

# BSAC BACTERAEMIA RESISTANCE SURVEILLANCE UPDATE: 2014-2016

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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](http://www.bsacsurv.org)).

Species tested are:

- *Staphylococcus aureus*, coagulase-negative staphylococci (CNS), *Streptococcus pneumoniae*, and *Enterococci* spp.
- *Escherichia coli*, *Enterobacter* spp., *Klebsiella* spp., Proteaeae, *Pseudomonas* spp., and *Serratia* spp.

The latest three years of data (Jan 2014 – Dec 2016) are presented.

## METHODS

Consecutive, non-duplicate isolates causing clinically significant bacteraemia were collected at 24-40 sites across the UK and Ireland (n=8411, Fig. 1).

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

Minimum inhibitory concentrations were determined centrally by BSAC agar dilution.<sup>1</sup> EUCAST breakpoints (Version 7.1, March 2017)<sup>2</sup> were used and non-susceptibility is defined as an intermediate or resistant breakpoint value.

## RESULTS

- Results are presented for agents/organisms when EUCAST breakpoints (bpts) and testing data for all three seasons are available.
- **Non-susceptibility of staphylococci** are shown in Fig. 2. All *S. aureus* isolates were susceptible to ceftobiprole.
- Rates of **methicillin resistance** decreased in staphylococci compared with rates in 2012: **MRSA**, 9% vs. 12%; **CNS**, 72% vs 77% (averaged across the 3 years).
- Non-susceptibility to penicillin in *S. pneumoniae* was 6.9%. The most common serotypes causing bacteraemia were 8 (16%), 12F (11%), and 22F (9%), and different from those predominating in community-onset lower respiratory tract infections (CO-LRTI) (15A, 11A, and 23A/B).
- Rates of **vancomycin resistance** in Enterococci remained similar to those reported in 2012: 31% *E. faecium* and 1% *E. faecalis* (averaged across the 3 years).
- **Non-susceptibility of Gram-negative isolates** is shown in Fig. 3. The rate of **ESBLs** in Enterobacteriaceae was ≤10%.
- **Carbapenemases** were rare: ≤1% in Enterobacteriaceae (n=4, OXA-48, n=1, KPC) and *Pseudomonas* spp. (n=2, VIM).
- **Colistin resistance** was higher in *E. cloacae* complex (5.3%, 8.5% and 14% in 2014, 2015 and 2016, respectively) (Fig. 3), compared with *E. coli* (0.4%), *Klebsiella* spp. (1.4%) and *P. aeruginosa* (<0.1%).
- Colistin resistance does not appear to be associated with *mcr-1*.

## CONCLUSIONS

- Rates of methicillin resistance in *S. aureus* and coagulase-negative staphylococci have continued to decrease.
- Pneumococcal serotypes causing bacteraemia are different to those causing CO-LRTI.
- Carbapenemase-producing Enterobacteriaceae and *Pseudomonas* spp. remain rare in this surveillance programme.
- Rates of colistin resistance continue to increase in *E. cloacae* complex.

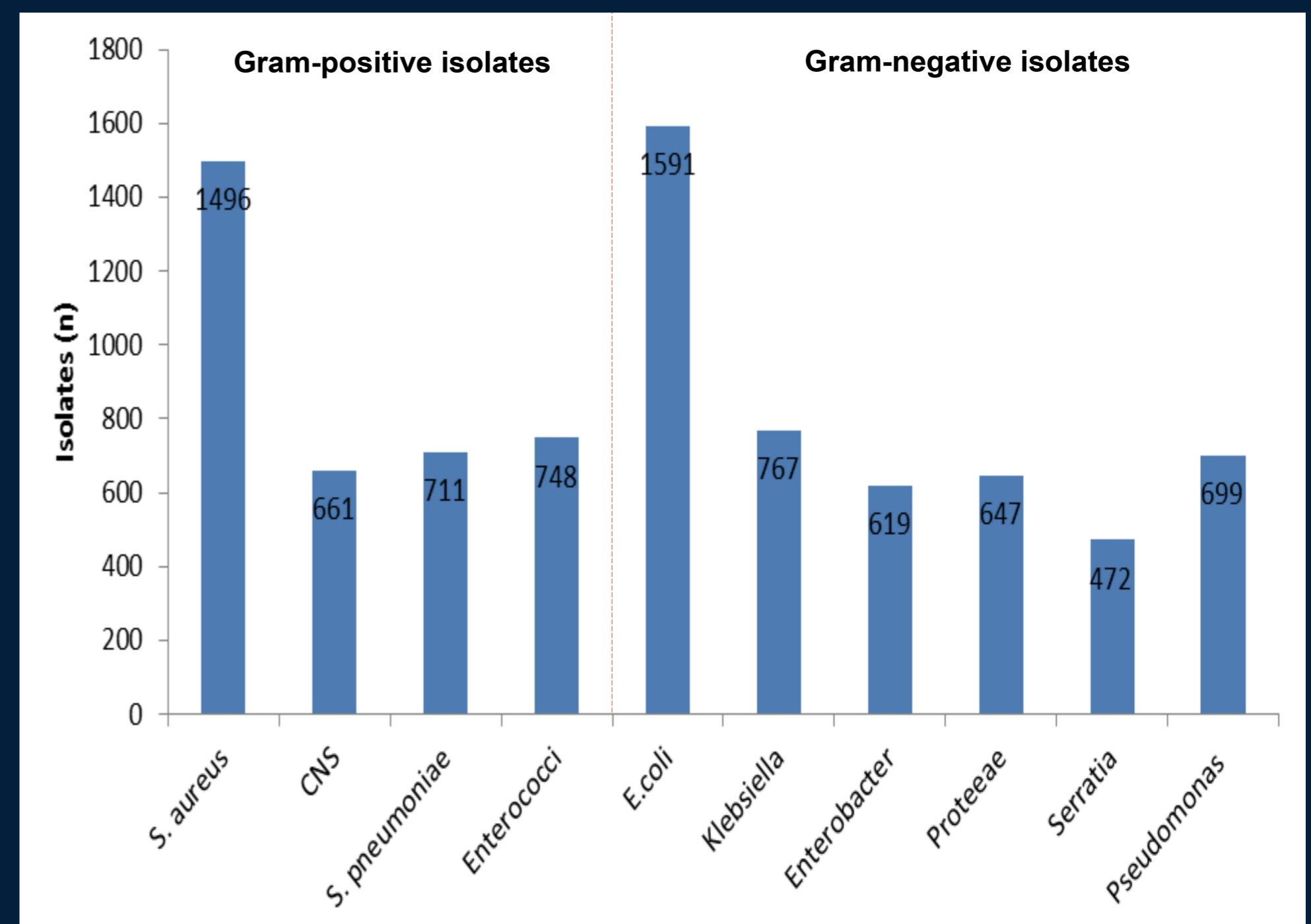
## ACKNOWLEDGEMENTS

**BSAC is grateful to:** Basilea, Bayer, MSD, Nabriva, and Pfizer for sponsoring the Programme, sentinel laboratories submitting isolates, and Shazad Mushtaq and staff at the Central Testing Laboratory, PHE, London.

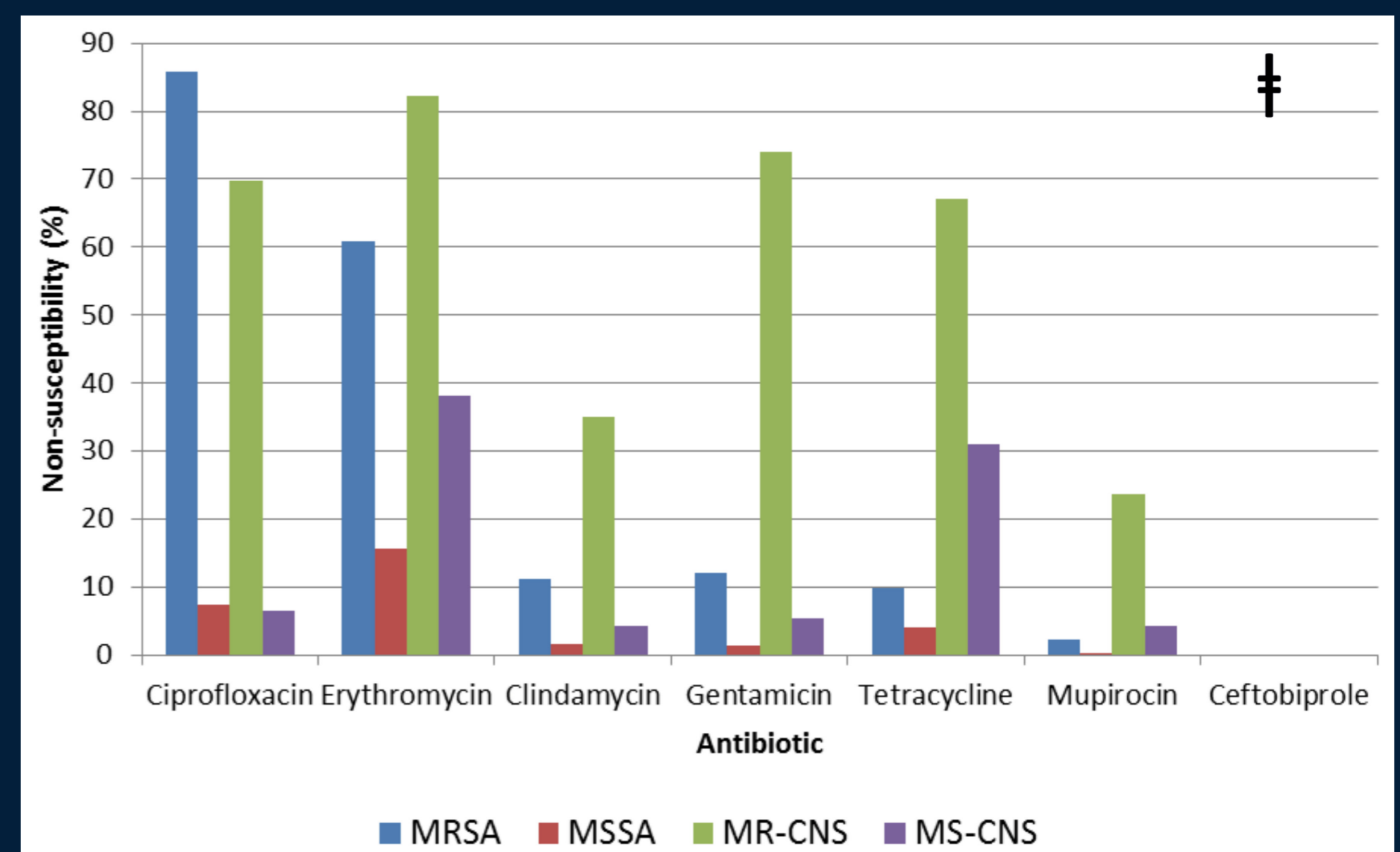
**BSAC Standing Committee on Resistance Surveillance:** Alasdair MacGowan (Chair), Derek Brown (formerly EUCAST), David Livermore (PHE), Alan Johnson (PHE), Sharon Peacock (London School of Hygiene and Tropical Medicine).

**Sponsor representatives:** Anne Santerre-Henriksen (Basilea), Chris Longshaw (formerly Basilea), Jeff Alder (Bayer), Adela Álvarez Buylla (MSD), Mike Allen (MSD), James Campling (Pfizer Vaccines), and Susanne Paukner (Nabriva).

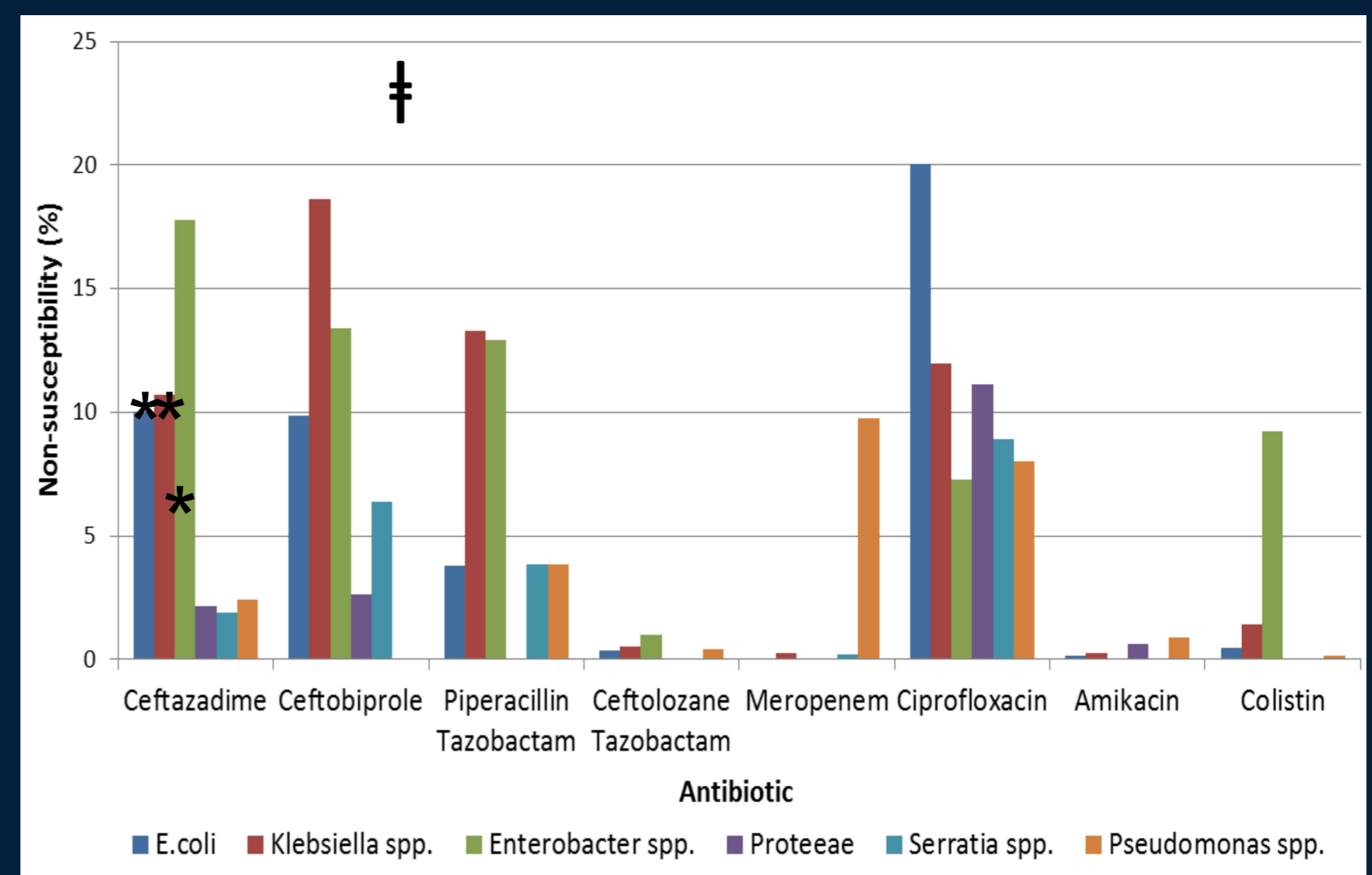
## RESULTS



**FIGURE 1.** Isolates from clinically significant bacteraemia, Jan 2014 - Dec 2016) (CNS: coagulase-negative staphylococci)



**FIGURE 2.** Non-susceptibility of staphylococci associated with bacteraemia, Jan 2014 – Dec 2016 († lack of EUCAST bpts for CNS)



**FIGURE 3.** Non-susceptibility of Gram-negative isolates associated with bacteraemia, Jan 2014 – Dec 2016 (\*ESBL-producers, † lack of EUCAST bpts; *P. mirabilis* and *S. marcescens* are intrinsically resistant to colistin).

## REFERENCES

- 1) Anon. *Journal of Antimicrobial Chemotherapy* 2008. 62, suppl 2 ii15-1128.
- 2) [http://www.eucast.org/clinical\\_breakpoints/](http://www.eucast.org/clinical_breakpoints/)

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