

# Diarrhoea case management in low- and middle-income countries — an unfinished agenda

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**Objective** To ascertain whether diarrhoea management improved during 1986–2003, a period when significant efforts were made to promote effective case management in children.

**Methods** We analysed household data from 107 Demographic and Health Surveys in 40 low- and middle-income countries from 1986 to 2003 and assessed trends in indicators of rehydration, fluid quantity and food intake in children with diarrhoea. A statistical analysis was made of the overall trend for each indicator.

**Findings** Modest progress was made with regard to the use of oral rehydration therapy (ORT) (0.39% per year) and increased fluid intake (1.02% per year), and use rates remained low in 2003, when compared with desired full coverage. Although use rates improved in the majority of countries, no progress was made in several countries. We estimate that, annually, 307 million children in low- and middle-income countries did not receive ORT, 356 million did not get increased amounts of fluids, and at the beginning of the 21st century, 227 million children got neither ORT nor increased amounts of fluids.

**Conclusion** The finding that many children in low- and middle-income countries do not receive proper treatment for diarrhoea points to the urgency in addressing this unfinished agenda in child survival. The effectiveness of diarrhoea control needs to be improved after critical review of established approaches and activities to reach caregivers of children at risk of dying from diarrhoeal diseases. Significant efforts must be made to scale up activities to improve case management and reduce childhood deaths from diarrhoea.

Bulletin of the World Health Organization 2007;85:42–48.

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يمكن الاطلاع على الملخص بالعربية في صفحة 48.

## Background

At the beginning of the 1980s, the number of child deaths caused by diarrhoea was estimated at 4.6 million every year.<sup>1</sup> In recognition of this significant burden of illness, the World Health Organization (WHO) initiated a special programme for Control of Diarrhoeal Diseases (CDD) in children in 1980. The programme set reduction of mortality caused by diarrhoea in children as an immediate objective, and a decrease in morbidity caused by diarrhoea as a longer-term objective.<sup>2</sup> The primary intervention chosen to reduce diarrhoeal mortality was promotion of oral rehydration therapy (ORT) with a solution containing glucose, sodium, potassium and a chemical base such as sodium bicarbonate. It was estimated that about two-thirds of all deaths caused by diarrhoea in children were attributable to acute watery diarrhoea and hence could be prevented with ORT.<sup>3–5</sup> Global guidelines for diarrhoea management and programme implementation were developed

by WHO, in close collaboration with other international organizations, such as the United Nations Children's Fund (UNICEF).

To increase the use of ORT became of the highest priority in diarrhoeal disease control efforts. The fluid given could be either oral rehydration salts (ORS) — a pre-packaged powder to be dissolved in a given quantity of water — or any fluid recommended by national CDD programmes for prevention or treatment of dehydration. Such fluids were labelled 'recommended home fluids' (RHF). Together, the two formed the basis for ORT. The CDD programme recommended that, ideally, rehydration therapy should be given to all children with diarrhoea to prevent or treat dehydration. Furthermore, it was advised that all children with diarrhoea should be given more to drink than usual, to compensate for losses of fluid through loose stools, and that feeding should not be stopped during diarrhoea.<sup>6</sup>

Most national programmes for the control of diarrhoeal diseases were

established between 1980 and 1990; by 1988, more than 100 countries had such programmes in place.<sup>7</sup> A very active promotion of ORT took place during those years globally, through WHO, and nationally through ministries of health with support from UNICEF and WHO. The global use of production of ORS was estimated to increase from 51 million packets in 1979–1980 to 800 million in 1991–92.<sup>8</sup> Significant investments were made in training of health workers<sup>9,10</sup> and revision of medical curriculae<sup>11</sup> within the framework of CDD and later the programme for Integrated Management of Childhood Illness (IMCI).<sup>12</sup>

In 1991, WHO and UNICEF agreed to develop a joint strategy for the control of diarrhoeal diseases in children, which included a coordinated approach to monitoring and evaluation. Eight targets were set, including a target to increase the proportion of diarrhoea cases receiving increased fluids and continued feeding from 20% in 1992 to 80% by the year 2000.<sup>10</sup>

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Ref. No. 06-030866

(Submitted: 13 February 2006 – Final revised version received: 16 June 2006 – Accepted: 12 September 2006)

In spite of the efforts made to reduce mortality caused by diarrhoea, a recent review of global childhood mortality concluded that diarrhoea is still a significant cause of death in childhood.<sup>13</sup> About 22% (2.4 million) of 10.8 million deaths in children aged less than 5 years were estimated to be caused by diarrhoea. Evidently, diarrhoea continues to pose a serious threat to children in low- and middle-income countries. It therefore is important to assess to what extent efforts to control mortality caused by diarrhoea have been successful. The overall purpose of this study is to contribute to this assessment. Our specific aim was to explore to what extent diarrhoea management improved during a period in which significant efforts were made to communicate messages, to the public and to health workers, on the proper management of diarrhoea and dehydration.

## Methods

In this study we analysed data on diarrhoea management from Demographic and Health Surveys (DHS) in low- and middle-income countries in which more than one survey had been conducted from 1986 to 2003 and for which data were available in October 2005.<sup>14</sup> DHS are nationally representative cluster-based household surveys with large sample sizes ranging from 5000 to 30 000 households. In households, women aged 15–49 years are interviewed on reproductive health, child health and nutrition. Within a country, DHS are ideally conducted every 5 years. Use of a standardized core questionnaire in DHS allows for comparisons across countries and time.

In the DHS, mothers are asked about any episode of diarrhoea in their children in the last 2 weeks. In this study, information on four indicators was sought from each of the surveys:

1. The percentage of children who had been given ORT, meaning either ORS or RHF or both;
2. The percentage of children who had been given increased quantities of fluids compared with their regular intake;
3. The percentage of children who had not been given ORT or increased quantities of fluids;
4. The percentage of children who had been given continued feeding during the diarrhoea episode. Continued

feeding is defined as giving the child the same or increased quantities of foods during the diarrhoea episode as before the diarrhoea started.

Indicators 1, 2 and 4 measure management of fluids and feeding during diarrhoea while indicator 3 measures the proportion of children at highest risk of developing dehydration, owing to absence of correct fluid management. For this indicator, a high value is a negative sign, since it means that a large proportion of children have not been given any rehydration therapy during their episode of diarrhoea.

Country trends for each of the indicators were assessed for all countries in which more than one survey had been conducted during the study period. There were 40 such countries, and a total of 107 surveys. The overall trend for each variable was estimated using random coefficient regression with identity link. It was found that a linear model with a country-specific random intercept but a common slope fitted the data appropriately. No weightings were used.<sup>15</sup>

In a separate analysis, an annual use rate for all countries in which DHS had been conducted in that particular year was estimated. This was done by first estimating the number of children with diarrhoea in a particular year in a country, using diarrhoea prevalence rates found in surveys and population data from the International Data Base of the United States Census Bureau.<sup>16</sup> This number was multiplied by the country-specific indicator value for a particular treatment. The total number of children in the countries surveyed given this treatment was then calculated by finding the sum of all the children that had been given the treatment. This number was divided by the total number of children with diarrhoea to get a use rate for the whole population surveyed.

## Results

### Percentage of children given ORT (either ORS and/or RHF)

Data on the indicator 'proportion of children given ORT' were available from 40 countries. The overall trend over time was estimated as an annual increase of 0.39% ( $P=0.089$ ). This suggests a positive, but weak association between time and use rate. Twenty-three (58%) of the countries showed a positive development of the indicator. In seventeen

countries (43%) the increase was larger than the average trend. The trend line is shown in Fig. 1.

### Percentage of children given increased fluids

Data on the indicator 'increased fluids' from more than one survey were available from 38 countries. The overall trend over time was estimated to an annual increase of 1.02% ( $P<0.01$ ) (Fig. 2). Twenty-six (68%) of the countries showed a positive development of the indicator. In twenty countries (53%), the increase was larger than the average trend.

Seven out of the eight surveys with the lowest rates (<10%) for increased fluid intake were carried out before 1994.

### Percentage of children given no ORT or increased fluids

Sequential data on the indicator 'percentage of children given no ORT or increased fluids' were available from 37 countries. The overall trend over time was estimated to an annual decrease of 0.64% ( $P=0.041$ ) (Fig. 3). Twenty-one (57%) of the countries showed a reduction in the indicator with time and 16 (43%) showed an increase. In eighteen countries (49%), the reduction in the indicator was faster than the average trend.

### Percentage of children given continued feeding

Questions on amounts of food given to the child during diarrhoea were included in 38 of the surveys. After the year 2000, only two countries collected data on this indicator in their surveys. Eight surveys carried out in 1986–1988 suggested that 100% of children with diarrhoea were being given 'continued feeding'. As these results were not duplicated in any later survey, a plausible interpretation is that they do not accurately reflect actual feeding practices. There may have been technical problems with the way in which the questions on feeding were phrased or interpreted by the caregivers in these surveys. After the countries that had 100% continued feeding were excluded, only 14 countries provided data that allowed comparisons between surveys to be made.

The overall trend over time was estimated as an annual decrease of 0.58% ( $P=0.42$ ) (Fig. 4). Five countries (38%) showed a positive trend in the development of the indicator, while in nine

countries (62%) the trend was negative. In seven countries (54%), the indicator either showed a greater positive development with time or decreased less rapidly than the average trend.

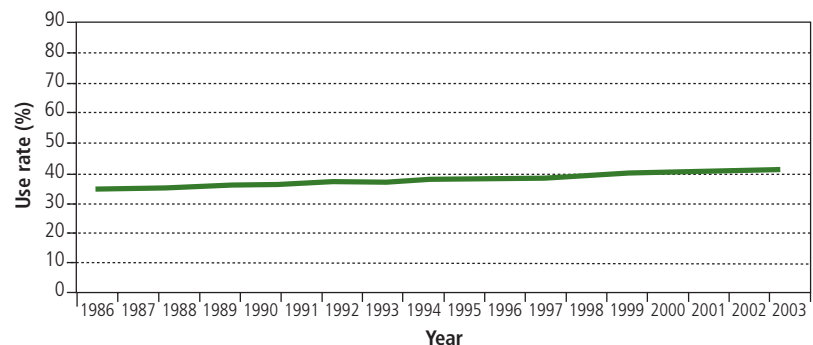
### All indicators taken together

Fourteen countries had trend data for all four indicators. Only one country (7%) showed positive trends for all indicators. Out of the 37 countries that had data on trends for at least three indicators, 17 (47%) showed positive developments for three indicators or more.

### Regional and country observations

When looking at regional trends, it should be noted that there are few observations in WHO regions with few Member States. Inter-regional comparisons should therefore be interpreted with great caution. The same would apply to specific countries in which the number of surveys over the study period varies from two to four. Some observations generated by the regional and country analysis are still worthy of mention. The proportion of countries with a positive development for ORT use was highest in sub-Saharan Africa (the WHO African Region) (57%). With regard to increased intake of fluids, both sub-Saharan Africa and the WHO Region of the Americas had more countries with positive than negative development. When looking at individual countries in the WHO South-East Asia Region, it was notable that Bangladesh had a positive development for ORT, while the trend for this indicator was negative for India.

Fig. 1. Estimated mean trend in oral rehydration therapy use rates<sup>a</sup> as documented in 107 surveys<sup>b</sup> in 40 low- and middle-income countries, 1986–2003



<sup>a</sup> The oral rehydration therapy use rate is defined as the percentage of children with diarrhoea in the last 2 weeks that had received oral rehydration salts and/or a 'recommended home fluid' during the diarrhoea episode.

<sup>b</sup> Demographic and Health Survey.

### Data for the total population surveyed

Results for the total child population surveyed in 1986–2003 are given in Table 1. Data on diarrhoea management had been collected in a total of 133 surveys. The total population aged less than 5 years was nearly 804 million in the countries surveyed.

The overall use rates in children studied during 1986–2003 are less than 50% for all four indicators. This means that less than half of children studied during the period were adequately managed with regard to each of the treatments studied.

When the earlier discussed surveys with 100% rates for the 'continued feeding' indicator are excluded, the overall rate for continued feeding is 38% for this indicator.

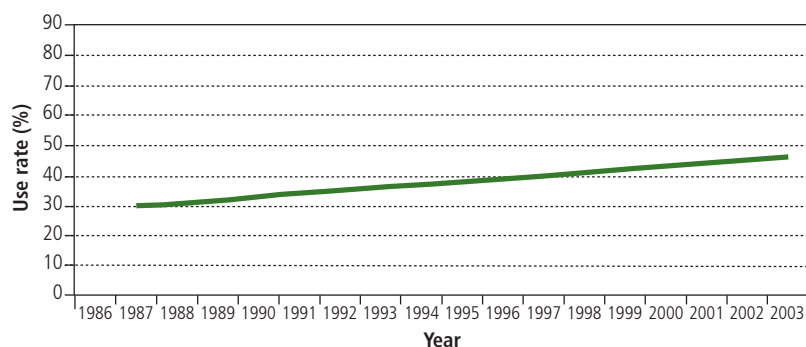
Results from 38 DHS conducted during 1999–2003 showed that the overall ORT use rate in the surveyed child population for that period was 40%, the 'increased fluid' rate was 34% and the 'no fluid' rate was 44%. If these numbers are representative of low- and middle-income countries,<sup>16</sup> then 307 million children aged under 5 years did not get ORT, 356 million did not get increased amounts of fluids and 227 million children with diarrhoea got neither ORT nor increased fluids at the beginning of the 21st century.

### Discussion

Using data from DHS, this study did not provide evidence that diarrhoea management in low- and middle-income countries has progressed during 1986–2003 according to targets and intentions. The results suggest that behaviour with regard to administration of rehydration fluids such as ORS and RHF to children with diarrhoea in several countries has improved only slightly. The data also suggest that use of these fluids has become less common in almost as many countries. Overall trends and most recent data from 1999–2003 suggest that use rates have developed much less quickly than expected and that achievements are far below the targets set by WHO and UNICEF at the beginning of the 1990s.

The finding on ORT use is supported by the estimate given by Jones et al. in 2003,<sup>17</sup> who suggested that the mean coverage of ORT in low- and middle-income countries in the year 2000 was

Fig. 2. Estimated mean trend in 'increased fluids'<sup>a</sup> use rates, as documented in 97 surveys<sup>b</sup> in 38 low- and middle-income countries, 1986–2003



<sup>a</sup> Use rate of 'increased fluids' is defined as the percentage of children with diarrhoea in last 2 weeks who received increased amounts of fluids during the diarrhoea episode compared with normal intake.

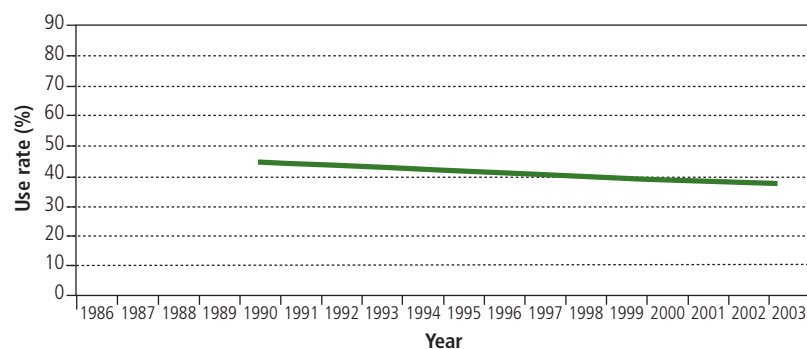
<sup>b</sup> Demographic and Health Survey.

20%, ranging from 4% to 50%, depending on country. However, our findings are challenged by the results of other studies. For instance, a study by Victora et al. in 2000 used all possible sources of information, including DHS, to evaluate global progress of control of diarrhoeal diseases.<sup>18</sup> The study suggested that the annual number of deaths attributable to diarrhoea among children aged less than 5 years fell from an estimated 4.6 million in 1980 to about 1.5 million in the year 2000. The main reason for the decline was considered to be the adoption of ORT.

There are few published studies at country level of the indicators reviewed in this article. Significant progress during the 1980s with regard to impact at country level from ORT has been reported from Brazil,<sup>19</sup> Egypt,<sup>20</sup> Mexico<sup>21</sup> and the Philippines,<sup>18</sup> using different country-specific data sources. The low coverage of ORT in India has in contrast been pointed out as a major problem.<sup>22</sup> When looking at DHS data, trends in ORT use in Egypt and the Philippines during the 1990s have not been quite as positive as in the 1980s. The findings from Brazil were confirmed by DHS surveys from 1986 and 1996.<sup>23</sup>

The conclusions of our study depend on the validity of the data collected through DHS. The core purpose of the DHS programme is to collect data of the best possible quality from households. The programme has spent significant resources on developing the survey instruments used, guidelines for their use and analysis of the data collected.<sup>24</sup>

Fig. 3. Estimated mean trend in 'no oral rehydration therapy or increased fluids' use rates,<sup>a</sup> as documented in 92 surveys<sup>b</sup> in 36 low- and middle-income countries, 1986–2003



<sup>a</sup> 'No oral rehydration therapy or increased fluids' use rates are defined as the percentage of children with diarrhoea in last 2 weeks that had not received oral rehydration salts, 'recommended home fluids' or increased amounts of fluids during the diarrhoea episode compared with normal intake.

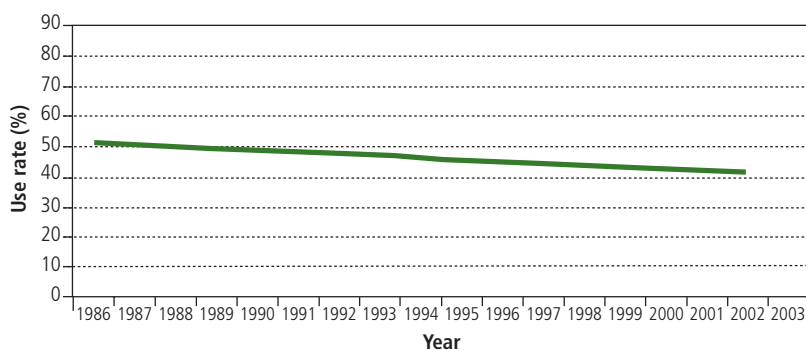
<sup>b</sup> Demographic and Health Survey.

The DHS programme gives high priority to training in survey techniques, including sampling and development of standards for interviewing. Priority in implementation is given to careful selection and training of surveyors and support to these surveyors during field work, through good logistical support and qualified supervision. As part of the programme, special efforts are regularly made to analyse and improve data quality.<sup>25–28</sup> There is no strong reason to believe that the quality of data on diarrhoea case management overall would be inferior to the quality of other information collected through the DHS programme, information that is generally considered to have high validity. Results for the three rehydration indi-

cators in this study are consistent and plausible. The feeding indicator on the contrary appears to have been somewhat problematic, as discussed in the results section. Consequently, surveys with the least plausible data on this indicator were excluded from the analysis.

If our findings are correct, why have changes in case management not been more prominent, given the significant efforts put into improving diarrhoea case management in the past two decades? Why are a possible majority of caregivers in low- and middle-income countries still not adopting recommended principles for home-based management of diarrhoea, despite guidelines for communicating such messages having been long available?<sup>29,30</sup> A possible explanation is that efforts to influence that management have been insufficient or ineffective. The importance of adequate home-based care may not have been emphasized sufficiently such that caregivers give it priority. In resource-scarce settings, caregivers' attention is divided between many obligations that are essential to the survival of the family. Decision-making during illness is complex in poor households.<sup>31</sup> Maintaining rehydration therapy and feeding is not easy with sick children who may be grumpy and restless or lethargic. Such case management can be seen as a round-the-clock task during the most acute phase of the disease. Knowledge on oral rehydration may be adequate, but may not be applied in an environment of competing priorities. This explanation finds some

Fig. 4. Estimated mean trend in 'continued feeding'<sup>a</sup> use rates, as documented in 29 surveys<sup>b</sup> in 14 low- and middle-income countries, 1986–2003



<sup>a</sup> 'Continued feeding' use rates are defined as the percentage of children with diarrhoea in last 2 weeks who had received the same or increased amounts of foods during the diarrhoea episode compared with normal intake.

<sup>b</sup> Demographic and Health Survey.

Table 1. Prevalence of diarrhoea, and use rates for four indicators (ORT,<sup>a</sup> increased fluids,<sup>b</sup> no fluids,<sup>c</sup> and continued feeding<sup>d</sup>) in child populations, as estimated from results of DHS<sup>e</sup> surveys, 1986–2003

Year	No. of surveys	Population aged 0–4 years <sup>f</sup> (millions)	Two-week prevalence <sup>g</sup> (%)	Indicator, use rate (%)			
				ORT	Increased fluids	No fluids	Continued feeding
1986	5	26.6	26	23	–	–	98
1987	8	25.5	27	14	3	–	81
1988	6	95.6	31	19	6	–	98
1989	3	5.9	23	49	36	–	0
1990	5	45.0	21	35	12	48	50
1991	4	27.9	17	49	42	33	55
1992	12	31.5	21	37	29	47	60
1993	6	154.7	13	33	21	56	–
1994	5	28.7	18	43	51	31	52
1995	8	22.9	23	42	46	36	39
1996	10	49.7	16	47	52	31	48
1997	10	45.2	16	41	53	31	43
1998	13	156.6	19	32	32	49	50
1999	7	44.8	14	55	49	26	44
2000	14	40.1	21	30	32	50	38
2001	5	9.5	24	38	38	43	–
2002	4	9.7	13	40	55	31	57
2003	8	70.0	18	39	25	48	–
<b>1986–2003</b>	<b>133</b>	<b>803.8</b>	<b>18</b>	<b>36</b>	<b>31</b>	<b>44</b>	<b>49</b>

<sup>a</sup> ORT = oral rehydration therapy, meaning oral rehydration salts or any fluid recommended by national programmes.

<sup>b</sup> Giving increased quantities of fluids compared with their regular intake.

<sup>c</sup> Not giving ORT or increased quantities of fluid.

<sup>d</sup> Giving the same or increased quantities of foods during the diarrhoea episode as before the diarrhoea started.

<sup>e</sup> DHS = Demographic and Health Survey.

<sup>f</sup> In countries surveyed.

<sup>g</sup> Two-week prevalence = percentage of children that had an episode of diarrhoea in the previous 2 weeks.

support in earlier studies of DHS data in which it has been consistently found that knowledge about ORS is considerably greater than actual use of the fluid. For instance, a review of data from surveys carried out in 1990–1995 showed that, on average, 46% of children were not treated with ORS, although their mothers were aware of this treatment.<sup>W32</sup> It is possible that families need to appreciate that proper management of a child with diarrhoea demands considerable time and attendance and, in particular, that ORT is a low-cost, effective and potentially life-saving measure, which is well worth the effort it requires.

A possible explanation for the absence of a strong improvement in the four case-management variables is that programmatic efforts have been effective in influencing caregivers, but that other, negative factors have had an even greater influence. In a recent review of DHS data from 1996–2002 by Stalling, a negative association was found between seeking care from health services and applying continued feeding during the diarrhoea episode.<sup>W33</sup> It is possible that health

workers were not promoting continued feeding sufficiently. Alternatively, caregivers felt that it was less important to continue feeding as they had been given some treatment for the diarrhoea illness at the health facility. It was also found in the same study that pills, syrups, injections, or intravenous fluids were given to 50% or more of children with diarrhoea in 36 out of 50 DHS conducted round the world in 1996–2002. Evidently, use of such remedies may compete with ORT and feeding.

Another possible reason for the inadequate coverage of proper case management is that programme messages may not have reached all target groups and in particular those with the highest risk of mortality. In Stalling's study on DHS,<sup>W33</sup> it was found that mothers with a higher level of education were more likely to adopt messages on diarrhoea management. Caregivers who were in contact with health services were more likely to use rehydration therapy than those who were not. The mean percentage of children with diarrhoea who were taken to an appropriate health-care

provider and received an oral rehydration solution ranged from 54% to 75%, compared with a range of 20% to 33% among children not taken to a health-care provider.<sup>W33</sup>

It is well known that coverage of public-health messages or activities often reaches a steady-state level after which it is difficult to increase coverage without specifically targeted activities or a significant increase in resources. In the last few years it has thus been proposed that, to increase their effectiveness, child survival programmes must become more targeted towards poor and vulnerable groups.<sup>W34</sup>

In summary, our findings point to an unfinished agenda in diarrhoea case management in the world. Today, more than 200 million children globally may not be receiving ORT when they suffer from diarrhoea. This is a cause of great concern. It calls for serious analysis of the reasons for a situation that is disappointing, given the significant efforts made over the past 25 years to promote proper home-based case management of diarrhoea in children. Adequate manage-

ment of childhood diarrhoea is essential to reach the Millennium Development Goal of a reduction in mortality rates of children aged less than 5 years by two-thirds between 1990 and 2015.<sup>W35</sup>

Activities to improve diarrhoea management and reduce childhood deaths from diarrhoea must be scaled up. Equally important is to critically review approaches and activities designed to reach caregivers of children at risk of

dying from diarrhoeal diseases, to make such approaches more effective.<sup>W36</sup>

Lastly, the role of research and research findings in the policy process needs to be better understood.<sup>W37</sup>

The scientific foundation of ORT is sound, but it is possible that relevant research findings were not forcefully promoted and their importance was not sufficiently realized among policy and decision-makers such that control of

diarrhoeal diseases was given adequate priority in health-sector support and development. ■

#### Acknowledgement

The authors wish to thank Anders Jakobsson and Ziad El Khatib for technical assistance in the preparation of this article.

**Competing interests:** none declared

## Résumé

### Prise en charge des cas de diarrhée dans les pays à revenus faibles ou moyens : les objectifs ne sont pas encore atteints

**Objectif** Déterminer si la prise en charge des cas de diarrhée s'est améliorée sur la période 1986-2003, pendant laquelle des efforts importants ont été consentis pour promouvoir une prise en charge efficace de la diarrhée chez l'enfant.

**Méthodes** Nous avons analysé des données collectées auprès des ménages provenant de 107 Enquêtes démographiques et de santé, réalisées dans 40 pays à revenus faibles ou moyens, entre 1986 et 2003, et évalué les tendances des indicateurs de la réhydratation, de la quantité de liquide et de la prise alimentaire chez les enfants souffrant de diarrhée. Nous avons effectué une analyse statistique de la tendance globale pour chaque indicateur.

**Résultats** Pour ce qui concerne la réhydratation par voie orale et l'augmentation de l'absorption de liquide, les progrès réalisés ont été modestes (0,39 % par an et 1,02 % par an respectivement) et les taux d'utilisation sont restés bas en 2003 par rapport à la couverture totale visée. Si les taux d'utilisation se sont améliorés dans la majorité des pays, aucun progrès n'a été enregistré dans plusieurs autres. D'après nos estimations, sur un an, 307 millions

d'enfants de pays à revenus faibles ou moyens n'ont pas bénéficié de la réhydratation orale et 356 millions d'une augmentation de la quantité de liquide, et globalement, au début du 21<sup>e</sup> siècle, 227 millions d'enfants diarrhéiques n'ont fait l'objet ni d'une réhydratation orale, ni d'une augmentation de la quantité de liquide.

**Conclusion** Le résultat de cette étude, selon lequel un grand nombre d'enfants des pays à revenus faibles ou moyens ne reçoivent pas de traitement anti diarrhéique approprié, souligne l'urgence de poursuivre les efforts en direction des objectifs non atteints en matière de survie des enfants. Il est nécessaire de rendre plus efficace la lutte contre la diarrhée après avoir dressé un bilan critique des démarches et des activités en place pour atteindre les personnes qui s'occupent d'enfants susceptible de mourir d'une maladie diarrhéique. Il faut s'efforcer d'étendre les activités destinées à améliorer la prise en charge des cas et à réduire la mortalité infantile due à la diarrhée.

## Resumen

### Manejo de los casos de diarrea en países de ingresos bajos y medios: un tema pendiente

**Objetivo** Determinar si el tratamiento de la diarrea mejoró durante 1986-2003, periodo durante el cual se hicieron grandes esfuerzos para fomentar un manejo eficaz de los casos en la población infantil.

**Métodos** Analizamos los datos de hogares de 107 encuestas de demografía y salud de 40 países de ingresos bajos y medios entre 1986 a 2003, evaluando las tendencias de los indicadores sobre la rehidratación y las cantidades de líquido y los alimentos ingeridos entre los niños con diarrea. Los datos se sometieron a un análisis estadístico para determinar la tendencia general de cada indicador.

**Resultados** Se registraron progresos moderados en relación con el uso de la terapia de rehidratación oral (TRO) (0,39% anual) y la ingestión de mayores cantidades de líquido (1,02% anual), pero las tasas de utilización se mantenían bajas en 2003, en comparación con la cobertura plena deseada. Aunque las tasas de uso mejoraron en la mayoría de los países, en varios de ellos

no se lograron avances. Estimamos que, cada año, 307 millones de niños de países de ingresos bajos y medios no recibieron TRO y 356 millones no recibieron mayores cantidades de líquido, y que al iniciarse el siglo XXI había 227 millones de niños que no recibieron ni TRO ni mayores cantidades de líquido.

**Conclusión** La observación de que muchos niños de los países de ingresos bajos y medios no reciben tratamiento adecuado para su diarrea muestra la urgente necesidad de abordar este punto pendiente de la agenda de la supervivencia infantil. Es necesario mejorar la eficacia del control de la diarrea, y realizar para ello un examen crítico de las prácticas y las actividades establecidas a fin de concienciar a los cuidadores de los niños que corren el riesgo de morir de enfermedades diarreicas. Habrá que hacer grandes esfuerzos para extender masivamente las actividades de mejora del manejo de los casos y reducir las defunciones infantiles por esa causa.

## ملخص

## معالجة حالات الإسهال في البلدان المنخفضة الدخل والمتوسطة الدخل: برنامج للعمل لم يستكمل

وتشير تقديراتنا على أن 307 ملايين طفل في بلدان الدخل المنخفض والدخل المتوسط لا يحصلون على المعالجة بالإمهاء الفموي (تعويض السوائل عن طريق الفم) في كل عام، وأن 356 مليون طفل لا يحصلون على كميات إضافية من السوائل، وأنه في بداية القرن الحادي والعشرين لم يحصل 227 مليون طفل على المعالجة بالإمهاء الفموي (تعويض السوائل عن طريق الفم) ولا على كميات إضافية من السوائل.

**الاستنتاج:** نظراً لأن العديد من الأطفال في البلدان المنخفضة الدخل والمتوسطة الدخل لا يحصلون على المعالجة السليمة للإسهال، فينبغي الاهتمام بهذا البرنامج غير المستكمل من أجل تعزيز بُقيا الأطفال. وينبغي الاهتمام بتحسين فعالية أنشطة مكافحة الإسهال، وذلك بعد مراجعة دقيقة للأساليب والأنشطة المتبعة للوصول إلى مقدمي الرعاية للأطفال المعرضين لخطر الموت من جراء أمراض الإسهال. كما يتعين القيام بجهود كبيرة للنهوض بالأنشطة الرامية إلى تحسين معالجة الحالات والحد من وفيات الطفولة بسبب الإسهال.

**الهدف:** استهدفت هذه الدراسة التحقق مما إذا كانت معالجة حالات الإسهال قد تحسنت في الفترة 1986 – 2003، وهي الفترة التي شهدت جهوداً كبيرة لتعزيز معالجة الإسهال بين الأطفال.

**الطريقة:** قمنا في إطار هذه الدراسة بتحليل البيانات الأسرية المستمدة من 107 مسوحات ديمغرافية وصحية أجريت في 40 من البلدان المنخفضة الدخل والمتوسط الدخل خلال الفترة من 1986 إلى 2003، وقمنا بتقييم الاتجاهات في مؤشرات الإمهاء (تعويض السوائل)، وكمية السوائل، والمدخول الغذائي لدى الأطفال المصابين بالإسهال. وأجرينا أيضاً تحليلاً إحصائياً للاتجاه العام لكل مؤشر.

**الموجودات:** أحرز تقدم بسيط في الاستفادة من المعالجة بالإمهاء الفموي (تعويض السوائل عن طريق الفم) (0.39% في العام)، وزيادة المدخول من السوائل (1.02% في العام)، ولكن ظلت معدلات الاستفادة منخفضة في عام 2003 بالمقارنة مع هدف التغطية الكاملة المنشود. ورغم تحسن معدلات الاستفادة في معظم البلدان، لم يُحرز أي تقدم في عدد من البلدان.

## References

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