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Enterobacteriaceae in the UK and Ireland 2011: Susceptibility to Old and New Agents

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BACKGROUND

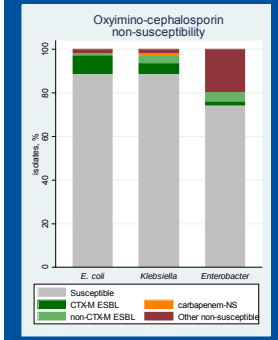
Increasing concern about resistance in Gram-negative bacteria has prompted the development of new antibiotics and the revival of old. The BSAC Resistance Surveillance Project monitors non-susceptibility in the UK and Ireland.

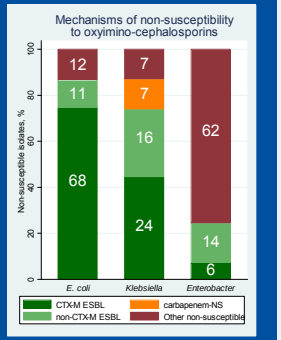
METHODS

38 centres in the UK and Ireland supplied isolates from blood in 2011 and hospital-onset (≥48 hours) lower respiratory tract infection (LRTI, Oct 2010-Sept 2011). MICs were measured centrally using BSAC agar dilution methods and breakpoints.

Number of isolates

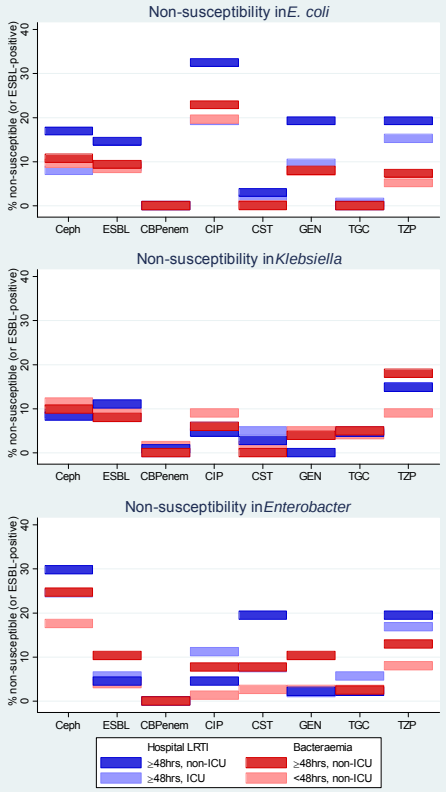
Site Hospital onset? Intensive care?	LRTI ≥48 hrs non-ICU	LRTI ≥48 hrs ICU	Blood ≥48 hrs non-ICU	Blood <48 hrs non-ICU	Blood all hrs ICU
E. coli	129	124	148	341	19
Klebsiella	108	100	100	121	30
Enterobacter	87	53	77	74	26





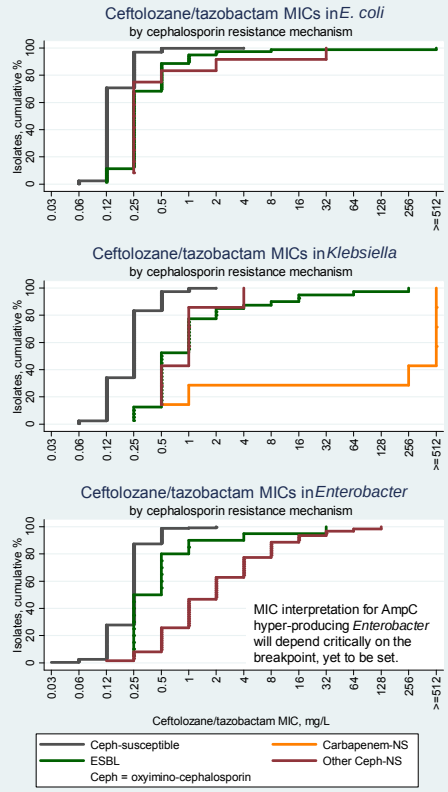
Non-susceptibility to carbapenems was rare (0/796 *E. coli*, 7/474 *Klebsiella*, 0/320 *Enterobacter*, 2/202 *Serratia* and 1/262 Proteeae) but VIM and OXA-48 carbapenemases were detected. These isolates were mostly multi-resistant with very high MICs for all tested β - lactams, ciprofloxacin and gentamicin.

Non-susceptibility



Non-susceptibility was more common in hospital-onset LRTI than in bacteremia for *E. coli*; differences for *Klebsiella* and *Enterobacter* were less consistent.

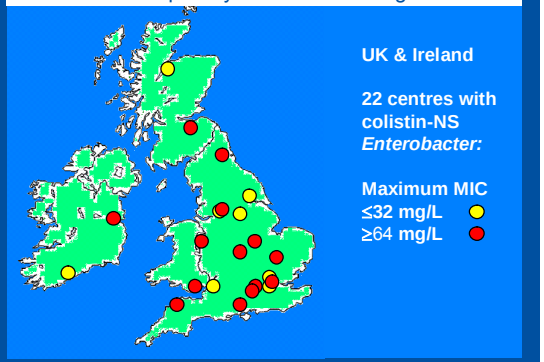
Ceftolozane/tazobactam



Ceftolozane/tazobactam (CXA-201) did not overcome carbapenem resistance but had good activity against most ESBL-producers in all three genera.

Colistin

Colistin had good activity against *E. coli* and *Klebsiella* but colistin-NS *Enterobacter* isolates were geographically widespread and quite common, over half of them (17/31) with MICs ≥64 mg/L.
Colistin-NS in *Enterobacter* was not associated with non-susceptibility to other tested agents.



Abbreviations (& non-susceptible breakpoints, mg/L)
Ceph oxyimino-cephalosporin (cefotaxime and/or ceftazidime >1); CIP ciprofloxacin (>1); CST colistin (>2); GEN gentamicin (>2); CBPenem carbapenem (imipenem and/or meropenem >2 and/or doripenem >1); TGC tigecycline (>1); TZP piperacillin/tazobactam (>8); ESBL extended-spectrum β-lactamase. NS non-susceptible.

CONCLUSIONS

- **Ceftolozane/tazobactam overcame resistance in most ESBL-producers, regardless of genus.**
- **Colistin was generally active, but with a wide geographical scatter of non-susceptibility amongst *Enterobacter*.**

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Organism ID and Susceptibility Testing 2011 collection: A. Kidney, S. Mushtaq and staff at HPA London & Quotient Bioresearch Microbiology.
Collecting Laboratories: *See* www.bsac.org.uk
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Central Laboratories: Health Protection Agency, London; Quotient Bioresearch, Fordham. Sponsors 2011: Astellas, Cubist, Janssen, Pfizer, Basilea (associate).
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