

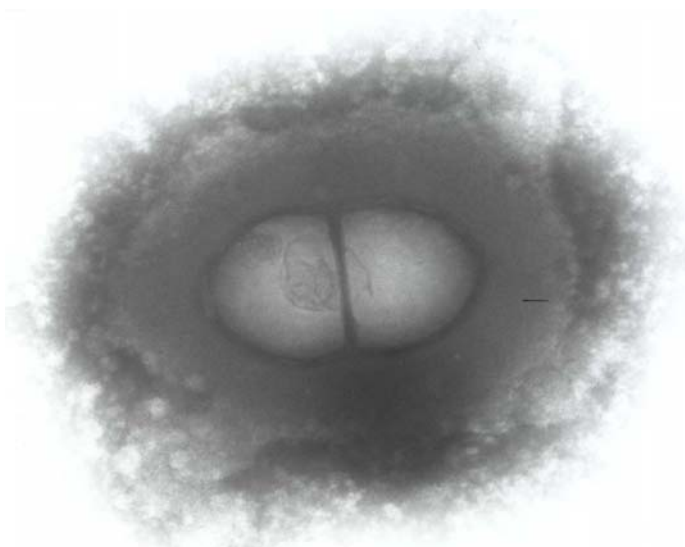


Pneumococcal disease – a risk for all children

Pneumococcal disease is a leading cause of illness in infants and young children, and it is a major public health problem worldwide. During childhood, all infants and young children are at risk.^{1,2}

Pneumococcal disease is caused by a bacteria

Streptococcus pneumoniae causes pneumococcal disease and about ninety different serotypes have been identified. *S. pneumoniae* can be characterized as a particular serotype because of the complex sugar coating that surrounds it. This coating can allow the bacteria to escape some of the human body's natural immune responses, making it challenging for the body to fight off infection; nevertheless, antibodies (proteins used by the immune system to identify and neutralize foreign objects like bacteria) specific to the serotype can protect a person against pneumococcal disease. Although there are several serotypes of *S. pneumoniae*, a limited number of these are responsible for most pneumococcal disease worldwide.³



Serotype 19F; Photograph by Rob Smith (Wyeth)

Carriage can lead to transmission and infection

S. pneumoniae can be found in the nose and throat of healthy people without causing disease (this is referred to as “carriage”). Carriage is especially common in young children and plays a key role in pneumococcal disease and in the spread of *S. pneumoniae* (transmission) to other susceptible individuals in the community. These bacteria are transmitted from one person to another through contact with nose and throat secretions of carriers,

who may be healthy or may be afflicted with a pneumococcal infection. Once an individual without carriage has been exposed to pneumococci in this way, nose and throat colonization may occur. If the colonizing bacteria are able to spread to the bloodstream, the lower respiratory tract, nearby sinuses or the middle ear, disease may occur.^{1,2}

The so-called “paediatric serotypes” are the ones likely to be found in the nose and throat of healthy young children (carriage). They may not respond as well as they used to previously to commonly used antibiotics (decreased antibiotic sensitivity).^{1,2}

Streptococcus pneumoniae – All infants and young children are at risk

Invasive pneumococcal diseases (IPD) occur when bacteria invade the bloodstream and cause bacteremia, sepsis, or bacteremic pneumonia, or cross the “blood/brain barrier” and cause meningitis (inflammation of the protective membranes covering the brain and spinal cord), which may lead to death or to serious brain damage. *S. pneumoniae* can also cause non-invasive diseases such as pneumonia and otitis media. Certain risk factors such as HIV infection, sickle-cell disease (SCD), or lack of a functioning spleen increase the likelihood of pneumococcal infections.¹

The reported incidences of cases of meningitis caused by *S. pneumoniae* in European children are documented in the table below. One can see that there are about 10 cases of pneumococcal meningitis per 100,000 children per year throughout Europe.⁴

Published Pneumococcal Meningitis Epidemiology Surveys (children <2 years old), Europe, 1985 to 2006³

Pneumococcal meningitis incidence*	Country	Year
3.0	Finland	2004
3.8	Spain	2002
4.7	Finland	1992
5.6	Switzerland	1998
7.2	Germany	2000
7.7	Austria	2004
10	Sweden	2000
11.8	Great Britain	2002
14	Spain	2002
14.8	Spain	2002
15	Great Britain	2004
16.1	Belgium	2003

*Per 100 000 population per year

Vaccines to protect against pneumococcal disease

Standard practice for the treatment of pneumococcal disease varies by country and by disease. The World Health Organization states that vaccination is the only public health measure likely to have a significant impact on invasive pneumococcal disease and in the process may reduce the level of antibiotic use and slow the growth of antibiotic resistance.^{1,2} A pneumococcal conjugate vaccine is available that helps protect against the serotypes that cause much of the pneumococcal disease in children. Epidemiological data between 1988 and 2003 in Europe indicates that serotype coverage varies from country to country. This vaccine should cover between 54% and 84% of the clinical isolates responsible for IPD in European children <2 years of age, and about 62% to 83% in children 2 to 5 years of age.⁴

In addition to having a direct effect on the vaccinated childhood population, conjugate vaccine immunization also has an indirect (“herd”) effect on the unvaccinated population.⁵ Moreover, vaccination was shown to reduce the incidence of pneumococcal antibiotic resistance.⁶

A pneumococcal polysaccharide (unconjugated) vaccine is also available for immunization of certain high-risk children 2 years of age and older (high-risk children include those without a spleen, those with SCD, HIV infection, and other immunocompromising or chronic diseases) and high-risk adults, including elderly persons (high-risk adults include those without a spleen, those with SCD, HIV infection, chronic kidney, liver, heart, or lung disease, diabetes, and alcoholism). Because this vaccine is not a conjugate vaccine, it is not effective in children younger than 2 years of age.

Implementation of vaccination

The opportunity to help protect infants and young children from pneumococcal disease is available through the use of pneumococcal conjugate vaccine. The World Health Organization (WHO) considers the introduction of pneumococcal conjugate vaccines into national immunization programs a priority.²

A pneumococcal heptavalent conjugate vaccine has been registered in more than 70 countries¹ and included in 18 national or regional immunization

programs. Currently in Europe, the countries of Belgium (2007), Denmark (2007) France (2006), Germany (2006), Greece (2006), Italy [most regions] (2006), Luxembourg (2003), Netherlands (2006), Norway (2006), Spain [Madrid] (2007), Sweden [Stockholm] (2007), Switzerland (2006), and the United Kingdom (2006) have introduced generalised vaccination:

<http://www.euvac.net/graphics/euvac/vaccination/pcv7.html>.

References

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