

Diarrhoea: why children are still dying and what can be done

Just under 9 million children aged under 5 years died in 2008 and nearly 40% of these deaths were due to two diseases: pneumonia and diarrhoea.¹ Diarrhoea remains the second leading cause of death in children younger than 5 years globally. Nearly one in every five child deaths—around 1.5 million a year—is due to diarrhoea, which kills more children than AIDS, malaria, and measles combined.²

Yet funding and attention directed toward the control of diarrhoea in recent years has been insufficient to address its enormous global burden.³ Any effort to achieve Millennium Development Goal 4 to reduce child mortality will need to adequately address this major cause of child deaths.

There are lessons to be learned from past experience. Global attention and funding directed toward childhood diarrhoea in the 1970s and 1980s resulted in a major reduction in deaths from diarrhoea.⁴ This reduction came about largely through scaling up oral rehydration therapy—heralded as one of the most important medical advances of the 20th century⁵—coupled with programmes to educate caregivers. But these efforts lost momentum as the world turned its attention to other global issues.

It is time to turn our attention back. On Oct 14, UNICEF and WHO released a report, *Diarrhoea: why children are still dying and what can be done*,⁶ to raise the profile of diarrhoea as central to improving child survival. The report includes a seven-point plan for comprehensive diarrhoea control (panel) and assesses how well countries are doing in making available key interventions to reduce the toll of diarrhoea.

Today, only 39% of children with diarrhoea in developing countries receive the recommended treatment, and limited trend data suggest little progress since 2000. Zinc supplements are largely unavailable in most developing countries, and low-osmolarity oral rehydration salts have been slow to roll out, even 5 years after UNICEF and WHO recommended their use in programmes.⁷

On the prevention side, progress has been made in many areas, notably vitamin A supplementation, measles immunisation, access to safe drinking water, and exclusive breastfeeding. But in other areas much work remains. Rotavirus vaccine is not available in

most developing countries. Around 2.5 billion people lack access to improved sanitation facilities, and nearly one in four people in developing countries practise open defaecation. Almost 1 billion people lack access to improved drinking-water sources. Today, 129 million children under 5 years in developing countries are underweight. And despite some recent progress, only 37% of infants in developing countries are exclusively breastfed for the first 6 months.

Vaccination against rotavirus, which causes 40% of hospital admissions from diarrhoea in children under 5 years worldwide,⁸ has recently been recommended for inclusion in all national immunisation programmes.⁹ Accelerating its introduction in Africa and Asia, where the rotavirus burden is greatest, needs to become an international priority.

Innovative delivery strategies to expand access to zinc and low-osmolarity oral rehydration salts are now being devised. Some proposals include delivering these life-saving remedies together in treatment kits through community-health workers or through special campaigns, as well as developing new flavours and packet sizes for oral rehydration salts.

Extensive consumer research is proving invaluable for promoting hand-washing with soap.¹⁰ New and more effective sanitation strategies¹¹ focus on triggering demand for toilets and stopping open defaecation, while encouraging households to invest in their own toilets

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Panel 1: Seven-point plan for comprehensive diarrhoea control

Prevention package

- Rotavirus and measles vaccinations
- Promotion of early and exclusive breastfeeding and vitamin A supplementation
- Promotion of handwashing with soap
- Improve water quantity and quality, including treatment and safe storage of household water
- Promotion of community-wide sanitation

Treatment package

- Fluid replacement to prevent dehydration*
- Zinc supplements

*Oral rehydration therapy is cornerstone of fluid replacement, and gold standard is low-osmolarity oral rehydration salts. Important additional components include continued feeding, including breastfeeding, and use of appropriate fluids in home if oral rehydration salts are not available, along with increased fluids in general.

without relying on subsidies. This approach emphasises behaviour-change triggers, such as disgust, nurture, comfort, and the desire to conform rather than health-related arguments alone. Household water treatment, supported by market-based product distribution, is becoming more mainstream.¹²

Political momentum is now building to address the leading causes of child deaths, including pneumonia and diarrhoea, to achieve measurable gains in child survival. The year 2008 marked the 30th anniversary of the Alma-Ata Declaration, with reinvigorated calls to focus on primary health care. Lessening the burden of childhood diarrhoea fits squarely with this emphasis, and is essential for achieving the Millennium Development Goal related to child mortality, the target date for which is only 6 years away.

Several key actions aimed at accelerating progress are identified in the report. Increasing access to cost-effective treatments by reinstating diarrhoea prevention and treatment as a cornerstone of community-based primary health care, ensuring that low-osmolarity oral rehydration salts and zinc are adopted as policy in all countries,¹³ and increasing resources towards diarrhoea control are important immediate steps. This work needs to go in hand with scaling up crucial preventive interventions, such as rotavirus vaccine, innovative hygiene-promoting practices, and demand-led sanitation.

We know what works to reduce child deaths from diarrhoea and what actions will make a lasting reduction in the burden of diarrhoea. We need to make the prevention and treatment of diarrhoea everybody's

business, from families and communities to government leaders to the global community.

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- 1 You D, Wardlaw T, Salama P, Jones G. Levels and trends in under-5 mortality, 1990–2008. *Lancet* 2009; published online September 10. DOI:10.1016/S0140-6736(09)61601-9.
- 2 WHO. The global burden of disease: 2004 update. 2008. http://www.who.int/healthinfo/global_burden_disease/2004_report_update/en/index.html (accessed Oct 6, 2009).
- 3 Rudan I, El Arifeen S, Black RE, Campbell H. Childhood pneumonia and diarrhoea: setting our priorities right. *Lancet Infect Dis* 2007; **7**: 56–61.
- 4 Boschi Pinto C, Lanata CF, Black RE. The global burden of childhood diarrhoea. In: Ehiri JE, Meremikwu M, eds. *International maternal and child health*. Washington, DC: Springer Publishing (in press).
- 5 Anon. Water with sugar and salt. *Lancet* 1978; **312**: 300–01.
- 6 UNICEF, WHO. Diarrhoea: why children are still dying and what can be done. New York: United Nations Children's Fund, 2009.
- 7 UNICEF, WHO. Joint statement: clinical management of acute diarrhoea. 2004. http://www.who.int/child_adolescent_health/documents/who_fch_cah_04_7/en/index.html (accessed Oct 6, 2009).
- 8 WHO. Estimated rotavirus deaths for children under 5 years of age: 2004. 2009. http://www.who.int/immunization_monitoring/burden/rotavirus_estimates/en/index.html (accessed Oct 6, 2009).
- 9 WHO. Meeting of the immunization Strategic Advisory Group of Experts, April 2009—conclusions and recommendations. *Wkly Epidemiol Rec* 2009; **84**: 213–36.
- 10 Curtis V, Cairncross S. Effect of washing hands with soap on diarrhoea risk in the community: a systematic review. *Lancet Infect Dis* 2003; **3**: 275–81.
- 11 Kar K, Pasteur K. Subsidy or self-respect? Community led total sanitation: an update on recent developments. November, 2005. http://www.communityledtotalsanitation.org/sites/communityledtotalsanitation.org/files/wp257_0.pdf (accessed Oct 12, 2009).
- 12 WHO. Safe water, better health. 2008. http://www.who.int/quantifying_ehimpacts/publications/saferwater/en/index.html (accessed Oct 6, 2009).
- 13 Fischer Walker CL, Fontaine O, Young MW, Black RE. Zinc and low osmolarity oral rehydration salts for diarrhoea: a renewed call to action. *Bull World Health Organ* 2009; **87**: 780–86.