

Empirical antibiotic therapy in acute orthopaedic infections: differences in antimicrobial susceptibility across anatomical sites



Sint Maartenskliniek

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BACKGROUND

At Sint Maartenskliniek, a tertiary referral center for orthopedic infections with a high volume of revision surgery and DAIR procedures, we observed that the recently introduced Dutch recommendations for empirical treatment of acute PJI (vancomycin plus ceftriaxone) differed substantially from our previous regimen of cefazolin monotherapy. This raised the question of whether broader empirical therapy was justified by our local microbiological profile. We therefore evaluated this in early postoperative orthopedic infections, including prosthetic and non-prosthetic infections.

AIM

To evaluate **local microbiological epidemiology and antimicrobial susceptibility** in early postoperative orthopaedic infections and to assess the empirical coverage of **cefazolin monotherapy vs vancomycin–ceftriaxone vs vancomycin–ciprofloxacin**, overall and across anatomical sites.

METHODS

- **Retrospective, single-centre cohort study** at Sint Maartenskliniek, Nijmegen, the Netherlands
- Early postoperative orthopaedic infections (**≤90 days**) treated between January 2022 and January 2025
- Included **implant-related and non-implant-related infections**
- Empirical coverage was assessed for **cefazolin monotherapy, vancomycin–ceftriaxone, and vancomycin–ciprofloxacin**, overall and by anatomical site, using observed antimicrobial susceptibility data

STUDY POPULATION

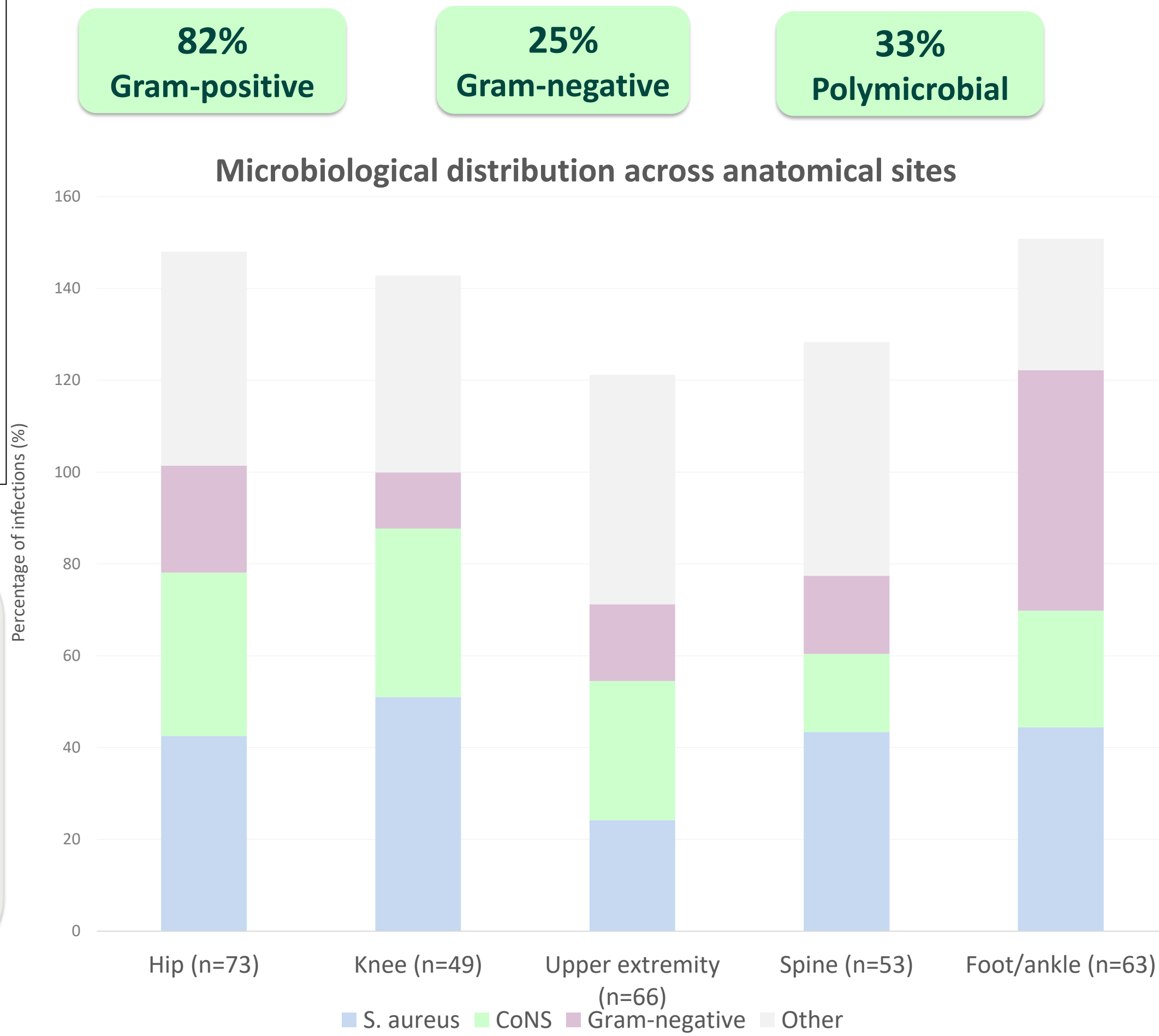
n=304
Early postoperative orthopaedic infections with complete microbiological and antimicrobial susceptibility data

152 PJI (50%)
55 OSM – (18%)
97 OSM+ (32%)

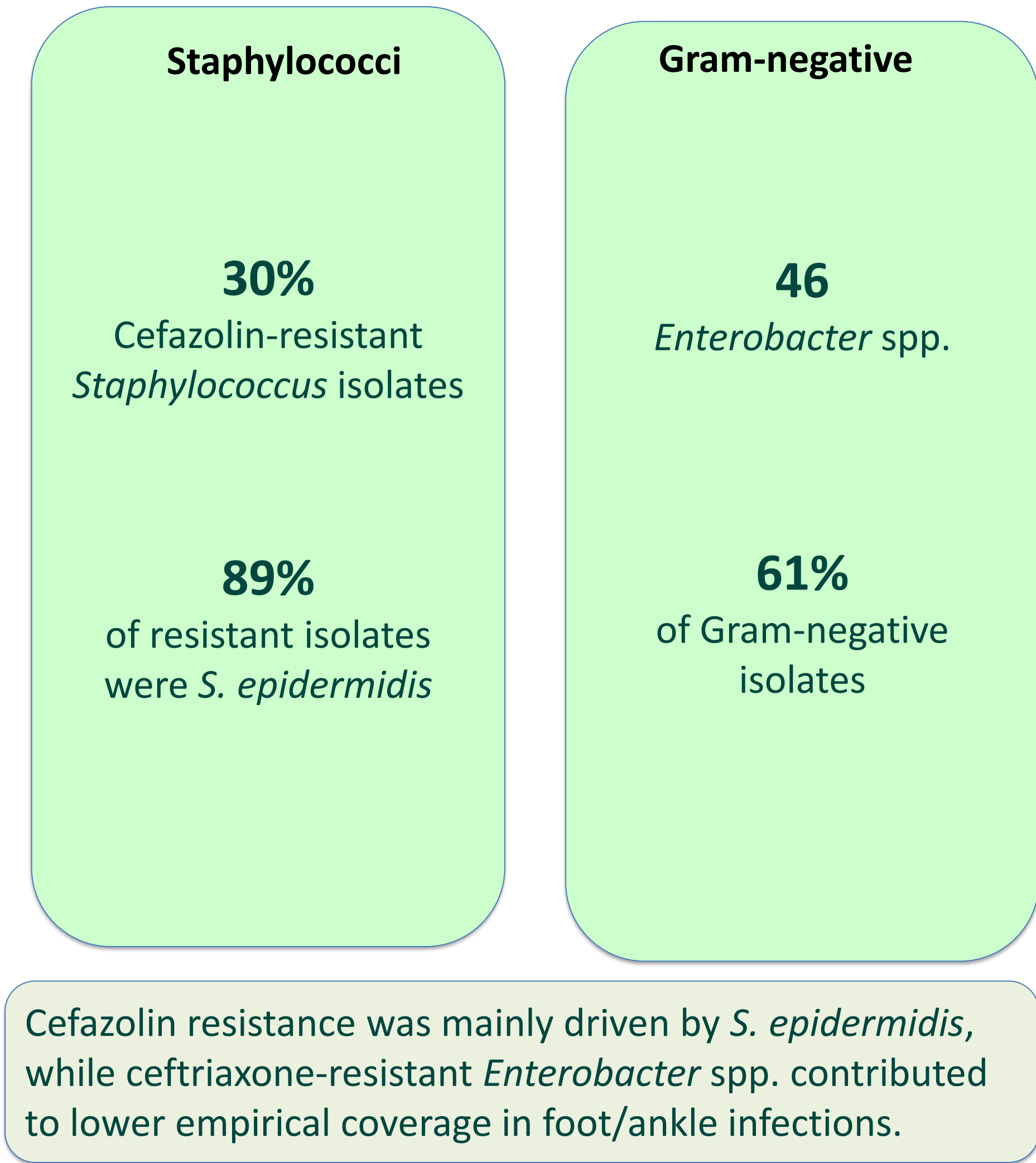
ANATOMICAL SITES

Hip 73 · Knee 49 · Spine 53
Foot/ankle 63 · Upper extremity 66

MICROBIOLOGY

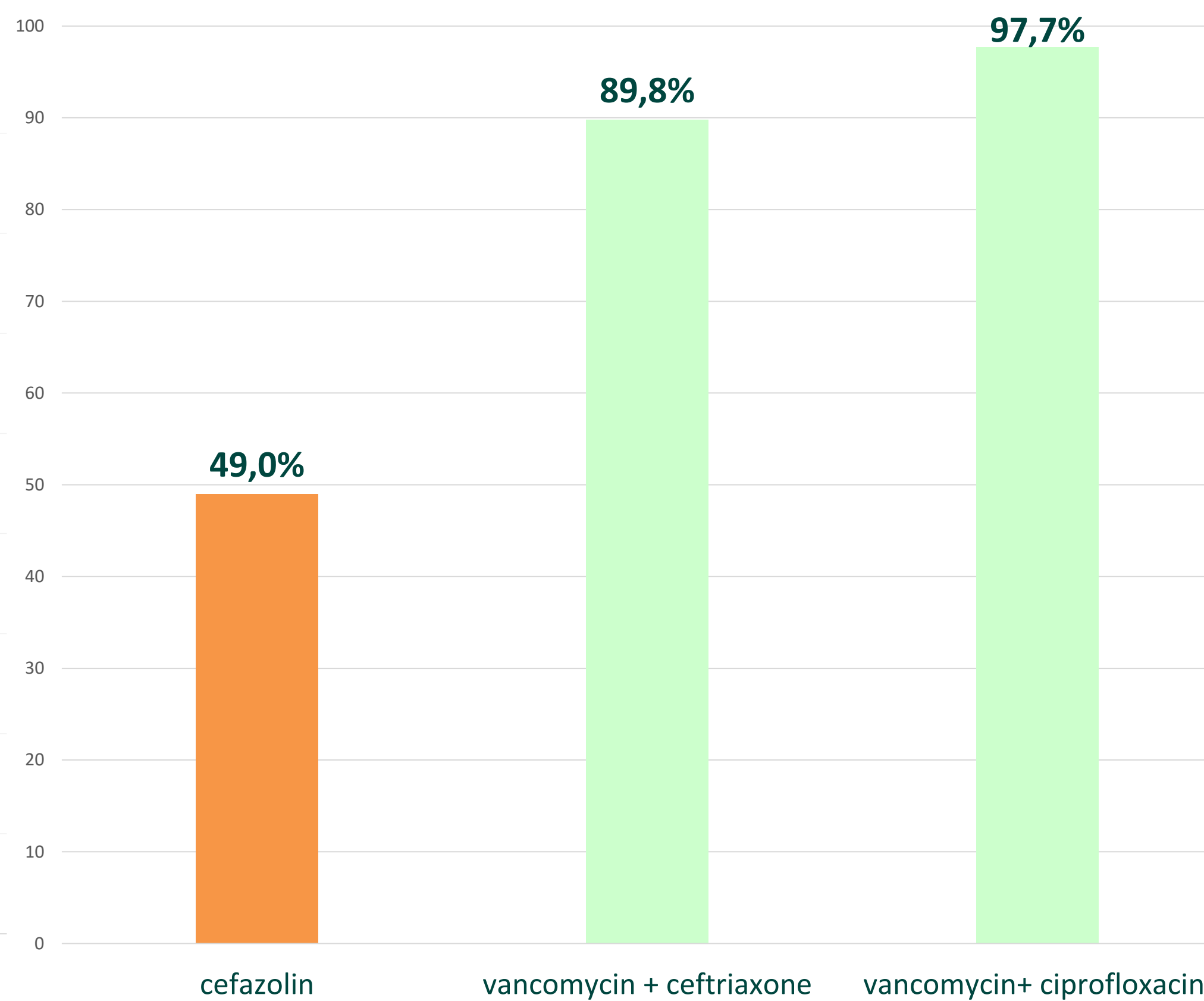


ANTIMICROBIAL SUSCEPTIBILITY



EMPIRICAL COVERAGE

Total cohort (n=304)



COVERAGE BY INFECTION TYPE (%)

Empirical regimen	PJI (n=152)	OSM– (n=55)	OSM+ (n=97)
Cefazolin	46.7%	72.7%	39.2%
Vancomycin–ceftriaxone	92.8%	100%	79.4%
Vancomycin–ciprofloxacin	97.3%	100%	98.9%

COVERAGE BY ANATOMICAL SITE (%)

Anatomical site	Cefazolin	Vanco – CTX	Vanco - CIP
Hip	42.5%	94.5%	95.9%
Knee	53.1%	91.8%	93.9%
Spine	52.8%	96.2%	100%
Foot/ankle	39.7%	76.2%	98.4%
Upper extremity	59.1%	90.8%	100%

CTX, ceftriaxone; CIP, ciprofloxacin

CONCLUSION

Vancomycin–ceftriaxone provides high empirical coverage for most early postoperative orthopaedic infections and aligns with Dutch SWAB guidance. Coverage is lower in **foot/ankle** infections, where ceftriaxone-resistant *Enterobacter* spp. are more prevalent. In this subgroup, **vancomycin–ciprofloxacin** provides superior empirical coverage.

TAKE-HOME MESSAGE

Empirical antibiotic therapy should reflect anatomical site and local microbiological epidemiology.

REFERENCE
SWAB. Antimicrobial Treatment of Periprosthetic Joint Infections. 2024.
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