

Seasonal Patterns of *Klebsiella Pneumoniae* and Antimicrobial Resistance in an East Java Referral Hospital: A Retrospective–Prospective Culture–Based Study

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Abstract:

Klebsiella pneumoniae is an important healthcare-associated pathogen and a global antimicrobial-resistance priority. Local data on its hospital distribution and resistance patterns in Indonesia remain limited. This study described the seasonal distribution and antimicrobial-resistance patterns of *K. pneumoniae* at Referral Hospital in Jember, East Java. A retrospective–prospective culture-based study was conducted at that hospital, from November 2024 to September 2026. Data from 2025 were obtained from electronic medical and laboratory records, while 2026 isolates were collected directly. Identification and AST used VITEK® 2 Compact (bioMérieux) and CLSI criteria. Repeated *K. pneumoniae* records were deduplicated by retaining the first record per patient and specimen type; records without patient identifiers were excluded. Seasons followed the existing database classification. Of 61 initial culture records, 56 records from 55 patients were retained; 31 occurred during the dry season and 25 during the rainy season. Before deduplication, sputum was the predominant specimen (38/61, 62.3%) and intensive care units contributed 24/61 records (39.3%). ESBL, MDR, and carbapenemase phenotypes were documented in 21/61 (34.4%), 6/61 (9.8%), and 2/61 (3.3%) records, respectively. Resistance was frequent to ampicillin (35/36, 97.2%), cefotaxime (22/31, 71.0%), trimethoprim–sulfamethoxazole (19/30, 63.3%), and ciprofloxacin (17/30, 56.7%). No robust seasonal resistance difference remained after multiple-comparison correction. *K. pneumoniae* was mainly recovered from respiratory specimens and critical-care settings, with substantial ESBL-associated resistance. These findings support microbiology surveillance and antimicrobial stewardship in this hospital. Seasonal findings are exploratory because specimen dates and admission or patient-day denominators were unavailable.

Keywords:

Klebsiella pneumoniae, antimicrobial resistance, hospital, seasonal distribution, ecology.