

The global burden of diarrhoeal disease, as estimated from studies published between 1992 and 2000

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Abstract Current estimates of the global burden of disease for diarrhoea are reported and compared with previous estimates made using data collected in 1954–79 and 1980–89. A structured literature review was used to identify studies that characterized morbidity rates by prospective surveillance of stable populations and studies that characterized mortality attributable to diarrhoea through active surveillance. For children under 5 years of age in developing areas and countries, there was a median of 3.2 episodes of diarrhoea per child-year. This indicated little change from previously described incidences. Estimates of mortality revealed that 4.9 children per 1000 per year in these areas and countries died as a result of diarrhoeal illness in the first 5 years of life, a decline from the previous estimates of 13.6 and 5.6 per 1000 per year. The decrease was most pronounced in children aged under 1 year. Despite improving trends in mortality rates, diarrhoea accounted for a median of 21% of all deaths of children aged under 5 years in these areas and countries, being responsible for 2.5 million deaths per year. There has not been a concurrent decrease in morbidity rates attributable to diarrhoea. As population growth is focused in the poorest areas, the total morbidity component of the disease burden is greater than previously.

Keywords Diarrhea/epidemiology; Child; Cost of illness; Developing countries; Longitudinal studies; Meta-analysis (*source: MeSH, NLM*).

Mots clés Diarrhée/épidémiologie; Enfant; Coût maladie; Pays en développement; Etude longitudinale; Méta-analyse (*source: MeSH, INSERM*).

Palabras clave Diarrea/epidemiología; Niño; Costo de la enfermedad; Países en desarrollo; Estudios longitudinales; Meta-análisis (*fuelle: DeCS, BIREME*).

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Voir page 201 le résumé en français. En la página 202 figura un resumen en español.

Introduction

Diarrhoea is one of the principal causes of morbidity and mortality among children in the developing world. In 1982, on the basis of a review of active surveillance data from studies conducted in the 1950s, 1960s and 1970s, it was estimated that 4.6 million children died annually from diarrhoea (1). In 1992, a review of studies conducted in the 1980s suggested that diarrhoeal mortality had declined to approximately 3.3 million annually (2). Both reviews estimated that children in the developing world experienced a median of between two and three episodes of diarrhoea every year. Neither review included data from China.

Since 1993 more complex methodologies have been applied to a wider range of data sources in order to estimate the global disease burden attributable to specific conditions, including diarrhoea (3–5). The strengths of recent approaches to disease burden modelling include the ability to compare figures for multiple diseases and the inclusion of the disability-adjusted life year, which takes into account both morbidity and mortality (6). However, for diseases that have been studied closely over time in many locations, such as diarrhoea among young children in developing countries, our understanding may

also be deepened by a more detailed review of the most rigorously conducted studies. The purpose of the present review is to examine recent data from studies meeting the same stringent criteria as were applied in the 1982 and 1992 reviews, and to look at trends and patterns in the light of current thinking on diarrhoeal diseases and related causes of morbidity and mortality.

Methods

The studies included in this review were identified through MEDLINE searches for English language sources published since 1990 by using the following keywords: morbidity and diarrhoea; longitudinal studies and diarrhoea; mortality and diarrhoea; and verbal autopsy and diarrhoea.

Further sources were located by cross-referencing, consultation with experts in the field, and the use of the related articles link. Morbidity studies were included if active surveillance had been conducted for at least one year in a stable population of children under 5 years of age in developing countries, including China. For intervention studies, only the placebo or non-intervention group was included in the estimates. In order to allow comparison over time we utilized the methods of the two previous reviews (1, 2). Whenever

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possible, data were stratified by age categories (0–5 and 6–11 months, and 1, 2, 3 and 4 years). Morbidity was expressed as episodes of diarrhoea per person-year. Because longitudinal data for older persons were sparse, estimates were calculated only for children aged under 5 years.

Studies were included in the mortality estimates if deaths due to diarrhoea were ascertained through active surveillance. Our estimates included prospective and retrospective studies but not ones based on vital statistics only. Death was considered to have been caused by diarrhoea only if this was listed as the primary cause. Studies that assigned equal weight to multiple causes of death were not included in the mortality estimates. If two sources described mortality rates in the same population with overlapping observation periods, only data from the more recent source were included.

Demographic data were obtained from the 1995 UNESCO estimates for countries in the following WHO regions: African, Americas, Eastern Mediterranean, South-East Asia, and Western Pacific (7). In contrast to the two earlier reviews, which excluded China from their calculations, three studies provided data from this country.

Results

Morbidity

Twenty-seven studies were included in the morbidity analysis (8–38) (Table 1). The studies varied in their definitions of diarrhoea and the frequency of surveillance. One study defined diarrhoea as two or more loose stools per day; 16 studies defined it as three or more loose stools per day; three studies defined it as four or more loose stools per day; in nine studies a local definition or that of the principal carer was used. Four studies also included episodes of bloody stool as diarrhoeal illness. The frequency of surveillance varied from once per day ($n = 1$) to once per month ($n = 2$), but most studies interviewed carers between two and three times weekly ($n = 16$) or weekly ($n = 8$). The incidence of diarrhoea was highest among children aged 6–11 months, who experienced a median of 4.8 episodes per child per year (Fig. 1). The incidence fell progressively to 1.4 episodes per child per year for 4-year-olds. The median incidence for all children aged under 5 years was 3.2 episodes per child-year.

The calculated median incidences were similar to those of the two previous reviews (Fig. 1). The slightly higher estimates in the current review may reflect more frequent surveillance of smaller populations in recent studies, resulting in more complete detection of mild episodes of illness (1, 39). Of 18 morbidity studies reviewed by Snyder & Merson in 1982, only five involved at least weekly follow-up of study populations smaller than 600; the median incidence was 3.0 episodes per child-year in these studies, whereas it was 2.2 for all the studies in the review. In the 1992 review, populations smaller than 600 were followed up at least twice weekly in 17 of 22 studies. The present review included studies comparable to those covered by the 1992 review: a group of fewer than 600 children was followed up in 15 of 27 studies and surveillance was at least weekly in 24 studies and at least twice weekly in 15 studies.

Mortality

Mortality estimates were derived from 34 studies in 21 countries (Table 2) (40–73). The age categories varied. In 22 studies, relevant data were provided for children younger than 5 years as a single category. Only 15 studies provided mortality data for children aged under 1 year, while 10 provided data for children

aged 1–4 years. Data from 30 studies were available for estimating the fraction of deaths attributable to diarrhoea. For children aged under 1 year and 1–4 years the median mortalities were 8.5 and 3.8 per 1000 children per year, respectively. Among children aged under 5 years the median mortality was 4.9 per 1000 per year and 21% of deaths were estimated to be attributable to diarrhoea.

The diarrhoea-specific mortality rates in infants and children aged 1–4 years and under 5 years in the developing world only were chosen in order to compare the summary statistics of the present study with those of the previous reviews (Fig. 2). This allowed the mortality burden to be expressed independently from the effects of population growth. Although the 1982, 1992, and current reviews used somewhat different age categories for their summary measures, there was a clear declining trend. Diarrhoea-specific mortality rates for children younger than 5 years steadily fell from 13.6 per 1000 per year in studies published between 1955 and 1979 to 5.6 per 1000 per year in 1980–89 and to 4.9 per 1000 per year in studies published between 1992 and 2000. For children aged under 1 year, mortality fell from 23.3 per 1000 per year in 1982 to 19.6 per 1000 per year in the 1992 review, and to 8.2 per 1000 per year in the current analysis. For children aged 1–4 years the fall was less marked, from 4.6 per 1000 per year in 1992 to 3.8 per 1000 per year in the current analysis.

The 1995 UNESCO estimates of the population of children aged under 5 years in the geographical areas of interest were multiplied by the specific mortality rate to obtain a yearly number of deaths from diarrhoea in this population. On the basis of this review, approximately 2.5 million children died from diarrhoeal disease each year in the 1990s (25th to 75th percentile, assuming a normal distribution of mortality rates: 2.1–4.7 million).

Case-fatality ratios

Case-fatality ratios were available from only two studies. One reported a case-fatality ratio of 0.11% in children under the age of 5 years (38). The other reported case-fatality ratios of 1.8% in children under the age of 1 year and 0.75% in children aged 1–3 years (32). The overall calculated case-fatality ratio obtained by dividing the estimated number of diarrhoea-related deaths by the estimated number of diarrhoea disease episodes in children under the age of 5 years was 0.15%, a quarter of that calculated in 1982 (0.6%) (1), half that reported in 1992 (0.3%) (2), and similar to the 0.2% estimated by the US Institute of Medicine in 1986 (74).

Discussion

The 1982 review was one of the first analyses to use existing data to make explicit estimates of disease burden. During the past decade, composite estimates of disease and disability burden for a wide variety of conditions have been presented as providing a basis for priority-setting and resource allocation in the sphere of public health (3–5). Although such estimates are accepted as valuable, researchers have questioned the complex modelling used to derive them, the underlying social and economic assumptions, and the appropriateness of their use in regions where data are sparse (75–78). Focused reviews of primary research concerning specific diseases can provide a more transparent method of assessing and synthesizing the available data, and are an important complement to estimates based on composite measures such as the disability-adjusted life year.

Table 1. Diarrhoea morbidity rates from prospective studies in 20 countries published between 1990 and 2000

| Region ^a | Country | Period | Population | No. of diarrhoea episodes per child at age | | | | | | | |
|--------------------------------|-----------------------|---------|---------------|--------------------------------------------|-------------|-----------|-----------|-----------|-----------|-----------|------|
| | | | | 0-5 months | 6-11 months | 1 year | 2 years | 3 years | 4 years | 0-4 years | |
| AFRO | Guinea-Bissau (8) | 1987-90 | 1314 | | | | | | | | 10.4 |
| | Nigeria (9) | 1989-90 | 351 | 3.3 | 4.1 | 2.9 | 2.2 | | | | |
| | Kenya (10) | 1989-90 | 920 | -----3.5----- ^b | | | | | | | |
| | Zaire (11) | 1987-88 | 1914 | | 7.3 | | | | | | 6.3 |
| | Zimbabwe (12) | 1987-88 | 204 | 1.8 | 4.8 | | | | | | |
| AMRO | Brazil (13, 14) | 1989-93 | 189 | | | 6.8 | | | | | 5.25 |
| | Brazil (15) | 1990-91 | 620 | | | 7.1 | | | | | |
| | Brazil (16) | 1990-92 | 270 | -----6.0----- | | | | | | | |
| | Chile (17) | 1986-89 | 360 | 2.3 | | 2.1 | 1.5 | 1.3 | 0.9 | | |
| | Honduras (18) | - | 266 | 5.0 | | 3.9 | 3.2 | 2.6 | 1.5 | | 3.2 |
| | Mexico (19) | 1988-91 | 214 | -----2.9----- | | | | | | | |
| | Guatemala (20) | 1987-89 | 321 | -----7.64----- | | | | | | | |
| | Peru (21-23) | 1985-87 | 677 | 7.3 | 10.3 | 9.1 | 6.3 | | | | |
| EMRO | Egypt (24) | 1995-98 | 397 | 7.3 | 8.8 | 5.5 | 3 | | | | |
| | Pakistan (25) | 1995 | 227 | | | | | | | | 7.1 |
| | Pakistan (26) | 1984-87 | 1476 | -----3.6----- | | | | | | | |
| SEARO | Indonesia (27) | 1989-91 | | -----0.84----- | | | | | | | |
| | Thailand (28) | | 449 | 2 | 2.4 | 1.2 | | | | | 0.9 |
| | Bangladesh (29, 30) | 1988-89 | 705 | | | | | | | | 4.6 |
| | India (31) | 1992-94 | 553 | 2 | 3.1 | 2 | 1.3 | 1.1 | | | |
| | India (32) | 1984-85 | 2278 | 6.0 | | 5.5 | 4.2 | | | | |
| India, Tamil Nadu (33) | 1989 | 7655 | -----5.6----- | | | | | | | | |
| WPRO | China (34) | 1989 | 74 | | 1.8 | 1.8 | 1.7 | | | | |
| | China (35) | 1986-87 | 270 | 4.2 | | 3.8 | 2.3 | 1.6 | 1.7 | | 2.5 |
| | China (36) | 1986-87 | | | | | | | | | 2.3 |
| | Malaysia (37) | 1988-89 | 156 | | | | | | | | 0.24 |
| | PNG ^c (38) | 1986-89 | 1926 | 2.7 | 5.4 | 5 | 2.8 | 1.5 | 1.2 | | 3 |
| Median global estimates | | | | 2.7 | 4.8 | 3.9 | 2.6 | 1.5 | 1.4 | 3.2 | |
| | | | | (2.0-7.3) ^d | (2.8-8.1) | (2.0-5.5) | (1.7-3.5) | (1.2-2.1) | (1.0-1.7) | (2.3-6.3) | |

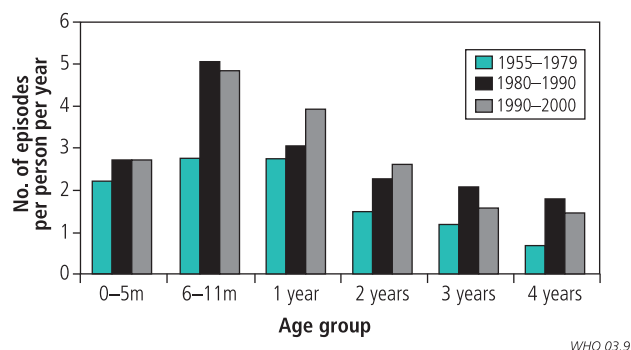
^a AFRO = WHO African Region; AMRO = WHO Region of the Americas; EMRO = WHO Eastern Mediterranean Region; SEARO = WHO South-East Asia Region; WPRO = WHO Western Pacific Region.

^b Solid lines indicate data for these ages combined.

^c PNG = Papua New Guinea.

^d Figures in parentheses are the 25th-75th percentiles.

Fig. 1. Median age-specific incidences for diarrhoeal episodes per child per year from three reviews of prospective studies in developing areas, 1955-2000



Estimates of disease burden from diarrhoea

Estimates of disease burden, however they may be derived, have substantial inherent uncertainty. In a detailed literature review the number of data points for any given region may be small, thus making regional estimates unreliable. The sites of the studies included may not be

representative of the country or the region as a whole. In the present review the regional boundaries were defined on the basis of geographical and political considerations, and the countries in a region often varied widely in socioeconomic and health status. Summing across the countries of a region may obscure important differences. However, the stringent inclusion criteria of the current review ensured that the data provided the most valid information available for examining the morbidity and mortality caused by diarrhoeal disease in recent years. The most important results of this review may not be the precise numbers but rather the patterns and trends emerging from the analysis.

Our findings confirm that mortality from diarrhoea has fallen substantially but that morbidity has remained high over the last four decades. The estimated median number of annual deaths from diarrhoea fell from 4.6 million in 1982 to 3.0 million in 1992 and to 2.5 million in the current review, despite world population growth and the inclusion of China in the current analysis. This decreasing trend is corroborated by other recent reviews (5, 79) and by vital registration data in Latin America (80).

Table 2. Age-specific annual mortality rates from 34 studies in 21 countries published between 1992 and 2000

| Region ^a | Country | Period | Population | Age-specific mortality rate (per 1000 per year) | | | | % of 0–4 years mortality |
|--------------------------------|-------------------------|---------------------|---------------------------------------|------------------------------------------------------------------|-----------------|-------------------|----------------------|--------------------------------|
| | | | | <1 year | 1–4 years | 0–4 years | under-5 ^b | |
| AFRO | Gambia (40) | 1989–93 | 155 000 ^c | 5.6 | 1.9 | | | 8.4 |
| | Gambia (41) | 1988–89 | 26 089 | 11 | 4.5 | 5.9 | | 17 |
| | Ghana (42) | 1990 | 851 | | | 4.3 | | 43 |
| | Ghana (43) | 1989–91 | ca 11 000 | | | 5.2 | | 27.8 |
| | Ghana (44) | 1993–95 | 16 495 | | | 4.2 | | 15.3 |
| | Guinea-Bissau (45) | 1987–90 | 1426 | | | 18.9 | | 30.7 |
| | Nigeria (46) | 1987 | 1928 | | | 20 | | 33 |
| | Senegal (47) | 1985–89 | 6352 ^c | | | | 15.1 | 18.6 |
| | Ethiopia (48) | 1994–95 | 5430 | | 14.6 | | | |
| | Ethiopia (49) | 1986–88 | 5067 | 7.6 | 3.1 | 4.1 | | 8.4 |
| South Africa (50) | 1992–95 | 63 000 ^c | | | 1.5 | | 20 | |
| AMRO | El Salvador (51) | 1988–93 | children of 5752 women | 7 | 3 | 3.8 | | 20 |
| | Ecuador (52) | 1979–89 | children of 7961 women | 7 | 5 | 5.4 | | 23 |
| | Nicaragua (53) | 1982–93 | children of 7150 women | 12 | 15 | 14.4 | | 31 |
| EMRO | Egypt (54) | 1992–96 | 1636 | 40.6 | | | 51.5 | 39.4 |
| | Pakistan (55) | 1988–91 | 4000 ^c | 13 | | | 22.7 | 35 |
| | Pakistan (56) | 1986 | 1194 | | | 8.8 | | 22 |
| | Sudan (57) | 1988–90 | 14 149 | | | 3.5 | | 43 |
| SEARO | Indonesia (58) | 1992–93 | 914 | 5.2 | | | | |
| | Indonesia (59) | 1986–87 | 8624 | | | 9.9 | | 23 |
| | Thailand (60) | 1991 | 824 | | | | 20.1 | 14.1 |
| | Bangladesh (61) | 1986–87 | 189 700 ^c | | | 8.6 | | 24.5 |
| | India (62) | 1987 | 3947 | | | 8.4 | | 20 |
| | India, Aligarh (63) | 1989–90 | 2035 | 16.8 | 6.3 | 11.8 | | 37.5 |
| | India, Ballarbarh (64) | 1992–94 | 5000 | 8.5 | | | | 16.7 |
| | India, Lucknow (65) | 1993–94 | 2796 | | | 4.6 | | 18.3 |
| | India, Pune (66) | 1987–94 | 4129 | 7.8 | 0.64 | 2.1 | | 15 |
| | India, Tamil Nadu (67) | 1989 | 7655 | | | 4.3 | | 41 |
| | India, West Bengal (68) | 1988 | 46 913 ^c | 9.9 | | | | 17 |
| | Nepal (69) | 1989–90 | 14 143 | | | 4.6 | | 28 |
| Nepal (70) | 1989–91 | 5832 | —17.0 ^d ————— ^e | | 20 ^c | | | |
| WPRO | China, Guizhou (71) | 1985–87 | 24 469 | 11.3 | | | | 9 |
| | Philippines (72) | 1998–91 | 9942 | —6.3 ^d ————— | | 14.6 ^d | | |
| | Viet Nam (73) | 1988 | 9691 | 3.4 | 0.68 | 1.4 | | 13 |
| Median global estimates | | | | 8.5 (7.0–12) ^f 3.8 (1.6–8.4) 4.9 (1.0–9.1) 21 (16–32) | | | | |

^a See footnote a, Table 1.

^b under 5 = cumulative mortality in children aged under 5 years.

^c Total population.

^d 0–2 years.

^e Solid lines indicate that the data from these ages are combined.

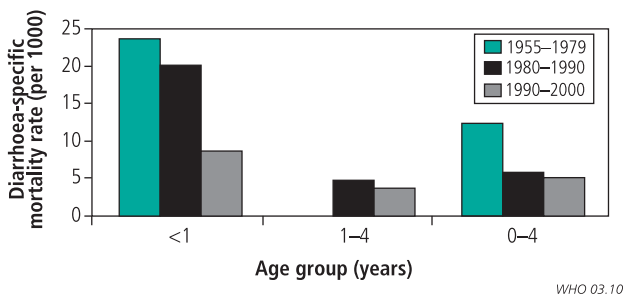
^f Figures in parentheses are the 25th–75th percentiles.

Estimates of mortality in developing countries should be interpreted with caution. In addition to the uncertainties inherent in extrapolation from relatively sparse data, there may be variations between studies in the methods of determining causes of death. For studies included in the 1982 review, the ascribed causes of death were based on physicians' clinical findings or on death certificates. The majority of the studies covered by the 1992 review and the current review used verbal autopsies, the sensitivity and specificity of which are reported to vary between sites (81–83). The Global Burden of Disease estimates (3, 4) were derived from vital registration data, and, for regions with low coverage, from mathematical modelling based on such data (84). For the regions included in the current

review, only countries in Latin America had vital registration coverage reaching 28% (84). For sub-Saharan Africa the coverage was estimated to be 0.4% (84), and this has led some authors to suggest that the estimates should not be used (78).

In contrast to mortality estimates, the incidence of diarrhoea appears to have remained remarkably stable over time. While the studies reviewed in 1982 may have underestimated incidence because of large study populations and infrequent surveillance (39), the 1992 review and the current one covered comparable groups of studies in these terms. Persistently high rates of morbidity are of concern, because early childhood diarrhoea may have long-term effects on linear growth (85, 86) and physical and cognitive function (87).

Fig. 2. **Diarrhoea-specific mortality trends from three reviews of active surveillance in developing areas, 1955–2000.** Only two studies presented in the review covering 1955–79 described age-specific mortality for children aged 1–4 years. Consequently, no rate is shown for this age group



Interventions for diarrhoeal disease

Most interventions for diarrhoeal disease, e.g. increased breastfeeding, better weaning practices, improved sanitation and higher rates of measles immunization, would be expected to affect mortality and morbidity simultaneously. The use of oral rehydration therapy is an exception, its increased use over the past two decades probably having been responsible for some of the decrease in case-fatality rates, especially from acute dehydrating diarrhoea. Globally, the proportion of diarrhoeal episodes treated with oral rehydration therapy was estimated to have risen from less than 15% in 1984 to approximately 40% in 1993 (88). Diarrhoeal mortality has fallen more rapidly among children aged under 1 year than among those aged 1–4 years. This is consistent with the observation that infants are at higher risk for death from acute dehydrating diarrhoea (89). Where oral rehydration therapy is widely used, persistent diarrhoea or dysentery may cause an increasing proportion of diarrhoeal deaths relative to those associated with watery diarrhoea (90). In order to achieve further declines in mortality it may be necessary to adopt a more complex approach that would include distinguishing acute watery diarrhoea, dysentery and persistent diarrhoea, and ensuring appropriate case management for each syndrome. These issues are specifically addressed in the WHO/UNICEF initiative for the improved management of childhood illness (91). Furthermore, diarrhoea surveillance should classify diarrhoeal episodes as acute watery, dysenteric, or persistent so that interventions can be appropriately targeted at the population level.

Nutritional status is another factor that may help to explain the de-linking of diarrhoeal mortality and morbidity rates. There are conflicting data on the effect of malnutrition on the incidence of diarrhoea (92–95). However, investigators agree that malnutrition prolongs the duration of diarrhoea (92, 94, 96) and increases the risk of mortality from the condition

(72, 97–99). The past two decades have seen an impressive decrease in rates of stunting in all parts of the world except East Africa (100).

The interaction between malnutrition and diarrhoeal disease is bi-directional (101). Increases in immunization coverage, better health care access, improvements in water and sanitation, and other socioeconomic changes affect both diarrhoeal mortality and childhood nutrition. Recent trends in mortality from diarrhoea and the prevalence of malnutrition should be interpreted in the light of these complex relationships (102).

Diarrhoeal disease and HIV/AIDS

This review does not include data that might help to assess the potential impact of HIV/AIDS on the global burden of diarrhoeal disease. Nevertheless, one of the many consequences of the HIV/AIDS pandemic may be to halt the impressive decline in childhood diarrhoeal mortality seen over the past four decades. Diarrhoeal incidence (103, 104), duration (105), severity (103, 105) and mortality (103) are higher in children with HIV/AIDS than in others. Chronic diarrhoea is also a major cause of morbidity and death among adults with HIV (106–108). This review therefore substantially underestimates the burden of diarrhoeal disease in areas where HIV is highly endemic.

Conclusions

It is important to note that the decline in diarrhoeal mortality occurred in the context of a decrease in overall childhood mortality. It has been estimated that worldwide mortality rates in children aged under 5 years declined from 159 to 70 deaths per 1000 live births between the periods 1955–59 and 1995–99 (109). The Global Burden of Disease estimate for the number of deaths in children under 5 years of age was 12.8 million in 1990. Our estimate of 2.5 million deaths in children under 5 years of age accounts for 19.5% of these deaths, a proportion that correlates well with the median of 21% of all deaths among children aged under 5 years that were caused by diarrhoea as determined by active surveillance. This is reassuring, given the different methodologies used in arriving at these estimates. An analysis of 10.5 million deaths in 1999 attributed 1.6 million of them to diarrhoea only; many other diarrhoeal deaths in children who also had malaria or pneumonia were attributed to these conditions (7; R. Lozano, unpublished observations, 2001). Diarrhoea thus still accounts for 1.6–2.5 million deaths annually, and each child in the developing world experiences an average of three episodes of diarrhoea per year. Clearly, despite the decline in diarrhoeal mortality, diarrhoea remains one of the principal causes of morbidity and mortality in children. ■

Conflicts of interest: none declared

Résumé

La charge mondiale des maladies diarrhéiques, calculée d'après les résultats des études publiées entre 1992 et 2000

Le présent article rapporte les estimations actuelles de la charge mondiale des maladies diarrhéiques et les compare avec les estimations précédentes basées sur des données recueillies en 1954-1979 et en 1980-1989. On a procédé à une recherche

documentaire structurée pour identifier les études ayant caractérisé les taux de morbidité au moyen d'une surveillance prospective des populations stables et les études ayant caractérisé la mortalité attribuable à la diarrhée au moyen d'une surveillance active. Dans

les zones et pays en développement, la médiane des épisodes de diarrhée chez les moins de 5 ans était de 3,2 par enfant-année. Ce résultat ne montre que peu de changement par rapport aux incidences décrites auparavant. Les estimations de la mortalité ont montré que dans ces zones et pays, le nombre d'enfants qui décédaient de maladie diarrhéique avant l'âge de 5 ans était de 4,9 pour 1000 par an, chiffre en diminution par rapport aux précédentes estimations, respectivement de 13,6 et 5,6 pour 1000 par an. La baisse était plus prononcée chez les enfants de moins

d'un an. Malgré une amélioration des tendances de la mortalité, les maladies diarrhéiques étaient responsables, en valeur médiane, de 21 % de l'ensemble des décès chez les enfants de moins de 5 ans dans ces zones et pays, avec 2,5 millions de décès par an. Il n'y a pas eu de baisse concomitante des taux de morbidité imputables à la diarrhée. Comme la croissance démographique est principalement concentrée dans les régions les plus pauvres, la part de la morbidité que représentent les maladies diarrhéiques dans la charge totale est plus importante qu'auparavant.

Resumen

La carga mundial de enfermedades diarreicas, según estimaciones de estudios publicados entre 1992 y 2000

Se informa de las actuales estimaciones de la carga mundial de morbilidad por diarrea, comparándolas con estimaciones anteriores realizadas durante 1954-1979 y 1980-1989.

Se hizo una revisión estructurada de la literatura para localizar estudios que hubieran determinado las tasas de morbilidad mediante la vigilancia prospectiva de poblaciones estables y estudios que hubieran determinado la mortalidad atribuible a la diarrea mediante medidas de vigilancia activa.

Para los niños menores de 5 años de los países y áreas en desarrollo, se observó una mediana de 3,2 episodios de diarrea por niño y año, lo que indica, si se consideran las tasas de incidencia notificadas con anterioridad, que la situación apenas ha cambiado. Las estimaciones de la mortalidad revelaron que 4,9 niños por

1000 fallecieron cada año en esos países y áreas como resultado de enfermedades diarreicas en los 5 primeros años de vida, lo que supone una reducción respecto a las estimaciones anteriores de 13,6 y 5,6 por 1000 cada año. La disminución más pronunciada es la observada en los menores de un año.

Pese a la mejora de las tendencias de las tasas de mortalidad, la diarrea fue la causa de un 21 % (valor mediano) de todas las defunciones de menores de 5 años en esos países y áreas, con 2,5 millones de muertes anuales. No ha habido una disminución paralela de las tasas de morbilidad por diarrea. Como el crecimiento demográfico se centra en las zonas más pobres, la contribución de esa enfermedad a la morbilidad total ha aumentado.

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