

PNEUMONIA

A threat to child health and survival

Pneumonia is the leading cause of death and illness among children under five years of age in the world. It results in nearly 120 million cases a year.

In India, pneumonia caused nearly 175,000 child deaths in 2013.^[1] Approximately one out of every five children who die globally, die from pneumonia.^[2, 3]

WHAT IS PNEUMONIA?

► Pneumonia is a form of acute respiratory infection that causes inflammation or fluid in the lungs. It makes breathing difficult and limits oxygen intake.^[4] Symptoms of pneumonia include cough, difficulty in breathing, fast breathing, chest in-drawing and/or wheezing. If infants are severely ill, they may also be unable to feed or drink and may experience unconsciousness, convulsions, and even death.

WHAT CAUSES PNEUMONIA?

► Pneumonia is caused by a number of infectious agents, including viruses, bacteria, and fungi. Two of the most common causes of severe bacterial pneumonia are *Streptococcus pneumoniae* (pneumococcus) and *Haemophilus influenzae* type b (Hib).

Young children are highly susceptible to the pathogens that cause this disease.

Several risk factors increase a child's likelihood of developing pneumonia:

- A weakened immune system from malnutrition or other illnesses, such as HIV and measles
- Environmental factors such as indoor air pollution, a crowded home, and exposure to parental smoking
- Both these bacteria can also cause acute meningitis, an infection of the membranes covering the brain, which can lead to deafness, seizures, motor impairment, and mental disabilities.

WHAT IS THE BURDEN OF PNEUMOCOCCUS AND HIB IN INDIA?

► Pneumococcus and Hib are the leading causes of severe bacterial pneumonia in children, together accounting for approximately 60% of pneumonia deaths in children under the age of 5 years. In India, it is estimated that in 2013 pneumococcus caused more than 60,000 pneumonia deaths and Hib caused more than 35,000 pneumonia deaths.* In addition to this high mortality burden, these two bacteria are responsible for millions of cases of pneumonia and tens of thousands of cases of debilitating meningitis in children each year.^[1, 5, 6]

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*Unpublished estimates based on published disease-specific estimates and updated child mortality estimates for 2013.^[1, 5, 6]



- 1 Fischer Walker, C., Rudan, I., Liu, L., et al. Global burden of childhood pneumonia and diarrhoea, *Lancet*, 2013.
- 2 Committing to Child Survival: A Promise Renewed Progress Report 2014, UNICEF (2014). Accessed 3 November, 2014: http://files.unicef.org/publications/files/APR_2014_web_15Sept14.pdf
- 3 Liu, L., et al., Global, regional, and national causes of child mortality: in 2000–13, with projections to inform post-2015 priorities: an updated systematic analysis. *Lancet* (2014). Access 21 November 2014: [http://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(14\)61698-6/fulltext](http://www.thelancet.com/journals/lancet/article/PIIS0140-6736(14)61698-6/fulltext)
- 4 WHO. Pneumonia Fact Sheet. Available from: <http://www.who.int/mediacentre/factsheets/fs331/en/index.html>
- 5 O'Brien KL, Wolfson LJ, Watt JP, Henkle E, Deloria-Knoll M, McCall N, et al. Burden of disease caused by *Streptococcus pneumoniae* in children younger than 5 years: global estimates. *Lancet*. 2009; 374(9693): 893-902
- 6 Watt JP, Wolfson LJ, O'Brien KL, Henkle E, Deloria-Knoll M, McCall N, et al. Burden of disease caused by *Haemophilus influenzae* type b in children younger than 5 years: global estimates. *Lancet*. 2009; 374(9693): 903-11.

HOW CAN PNEUMONIA BE ADDRESSED?

Strategies for preventing and treating pneumonia

A set of comprehensive interventions that includes protection, prevention, and treatment, and which is supported by robust health systems, is essential to address death and suffering arising from this disease. A key component of prevention is vaccination.

Protection ✓

- Exclusive breastfeeding for 6 months
- Vitamin A and Zinc supplementation
- Adequate nutrition

Prevention

- Vaccination:
 - *pneumococcus, Hib, measles, pertussis*
- HIV Prevention
- Promotion of hand washing and hygiene
- Reduction of indoor air pollution

Treatment +

- Improvement of care-seeking behaviour
- Community case management
- Health facility case management

HIB VACCINES

► Hib vaccines are currently being used in over 185 countries worldwide.^[7] The disease has been virtually eliminated from industrialised countries, where the vaccine has been in widespread use for over 20 years. In developing countries that have introduced the vaccine into their national immunisation programmes, Hib pneumonia and meningitis have been drastically reduced.^[6]

7 International Vaccine Access Center (IVAC), Johns Hopkins Bloomberg School of Public Health, Vaccine Information Management System (VIMS) Report: Global Vaccine Introduction 2013 [cited September 2014]; Available from: <http://www.jhsph.edu/research/centers-and-institutes/ivac/vims/>

PNEUMOCOCCAL VACCINES

► Pneumococcal vaccines are currently being used in more than 115 countries.^[8] There has been an almost complete elimination of pneumococcal disease in countries where pneumococcal vaccines have been introduced. The vaccine has also been shown to reduce the disease among unvaccinated children and adults in a population – an effect of “herd immunity”.^[9, 10]

8 World Health Organization. WHO Position paper on Haemophilus influenzae type b conjugate vaccines. Weekly Epidemiological Record. 2006; 81(47)

9 Feikin DR, Kagucia EW, Loo JD, et al. Serotype-specific changes in invasive pneumococcal disease after pneumococcal conjugate vaccine introduction: a pooled analysis of multiple surveillance sites. PLoS Med 2013; 10(9): e1001517.

10 Davis SM, Deloria-Knoll M, Kassa HT, O'Brien KL. Impact of pneumococcal conjugate vaccines on nasopharyngeal carriage and invasive disease among unvaccinated people: review of evidence on indirect effects. Vaccine 2013; 32(1): 133-45.

RECOMMENDED BY EXPERTS

► These vaccines have been recommended by the WHO for use in national immunisation programmes worldwide and have been listed as necessary components of WHO and UNICEF's Integrated Global Action Plan for the Prevention and Control of Pneumonia and Diarrhoea (GAPPD). They are also key elements of the WHO Global Vaccine Action Plan, which is endorsed by 194 member states, including India. In India, the Indian Academy of Pediatrics has recommended the use of these vaccines for all Indian children.^[11, 12]

11 WHO, UNICEF. The Integrated Global Action Plan for Pneumonia and Diarrhoea (GAPPD) 2013. <http://defeatdd.org/sites/default/files/node-images/gappd-full-report.pdf> [accessed 1 Aug 2013].

12 WHO, Strategic Advisory Group of Experts on Immunisation (SAGE). 2014 Assessment Report of the Global Vaccine Action Plan. http://www.who.int/immunization/sage/meetings/2014/october/1_GVAP_Assessment_Report_2014_draft_SAGE_discussion.pdf [accessed 24 Nov 2014].

HIB AND PNEUMOCOCCAL VACCINES IN INDIA

► In 2011, the Government of India introduced the Hib-containing pentavalent vaccine in a phased manner. The pentavalent vaccine provides protection against five diseases: diphtheria, tetanus, pertussis, hepatitis B, and Hib. Between 2011 and 2013, the vaccine was introduced in 14 states and union territories. In 2013, the National Technical Advisory Group on Immunization recommended the national scale-up of the vaccine.

Pneumococcal vaccines are currently not included in India's national immunisation programme. They are only available on the private market, making them out of reach for the most vulnerable children.

