

Vaccine against pneumococcal infections has led to widespread reduction in serious disease

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Vaccination with the pneumococcal conjugate vaccine-7 [PCV7—a vaccine that covers 7 strains (serotypes) of *Streptococcus pneumoniae*] is linked to overall decreases in the rate of serious infections caused by this bacterium, such as pneumonia and meningitis, referred to as invasive pneumococcal disease (IPD)], but small increases in IPD caused by serotypes of *Streptococcus pneumoniae* not covered by the vaccine (referred to as non-vaccine type IPD), according to a study published in PLOS Medicine this week.

The results of this study, led by Daniel Feikin, Matthew Moore, and their colleagues from Johns Hopkins School of Public Health and the Centers for Disease Control and Prevention, USA, are important as they suggest rapid and sustained reductions in pneumococcal disease after vaccine introduction. The study does show that serotypes causing IPD covered by PCV-7 have been partially replaced by types not covered by PCV-7 (a phenomenon referred to as serotype replacement), which has implications for the surveillance of newer pneumococcal [conjugate vaccines](#), such as PCV10 and PCV13, which cover more serotypes.

The authors combined IPD surveillance information from multiple countries to estimate changes in IPD rates before and after PCV7 introduction. For children aged under 5 years, the authors found that the overall number of observed cases of IPD in the first year after the introduction of PCV7 was about half the expected number; this reduction in the number of IPD cases remained relatively stable over 7 years. Among adults, the authors observed smaller, more variable

decreases in overall IPD. Notably, the rate of IPD caused by vaccine serotypes decreased every year, but the rate of IPD caused by non-vaccine serotypes increased annually, which was likely to be the result of serotype replacement.

However, these findings have several limitations: PCV7 is no longer made and so extrapolation of these results to newer PCV10 and PCV13 formulations should be done cautiously. Moreover, because the surveillance data used in this study mainly came from high-income countries, these findings may not be generalizable to low-income countries, in which pneumococcal disease is a major problem.

The authors say: "The most important public health implication of our analysis was that decreases in overall IPD rates in children—the group targeted for PCV7 vaccination— occurred quickly and were sustained after vaccine introduction despite increases in [non-vaccine serotype] rates."

They continue: "Optimizing surveillance data that allows for valid interpretations of the [vaccine](#) effect on disease is essential for sound policy decisions."

More information: Feikin DR, Kagucia EW, Loo JD, Link-Gelles R, Puhan MA, et al. (2013) Serotype-Specific Changes in Invasive Pneumococcal Disease after Pneumococcal Conjugate Vaccine Introduction: A Pooled Analysis of Multiple Surveillance Sites. *PLoS Med* 10(9): e1001517. [DOI: 10.1371/journal.pmed.1001517](https://doi.org/10.1371/journal.pmed.1001517)

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