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A Global Review of Diarrhoeal Disease Control

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Executive summary

Introduction

The objective of the present review was to summarize available information on diarrhoea morbidity and mortality, preventive strategies, case management and national programmes, from 1980 to 1992, for the Americas, South Asia, East Asia, Middle East and North Africa, and sub-Saharan Africa, and to propose recommendations to UNICEF.

Methods

The review process included computerized literature searches and contact with international agencies and with individual researchers in the regions. UNICEF also commissioned five expert groups to prepare a comprehensive regional report, which was presented to a meeting of interested parties at UNICEF/New York in April 1993. Subsequently, these have been collated as a single global report.

Lessons learned

1. Morbidity and mortality

Diarrhoea remains a major cause of child morbidity and mortality globally. The World Health Organization (WHO) estimates that there are approximately 1.3 billion episodes and 3 million deaths annually in children under five years of age. Although there have been a few reports of declines in incidence rates in some specific countries, for most regions, no decline in the incidence of diarrhoea was observed over the past five years.

Nevertheless, in most countries, diarrhoea mortality has been falling over the past 10-20 years, as well as diarrhoea admissions to hospitals and the case-fatality rate. In some countries, the fall in the last decade has been of up to 20 per cent per year. A number of local studies have attempted to document associations between reduction in diarrhoea mortality and improvements in case management or in preventive strategies conducted by the national control of diarrhoeal diseases (CDD) programmes. Although the role of national programmes is in some cases very clear, it is difficult to rule out alternative explanations for the observed decline.

The etiology of diarrhoea has been assessed in studies from many countries, but because of incomplete laboratory methodologies employed, and sampling from only hospital or clinic based patients, the results of such studies are often only partially valid. Cholera has become epidemic in some countries, and antibiotic resistance has spread to many organisms.

Little evidence is available on whether diarrhoea deaths were mostly due to acute watery

diarrhoea, dysentery or persistent diarrhoea. Existing data suggest a large role for persistent episodes. Better management of acute watery diarrhoeas, dealing with bloody diarrhoea with appropriate antibiotics and proper feeding, are all critical components; this will also reduce persistent diarrhoea deaths.

2. Control of morbidity and mortality

CDD programmes have concentrated principally on diarrhoea case management. Activities aimed at diarrhoea prevention have been implemented by other programmes. Breastfeeding duration varies according to region, being usually lower in urban areas. Exclusive breastfeeding, however, is low worldwide, due to the early introduction of water, herbal teas and weaning foods. These practices should be strongly discouraged, as they are importantly associated with diarrhoea morbidity and mortality.

Availability of adequate supplies of water, as well as cleanliness of available water, is particularly important for diarrhoea prevention. There has been much investment in the provision of water and adequate sanitation in some countries as consequence of the cholera epidemic. These efforts have generally not been managed by diarrhoea programmes.

The impact that the provision of vitamin A may have produced on the morbidity and mortality from diarrhoea is difficult to ascertain. However, in some regions, mild, subclinical, vitamin A deficiency is present in an important part of the population and it is possible that its provision can have some effect on the current declining mortality observed in some areas.

Research carried out in different regions has also implicated the following risk factors in diarrhoea morbidity and mortality: low family income, low maternal education, low birth weight, malnutrition, lack of safe water and poor domestic and personal hygiene. Most, if not all of these associations, are likely to be causal. However, there have been very few specific intervention studies for establishing causality and for showing the feasibility of modifying these risk factors. Interventions to improve levels of family income and maternal education are long-term investments which fall outside the usual role of health services. Also, improving birth weights or nutritional status are difficult enterprises which have failed in most settings.

3. Case management of diarrhoea

a) Home case management

Caretakers in most countries are familiar with ORT. Several studies have shown that mothers have elaborate conceptions of signs of diarrhoea severity, and use ORT according to this perception. Studies have demonstrated that early signs, such as vomiting and fever, allow the identification of a large proportion of those children who will develop dehydration later in the episode. If parents and caretakers can be taught to increase ORT use as well as recognize signs of severe diarrhoea and seek health care, it may be possible to achieve important reductions in mortality. Sustaining and achieving

high levels of oral rehydration therapy continues to be a challenge.

It is clear, from a large number of studies however, that caretakers do not have adequate practices regarding ORT or ORS use. The majority of them do not mix ORS correctly, most commonly not adding sufficient volumes of water. Recommended home fluids are not used. In addition, most caretakers do not provide adequate volumes of fluid necessary for rehydrating a child. Also, caretakers still give to their children unnecessary and dangerous antibiotics and antidiarrhoeal preparations.

b) Health facility case management

Health care providers have been the principal focus of training efforts of national programmes. Although trained health workers perform better than those without training, even the trained ones frequently do not assess or effectively treat children with diarrhoea. Further, they prescribe antibiotics more usually than ORS. Besides training, other situational factors, such as supervision and availability of materials and drugs, may play critical roles in supporting the quality of performance.

The importance of health care providers in the private sector needs to be taken into account. Private practitioners, drug sellers, pharmacists, traditional healers, all play a major role in the management of diarrhoea in children, and can contribute to extend the reach of health care services on a national scale. In some countries, for example, traditional healers outnumber their biomedical counterparts by 100 to 1, and are the main sources of health care for many segments of the population.

4. National CDD programmes

a) ORS production and logistics

A wide range of access to ORS is seen in the different regions, with critical shortages in some countries, as for example, Sudan. This maybe due to decreased supply or increased demand or both. Reports also indicated that many facilities experienced stock-outs of ORS, while others had large supplies. Increasing quantities of ORS supply appear to be needed by national CDD programmes. To meet this need, many national programmes have worked with private firms or parastatal industries to locally produce ORS. However, concerns about effective quality control as well as costs have to be further reviewed.

b) Communication

Communication has been a critical programme component wherever progress has been seen. Development of sound communication strategies involving mobilization of the community and households in support of families, have all contributed to increasing ORT use rates and changing behaviour. Unfortunately, most countries do not give adequate attention and resources to information, education and communication. Communication expertise is often not used. But where

it has been - as in Mexico, Morocco, Brazil and Egypt - the positive changes are significant.

c) Training

Training has been a major activity of essentially all national CDD programmes, but the coverage of training for both clinical and supervisory skills, varies widely. Decentralization of training beyond a few centralized Diarrhoea Training Units (DTUs) to smaller peripheral units has begun in many places. WHO has developed a distance learning course in which the individual health worker teaches himself with the aid of materials and feedback provided by the national programme. To overcome the problem of the small numbers of dehydrated patients available for 'hands-on' training on ORT at peripheral treatment sites, WHO has also developed courses with simulated teaching cases for both teaching as well as assessing performance of participants.

d) Cost allocations

As activities of national programmes have expanded, budgetary resources have not kept pace. Allocation of costs is now an important consideration for national programmes. To help programme managers, WHO has developed costing guidelines for national programmes to assist in better defining how costs are being allocated, and how best to select the most cost-effective intervention options.

e) Measurement of progress

In order to track the changes over time in morbidity and mortality reduction targets as well as other programme management objectives, the WHO Global Programme for the Control of Diarrhoeal Diseases has promoted the use of 16 programme indicators of which seven are being jointly monitored by UNICEF/WHO. With the exception of training coverage, which is an administrative estimate, the other programme indicators are collected from surveys of households or health facilities. However, some of the indicators such as ORT use are difficult to measure. UNICEF has recently developed the Multiple Indicator Cluster Survey which gives important information on use of oral rehydration therapy, continued feeding and increased fluids. This is a very useful instrument. Recent and reliable estimates on oral rehydration therapy are not available currently for most countries. However, all these data that are collected need to be effectively integrated into ongoing programme management and planning, or else it is costly misuse of scarce resources.

f) Research

The benefits of research in guiding CDD programmes and solving problems are clear. Small surveys have been critical to identifying problems, while studies of epidemiology, etiology, the behaviours of caretakers and practitioners in response to diarrhoea, alternative methods of training and education, have all played a role in improving the effectiveness of CDD activities. Monitoring

indicators need to be validated, and additional ones further developed as a priority area for research. The reason for the gap between knowledge and use of ORT needs to be better understood as do factors that contribute to better programme planning and management.

Recommendations

The following recommendations emerge from the review, and are particularly relevant to countries meeting the WHO/UNICEF CDD targets for 1995 and 2000:

1. Private Sector: Increase support of activities aimed at engaging the private sector in appropriate case management for diarrhoea, through collaboration with ORS and consumer goods (e.g. soap) manufacturers, and through efforts to reach private physician and non-physician practitioners, including unlicensed practitioners who care for diarrhoea patients.

2. Measurement and Targets: Develop measures and set targets for CDD related behaviour, in particular ORT/ORS use, which reflect the different responses by caretakers and practitioners to children with mild versus severe dehydrating diarrhoea. Implement monitoring of preventive behaviours and programme activities, in addition to case management.

3. Research and Evaluation: Develop better monitoring indicators in order to allow data based problem solving and planning, and targeting of sub-populations at higher risk for intensified CDD efforts.

4. Communications: Develop communication strategies to achieve/sustain high levels of oral rehydration therapy and timely care seeking. Increase the support in the region for audience, channel, and message research needed to make communications efforts effective; continue support for air time and other 'marketing' costs, recognizing that desired patterns of behaviour must continuously be defended against competing alternative behaviours by effectively varying marketing strategies and messages.

5. Integration and Decentralization: Seek, through evaluation and monitoring, a more appropriate balance between integration and independence of CDD programmes and efforts, so that effectiveness is not diminished by efforts to obtain greater efficiency. Similarly assess and balance, based on objective data, the tension between decentralization and central concentration of CDD activities and decision making.

6. Medical Education/Pre-Service Education: Encourage the use of the newly available WHO materials for medical, nursing, and pharmacist/drug seller pre-service education as the basis for enhanced activities in this area, to provide a foundation of appropriate practitioner behaviour for the future.

7. Prevention: Greater coordination is required for efforts aimed at the prevention of diarrhoea,

especially water/hygiene/sanitation; exclusive breastfeeding; facilitating and tracking measles immunization; and communications efforts supporting prevention.

8. Training: Take steps to avoid wasting resources on ineffective training, by eliminating ineffective training (determined by evaluation research), improving training methods, providing adequate time and appropriate materials for learning, supervising the quality of training activities while in process, and providing adequate post-training supervision to ensure implementation of the training.

Précis

Introduction

L'objectif du présent examen est de résumer les informations disponibles entre 1980 et 1992 dans les Amériques, en Asie du Sud, en Asie de l'Est, au Moyen-Orient et en Afrique du Nord, en Afrique subsaharienne sur la morbidité et la mortalité dues à la diarrhée, les stratégies de prévention, la prise en charge des cas et les programmes nationaux, et de proposer des recommandations à l'UNICEF.

Méthodologie

Le processus d'examen repose sur des recherches documentaires informatisées et des contacts avec les organismes internationaux et des chercheurs dans les différentes régions. L'UNICEF a également demandé à cinq groupes d'experts d'établir des rapports régionaux détaillés qui ont été présentés à une réunion des parties intéressées à l'UNICEF en avril 1993, à New York. Par la suite, ces rapports ont été fusionnés en un seul rapport global.

Enseignements tirés

1. Morbidité et mortalité

La diarrhée demeure une cause importante de morbidité et de mortalité infantiles dans le monde. L'Organisation mondiale de la santé (OMS) estime qu'il y a environ 1,3 milliard d'épisodes diarrhéiques et 3 millions de décès par an parmi les enfants de moins de 5 ans. Bien que certains pays aient fait état d'une baisse des taux d'incidence, il n'en reste pas moins qu'aucune réduction de l'incidence de la diarrhée n'a été observée au cours des cinq années écoulées dans la plupart des régions.

Toutefois dans la plupart des pays, la mortalité par diarrhée a baissé au cours des 10 à 20 dernières années, de même que le taux de létalité et les admissions de cas de diarrhée dans les hôpitaux. Dans certains pays, cette réduction au cours de la décennie écoulée a atteint 20 % par an. Un certain nombre d'études locales ont tenté de mettre en évidence les liens entre la baisse de la mortalité par diarrhée et l'amélioration de la prise en charge des cas ou des stratégies de prévention menées par les programmes nationaux de lutte contre les maladies diarrhéiques (LMD). Bien que le rôle des programmes nationaux soit tout à fait clair dans certains cas, il est toutefois difficile d'écarter d'autres explications du recul observé.

L'étiologie de la diarrhée a été examinée dans des études portant sur de nombreux pays, mais les résultats de ces dernières ne sont que partiellement valides souvent du fait que des méthodes de laboratoire laissant à désirer ont été employées et que les échantillons étaient constitués uniquement de patients admis dans les hôpitaux et les dispensaires. Plusieurs pays sont en proie à des épidémies

de choléra et de nombreux vibriions sont devenus résistants aux antibiotiques.

Il y a peu d'informations sur les causes des décès par diarrhée: on ignore s'ils sont principalement causés par des diarrhées aqueuses aiguës, la dysenterie ou des diarrhées persistantes. Les données disponibles font ressortir l'importance des épisodes de diarrhées persistantes. Une meilleure prise en charge des diarrhées aqueuses aiguës, le traitement des diarrhées sanglantes par antibiotiques et une alimentation appropriée sont des éléments cruciaux et contribueront également à réduire les décès dus aux diarrhées persistantes.

2. Lutte contre la morbidité et la mortalité

Les programmes de LMD ont été essentiellement axés sur la prise en charge des cas de diarrhées. Les activités visant à les prévenir sont menées dans le cadre d'autres programmes. La durée de l'allaitement maternel, qui varie selon les régions, est généralement plus courte dans les zones urbaines. Le taux d'allaitement maternel exclusif est faible dans le monde en raison de l'administration précoce d'eau, d'infusions et d'aliments de sevrage. Il faut décourager énergiquement ces pratiques qui sont étroitement associées à la morbidité et la mortalité dues à la diarrhée.

Un approvisionnement adéquat en eau ainsi que la salubrité de celle-ci sont particulièrement importants dans la prévention de la diarrhée. Certains pays ont consenti des investissements importants dans l'approvisionnement en eau et l'assainissement par suite d'épidémies de choléra. Ces activités ont été menées généralement en marge des programmes de lutte contre la diarrhée.

Il est difficile de déterminer l'importance que l'administration de la vitamine A a pu avoir sur la morbidité et la mortalité dues à la diarrhée. Cependant une partie importante de la population de certaines régions souffre d'avitaminose A légère et subclinique, et il est possible que l'administration de vitamine A ait pu avoir une incidence sur la baisse actuelle de la mortalité observée dans certaines régions.

Des études menées dans différentes régions ont également mis en lumière les facteurs de risque suivants dans la morbidité et la mortalité dues à la diarrhée : un faible revenu familial, un niveau d'instruction peu élevé de la mère, le poids insuffisant de l'enfant à sa naissance, la malnutrition, l'absence d'eau salubre et une hygiène personnelle et familiale médiocre. La plupart de ces liens, sinon tous, sont probablement des causes. Toutefois très peu d'études ont été effectuées sur les interventions spécifiques établissant une relation de causalité ou sur la possibilité de modifier ces facteurs de risque. Les interventions visant à relever le revenu familial et le niveau d'instruction maternelle nécessitent des investissements à long terme qui ne sont pas du ressort des services de santé. De même, l'amélioration du poids des enfants à leur naissance ou de leur état nutritionnel est une tâche difficile qui n'a pas toujours donné des résultats satisfaisants.

3. Prise en charge des cas de diarrhée

a) Traitement des cas à domicile

Dans la plupart des pays, les personnes qui s'occupent des enfants connaissent bien la TRO. Plusieurs études ont indiqué que les mères se font une conception élaborée des signes indiquant la gravité de la diarrhée et utilisent la TRO en conséquence. Des études ont démontré que les premiers symptômes, tels que les vomissements et la fièvre, permettent d'identifier une large proportion des enfants qui souffriront ultérieurement de déshydratation au cours de l'épisode diarrhéique. Si les parents et les personnes s'occupant des enfants apprennent à utiliser plus souvent la TRO, à reconnaître les signes de diarrhée grave et à amener sans délai l'enfant en consultation, il sera possible de parvenir à une forte réduction de la mortalité. Mais il reste difficile d'atteindre et de maintenir des taux élevés de thérapie de réhydratation orale.

Toutefois il est clair, au vu d'un grand nombre d'études, que les personnes s'occupant des enfants n'utilisent pas la TRO ou les SRO de façon satisfaisante. La majorité d'entre elles ne préparent pas correctement les SRO et généralement n'ajoutent pas suffisamment d'eau. Les liquides recommandés pour l'utilisation à domicile ne sont pas employés. En outre, la plupart des personnes s'occupant des enfants ne donnent pas de liquide en quantités suffisantes pour réhydrater l'enfant. De même, elles continuent à donner aux enfants des préparations antidiarrhéiques et des antibiotiques dangereux et superflus.

b) Traitement des cas dans les établissements de santé

Les programmes nationaux ont essentiellement porté sur la formation des agents de santé. Bien que le personnel formé s'acquitte mieux de ses tâches que les personnes n'ayant pas suivi de formation, il arrive souvent qu'il évalue mal les cas de diarrhée ou qu'il ne les traite pas avec l'efficacité voulue. En outre il prescrit des antibiotiques plus souvent que des SRO. A part la formation, d'autres facteurs tels que la supervision et l'approvisionnement en médicaments et en matériel jouent un rôle crucial dans la qualité des soins.

Il faut également prendre en compte l'importance des agents de santé du secteur privé. Les praticiens ayant une clientèle privée, les vendeurs de médicaments, les pharmaciens, les guérisseurs traditionnels jouent tous un rôle non négligeable dans le traitement de la diarrhée infantile et ils peuvent contribuer à élargir la portée des services de santé au niveau national. Ainsi par exemple, dans certains pays, les guérisseurs traditionnels sont 100 fois plus nombreux que leurs homologues médicaux et fournissent l'essentiel des soins à de nombreux groupes de population.

4. Programmes nationaux de LMD

a) Production de SRO et logistique

L'accès aux SRO est variable dans différentes régions, et de graves pénuries sévissent dans certains pays, comme par exemple le Soudan. La cause tient peut-être à la baisse de l'offre ou à l'augmentation de la demande ou à ces deux facteurs à la fois. On signale également que de nombreux établissements sont en rupture de stocks tandis que d'autres sont bien approvisionnés. Il semble également que les programmes nationaux de LMD aient besoin de quantités croissantes de SRO. Pour répondre à cette demande, de nombreux programmes nationaux ont collaboré avec des entreprises privées ou des industries semi-publiques pour produire des SRO sur place. Toutefois, il convient d'examiner de façon plus approfondie les problèmes de coûts et de contrôle efficace de la qualité.

b) Communications

Les communications ont été un élément déterminant des programmes chaque fois que des progrès ont été enregistrés. L'élaboration de stratégies de communication bien conçues visant à mobiliser les collectivités et les ménages pour venir en aide aux familles a contribué à accroître les taux d'utilisation de la TRO et à modifier les comportements. Malheureusement, la plupart des pays n'accordent pas une attention et des ressources suffisantes aux activités d'information, d'éducation et de communication. Le savoir-faire en communication souvent n'est pas utilisé. Mais lorsqu'il est mis à profit, comme au Mexique, au Maroc, au Brésil et en Égypte, les changements positifs sont importants.

c) Formation

La formation est une activité importante dans presque tous les programmes nationaux de LMD, mais la formation aux compétences cliniques et de supervision est très variable. La décentralisation de la formation sur la diarrhée, qui était dispensée dans quelques services centralisés, vers des services périphériques plus petits a commencé à de nombreux endroits. L'OMS a élaboré un cours d'apprentissage à distance qui permet à l'agent sanitaire de se former lui-même à l'aide de matériel et d'informations en retour fournis dans le cadre du programme national. Pour pallier le problème du petit nombre de patients déshydratés dans les établissements de traitement périphériques pour les besoins de la formation pratique à la TRO, l'OMS a également élaboré des ateliers comportant des exercices de simulation se prêtant tant à l'enseignement qu'à l'évaluation du travail des participants.

d) Allocation des coûts

Si les activités de programmes nationaux se sont développées, les ressources budgétaires par contre n'ont pas suivi. Les coûts sont à présent une considération importante dans les programmes nationaux. L'OMS a formulé des directives sur l'établissement des coûts pour les programmes

nationaux afin d'aider les directeurs des programmes à mieux définir les modalités d'allocation des coûts et du choix des interventions les plus rentables.

e) Évaluation des progrès

Afin de suivre l'évolution dans le temps des objectifs de réduction de la morbidité et de la mortalité ainsi que des autres objectifs des programmes, le Programme mondial OMS de lutte contre les maladies diarrhéiques a encouragé l'emploi de 16 indicateurs, dont sept sont suivis conjointement par l'UNICEF et l'OMS. À l'exception de la formation, qui représente une estimation administrative, les informations concernant les autres indicateurs sont recueillies à partir d'enquêtes sur les ménages ou dans les établissements de santé. Cependant certains indicateurs, tels que l'utilisation de la TRO, sont difficiles à évaluer. L'UNICEF vient d'élaborer l'enquête par grappes faisant appel à des indicateurs multiples qui donne des informations importantes sur l'utilisation de la thérapie de réhydratation orale, l'alimentation continue et l'administration d'une quantité plus importante de liquides. Cette enquête est un instrument extrêmement utile. Des estimations récentes et fiables sur la thérapie de réhydratation orale ne sont pas disponibles à l'heure actuelle pour la plupart des pays. Toutefois, toutes les données recueillies doivent être intégrées de façon satisfaisante à la gestion et à la planification des programmes en cours; dans le cas contraire, il pourrait en résulter une utilisation malavisée de ressources limitées.

f) Recherche

Les avantages que présente la recherche pour l'orientation des programmes de LMD et le règlement des problèmes sont évidents. De petites enquêtes ont sensiblement contribué à l'identification des problèmes tandis que les études sur l'épidémiologie, l'étiologie et le comportement des personnes s'occupant des enfants et des praticiens en réponse à la diarrhée ainsi que les autres méthodes de formation et d'éducation ont permis d'améliorer l'efficacité des activités de LMD. Les indicateurs de suivi doivent être confirmés et d'autres doivent être élaborés à titre de recherche prioritaire. Il faut mieux appréhender les raisons de l'écart entre les connaissances sur la TRO et son utilisation ainsi que les facteurs qui contribuent à une planification et une gestion améliorées des programmes.

Recommandations

Les recommandations suivantes découlent de l'examen et sont particulièrement utiles pour les pays cherchant à atteindre les objectifs de LMD définis par l'OMS et l'UNICEF pour 1995 et l'an 2000:

1. Secteur privé : Accroître l'appui aux activités visant à favoriser la participation du secteur privé au traitement approprié des cas de diarrhée par la collaboration avec les fabricants de SRO et de biens de consommation (de savon par exemple) et par des efforts visant à toucher les médecins ayant une

clientèle privée et les praticiens autres que les médecins, y compris ceux qui en exerçant sans licence sont appelés à soigner des cas de diarrhée.

2. Évaluation et objectifs : Procéder à des évaluations et fixer des objectifs pour le comportement en matière de LMD, notamment l'emploi de la TRO et des SRO, qui reflète les différentes réponses des praticiens et des personnes s'occupant des enfants devant les cas de diarrhée légère ou de diarrhée déshydratante grave. Assurer le suivi des comportements préventifs et des activités dans ce domaine en plus du traitement des cas.

3. Recherche et évaluation : Élaborer de meilleurs indicateurs de suivi qui permettront de planifier et de régler les problèmes en s'appuyant sur des données et de cibler les groupes de population à haut risque en vue d'activités intensifiées de LMD.

4. Communications : Formuler des stratégies de communication en vue d'atteindre ou de maintenir des taux élevés d'utilisation de la thérapie de réhydratation orale et de consultations sans retard du personnel sanitaire. Accroître le soutien, dans la région, à la recherche sur le public, les moyens et les messages qui permettra d'accroître l'efficacité des activités de communication; continuer à appuyer l'achat d'espaces publicitaires et d'autres dépenses de «marketing», en reconnaissant que les schémas de comportements souhaités doivent être continuellement renforcés par rapport à d'autres comportements antagoniques grâce à la variété des messages et stratégies de marketing.

5. Intégration et décentralisation : Rechercher, par l'évaluation et le suivi, un équilibre plus approprié entre l'intégration et l'autonomie des programmes et activités de LMD pour éviter que leur efficacité ne soit limitée par les efforts visant une productivité plus grande. De même, évaluer et équilibrer, compte tenu de données objectives, la décentralisation et la concentration centralisée des activités de LMD et de la prise de décisions.

6. Études de médecine/Formation théorique préalable à la prestation de services : Encourager l'utilisation, pour la formation théorique préalable à la prestation de services des médecins, infirmières, pharmaciens ou vendeurs de médicaments, des nouveaux matériels de l'OMS qui contribueront à améliorer les activités dans ce domaine, ce qui donnera aux praticiens les règles de base nécessaires pour adopter un comportement professionnel approprié dans l'avenir.

7. Prévention : Une coordination plus grande est nécessaire dans les activités visant la prévention de la diarrhée, en particulier l'approvisionnement en eau, l'hygiène et l'assainissement, l'allaitement maternel exclusif, l'encouragement et le suivi de la vaccination contre la rougeole et les activités de communication en faveur de la prévention.

8. Formation : Prendre des mesures pour éviter le gaspillage des ressources en éliminant les formations inefficaces (telles que déterminées par les évaluations), en améliorant les méthodes de formation, en fournissant suffisamment de temps et des matériels appropriés pour l'apprentissage, en contrôlant la qualité des activités de formation pendant leur déroulement et en fournissant une

supervision adéquate après la formation pour assurer la mise en pratique de celle-ci.

Síntesis de acción

Introducción

El objetivo del presente examen es resumir la información disponible sobre la morbilidad y mortalidad debidas a la diarrea, las estrategias preventivas, el tratamiento de los casos y los programas nacionales, de 1980 a 1992, para las Américas, Asia Meridional, Asia Oriental, Asia Central y Africa Septentrional y el Africa Subsahariana y hacer recomendaciones al UNICEF.

Métodos

El proceso de examen incluyó búsquedas computadorizadas en la literatura y contactos con organismos internacionales e investigadores individuales en la región. UNICEF también encargó a cinco grupos de expertos la preparación de un informe regional amplio, presentado a una reunión de las partes interesadas en UNICEF, en Nueva York, en abril de 1993. Posteriormente, éstos se incluyeron en un solo informe mundial.

Lecciones aprendidas

1. Morbilidad y mortalidad

La diarrea sigue siendo una causa importante de morbilidad y mortalidad infantil en todo el mundo. La Organización Mundial de la Salud (OMS) estima que anualmente ocurren aproximadamente 1.300 millones de episodios y 3 millones de muertes de niños de menos de cinco años. Aunque algunos informes señalan disminuciones de las tasas de incidencia en ciertos países, en la mayoría de las regiones no se ha observado una disminución de la incidencia de la diarrea en los últimos cinco años.

Sin embargo, en la mayoría de los países, la mortalidad debida a la diarrea ha venido disminuyendo durante los últimos 10 a 20 años, así como las admisiones a los hospitales y la razón entre casos y mortalidad. En algunos países, la disminución ha sido de hasta el 20 por ciento anual durante el último decenio. Varios estudios locales han tratado de documentar las asociaciones entre la disminución de la mortalidad de la diarrea y las mejoras en el tratamiento de los casos o en las estrategias preventivas llevadas a cabo por los programas nacionales de control de las enfermedades diarreicas (CED). Aunque en algunos casos el papel de los programas nacionales está muy claro, es difícil eliminar las explicaciones alternativas de la disminución observada.

La etiología de la diarrea se ha evaluado en estudios llevados a cabo en muchos países, pero debido a las metodologías de laboratorio incompletas empleadas y a que las muestras se han tomado únicamente entre pacientes de hospitales y clínicas, la validez de los resultados de tales estudios es a menudo parcial. El cólera se ha vuelto epidémico en algunos países y el número de organismos resistentes a los antibióticos ha aumentado.

Se dispone de pocas pruebas de si las muertes ocasionadas por la diarrea se deben en su mayor

parte a diarrea acuosa aguda, disentería o diarrea persistente. Los datos existentes sugieren que los episodios persistentes desempeñan un papel importante. Un mejor tratamiento de las diarreas acuosas agudas, el tratamiento de la diarrea hemorrágica con antibióticos apropiados y una alimentación adecuada, son todos componentes críticos. Esto también reduciría las muertes por diarrea persistente.

2. Control de la morbilidad y la mortalidad

Los programas de CED se han concentrado primordialmente en el tratamiento de los casos de diarrea. Otros programas han llevado a cabo actividades destinadas a prevenir la diarrea. La duración de la lactancia materna varía según la región y suele ser más corta en las zonas urbanas. Sin embargo, la lactancia materna exclusiva es baja en todo el mundo, debido a la introducción temprana de agua, téis de hierbas y alimentos de destete. Estas prácticas se deben desalentar enérgicamente, ya que guardan una relación importante con la morbilidad y mortalidad debidas a la diarrea.

La disponibilidad de un suministro adecuado de agua, así como la limpieza del agua disponible, es de especial importancia para la prevención de la diarrea. En algunos países se han hecho importantes inversiones en el suministro de agua y el saneamiento adecuado como consecuencia de la epidemia de cólera. Los programas contra la diarrea no han estado relacionados, por lo general, con estos esfuerzos.

El efecto que ha producido el suministro de vitamina A sobre la morbilidad y mortalidad debidas a la diarrea es difícil de determinar. Sin embargo, en algunas regiones hay deficiencia leve, subclínica, de vitamina A en una parte importante de la población y es posible que su suministro tenga algunos efectos sobre la disminución de la mortalidad que se está observando en algunas zonas.

La investigación que se ha llevado a cabo en diferentes regiones también ha implicado los siguientes factores de riesgo en la morbilidad y mortalidad debidas a la diarrea: ingresos familiares bajos, escasa educación materna, peso bajo al nacer, malnutrición, falta de agua pura e higiene doméstica y personal deficientes. Es probable que la mayoría, sino todas estas asociaciones, sea causal. Sin embargo, se han llevado a cabo pocos estudios específicos sobre la intervención para establecer la causalidad y para mostrar la factibilidad de modificar estos factores de riesgo. Las intervenciones para mejorar los niveles de ingresos familiares y la educación materna exigen inversiones a largo plazo que se sitúan fuera del ámbito usual de los servicios de salud. Asimismo, mejorar los pesos al nacer o el estado nutricional son empeños difíciles que han fracasado en la mayoría de las situaciones.

3. Tratamiento de los casos de diarrea

a) Tratamiento casero de los casos

Los cuidadores conocen la terapia de rehidratación oral (TRO) en la mayoría de los países. Varios estudios han demostrado que las madres tienen percepciones complejas de los signos de la severidad de la diarrea y utilizan la TRO de acuerdo con esas percepciones. Los estudios han demostrado que los signos iniciales, tales como vómitos y fiebre, permiten la identificación de una gran proporción de los niños que más adelante se deshidratarán durante el episodio. Si se puede enseñar a los padres y cuidadores a aumentar el empleo de la TRO y a reconocer los signos de la diarrea grave y a obtener atención médica, se podrían lograr disminuciones importantes de la mortalidad. Sigue constituyendo un desafío el sostener y lograr niveles altos de terapia de rehidratación oral.

Está claro, sin embargo, a juzgar por un gran número de estudios, que los cuidadores no emplean prácticas adecuadas respecto de la TRO o el empleo de la solución de rehidratación oral (SRO). La mayoría de ellos no mezclan correctamente la SRO, generalmente porque no añaden cantidades suficientes de agua. No se emplean los líquidos caseros recomendados. Además, la mayoría de los cuidadores no administran los volúmenes de líquido adecuados para rehidratar al niño. Además, los cuidadores siguen dando a los niños preparados antidiarreicos y antibióticos innecesarios y peligrosos.

b) Tratamiento de los casos en instalaciones sanitarias

Los suministradores de atención médica han sido el objetivo principal de las actividades de capacitación de los programas nacionales. Aunque los trabajadores sanitarios capacitados trabajan mejor que los que carecen de capacitación, con frecuencia hasta los que han recibido capacitación no evalúan ni tratan efectivamente a los niños con diarrea. Además, recetan antibióticos con más frecuencia que SRO. Además de la capacitación, otros factores de situación, tales como la supervisión y la disponibilidad de materiales y medicamentos, pueden desempeñar papeles críticos para dar apoyo a la calidad del desempeño.

Se debe tomar en cuenta la importancia que tienen los suministradores de atención médica en el sector privado. Los médicos privados, los vendedores de medicamentos, los farmacéuticos, los curanderos tradicionales, todos desempeñan un papel importante en el tratamiento de la diarrea en los niños y pueden contribuir a ampliar los alcances de los servicios de atención de la salud a escala nacional. En algunos países, por ejemplo, los curanderos tradicionales sobrepasan en número a sus contrapartes biomédicas por 100 a 1, y son las fuentes principales de atención de la salud para muchos segmentos de la población.

4. Programas nacionales de CED

a) Producción de SRO y logística

Se aprecia una amplia gama de acceso a las SRO en las diferentes regiones, con escaseces críticas

en algunos países, como por ejemplo en el Sudán. Esto se puede deber a que hay una menor oferta, una mayor demanda, o ambas. Los informes indican también que muchas instalaciones se quedan sin SRO, mientras que otras tienen abundantes existencias. Parece que los programas de CED necesitan aumentar las cantidades de SRO. Para satisfacer esta necesidad, muchos programas nacionales han trabajado con empresas privadas o industrias paraestatales para producir SRO localmente. Sin embargo, se deben revisar cuidadosamente los problemas relativos al control efectivo de la calidad y los costos.

b) Comunicación

La comunicación ha sido un componente crítico de los programas donde se han apreciado progresos. La creación de estrategias confiables de comunicación en los que participa la movilización de la comunidad y los hogares en apoyo de las familias han contribuido a aumentar las tasas de empleo de la TRO y a modificar la conducta. Desafortunadamente, la mayoría de los países no dedican suficiente atención ni recursos a la información, la educación y la comunicación. Con frecuencia no se aplican los conocimientos acerca de la comunicación. Pero donde se han empleado - como en México, Marruecos, el Brasil y Egipto - los cambios positivos han sido notables.

c) Capacitación

La capacitación ha sido una actividad importante de virtualmente todos los programas nacionales de CED, aunque la cobertura de la capacitación en materia de habilidades clínicas y de supervisión varía ampliamente. La descentralización de la capacitación, más allá de unos cuantos Centros de Capacitación sobre Diarrea (CCD), a centros periféricos más pequeños, ha comenzado en muchos lugares. La OMS ha creado un curso de aprendizaje a distancia en que cada trabajador de salud individual se enseña a sí mismo con la ayuda de materiales y retroalimentación proporcionados por el programa nacional. Para resolver el problema del pequeño número de pacientes deshidratados con que se cuenta para una capacitación práctica en los centros de capacitación sobre TRO, la OMS ha creado cursos con casos simulados para enseñar y evaluar la actuación de los participantes.

d) Asignación de los costos

Los recursos presupuestarios no han aumentado al mismo ritmo al que se han ampliado las actividades de los programas nacionales. La asignación de los costos es ahora una consideración importante en los programas nacionales. Para ayudar a los administradores de los programas, la OMS ha establecido pautas para la determinación de los costos de los programas nacionales para ayudar a definir mejor cómo se asignan los costos y cómo seleccionar mejor las opciones de intervención más efectivas en función de los costos.

e) Medición de los avances

Para llevar un control de los cambios a lo largo del tiempo en las metas de reducción de la morbilidad y la mortalidad así como otros objetivos de gestión de los programas, el Programa

Mundial de la OMS para el Control de las Enfermedades Diarreicas ha promovido el empleo de 16 indicadores de programas, de los cuales siete están siendo supervisados conjuntamente por UNICEF y la OMS. Con la excepción de la cobertura de la capacitación, que es una estimación administrativa, los otros indicadores de los programas se toman de encuestas llevadas a cabo en los hogares o centros de salud. Sin embargo, algunos de los indicadores, tales como el empleo de la TRO, son difíciles de medir. UNICEF creó recientemente la Encuesta del Grupo de Indicadores Múltiples, que da información importante acerca del empleo de la terapia de rehidratación oral, la continuación de la alimentación y el aumento de los líquidos. Este es un instrumento muy útil. Actualmente no se cuenta con estimaciones recientes y confiables sobre la terapia de rehidratación oral para la mayoría de los países. Sin embargo, todos los datos que se han reunido deben integrarse efectivamente en la administración y planificación de los programas en curso, pues lo contrario constituye un costoso uso indebido de recursos insuficientes.

f) Investigación

Son evidentes los beneficios de la investigación para orientar los programas de CED y resolver los problemas. Pequeñas encuestas han sido críticas para la identificación de problemas, mientras que estudios de la epidemiología, la etiología, las conductas de los cuidadores y profesionales en respuesta a la diarrea, los métodos alternativos de capacitación y educación han desempeñado todos un papel importante en el mejoramiento de la efectividad de las actividades de CED. Es necesario confirmar los indicadores de supervisión y mejorar otros adicionales como esfera prioritaria para la investigación. Es necesario comprender mejor la razón de la brecha entre los conocimientos y el empleo de la TRO, así como los factores que contribuyen a una mejor planificación y gestión de los programas.

Recomendaciones

Las siguientes recomendaciones se desprenden del examen y son especialmente pertinentes para los países que alcancen los objetivos de CED de la OMS y el UNICEF para 1995 y 2000:

1. Sector privado: Aumentar el apoyo dado a actividades destinadas a hacer participar al sector privado en el tratamiento adecuado de la diarrea, mediante su colaboración con fabricantes de SRO y de bienes de consumo (por ejemplo jabón) y mediante esfuerzos por llegar hasta los profesionales privados, médicos y no médicos, incluidos los curanderos no graduados que atienden a pacientes de diarrea.

2. Mediciones y metas: Crear medidas y establecer metas para conductas relacionadas con el CED, y en particular el empleo de TRO y SRO, que tengan en cuenta las diferentes respuestas de los cuidadores y profesionales a los niños con diarrea deshidratante severa. Poner en práctica la supervisión de conductas preventivas y actividades programáticas, además del tratamiento de los casos.

3. Investigación y evaluación: Crear mejores indicadores de la supervisión para permitir la solución de problemas, la planificación basadas en datos y la identificación de poblaciones secundarias que corren un riesgo mayor, con el fin de intensificar las actividades de CED.

4. Comunicaciones: Crear estrategias de comunicación para lograr o mantener niveles elevados de terapia de rehidratación oral y que se obtenga a tiempo atención médica. Aumentar el apoyo en la región de la investigación de los públicos, los conductos y los mensajes necesarios para que las actividades de comunicación sean efectivas; continuar dando apoyo a gastos de radiodifusión y otros relacionados con la "comercialización", reconociendo que las pautas de conducta deseadas deben defenderse constantemente contra las conductas alternativas que compiten con ellas variando efectivamente las estrategias y mensajes de comercialización.

5. Integración y descentralización: Perseguir, mediante la evaluación y la supervisión, un equilibrio más apropiado entre la integración y la independencia de los programas y actividades de CED, para que los esfuerzos por lograr una mayor eficiencia no disminuyan su efectividad. Evaluar también y equilibrar, sobre la base de datos objetivos, la tensión entre la descentralización y la concentración central de las actividades y decisiones acerca del CED.

6. Educación médica y previa al servicio: Fomentar el uso de los nuevos materiales de la OMS para la educación previa al servicio de médicos, enfermeras y farmacéuticos o vendedores de medicamentos como base para fortalecer las actividades en este ámbito, para establecer una base de conductas apropiadas de los profesionales en el futuro.

7. Prevención: Se necesita una mayor coordinación de los esfuerzos destinados a prevenir la diarrea, especialmente en materia de agua, higiene y saneamiento; la lactancia materna exclusiva; facilitar y llevar un control de la inmunización contra el sarampión; y actividades de comunicación en apoyo de la prevención.

8. Capacitación: Tomar medidas para evitar el desperdicio de recursos en capacitación inefectiva, eliminando la capacitación inefectiva (determinada mediante investigaciones de la evaluación), mejorar los métodos de capacitación, dar tiempo adecuado y materiales apropiados para el aprendizaje, supervisar la calidad de las actividades de capacitación mientras éstas se llevan a cabo y ofrecer supervisión adecuada después de la capacitación para garantizar que se aplique la capacitación recibida.

Introduction

Global overview

Diarrhoeal diseases are major contributors to the morbidity and mortality among infants and young children in the developing world. The World Health Organization estimates that there are approximately 1.3 billion episodes and 3 million deaths annually in children under five years of age. Since the establishment of the Global Programme for the Control of Diarrhoeal Diseases in 1980, 126 countries worldwide have created national programmes for the control of diarrhoeal diseases (CDD) whose activities have emphasized the promotion of oral rehydration therapy (ORT). Considerable efforts have been undertaken to reach the health workers and family who provide the necessary care of sick children with diarrhoea through training and mass communications. National programmes have strived to ensure adequate supplies of oral rehydration salts (ORS), or more recently to promote the use of home available fluids for early treatment of diarrhoea.

Purpose of this review

A decade after the initiation of global activities in the control of diarrhoeal diseases, it was important to review the progress that had been achieved in reducing the morbidity and mortality associated with diarrhoeal diseases. To accomplish this, UNICEF commissioned five expert groups (Appendix 1) to conduct an in-depth review of published and unpublished literature for each of five regions listed in Table 1.

Table 1: Studied regions

- East Asia
 - South Asia
 - sub-Saharan Africa
 - Middle East/North Africa
 - the Americas
-

These regional reports were prepared from reviews of the existing literature. Each regional review focussed on four broad categories which are listed in Table 2. Summaries of each regional review were presented to a meeting of interested parties at UNICEF/New York in April 1993. Using each regional report, this global review was assembled to reflect the current status and trends in each of the four major activity areas.

It should be noted that the accuracy and reliability of the information presented in each of the sources was assumed, though it is acknowledged that there is great variation in the quality and quantity of information contained in them. Also, this review relies extensively on the documented experience of the major bilateral (United States Agency for International Development-USAID) and multilateral (WHO, UNICEF) donors. The authors used published global summaries issued by the Global Programme for the Control of Diarrhoeal Diseases of the World Health Organization derived from national surveys, studies and evaluations as primary sources for many of information presented in the paper.

Table 2: Topics of review

- MORBIDITY AND MORTALITY
- CASE MANAGEMENT
- PREVENTION
- CDD PROGRAMME MANAGEMENT

Morbidity and mortality

Morbidity

Diarrhoea remains one of the most common diseases afflicting children under five years of age. The number of episodes per year among these children varies according to the area and country, and is reported to be between two and four. The lowest reports come from East Asia and the highest from South Asia (Bangladesh). Although there have been a few reports of declines in incidence rates in some specific countries, such as Morocco and Brazil (only for São Paulo State), for most regions, no decline in the incidence of diarrhoea was observed over the past five years.

There are several possible explanations for this situation. First, diarrhoea is a disease of poverty afflicting malnourished children in crowded and contaminated environments. With few exceptions, the global economic situation has not significantly improved over the last decade. As the global population continues to expand at nearly two per cent per year, the population of impoverished children also grows. Only the efforts to immunize children against measles, provide safe water and adequate sanitation facilities, and to encourage mothers to exclusively breastfeed infants through six months of age, may have blunted an increase in diarrhoea morbidity and mortality. Second, national diarrhoea disease control programmes have emphasized and promoted effective diarrhoea case management in an effort to prevent deaths due to dehydration, and have not placed great emphasis on preventive strategies to limit the transmission of diarrhoeal disease.

Table 3 : Factors contributing to diarrhoea morbidity

BIOLOGICAL FACTORS

age of the child
age of the caretaker
birth order of child
feeding mode

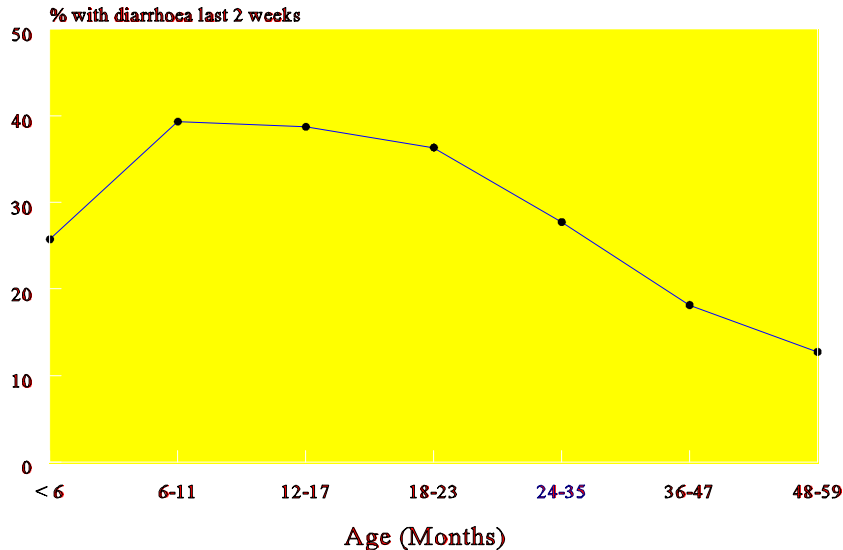
SOCIO-ENVIRONMENTAL FACTORS

family income
education level of caretaker
water quality and/or quantity
sanitation facilities

A number of studies from Asia, Africa and Latin America have identified a set of common risk factors for diarrhoea morbidity. These include low socio-economic status, low maternal education, lack of safe water, poor domestic and environmental sanitation, malnutrition (including vitamin A deficiency) and age of the child. Figure 1 presents data from the Demographic and Health Surveys conducted in Asia, Africa and Latin America which show that diarrhoea prevalence peaks in the 6-11 month age group and remains high through 24 months. It is clear that a multitude of biologic and

socio-environmental factors interact in diverse ways to contribute to the development of diarrhoeal diseases through impacting on host defenses or on environmental exposures to diarrhoeal pathogens. Table 3 presents some of these key factors.

Figure 1. Diarrhoea prevalence by age
Demographic & health surveys



Surveys conducted in a number of countries in the Middle East and North Africa have indicated that diarrhoea morbidity is higher in rural than in urban areas. Regarding gender, there have been no reports of differences, except for an increased mortality among females in cases of persistent diarrhoea observed in Bangladesh¹ which needs more investigation.

Although overall diarrhoea morbidity has not clearly declined over the last decade, the distribution of types of diarrhoea may be changing. The etiology of diarrhoea has been assessed in studies from many countries, but because of incomplete laboratory methodologies employed, and sampling from only hospital or clinic based patients, the results of such studies are often only partially valid.

Persistent diarrhoeas (lasting over 14 days) have been identified as significant contributors to diarrhoea morbidity and mortality. It is estimated that 3 - 20 per cent of diarrhoeas are persistent and these contribute disproportionately to diarrhoea deaths. For instance, in Southern Brazil, 62 per cent of infant diarrhoea deaths were due to persistent diarrhoea². Studies in Asia, Latin America and Africa have all indicated that young children (under one year of age) who are malnourished, not breastfed, and have had frequent diarrhoeal episodes or a previous episode of persistent diarrhoea, carry the greatest risk for persistent diarrhoea and its consequences.

Another important change in the epidemiology of diarrhoea has been the re-emergence of cholera on a pan-global scale. Cholera has become epidemic in some countries, and antibiotic resistance has spread to many organisms. The seventh pandemic began in Indonesia, spread to Africa in the early 1970s and to Latin America in the early 1990s. Particularly in Africa, where case fatality rates have been as high as 30 per cent, and hover between 5-10 per cent, cholera has taken a devastating toll. In 1991, there were over 150,000 cases and 14,000 deaths due to cholera in Africa alone. However, national programmes must continue to put cholera into perspective. At its height in 1991, cholera constituted only three per cent of diarrhoea cases and less than one per cent of diarrhoea deaths in Africa.

Mortality

Diarrhoea globally accounts for 15-30 per cent of under-five deaths in childhood. There is little hard evidence on the changing pattern of mortality due to diarrhoea globally. As indicated above, deaths due to acute watery diarrhoea may be declining, but we need to continue to ensure high use of oral rehydration therapy. Along with this, the non-watery diarrhoeas including dysentery and persistent diarrhoea need more emphasis. Though like morbidity data, more information is needed on mortality trends - the available evidence points to a decrease in diarrhoea mortality, often dramatically. For instance, in Sao Paulo, Brazil, there was a 73 per cent reduction in diarrhoea mortality over the six year period of 1981 to 1987³. Declines often parallel and occasionally exceed the declines in infant and under-five mortality rates.

Limited evidence is available on whether diarrhoea deaths are mostly due to acute watery diarrhoea, dysentery or persistent diarrhoea. Existing data suggest a large role for persistent episodes. Better management of acute watery diarrhoeas, dealing with bloody diarrhoea with appropriate antibiotics and proper feeding are, therefore, all critical components.

A number of studies, particularly in Latin America, have addressed the factors which influence diarrhoea mortality. In Southern Brazil, diarrhoea mortality was associated with low socio-economic status, low maternal educational level, lack of safe water and sanitation, and lack of breastfeeding. Of particular note are the findings related to maternal education and breastfeeding. It was found that for each additional year of education, diarrhoea incidence was lowered by 7 per cent. Infants who were exclusively breastfed had a 14-fold reduction in risk of diarrhoea mortality compared to children who had been weaned off the breast.

Beyond the environmental factors mentioned above, the changing epidemiology of diarrhoea is also affecting the patterns of diarrhoea mortality. For instance, in Matlab Bangladesh, for deaths among under-fives, acute watery diarrhoea accounted for 34 per cent of diarrhoea deaths while the remaining 66 per cent were related to dysentery or persistent diarrhoea and malnutrition. This pattern was age-dependent with acute watery deaths being more important in infancy, being associated with 40 per cent of deaths and less important in later childhood, being associated with 10 per cent of deaths.

Studies in Asia and Africa have clearly shown that establishment of an ORT unit with training of hospital staff can significantly reduce diarrhoea case fatality rates. For instance, at Mama Yemo Hospital in Kinshasa, Zaire, there was a 69 per cent decline in diarrhoea deaths after creation of an ORT unit. At Kamuzu General Hospital in Malawi, inpatient diarrhoea case fatality fell by 38 per cent. At the National Children's Hospital in Manila, Philippines, the diarrhoea case fatality rate was reduced by 50 per cent after the ORT unit was started. On a community level, studies in Teknaf, Bangladesh⁴, and in Egypt⁵, have demonstrated that intensive campaigns to increase effective use of oral rehydration therapy can reduce mortality. For instance, in Egypt, diarrhoea case fatality rates fell by 50 per cent following intensive targeting by the national diarrhoeal disease control programme.

Case management

An operational model

Effective case management is the foundation of most national CDD programme efforts. Through effective case management (oral rehydration, feeding and fluids) by caretakers in the home and by health workers in facilities, the toll of diarrhoea mortality can be substantially reduced. There are two arms of the case management pathway which the national programme strives to influence - home case management and case management in health facilities. Communication activities work to upgrade the knowledge, and hopefully the practice, of caretakers and health workers. Training provides health workers, and sometimes caretakers, with the skills necessary for effective case management. Both caretakers and health workers depend upon the availability of appropriate rehydration fluids including ORS and the ingredients to prepare a variety of home fluids.

Home case management

Caretakers need to have the following knowledge and/or skills in order to provide effective case management: understand that diarrhoea can be a serious disease leading to dehydration and death unless specific actions are taken; recognize the signs of dehydration in order to seek care or take actions to rehydrate the child; prepare oral rehydration solutions including ORS and home available fluids; increase volume of fluids given to the child during the episode; maintain an adequate diet during the episode and during convalescence; know how to prevent future episodes through improved environmental and food hygiene, exclusive breastfeeding for 4 to 6 months, avoiding bottle feeding, and by ensuring that their child is immunized against measles.

Various countries have sought to reduce the economic and logistical burden of using only ORS as the solution for treating diarrhoea, by identifying other fluids used by caretakers. These fluids, with some modification, could be adequate rehydration fluids, especially for early rehydration of children without dehydration. In Bangladesh, rice-based fluids have been tried; in Africa, millet, maize and sorghum-based fluids have been investigated. However, since many of these fluids have been used for generations as weaning paps, there has been much confusion by mothers (and also by researchers themselves) as to the exact nature and use of these fluids, whether they are foods for weaning, fluids for diarrhoea, or both. However, this distinction may not be so relevant since children need both fluids and food.

A key issue for national programmes seeking to improve rehydration practices in the home are the factors influencing use of ORS or other rehydrating fluid. One important factor that leads caretakers to use ORS, ORT or seek health care is the perceived severity of the diarrhoea. This is well documented in different countries in the world. In an ethnographic study in the highlands of central Mexico⁶, mothers identified diarrhoea as a common problem which most often is not life-threatening, and directed their treatment, including use of liquids and feeds, according to their assessment of severity. Besides considering the number and aspect of stools, mothers assessed diarrhoea severity by how much the episode interfered with their daily activities. Evolution of the episode was assessed

through common signs and symptoms related to stool appearance, acceptance of feeding, the child's mood, attitudes and complaints. To decide whether or not the child was improving, mothers often relied on the appearance of the eyes, citing sunken, sad and upward-turned eyes as signs of danger.

A study conducted in Rio de Janeiro, Brazil⁷, has shown that dehydration signs and symptoms more frequently identified by mothers included number of stools, number of vomiting episodes, thirsty and sunken eyes. In this study, one third of the mothers underestimated diarrhoea severity and another one third overestimated dehydration. Underestimation of severity was directly associated with lower levels of maternal education.

Despite misclassification, signs and symptoms assessed by mothers are often correct, as revealed by another study carried out in southern Brazil⁸. Sensitivity and specificity of several signs and symptoms observed during the first day of the diarrhoea episode for predicting the later occurrence of dehydration were estimated. Alterations in thirst, six or more stools/day, fever and vomiting had the best sensitivities, while blood in the stools, fever and vomiting had the best specificities.

The only community survey conducted in Bangladesh which attempted to measure ORT usage according to severity, as defined by the mothers, found a much higher use of ORT in severe cases of acute watery diarrhoea. Usage in severe illness was 52 per cent when the overall usage - considering all episodes of diarrhoea, whether it was mild, moderate or severe - was less than 20 per cent⁹.

In Egypt, studies also show that the use of ORS in severe cases is high. A national knowledge, attitudes and practices (KAP) study in 1988 and two studies in Menofia in 1988 and 1990, all indicated that use of ORS for diarrhoea considered as 'strong' was between 66 per cent and 72 per cent, while for a 'simple' diarrhoea was between 25 per cent and 37 per cent¹⁰. Similar results were seen relative to the concept of dehydration: children considered by their caretakers to be dehydrated were treated with ORS in 83-89 per cent of the cases, while 33 per cent of those not perceived as dehydrated received ORS. In The Gambia, one of the few predictors of the use of ORS was the caretakers' perceived severity of the episode (Foote DR et al. 'The Mass Media and Health Practices Evaluations in Honduras and the Gambia', 1985, unpublished).

These multiple studies, showing that mothers adopt ORS according to their perception of diarrhoea severity, lead to two important conclusions. First, more emphasis should be placed on teaching health workers and mothers about early signs of diarrhoea severity, including vomiting, fever, thirst and number of stools. Second, as most episodes of diarrhoea are mild, it is possible that the goals of achieving high proportions of ORS use might prove to be unrealistic and should be re-evaluated. However, for every case of diarrhoea, ORT remains important.

The teaching of caretakers should concentrate not only on the perception of diarrhoea severity, but also on the correct preparation and administration of fluids. Caretakers should know very clearly

that for ORS or home fluids to be 'effective' rehydrating solutions, they must be mixed properly and administered in sufficient amounts. Considerable evidence exists from each of the five regions, that ORS and home fluids are not mixed properly. For instance, household surveys in six countries in Africa have shown that less than 50 per cent of mothers are able to properly mix ORS, the most common error being not adding adequate volumes of water. In Bangladesh, only 40 per cent of caretakers could prepare the home-made sugar-salt solution (LGS) properly¹¹, and only three per cent of caretakers in Nepal were able to mix correctly¹². Moreover, of 6 surveys carried out in Africa, only two showed that the average volume of fluid administered per day exceeded the WHO-recommended 500 ml. In Egypt, 91 per cent of children who died from diarrhoea in one study had received some ORS - two-thirds of these children had received an insufficient amount of ORS.¹³ The national programme in Egypt found that provision of plastic containers improved the correctness of mixing¹⁴, as did the intensive training of mothers¹⁵. However, despite these improvements, the incidence of hypernatremia associated with overly concentrated ORS solutions has increased in Egypt^{16,17}, ironically along with the national programme's efforts at promoting the use of ORS.

In a population-based study in northeastern Brazil, samples of rehydration solutions prepared by the mothers were tested in a laboratory. Over concentration was just as frequent for ORS as for all sugar-salt solutions (18). When prepared with a plastic measuring spoon, sugar-salt solutions performed better than ORS.

Another core element of appropriate home case management is the administration of increased volumes of fluids of any type to a child with diarrhoea, early and continuously in the course of the episode. Only a third to one-half of children with diarrhoea receive increased volumes of fluid in household surveys in Asia, Africa and Latin America. For instance, in Mexico, only 36 per cent of caretakers increased fluids for children with diarrhoea¹⁸. This suggests, along with the low volumes of ORS administered, that the majority of the world's children are not effectively managed during episodes of diarrhoea in the home. In part, this may be due to the lack of emphasis in communication campaigns on administration of appropriate volumes of fluid. Along with the high drug use rates by caretakers for children with diarrhoea, there is considerable work to be done to improve case management of the child with diarrhoea in the home to obtain more effective care for the child if he/she is not responding to actions taken in the home.

Case management in health facilities

Health care seeking is a complex personal and cultural behaviour, and the most important sources of health care need to be known, so that adequate training for personnel can be provided. Results from 22 Demographic and Health Surveys in Africa, Asia and Latin America suggest that only about half of children with diarrhoea may end up at a health facility. In many countries, this is even less. For instance, in northeastern Brazil, only 14 per cent of children with diarrhoea are taken to a health facility, while traditional healers are the most frequently consulted providers of diarrhoea care, seeing 24 per cent of the episodes (21 per cent in urban areas and 26 per cent in rural areas)¹⁹.

What is the quality of care given to the children that are brought to health facilities with

diarrhoea? National CDD programmes have expended a great deal of resources in training health workers, providing them with basic equipment, supervising them and reinforcing their acquired skills through various communication activities. The importance of the health worker in the ORT strategy cannot be overstated. In many countries, they are the main source of information about ORT for caretakers. In one study in Thailand²⁰, 77 per cent of mothers learned about ORT from a health worker. In Kenya, they served as the main information source for 50-75 per cent of caretakers (Endsley S. 'The Challenge of Diarrhoeal Diseases Control in Kenya', 1992, unpublished). They not only are a key resource for caretakers, but also for other providers. For instance, pharmacy surveys in Mali and Senegal found that health workers were the number one source of information on ORT.

It has been clearly demonstrated in several countries that health workers in health facilities which have a diarrhoea training unit (DTU) with ongoing efforts to train and support effective oral rehydration, can improve their performance dramatically. For example, at the Kamuzu Central Hospital in Llongwe, Malawi, a DTU was established in 1984 with subsequent training of paediatric staff in ORT. Two years following the establishment of the DTU, there was a 50 per cent reduction in diarrhoea admissions, a 300 per cent increase in the number of children receiving ORS, and a 300 per cent decrease in the use of IV fluids for rehydration. As a result of this improved performance, hospital diarrhoea case fatality rates fell by 39 per cent and hospital costs for diarrhoea treatment declined by 32 per cent²¹. Pre-service training on the principles and practice of ORT during medical education, such as is being done in the Philippines, Indonesia, Nigeria and Egypt, may be more effective in introducing lifelong habits of effective case management.

It is important to know if the intensive efforts to train and support health workers resulted in adequate performance of case management by these health workers when they returned home to their facility without the daily support and stimulation of a training institution. Data from health facility surveys from Asia, Africa and Latin America suggest that progress has been made, but it has been disappointingly slow. Fourteen surveys in Africa found that only 23 per cent of health workers could correctly assess the degree of dehydration of a child with diarrhoea, and 28 per cent correctly rehydrated the child. In Egypt, 10 per cent of children were correctly assessed and 33 per cent correctly rehydrated²². Given the generally disappointing performance of health workers in peripheral health facilities, what are the possible factors which might be influencing the quality of performance?

It seems that the correct training of health workers can be a key issue. Studies in Mexico show that the training of physicians and nurses at health facilities improve their skills in the management of diarrhoea episodes^{23,24,25,26}. One study in northeastern Brazil has shown that the proper training of traditional healers is also effective, increasing mothers' awareness, use and adequate preparation of ORT, as well as the continuation of breastfeeding and other foods during the diarrhoea episode²⁷.

Other situational factors, such as supervision and availability of materials and drugs, may play critical roles in supporting the quality of performance. Surveys in Africa have shown that 25-50 per cent of health facilities have significant shortages of ORS and utensils such as cups and spoons, and as many as 70-90 per cent may lack educational materials for teaching caretakers. Without regular and adequate supplies of ORS, children brought to health facilities many not receive appropriate

rehydration and may also receive costly and ineffective or dangerous antidiarrhoeals and antibiotics. Health workers in Asia, Africa and Latin America have been found to prescribe drugs more frequently than ORS for diarrhoea in children. For example, in Brazil, 47 per cent of the episodes were treated with medicines¹⁹; and in Egypt, drugs were prescribed 54 per cent of the time compared with 23 per cent for ORS²⁸.

Involvement of the private sector

Though national CDD programmes operate mainly in the public sector, the private sector contributes significantly to national diarrhoeal disease control efforts. Private practitioners, traditional healers, pharmacists and drug sellers, and non-governmental organizations (NGOs) all do, or potentially could, participate in extending the reach of oral rehydration services. In Africa, many of the NGOs are involved in training community health workers to teach caretakers about ORT and to distribute ORS packets. Pharmacists and drug sellers are also important providers of advice and drugs for diarrhoea case management. The World Health Organization is developing a guide for improving the diarrhoeal treatment practices of pharmacists and licensed drug sellers, which includes firstly the collection of preliminary KAP information, which is then used to develop communication and educational materials.

Traditional healers and traditional birth attendants (TBAs) represent an enormous and largely untapped corps of traditional health providers who have the potential to be major participants in national CDD efforts. For instance, it is estimated that there are over one million traditional healers in sub-Saharan Africa serving 80-90 per cent of the population. Traditional practitioners outnumber biomedical practitioners 100 to 1. In northeastern Brazil, traditional healers are the most frequently consulted health providers (24 per cent of consultations for diarrhoea)¹⁹. Evidence exists which suggests that traditional healers have already assimilated components of oral rehydration therapy into their practice. In Zambia, a recent survey found that 95 per cent of traditional healers were aware of the signs of dehydration and 77 per cent were aware of ORS; 31 per cent were advising caretakers to increase the amount of fluids during the episode of diarrhoea (incidentally, this is a greater percentage recommending increasing fluid intake than health workers are found to do from surveys).

Another important contribution of the private sector is the local production and distribution of oral rehydration salts. Twenty-seven countries in sub-Saharan Africa, for example, have local commercial firms which are producing various quantities of ORS. Commercialization of ORS is also prominent in Asia (Indonesia, Pakistan and Philippines are good examples) and Latin America (Honduras, Guatemala and Mexico). However, as with many nascent industries, ORS commercialization has encountered several obstacles. First, some commercial producers are food producers who do not use adequate manufacturing practices. Second, with many economic and political barriers, commercial production has contributed only a small fraction of the ORS need. For example, import duties on aluminum foil forced commercial firms in Kenya to pass the added cost onto the consumer, making commercial ORS too costly for the average Kenyan. However, studies in Kenya have suggested that by targeting both public and private sector ORS supplies to separate segments of the population, overall ORS use can be increased (Endsley S. 'The Challenge of

Diarrhoeal Disease Control in Kenya', 1992, unpublished).

Prevention

National diarrhoeal disease control efforts have focused mainly on improving the effectiveness of case management. There have been parallel efforts to address factors which prevent the development of diarrhoea, such as the provision of safe water and sanitation, and the promotion of breastfeeding. Other activities, such as measles immunization and provision of vitamin A, can also prove to be important measures in preventing diarrhoea morbidity and mortality.

Water supply

It has been estimated that implementation of water systems including deep-bore wells, protected springs, and piped water could reduce diarrhoea morbidity by 26 per cent. Moreover, improved hygiene practices could reduce morbidity by 33 per cent. The decade of the 1980s was identified by WHO and UNICEF as the Water and Sanitation Decade. Across the globe, accelerated efforts were undertaken to improve water supplies and to provide adequate sanitation facilities. For instance, in Africa, the proportion of the population with access to safe water and adequate sanitation doubled or tripled from less than 15 per cent to 30-45 per cent. However, a significant proportion of the world still lives without safe water and sanitation.

Evidence from Asia, Africa and Latin America consistently demonstrates that improvements in water supply can reduce the morbidity and mortality associated with diarrhoea. For example, a study in Bangladesh found that installation of handpumps resulted in a 27 per cent reduction in diarrhoea incidence. A study in Malawi found that there was a 20 per cent decline in diarrhoea mortality in households with piped water. A study in China found 38 per cent less diarrhoea in households with access to protected wells²⁹. Finally, a study in Brazil found that the risk of dying from diarrhoea was increased threefold in households without piped water³⁰. An intriguing study from Imo State in Nigeria found no impact of deep-bore wells on diarrhoea morbidity³¹. However, it did find a significant impact of wells on diarrhoea morbidity on the sub-population that lived close to the wells and spent less time collecting water. This suggests that water quantity and availability is more important than water quality.

Sanitation and hygiene behaviour

The evidence that sanitation improvements can reduce diarrhoea morbidity and mortality is less consistent. In the Philippines, a study found 20 per cent less diarrhoea in households with a pit latrine³². In Brazil, presence of a pit latrine was associated with a 2 to 3 fold decrease in diarrhoea incidence³³. A project in Lesotho, Southern Africa found that the combination of ventilated pit latrines, and regular hand-washing was associated with a 24 per cent reduction in diarrhoea incidence³⁴. However, a reanalysis of 22 Demographic and Health Surveys (DHS) from Asia, Africa and Latin America suggests that the association between improved sanitation and lower diarrhoea incidence was not consistent either in the direction or magnitude of association. An in-depth analysis of the DHS survey from Senegal could find no clear association between sanitation facility and diarrhoea morbidity. This lack of consistency of association might be explained by the complexity of

behaviours related to sanitation. For instance, the action of hand washing, especially with soap or the breastfeeding status of the child, may interact with the presence or absence of a pit latrine to produce a mixture of changes in disease patterns. A good example of this is the study from Lesotho, which found a reduction in diarrhoea only with the combination of hand washing and the presence of a ventilated pit latrine; either alone was not associated with a change in diarrhoea incidence. Another good example is the water and sanitation project in Zomba District, Malawi³⁵. Disease surveillance suggests that the largest reduction in diarrhoea morbidity was associated with the presence of a pit latrine, safe water (low faecal coliforms), and exclusive breastfeeding. This combination resulted in a six-fold reduction in diarrhoea incidence. Safe water and VIP latrines were not associated with reductions in diarrhoea when the child was not being breastfed.

Breastfeeding

One of the most dramatic findings in child survival has been the discovery of the strong influence breastfeeding has on childhood diseases, especially diarrhoea. As mentioned above, the impact of improved water and sanitation can be obliterated if the child is not breastfed. A study from Brazil by Victora and colleagues³⁶ demonstrated that non-breastfed infants have a 14-fold greater risk of dying from diarrhoea when compared with exclusively breastfed infants. Even with partial breastfeeding, there was a four-fold reduction in risk of death from diarrhoea compared with non-breastfed infants.

The vast majority of mothers in Asia, Africa and Latin America initiate breastfeeding at birth with incidence rates greater than 90 per cent. Moreover, well over 80 per cent of breastfeeding mothers continue to breastfeed during episodes of diarrhoea, thus providing essential fluid and nutrition to the sick child. The fundamental problem related to breastfeeding is clearly the early introduction of water and teas, and to a lesser extent, solids before six months of age. In some areas, the discarding of the colostrum due to cultural reasons is also a reason for concern. Exclusive breastfeeding rates are globally low, and the early introduction of water and teas is associated with increased risk of diarrhoea³⁷, and more importantly, a 42 per cent increase in risk of dying from diarrhoea³⁸. Studies in Peru, Cameroon and Pakistan have all demonstrated that exclusively breastfed infants are able to maintain normal hydration status even in hot, arid climates without requiring additional water or other fluids.

The extent of the importance of breastfeeding has only been acknowledged in the past several years. WHO and UNICEF, as well as many of the bilateral donors, have developed specific programmes to promote lactation practices, with especial emphasis on exclusive breastfeeding. Lactation management training units are being established in Africa and Latin America, and training curricula developed to train physicians and other health workers on how to deal with the problems of breastfeeding. Both international agencies have played leading roles in establishing the Baby Friendly Initiative, which seeks to promote change within health institutions to support lactating mothers. Both have collaborated in developing simple breastfeeding indicators with which to monitor the progress of countries in improving the quality of lactation of children.

Measles immunization

It is unclear whether the changes in mortality and morbidity reported from some countries stem from the impact of improved oral rehydration and case management or from increasing coverage by measles immunization in the region. While measles immunization was not done exclusively in the name of control of diarrhoeal diseases, data from many countries suggest that measles immunization may be a powerful intervention available to prevent mortality from diarrhoea. In Egypt, for example, measles immunization coverage was 86 per cent in 1990, much higher than a decade previously^{22,13}. Thus, much of the change seen in morbidity and mortality figures at that time, may have been due to increases in immunization coverage.

Vitamin A supplementation

A recent study conducted in Sudan has indicated that prospective vitamin A supplementation did not appear to reduce morbidity from diarrhoea, but appears to have reduced the severity of cases who did acquire diarrhoea³⁹. Based on this data, it seems likely that the impact of vitamin A in that population was to reduce severity of illness, not incidence per se. There is emerging information that mild vitamin A deficiency is quite widespread in different global areas. If this is so, programmes aimed at reducing that deficiency of vitamin A may well have an impact on diarrhoeal severity, thus reducing mortality.

Diarrhoeal disease control programme management

Over 126 countries worldwide now have national diarrhoeal disease control programmes. Following a management model proposed by the WHO Global Programme for the Control of Diarrhoeal Diseases, national programmes have organized activities into the four programmatic categories listed in Table 4. The sum of these activities is designed to improve the effectiveness of case management of diarrhoea by caretakers and health workers.

Table 4: Programmatic components

- ORS procurement and distribution
- Information, education and communications
- Training and supervision
- Monitoring and evaluation

Country programmes are frequently evaluated, and the programme CDD reviews include comprehensive reviews, CDD desk reviews and joint Primary Health Care reviews with a CDD component. The WHO CDD programme has summarized the most common review findings and recommendations which apply to developing countries⁴⁰.

Programme planning is generally weak, resulting in unrealistic plans and poorly defined targets which cannot be attained. Insufficient staff and lack of, or delay in funding, often present problems. Despite the tremendous efforts that many countries have put into training and achieving adequate coverage with diarrhoea case management, training continues to be a challenge. It is true that diarrhoea case management at health facilities has improved, and that most children with diarrhoea receive ORS solution. However, there is a great need to improve further case management as ORS solution is often not administered correctly, inappropriate use of drugs is common, advice to the caretakers is often lacking, and knowledge and treatment of dysentery and persistent diarrhoea are frequently poor. The quantity and quality of supervision and monitoring are often unsatisfactory and constitute an area which the CDD programme will emphasize in the next biennium.

One might possibly add to the above list of constraints, lack of continued feeding during diarrhoea, inappropriate distribution and opening hours of health facilities, and lack of coordination with non-government providers including the private sector, NGOs (including religious programmes) and traditional healers.

The fact that the knowledge of ORT among health workers is not adequate is well illustrated by the finding, in Bangladesh, that the knowledge of such workers was less than that of the mothers¹¹.

As national diarrhoeal disease programmes mature, they confront at various stages of development several key management issues which test the managerial skills and flexibility of programme staffs. These include ORS supply procurement and distribution, training coverage, cost allocation and measurement of programme progress.

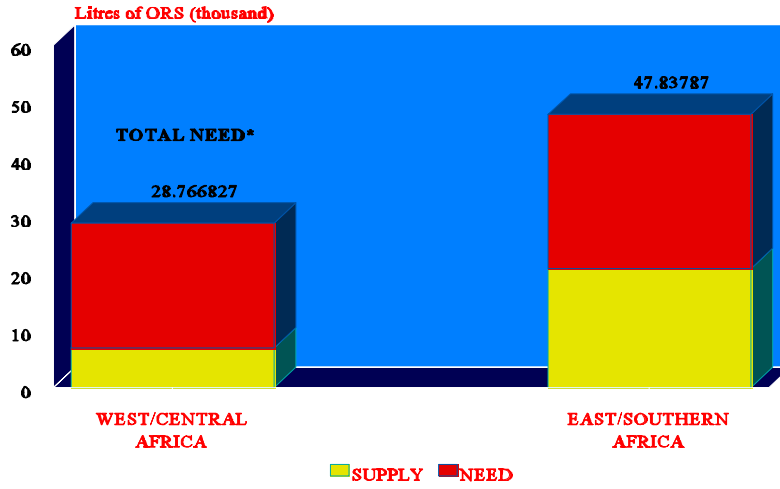
ORS supply procurement and distribution

The foundation of most national diarrhoeal disease control programmes has been the principles of effective case management, which utilizes ORS, and more recently, home fluids given in appropriate volumes for appropriate durations. Without ORS, even the best trained health worker or caretaker cannot provide effective care for children with diarrhoea. This was dramatically demonstrated recently in Niger State, Nigeria, where health workers were trained in ORT and their skill levels assessed using an innovative performance-based test⁴¹. Following training, they were followed up by supervisors to determine how well they were performing in their home facility. It was found that 75 per cent of health facilities had significant shortages or were completely out of stock which resulted in the trained health workers being unable to carry out oral rehydration therapy.

National CDD programmes have been faced with procuring and distributing increasing quantities of ORS. To meet this need, many national programmes have worked with commercial firms or parastatal industries to locally produce ORS. For instance, 12 of 16 countries in the Middle East/North Africa, and 26 countries in sub-Saharan Africa have local production ability. However, the majority of countries with local production capacity are still dependant on the importation of ORS. In fact, support of ORS importation by the major donors including UNICEF, may act as a major disincentive for local production which may, in the long term, prove to be the more cost-effective mechanism for ensuring ORS supply. This is now recognized and the major donors have begun to work with private sector and parastatal firms to begin or improve local production capacity for ORS production.

Whether ORS supplies come from imported or local sources, what occurs in many developing countries is that the supply is not sufficient to meet the demand. In Africa, assuming that 15 per cent of diarrhoea episodes will require ORS (the remainder would be treated with increased fluids, continued feeding and specific home fluids), only 24 per cent of appropriate diarrhoea cases in West/Central Africa and 44 per cent in East/Southern Africa would have ORS available, assuming unrestricted distribution (Figure 2). Another way of looking at the trends in ORS supply is to ask how much ORS is available to the current users of ORS (ie. litres per ORS user). Again using Africa as an example, Figures 3a and b show that with few exceptions, the supply per user has declined over the five year period from 1986 to 1990. This may be due to decreased supply or increased demand or both. Optimally, national programmes would like to ensure a minimum of two litres of ORS per episode, so it is evident that there are alarming shortages of ORS even to cover the 20 per cent of the episodes of diarrhoea which use ORS. Thus, it is not a surprising finding that many caretakers and health workers use insufficient volumes of ORS to hydrate children with diarrhoea.

Figure 2: ORS supply and demand - 1990

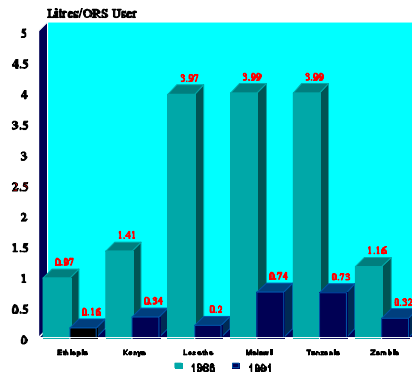
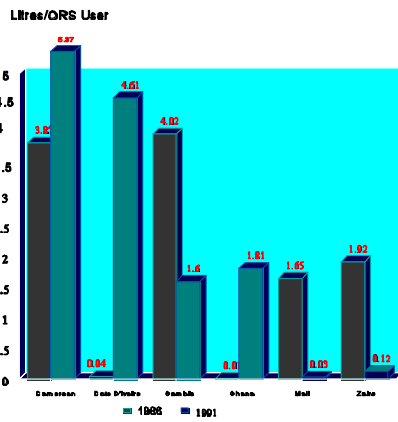


*need estimated at 15% total episodes

Figure 3. ORS supply per ORS user

WEST CENTRAL AFRICA REGION

EAST/SOUTHERN AFRICA REGION



Many countries now recognize that it is not economically or logistically possible to close the supply-demand gap, and have begun to identify fluids commonly used by caretakers which could be recommended for early use in diarrhoea. The best example of the potential for home fluids has been the Bangladesh Rural Advancement Committee (BRAC) project in Matlab, Bangladesh which has taught 14 million mothers how to prepare and administer home mixtures of *lobon gur* which is a sugar and salt solution. They have also undertaken to teach mothers how to prepare a rice and salt solution which has been shown to decrease stool output and diarrhoea duration.

Communication

Communication has been a critical programme component wherever progress has been observed. The development of sound communication strategies; involvement of the community to support families - mothers, fathers and caretakers; adequate media time; mobilization of youth and women on community-based strategies to support the households; have all contributed to increasing ORT use rates and changing behaviour. Unfortunately, most countries do not devote adequate attention and resources to information, education and communication. Communication expertise is often not used; but where it has been - as in Mexico, Morocco, Brazil or Egypt - the positive changes are significant. Case studies of several countries are being written now, which will document communication and social mobilisation activities.

Training Coverage

Training has been the activity of highest priority for most national programmes. The initial strategy was to train key health workers at a specialized training unit, the Diarrhoea Training Unit (DTU), which generally were centralized in the largest cities. As of 1994, global training coverage rates were between 15 per cent to 35 per cent. Several key problems with this strategy have been identified. First, it was not particularly cost-effective to bring small groups of health workers into the city to train them for a week. This was due both to the logistical costs for the training course as well as the administrative costs for maintaining a specialized training unit which functioned mainly during the peak diarrhoea season. Second, selection of participants was found to be problematic. Since training courses are prized activities, the lowest level health worker who might have the greatest need to receive ORT training is often passed over in favour of individuals with higher priority. Third, trained trainers are often not paid for their teaching, and so it has been difficult to maintain an active pool of trainers who are concurrently involved in earning an income to support their families.

To address these issues, several strategies have been developed. To overcome the issue of travel and cost, WHO has developed training curricula for small hospitals which would allow short courses which are practice-oriented. Many countries also now focus on decentralized training using this and other similar curricula as the foundations of their training strategy. It reduces costs and allows for learning in a more realistic environment. For instance, in Kenya, which does not have a national DTU, over 3,000 health workers have been trained at district-level courses.

Finally, even administering district courses can have economic and logistical barriers. To address this constraint, WHO has also developed a distance learning course in which the individual health worker teaches himself with the aid of materials and feedback provided by the national programme.

A last concern for programme managers who coordinate training, is the availability of diarrhoea cases for course participants to learn hands-on oral rehydration therapy. For instance, in the Philippines, one DTU course had only eight cases for 20 participants. It is now recognized that hands-on practice is critical to mastering the fundamentals of oral rehydration therapy. To overcome this, several attempts have been made to develop simulated cases which test and teach the management principles of ORT. In the Philippines, the national programme along with WHO, developed simulated teaching cases which were used at the two national DTUs. Not only did the national programme use these simulations to teach participants, but they also used them to assess performance in the participants' home facilities during a health facility survey.

Another important area is basic technical training. WHO has developed a pre-service curriculum for the management of diarrhoea which can be used in medical and nursing schools. Currently, this curriculum is being used in the Philippines, Indonesia, and Nigeria. This strategy focuses on future doctors and nurses while they are already in a learning situation and moreover, clustered together in classes for extended periods of time. For instance, in the Philippines, medical and nursing students in Manila rotate through the National Rehydration Training and Treatment Unit at San Lazero Hospital as part of their basic education.

Cost allocation

The selection of oral rehydration therapy as a component of selective primary health care was based, in part, upon its demonstrated cost-effectiveness as an intervention. As national programmes expand the scope of their activities, and consider new dimensions to the interventions they promote, cost becomes an important element in planning, monitoring and evaluating programme activities. Clearly, cost is not the only criteria upon which programme managers rely in making decisions about programme interventions and allocation of resources, but it plays an important role in promoting better health as well as better health programmes.

WHO produced and distributed cost guidelines in 1989 to enable national programmes to conduct cost analysis of diarrhoeal disease control activities. To date, cost studies have been done in Latin America (Mexico)⁴² and Africa (Lesotho⁴³, Malawi²¹, Swaziland) (McFarland D. 'Cost of the Expanded Programme on Immunization and the Control of Diarrhoeal Diseases Programme in Swaziland', 1990, unpublished). These studies have been of two types: cost effectiveness studies of ORT units and other levels of health facilities, and cost studies of national programmes. The key findings of these studies for national diarrhoeal disease control programmes are shown in Table 5.

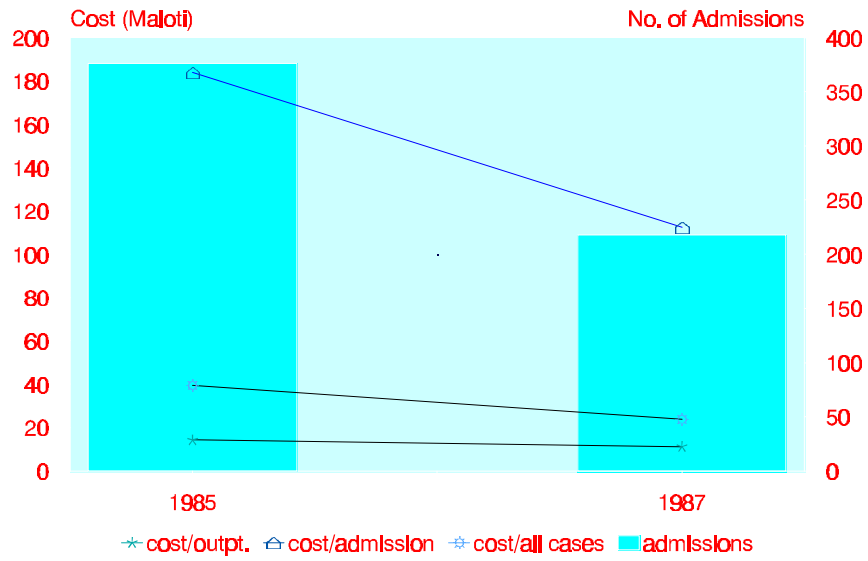
Table 5: Summary of cost studies

1. Establishment of ORT units can reduce costs of:
 - a) diarrhoea treatment
 - b) hospital admissions
 - c) drugs
2. Drugs account for 10-15% of treatment costs
3. Training reduces diarrhoea treatment costs
4. Economies of scale apply both to national programmes and to health facilities

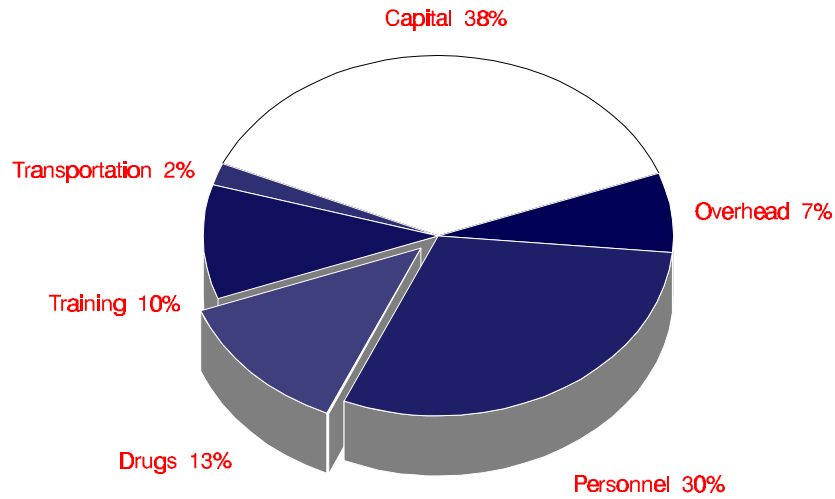
Lesotho, Southern Africa provides a good example of cost assessment and how it can be applied by national diarrhoeal disease control programmes. Figure 4 presents data from a cost-effectiveness study conducted at Queen Elizabeth II Hospital in Maseru. An ORT unit was opened in 1986. Costs were compared for one year prior to and one year after the opening of the unit. Total costs for diarrhoea treatment, both inpatient and outpatient, were reduced by 38 per cent. The overall proportionate cost to the hospital for diarrhoea treatment was reduced by 43 per cent from 1.31 per cent to 0.57 per cent. Cost per patient declined by 34 per cent, the admission rate for diarrhoea declined, drug costs per patient were reduced and length of hospitalization for uncomplicated cases decreased from 5.7 to 3.4 days per patient.

Figure 5 presents a unit cost study conducted at 20 health facilities throughout rural Lesotho. The unit cost per child treated ranged from US\$1.00 to US\$8.90 with an average of US\$4.50. Drug costs per child per episode ranged from US\$.06 to US\$1.50. Overall, drugs accounted for 13 per cent of treatment costs. Two associations were noted in this study. First, lower unit costs were associated with longer periods of training; second, lower unit costs were associated with greater facility access. This led to the recommendation that the CDD programme focus on training health staff from remote facilities to reduce costs.

**Figure 4. Cost study
Queen Elizabeth II Hospital - Lesotho**



**Figure 5: Diarrhoea treatment cost profile
Lesotho - 1990**



Measurement of Progress

The majority of national diarrhoeal disease control programmes worldwide have defined morbidity and mortality reduction targets as well as sub-targets in training, communications, case management and programme logistics. In order to track the changes in these targets over time, the WHO Global Programme for the Control of Diarrhoeal Diseases has promoted the use of 16 programme indicators (see appendix 2) which monitor training coverage, and case management in health facilities and in the home. With the exception of training coverage which is an administrative estimate, the other programme indicators are collected from surveys of households or health facilities.

Information collected through these surveys were intended to assist the monitoring of programme interventions, and to facilitate replanning of strategies. It is now recognized, however, that much information collected through periodic surveys are not integrated into the programme planning process. There are some exceptions. For instance, the national programme in Kenya formally reviewed the findings of the 1990 household survey of case management practices, and used some of the key findings to reorient their communications strategy to improve identified deficiencies in home case management, which included inadequate volumes of fluid given and overuse of inappropriate drugs (Endsley S. 'The Challenge of Diarrhoeal Disease Control in Kenya', 1993, unpublished).

Following the World Summit for Children in 1990, WHO and UNICEF convened a meeting in New York to look ahead to diarrhoea disease control in the 1990s. Subsequently, several meetings were held to narrow down the list of indicators. A minimal set of seven programme indicators to jointly monitor programme progress towards targets in the years 1995 and 2000 are listed below. As with the WHO 16 indicators, these all require periodic surveys of households and health facilities.

- **ORS and/or recommended home fluids use (previously referred to as use of ORT)**
- **increased fluid with continued feeding**
- **access to ORS**
- **Caretaker knowledge of three rules of home case management (fluids, feeding, further care)**
- **Diarrhoea cases correctly managed at health facilities (correct assessment, advice and treatment)**
- **Health facility case management capability for diarrhoea (trained health worker and regular supply of ORS)**
- **ORS use among those who sought care outside the home (provider compliance with ORS use)**

Even with the reduction of programme indicators from 16 to seven, there remain questions concerning measurement and interpretation of key indicators. It is difficult to measure ORT use. An important issue is that of ORS use. As noted previously, several studies and surveys have found that caretakers use ORS more frequently if they perceive the diarrhoea episode as being serious. Consideration is being given to how best to measure ORS use according to perceived severity. Given that it is the most severe cases that need ORS the most, ORS use rates in severe cases might be a more meaningful indicator of programme progress for ORS use. Other important issues in ORS use are how best to define 'use'. There are several categories of 'use' including ever-use, use in current/last episode, continuous use, and intent-to-use (future use). Current surveys collect information on current/last episode use. Moreover, ORS use rates do not necessarily indicate effective use. From the national programme's perspective, planning could be more targeted and realistic if the distribution of regular and effective users of ORS were known.

Another important concern of national programmes is how competent are the health workers it trains, both following the training and on return to their home facilities. Moreover, it is important to assess the adequacy of the training course itself. WHO has field-tested in the Philippines two new innovative methods of evaluation. The first, is a structured evaluation of DTU training courses using standardized observation. The second, is a method of measuring skills attainment using case simulations. This latter method was applied in the Philippines⁴⁴, not only to measure the competency of the participants of DTU courses, but also to assess their skill retention six months after training. Finally, the post-training health facility survey incorporating case simulations also collected information on 'support' factors for case management including availability of essential materials (ORS, cups and spoons), supervision, continuing education and in-house training, patient load, and case mix.

With the proliferation of information collection methods, up until recently, there has been a lag in systematic guidance on the use of information for planning. Since 1983, WHO with UNICEF's support and participation, has assisted national CDD programmes plan and execute 'comprehensive programme reviews'. This method entailed large teams of external experts and national programme staff performing extensive document review, field visits, and key informant interviews. These reviews generated a great number of recommendations, which often were not integrated into subsequent plans of action.

Recognizing that this process possessed several important limitations including cost, dependance on external experts (hence not sustainable), and ultimate utility (recommendations remained unimplemented), WHO developed a refined methodology called the Focussed Programme Review (FPR). FPRs provide guidance on using existing data to identify priority constraints which would be explored in greater depth (hence a 'focussed' review). Several Focussed Programme Reviews have been done globally in Asia, the Middle East, Africa and Latin America (16 as of end 1994) . The experience with this method has revealed that four areas of programme activity are of critical importance to national staff including training, supervision, communications and education, and programme management. These four areas constituted 75 per cent of the priority constraints identified in the 16 reviews. The output of these reviews are intended to be specific plans of action

with budgets, task responsibilities and timelines agreed upon. It clearly has demonstrated that national programme staff can rationally examine the progress and problems in their own programmes in a critical manner.

UNICEF has recently developed the Multiple Indicator Cluster Survey which gives important information on use of oral rehydration therapy, continued feeding and increased fluids. This is a very useful instrument. Recent and reliable estimates on oral rehydration therapy are otherwise not currently available for most countries.

Research

The benefits of research in guiding CDD programmes and solving problems are clear from the reports of all studied areas. Small surveys have been critical to identifying problems, and studies of epidemiology, etiology, the behaviours of caretakers and practitioners in response to diarrhoea, alternative methods of training and education, have all played a role in improving the effectiveness of CDD activities.

An important aspect related to research is the quality of measurement and the assessed indicators. Data generated from the regions has largely been confined to standard WHO measures, although some individual studies have used experimental indicators consistent with the topics of the research. Standard indicators have proven useful in comparisons across countries, but the current low utilization of ORS/ORT despite intensive programmes, suggests that additional indicators are necessary. The gap between widespread awareness and knowledge of ORT and its actual use suggests that there is information that the current indicators do not adequately represent. Using indicators which will differentiate use of ORS and ORT according to severity of diarrhoea, measure changes in the numbers of patients requiring admission for severe dehydration, assess training activities and coverage, and in particular, measure private sector behaviours, will be critical in achieving programme targets.

A candidate for an indicator which would represent case management by any practitioner as well as home case management, would be to ascertain at the time of measles immunization (a peak age for diarrhoea incidence) from the children coming for such immunization, who had had diarrhoea during the preceding two weeks. The portion of those children having received ORS/ORT for that diarrhoea episode could then be determined. The related CDD programme target would be that 'all' (80 per cent) of those who had consulted a practitioner for that diarrhoea episode, should have received ORS/ORT.

New methods in measurement, such as Lot Quality Assurance Sampling (LQAS), and the use of sentinel systems, should be explored as well, to provide objective data for programme decision-making in a more feasible and cost-effective manner.

Conclusions

Diarrhoea morbidity and mortality

Diarrhoeal diseases remain one of the leading killers of children under five years of age around the world. The young child experiences on average, two to four episodes of diarrhoea per year, spending five per cent to 10 per cent of his/her childhood fighting diarrhoea. The global efforts for control of diarrhoeal diseases spearheaded by the World Health Organization and UNICEF, have emphasized effective case management of the diarrhoeal episode, through education and training of health providers and caretakers, including through information and education of families, in order to prevent deaths due to dehydration. Though the evidence is scarce, mortality associated with diarrhoea seems to be declining, often dramatically. In some countries, diarrhoea-associated mortality is declining at a faster rate than overall infant and childhood mortality.

Several trends in diarrhoea morbidity and mortality have been noted. First, diarrhoea prevalence does not seem to be decreasing. Second, epidemics of cholera and dysentery are increasingly becoming important elements of the overall diarrhoea picture. Third, efforts must continue to achieve and sustain high use of oral rehydration therapy to deal with dehydration most commonly associated with acute watery diarrhoea. Fourth, persistent diarrhoea (diarrhoeas lasting two weeks or longer) are now recognized as important contributors to diarrhoea morbidity and mortality, accounting for 3-20 per cent of diarrhoea episodes, and 30-50 per cent of diarrhoea deaths, and requiring greater emphasis on nutrition rehabilitation. Fifth, oral rehydration therapy (ORT) has been demonstrated to reduce both hospital and community mortality associated with diarrhoea by as much as 50-75 per cent.

Diarrhoea case management

Effective case management at home and health facilities has been the foundation of the 126 national diarrhoeal disease control programmes now functionally globally. This means the correct preparation and administration in adequate volumes of oral rehydration salt solutions or other rehydrating solutions. In the community, ORS use has increased, often doubling or tripling, since the inception of the global programme for control of diarrhoeal diseases in 1980. However, evidence shows these use levels tapering off, and hovering in the 20 per cent range for the past several years. Studies have shown that adoption of ORS as a routine measure by caretakers is a slow process. Frequently, the pattern is trial of ORS with gradual increase in proportion of household episodes treated with ORS. It is also clear now that caretakers are more likely to use ORS if they perceive the episode to be severe. It is therefore, important to re-evaluate the goals of high use of ORS in diarrhoea, since most episodes are mild and not perceived by caretakers as in need of receiving ORS. Also, national programmes have identified common fluids used by caretakers which might be adequate home rehydrating solutions. When these fluids are factored into the use rates of rehydrating fluids given to children, ORT use has climbed into the 70-80 per cent range.

Key issues identified in home case management of diarrhoea are the proper mixing and

administration of ORS or home fluids. The majority of caretakers are still unable to correctly mix ORS and administer adequate volumes to replace fluids lost due to diarrhoea. The most common error in preparation is the addition of too little water, making the ORS solution dangerously high in sodium. In at least one country, the incidence of hyponatremia is increasing since the inception of the national diarrhoeal disease control programme. In addition, home available fluids are not used as soon as diarrhoea starts; timely referral for severe cases of diarrhoea remains an issue.

Prevention of diarrhoea

Efforts have been made to prevent diarrhoea through different programmes. Programmes in water and sanitation, and in breastfeeding, have been clearly shown to make a difference in reducing diarrhoea morbidity and mortality. Improved water systems, which improve the quality and especially the quantity of water, have been shown on the local level in Asia, Africa and Latin America, to reduce diarrhoea incidence and mortality. The impact of sanitation projects is less clear, being clouded by the effect of attendant behaviours on diarrhoea frequency such as domestic and personal hygiene practices. It seems that combinations of improved water and improved sanitation coupled with attention to adequate hygiene holds the greatest prospect for reducing diarrhoeal disease morbidity and mortality.

The impact of breastfeeding on diarrhoeal disease has been one of the most dramatic. Clear evidence now exists which shows that a non-breastfed infant has 14 times greater risk of dying from diarrhoea than an exclusively-breastfed infant. Though the vast majority of mothers in the developing world initiate breastfeeding, more than 90 per cent introduce water and teas to the infant before six months of age. These supplemental fluids are both unnecessary and potentially dangerous, being associated with greater incidence of diarrhoea and higher risk of death from diarrhoea.

National CDD programmes

National programmes have expended great amounts of resources in training health workers in effective case management. Performance, however, remains less than optimal with the majority of health workers still not correctly assessing the child's hydration status nor treating the child appropriately. In addition, use of inappropriate antibiotics and antidiarrhoeals still exceeds the use of ORS by health workers.

Another identified weakness in case management performance has been the counselling of caretakers on correct ORT. Health workers are not only the main source of information on ORT for caretakers, but also for other providers, including community health workers, and pharmacists and drug sellers. So this is truly a missed opportunity to disseminate information on ORT.

Training has been shown to improve health worker performance when there is continuous support

of their ORT activities, such as for staff of hospitals with active diarrhoea training units (DTUs). However, health workers returning to peripheral health facilities are in environments which have less support. In many of these peripheral settings, it has been difficult to demonstrate an increased effect of training on performance compared to no training. Supply of essential materials, including ORS and utensils for administration, and regular, interactive supervision, are now recognized as being crucial elements in performance.

Communication has been a critical programme component wherever progress was achieved in increasing ORT use rates and changing behaviour, as in Mexico, Morocco, Brazil or Egypt. However, most countries tend not to give adequate attention and resources to information, education and communication. This is therefore, an area that deserves focussed and systematic effort, particularly in mobilizing community action.

The private sector including physicians practising in the private sector, traditional healers, commercial firms producing ORS, private voluntary organizations, and pharmacists and drug sellers, all have had varying degrees of involvement in national diarrhoeal disease control efforts. Traditional healers, often outnumbering biomedical providers 100 to one, are an enormous potential resource for extending the reach of ORT services. Local commercial producers of ORS have the potential to contribute significantly to ensuring national ORS supplies.

Since 1980, 126 national programmes for the control of diarrhoeal diseases have been established, which emphasize effective case management promoted through extensive training and communication efforts. As these programmes have matured, they have confronted several key management issues including: ensuring ORS supply in the face of increasing demand; providing training for peripheral health workers and maintaining their skill levels over time; making the most of scarce financial resources by identifying the most cost-effective interventions; and measuring the progress of the programme over time.

Shortages of ORS are becoming more acute in many countries. National programmes have enlisted local commercial firms to produce ORS. Future needs include targeting of ORS to those in greatest need. Reaching peripheral health workers has been improved through the development of district case management courses and distance learning strategies. ORT units have been shown to be highly cost-effective in terms of lowering hospital costs for diarrhoea treatment. More rational use of drugs in diarrhoea offer a further means of substantially reducing treatment costs.

The efforts to achieve the mid-decade goal on ORT will accelerate mortality reduction. The successful experiences will be documented. The challenge will be to achieve universal ORT use, continued feeding and to provide appropriate care for every child who suffers from diarrhoea.

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Appendix 1

Regional reviews

EAST ASIA

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Appendix 2

Definitions of CDD and ARI programme indicators

The following is a list of suggested indicators that countries may wish to use to monitor CDD and ARI implementation. Data are available from countries only for a limited number of these indicators

CDD programme indicators

1. ORT (increased fluid intake) plus continued feeding

Proportion of all diarrhoea cases in children less than 5 years receiving increased amounts of fluid and continued feeding.

2. Access to ORS

Proportion of population less than 5 years with a regular supply of ORS available in their community.

Definitions:

Regular - presence of ORS in stock at the time of evaluation, and reports that sufficient stock has been available all or most of the time in the past three months to meet the needs of the population.

Community - for evaluation of this indicator, the household survey cluster will be considered as the community. For monitoring, communities will be defined as the natural geographic groups recognized within an area. This may be a village, an urban ward, or a quarter. If no natural communities exist, a formula based on time and distance may be defined at the national level.

3. Caretaker knowledge of the three rules of home case management

Proportion of mothers or other caretakers who know the three rules of home case management. The three rules are (1) to give increased amounts of fluid; (2) to continue feeding; and (3) to seek treatment outside the home for a child with diarrhoea when appropriate.

4. Cases correctly managed at health facilities

Proportion of diarrhoea cases among children less than 5 years seen at health facilities who receive standard case management. Standard case management includes correct assessment and advice to the caretakers for children who are not dehydrated (Plan A), and correct assessment and treatment for children who are dehydrated (Plans B and C).

5. Health facility case management capability for diarrhoea

The proportion of facilities with at least one health worker trained in standard case management (where training includes practice) and with a regular supply of ORS.

Definition:

Regular - the presence of ORS in stock on the day of the survey visit, and facility reports that sufficient stock has been available all or most of the time in the past three months to meet the needs of facility patients.

6. *ORS and/or RHF use (pre-1991 definition of ORT)*

The proportion of all cases of diarrhoea in children less than 5 years who received ORS and/or recommended home fluids.

7. *ORS use among those who sought care outside the home*

The proportion of all cases of diarrhoea in children less than 5 years who seek care outside the home who received ORS.

8. *ORT use (increased fluid intake)*

Proportion of all cases of diarrhoea in children less than 5 years who actually consumed more fluid (e.g. ORS, food-based drinks, other recommended fluids, water) during their diarrhoea than they usually consume.

9. *Continued feeding*

Proportion of all cases of diarrhoea in children less than 5 years who actually consumed about the same amount, or more food during their diarrhoea than they usually consume.

10. *Cases correctly assessed*

Proportion of diarrhoea cases among children less than 5 years treated at health facilities who are correctly assessed.

11. *Cases correctly rehydrated*

Proportion of children less than 5 years with some or severe dehydration treated at health facilities who are correctly rehydrated (orally or intravenously).

12. *Cases whose caretakers were correctly advised on home case management*

Proportion of diarrhoea cases among children less than 5 years treated at health facilities whose mothers (or other caretakers) are correctly advised on home case management (increased fluids, continued feeding, and careseeking).

13. Dysentery cases given appropriate antibiotics

Proportion of dysentery cases among children less than 5 years treated at health facilities who are given appropriate antibiotics.

14. Training coverage rates

Health workers trained in case management

Proportion of facility health workers with responsibility for treating diarrhoea cases who have been trained in standard diarrhoea case management (training must include practice).

Other providers trained in case management

Proportion of other providers (to be defined in each country) trained in case management.

Supervisory staff trained

- a. Proportion of current health staff with supervisory responsibilities who have been trained in supervisory skills.
- b. Proportion of current health staff with supervisory responsibilities who have been trained in case management.

15. Health facilities with trained health staff

Proportion of health facilities with at least one health worker trained in standard case management (training must include practice).

16. Exclusive breast-feeding in children less than 4 months old

Proportion of children less than 4 months who are exclusively breast-fed.

ARI programme indicators

1. Health facilities with trained health staff

Proportion of health facilities with at least one health worker trained in standard ARI case management (training must include practice on cases).

2. Antibiotic availability in health facilities

Proportion of health facilities with a regular supply of the antibiotic(s) recommended for home treatment of pneumonia in stock.

3. Health facility case management capability for ARI

Proportion of facilities with at least one health worker trained in standard case management (where training includes practice) and with a regular supply of the antibiotics) recommended for the home treatment of pneumonia in stock.

4. Severe cases correctly treated

Proportion of children with very severe disease or severe pneumonia seen in a health facility who are correctly referred or admitted to hospital by the health worker.

5. Pneumonia cases correctly treated with an antibiotic at home

Proportion of children with pneumonia seen in a health facility who are given an appropriate antibiotic by the health worker.

6. Cases whose mothers were correctly advised on home care

Proportion of children with ARI seen at health facilities and not referred or admitted to the hospital by the health worker whose caretaker receives appropriate home care advice

7. ARI cases correctly managed

Proportion of children classified with very severe diseases, severe pneumonia, pneumonia, and no pneumonia (cough or cold) who are correctly managed by the health worker.

8. Careseeking for ARI needing assessment (ANA) outside the home

The proportion of ANAs for whom care was sought outside the home. ANAs are defined as cases with cough who have rapid or difficult breathing.

9. *Care seeking for ARI needing assessment from appropriate providers*

The proportion of ANAs for whom care was sought from providers who have been trained in standard ARI case management and supplied with appropriate antibiotics, or other providers expected to deliver good case management.

10. *Caretaker knowledge of when to seek care for ARI*

The proportion of caretakers who know when to seek care from a health worker for a child with cough. In order to be counted as having correct knowledge caretakers must mention at least one of the following signs: fast breathing, difficult breathing, or a local term concordant with fast or difficult breathing or pneumonia.