

## BACKGROUND

- The BSAC Bacteraemia Resistance Surveillance Programme has been monitoring antimicrobial susceptibility in the major organisms causing bacteraemia in the UK and Ireland since 2001.
- In 2012, the BSAC Bacteraemia Resistance Surveillance Programme collected 3,205 blood isolates from 39 laboratories in the UK and Ireland.

## RESULTS

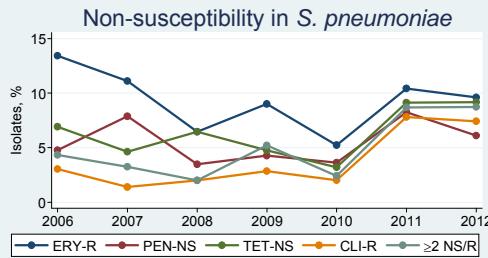
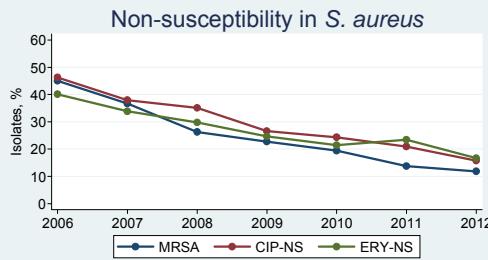
### GRAM POSITIVE BACTERIA

#### Staphylococci

- MRSA continued to decline to 12% of 515 *S. aureus* in 2012 from 45% in 2006 and 5-year average 2007-11 of 24%.
- Non-susceptibility (NS) of *S. aureus* to ciprofloxacin (16%) and erythromycin (17%) was also lower in 2012; mupirocin NS (2%) and gentamicin NS (3%) were little changed.
- NS rates in 203 isolates of coagulase-negative staphylococci were similar to previous years, with 77% methicillin-resistant.

#### Streptococci and enterococci

- Penicillin NS in 229 *S. pneumoniae* in 2012 was stable at 6%, all intermediate with MIC  $\leq$  2 mg/L. Rates of clindamycin resistance (7%, all high-level, MIC  $>$  128 mg/L) and dual or multiple-agent NS (9%) were similar to 2011 but higher than in the previous 5 years.
- 190 other  $\alpha$ -haemolytic streptococci showed similar rates of non-susceptibility as in previous years with 15% penicillin NS, 10% amoxicillin NS and 37% erythromycin NS.
- All of 244  $\beta$ -haemolytic streptococci were penicillin susceptible in 2012, as usual.
- There was little change in NS among enterococci. All were susceptible to tigecycline and linezolid. All of 128 *E. faecalis* were susceptible to ampicillin and impenem, and only 2% were NS to vancomycin; 30% of 115 *E. faecium* were vancomycin NS.



## METHODS

- Clinical laboratories collect up to a defined quota of isolates from January to December in each surveillance year.
- MICs are measured and interpreted by BSAC methods.
- 2012 results were compared primarily with data for the five preceding years (2007-2011).
- See [www.bsacsurv.org](http://www.bsacsurv.org) or *JAC*, 2008. **62**, suppl 2 ii15 - ii28

## RESULTS

### GRAM-NEGATIVE BACTERIA

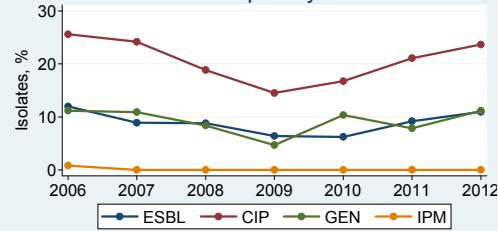
#### *Pseudomonas aeruginosa*

- Non-susceptibility (NS) in *P. aeruginosa* has changed little over 12 years' surveillance. Of 218 isolates in 2012, 23 were imipenem NS, one being a VIM metallo- $\beta$ -lactamase producer. All were susceptible to colistin.

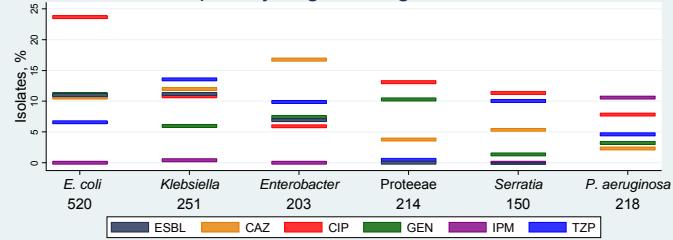
#### Enterobacteriaceae

- Rates of **ESBL production**(11%) and **ciprofloxacin** NS (24%) noted in 520 *E. coli* in 2012 have clearly risen from their 2009-10 troughs of 6% and 15%, respectively. Little or no such increase was seen by 2012 in 251 *Klebsiella* (11% ESBL, 11% CIP-NS) or 203 *Enterobacter* (7% ESBL, 6% CIP-NS).
- AmpC** hyper-production was found in 12% of *Enterobacter* and 13% of 150 *Serratia*.
- Gentamicin** NS changed little in any Gram-negative group.
- Carbapenems** All *E. coli*, *Enterobacter* and *Serratia* and 250/251 *Klebsiella* were susceptible to imipenem, the exception being a single VIM-producing isolate of *K. pneumoniae*.
- Colistin** non-susceptibility was seen in 6% of *Enterobacter* isolates compared with <2% among *E. coli* and *Klebsiella*.

#### Non-susceptibility in *E. coli*



#### Non-susceptibility in gram-negative bacteria, 2012



## CONCLUSION

- Methicillin resistance in *S. aureus* has continued to fall since 2009 but not as steeply as between 2006 and 2008.
- ESBLs and ciprofloxacin resistance in *E. coli* have risen again, from a trough around 2009-2010.
- Resistance rates are still low in *S. pneumoniae*; changing patterns may reflect selective pressure from vaccines.

**Abbreviations:** ESBL extended-spectrum  $\beta$ -lactamase, MRSA methicillin-resistant *S. aureus*. CAZ ceftazidime, CIP ciprofloxacin, CLI clindamycin, ERY erythromycin, FUS fusidic acid, GEN gentamicin, IPM imipenem, PEN penicillin, TET tetracycline, TGC tigecycline, TZP piperacillin-tazobactam. R resistant, NS non-susceptible.

**Extended Working Party Members (October 2013):** A. MacGowan<sup>1</sup> (Chair), M. Allen<sup>2</sup>, D. Brown<sup>3</sup>, P. Fernandes<sup>4</sup>, H. Grundmann<sup>5</sup>, R. Janes<sup>6</sup>, A. Johnson<sup>7</sup>, M. Jones,<sup>8</sup> A. Kidney<sup>6</sup>, D. Livermore<sup>2</sup>, S. McCurdy<sup>9</sup>, V. Martin<sup>1</sup>, T. Mepham<sup>10</sup>, S. Mushtaq<sup>7</sup>, S. Peacock<sup>11</sup>, J. Porter<sup>12</sup>, R. Reynolds<sup>1</sup>, C. Thomson<sup>13</sup>.

**Organism ID and Susceptibility Testing:** S. Mushtaq<sup>7</sup> and staff at Public Health England - Colindale

<sup>1</sup>North Bristol NHS Trust; <sup>2</sup>Novartis; <sup>3</sup>EUCAST Scientific Secretary; <sup>4</sup>Cempra; <sup>5</sup>RIVM; <sup>6</sup>Quotient BioAnalytical Sciences, Fordham; <sup>7</sup>Public Health England, London; <sup>8</sup>Basilea; <sup>9</sup>Cubist;

<sup>10</sup>AstraZeneca; <sup>11</sup>University of Cambridge; <sup>12</sup>Pfizer; <sup>13</sup>Astellas.

**Collecting Laboratories:** See [www.bsacsurv.org](http://www.bsacsurv.org) **Sponsors 2012:** Basilea, Cempra, Cubist, Pfizer. **Support:** BSAC