

DIVERSITY OF ANTIBIOTIC RESISTANT PHENOTYPES AMONG ISOLATES FROM PERIPROSTHETIC JOINT INFECTIONS

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Introduction

Periprosthetic joint infections (PJI) are severe complications that can compromise the success of joint replacement surgeries.

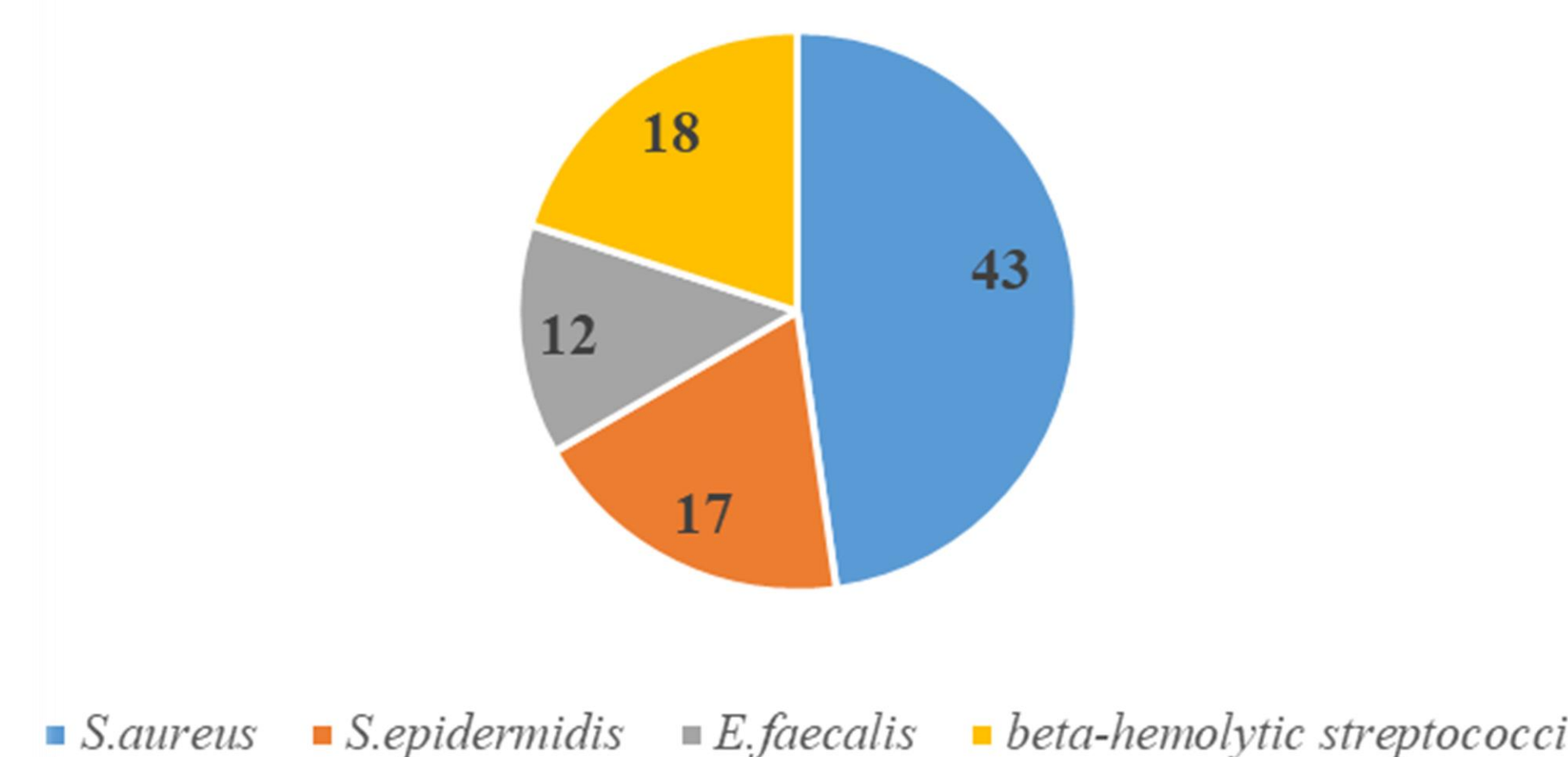
Objectives

This study aims to evaluate the causative microbial agents of PJIs and their resistance phenotypes, providing critical insights into the prevalence of antibiotic-resistant strains.

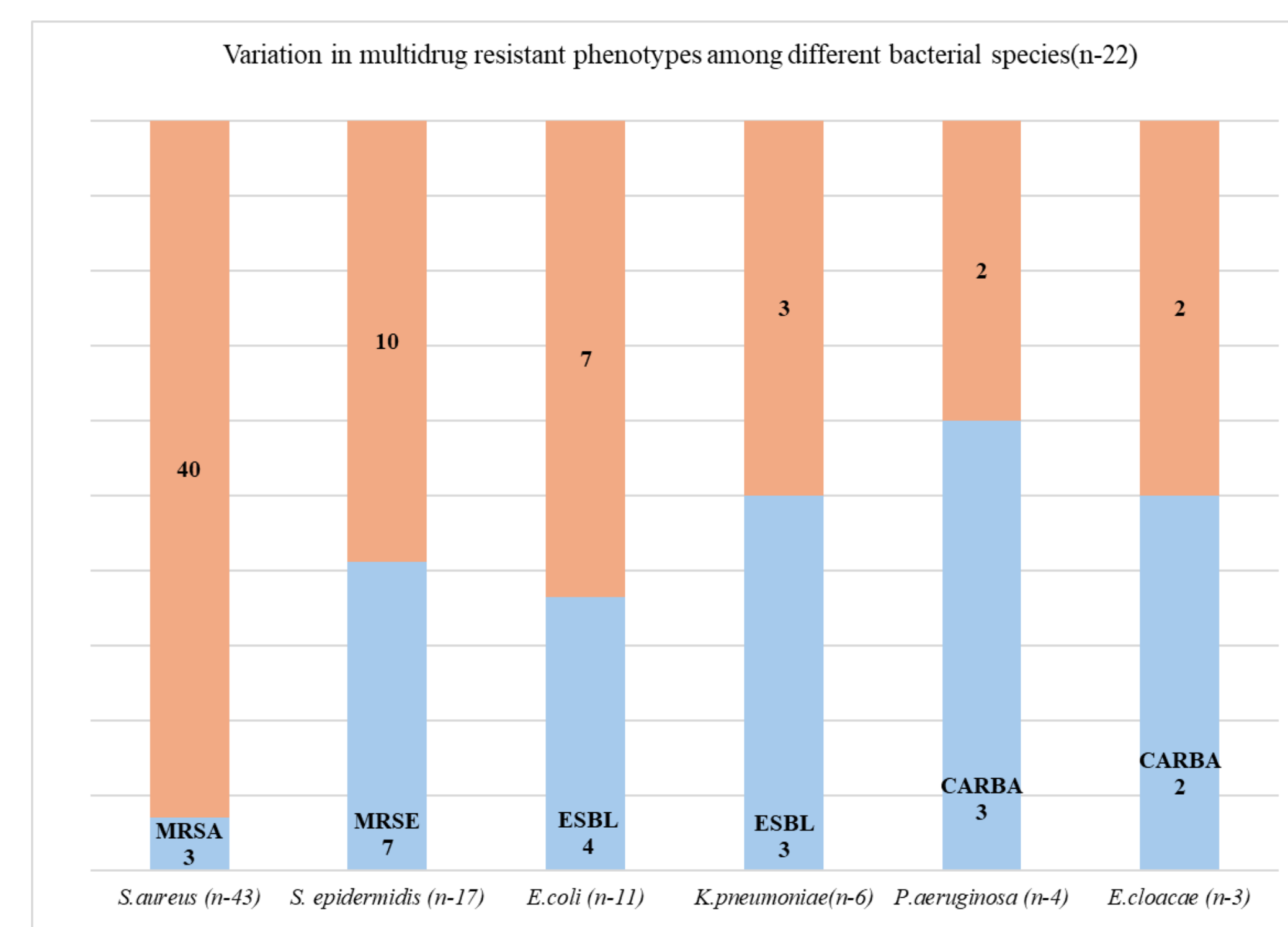
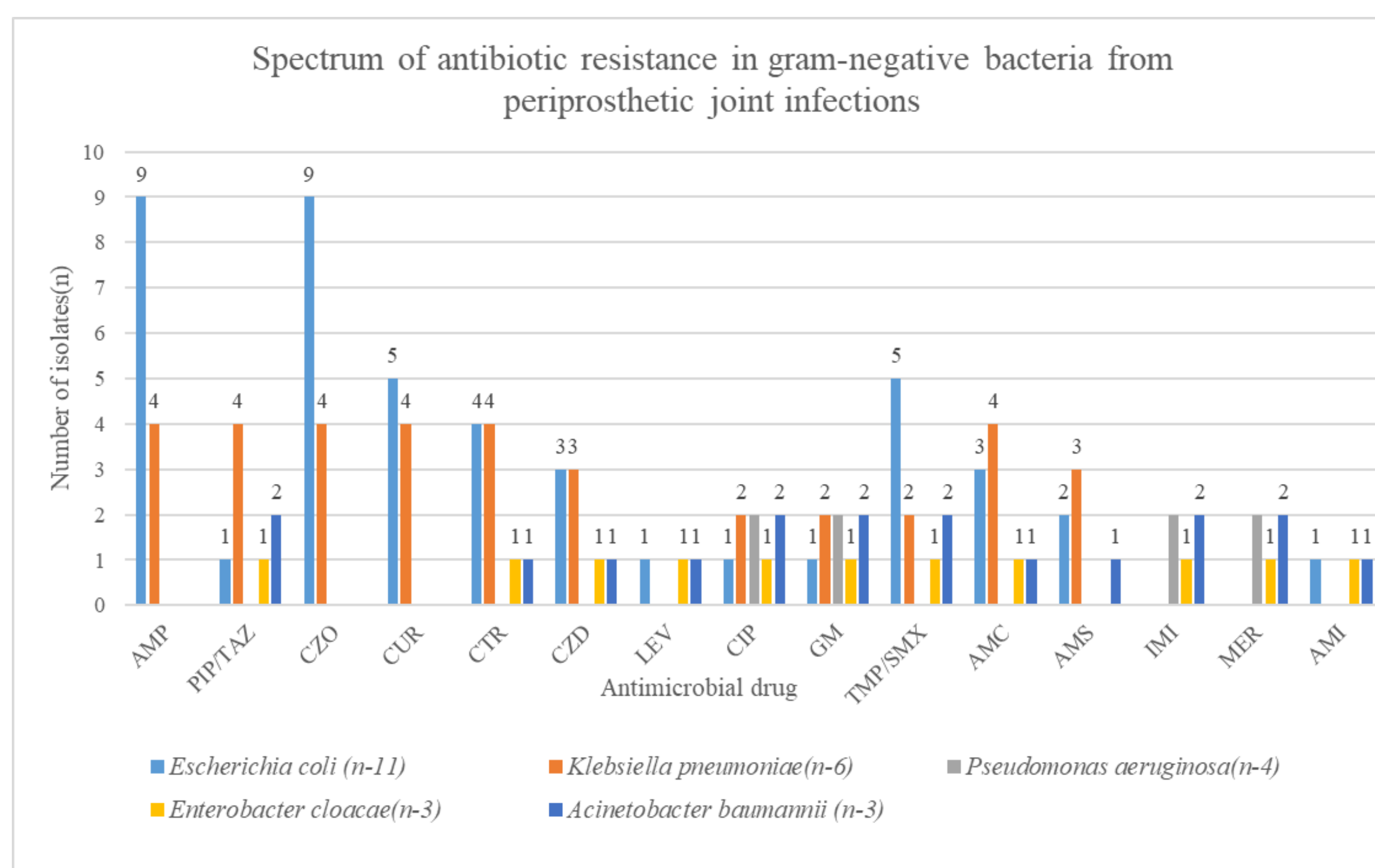
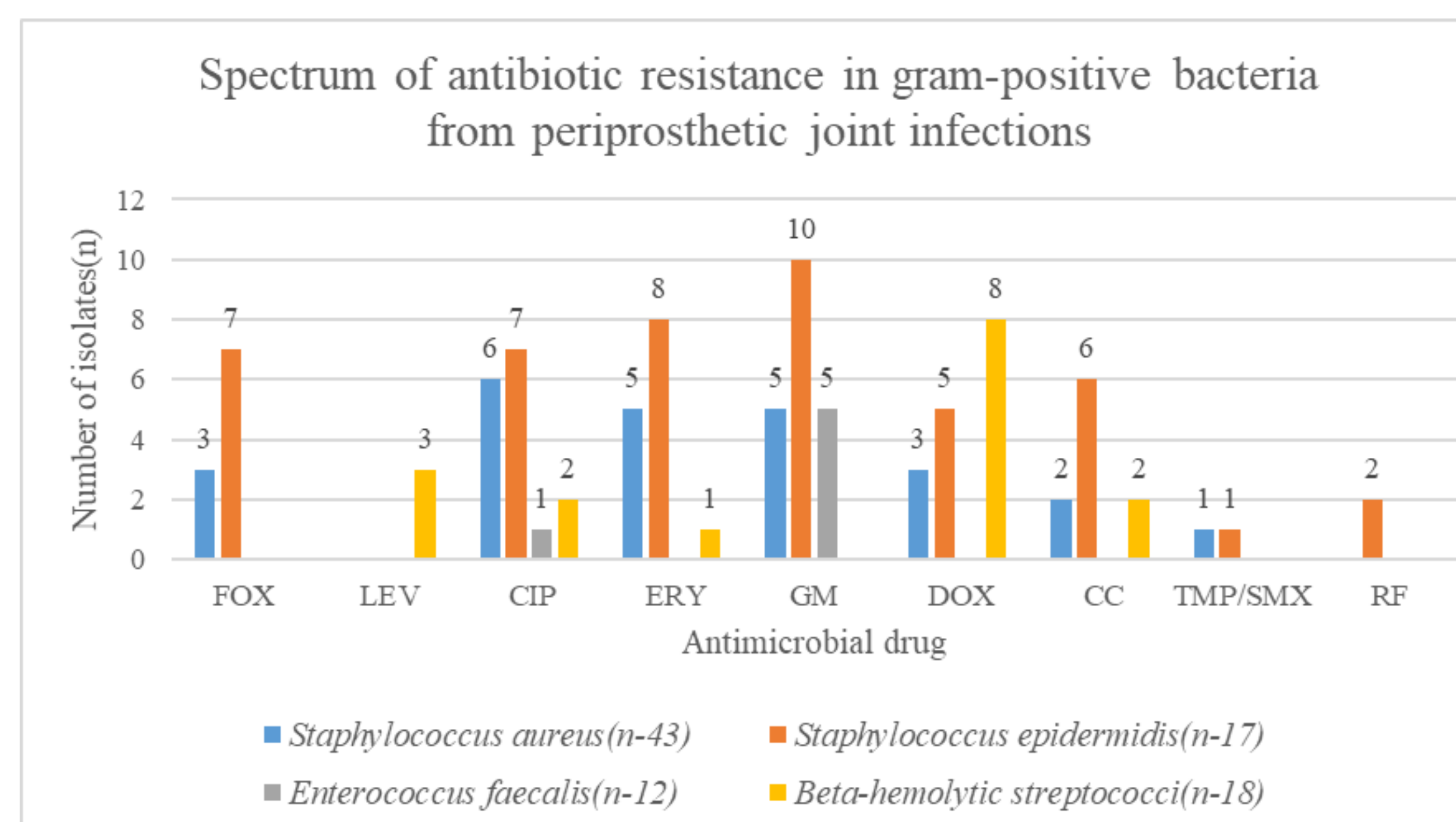
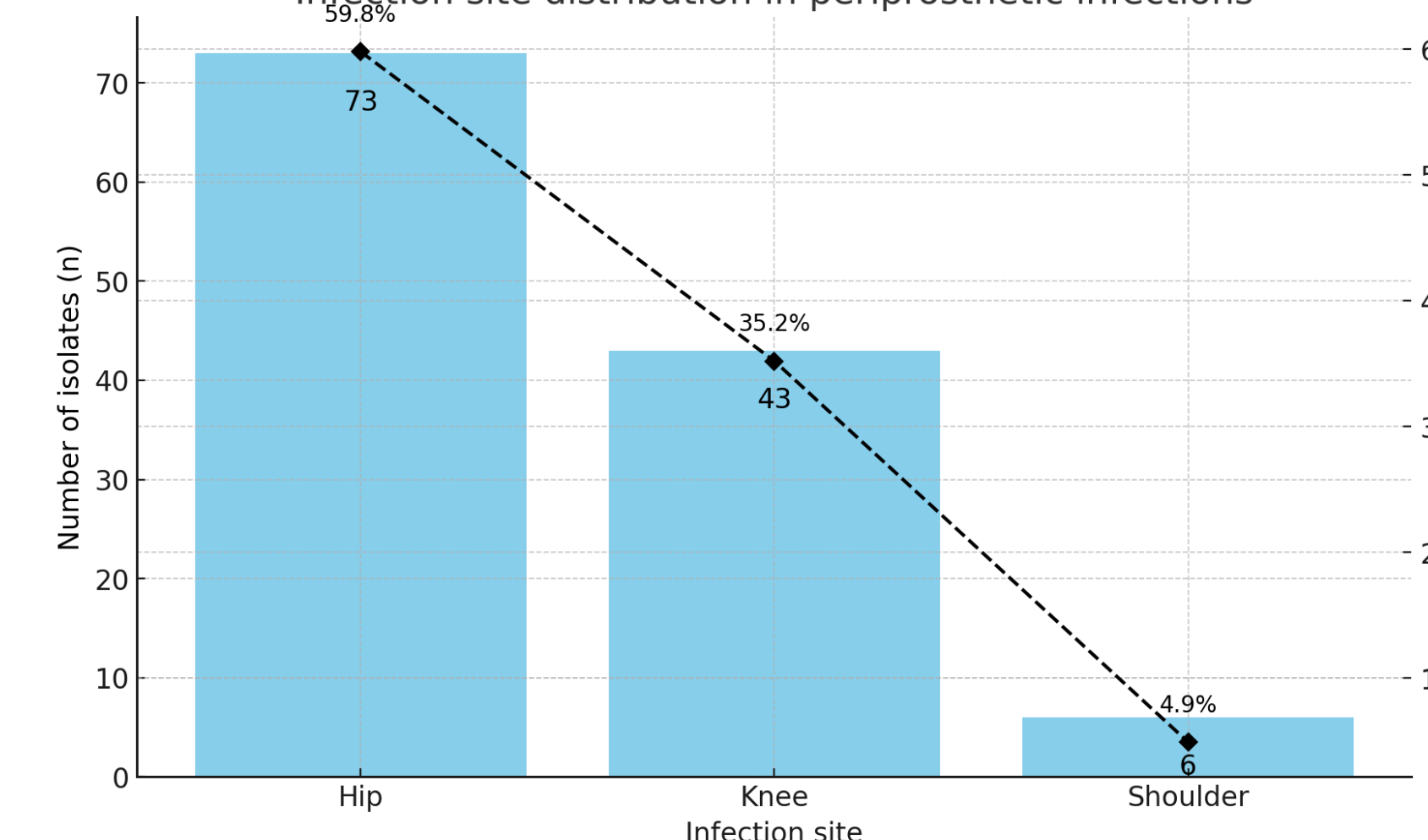
Methods

- Microorganisms were identified from PJI samples by *Vitek 2 compact* system, antibiotic susceptibility was evaluated by using Kirby-Bauer disk diffusion method.
- Epidemiologically relevant resistance phenotypes were confirmed by phenotypic(NG-Test Carba 5,combination disk method for ESBL) and genotypic tests(BIOFIRE JI Panel, BIOFIRE BCID2 Panel).
- Data were derived from the laboratory information system and isolated bacterial strains were phenotyped according to antibiograms. Data processed using MS Excel 2021.

Gram-positive microorganism isolate diversity



Infection site distribution in periprosthetic infections



Results

- Analyzed results were obtained from positive cultures from patients with confirmed periprosthetic joint infections in 2022 and 2023 at the Hospital of Traumatology and Orthopedics.
- The study analyzed a total of 122 cases with PJI were included, of which 55,7% were women and 44,3% were men, aged 34 – 95 years. Average age 69,3 years.
- The most common causative pathogens were gram-positive cocci(73,22%,n=93). *S. aureus* (n = 43; 33,85%) was the most frequently detected, followed by β – hemolytic streptococci (n = 18; 14,17%) and *S. epidermidis* (n = 17; 13,38%).
- Gram-negative pathogens and fungi could be detected in 26,8% (n = 34) and 1,6% (n = 2) of all cases. The prevalence of polymicrobial growths was (n = 11; 9,01%)
- The percentage of MDR isolates was 18,1% (n=23) Methicillin resistance was 3,22% for *S. aureus* and 7,52% for *S. epidermidis*. ESBL was detected in 20,5%, n=7. There were 14,7% (n=5) carbapenemase producing isolates. The most common gene identified in MDR pathogens was *mecA* (n=10, 50%), carbapenemase genes were detected in five isolates *bla*_{VIM} (n=2) *bla*_{NDM} (n=2), *bla*_{OXA} (n=1)
- Among gram-negative bacteria highest resistance rates were against cefazolin (47,05%)
- gram-positive isolates showed the highest resistance to gentamicin (22,58%),doxycycline(17,2%) and erythromycin (15,05%)

Conclusions

The most frequently isolated MDR phenotype was methicillin-resistant *S. epidermidis*. The second most frequently observed phenotype was ESBL production in Enterobacterales. Antimicrobial resistance surveillance among PJI isolates under the antimicrobial stewardship program reveals high rates of resistance. Continuous surveillance is essential for managing resistant PJI pathogens and improving patient outcomes.