Pneumonia and diarrhoea: leading killers for vulnerable children

Key Facts from the report: Pneumonia and diarrhoea: Tackling the deadliest diseases for the world’s poorest children

Situation/Prevention

• Pneumonia and diarrhoea are the two leading causes of death for children under age 5 globally, representing 29 per cent of total child deaths worldwide.
• Both illnesses are preventable by vaccinations, clean homes, safe drinking water, improved sanitation, consistent access to health care and adequate nutrition for mothers and children, including breastfeeding and nutritional supplements.
• Both new and old vaccines against pneumonia and diarrhoea are effective; these include vaccines against leading pneumonia-causing pathogens as well as rotavirus vaccines for severe diarrhoea.
• Poor children in low-income countries, notably in South Asia and sub-Saharan Africa, are most at risk of death from pneumonia or diarrhoea but much less likely to be vaccinated. Sub-Saharan Africa has the highest rate of pneumonia deaths.
• The lives of 2 million children could be saved by the Millennium Develop Goals’ 2015 deadline if, in each of the 75 countries with the highest death rates, coverage were applied across the entire population at the level of the richest 20 per cent of households.
• Hand-washing with soap and water is the most cost-effective way to reduce rates of pneumonia and diarrhoea in children under age 5. Yet disparities of such practices vary widely across countries, with low rates especially in developing countries.
• Supplements like zinc and vitamin A and exclusive breastfeeding of infants through six months old can reduce malnutrition, thereby making children with pneumonia or diarrhoea less vulnerable to contracting more severe illnesses or death.

Pneumonia

• Pneumonia can result from both measles and pertussis (whooping cough), and though global coverage for these diseases is 85 per cent each, the poorest children often go unprotected.
• Household air pollution remains a high risk for childhood pneumonia infection, since low-income countries rely mostly on solid fuels (such as wood, dung, coal) for cooking or heating with poorly ventilated fires and stoves. Overcrowded homes also contribute to higher levels of childhood pneumonia.
• Progress has been made in increased use of pneumonia vaccines, particularly in the poorest countries, but inequities exist even in countries with wide coverage.

Diarrhoea

• Unsafe water, inadequate sanitation and poor hygiene are attributed to 88 per cent of deaths from diarrhoea worldwide, while gaps in these areas continue between rich and poor households and urban-rural communities.
• Some 783 million people do not have access to safe water sources, mostly in rural areas. And 37 per cent of the world’s population does not have access to basic sanitation, a majority in rural areas.
• Some 1.1 billion people still practice open defecation. In South Asia, nearly everyone in the poorest 20 per cent of households still practices open defecation.
• Rotavirus, accounting for about 40 per cent of all hospital admissions among children under age 5, remains a large problem in sub-Saharan Africa and South Asia because the vaccine is mostly unavailable.

Figure 1
[Figure 1.1 from the main report]

Treatment

Coordinating medical coverage at all levels among health-care workers in the poorest communities can cut child deaths, particularly from pneumonia or diarrhoea.

• Prompt, effective treatment for pneumonia can save lives, but diagnosing it can be problematic in low-income countries, which may not have proper tools available. Available methods are also not consistently used. Poor communities often rely on home remedies or seek care outside the formal health care system.
• Boys and girls in developing countries are likely to receive equal care for pneumonia, but children in rural areas or the poorest households are much less likely to receive the right care than their peers in urban or better-off households.
• Progress for appropriate care for pneumonia (as defined by respiratory rate) remains limited in scope, though rural children have made bigger gains in receiving care than their urban counterparts in every region. Yet a rural-urban gap persists, with universal care still falling far short, especially in sub-Saharan Africa.
• Less than a third of children with pneumonia received antibiotics in developing countries, with South Asia averaging 18 per cent. In developing regions, children with pneumonia in urban areas are 1.4 times more likely to receive antibiotics than children in rural areas.

• In high-mortality countries, diarrhoea is often treated through private sources such as pharmacies, leading to expensive, ineffective care. Appropriate care providers include hospitals, health-care centres, doctors and community health workers.

• In developing countries, 39 per cent of children with diarrhoea received the recommended treatment of oral rehydration therapy with salt solutions and continued feeding. (Zinc supplements are also recommended but not always available.) The regions with the highest diarrhoea deaths, sub-Saharan Africa and South Asia, have the lowest oral-rehydration treatment coverage (34 per cent and 37 per cent respectively).

• Only about a third of children with diarrhoea in developing countries receive oral rehydration salt solutions. Sub-Saharan Africa showed improvement in coverage, from 24 per cent to 30 per cent from 2000-2010, but it is still too low.

• Flavoured versions of oral rehydration solutions are now prioritized for mothers and children.

• UNICEF is one of the largest buyers of oral-rehydration salt solutions internationally, but manufacturers have been slow in producing this new formula.

• Less than a quarter of children with diarrhoea in developing countries drink more fluids as treatment and a third eat less food or none at all during their illness.

• Zinc supplements remain important in treating diarrhoea, but its use is low, data tracking such use is limited and supplies are abysmal compared with need.

**FIGURE 2.1** Many prevention and treatment strategies for diarrhoea and pneumonia are identical

<table>
<thead>
<tr>
<th>Diarrhoea</th>
<th>Pneumonia</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Prevention</strong></td>
<td><strong>Prevention</strong></td>
</tr>
<tr>
<td>Vaccination: rotavirus, cholera, typhoid</td>
<td>Vaccination: pneumococcal conjugate, <em>Haemophilus influenzae</em> type b, pertussis</td>
</tr>
<tr>
<td>Safe water and improved sanitation</td>
<td>Reduced household air pollution</td>
</tr>
<tr>
<td>Low-cost mortality oral rehydration salts, zinc and continued feeding</td>
<td>Antibiotics for pneumonia</td>
</tr>
<tr>
<td>Antibiotics for dysentery</td>
<td>Oxygen therapy (where indicated)</td>
</tr>
<tr>
<td><strong>Treatment</strong></td>
<td><strong>Treatment</strong></td>
</tr>
<tr>
<td>Improved care-seeking behaviour</td>
<td>Improved case management at both the community and health facility levels</td>
</tr>
</tbody>
</table>

Note: A complete list of Child Health Epidemiology Reference Group review papers on the effects of pneumonia and diarrhoea interventions on child survival is available at www.cherg.org/publications.html. Effectiveness of pneumonia interventions was also recently reviewed by Niesan and others (2005). Source: Adapted from the Global Action Plan for Prevention and Control of Pneumonia and presentations in WHO regional workshops in 2011.
June 6, 2012

Recommendations: Scaling up interventions fairly

Tackling pneumonia and diarrhoea can save millions of children's lives with proven prevention and treatment programs. This can be achieved by increasing the scope of coverage for the world’s poorest children, who bear the brunt of deaths from these two illnesses.

- Provide care to the most vulnerable children equal to that received by the richest 20 per cent of households in the countries with the highest fatalities from pneumonia and diarrhoea. In doing so, child deaths from pneumonia could drop 30 per cent; from diarrhoea, 60 per cent. [Modelling in Bangladesh, for example, shows that through the key interventions, six times as many children’s lives could be saved in the poorest homes compared with the richest ones.]
- Ensure global immunization of old and new vaccines, exclusive breastfeeding for infants and use of vitamin A supplements and adequate nutrition, safe drinking water and proper sanitation practices.
- Increase treatments for diarrhoea quickly and easily through fluid replacement, oral hydration salt solutions and zinc supplements. For bacterial pneumonia, treat with antibiotics. Many interventions for both illnesses are identical and could be prevented in coordinated fashion.
- Improve diagnosis of pneumonia and appropriate follow-up care for children in developing countries.
- Control indoor air pollution using new technologies.
- Prevent mother-to-child transmission of HIV, an important intervention.
In Bangladesh more children’s lives are saved by targeting the poorest households with key pneumonia and diarrhoea interventions

Predicted numbers of deaths averted among children under age 5 if near universal coverage (90 per cent) of key pneumonia and diarrhoea interventions were achieved in the poorest and richest 20 per cent of households in Bangladesh (millions)

Note: Averted deaths due to pneumonia and diarrhoea do not sum to total averted child deaths because pneumonia and diarrhoea interventions have an effect on other causes of child mortality.

Source: Lives Saved Tool modelling by Johns Hopkins University Bloomberg School of Public Health (see annex 2).
Figure 5
[Figure 3.7 from the main report]

![Bar chart showing the number of people without an improved water source or sanitation facility, by urban and rural areas, in 2010 (millions).]

**Figure 3.7** Most people without an improved water source or sanitation facility live in rural areas

People without an improved drinking water source, people without an improved sanitation facility and people practicing open defecation, 2010 (millions)

- Urban
- Rural

Figure 7
[Figure 3.13 from the main report]

Young infants who are not breastfed are at a greater risk of dying due to pneumonia or diarrhoea.

Relative risk of pneumonia and diarrhoea incidence and mortality for partial breastfeeding and not breastfeeding compared with that for exclusive breastfeeding among infants ages 6–5 months.

Source: Black and others 2008.
Figure 8
[Figure 4.8 from the main report]

Every region has shown progress in appropriate case-seeking for suspected childhood pneumonia over the past decade.

**Figure 4.8**

- Share of children under age 5 with suspected pneumonia taken to an appropriate healthcare provider or facility, by region, around 2000 and around 2010 (per cent)

- **2000**
- **2010**

- Excludes China

Note: Estimates are based on a subset of 62 countries with available data for 2000-2011, covering 70 per cent of the under-five population in developing countries in 2000 and 2010 (excluding China, for which comparable data are not available) and at least 50 per cent of the under-five population in each region. Data coverage was insufficient to calculate the regional average for CEE/CIS, Latin America and the Caribbean, Middle East and North Africa, and industrialized countries. Source: UNICEF global databases 2012, based on Multiple Indicator Cluster Surveys, Demographic and Health Surveys and other national surveys.
Figure 9

[Figure 4.19 from the main report]

**Figure 4.19**

Use of solutions made of oral rehydration salts to treat childhood diarrhoea has changed little since 2000

<table>
<thead>
<tr>
<th>Region</th>
<th>2000</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Middle East and North Africa</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sub-Saharan Africa</td>
<td></td>
<td></td>
</tr>
<tr>
<td>South Asia</td>
<td></td>
<td></td>
</tr>
<tr>
<td>East Asia and Pacific</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Developing countries</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Excludes China.

Note: Estimates are based on a subset of 68 countries with available data for 2006-2011, covering 79 per cent of the under-five population in developing countries (excluding China, for which comparable data are not available) and at least 50 per cent of the under-five population in each region. Data coverage was insufficient to calculate the regional average for CEE/CIS, Latin America and the Caribbean, and industrialized countries.

Source: UNICEF global databases 2012, based on Multiple Indicator Cluster Surveys, Demographic and Health Surveys and other national surveys.