Global Burden of Childhood Diarrhea and Pneumonia: What Can and Should Be Done?

INTRODUCTORY COMMENTARY

Although significant success has occurred in combating the huge number of young children who die each year of common preventable and treatable infectious diseases, many millions still die because of the lack of simple and inexpensive interventions. Dr Bhutta has focused his global health discussion on the massive potential gains by specific targeted efforts on decreasing 2 leading causes, pneumonia and diarrhea. The costs to young lives and the detrimental societal effects of these 2 infectious diseases alone are immense. Dr Bhutta also appropriately points out that greater political will and collaboration among nations will speed up progress in achieving child survival targets as agreed upon in the established Millennium Development Goals. Clearly, pediatricians everywhere should take a strong leadership role in pressing this agenda.

—Jay E. Berkelhamer, MD, FAAP
Editor, Global Health Monthly Feature

Children represent the future of any nation, and it is a societal responsibility to ensure their health, growth, and development. A major goal among the Millennium Development Goals (MDGs) agreed upon by 190 countries at the Millennium Summit in September 2000 was MDG4 with the specific target of reducing under 5 child deaths by two-thirds, from the 1990 baseline, by the year 2015.

Despite considerable progress over the last decade and an average reduction in child mortality of over 2.5 million deaths annually, the rate of reduction is still too slow in many countries to enable them to reach their MDG4 targets. In 2011, ~6.9 million children under 5 years old died, recording a decrease of 5.1 million from the estimated child mortality in 1990. The highest rates of child mortality continue to be concentrated in sub-Saharan Africa and South Asia (83%) and with wide variations in the coverage of interventions and high birth rates, this gap may continue to widen. These inequities in coverage are notable across interventions but are relatively smaller for interventions delivered through community outreach services and vaccinations, in contrast with interventions that require continued access to health facilities or specialty centers. An estimated 4.4 million (58%) of these under 5 deaths in 2011 were due to infectious causes, of which pneumonia (1.4 million) and diarrhea (800,000) are the 2 leading causes of postneonatal deaths (Fig 1), and high rates of HIV also impact on child survival, contributing 4% of all child deaths in Africa. Of the many determinants, maternal and child undernutrition is an underlying determinant of mortality in more than one-third of the deaths.

Invigorating efforts against pneumonia and diarrhea, while augmenting nutrition, could save thousands of vulnerable children globally. It is known that if implemented at scale, a range of simple interventions such as exclusive breastfeeding up to 6 months of age, improved case management of diarrhea with oral rehydration and zinc therapy, strategies to promote complementary feeding, and selected micronutrient supplementation strategies with zinc and vitamin A have the potential to reduce mortality in children under 36 months of age by 25%.

More recently using the Lives Saved Tool, Fischer-Walker et al estimated that if a combination of 10 interventions for diarrhea (7 preventive and 3 therapeutic) were scaled up in 68 countdown countries (those with over 95% of the burden of child mortality), diarrhea-specific mortality could be reduced by 78% by 2015. They further estimated additional costs to achieve this reduction in nonwater/sanitation and hygiene interventions such as clean household water availability, hand-washing with soap, and sanitation at a mere US$0.49 per capita and an additional US$1.78 per capita for the more structural water/sanitation...
and hygiene interventions. A recent Federation of International Pediatric Societies for Pediatric Gastroenterology, Hepatology, and Nutrition working group on acute diarrhea has also prioritized interventions that could reduce diarrhea-related mortality and include in some order of priority rotavirus immunization, promotion of oral rehydration solutions, and reduction in inappropriate medical interventions (hospitalization, microbiological investigations, dietary modifications, and unnecessary drugs administration). It is also recognized that many of these direct interventions may have additional nonspecific benefits on child survival and additional benefits on child development.

Although a global action plan for pneumonia has been in existence for some years, its actual implementation in countries has varied considerably. Of the number of countries with high burden of childhood pneumonia, few have introduced pneumococcal vaccine and almost none have addressed issues of environmental health and air pollution, important risk factors for childhood pneumonia. It is noted that newer Haemophilus influenzae type b, pneumococcal, and rotavirus vaccines have the potential to reduce pneumonia- and rotavirus-related deaths by 18%, 26%, and 74%, respectively. Recent findings indicate that a median 43% of children in low income countries with features of pneumonia are seen by an appropriate care-provider, and less than one-third (29%) receive antibiotics.

Attaining the MDGs will require universal coverage of key effective, affordable interventions, complemented by strategies to enhance access. Given the shortage of human resources in some of the poorest areas of the world, frequently driven by external and internal health worker migration, this will require alternate strategies or platforms to accelerate the uptake and scale up of the proven interventions. One such strategy is reaching out to poor and difficult-to-reach families through community health workers. These community health workers offer a unique opportunity to address a range of preventive and promotive strategies for women and children. Such outreach services and task shifting/task sharing with physicians may offer a unique opportunity to address the MDGs, as well as the challenge posed by noncommunicable diseases. Such delivery platforms also offer a unique opportunity for integrating services at the point of service delivery and enabling an implementation strategy in poor and difficult to reach populations. Access to essential drugs and technologies have become priorities for national health systems, and removal of bottlenecks to address the shortages of critical supplies and commodities, such as oral rehydration solution and zinc for diarrhea and amoxicillin for pneumonia, have led to the recent creation of the UN Commission for Life Saving Commodities to help improve the supply chain and ensure their availability to countries at scale. In many high-mortality countries, a large proportion of care for childhood illnesses is provided by private sector care providers who must be part of any action plan to address diarrhea and pneumonia. Additionally, many families seek treatment of these illnesses from private retail outlets such as pharmacies and drug shops.

Of the various determinants of burden of diarrhea and pneumonia and excess mortality, poverty remains a major barrier impeding access to preventive and curative services. There is a clear need to breach these financial barriers in enhancing the uptake of services by provision of incentives, as well as universal health coverage. There is no substitute to national ownership of these issues, and remarkable examples exist of effective state ownership of public health through schemes such as national health insurance programs. It is notable that domestic health funding in 40 countdown countries is less than 10% of their Gross Domestic Product on health. Similar strategies are being planned in other lower income countries like China, India, South Africa, and Columbia and could include a major scale up of interventions to address childhood diarrhea and pneumonia. The key outcomes must be
equity focused approaches and access to services. It is estimated that comparatively 6 times more lives could be saved in the poorest households by scaling up key pneumonia and diarrhea interventions to near universal levels.\(^9\) Bangladesh provides a clear example of how this can be done for newborn health\(^16\) and other complex interventions such as promotion of hand washing, sanitation, and clean water.\(^16\)

As we address the emerging global development agenda post 2015, it is important to underscore that child survival goals remain tenuous. Only 22 of the countdown countries are on track to achieve MDG4, whereas 3 countries have made little or no progress. The recent call for action by the United Nations Children’s Fund and US Agency for International Development of reducing global child mortality to 20 or less per 1000 live births by 2035 is a clear opportunity to keep the focus on saving lives and is consonant with the overall goal of eliminating unnecessary diarrhea and pneumonia deaths.\(^17\) The fact that in many poor communities both disorders have common risk factors and are frequently seen in the same children\(^18\) lends further credence to the need to integrate diarrhea and pneumonia strategies.

Given the close link with undernutrition and the opportunity for integrating child survival and development interventions,\(^19\) a renewed global focus on eliminating childhood diarrhea and pneumonia deaths and reducing morbidity will yield many dividends beyond health.

What is needed is the political will and partnerships to make this happen in a time frame faster than secular change. The key challenge of delivering these integrated and cost-effective interventions to those in greatest need can only be met through concerted advocacy, contextual application of innovations and robust monitoring and evaluation. We as individuals and members of the global fraternity of pediatricians have a role to play in ensuring that the tangible goal of eliminating diarrhea and pneumonia deaths within a generation can be agreed upon and achieved.

**REFERENCES**


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