



BSAC BACTERAEMIA RESISTANCE SURVEILLANCE: A FIVE YEAR REVIEW OF NON-SUSCEPTIBILITY (2013-2017)

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INTRODUCTION

The British Society for Antimicrobial Chemotherapy (BSAC) Bacteraemia Resistance Surveillance Programme has monitored the antimicrobial susceptibility in the organisms commonly causing clinically significant bacteraemia in the UK and Ireland since 2001 (www.bsacsurv.org).

The latest 5 years of data (Jan 2013 – Dec 2017) are presented.

METHODS

Consecutive, non-duplicate isolates (n=16,178, Fig. 1) causing clinically significant bacteraemia were collected at 24-40 sites across the UK and Ireland.

Each site was asked to collect a set quota (7-20) isolates/species/season.

MICs were determined centrally by BSAC agar dilution.¹ EUCAST breakpoints (Version 8.1, 2018)² were used and non-susceptibility was defined as including an intermediate (I) or resistant breakpoint (R).

RESULTS

- Results are presented for agents/organisms when EUCAST breakpoints (bpts) and testing data for all 5 seasons are available.
- Non-susceptibility of staphylococci** is shown in Fig. 2. All *S. aureus* were susceptible to ceftobiprole, teicoplanin and vancomycin.
- The proportion of **oxacillin resistance** among *S. aureus* decreased by 50% (12%, 2013 to 6%, 2017) (Fig. 2); no decrease in oxacillin resistance was seen among coagulase-negative staphylococci (CoNS) (av. 73%).
- Non-susceptibility to penicillin in *S. pneumoniae* was 5.6% (all I). The collection comprised 48 serotypes; the most common types were 8 (16%), 12F (9%), and 22F (8%).
- The proportion of ***E. faecium* increased** among enterococci (44% - 2013, 50% - 2017), whereas the proportion of *E. faecalis* decreased (53% - 2013, 45% - 2017). Rates of resistance to vancomycin were 31% for *E. faecium* and 1% for *E. faecalis*.
- The proportion of **Group A streptococci decreased** among β -haemolytic streptococci (BHS) (42% - 2013, 29% - 2017). All BHS were susceptible to penicillin, whereas 14% of **α -/non-haemolytic streptococci** were non-susceptible to penicillin, with no high-level gentamicin-resistant isolates seen.
- Non-susceptibility among Gram-negative isolates** is shown in Fig. 3: 98% were susceptible to ceftolozane-tazobactam; 89% were susceptible to ceftobiprole (Enterobacteriaceae only).
- Rates of **ESBL** production were higher in *Klebsiella* and *E. coli* (10%) than in *Enterobacter* (6%), *Proteaeae* (0.5%) or *Serratia* (0.3%).
- Carbapenemases** were rare: $\leq 1\%$ (n=11) in Enterobacteriaceae [OXA-48 (5), KPC (3) and NDM (1)] and *Pseudomonas* spp. [VIM (1), NDM (1)].
- Colistin resistance** was higher and increasing in *Enterobacter* (6% in 2013 to 12% in 2017, p=0.03), compared with *E. coli* (0.5%), *Klebsiella* spp. (1%) and *P. aeruginosa* (<0.1%, Fig. 3).

CONCLUSIONS

- The proportion of MRSA among *S. aureus* has continued to decrease, whereas the proportion of MR-CoNS remains unchanged.
- The proportion of Group A streptococci associated with bacteraemia has decreased, whereas the proportion of *E. faecium* has increased; importantly *E. faecium* is commonly more resistant than *E. faecalis*.
- Carbapenemase-producing Enterobacteriaceae and *Pseudomonas* spp. remain rare in this surveillance programme.
- Rates of colistin resistance continue to increase in *E. cloacae* complex.

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BSAC Standing Committee on Resistance Surveillance: Alasdair MacGowan (Chair), Derek Brown (formerly EUCAST), David Livermore (UEA), Alan Johnson (PHE), Neil Woodford (PHE).

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RESULTS

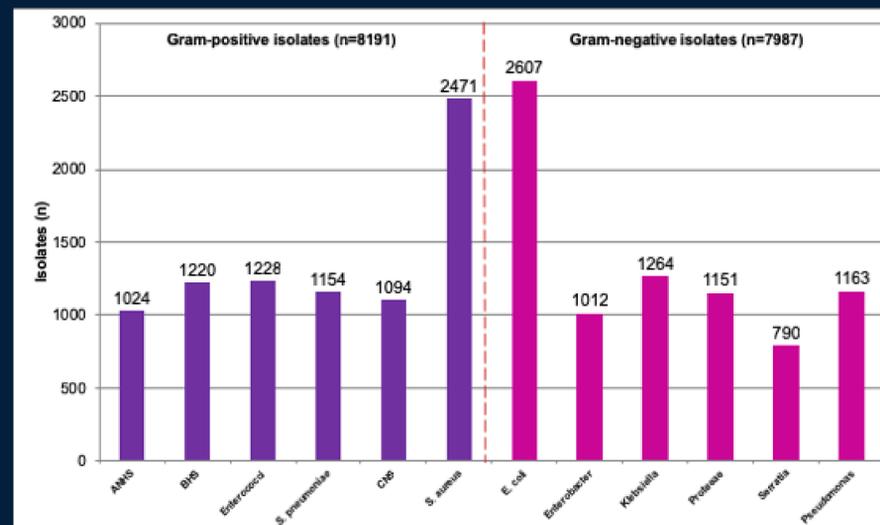


FIGURE 1. Isolates from clinically significant bacteraemia, Jan 2013 - Dec 2017. ANHS: α -/non-haemolytic streptococci; BHS: β -haemolytic streptococci; CoNS: coagulase-negative staphylococci.

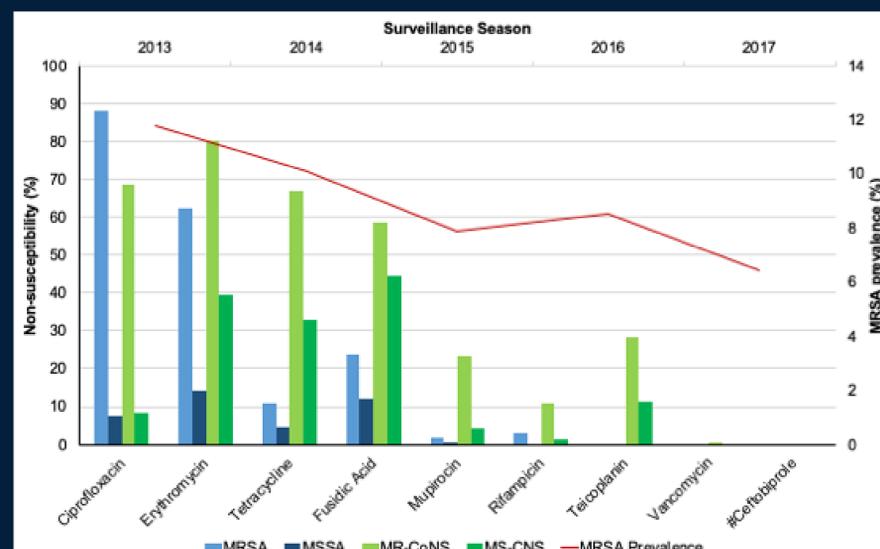


FIGURE 2. Non-susceptibility of staphylococci associated with bacteraemia, Jan 2013 – Dec 2017. #Lack of EUCAST bpts for CoNS and ceftobiprole.

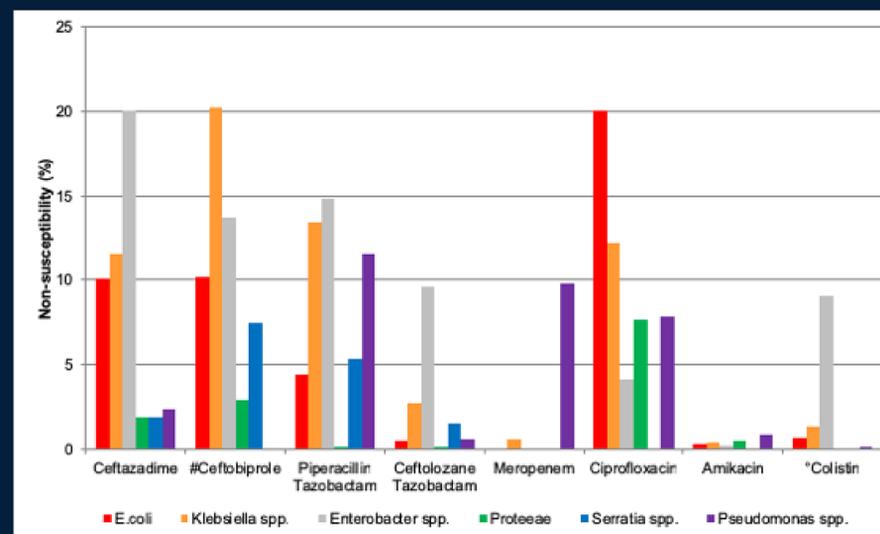


FIGURE 3. Non-susceptibility of Gram-negative isolates associated with bacteraemia, Jan 2013 – Dec 2017. #Lack of EUCAST bpts for *Pseudomonas*; *P. mirabilis* and *S. marcescens* are intrinsically resistant to colistin.

REFERENCES

- Reynolds, et al. *J Antimicrob Chemother* 2008. 62, suppl 2 ii15-1128.
- http://www.eucast.org/clinical_breakpoints/

TO REQUEST ISOLATES FROM THE BSAC COLLECTION

Contact Dr Carolyne Horner. Email: rs@bsac.org.uk