

# Pneumococcal Serotypes Causing Empyema In UK Children From The Enhanced Surveillance Programme 2006-2009



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## Introduction

- Pneumococcal infection has been shown to be the commonest cause of empyema in UK children<sup>1,2</sup>.
- The seven-valent pneumococcal conjugate vaccine (PCV-7), Prevnar™ was introduced into the UK routine immunisation programme in September 2006.
- Enhanced surveillance of paediatric empyema was established in the UK to monitor changes in the serotype distribution following the vaccine introduction.
- We report the results of the non-culture surveillance August 2006-September 2009.

## Methods

- Pleural fluid samples that are negative on standard culture methods.
- Pneumolysin PCR or IytA PCR to confirm pneumococcal infection. Positives sent to the Respiratory & Systemic Infections Laboratory, London.
- Multiplex immunoassay using Luminex technology for detection of pneumococcal serotype polysaccharides.
- Assay includes 1, 3, 4, 6A/C, 6B, 7F/A, 8, 9V, 14, 18, 19A, 19F, 23F and C-polysaccharide.

## Results

223 samples were received from 211 patients (64 in 2006-07, 53 in 2007-08 and 94 in 2008-09). 207 serotypes were obtained (93% detection rate). The median age was 3 yrs (Range: 0 – 16 yrs) and 55 % were male.

Figures 1 – 3 show the detected serotype distribution across different age groups.

Serotype 1 caused the greatest burden of disease over the study period, however serotype 3 increased significantly between 2006 and 2009 from 12 % to 30 % ( $p=0.003$ ).

## Discussion

- There was a 31 % increase in the number of samples received in 2008-9 compared to 2006-7. This is likely to be as a result of an increase in reporting with the commencement of a national research study of paediatric empyema in September 2008, although an increase in disease cannot be ruled out.
- The overall proportion of serotype 1 declined over the study period, although in the under 2's it increased significantly from 9 % to 23 % ( $p=0.01$ ).
- 93 % of pleural fluid tested was found to have serotypes contained within the PCV-13 vaccine.

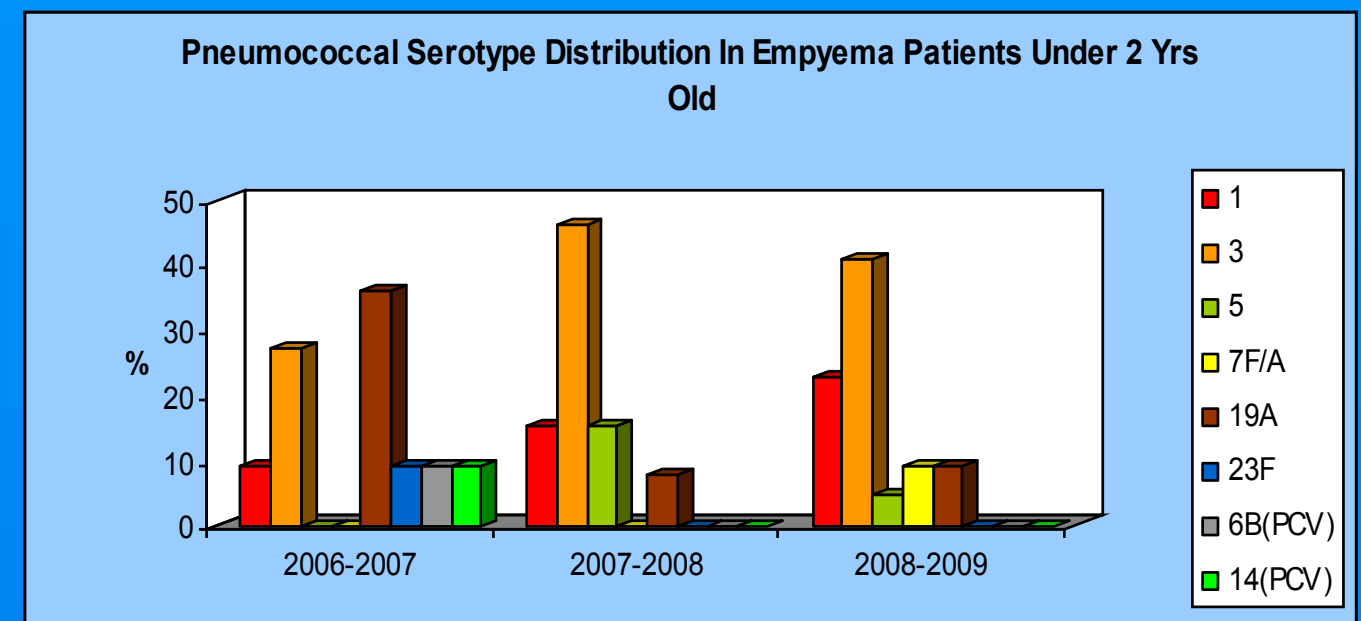


Figure 1

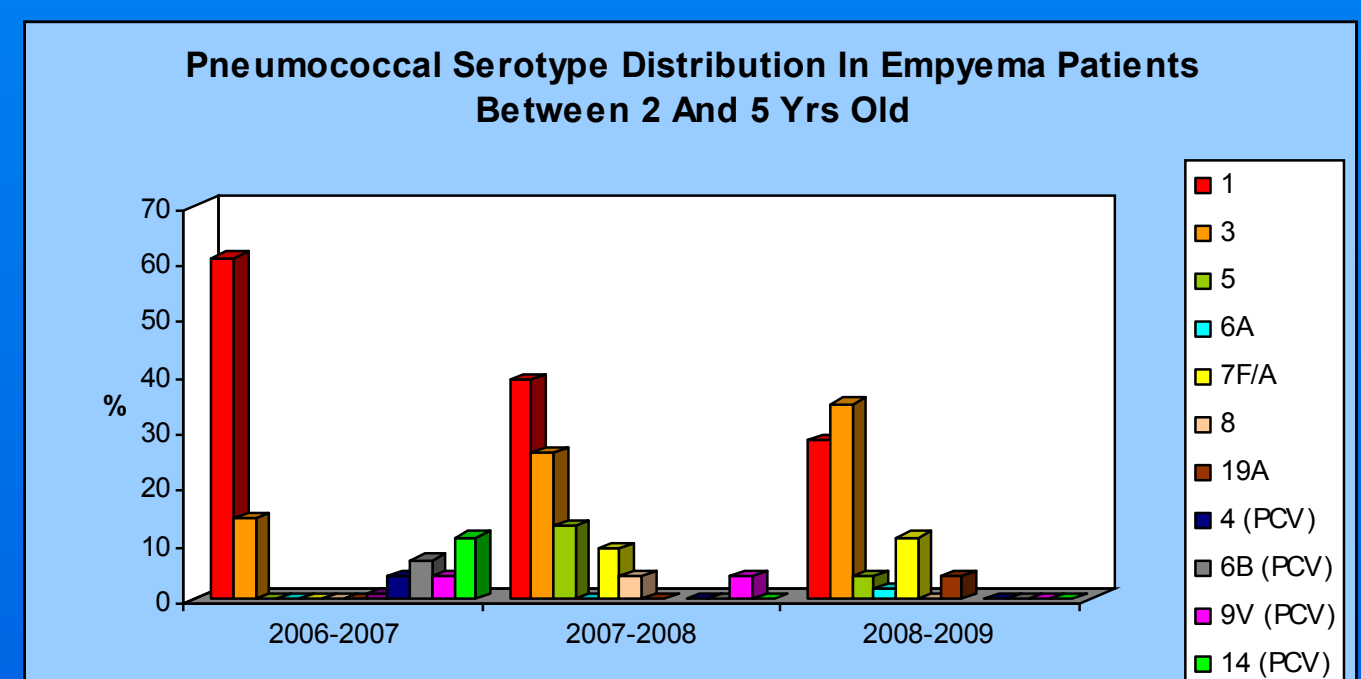


Figure 2

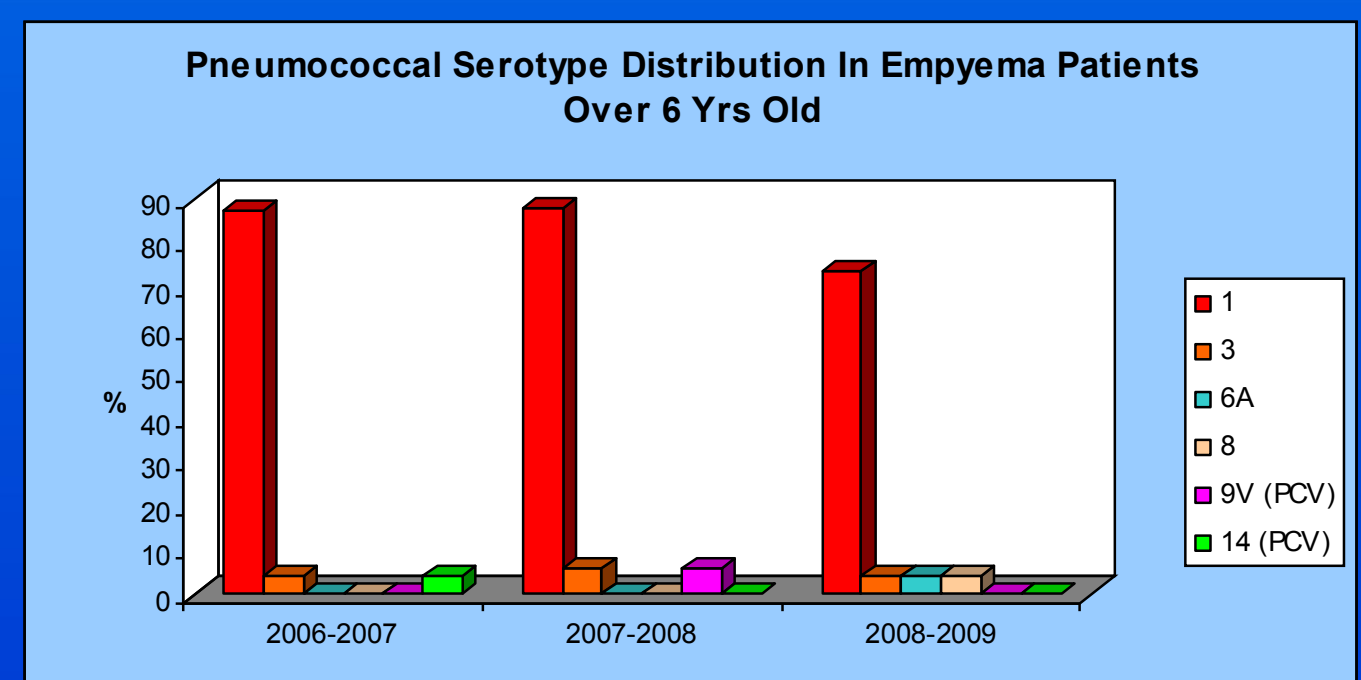


Figure 3

## Conclusions

- In the third year of surveillance no PCV-7 serotypes were detected.
- Serotype 3 appeared to increase significantly over the study period.
- 93% of pleural fluids tested in 2008-2009 contained PCV-13 serotypes.

## References

- Saglani S, Harris KA, Wallis C, Hartley JC. Empyema: the use of broad range 16S rDNA PCR for pathogen detection. *Arch Dis Child* 2005;90:70-73
- Eltingham, G et al. Culture-negative childhood empyema is usually due to penicillin-sensitive *Streptococcus pneumoniae* capsular serotype 1. *J Clin Micro* 2003;41:521-2