



Antibiotic prescribing challenges for neonatal infections: Replicating ACORN2 at Philippine General Hospital



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Background:

Antimicrobial resistance (AMR) is a leading cause of morbidity and mortality globally, with drastic implications across both high and low-resourced settings.¹ Plagued by non-specific and challenging diagnostics, a high prevalence of culture-negative infections, and empirical antibiotic recommendations that no longer reflect the pathogen profile,^{2,3} choosing appropriate treatments for neonates is a growing challenge.⁴

Methodology:

Utilising ACORN2 (A Clinically Oriented Antimicrobial Resistance Network) active surveillance methodology,⁵ we collected blood culture results, antibiotic prescribing, and clinical outcome data from all age-corrected neonates with clinically-suspected infections admitted to the Neonatal Intensive Care Unit (NICU) at PGH, Manila, Philippines, over one year (Nov 2023-Nov 2024). An infection episode included clinically-suspected infections where an IV antibiotic was prescribed for a suspected bacterial infection.

Aims: We evaluated the epidemiology of neonatal sepsis at Philippine General Hospital (PGH) to analyse how empirical antibiotics relate to antimicrobial susceptibility of isolated pathogens.

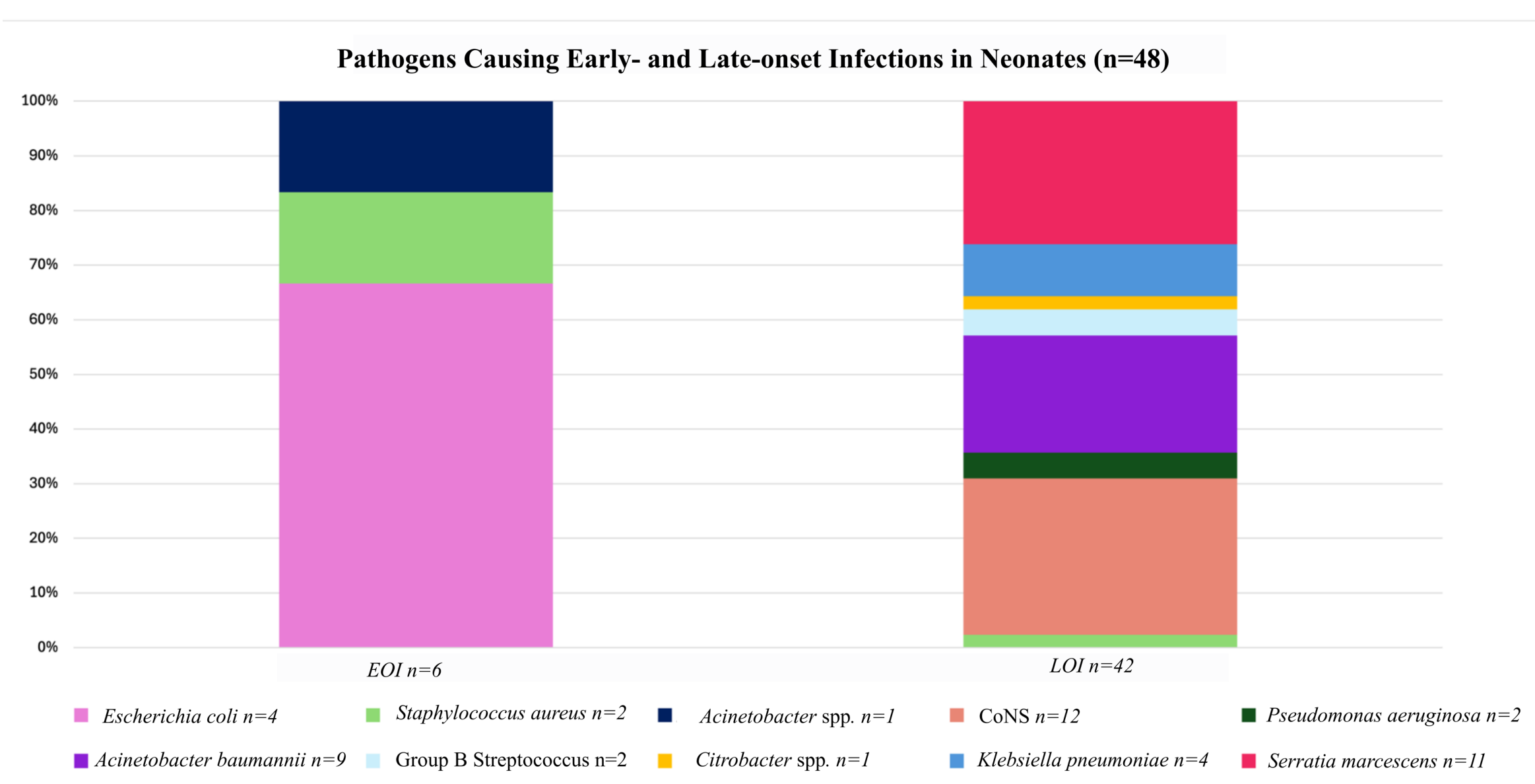


Figure 1. Pathogens causative of early-onset (<48hrs) and late-onset (≥48hr) infection episodes, CoNS: Coagulase negative staphylococcus species

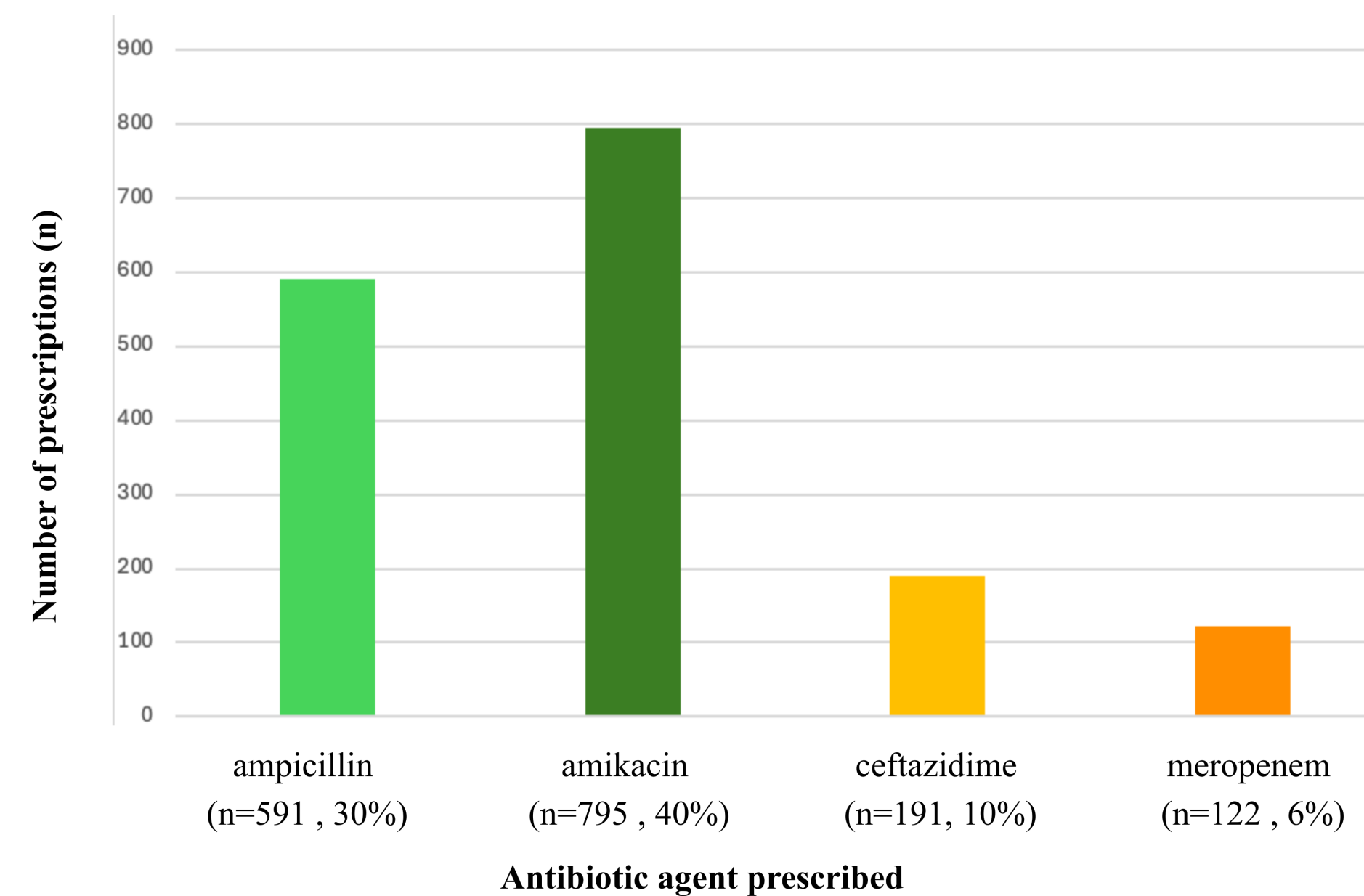


Figure 2. Top 4 most-commonly prescribed empirical antibiotics *291 other antimicrobials were prescribed empirically but have not been included here.

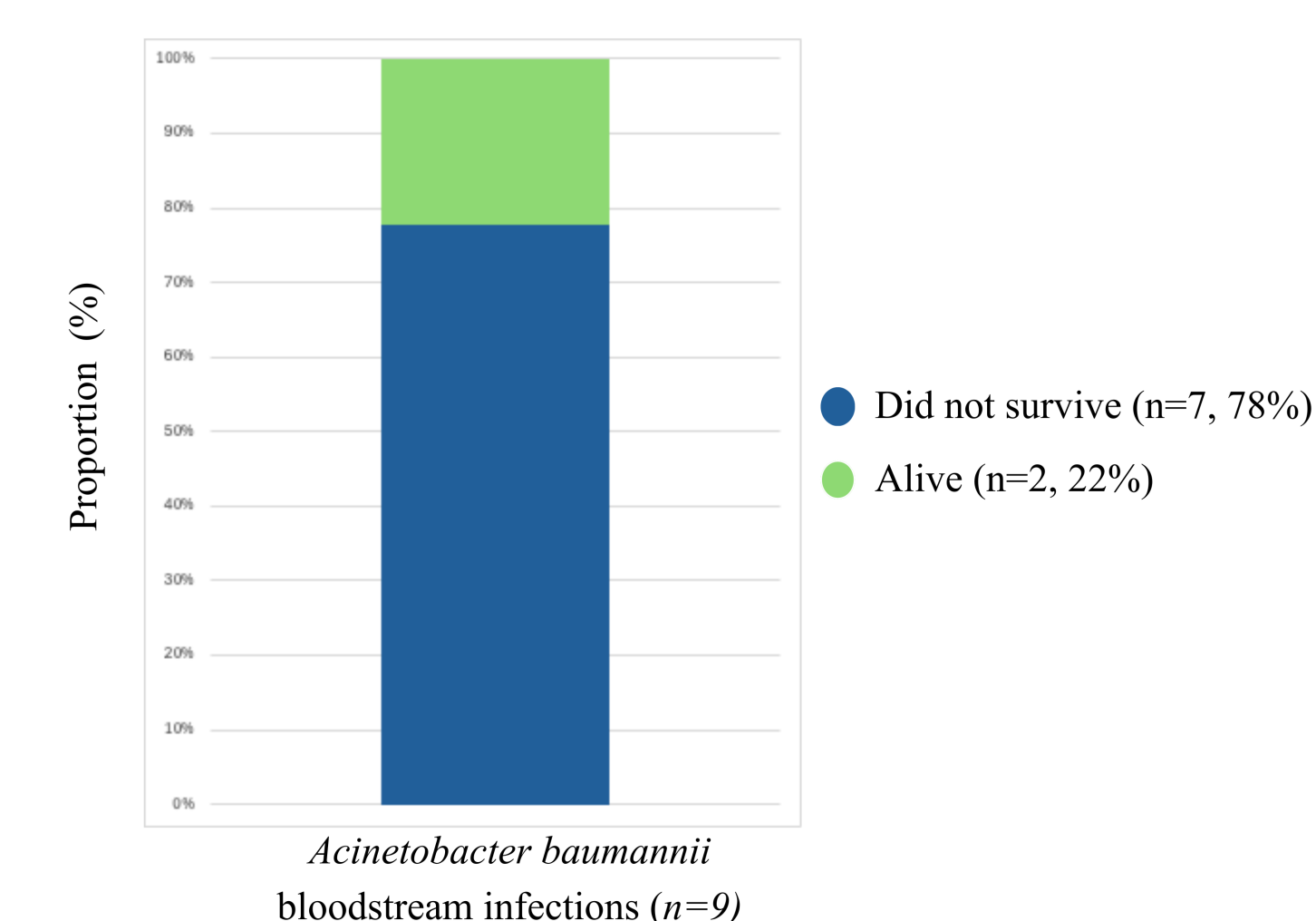


Figure 3. Day 28 Mortality status for Neonates with A.baumannii bloodstream infections

Infection Episodes

- **1024 episodes of infection** were recorded for **799 enrolled neonates** yielding **48 significant pathogens**.
- Microbiological diagnoses to target antibiotic therapy were only available for 5% of infection episodes (47/1024), resulting in 95% of episodes requiring **empirical antimicrobial treatment** (977/1024)
- The most commonly-isolated gram-negative pathogens overall were *Serratia marcescens* (11/48, 23%) *Acinetobacter baumannii* (9/48, 19%) and *Klebsiella pneumoniae* (4/48, 8%) (Fig. 2)

Clinical outcomes at 28 days:

- Mortality rate overall was 15% (117/799) while Seven of nine of neonates with *A. baumannii* bloodstream infections did not survive (Fig. 3)

Antimicrobial Susceptibility Testing

Five of the eight tested *A. baumannii* infections were non-susceptible to Carbapenems, and Aminoglycosides and four of the eight were non-susceptible to ceftazidime (Fig. 4)

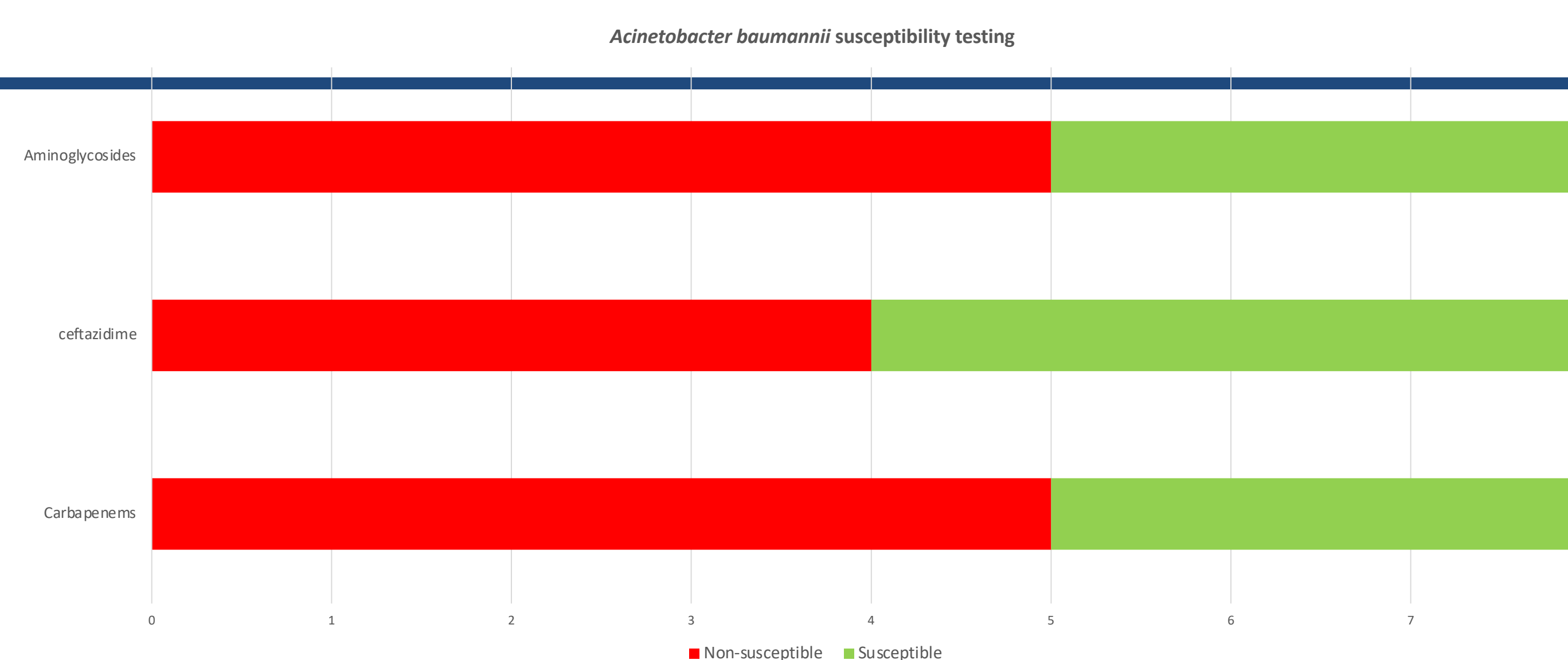


Figure 4. Antimicrobial susceptibility testing of isolated *A. baumannii* (n=8)

Conclusion: Broad-spectrum empirical antimicrobial prescribing presents a challenge for antimicrobial stewardship, particularly where culture-negative infections predominate. A high prevalence of antimicrobial resistance and the mortality rates associated with these infections are concerning, highlighting the need for low-cost infection prevention and control strategies and novel antimicrobial therapies to reduce the burden of neonatal infection.

