantly shorter, averaging 8 minutes (range 6-9), and adopt a similar pattern to the first consultation, and focus on how the problem that led to the first consultation is being dealt with.

breastfeeding practices will be measured at the time of hospital discharge and, at home, two weeks later. Results from this trial will be available in 1994.

The first of the WHO/UNICEF *Ten steps to successful breastfeeding* highlights the importance of having a written breastfeeding policy that is routinely communicated to all health care staff. A study has been supported in Turkey to document and analyse the process of transmission of the national breastfeeding policy (consistent with the *Ten steps*) from its inception at the Ministry of Health through to the institutions that provide maternity services in Istanbul. The study will also review maternity services' performance and its determinants, and develop recommendations for improvements in policy transmission and institutional performance.

Interventions to promote improved breastfeeding have tended to focus on changing knowledge and practices of individual mothers. However, the social, cultural and environmental factors are also important. Expectations of behaviours and perceptions of social support, desire to satisfy group norms, and perceptions of availability and adequacy of support may be of fundamental importance in promoting behaviour change. A study has been funded to examine the effect of the social environment (i.e. social influence and social support) on the decision to breastfeed and to continue breastfeeding among urban mothers in Turkey. The study will develop more specific models that make explicit the relation with certain variables with behaviour which, if significant, may lead to new interventions for the promotion of improved breastfeeding practices.

To assist the national authorities to identify optimal interventions to protect, promote and support breastfeeding that correspond to specific national problems and resources, the Programme is developing a set of instruments for breastfeeding situation analysis. It is anticipated that they will, in particular, assist in identifying the nature of the breastfeeding problem, defining target groups, and formulating messages and channels for promotional activities. The situation analysis has a two-phase structure. Phase one consists of qualitative research to examine different practices related to infant feeding, to identify common terms that are used to describe these practices, and to explore the social, educational, cultural and situational factors that influence these practices. Phase two consists of 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, influence or support regarding breastfeeding. An

assessment of this kind, aimed at instrument development and data collection, has recently been completed in Ethiopia. Another is planned for China.

Promotion of improved complementary feeding

Global estimates of mortality in children under five suggest that malnutrition is an associated factor in 40-60% of diarrhoeal deaths. Not only does the risk of severe diarrhoea increase with malnutrition, but the risk of malnutrition increases as a result of frequent or severe diarrhoea episodes. Continued adequate feeding during diarrhoea, however, shortens the duration of the episode, and children with adequate diets during the diarrhoea episode recover fully and resume their normal growth following diarrhoea. In addition to being an integral part of correct case management when the child is sick, the promotion of improved complementary feeding practices when the child is healthy as well, can lead to significant reductions in the prevalence of malnutrition, and, consequently, to the prevention of severe diarrhoea.

Given its importance in the management of diarrhoeal episodes and in preventing severe diarrhoea and death, the promotion of improved complementary feeding has been identified by the Programme as an important addition to its case management strategy for reaching its mortality reduction goal.

Timing the beginning of complementary feeding

The Programme has supported, in collaboration with the Thrasher Research Fund, UNICEF and USAID, a randomized, controlled trial in Honduras which will measure the effects of introducing supplementary foods to exclusively breastfed infants at 4 and 6 months. Effects on growth, total energy intake and total breastmilk intake are measured at 16, 21 and 26 weeks of life and compared among three groups: those receiving the supplements, those receiving the supplements and recommendations for maintaining the frequency of breastfeeding and those exclusively breastfed. Results from this study will be available in 1994.

Adequacy of food intake

The adequacy of dietary intakes depends on the energy and nutrient density of complementary foods, the frequency of feeding, the quantities offered and the child's appetite. Low energy density is a common problem, but increasing energy density beyond a certain level may lead to a reduction in energy intake. How different approaches might be balanced in order to lead to improved intakes was identified as a priority for research. Two randomized trials are under way to examine the combined effects of different strategies for increasing the total energy intake among malnourished infants: (i) increasing the energy density of weaning foods and the frequency of feeding, in Peru, and (ii) increasing the energy density and varying the viscosity of weaning foods, in Jamaica. Preliminary results from the study in Peru indicate that the total amount of complementary food consumed varied inversely with its energy density. Consumption was greater when four or five meals were offered than when three meals were offered. The total energy intake increased in direct relation to dietary energy density and did not reach a plateau even with energy densities of 150 kcal/100 g. Results from the Jamaican study are summarized in Box 24.

An intervention is being tested in rural Guatemala that promotes improved energy and nutrient intakes for young children during diarrhoea, convalescence and in health. The formative phase identified that the energy density of complementary foods was adequate, but that low feeding-frequency and passive maternal feeding behaviours led to low energy intakes. The key recommendations provided by the intervention to mothers of children 6-24 months of age are to increase the frequency of feeding to five meals per day and to stimulate and help the child to eat all the food offered. Various media are used for the introduction of the recommendations: radio, community loudspeakers, as well as interpersonal channels (health personnel in health posts). Supporting educational activities are carried out in schools, with children serving as recall agents for mothers at home. In addition, health centres provide graphical materials for mothers to take home. A monitoring system is collecting data on how the intervention is progressing. The results from the evaluation, in terms of changes in feeding frequency and in energy intake, will be available in 1994.

Box 24

Increasing the energy density of weaning foods in Jamaica

Porridges play an important role in the weaning diets of most developing countries. Increasing the energy density of weaning foods is considered a high priority, but there is controversy over how this increase might best be achieved. One strategy is simply to increase the quantity of ingredients for the liquid used and feed thicker porridges, but it has been suggested that the higher viscosity of these porridges constrains the amount that can be consumed, with no net increase in energy intake. Sufficient concern has been generated worldwide that specific processing techniques to liquefy thick porridges are being promoted.

This study examined whether a thick consistency constrains the amount of weaning food consumed by quantifying the effects of porridge viscosity and energy density on porridge consumption and overall energy intake. Three porridges were compared in a carefully controlled feeding trial:

- thin porridge: low viscosity, low energy density (51 kcal/100 g; viscosity 280-480 cP);
- thick porridge: high viscosity, high energy density (98 kcal/100 g; viscosity 3000-4000 cP);
- amylase-thinned porridge: low viscosity, high energy density (97 kcal/100g; viscosity 280-480 cP).

The thin and thinned porridges were easily drinkable while the thick porridge was semi-solid. The ingredients used were maize meal, sugar and skimmed milk powder; these are commonly used to prepare infant porridges in Jamaica. The amounts were approximately doubled and vegetable oil added to achieve the high energy density. Using a cross-over design each porridge was fed *ad lib* four times daily for four days by specially trained feeders. Four feeds were offered daily as it was felt that this number could realistically be achieved at home by mothers (see following Table).

Mean daily energy intakes and meal duration

Porridge	Energy intake (kcal/kg)	Time (minutes)
Thin	71[a]	7.4
Thick	96	12.9[b]
Amylase-thinned	105	6.4

[a] Significantly different from thick and amylase-thinned porridge ($p<0.001$).

[b] Significantly different from thin and amylase-thinned porridge ($p<0.001$).

The mean energy intake of the thin porridge was significantly lower than that of the amylase-thinned and thick porridges. The mean daily energy intakes of the amylase-thinned and thick porridges were similar and matched WHO/FAO recommended requirements. Meal duration was significantly longer for the thick porridge, which was fed by cup and spoon, than for the amylase-thinned and thin porridges which were consumed as a drink.

Feeding a thick porridge with an energy density of 100 kcal/100 g four times daily satisfied the recommended daily energy requirements for infants and young children. The only advantage of reducing the viscosity of the thick porridge was the shorter time spent feeding. Viscosity reduction of this type of porridge would therefore appear to be unnecessary. It is simpler and probably more appropriate in this population to promote the use of semi-solid energy-dense porridges.

Safety of complementary foods

Inadequate preparation, storage and handling of weaning foods are likely to be major risk factors for diarrhoea. Little is known, however, about the determinants of practices associated with high risk of contamination of weaning foods, and, more important, how unsafe practices might be modified.

A study is under way in Guatemala to describe the sociocultural context in which hygiene behaviours relating to complementary food preparation, handling and storage take place; to select specific hygiene behaviours for intervention, in terms of their potential health impact and feasibility of change; to test, in an experimental context, the most cost-effective ways to change these behaviours so as to reduce or eliminate bacterial contamination and proliferation; and to propose and test through household trials specific behavioural recommendations. Results from the study will be available in 1994.

Valid and practical techniques for the measurement of hygiene behaviours are required for the development and evaluation of interventions aiming to promote improved hygiene. A study has been supported in Burkina Faso to measure (i) the repeatability of structured observations of hygiene behaviours and (ii) the degree of agreement, at the individual and the community levels, between data obtained through structured observation and by interview. The study will also investigate whether this degree of agreement varies according to the form of the question posed at the interview; and the "reactivity" of hygiene behaviours to the presence of an observer. Results of the study will be available in 1994.

Vitamin A and micronutrient supplementation

Vitamin A

Results from two randomized, double-blind, placebo-controlled trials of vitamin A supplementation supported by the Programme became available in the biennium.

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.

Results from this project indicate that vitamin A supplementation reduced the overall incidence of diarrhoea by 6%. Its protective effects were particularly strong in relation to high purging episodes, with reductions of 23% in the prevalence of episodes with six or more diarrhoeal stools per day. The effects of supplementation on episodes of varying stool rates are presented in Table 11.

The protective effect was greater in the first month after supplementation and tended to decrease over time until it almost disappeared four months after supplementation, as shown in Figure 12. No effects of supplementation were detected in the incidence or severity of respiratory infections.

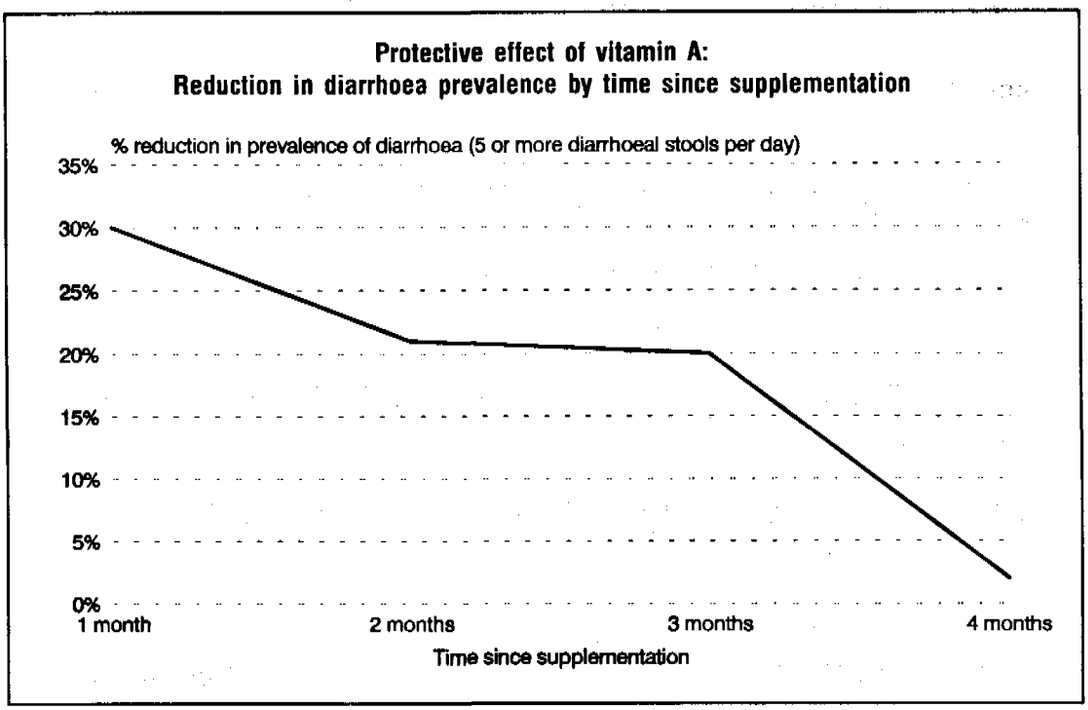
In India, 900 children aged 12-36 months attending a health facility for the treatment of diarrhoea received 200 000 IU of vitamin A or a placebo and were followed for 90 days after the

Table 11

Vitamin A supplementation and prevalence of diarrhoea episodes

Stools per day	Mean daily prevalence		Vitamin A/Placebo	p value
	Vitamin A	Placebo		
3 or more	0.0478	0.0517	0.92	0.074
4 or more	0.0232	0.0259	0.90	0.049
5 or more	0.0099	0.0123	0.80	0.005
6 or more	0.0043	0.0056	0.77	0.006

Figure 12



end of the episode through twice-weekly home visits. Results indicate that vitamin A supplementation may be associated with increased risks of acute respiratory infections in young children. The incidence of clinical pneumonia among supplemented children younger than 2 years was 35% higher than among those not supplemented. The risk of having radiologically diagnosed pneumonia was 2.5 times greater among the same children. Although these preceding differences were not statistically significant, supplemented children nevertheless had significantly greater risk of presenting lower chest indrawing (2.13 times) and cough (1.11 times) than non-supplemented children.

Preliminary results from a meta-analysis commissioned by the Programme for the Control of Acute Respiratory Infections do not exclude the possibility of supplementation leading to an increased risk of mortality in younger children and its association with increased risks of pneumonia. These preliminary results and those from India prompted the Programme to initiate a multicentre trial to examine the safety and efficacy of linking the delivery of vitamin A supplements to immunizations in early infancy (i.e. at 6, 10 and 14 weeks, and at 9 months of age).

Consequently, a multicentre study was organized. The study, to be implemented in Brazil, Ethiopia, Ghana, India, Indonesia and Peru involves the follow up of 12 000 infants through fortnightly home visits from birth to 12 months of age. The project is being coordinated by CDD in collaboration with WHO's Expanded Programme on Immunization and the Nutrition Unit, the Johns Hopkins University and the London School of Hygiene and Tropical Medicine.

Zinc

A randomized, double-blind, placebo-controlled trial is under way in India, jointly supported by the Thrasher Research Fund. The trial will examine the impact of providing zinc supplementation to children attending a health facility with diarrhoea on the incidence, duration and severity of subsequent diarrhoea and respiratory infections, in addition to its effect on growth. Results from this trial will be available in 1994.

Vaccine evaluation research

The Programme has continued to support research to evaluate promising candidate vaccines for the most important causes of acute diarrhoea. These include rotavirus diarrhoea, cholera, shigellosis and disease caused by enterotoxigenic *Escherichia coli*. This support is focused on field trials to evaluate vaccine safety, immunogenicity and efficacy, and on epidemiological studies to prepare

for such trials. During the biennium, basic research to develop new candidate vaccines for these diseases was supported within WHO by the WHO/UNDP Programme for Vaccine Development (PVD). Programme efforts on vaccine development are closely coordinated with those of PVD and of the 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, preferably with oral polio vaccine (OPV). The vaccine should protect against illness, especially severe illness, caused by all four of the important serotypes of rotavirus. Efficacy should be demonstrated among high-risk populations in developing countries.

Recent studies have focused on attenuated vaccines consisting of rhesus rotavirus (RRV) with incorporated RNA that encodes production of the VP7 serotype protein of human rotavirus. RRV-tetravalent (TV) vaccine consists of rhesus-human reassortant viruses corresponding to serotypes 1, 2 and 4, and RRV for serotype 3.

In the United States, studies with RRV-TV vaccine, supported by other bodies, have involved infants given three doses of vaccine containing $4x10^4$ or $4x10^5$ PFU. These have shown 50-60% protection against all rotavirus diarrhoea episodes for two years, but 80% protection for episodes that were clinically "severe". Protection was not increased when the higher dose was given. When vaccine contained only the serotype 1 reassortant virus, similar protection was seen against serotype 1 disease, but protection was much lower (7-27%) against disease caused by other serotypes. Based on the high level of protection against severe disease, the vaccine manufacturer, Wyeth-Ayerst Laboratories, is planning to seek licensing of the RRV-TV vaccine in the United States and Europe.

So far, results with RRV-TV in developing countries have been less encouraging. Studies in Brazil (supported by the Programme) and Peru, involving infants given three doses of RRV-TV ($4x10^4$ PFU), have shown 20-40% protection against all rotavirus diarrhoea episodes. Protection was slightly higher (30-45%) when only episodes in which rotavirus was the sole detected pathogen were considered, and increased to 50-75% for rotavirus episodes that were clinically "severe". It is hoped that greater protection will be seen when the vaccine dose is increased to $4x10^5$ PFU; studies with this dose of vaccine are under way with Programme support. One, in Myanmar, has yielded very few cases and shows overall vaccine efficacy of about 40%. A much larger study, involving 2500 infants, is under way in Venezuela. This trial, which will be completed in 1995, focuses on children who present to hospital with diarrhoea; it should enhance the ability to assess protection by vaccine against serious episodes of rotavirus diarrhoea.

In Thailand, a study has sought to determine whether simultaneous immunization of infants with RRV-TV ($4x10^4$ PFU/dose) and OPV would interfere with the immunogenicity of either vaccine. 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 serological responses to polio vaccine serotypes 2 or 3, but may have modestly suppressed responses to serotype 1 polio vaccine. These studies may need to be repeated with the $4x10^5$ PFU dose of rotavirus vaccine to determine whether enhanced seroresponses to rotavirus can be achieved without interfering significantly with the immunogenicity of OPV, especially serotype 1.

Cholera vaccines

The dramatic appearance in 1992 of epidemic cholera caused by a new serotype of *Vibrio cholerae*, O139, may be the onset of a new pandemic. As the O antigen of this serotype is unrelated to that of *V. cholerae* O1, a vaccine based on *V. cholerae* O1 will not protect against *V. cholerae* O139, and vice versa. Thus, the aim of cholera vaccine research has become to develop a cost-effective vaccine for preventing cholera caused by *V. cholerae* O1 *and* O139, and preventing the spread of these agents.

Although research to develop combined vaccines effective against *V. cholerae* O1 and O139 has begun, such vaccines are not yet ready for large scale field trials. In the meantime, the field evaluation of the two most promising candidate oral vaccines for *V. cholerae* O1 has continued.

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

Studies among volunteers in Sweden and the United States, described in the Eighth Programme Report 1990-1991, have shown that WC/rB vaccine is safe and has immunogenicity comparable to that of the earlier WC/B vaccine.

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 prior to possible efficacy trials in the Region. 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 significant 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 people developed four-fold or greater rises in serum vibriocidal antibody and the mean rise in serum antitoxin was about two-fold. Efforts to develop a trial of vaccine efficacy in Colombia were not successful because disease attack rates at the proposed sites were too low. An efficacy trial has been initiated in Lima, Peru with support from other sources. A second trial site in Peru is being investigated with support from the WHO Regional Office for the Americas.

Live cholera vaccine CVD-103-HgR

This live oral vaccine consists of a strain of *V. cholerae* O1 that lacks 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 America, South America and Asia, some of which were supported by the Programme. These show that a single dose of $5x10^9$ CFU is safe and immunogenic in both non-immune people and in those with some degree of immunity from 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 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), has helped to develop and support the first field trial of this vaccine, in Indonesia. The trial began in 1993 and involves 66 000 people. Immunization has been completed and surveillance for cases will continue for 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. A small efficacy trial conducted among adults in Israel in 1993 suggested that a parenteral *S. sonnei* polysaccharide-protein conjugate vaccine was protective. A larger trial is planned for 1994. Although *S. sonnei* is not the most important shigella serotype in developing countries, success with this approach would suggest that it could be used for other, more important serotypes, especially *S. dysenteriae* type 1 and some serotypes of *S. flexneri*. The Programme is monitoring the progress of these studies and will 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 the most important colonization factor antigens (CFAs) and purified B subunit of cholera toxin. This combination 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. The next step will be to evaluate the efficacy of the vaccine in travellers who are at high risk of diarrhoea caused by ETEC. If effective, the vaccine would then be evaluated in children.

Box 25

North-east Brazil: Did ORT play a role in reducing diarrhoea mortality?

Data from different sources were used to assess the plausibility of an impact of improved diarrhoea case management on mortality in Brazil's north-east, where a marked reduction in diarrhoea deaths among young children was recently observed.

Infant mortality fell from 32% of the total mortality in under-fives in 1980 to 17% in 1989; at the same time, the percentage of infant deaths attributed to diarrhoea dropped from 41% to 25%. These trends correspond to a 57% reduction in infant diarrhoea mortality. Similar decreases were also observed for children aged 1-4 years. No other major cause of death showed significant reductions over the same period.

Data from the nine major paediatric hospitals in the region showed that diarrhoea admissions fell from 57% of infants seen in 1980 to 30% in 1990. Admissions due to other main diseases either remained stable or increased in relative terms.

Oral rehydration therapy for the case management of diarrhoea was introduced in the north-east in the early 1980s. By 1991, following intense national programme activities, it was used in 35% of all episodes and in 62% of episodes judged by the mother to be severe.

Other important changes were also observed during the decade that could have affected diarrhoea mortality. They included a worsening of socioeconomic conditions; increases in water supply, vaccine coverage and breastfeeding duration; and a reduction in the prevalence of malnutrition. Using relative risks of diarrhoea mortality from other Brazilian studies, it was estimated that the observed changes in socioeconomic, environmental and health-related variables would result in a 21% decrease in infant mortality due to diarrhoea, or about one-third of the observed decline. Finally, an inverse correlation was present at state level between ORT use rates and proportionate infant diarrhoea mortality (Spearman $r = -0.61$; $p = 0.04$).

Despite shortcomings in the available data and the consequent constraints in the methods of analysis, the evidence suggests that the improved diarrhoea case management promoted by the national programme had a significant impact on the level of diarrhoea mortality in the region.

Measuring the impact of national programmes

During 1992-1993, support was provided to studies aiming to assess the impact of national CDD programme activities on the management of children with diarrhoea and on reductions in diarrhoeal mortality. Results from a study supported in Brazil are presented in Box 25.

Support was also provided for the first phase of a project aiming to evaluate the impact of the activities conducted by the CDD programme in the Philippines. During this phase, secondary information will be gathered, reviewed and classified. Evaluation plans will then be finalized and a proposal for the implementation of these plans prepared. The study is being coordinated by a national steering committee, consisting of researchers and ministry of health staff.

Guidelines for the evaluation of programme impact will be prepared, drawing on the experience of these two projects, to be made available to other interested national CDD programmes.

Research training and strengthening

In 1992-1993 the Programme carried out the following research strengthening activities, with the aim of enhancing the capacity of institutions in developing countries to conduct research of high quality 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.

- One workshop was held in China in collaboration with the Ministry of Public Health, with support from the Australian International Development Aid Bureau (AIDAB), to assist 18 developing-country researchers to enhance their skills and develop proposals for intervention-related studies on the prevention of diarrhoea.

- One workshop was held in Mexico, in collaboration with the ADDR, to review and analyse the data and prepare a manuscript presenting the main results from the multicentre study conducted to evaluate the efficacy of an algorithm for the management of persistent diarrhoea (see the section Persistent diarrhoea).

- Continued research strengthening support was provided to six institutes in Brazil, India, Peru (2) and the Philippines (2) 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 NGO staff with the intention of securing their participation in interpreting the study findings and identifying areas for further analyses, and to facilitate the use of the information in the development of future programme activities.

Research documents

Documents produced or commissioned by the Programme in 1992-1993 included the following:

- a review of the traditional technologies in increasing the energy density of weaning foods;[30]

- 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 six months of life;[31]

- a paper presenting the results of a meta-analysis of clinical trials on the impact of rice-based ORS on diarrhoea;[32]

- a review on the timing of the introduction of weaning foods;[33]

- a review of the magnitude of diarrhoea morbidity and mortality;[34]

- a chapter presenting a review of priority interventions for diarrhoeal disease control;[35]

- a paper presenting the results of studies on feeding full-strength cow's milk formula during diarrhoea to infants younger than 6 months;[36]

- a monograph on the outcome of a workshop on measuring hygiene behaviour;[37]

- a paper detailing the results of a study on the comparative efficacy of rice-based ORS and glucose-based ORS when they are used with early feeding.[38]

Collaborating Centres

The 10 Collaborating Centres of the Programme continued to play a role in support of research efforts, especially in the areas of epidemiology and vaccine development and evaluation. Activities of special importance have been described in earlier sections of the report. A list of the centres with their full addresses is given in Annex 4.

30 Ashworth A, Draper A. *The potential of traditional technologies for increasing the energy density of weaning foods.* Document WHO/CDD/EDP/92.4.

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

32 Gore SM, Fontaine O, 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.

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

34 Bern C, Martines J, de Zoysa I, Glass RI. The magnitude of the global problem of diarrhoeal disease: A ten-year update. *Bull WHO*, 1992, 70(6):705-714, 1992.

35 Martines J, Phillips M, Feachem RGA. Diarrheal diseases. In: Jamison DT et al., eds. *Disease control priorities in developing countries.* New York, Oxford University Press, 1993, 91-116.

36 Chew F et al. Is dilution of cow's milk formula necessary for dietary management of acute diarrhoea in infants aged less than 6 months? *Lancet*, 1993, 341:194-197.

37 *Actions speak: The study of hygiene behaviour in water and sanitation projects.* The Hague, International Water and Sanitation Centre, 1993.

38 Fayad IM et al. Comparative efficacy of rice-based ORS plus early feeding versus glucose based ORS plus early feeding. *Lancet*, 1993, 342:755-756.

Collaboration with industry

The Programme has maintained close collaboration with companies producing biologicals, pharmaceuticals, and diagnostic reagents, in particular those listed in Table 12. Details of the studies benefiting from this collaboration have been described above.

Collaboration with other agencies and organizations

During the biennium, the Programme collaborated with several international agencies and organizations that have an interest in diarrhoeal disease research. A few examples of such collaboration are provided below:

- The Programme is collaborating closely with the International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B) by directly supporting individual research projects at the Centre and by managing a grant from the United Nations Development Programme to support research that is complementary to WHO's overall research effort.

- The Programme is coordinating its research efforts with the USAID-supported Applied Diarrheal Disease Research (ADDR) Project (a project which promotes and supports applied research in developing countries). USAID is also providing support to enable staff from its HEALTHCOM (Communication for Child Survival) project to assist the Programme in research and developmental activities. Finally, Programme staff regularly participate in meetings of the USAID Consultative Group on Vaccine Development. In 1992-1993, regular meetings were held between USAID and representatives from agencies or organizations receiving support from USAID for diarrhoeal disease research (ADDR, ICDDR,B and the WHO CDD Programme), to define complementary roles, and to review and coordinate activities.

- The Programme co-funded projects with the Academy for Educational Development, the International Development Research Centre, the United Kingdom Overseas Development Administration, the Swedish Agency for Research Cooperation with Developing Countries, the Thrasher Research Fund, and UNICEF; specific projects receiving such co-funding have been described in the preceding sections of this report.

- The Programme collaborated with the Swedish International Development Authority in supporting preparations for cholera vaccine field trials. In particular, the Authority made funds available for the provision of whole-cell/recombinant B-subunit (WC/rB) vaccine for field trials in Latin America.

Table 12

Research collaboration with industry, 1992-1993

Company	Area of collaboration
Bayer Diagnostics *(France)*	Evaluation of an algorithm for the management of persistent diarrhoea
Dakopatts A/S *(Germany)*	Evaluation of an algorithm for the management of persistent diarrhoea
Galactina *(Switzerland)*	Clinical trials of precooked rice-based ORS
Hoffmann-La Roche *(Switzerland)*	Field trials of vitamin A supplementation
Lederle Laboratories *(USA)*	Evaluation of an algorithm for the management of persistent diarrhoea (including use of multivitamin and mineral supplements)
Laboratoire Plan SA *(Switzerland)*	Clinical trials of low osmolarity ORS
Pasteur-Mérieux *(France)*	Field trials of Vi typhoid vaccine
Swedish National Bacteriological Laboratory *(Sweden)*	Killed oral cholera vaccine studies
Swiss Serum and Vaccine Institute *(Switzerland)*	Live oral cholera vaccine (CVD-103-HgR) studies
Wyeth-Ayerst Laboratories (USA)	Field trials of rotavirus vaccine

CHAPTER 4

Information Services

The Programme continued to work with other agencies and institutions in disseminating documentation on diarrhoea, and to respond to requests for information.

The quarterly newsletter *Dialogue on Diarrhoea*, produced by the Appropriate Health Resources and Technologies Action Group Ltd (AHRTAG), United Kingdom, remained an important means of keeping health workers of all levels abreast with developments in diarrhoeal disease control. Distributed free to readers in and students from developing countries, *Dialogue on Diarrhoea* has brought to a wider readership many of the issues involved in CDD, including:

- the importance of breastfeeding;
- educating private sector drug sellers;
- the problem of ineffective and expensive drug prescription for diarrhoea;
- feeding during diarrhoea;
- the management of persistent diarrhoea;
- the role of evaluation in effective diarrhoea control programmes;
- hygienic use of water and sanitation facilities;
- control of cholera;
- the basic features of oral rehydration therapy;
- the advantages of collaborating with traditional healers.

Dialogue on Diarrhoea is published in English, Bangla, Chinese, French, Nepali, Portuguese, Spanish, Tamil, Urdu and Vietnamese, and reaches more than 287 000 readers worldwide.

The continuation of the global cholera pandemic prompted large media campaigns to allay public fears and to secure governmental support for effective — and rational — cholera control measures. The Programme helped to finance the production of two videos for national broadcasting: *Cholera — The unnecessary disease* (32 minutes, produced by Television Trust for the Environment, London, in Spring 1993) and *A new time of cholera* (24 minutes, produced by Insight News Television Limited, London, in August that year).

The Programme continued the wide dissemination of practical advice on diarrhoea disease control through its *Update* newsletters, which during the biennium looked at: indicators for assessing breastfeeding practices; the rational use of drugs in the management of diarrhoea in children; advising mothers on management of diarrhoea in the home; and focused programme reviews.

The Programme produced a wide range of technical papers and other documentation (see Annex 5), and, in collaboration with the United States National Library of Medicine, continued to distribute to developing countries the biannual *Bibliography of Diarrhoeal Diseases*.

WHO issued several press releases during 1992-1993 on diarrhoea and cholera, in an attempt to bring to the widest possible audience the steps being taken to combat them. They related to the decision by the countries in Africa to fight cholera together and the Southern Africa Initiative (see Box 18); and the need to boost financial resources if planned CDD programme activities were not to be shelved.

Ten briefing sessions for small groups on the work of the WHO CDD and ARI Programmes were held. This biennium, their target audiences were widened to include, in addition to WHO staff, personnel from international agencies such as UNICEF and the IFRC, various NGOs, and individuals interested in the two Programmes.

CHAPTER 5

Programme Management and Financial Resources

Organization

The CDD Programme at WHO Headquarters is one of the two Programmes of the Division of Diarrhoeal and Acute Respiratory Disease Control (CDR). The office of the Director of the Division, with five professional and five general services staff, provides general direction and management support to the global Programme, including budget planning and monitoring, computer services and editorial assistance. It also coordinates the Programme's cooperation with multilateral and bilateral development agencies and NGOs.

The CDD Programme at Headquarters is responsible for formulation of global technical and managerial policies, global coordination of support to national programmes, research and development activities, coordination with other WHO programmes and the evaluation of progress towards global targets. At Headquarters the CDD staff consists of eight professionals and six secretaries. All eight professionals are charged with the coordination of support to implementation and support to regional offices; they also play a role in both support to programme implementation, and research and development.

The regional offices are responsible for all cooperation with countries in the planning, implementation and evaluation of CDD programmes. With the exception of the European Regional Office, all regional offices have a full-time CDD regional adviser. In the African Region, two intercountry medical officers have been appointed to collaborate with the ARI and CDD regional advisers. One is sited in Côte d'Ivoire for selected French-speaking countries, and the other in the United Republic of Tanzania for a small group of English-speaking countries. An Associate Professional Officer (APO) has been assigned to the Programme in the Western Pacific Regional Office. One APO in Geneva Headquarters concentrates on coordinating breastfeeding activities.

From January 1994, all the CDD posts at country level will be transformed into ARI/CDD posts. The same approach has already been applied to the modification of the terms of reference of most APOS at country level (see Box 19). During the biennium, APOs for CDD and ARI were assigned to the programmes of Angola, Burundi, Ghana, Guinea-Bissau, Haiti, Jamaica, Kenya, Lao People's Democratic Republic, Namibia, Nepal, Pakistan, Papua New Guinea, Philippines, Uganda, Viet Nam, Zambia and Zimbabwe.

Programme review bodies

Technical Advisory Group

The scientific and technical review of programme activities is the responsibility of a Technical Advisory Group (TAG) comprising sixteen leading experts in medicine or public health, including both researchers and practitioners, from outside WHO. Their appointment is for a three-year period. The full Group meets once every two years and a small group of TAG members has a meeting in the intervening year. During the biennium, the full TAG met on 16-20 March 1992,[39] and rather than a small group meeting, a shorter, more focused meeting was held on 8-10 March 1993.[40] At the 1993 meeting, the TAG, inter alia:

- Strongly endorsed the initiative for an integrated approach to the sick child, and viewed CDR an appropriate coordinator within WHO given the contribution of ARI and CDD to changing mortality rates and the leadership already demonstrated with this initiative.

[39] *Report of the thirteenth meeting of the Technical Advisory Group*, Geneva, 16-20 March 1992. Document WHO/CDD/92.39.

[40] *Report of the fourteenth meeting of the Technical Advisory Group*, Geneva, 8-10 March 1993. Document WHO/CDD/93.42.

- Reviewed the experience with the new structure of four research and development working groups, and the country support activities, and noted that the experience to date was positive.
- Reviewed the Programme's targets, and, although believing them to be largely achievable, stated that a major effort would be required by governments, involving other agencies and NGOs.
- The TAG commended the Programme for its efforts to involve the private sector in assuring sustained availability of ORS, and noted with satisfaction the development of the focused ethnographic study. It urged the Programme to collaborate more closely with health professional associations, commending the progress made by the Programme in developing the *Guide for improving diarrhoea treatment practices of pharmacists and licensed drug sellers*. It expressed satisfaction over the finalization of the *Advising mothers* guide.
- The TAG congratulated the Programme for its close collaboration with UNICEF and other organizations to ensure high quality training through the use of its standard training guidelines.
- The TAG welcomed the development of a comprehensive conceptual model specifying factors in and determinants of home care, but urged that high priority be given to developing a similar model for effective case management in health facilities.
- The TAG noted with satisfaction the collaboration with other parties both within and outside WHO for the development of the breastfeeding counselling training course.

Management Review Committee

The annual review of the management of the Programme is entrusted to an ARI/CDD Management Review Committee (MRC), composed of representatives of four United Nations organizations and specialized agencies (UNDP, UNICEF, World Bank and WHO). The twelfth meeting of the MRC was held in Washington, DC, USA, on 6 April 1992,[41] and the thirteenth meeting in Geneva, on 28 June 1993.[42] At the 1993 meeting, the Committee, inter alia:

- Felt that the 1993 *World Development Report* provided a strong justification for the integrated approach to the management of childhood illness as one of the components of a package of essential clinical services.
- Was of the opinion that CDR, with its considerable capacity and experience in research, development and support to national programmes, was the logical focal point for collaboration with other child survival programmes on the integrated approach.
- However, felt it unwise that moves towards integration should lead to the dismemberment of ARI and CDD programmes at the country level, as they still had a valuable role to play as entities in their own right in most countries.
- Recommended that the budgets of the ARI and CDD Programmes be merged, as part of the integration of the two Programmes.

Meeting of Interested Parties

Contributors to the Programme meet annually at a Meeting of Interested Parties (MIP) for the ARI and CDD Programmes, in which the status and plans for development of the Programmes are discussed. Representatives of developing countries and NGOs also attend the meetings. The MIP met on 2-3 July 1992[43] and on 1-2 July 1993.[44] In each meeting the MIP reviewed the Programme's progress report and the budget documents. The 1992 Meeting discussed a special report on the activities of the Programme in the promotion, protection and support of breastfeeding. In 1993 it received a special report on the integrated management of childhood illness. In this meeting, the MIP approved a plan for an external review of the ARI and CDD Programmes, to be carried out by a team of six independent experts from October 1993 to April 1994. The report of the external review will be presented to the MIP in 1994.

[41] *Report of the twelfth meeting of the Management Review Committee*, Washington, DC, 6 April 1992. Document CDR/MRC/92.1.

[42] *Report of the thirteenth meeting of the Management Review Committee*, Geneva, 28 June 1993. Document CDR/MRC/93.1.

[43] *Report of the twelfth Meeting of Interested Parties*, Geneva, 2-3 July 1992. Document CDR/MIP/92.17.

[44] *Report of the thirteenth Meeting of Interested Parties*, Geneva, 1-2 July 1993. Document CDR/MIP/93.10.

Resources and obligations

The Programme's financial position at the end of the 1992-1993 biennium, under all sources of funds, is shown in the following Table.

Table 13

Financial position as at 31 December 1993

	US$
Balance available on 1 January 1992	4 716 880
Amount received since 1 January 1992	19 319 037
Total available 1992-1993	24 035 917
Actual obligations 1992-1993	21 737 996
Balance carried forward to 1994-1995	2 297 921

The resources available to the Programme under all sources of funds for 1992-1993 and previous financial periods are presented in Table 1 of Annex 6. Since 1978, a total of 30 countries and agencies have contributed over US$ 118 million to the Programme. All 17 countries and agencies that contributed in 1990-1991 contributed in the 1992-1993 biennium — as well as two new contributors.

Table 2 in Annex 6 is a summary of actual obligations for 1990-1991, estimated obligations (budget) for 1992-1993, and actual obligations for 1992-1993, by Programme component.

Because of the decline in resources, actual obligations for 1992-1993 were US$ 0.5 million, or 2.5% less than had been budgeted. This budget, however, involved a 12.4% reduction from what had been previously planned, and this reduction was made in early 1993 when it became apparent that extrabudgetary contributions were going to be less than had been anticipated. The total amount obligated, US$ 21.7 million, was US$ 0.8 million or 4% more than in 1990-1991.

In the services component, at the global and interregional level the amount obligated for salaries is similar to what was planned, but is significantly more than in 1990-1991. This difference is due primarily to the fact that all posts, eight professional and six support, were filled throughout the biennium, whereas there were frequent gaps in filling posts in the earlier period. There has also been an increase in the cost of staff in Geneva in this period.

There has also been a greater increase in the amount devoted to cholera control. Funds from the Director-General's Fund have paid for these activities.

In the WHO regions, less than anticipated was obligated for planning. Nearly all countries now have national plans of operations, and modification of these plans has not yet become a major activity. As expected, the largest single category in the services budget was for support of operational activities, which includes WHO regional and country staff. Significantly less than anticipated was required for training. Clearly more emphasis is required in this area if plans are to be carried out and ambitious targets achieved.

Overall in the services component, two-thirds of obligations continued to be at the regional and country levels. Overall, 45% of the Programme's total obligations are in regions and countries.

In the research component, the amounts for staff salaries reflect one less professional and one less support staff, together with the increased cost of staff. Overall, while less was spent on the four research areas than had been planned, essentially the same amount, US$ 3 million was spent in 1992-1993 as in 1990-1991. As planned, a greater proportion of the research budget was devoted to implementation research than in the past, with corresponding decreases in other areas. The increase in IMV is not a real increase, and reflects a one-time purchase of vaccine for a trial, for which special funds were contributed.

Programme management and support costs were somewhat greater than anticipated, reflecting the increased cost of permanent and short-term staff.

Annex 1

WHO CDD estimates of ORS access and ORS/ORT use rates by country and region, 1993

	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	4 083	3.1	12 657	6	84 cn	19 cn	27 cn
Angola	2 043	2.0	4 086	1 173	60 cn	32 cn	48 cn
Benin	998	4.7	4 691	36	85 a	21 a	28 a
Botswana	228	3.2	730	100	95 a	56 a	64 a
Burkina Faso	1 795	6.9	12 386	586	65 c	13 b	15 b
Burundi	1 122	1.3	1 459	1 065	90 cn	41 cb	49 cb
Cameroon	2 164	4.5	9 738	1 323	50 a	7 ab	84 ab
Cape Verde	64	4.8	307	138	81 cn	5 cn	5 cn
Central African Republic	591	3.9	2 305	281	49 cn	13 cn	24 cn
Chad	1 051	7.6	7 988	571	65 cn	15 cn	15 cn
Comoros	121	4.0	484	0	84 cn	13 cn	70 cn
Congo	454	6.6	2 996	161	75 cn	15 cnb	67 cnb
Côte d'Ivoire	2 722	7.1	19 326	53	26 cn	4 cn	16 cn
Equatorial Guinea	66	1.9	125	1	80 cn	35 cn	40 cn
Ethiopia	10 546	4.8	50 621	3 868	50 a	38 ab	68 ab
Gabon	207	3.3	683	3	70 cn	20 cn	25 cn
Gambia	164	4.6	754	110	80 a	40 ab	51 ab
Ghana	2 928	4.5	13 176	940	78 cn	25 cn	44 cn
Guinea	1 231	4.6	5 663	148	45 a	39 ab	82 ab
Guinea-Bissau	171	4.3	735	208	80 a	23 ab	26 ab
Kenya	4 896	4.3	21 053	6 361	65 cn	26 cn	69 cn
Lesotho	286	8.8	2 517	53	54 cn	36 cn	78 cn
Liberia	532	4.0	2 128	240	30 cn	10 cn	15 cn
Madagascar	2 434	4.8	11 683	554	70 a	76 a	26 a
Malawi	2 187	6.0	13 122	1 798	56 cn	32 bg	50 bg
Mali	2 000	4.0	8 000	180	95 a	14 cn	41 a
Mauritania	404	7.0	2 828	226	30 cn	13 cn	54 cn
Mozambique	2 787	9.3	25 919	5 379	70 a	60 a	60 a
Namibia	286	N/A	N/A	N/A	70 a	77 a	75 a
Niger	1 707	7.2	12 290	153	65 a	11 ab	17 ab
Nigeria	22 499	4.8	107 995	3 379	60 a	2 ab	80 ab
Rwanda	1 608	4.0	6 432	1 170	80 a	28 ab	36 ab
Sao Tome & Principe	24	2.5	60	45	99 an	50 an	50 an
Senegal	1 401	4.8	6 725	13	16 cn	5 cn	27 cn
Sierra Leone	829	3.2	2 653	357	55 cn	55 cn	60 cn
Swaziland	130	4.0	520	500	90 cn	15 cn	85 cn
Togo	718	5.3	3 805	434	60 a	11 a	33 a
Uganda	3 888	5.2	20 218	2 692	68 a	38 a	45 a
United Republic of Tanzania	5 642	3.5	19 747	9 023	75 cn	39 cnb	83 cnb
Zaire	8 079	5.9	47 666	669	50 a	16 a	46 a
Zambia	1 719	5.1	8 767	3 635	95 a	53 a	90 a
Zimbabwe	1 921	3.9	7 492	1 061	98 a	1 cn	82 a
AFR	**98 726**	**4.9**	**482 530**	**48 692**	**63**	**22**	**57**

	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	0	100 n	50 n	50 n
Argentina	3 255	3.0	9 764	2 620	80 a	70 a	80 a
Bahamas	25	3.0	75	0	98 n	45 n	54 n
Barbados	20	3.0	60	38	99 a	15 n	15 n
Belize	30	1.5	45	150	99 a	92 a	92 a
Bolivia	1 144	3.0	3 432	3 113	58 n	35 n	63 n
Brazil	17 192	4.0	68 768	18 982	68 n	13 nb	63 nb
Chile	1 499	1.5	2 249	1 382	80 a	40 a	90 a
Colombia	3 858	5.0	19 290	6 603	62 a	31 a	40 a
Costa Rica	414	4.6	1 904	633	90 a	73 a	78 a
Cuba	915	1.0	915	1 366	100 n	80 n	80 n
Dominica	9	3.0	27	0	100 n	50 n	50 n
Dominican Republic	991	7.0	6 940	1 020	13 n	25 a	37 a
Ecuador	1 524	4.1	6 248	2 609	55 n	25 n	70 n
El Salvador	829	4.1	3 399	3 816	84 a	45 a	45 a
Grenada	13	3.0	39	0	100 n	70 n	70 n
Guatemala	1 716	5.2	8 923	2 023	40 a	23 a	24 a
Guyana	94	3.0	282	8	100 n	31 n	31 n
Haiti	1 045	7.0	7 315	1 225	52 n	15 n	20 n
Honduras	926	3.0	2 777	706	65 a	40 a	70 a
Jamaica	268	0.5	134	300	84 a	8 a	10 a
Mexico	11 771	2.2	25 896	29 948	90 a	38 ab	87 ab
Nicaragua	735	2.0	1 470	1 693	75 a	40 a	40 a
Panama	305	3.0	915	353	80 a	62 a	70 g
Paraguay	692	2.5	1 731	818	91 a	39 a	52 a
Peru	2 946	5.0	14 732	4 474	28 n	20 n	31 n
Santa Lucia	18	3.0	54	0	100 n	60 n	75 n
St Kitts & Nevis	5	3.0	15	0	100 n	5 n	5 n
St Vincent & Grenadines	17	3.0	51	0	100 n	98 n	98 n
Suriname	55	2.0	110	1	99 a	37 n	63 n
Trinidad & Tobago	146	1.5	219	0	100 a	68 a	75 a
Uruguay	261	0.7	183	220	84 a	58 a	96 a
Venezuela	2 540	3.0	7 620	3 638	70 a	70 a	80 a
AMR	**55 265**	**3.5**	**195 582**	**87 738**	**70**	**28**	**59**
Bangladesh	18 776	3.5	65 716	34 478	75 a	14 ab	26 ab
Bhutan	99	3.9	386	1	85 a	35 ab	85 ab
Dem. People's Rep. of Korea	2 588	1.3	3 442	0	100 a	52 a	85 a
India	113 496	1.7	192 943	71 710	77 nc	12 nb	37 nb
Indonesia	23 236	0.8	18 589	10 043	92 n	43 ab	78 ab
Maldives	40	2.0	80	0	100 a	18 a	27 a
Mongolia	359	1.7	610	195	70 a	22 ab	65 ab
Myanmar, Union of	6 313	1.3	8 207	3 485	57 nc	25 b	37 b
Nepal	3 385	3.3	11 171	3 714	80 a	11 a	14 a
Sri Lanka	1 801	0.7	1 261	1 555	100 ab	27 ab	76 ab
Thailand	5 579	1.3	7 253	7 895	90 a	26 ab	65 ab
SEA	**175 672**	**1.8**	**309 657**	**133 077**	**79**	**15**	**38**

	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	3 735	3.8	14 193	1 069	32 n	12 n	26 n
Bahrain	67	2.9	194	0	100 a	60 a	73 a
Cyprus	62	2.0	124	0	95 a	60 a	60 a
Djibouti	89	2.8	249	390	80 n	47 n	56 n
Egypt	7 714	3.8	29 313	3 502	100 a	23 ab	34 ab
Iran (Islamic Republic of)	8 603	2.0	17 206	10 720	85 n	39 n	85 n
Iraq	3 712	3.8	14 104	3 615	85 a	58 n	70 n
Jordan	763	1.3	992	912	93 a	35 ab	53 ab
Kuwait	272	2.7	734	0	100 a	10 n	10 n
Lebanon	397	3.6	1 428	312	95 n	27 n	45 n
Libyan Arab Jamahiriya	930	3.0	2 790	0	80 n	60 n	80 n
Morocco	3 907	8.0	31 256	665	70 a	12 ab	14 ab
Oman	321	2.5	803	720	95 a	72 ab	72 ab
Pakistan	21 922	3.7	81 111	27 234	90 a	42 ab	59 ab
Qatar	54	2.7	146	1	75 n	20 n	20 n
Saudi Arabia	2 891	2.0	5 782	0	100 n	89 a	90 a
Somalia	1 521	4.3	6 542	3 816	31 n	12 n	78 n
Sudan	4 907	6.5	31 893	9 873	50 a	45 a	47 a
Syrian Arab Republic	2 644	2.0	5 288	924	95 n	21 n	95 n
Tunisia	1 115	2.8	3 122	582	99 a	8 ab	22 ab
United Arab Emirates	168	2.0	336	15	95 n	77 n	81 n
Yemen	2 634	2.7	7 112	1 959	16 n	6 n	6 n
EMR	**68 427**	**3.7**	**254 717**	**66 307**	**80**	**34**	**50**
Cambodia	1 457	4.5	6 557	1 016	25 n	6 n	6 n
Cook Islands	2	1.2	2	0	58 n	8 n	8 n
Fiji	86	2.5	215	0	99 a	90 a	100 a
Kiribati	8	3.5	28	349	100 n	40 n	85 n
Lao People's Dem. Rep.	832	1.7	1 414	300	85 ab	40 ab	55 ab
Malaysia	2 637	1.2	3 164	1 086	95 nc	38 nb	47 nb
Papua New Guinea	619	2.9	1 795	0	95 a	13 ab	51 ab
Philippines	9 289	2.8	26 009	3 681	85 a	37 ab	59 ab
Samoa	24	1.5	36	0	50 n	20 a	60 a
Solomon Islands	60	3.5	210	0	92 n	13 ab	60 ab
Tonga	17	2.4	41	0	98 a	40 a	40 a
Vanuatu	27	3.8	103	50	95 a	30 a	66 a
Viet Nam	9 463	2.3	21 765	4 706	91 a	45 ab	52 ab
WPR (excluding China)	**24 521**	**2.5**	**61 339**	**11 187**	**85**	**36**	**50**
China	116 769	3.2	373 661	3 105	50	3	22
Global (excluding China)	**422 611**	**3.1**	**1 303 825**	**347 001**	**75**	**25**	**51**

[a] National CDD Programme estimate (made in 1993) from CDD country profile or other programme reports.

[b] Based on household surveys (CDD household surveys, demographic health surveys and others). If more than one survey, median rates were used.

[c] Estimate from WHO regional office.

[n] Estimate from 1992 or earlier in absence of more recent and reliable data.

[g] Estimate from Headquarters.

N/A = not available

Annex 2

New research projects supported by the Programme

(from 1 January 1992 to 31 December 1993)

Case management

HQ90059
The role of uji in the management of diarrhoea among children in rural Kakamega district of Western Province in Kenya.

Kenya
Dr E.G. Muia
Department of Community Health
University of Nairobi

HQ91046
Dietary management of persistent diarrhoea in infants and children. Evaluation of an algorithm for persistent diarrhoea in a community setting.

India
Dr M.K. Bhan
Dr N. Bhandari
Department of Paediatrics
All India Institute of Medical Sciences
New Delhi

HQ91049
A qualitative study on the use of foods and fluids during diarrhoea in children less than 2 years of age, with emphasis on rice and rice-water.

Philippines
Dr C.S. Acuin
New Tropical Medicine Foundation Inc
Metro Manila

HQ91050
Addressing health workers' practices in the dietary management of diarrhoea.

Philippines
Dr J. Rodriguez
Department of Science and Technology
Regional Health Research and
Development Foundation
Cebu City

HQ91063
Community oral rehydration units in Cali, Colombia: operational characteristics, quality of care and community acceptance.

Colombia
Dr I.A. Concha Eastman
Secretaria de Salud Publica Municipal
Santiago de Cali

HQ91066
Determinants of ORS use and its impact on mortality in Cebu, Philippines.

USA
Dr Stan Becker
Department of Population Dynamics
The Johns Hopkins University
Baltimore

HQ93004
Clinical assessment of a low osmolarity ORS solution. Technical assistance Professor Fayad, Abu El-Reeche Hospital, Cairo.

USA
Dr M. Santosham
Department of International Health
School of Hygiene & Public Health
The Johns Hopkins University
Baltimore

HQ93005
Clinical trial of a low osmolarity ORS solution.

Egypt
Professor Ibrahim Fayad
Gastro-enteritis unit
Abu El-Reeche Hospital
Cairo

HQ93033
A double-blind controlled trial comparing standard and low osmolarity oral rehydration solution (ORS) for the maintenance therapy of adult cholera patients.

Indonesia
Dr Sri Pandam Pulungsih
Rumah Sakit Khusus Penyakit Infeksi
Jakarta

Evaluation of programme impact

HQ92023
Recent trends in diarrhoea mortality in north-eastern Brazil.

Brazil
Dr C. Victora
Universidade Federal de Pelotas
Pelotas

HQ93020
Start-up grant for the development of a research proposal to evaluate the impact of the National Control for Diarrhoeal Disease Program (NCDDP) on childhood mortality in the Philippines.

Philippines
Dr C.C. Carlos
New Tropical Medicine Foundation Inc
Metro Manila

Infant feeding and hygiene

HQ91048
Effects on growth of breastfeeding beyond 12 months old.

Philippines
Dr A.C. Santa Maria
Research Institute for Tropical Medicine
Metro Manila

HQ91064
Operational and effect evaluation of a breast-feeding promotion course for health professionals.

Brazil
Dr J.A. Taddei
Departamento de Pediatria
Escola Paulista de Medicina
Sao Paulo SP

HQ91069
The hygiene of domestic weaning foods. Design of an education intervention in rural Guatemala.

Guatemala
Ms S. Saenz de Tejada / Ms F. Cano
División de Nutrición y Salud
Instituto de Nutrición de Centro América y Panamá
Guatemala

HQ91073
Defining appropriate ways to increase the energy density of weaning foods — a preliminary exploratory study.

Jamaica
Dr J. Meeks Gardner
Tropical Metabolism Research Unit
University of the West Indies
Kingston

United Kingdom
Dr A. Ashworth
Centre for Human Nutrition
London School of Hygiene & Tropical Medicine
London

HQ92017
Evaluation of the influence of the Guarujá Lactation Centre on breastfeeding: a controlled study.

Brazil
Dr F. Barros
Departamento de Medicina Social
Universidade Federal de Pelotas
Pelotas

Dr S. Tonioli Filho
Guarujá Health Centre
Guarujá

HQ92025
An evaluation of structured observations and questionnaires for measuring hygiene behaviours.

United Kingdom
Dr S. Cousens
Department of Epidemiology & Population Sciences
London School of Hygiene & Tropical Medicine
London

Burkina Faso
Dr E. Traore
Direction Provinciale de la Santé du Houet

Ms B. Kanki
Project Diarrhées
Centre Muraz

HQ92028
Community-based nutritional therapy during diarrhoea and convalescence. Part II: implementation and evaluation of an educational intervention.

Guatemala
Dr J. Rivera / Dr M.C. Santizo
Instituto de Nutrición de Centro América y Panamá
Guatemala

HQ92031
Pacifier use and early weaning: a cohort study among Brazilian children.

Brazil
Dr C. Victora
Universidade Federal de Pelotas
Pelotas

HQ92040
Ten steps for successful breastfeeding: assessment of hospital performance, its determinants and planning for improvement.

Turkey
Dr Ümit Kartoglu
Institute of Child Health
The University of Istanbul
Istanbul

HQ92044
Determinants of infant feeding in the first 6 months of life in rural Guatemala: formative research.

Guatemala
Dr M.T. Ruel
Instituto de Nutrición de Centro América y Panamá
Guatemala City

HQ92092
Impact of lactation counselling on the breastfeeding behaviour of mothers.

Pakistan
Dr K.A. Abbas
Pakistan Institute of Medical Sciences
The Children's Hospital
Islamabad

HQ92093
Assessing the role of social environment (social support and influence) on infant feeding practices in the first 3 months in Turkey.

Turkey
Dr F. Goksen
Institute of Child Health
University of Istanbul
Istanbul

USA
Annenberg School of Communications
University of Pennsylvania
Pennsylvania

HQ92094
Promotion of exclusive breastfeeding and lactation management in infants aged 1-12 weeks in diarrhoeal disease hospital and effects on feeding practices.

Bangladesh
Dr R. Haider
International Centre for Diarrhoeal Disease Research, Bangladesh
Dhaka

HQ93008
Breastfeeding beyond 12 months: Who decides, who benefits?

USA
Dr K. Rasmussen
Division of Nutritional Sciences
Cornell University
Ithaca

Rational use of drugs

HQ91072
Promoting appropriate prescribing behaviour for diarrhoeal diseases in children: an intervention study on southern Brazilian physicians.

Brazil
Dr J.U. Beria
Departamento de Medicina Social
Universidade Federal de Pelotas
Pelotas

HQ92014
Regulatory intervention in Pakistan: a case history of the deregistration of paediatric antimotility drugs.

Pakistan
Professor T.I. Bhutta
Department of Paediatrics
King Edward Medical College
Lahore

Dr Z. Mirza
The Network
Associations for the Rational Use of Medication in Pakistan
Islamabad

HQ92032
Intervention trial to decrease the inappropriate use of drugs during childhood diarrhoea.

Peru
Dr P. Paredes
Instituto de Investigación Nutriciónal
Lima

Vaccine testing

HQ92011
Efficacy trial of a quadrivalent rotavirus vaccine.

Venezuela
Dr I. Perez-Schael
Instituto de Biomedicina
Ministerio de Sanidad y Asistencia Social
Caracas

HQ93015
Large scale randomized, double-blind, placebo-controlled field trial to assess the efficacy of a single oral dose of live oral cholera vaccine CVD 103 HgR in preventing cholera in northern Jakarta.

Indonesia
Dr Cyrus Simanjuntak
National Institute of Health Research and Development
Jakarta

Vitamin A and zinc supplementation

HQ92004
Effect of Vitamin A administered to children during acute diarrhoea on subsequent diarrhoeal morbidity. Phase II. Evaluation of Zinc supplementation in patients with vitamin A supplementation.

India
Dr M.K. Bhan
Dr S. Sazawal
Department of Paediatrics
All India Institute of Medical Sciences
New Delhi

HQ92007
Randomized controlled community trial of zinc or multiple vitamin and mineral supplements for the management of ambulatory patients with persistent childhood diarrhoea.

Peru
Dr K.H. Brown
Department of Nutrition
University of California, Davis

Dr M. Penny
Instituto de Investigación Nutriciónal
Lima

HQ93001
Multicentre study on the effect of vitamin A supplementation during infancy on diarrhoeal and non-diarrhoeal morbidity. Phase III.

India
Dr M.K. Bhan
Department of Paediatrics
All India Institute of Medical Sciences
New Delhi

Peru
Dr C. Lanata
Instituto de Investigación Nutriciónal
Lima

Annex 3

Publications arising out of research supported by the Programme over the last five years

The names of principal investigators of funded projects are in bold

1989

Beards GM, Desselberger U, **Flewett TH.** Temporal and geographical distributions of human rotavirus serotypes, 1983-1988. *J Clin Microbiol*, 1989, 27:2827-2833.

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Bhan MK, Khoshoo V, Sommerfelt H, Pushker Raj, Sazawal S, Srivastava R. Enteroaggregative *Escherichia coli* and Salmonella associated with nondysenteric persistent diarrhea. *Pediatr Infect Dis J*, 1989, 8: 499-502.

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Annex 4

WHO Collaborating Centres working with the Programme

Australia
WHO Collaborating Centre for Research on Human Rotaviruses
Department of Gastroenterology
Royal Children's Hospital
Flemington Road
Parkville, Victoria 3052

Bangladesh
WHO Collaborating Centre for Research, Training and Control in Diarrhoeal Diseases
International Centre for Diarrhoeal Disease Research, Bangladesh
G.P.O. Box 128
Dhaka 100

Belgium
Centre Collaborateur de l'OMS pour le Campylobacter entérique
Hôpital St Pierre
Rue Haute 322
1000 Bruxelles

Denmark
WHO Collaborating Centre for Reference and Research on Escherichia and Klebsiella
Statens Seruminstitut
Amager Boulevard 80
DK 2300 Copenhagen S

France
Centre collaborateur OMS de Référence et de Recherche pour les Salmonellae
Institut Pasteur
25, rue du Dr Roux
75015 Paris

Hungary
WHO Collaborating Centre for Reference and Research on Bacterial Vaccines
"Human" Institute for Serobacteriological Production and Research
1107 Budapest

India
WHO Collaborating Centre for Diarrhoeal Diseases Research and Training
National Institute of Cholera and Enteric Diseases
P-33, CIT Road Scheme XM
Beliaghata
P.O. Box - 177
Calcutta 700 016

United Kingdom
WHO Collaborating Centre for Phage-typing and Resistance of Enterobacteria
Central Public Health Laboratory
Colindale Avenue
London NW9 5HT

WHO Collaborating Centre for Environmental and Epidemiological Aspects of Diarrhoeal Diseases
Department of Epidemiology and Population Sciences
London School of Hygiene and Tropical Medicine
Keppel Street
London WC1E 7HT

United States
WHO Collaborating Centre for Shigella
Division of Bacterial Diseases
Center for Infectious Diseases
Centers for Disease Control and Prevention
Atlanta, GA 30333

Annex 5

New publications and documents

National programme progress

Combined CDD/ARI breast-feeding survey, Sri Lanka, 1992. *WER*, 1993, 68:120-122.

Evaluation of training and performance — Philippines. *WER*, 1993, 68:239-241.

Education and training

Diarrhoea management training course:

- *Participant manual.* Document CDD/SER/90.3 Rev. 1 (1992).
- *Guidelines for conducting clinical training courses at health centres and small hospitals.* Document CDD/SER/90.2 Rev. 1 (1992).

Strengthening the teaching of diarrhoeal diseases in medical schools:

- *Readings on diarrhoea: Student manual.* Geneva, WHO, 1992.
- *References on diarrhoea.* Geneva, WHO, 1993.
- *Instructor manual.* Document CDD/SER/93.1.
- *Guide to student evaluation.* Document CDD/SER/93.2.
- *Workshop participant manual.* Document CDD/SER/93.3.
- *Workshop director guide.* Document CDD/SER/93.4.
- *Introductory brochure.* Document CDD/93.6.

Advising mothers on management of diarrhoea in the home:

- *A guide for health workers.* Document CDD/93.1.
- *Instructions for facilitators.* Document CDD/93.2.

Guide for improving diarrhoea treatment practices of pharmacists and licensed drug sellers. Document WHO/CDD/93.43.

Clinical skills: A self-instructional course for health workers who manage patients with diarrhoea (modules, guides and audiocassette). Geneva, WHO, 1993.

Breastfeeding counselling — A training course:

- *Director's guide.* Document WHO/CDR/93.3-UNICEF/NUT/93.1.
- *Trainer's guide.* Document WHO/CDR/93.4.-UNICEF/NUT/93.2.
- *Participants' manual.* Document WHO/CDR/93.5-UNICEF/NUT/93.3.
- *Flipchart of overhead figures.* Document WHO/CDR/93.6-UNICEF/NUT/93.4.

Manuals and guidelines

The management and prevention of diarrhoea — Practical Guidelines. Geneva, WHO, 1993.

Management of the patient with diarrhoea: A case management chart. Revised 1992. Geneva, WHO.

The selection of fluids and food for home therapy to prevent dehydration from diarrhoea: Guidelines for developing a national policy. Document WHO/CDD/93.44.

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Breastfeeding and child-spacing. No. 2, November 1992.

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Eighth Programme Report, 1990-91. Document WHO/CDD/92.38.

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Report of the thirteenth meeting of the Technical Advisory Group (Geneva, 16-20 March 1992). Document WHO/CDD/92.39.

Report of the fourteenth meeting of the Technical Advisory Group (Geneva, 8-10 March 1993). Document WHO/CDD/93.42.

Report of the twelfth meeting of the Management Review Committee (Washington, DC, 6 April 1992). Document CDR/MRC/92.1.

Report of the thirteenth meeting of the Management Review Committee (Geneva, 28 June 1993). Document CDR/MRC/93.1.

Report of the twelfth Meeting of Interested Parties (Geneva, 2-3 July 1992). Document CDR/MIP/92.17.

Report of the thirteenth Meeting of Interested Parties (Geneva, 1-2 July 1993). Document CDR/MIP/93.10.

Proposed Programme budget for the financial period 1994-1995. Document CDD/93.4.

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Guidelines for cholera control. Document WHO/CDD/SER/80.4 Rev. 4 (1992).

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Annex 6

Table 1

Financial resources: 1978-1993 — Status at 31 December 1993

SOURCE	1978-1987	1988-1989	1990-1991	1992-1993
REGULAR BUDGET	**US$**	**US$**	**US$**	**US$**
Global and interregional	3 928 405	1 090 897	1 203 888	1 506 122
Regions	6 051 067	1 812 133	1 724 583	1 815 035
TOTAL REGULAR BUDGET	**9 979 472**	**2 903 030**	**2 928 471**	**3 321 157**
OTHER SOURCES				
Australia	969 319	418 665	505 570	756 390
Austria				25 013
Belgium	188 306			
Canada (CIDA)	1 297 188	501 536	213 109	401 259
China	150 000	50 000	50 000	50 000
Denmark (DANIDA)	3 211 141	1 294 292	770 826	603 630
Finland	1 129 099	940 797	1 204 948	235 018
France	229 833	97 984	664 070	70 840
India	100 000			
Italy	101 062	632 830	245 009	285 715
Japan	725 000	300 000	150 000	150 000
Kuwait	10 000			
Luxembourg				204 066
Morocco	7 475			
Netherlands	2 766 050	971 829	1 170 641	841 327
Nigeria	6 680			2 698
Norway	466 391	299 406	1 780 980	1 712 770
Sweden (SIDA/SAREC)	4 396 499	945 354	949 079	1 968 168
Switzerland	2 002 840	520 833	1 729 685	942 242
United Kingdom	1 349 700	1 200 977	1 653 775	1 732 000
United States of America	4 774 300	2 153 450	2 076 223	3 253 503
Pan American Health Organization	49 695			
United Nations Children's Fund	2 601 183	705 837	771 973	743 159
United Nations Development Programme	9 723 115	2 055 500	3 143 659	1 750 876
Arab Gulf Programme for United Nations Development Organizations (AGFUND)	2 500 000	1 000 000		
International Development Research Center (Canada)	916 307	184 594		
Rotary International	5 000			
Sasakawa Research Fund	79 571			
Thrasher Research Fund	20 000			
Ciba-Geigy	3 336 941	2 650 970		
Special Account for the Cholera Programme	433 990			
Special Account for Miscellaneous Designated Contributions	1 066 360			
Other	6 189	800	154	5 826
Interest	2 341 525	1 059 760	963 390	263 380
TOTAL OTHER SOURCES	**46 960 759**	**17 985 414**	**18 043 091**	**15 997 880**
TOTAL	**56 940 231**	**20 888 444**	**20 971 562**	**19 319 037**

Table 2

Actual obligations incurred in 1990-1991, estimated obligations for 1992-1993 (budget) and actual obligations for 1992-1993

Programme component	Actual obligations 1990-1991	Estimated obligations 1992-1993	Actual obligations 1992-1993	
	US$	US$	US$	%
I. ADVISORY AND MANAGEMENT MEETINGS				
Global and interregional	182 575	210 000	203 974	0.9
II. HEALTH SERVICES				
Global and interregional	4 318 768	4 489 000	4 965 926	22.9
Regional	10 048 478	10 517 000	9 820 416	45.2
	14 367 246	15 006 000	14 786 342	68.1
III. RESEARCH				
Global and interregional	4 240 044	4 605 000	4 097 058	18.8
IV. PROGRAMME MANAGEMENT AND SUPPORT				
Global and interregional	2 120 512	2 457 000	2 650 622	12.2
TOTAL				
Global and interregional	10 861 899	11 761 000	11 917 580	54.8
Regional	10 048 478	10 517 000	9 820 416	45.2
TOTAL	**20 910 377**	**22 278 000**	**21 737 996**	**100.0**

Table 3

Health services

Programme area	Actual obligations 1990-1991	Estimated obligations 1992-1993	Actual obligations 1992-1993	
	US$	US$	US$	%
Global and interregional				
PLANNING, EVALUATION AND COORDINATION				
Coordination				
(a) staff salaries and related costs	1 809 578	2 400 000	2 578 946	11.9
(b) other*	974 607	766 000	857 353	3.9
Strategies for prevention	82 031	75 000	52 772	0.2
Oral Rehydration Salts				
(a) production	5 979	10 000	6 095	0.0
(b) stock	486	0	0	0.0
Evaluation				
(a) comprehensive programme reviews	0	0	0	0.0
(b) management information system	0	0	0	0.0
(c) survey development	351 037	300 000	274 936	1.4
Cholera control activities	67 133	150 000	330 402	1.5
Miscellaneous	(7 171)	15 000	350	0.0
Subtotal	**3 283 680**	**3 716 000**	**4 100 854**	**18.9**
DEVELOPMENT OF TRAINING AND EDUCATIONAL MATERIALS				
Development of new materials	536 046	290 000	374 508	1.7
Communication activities	18 406	33 000	34 106	0.2
Modifications of management training	0	10 000	4 838	0.0
Subtotal	**554 452**	**333 000**	**413 452**	**1.9**
TRAINING COURSES				
Courses and materials	406 015	390 000	418 272	1.9
Testing new and revised courses	74 621	50 000	33 348	0.2
Subtotal	**480 636**	**440 000**	**451 620**	**2.1**
Total global and interregional	**4 318 768**	**4 489 000**	**4 965 926**	**22.9**
Regional				
Planning	248 703	398 000	266 233	1.2
Operations	5 747 302	4 993 000	5 927 665	27.3
Training	3 115 882	3 879 000	2 561 127	11.8
Evaluation	936 591	1 247 000	1 065 391	4.9
Total regional	**12 395 000**	**10 517 000**	**9 820 416**	**45.2**
TOTAL HEALTH SERVICES	**17 494 000**	**15 006 000**	**14 786 342**	**68.1**

* Includes temporary staff, consultants, duty travel, contracts, internal reproduction, and miscellaneous supplies.

Table 4

Research

Programme area	Actual obligations 1990-1991	Estimated obligations 1992-1993	Actual obligations 1992-1993	
	US$	US$	US$	%
COORDINATION				
Staff salaries and related costs	1 185 378	1 010 000	1 019 055	4.6
Other*	92 901	50 000	46 893	0.2
Subtotal	**1 278 279**	**1 060 000**	**1 065 948**	**4.8**
IMMUNOLOGY, MICROBIOLOGY, AND VACCINE DEVELOPMENT (IMV)				
Contracts	318 760	985 000	800 869	3.7
Other*	177 772	75 000	88 309	0.4
Subtotal	**496 532**	**1 060 000**	**889 178**	**4.1**
CASE MANAGEMENT (CMT)				
Contracts	1 026 183	625 000	424 183	2.0
Other*	67 846	60 000	92 113	0.4
Subtotal	**1 094 029**	**685 000**	**516 296**	**2.4**
EPIDEMIOLOGY AND DISEASE PREVENTION (EDP)				
Contracts	935 192	620 000	654 384	3.0
Other*	125 913	215 000	166 641	0.8
Subtotal	**1 061 105**	**835 000**	**821 025**	**3.8**
IMPLEMENTATION (IMP)				
Contracts	258 772	795 000	704 808	3.2
Other*	51 327	170 000	99 803	0.5
Subtotal	**310 099**	**965 000**	**804 611**	**3.7**
TOTAL RESEARCH	**4 240 044**	**4 605 000**	**4 097 058**	**18.8**

* Includes Collaborating Centres, special workshops, temporary staff, consultants, duty travel, contracts, fellowships, internal reproduction and miscellaneous supplies.

Table 5

Programme management and support

Programme area	Actual obligations 1990-1991	Estimated obligations 1992-1993	Actual obligations 1992-1993	
	US$	US$	US$	%
Staff salaries and related costs	1 288 018	1 457 000	1 590 760	7.3
Other*	832 494	1 000 000	1 059 862	4.9
TOTAL PROGRAMME MANAGEMENT AND SUPPORT	**2 120 512**	**2 457 000**	**2 650 622**	**12.2**

* Includes temporary staff, consultants, duty travel, common services, rent, publications, and miscellaneous supplies.