

Reduced effect of the pediatric pneumococcal conjugate vaccination on invasive pneumococcal disease in adults in Germany

Mark van der Linden, Stephanie Perniciaro, and Matthias Imöhl

German National Reference Center for Streptococci (GNRCS) and Institute of Medical Microbiology, RWTH-Aachen, Germany

Mark van der Linden
University Hospital RWTH Aachen
Institute of Medical Microbiology
National Reference Center for Streptococci
Pauwelsstrasse 30, 52074 Aachen, Germany
Email: mlinden@ukaachen.de

INTRODUCTION AND PURPOSE

Streptococcus pneumoniae is one of the most common causes of pneumonia, sepsis and meningitis in older adults. In July 2006, a general recommendation was issued for pneumococcal conjugate vaccine administration in all children under two.

For adults over 60, there is a recommendation for the polysaccharide vaccine. In this study, we show a stagnation of the herd protection effect of the infant vaccination program on adult disease.

METHODS

Invasive pneumococcal disease (IPD) is not subject to required reporting in Germany, but the German National Reference Center for Streptococci (GNRCS) has been collecting invasive isolates from adults since 1992. Serotyping was performed by Quellung reaction, and statistical analyses were carried out with R.

RESULTS

The collection of the GNRCS contains 28,552 isolates from IPD in adults, of which 7,359 were from pneumonia cases. 18,645 cases are from adults over 60, of which 4,836 were from pneumonia. In the last three seasons, there has been a significant increase in Serotype 3 IPD cases in adults.

Serotype 3 now represents 19.9% of all IPD cases in adults. The decrease in the remaining vaccine-type serotypes is no longer so pronounced as in previous years. The number of IPD cases in Serotype 1 is still decreasing, but the proportion of cases from serotypes 19A and 7F remains consistent.

Figure 1. Herd protection effect of pediatric PCV program on adult IPD serotype distribution. * = incomplete season

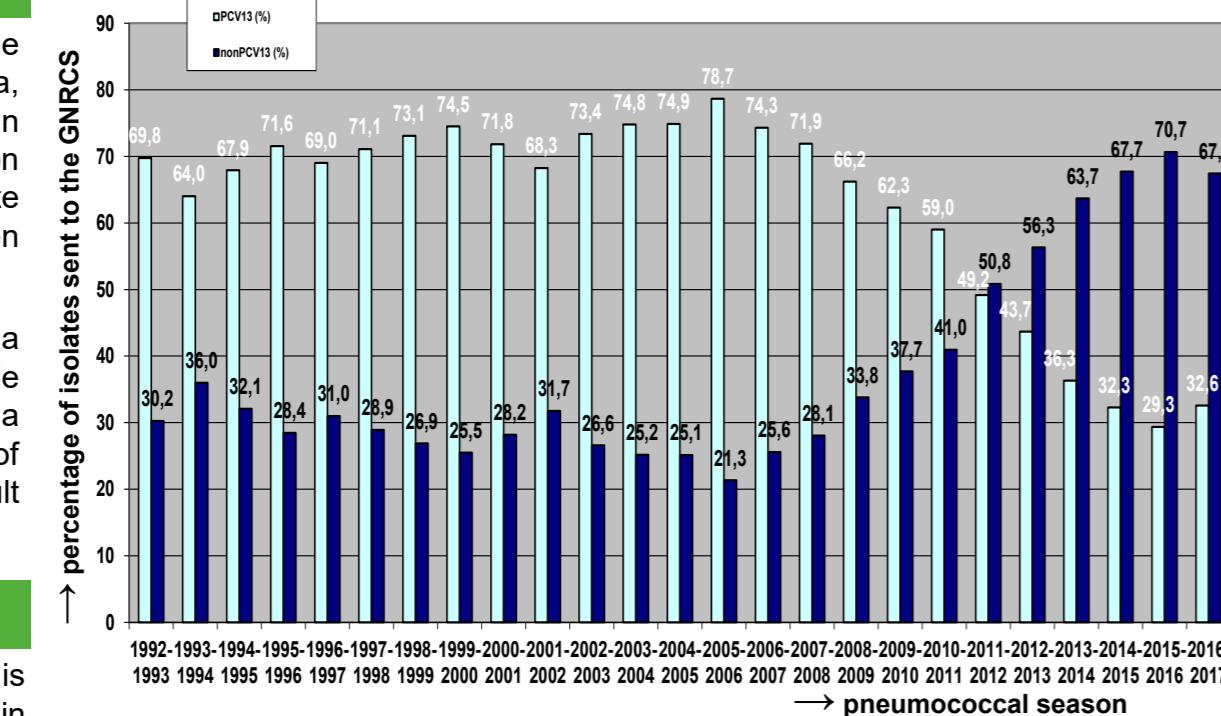


Figure 2. Herd protection effect of pediatric PCV program Serotypes 1, 3, 5, 6A, 7F, and 19A on IPD in adults in Germany. * = incomplete season

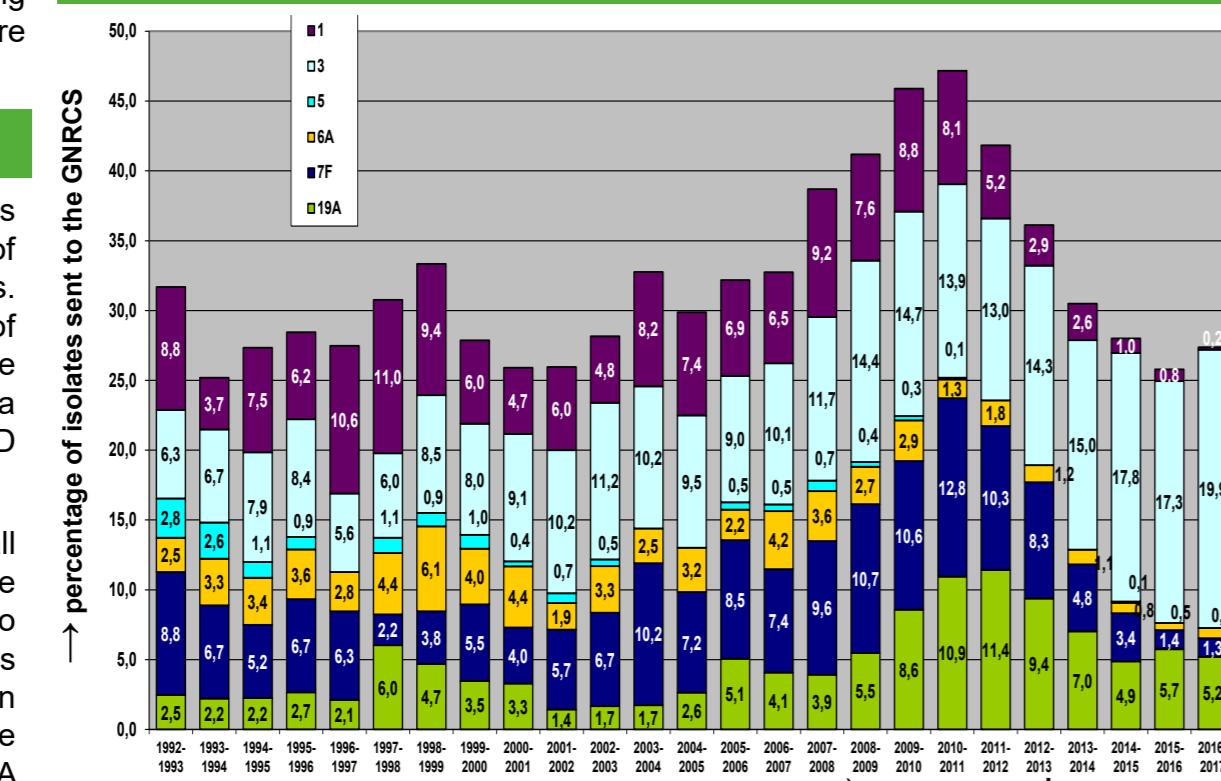


Figure 3. Count of Serotypes 1, 3, 7F, and 19A IPD isolates from adults in Germany. * = incomplete season

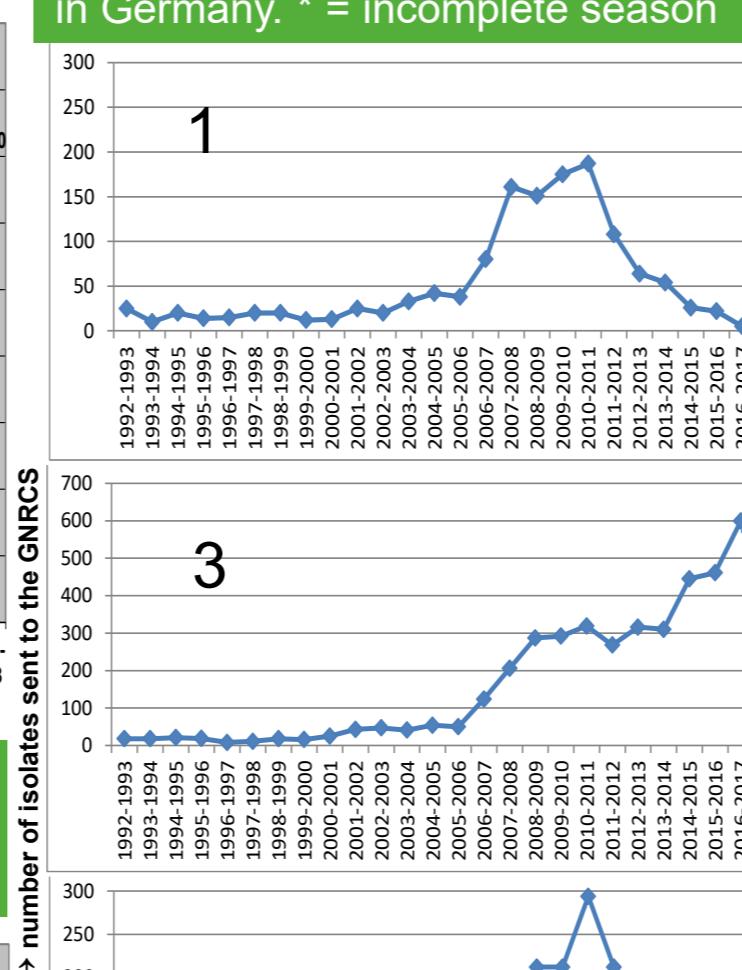


Figure 4. Increasing estimated incidence of Serotype 3 IPD in adults over 60 years of age in Germany from 2006-2007 to 2016-2017. Cases of Serotype 3 IPD per federal state were compared to population by age for each federal state for the pneumococcal seasons 2006-2007 (near right) and 2016-2017 (far right).

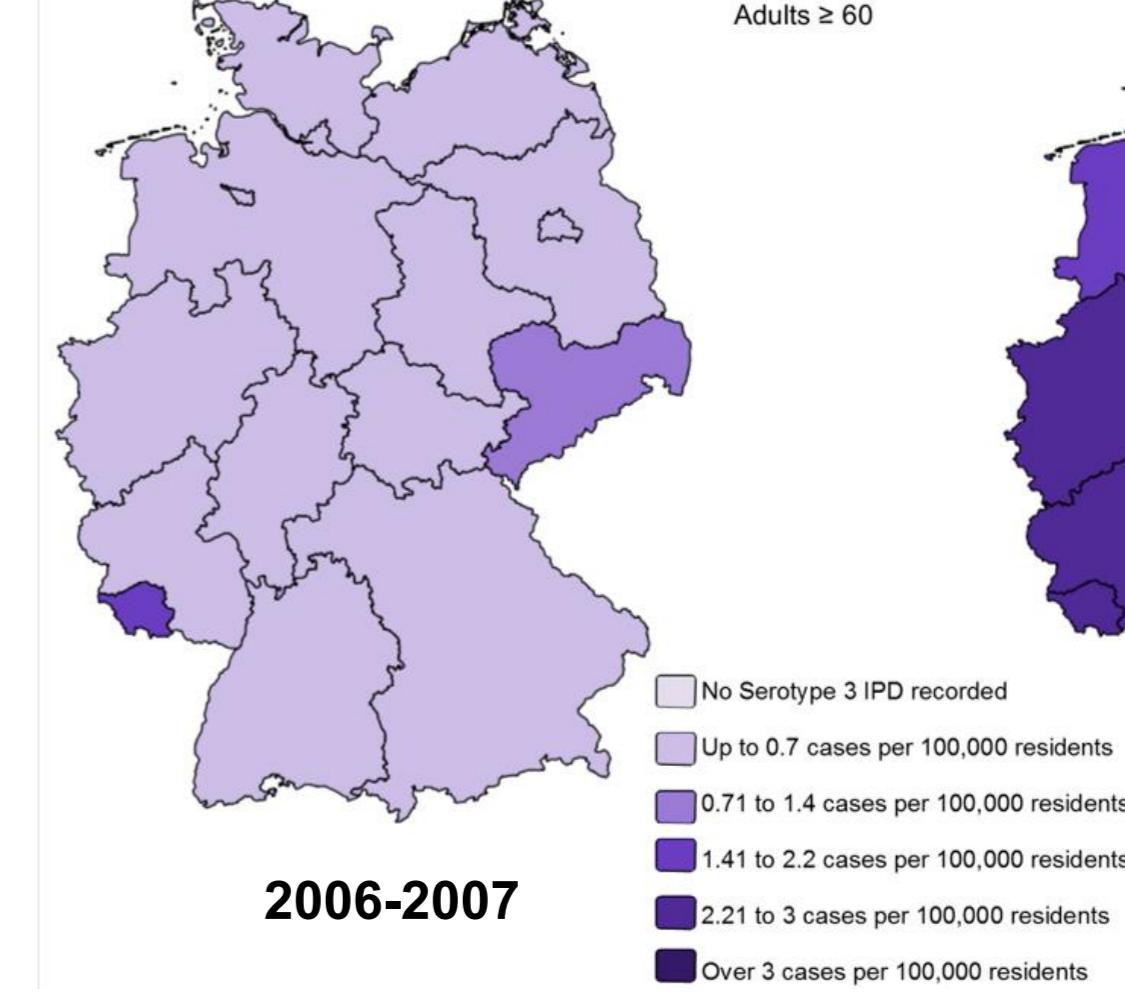
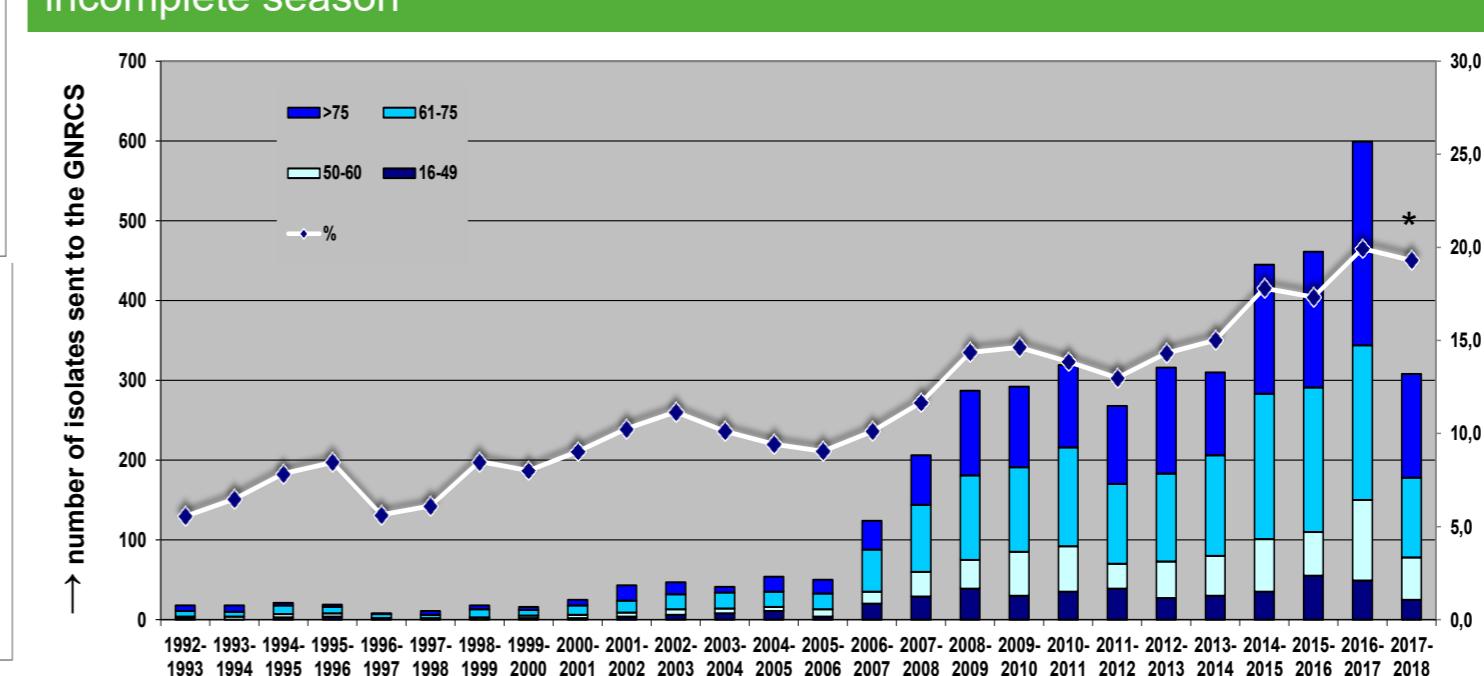


Figure 5. Count of Serotype 3 IPD isolates in adults in Germany by age group and the percentage of Serotype 3 among all IPD isolates. * = incomplete season



CONCLUSIONS

- A strong increase in serotype 3 IPD has been observed in all adults. It seems that there is no herd protection effect from childhood immunization.
- Serotypes 19A, 6A, and 7F persist as well.
- Persistence of vaccine-type serotypes despite childhood vaccination indicates that a pneumococcal conjugate vaccine program for adults, especially older adults could be helpful in reducing vaccine-type IPD.

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