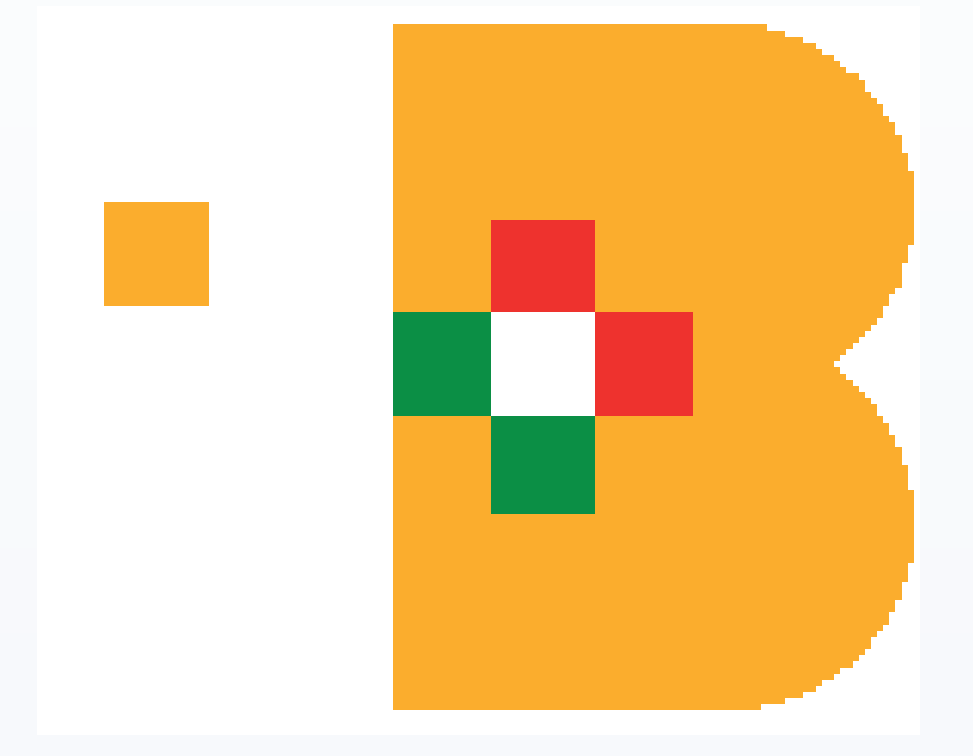




## MAPPING ANTIBIOTIC USE PATTERNS IN A SEPTIC ORTHOPAEDIC WARD



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### Background and Purpose

The Septic Ward treats patients with bone-joint-, and prosthetic-joint infections. The treatment of these infections requires complex, long-term antibiotic therapies. Clinical pharmacy services were introduced in 2015. This included revision of antimicrobial therapies and surveillance of antibiotic consumption.

The aim of the study was to analyse antibiotic use and microbiological data in the ward between 2010 and 2017.

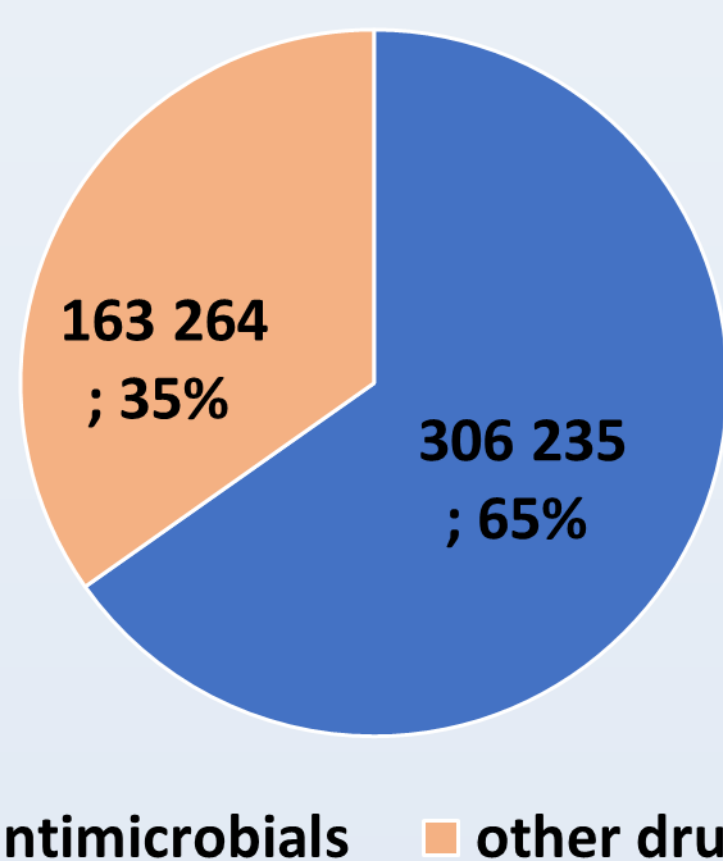
### Materials and methods

Data was collected on systemic antibiotics dispensed from the pharmacy's database. Both WHO DDD (Defined Daily Dose) and PDD (Prescribed Daily Dose) methods were used to analyse antibiotic consumption, standardized to 100 patient days. Microbiological data were collected from the Microbiology Department's database.

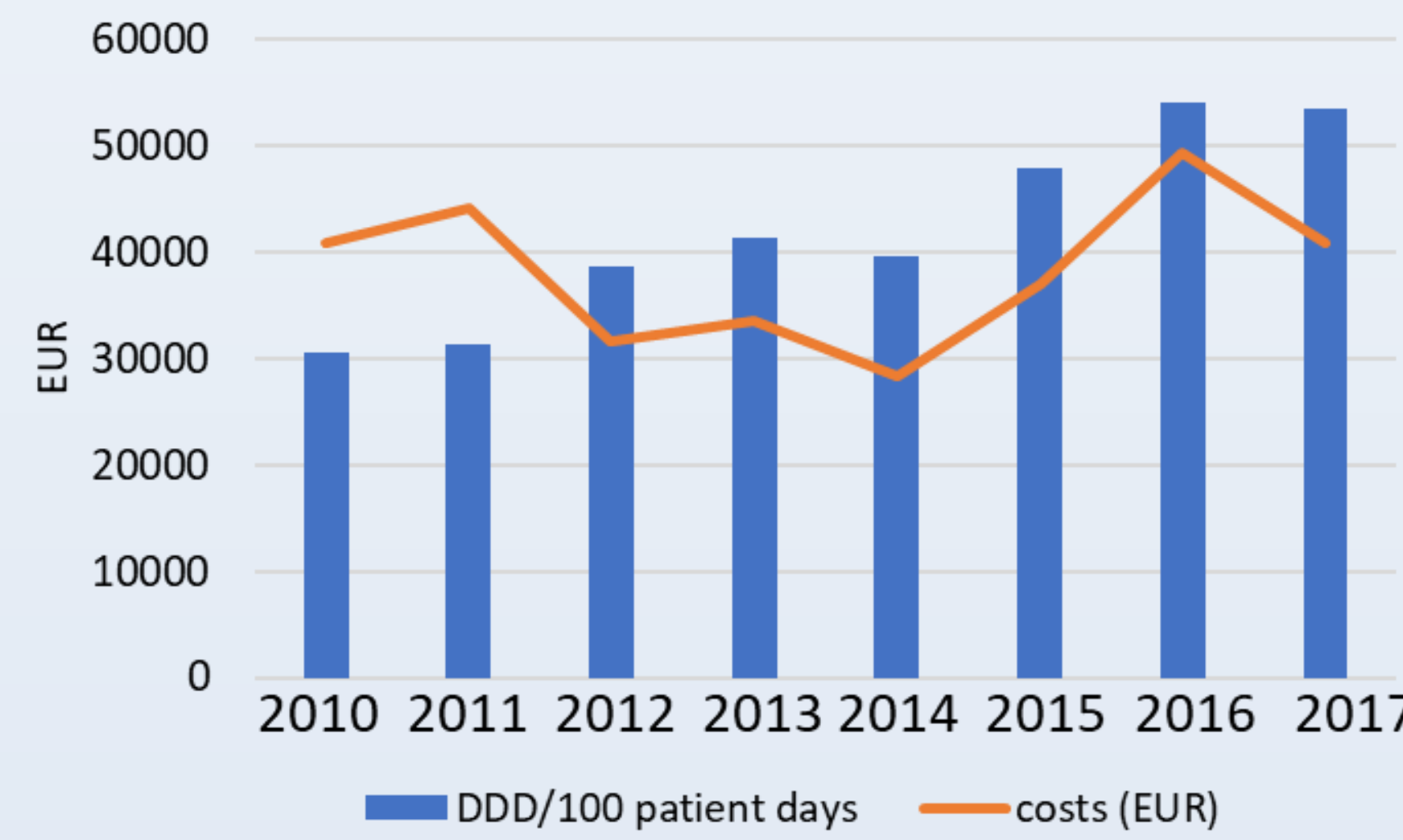
### Results

The cost of antibiotics accounts for 65% of all pharmaceutical-expenses between 2010-2017. Antimicrobial use and costs do not correlate with alteration of patient days.

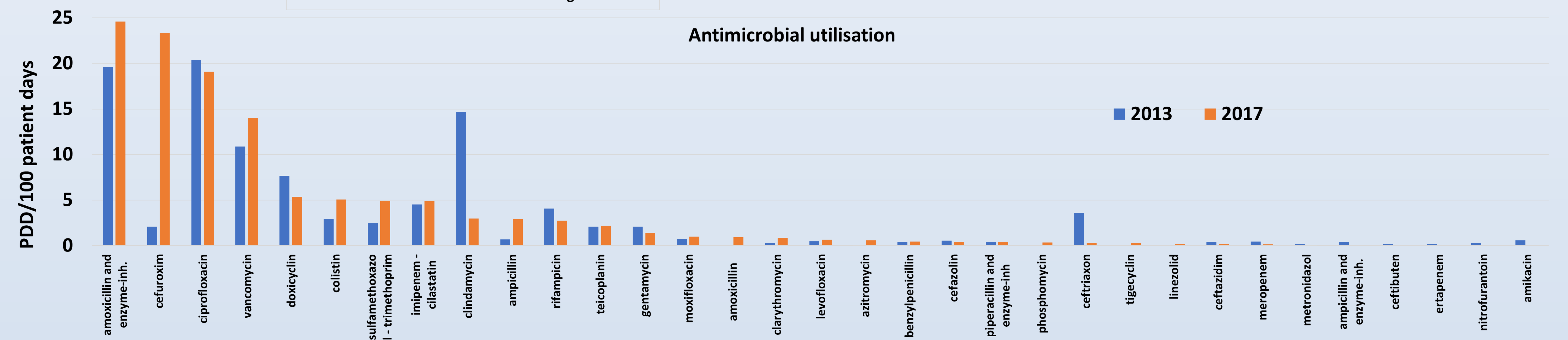
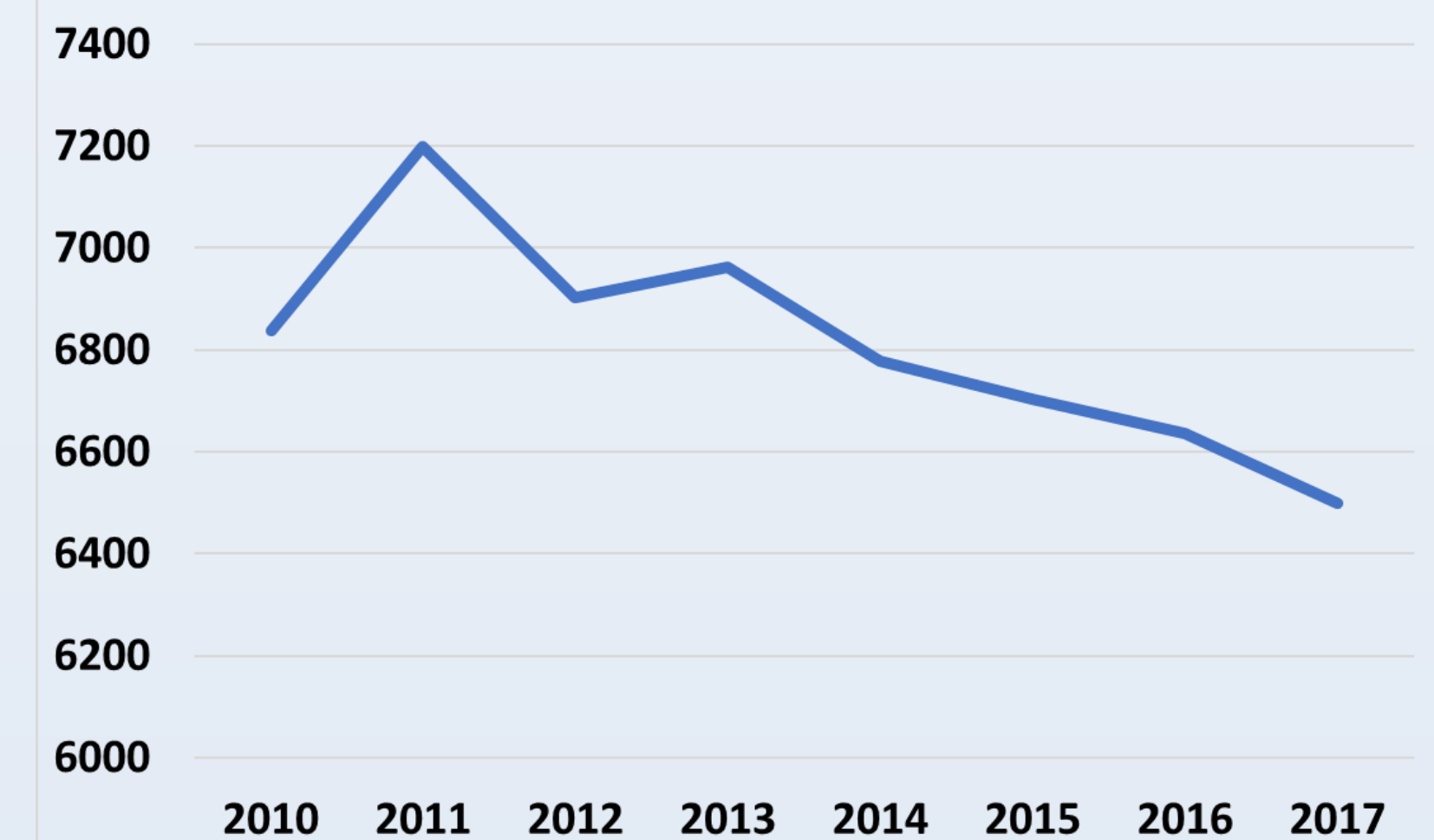
Antimicrobials vs other drugs costs (EUR) 2010-2017



Antimicrobial utilisation and costs



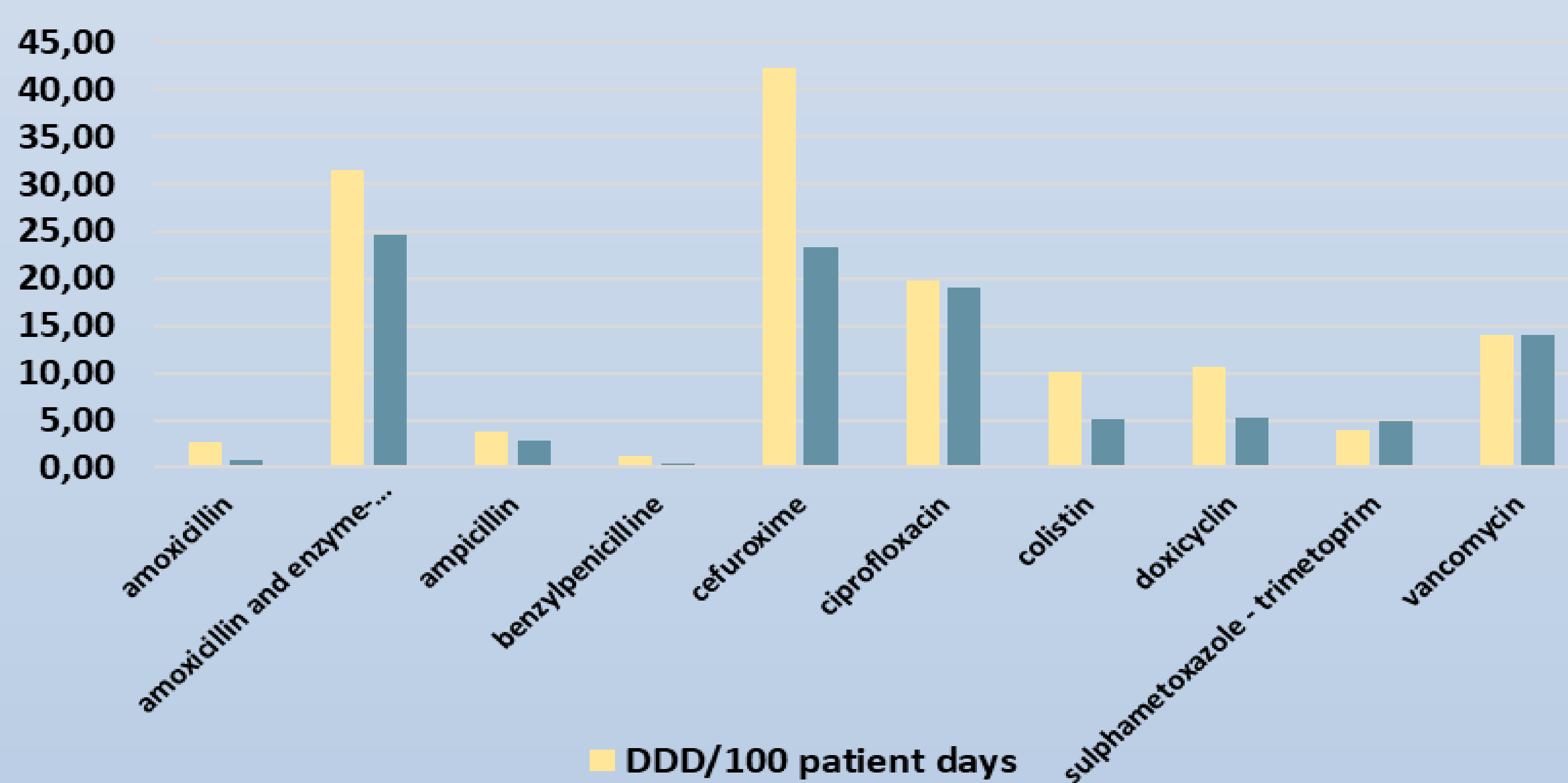
Number of patient days



28 antibacterial agents were used in 2017, 30 in 2013 and 2010. In 2017, 11 agents were responsible for the DU90% segment of the consumption. Most extensively used agents were amoxicillin-clavulanic-acid, cefuroxime and ciprofloxacin. The utilization of clindamycin (14.48 DDD/100 patient days in 2013 vs. 2.99 in 2017 - same in PDDs) and ceftriaxone (3.61 vs. 0.31 DDD/100 patient days - same in PDDs) decreased notably, while the use of narrow-spectrum beta-lactams increased in the last three years (from 2.93 to 7.84 DDD/100 patient days - 1.12 vs. 4.13 PDD/100 patient days), which was an initial goal of the pharmacist' interventions.

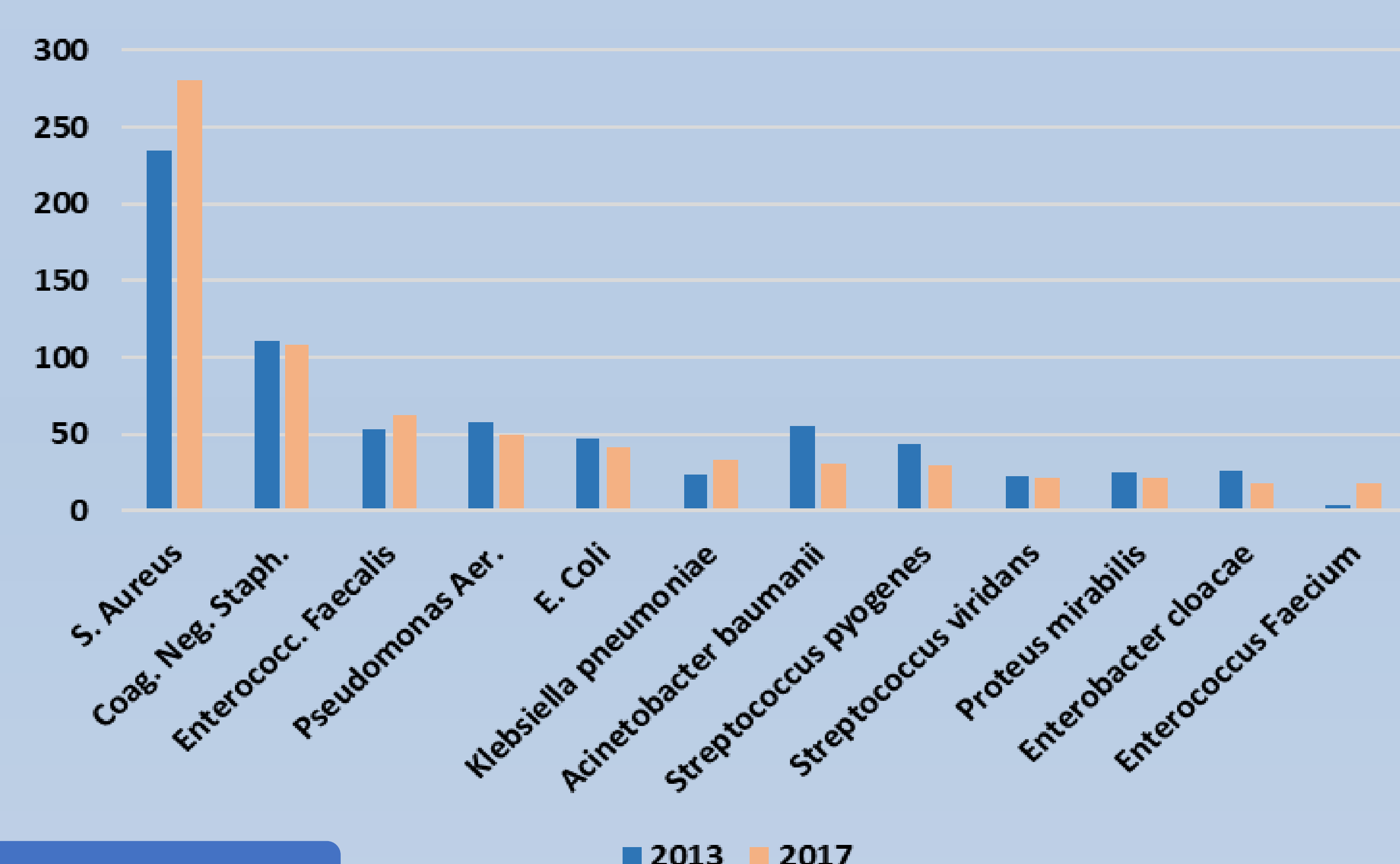
Antimicrobial utilisation - notable differences

DDD vs PDD



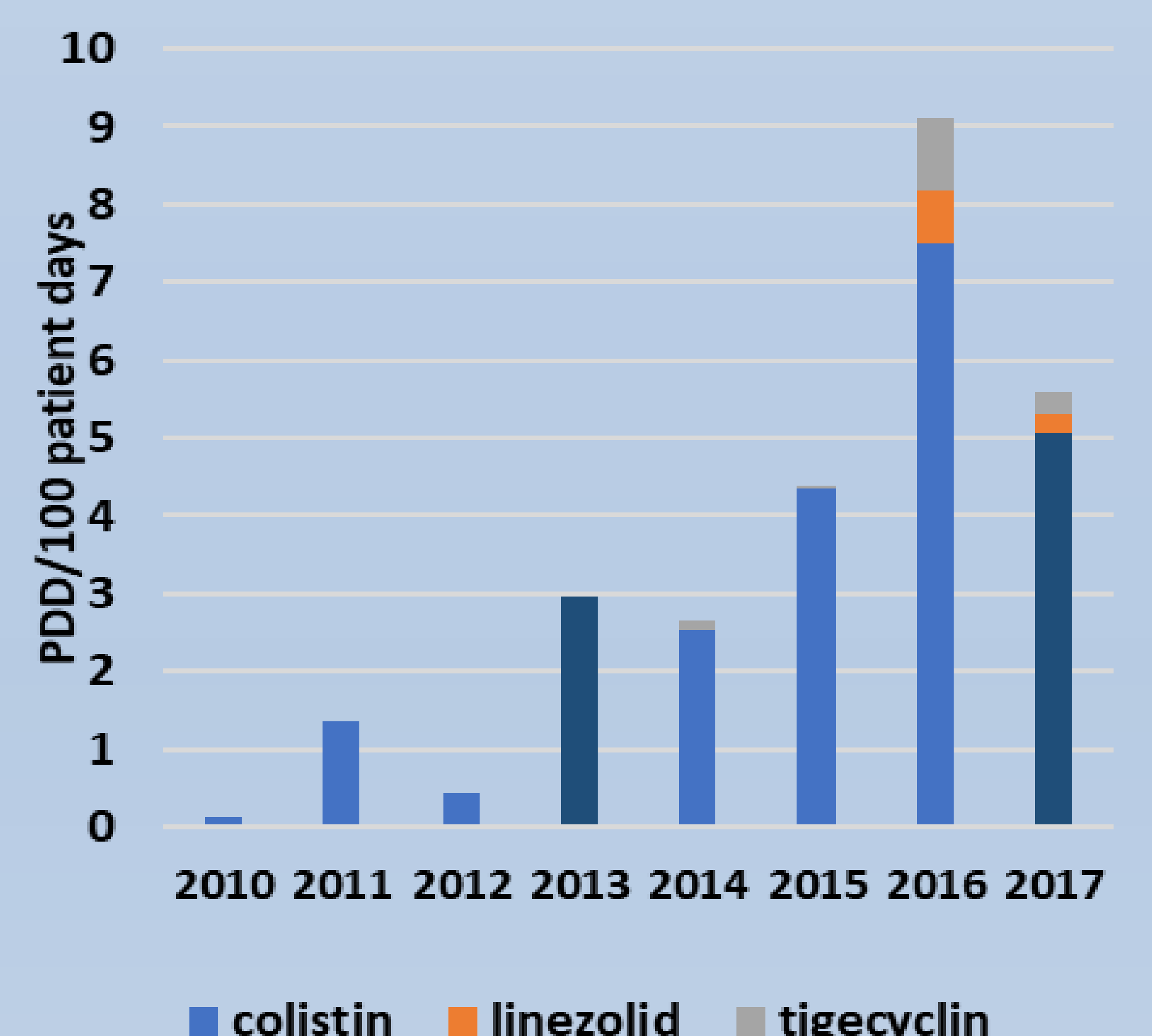
There was a significant difference between the results of the DDD and PDD analyses. DDD calculates with the average dose of an agent, which can be different in different indications or target population. PDD gives a more appropriate value of the consumption, as it calculates with the actually used doses.

Distributions of frequent pathogens



Microbiological data showed an increased rate of multiresistant pathogens, especially Vancomycin-resistant *E. faecium* (0 in 2010, 2 in 2013 and 14 in 2017), resulting in increased consumption of reserve antibiotics like linezolid and tigecycline.

Utilisation of reserve antibiotics



### Conclusion

Monitoring the use of antibiotics and comparing results with microbiological data gives a scope of local resistance conditions, which are fundamental to antimicrobial guideline development. The data highlights desirable trends and critical points, allowing pharmacists to feedback to prescribers and emphasise the value of their interventions. Interpretation of results must account for the fact that the generally accepted DDD method can be incorrect due to differences in antibiotic dosing.

