

**BACKGROUND** The BSAC Resistance Surveillance Project tracks antimicrobial susceptibility in *S. pneumoniae* from blood (invasive infections) and community-onset lower respiratory infections (LRTI, up to 48 hours in hospital) in the UK and Ireland.

Routine vaccination with PCV7 (from Sept 2006) and PCV13 (from April 2010) targeted resistant invasive serotypes, while increasing antibiotic prescription<sup>1</sup> maintained selection pressure on LRTI in the community.

**METHODS** From Oct 2000 to Dec 2013, 8037 LRTI and 2959 blood isolates were collected from 20-39 centres per year. MICs were measured by BSAC agar dilution in two central laboratories and interpreted by BSAC/EUCAST breakpoints.

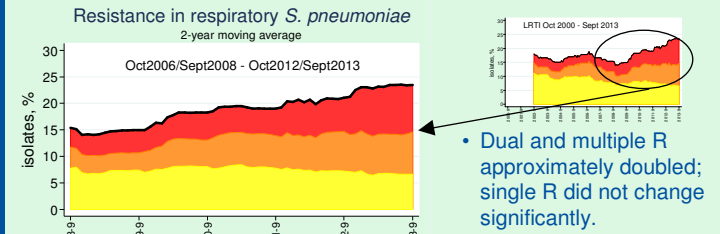
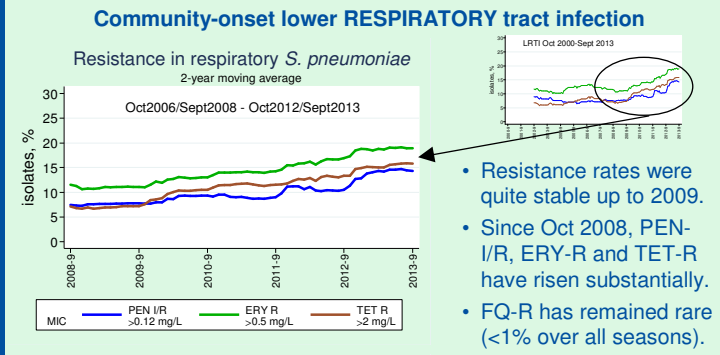
Resistance (R) classes were penicillin (PEN) intermediate (I) or R; erythromycin (ERY) R; tetracycline (TET) R; and fluoroquinolone (FQ) R - defined as ciprofloxacin MIC >8 mg/L, known to predict moxifloxacin R. Dual R is R to exactly 2 classes; multiple R is R to ≥3 classes.

**RESULTS** 89% of blood *S. pneumoniae* of known origin were from RTI; 30% lacked this data.

**CONCLUSIONS**

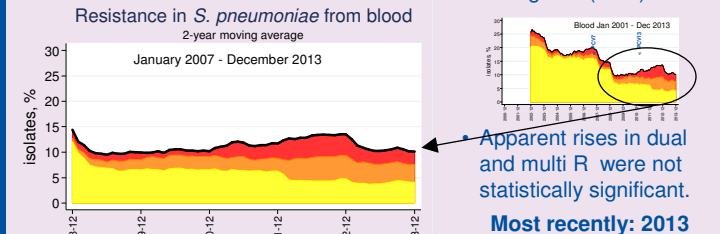
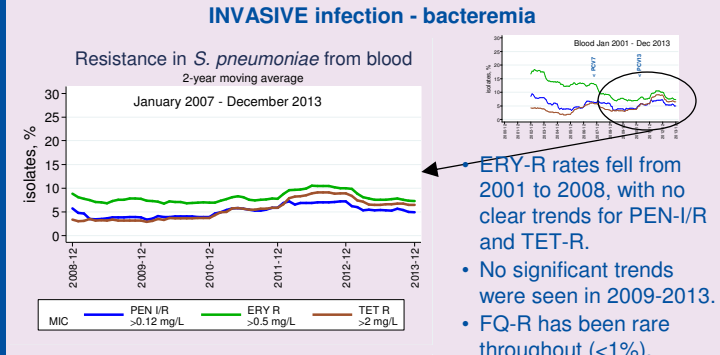
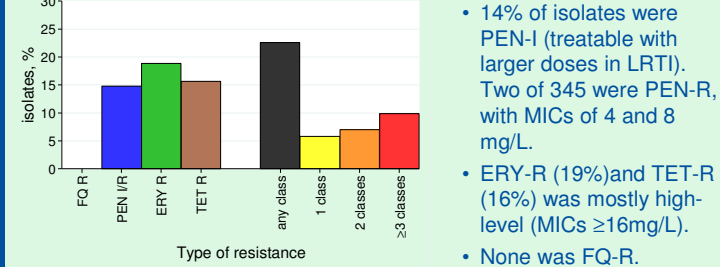
**Among *S. pneumoniae*, in the last 5 years:**

- Rates of resistance to PEN, ERY and TET increased substantially among respiratory isolates, as did dual and multiple resistance.
- An apparent shift from single to dual and multiple resistance among invasive isolates was not a statistically significant trend.
- Respiratory *S. pneumoniae* are now three times as likely as invasive isolates to have at least one resistance (22.6 vs 7.2%), and nearly five times as likely to have multiple resistance (9.9 vs 2.1%).



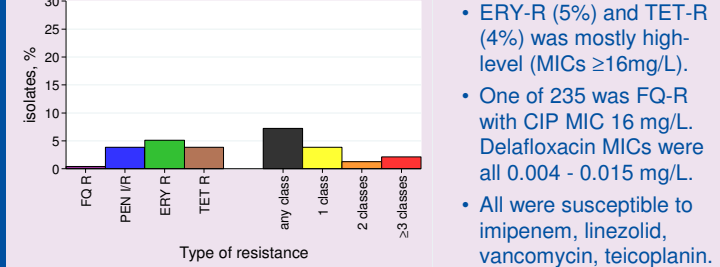
**Most recently: 2012/13**

- 23% of *S. pneumoniae* were R to ≥1 class, 7% were R to 2 classes, and 10% to ≥3 classes.



**Most recently: 2013**

- 7% of *S. pneumoniae* were R to ≥1 class; 2% were R to ≥3 classes.
- 4% were PEN-I, none PEN-R.
- ERY-R (5%) and TET-R (4%) was mostly high-level (MICs ≥16mg/L).
- One of 235 was FQ-R with CIP MIC 16 mg/L. Delafloxacin MICs were all 0.004 - 0.015 mg/L.
- All were susceptible to imipenem, linezolid, vancomycin, teicoplanin.



<sup>1</sup>Hawker et al 2014 J Antimicrob Chemother doi:10.1093/jac/dku291 - Trends in antibiotic prescribing in primary care...  
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**Organism ID and Susceptibility Testing:** J. Murray and staff at LGC, Fordham; S. Mushtaq and staff at Public Health England.  
**Collecting Laboratories:** See www.bsac.org.uk <sup>1</sup>North Bristol NHS Trust; <sup>2</sup>Bayer; <sup>3</sup>Novartis; <sup>4</sup>EUCAST Scientific Secretary; <sup>5</sup>Pfizer; <sup>6</sup>Public Health England; <sup>7</sup>University of East Anglia; <sup>8</sup>AstraZeneca; <sup>9</sup>LGC; <sup>10</sup>Cambridge University; <sup>11</sup>Basilea; <sup>12</sup>Cubist.

**Sponsors 2000-2013:** Abbott, Astellas, **AstraZeneca**, Aventis, **Basilea**, Bayer, Cempra, Cerexa, **Cubist**, GSK, Genesoft, J&J/Janssen-Cilag, **Melinta** (associate), Merck, Novartis, **Pfizer**, Theravance. (2013 in bold)  
**Central Laboratories:** Public Health England, London; **LGC**, Fordham.  
**Support: BSAC.**  
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