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Comparison between respiratory and blood isolates of community-acquired *Streptococcus pneumoniae* from the UK and Ireland: resistance and serotypes

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Objective Results from the BSAC Respiratory and Bacteraemia Resistance Surveillance Programmes were compared to identify differences between respiratory and blood isolates of community-acquired *S. pneumoniae*.

Methods Respiratory isolates were collected each winter from 1999/2000 to 2005/2006, blood isolates each year from 2001 to 2005. Fifty centres contributed (21 respiratory only, 19 blood only, 10 respiratory and blood), not all in every year. MICs were measured by BSAC methods in two central laboratories, one for each programme. Respiratory isolates from 2005/06 and all blood isolates were serotyped. Logistic and multinomial logit models used robust errors to account for clustering of effects by centre.

Results Results are shown for 843 blood and 5065 respiratory isolates (843 and 749 with known serotype) taken from patients in the community or within 48 hours of hospital admission; 81% of blood and 60% of respiratory isolates were from hospitalised patients. Blood isolates were more likely than respiratory to be from very young or old patients – 10 *vs*. 6% were ≤4 and 22 *vs*. 11% were ≥80 years old. Male patients contributed 52% of blood and 59% of respiratory isolates.

Conclusions

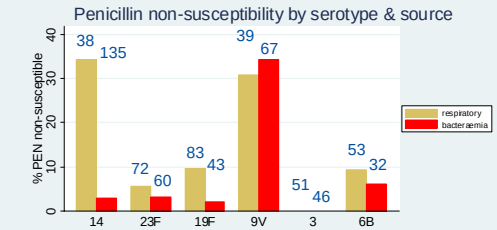
- Penicillin non-susceptibility has been and remains uncommon in community-acquired *S. pneumoniae* in the UK.
- Serotype distributions differ between blood and respiratory isolates, and have shifted gradually in blood over the last 5 years.
- These results provide a baseline for comparison should serotype distributions and associated resistance change with future use of the 7-valent conjugate vaccine.

Figures above bars on charts show total number of isolates tested.

% Penicillin non-susceptible (MIC > 0.06 mg/L)								
season*	1999	2000	2001	2002	2003	2004	2005	total
blood	-	-	5.4	7.0	6.2	2.8	2.5	4.7
respiratory	10.7	10.2	7.7	8.8	6.8	7.3	6.8	8.3

* i.e. year (e.g. 2001) or winter season (e.g. 2001-02)

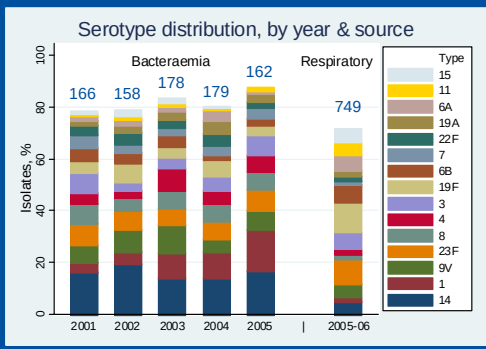
Penicillin non-susceptibility has been less prevalent in blood than respiratory isolates throughout the period of the two studies. However, there was not enough information for a reliable and complete analysis of the (possibly interacting) effects of patient age, care setting, isolate source and serotype, as only 264 blood and 291 respiratory isolates with known serotypes were obtained from the same centres in overlapping time periods.

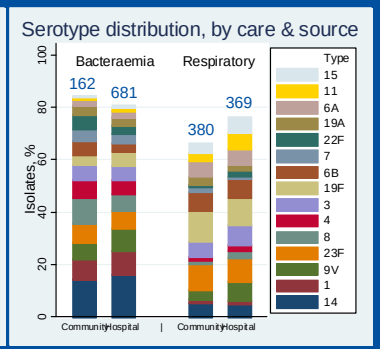


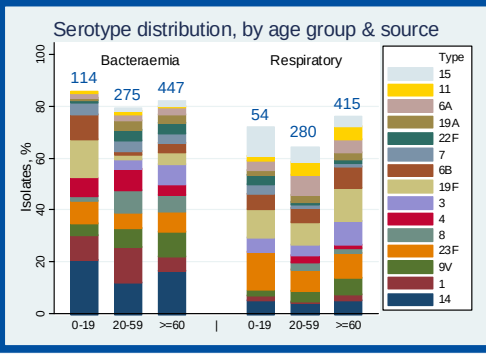
There were clear differences in penicillin non-susceptibility between different serotypes, but this did not explain possible differences in susceptibility between blood and respiratory isolates. In some cases, there were also clear susceptibility differences between blood and respiratory isolates of the same serotype.

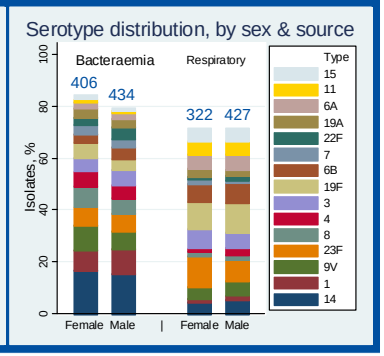
Penicillin non-susceptibility was more prevalent in 7-valent vaccine serotypes than others – 8 *vs*. 2% in blood and 13 *vs*. 2% in respiratory isolates.

The distribution of serotypes from blood changed gradually over the 5 years, with serotype 1 increasing at the expense of other serotypes. The distribution of lower respiratory serotypes in 2005-06 was substantially different. Serotypes representing ≥5% of the total were, in order, 14, 1, 9V, 23F, 8, 4, 3 & 19F (total 63%) in blood and 19F, 23F, 6B, 3, 6A, 9V & 14 in respiratory isolates (total 51%).
Serotypes present in the 7-valent conjugate (23-valent polysaccharide) vaccines represented 48 (91)% of blood and 42 (≤ 73)% of respiratory isolates.
Serotype distributions also varied with age group, but not so greatly. They did not vary with sex or care setting (community, or hospital within 48 hours of admission).









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