



High Mortality Associated with a high burden of Antimicrobial Resistant Neonatal Infections in Southeast Asia



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Background: Rising antimicrobial resistance (AMR) threatens improvements in rates of neonatal mortality.¹ One-third of all global neonatal deaths occur in South Asia, many of which are caused by neonatal infection.² This region has been identified as having high numbers of neonatal infections, many of which are no longer treatable with available anti-infectives.³

Aim: We aimed to quantify the burden of antimicrobial resistance in gram-negative pathogens causative of neonatal infections across high-burden sites in the NeoSEAP (Neonatal Sepsis in Southeast Asia and the Pacific) consortium.

Methods: Between 1st November 2024 and the 9th August 2025, we systematically enrolled all infants and neonates <180days with positive blood or cerebrospinal fluid cultures or positive molecular tests for bacterial or fungal pathogens at three clinical sites (Fig. 1) We linked clinical data to microbiological data to determine causes of infection and the associated clinical outcomes.

Clinical sites

Hasan Sadikin Hospital Bandung, Indonesia
Soetomo General Hospital, Surabaya, Indonesia
Aga Khan University Hospital, Karachi Pakistan

Infants/Neonates aged <180 days on participating neonatal units with culture/molecular positive bacterial or fungal infection enrolled

Anonymised clinical data captured on online REDCap database

Anonymised clinical data collected from medical records

Risk factors for neonatal sepsis evaluated

Clinical outcomes followed up 28 days after infection onset

Figure 1. Recruitment and data collection

Carbapenem non-susceptibility

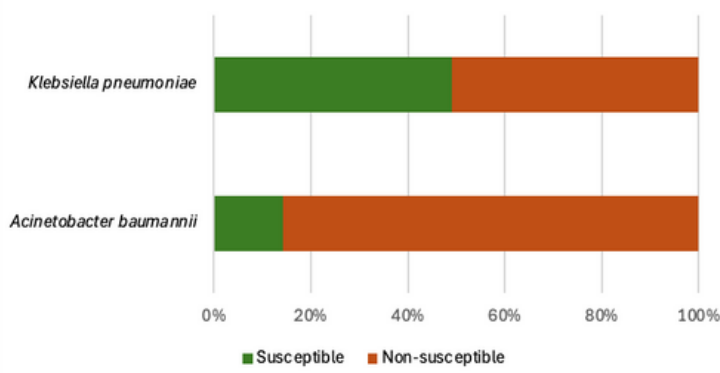


Figure 3. A. Baumannii and K. pneumoniae non-susceptibility

Clinical outcomes: discharge data were available for 206 participants with a further 51 either still admitted or lost to follow up. **47% (97/206) died during their hospital admission (Fig. 4.)** 43% (23/53) of those with *A. baumannii* infections and 51% (35/68) with *K. pneumoniae* isolated did not survive.

Results

Number enrolled: n= 257

Neonates (age corrected) <28days = 93% (240/257)

Age at infection onset (days) median (interquartile range (IQR)): 11 (7-20)

Early onset <72h: 4% (10/257), **Late onset >72h:** 96% (246/257) (missing age 1/257)

Gestational age (weeks) (med,IQR): 34 (31-37)

Birth weight (grams) (med,IQR): 2005g (1400g-2634g)

Delivery mode: Caesarean Section 60% (156/257)

316 organisms were identified among 257 infants (polymicrobial episodes n=59)
The most **commonly-isolated organism was *Klebsiella pneumoniae*** (22% 68/316) followed by *Acinetobacter baumannii* (17%, 53/316).

Two-thirds of isolated organisms were gram-negative (209/316), followed by 18% (57/316) gram-positive, and 16% fungal (50/316) (Fig.2)

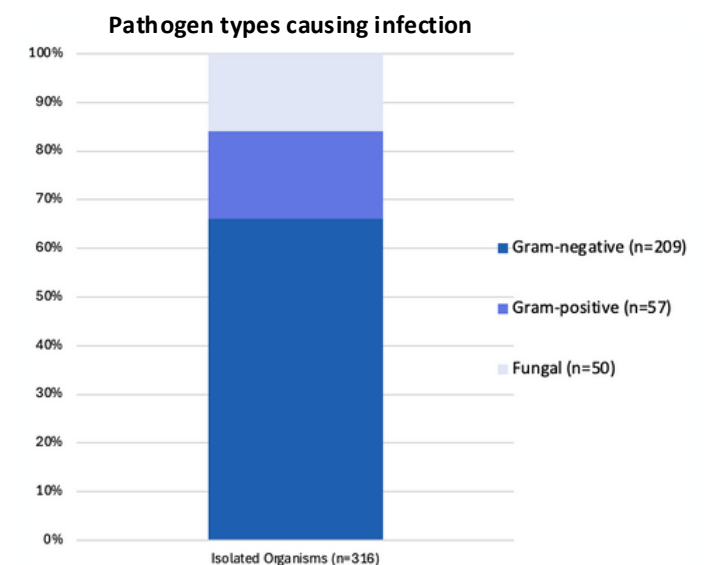


Figure 2. Causative pathogens

A. baumannii was non-susceptible to many antibiotics tested with only **14% (7/49) susceptible to carbapenems.**

Only half of the *K. pneumoniae* tested were susceptible to carbapenems (49%, 27/55), with 4% susceptible to cephalosporins (2/56) and 22% (12/54) susceptible to the penicillins tested (Fig. 3)

Mortality status on discharge

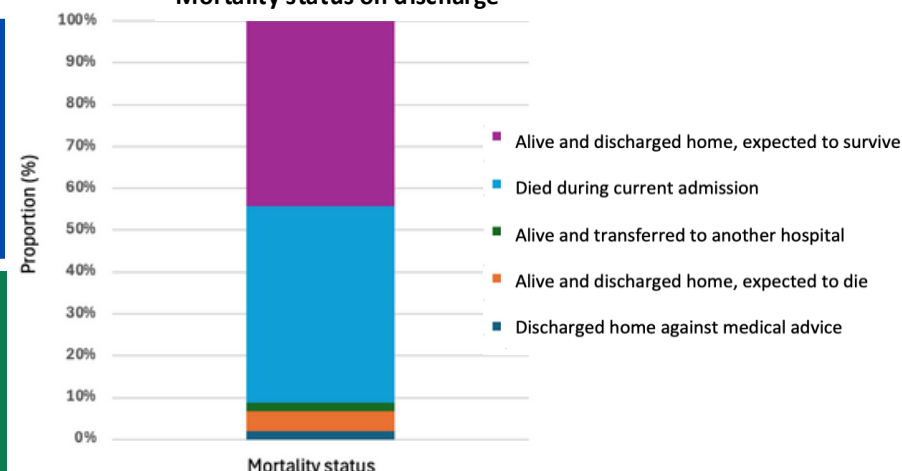


Figure 4. Mortality status on discharge

Conclusion: These results highlight the high mortality observed among neonates and young infants with infections in Southeast Asia. Antibiotic resistance in isolated pathogens shows a clear need for immediate antibiotic discovery and novel infection prevention and control strategies to curb the rates of mortality from resistant pathogens.

References:

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