

## Fact Sheet: Pneumonia

**About 1 in 5 child deaths under 5 years of age is due to [pneumonia](#).**

Pneumonia is the leading killer of children worldwide: it kills more children than AIDS, malaria and measles combined.<sup>1</sup> Pneumonia is a severe acute lower respiratory infection that specifically affects the lungs. Pus and fluid fill the [alveoli](#), the smallest air spaces in the lungs, and make it difficult to absorb oxygen.<sup>2</sup>

Children with compromised immune systems are at greater risk for acquiring pneumonia. For example, undernourished children, low birth-weight infants, infants who are not breastfed and children suffering from other illnesses such as AIDS are more likely to develop pneumonia. Environmental factors also increase the risk for pneumonia: overcrowding in homes and exposure to tobacco smoke or indoor air pollution can make children more susceptible to pneumonia.<sup>3 4 5</sup>



***Streptococcus pneumoniae* ([pneumococcus](#)) is the leading cause of severe pneumonia among children in the developing world.** [Bacteria](#) are more likely to result in severe pneumonia, and pneumococcus is an important bacterial cause of pneumonia worldwide. [Vaccine](#) studies using [pneumococcal conjugate vaccine](#) indicate that up to 37-39% of pneumonia cases in children are caused by pneumococcus.<sup>6 7</sup> Pneumonia can also be caused by some kinds of viruses, such as influenzae, and some kinds of fungi, such as *Pneumocystis jiroveci* (PCP) which is an important cause of pneumonia in persons with AIDS.<sup>8</sup>

Of the deaths due to pneumonia, 25-45% are attributed to pneumococcus, making pneumococcus the most common bacterial cause of pneumonia deaths.<sup>9</sup> The WHO estimates that more than 1.6 million people die of pneumococcal pneumonia each year, and over half of these deaths— up to 1 million deaths—are in children under the age of five years.<sup>10</sup>

**Few children with pneumonia receive appropriate [antibiotic](#) therapy.** Pneumonia is a serious infection that requires prompt treatment with an appropriate course of antibiotics. However, in surveys from various countries, few caregivers correctly recognized the key symptoms of pneumonia in children.<sup>11</sup> Cough, fast breathing and/or

<sup>1</sup> WHO. World Health Report 2004.

<sup>2</sup> UNICEF. Pneumonia: the Forgotten Killer of Children 2006.

<sup>3</sup> UNICEF. Pneumonia: the Forgotten Killer of Children 2006.

<sup>4</sup> WHO. Indoor air pollution and lower respiratory tract infections in children 2007.

<sup>5</sup> Victora CG, Kirkwood BR, et al. Am J Clin Nutr 1999; 70: 309-20.

<sup>6</sup> Cutts FT, Zaman SMA, et al. Lancet 2005; 365: 1139-46.

<sup>7</sup> Grijalva CG, Nuorti JP, et al. Lancet 2007; 369: 1179-86.

<sup>8</sup> UNICEF. Pneumonia: the Forgotten Killer of Children 2006.

<sup>9</sup> WHO. Global Burden of Disease Estimates (data unpublished).

<sup>10</sup> WHO Position Paper. Weekly Epidemiological Record, No. 12, 2007; 82:93-104.

<sup>11</sup> UNICEF. Pneumonia: the Forgotten Killer of Children 2006.

fever are often the presenting symptoms of pneumonia. Severe pneumonia causes difficulty breathing which may manifest in children under 5 years as chest in-drawing, grunting or nasal flaring (in young infants). A child with very severe pneumonia may also appear lethargic, unconscious or have central cyanosis and be unable to eat or drink.<sup>12</sup>

### Diagnosing pneumonia

Pneumonia is diagnosed most often by the combination of presenting clinical symptoms. There is no easy way of distinguishing bacterial and viral causes of pneumonia because there is large overlap in common presenting clinical symptoms.

A chest X-ray can help confirm the diagnosis since a chest X-ray should be abnormal in the case of a pneumonia. A lobar consolidation is the classical presentation of a bacterial pneumonia, however, sometimes viral pneumonias can also result in lobar consolidation. A blood culture may help determine the exact cause of a bacterial pneumonia but is only positive in less than 10% of patients with a clinical diagnosis of pneumonia.<sup>13 14</sup>

### Treatment

Pneumonia is treated with a prompt, appropriate course of antibiotics. The type of antibiotic, route of administration and duration of therapy depend on the age of the patient, the severity of the pneumonia and local patterns of [antimicrobial resistance](#). Cotrimoxazole and amoxicillin are usually effective drugs against the common bacteria causing pneumonia and are used often to treat children in developing countries. Infants under two months are at risk of severe illness and death, and so they should be referred to a hospital for treatment with intravenous antibiotics.

Where antibiotic resistance rates are high, the first-line drugs may be less effective against pneumonia and alternative drugs may be needed. In some settings, where there are large numbers of high-risk persons who are undernourished or HIV-positive, treatment strategies need to be adapted to use drugs that are effective against PCP.<sup>15</sup>

**Preventing pneumonia is key to improving child survival.** Preventing under-nutrition in children can reduce their risk of acquiring pneumonia or dying from pneumonia. Breastfeeding infants and providing zinc supplementation for children have been proven to reduce the risk of pneumonia and death.<sup>16 17</sup> There are also well-tolerated, effective vaccines against the common bacterial causes of pneumonia: the pneumococcal conjugate vaccine and the [Haemophilus influenzae type b \(Hib\) vaccine](#). The routine use of these vaccines can significantly reduce the burden of illness and death due to pneumonia among children worldwide.<sup>18 19</sup>

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<sup>12</sup> WHO. Management of the Child with a Serious Infection of Severe Malnutrition 2000. Accessed at [http://www.who.int/child-adolescent-health/publications/referral\\_care/Referral\\_Care\\_en.pdf](http://www.who.int/child-adolescent-health/publications/referral_care/Referral_Care_en.pdf)

<sup>13</sup> Shah SS, Alpern ER, et al. Arch Pediatr Adolesc Med 2003; 157(4): 389-92.

<sup>14</sup> Vuori-Holopainen E and Peltola H. CID 2001; 32: 715-26.

<sup>15</sup> UNICEF. Pneumonia: the Forgotten Killer of Children 2006.

<sup>16</sup> Victora CG, Kirkwood BR, et al. Am J Clin Nutr 1999; 70: 309-20.

<sup>17</sup> Black RE. J Nutrition 2003; 1485S-1489S.

<sup>18</sup> Madhi SA, Kuwanda L, et al. CID 2005; 40: 1511-8.

<sup>19</sup> WHO. The WHO position paper on *Haemophilus influenzae* type b conjugate vaccines. WER 1998; 73: 64-71.