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Original study

Comparative evaluation of antibiotic prescribing patterns in hospitalized paediatric patients at government and private tertiary care hospitals: a cross-sectional observational study.

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ABSTRACT
Background:
To compare antibiotic prescribing patterns among hospitalized paediatric patients at a government and a private tertiary care hospital in Karnataka, India.

Methods:
A prospective observational study was conducted in the Department of Paediatrics at Koppal Institute of Medical Sciences (government hospital) and Lake View Hospital, Belagavi (private hospital). Two hundred hospitalized patients aged under 18 years who received at least one antimicrobial agent were consecutively enrolled from each site following informed parental consent. Demographic, clinical, and antibiotic-prescribing data were collected from case records and analysed using SPSS v26.0, with Chi-square and independent-samples t-tests applied as appropriate (significance at $p<0.05$).

Results:
Demographic and diagnostic profiles were broadly comparable, though the government hospital served predominantly rural, lower-socioeconomic patients while the private hospital served urban, higher-socioeconomic patients ($p<0.001$). The private hospital generated more antibiotic prescriptions (380 vs. 250) and higher per-patient antimicrobial intensity (1.90 vs. 1.25 antimicrobials/encounter; 3.6 vs. 2.8 drugs/patient). Ceftriaxone and cephalosporins predominated at both sites but more markedly in the private hospital (59.2% vs. 46.0% of prescriptions). Treatment duration was longer in the government hospital for several agents, along with longer overall hospital stay (6.5 vs. 4.2 days). Generic-name documentation was complete at both sites, though the private hospital also recorded brand names.

Conclusion:
Government and private tertiary hospitals exhibit distinct antibiotic prescribing cultures—the private sector favouring higher prescribing intensity, and the government sector favouring prolonged treatment durations likely linked to delayed microbiological diagnostics. These findings indicate that antimicrobial stewardship interventions in this region should be tailored to each sector rather than applied uniformly.

Keywords: *Antibiotics, Tertiary care hospital, antimicrobial resistance, Comparison, Ceftriaxone, Sensitivity*
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INTRODUCTION
Infectious diseases continue to account for a huge share of childhood morbidity and hospital admissions in low- and middle-income countries, and antibiotics remain the most frequently prescribed class of drugs in paediatric inpatient care. [1] Because children cannot always show the same clinical or laboratory signals of infection that guide therapy as in adults, empirical antibiotic use is common, and it is often initiated well before culture and sensitivity results are available. That may lead to irrational or unnecessarily broad-spectrum prescribing. [2,3] The 2022 Global Research on Antimicrobial Resistance (GRAM) analysis estimated that bacterial antimicrobial resistance was directly responsible for 1.27 million deaths worldwide in 2019.[4] India, given its high infectious disease load, dense population, easy over-the-counter access to antibiotics, and comparatively weak enforcement of prescription regulation, has repeatedly been flagged as one of the countries most vulnerable to accelerating resistance. [5]

A finding in the Indian literature is that antibiotic prescribing does not look the same across the public and private sectors. Studies from central India comparing paediatric inpatients at private teaching and non-teaching hospitals found that the proportion of children who received at least one antibiotic, the choice of agent, and adherence to essential-medicine lists varied substantially between the two settings, with broad-spectrum thirdgeneration cephalosporins and newer fixed-dose combinations dominating prescribing.[6,7] Studies have shown differences in adhering to the WHO Essential Medicines List for Children and to the WHO AWaRe (Access, Watch, Reserve) framework depending on hospital type. [8] Broader point-prevalence surveys conducted across Indian tertiary and secondary care centres have echoed this concern, repeatedly showing that a large share of prescribed antibiotics fall into the Watch category rather than the narrower-spectrum Access group that WHO recommends as the first-line choice for most common infections. [9,10,11]

Government and private tertiary care hospitals in India differ not only in ownership but in patient case-mix, diagnostic infrastructure, nursing ratios, out-of-pocket cost pressures, and the degree of formal antimicrobial stewardship oversight — all factors that decide which antibiotics are chosen. [12] Existing Indian evidence on paediatric antibiotic use comes from single-institution audits, and comparative, prospective, head-to-head data contrasting government and private tertiary centres within the same region are limited. With this background, the present prospective observational study was undertaken to compare antibiotic prescribing patterns — including choice of agent, spectrum, route and duration- among hospitalized paediatric patients at a government and a private tertiary care hospital.

METHODOLOGY

Study Design and Setting

A cross-sectional observational comparative study was conducted in the Department of Paediatrics at two tertiary care hospitals in Karnataka, India: Koppal Institute of Medical Sciences (government hospital) and Lake View Hospital, Belagavi (private hospital), both of which are tertiary care hospitals. The study was conducted from August 2025 to February 2026.

Eligibility criteria

The study included hospitalized paediatric patients aged <18 years who were prescribed at least one antimicrobial agent during hospitalization. Consecutive sampling was used, and all eligible patients meeting the inclusion criteria were enrolled until 200 participants were recruited from each hospital.

Study size:

The sample size was calculated for comparing two independent proportions using the formula:

$$n = \frac{2(Z\alpha/2 + Z\beta)2\bar{p}(1-\bar{p})}{(p1-p2)^2}$$

The expected proportions of antibiotic prescribing were taken as 70% and 84%, respectively, based on the findings reported by Sharma M et al. [5]

- p_1 = 0.70 (government hospital prescribing proportion)
- p_2 = 0.84 (private hospital prescribing proportion)
- $\alpha = 0.05$ (two-sided) → $Z\_\alpha/2 = 1.96$
- Power = 80% → $Z\_\beta = 0.84$ (90% power → $Z\_\beta = 1.28$)

At 90% power: $(1.96+1.28)^2 = 10.50$ → $n = 2\times10.50\times0.1771 / 0.0196 \approx 185$ per group
185 → rounded up to 200 participants per hospital
Total sample size = 200 × 2 = 400 pediatric patients
Thus, a total of 400 pediatric inpatients (200 from the Government Hospital and 200 from the Private Hospital) were included in the study.

Data Collection

Data were collected prospectively using a predesigned data collection proforma after obtaining written informed consent from parents or legal guardians. Information was obtained from inpatient case records, treatment charts, medication records, or discharge summaries. The final diagnosis documented by the treating paediatrician at discharge was considered for analysis. Data collected included demographic characteristics (age, sex, weight, and residence), clinical characteristics (diagnosis), and antibiotic prescribing variables. Antibiotic-related variables comprised the prescribed agent, dose, frequency, route, duration, indication, and generic or brand prescribing.

Statistical Analysis

Data were entered into Microsoft Excel and analysed using SPSS version 26.0. Categorical variables were expressed as frequencies and percentages, while continuous variables were summarized as mean ± standard deviation or median, as appropriate. The independent-samples *t*-test for continuous variables after assessing normality. Crude odds ratios (ORs) with 95% confidence intervals (CIs) were calculated for selected prescribing practices. A *p*-value <0.05 was considered statistically significant.

Ethical considerations

The study was approved by the Institutional Ethics Committee of Koppal Institute of Medical Sciences, Koppal, and Lake View Hospital, Belagavi. Written informed consent was obtained from the parents or legal guardians of all participants before enrolment.

Informed consent

Written informed consent was obtained from the parents or legal guardians of all participants before enrolment.

Bias

Data were collected using a standardized data collection proforma and extraction of data from medical records. The collected data were cross-checked for completeness and accuracy before statistical analysis.

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RESULTS

Table 1: Demographic data of the study participants

Characteristic	Government n (%)	Private n (%)	p
Gender			
Male	118 (59.0)	110 (55.0)	.42
Female	82 (41.0)	90 (45.0)	
Age			
1–12 months	30 (15.0)	25 (12.5)	
13 months–2 years	50 (25.0)	45 (22.5)	
2–5 years	70 (35.0)	75 (37.5)	.71
6–11 years	35 (17.5)	40 (20.0)	
12–18 years	15 (7.5)	15 (7.5)	
Area			
Urban	80 (40.0)	150 (75.0)	< .001
Rural	120 (60.0)	50 (25.0)	
Socio-economic status			
Upper (I)	10 (5.0)	40 (20.0)	
Upper Middle (II)	20 (10.0)	60 (30.0)	< .001
Lower Middle (III)	50 (25.0)	60 (30.0)	
Upper Lower (IV)	70 (35.0)	30 (15.0)	
Lower (V)	50 (25.0)	10 (5.0)	

The demographic characteristics of the study participants are presented in Table 1. A total of 200 paediatric patients each were included from the government and private hospitals. Male participants constituted 59.0% of the study population in the government hospital and 55.0% in the private hospital, while females accounted for 41.0% and 45.0%, respectively. The gender distribution did not differ significantly between the two hospitals (p = 0.42). Children aged 2–5 years represented the largest age group in both hospitals (35.0% in the government hospital and 37.5% in the private hospital), followed by those aged 13 months–2 years. No statistically significant difference was observed in the age distribution between the two groups (p = 0.71). A significant difference was observed in the residential distribution of patients. The majority of patients attending the government hospital were from rural areas (60.0%), whereas most patients attending the private hospital were from urban areas (75.0%) (p < 0.001). Similarly, socioeconomic status differed significantly between the hospitals (p < 0.001), with higher socioeconomic classes predominating in the private hospital and lower socioeconomic classes being more common among patients in the government hospital.

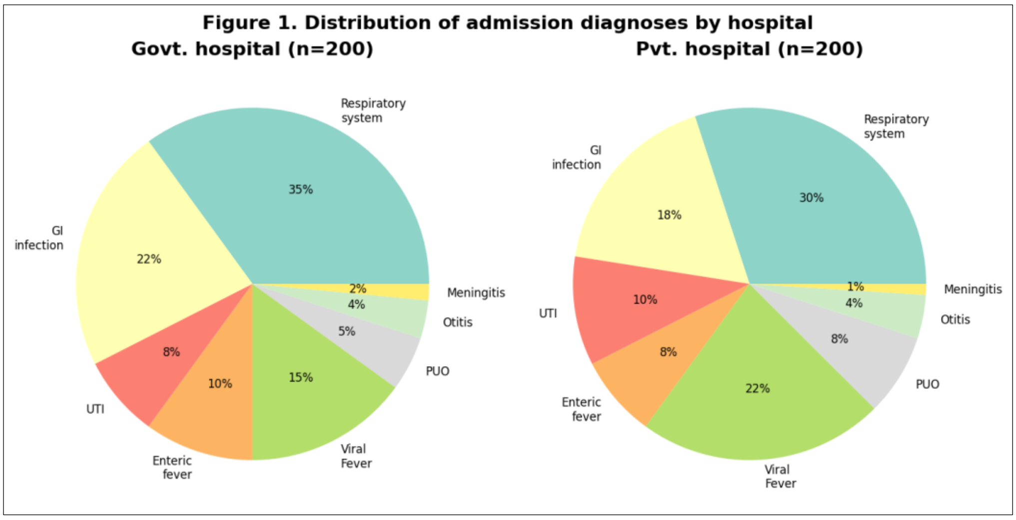

Figure 1: Diagnosis of the study participants

Figure 1 illustrates the distribution of clinical diagnoses among the paediatric patients enrolled in the study. Respiratory tract infections constituted the most common diagnosis in both hospitals, followed by gastrointestinal infections, urinary tract infections, skin and soft tissue infections, and other infectious conditions. Overall, the pattern of diagnoses was comparable between the government and private hospitals, although minor variations were observed in the frequency of individual disease categories.

Table 2: Use of various antibiotics in the paediatric patients

Antibiotic	Govt n (%)	Mean days	Private n (%)	Mean days
Amoxicillin-Clavulanic acid	45 (18.0)	5.2	40 (10.5)	4.0
Ceftriaxone	60 (24.0)	6.5	130 (34.2)	4.5
Cefixime	30 (12.0)	5.0	60 (15.8)	4.0
Azithromycin	20 (8.0)	5.0	35 (9.2)	3.5
Amikacin	15 (6.0)	6.0	20 (5.3)	4.0
Levofloxacin	5 (2.0)	5.5	10 (2.6)	4.0
Ciprofloxacin	8 (3.2)	5.0	12 (3.2)	4.0
Vancomycin	5 (2.0)	7.0	8 (2.1)	5.0
Meropenem	7 (2.8)	8.0	10 (2.6)	6.0
Cefotaxime	25 (10.0)	6.0	35 (9.2)	4.0
Clindamycin	10 (4.0)	5.0	10 (2.6)	4.0
Metronidazole	20 (8.0)	5.5	10 (2.6)	4.0

The pattern of antibiotic utilization is summarized in Table 2. A total of 250 antibiotic prescriptions were recorded in the government hospital compared with 380 prescriptions in the private hospital. Ceftriaxone was the most frequently prescribed antibiotic in both hospitals, accounting for 24.0% of prescriptions in the government hospital and 34.2% in the private hospital. Other commonly prescribed antibiotics included amoxicillin–clavulanic acid, cefixime, cefotaxime, azithromycin, and metronidazole. The mean duration of therapy was generally longer in the government hospital for most antibiotics. Meropenem showed the longest treatment duration (8.0 days in the government hospital and 6.0 days in the private hospital), followed by vancomycin and ceftriaxone.

Table 3: Comparison of mean treatment duration for individual antibiotics

Antibiotic	Govt	Private	Difference	p
Amox-Clav	5.2	4.0	1.2	.03
Ceftriaxone	6.5	4.5	2.0	< .001
Cefixime	5.0	4.0	1.0	.04
Azithromycin	5.0	3.5	1.5	.01
Amikacin	6.0	4.0	2.0	.02
Levofloxacin	5.5	4.0	1.5	.09
Ciprofloxacin	5.0	4.0	1.0	.12
Vancomycin	7.0	5.0	2.0	.08
Meropenem	8.0	6.0	2.0	.06
Cefotaxime	6.0	4.0	2.0	.01
Clindamycin	5.0	4.0	1.0	.15
Metronidazole	5.5	4.0	1.5	.03

Table 3 compares the mean duration of antibiotic therapy between the two hospitals. The duration of treatment was significantly longer in the government hospital for amoxicillin–clavulanic acid ($p = 0.03$), ceftriaxone ($p < 0.001$), cefixime ($p = 0.04$), azithromycin ($p = 0.01$), amikacin ($p = 0.02$), cefotaxime ($p = 0.01$), and metronidazole ($p = 0.03$). Although longer treatment durations were also observed for levofloxacin, ciprofloxacin, vancomycin, meropenem, and clindamycin in the government hospital, these differences were not statistically significant ($p > 0.05$).

Table 4: WHO core prescribing indicators

Indicator	Government	Private
Drugs/patient	2.8	3.6
Antimicrobials/encounter	1.25	1.90
Generic prescribing (%)	100	100*
Hospital stay (days)	6.5	4.2

*Note. *Private hospital documented both generic and brand names.*

The WHO core prescribing indicators are shown in Table 4. The average number of drugs prescribed per patient was higher in the private hospital (3.6) than in the government hospital (2.8). Similarly, the average number of antimicrobials per encounter was greater in the private hospital (1.90) compared with the government hospital (1.25). Generic prescribing of antimicrobials was 100% in both of the hospitals, but in the private hospital, both brand name and generic name were written. The average duration of hospital stay was longer in the government hospital (6.5 days) compared with the private hospital (4.2 days).

Table 5: Use of various classes of antibiotics in the paediatric patients

Class	Government n (%)	Private n (%)
Penicillins	45 (18.0)	40 (10.5)
Cephalosporins	115 (46.0)	225 (59.2)
Macrolides	20 (8.0)	35 (9.2)
Aminoglycosides	15 (6.0)	20 (5.3)
Fluoroquinolones	13 (5.2)	22 (5.8)
Glycopeptides	5 (2.0)	8 (2.1)
Carbapenems	7 (2.8)	10 (2.6)
Lincosamides	10 (4.0)	10 (2.6)
Nitroimidazoles	20 (8.0)	10 (2.6)

The distribution of antibiotic classes prescribed is presented in Table 5. Cephalosporins were the most commonly prescribed antibiotic class in both hospitals, accounting for 46.0% of prescriptions in the government hospital and 59.2% in the private hospital. Penicillins were the second most frequently prescribed class, followed by macrolides, aminoglycosides, fluoroquinolones, nitroimidazoles, lincosamides, carbapenems, and glycopeptides.

Nitroimidazole use was relatively higher in the government hospital (8.0%) than in the private hospital (2.6%), whereas cephalosporin utilization was markedly higher in the private hospital. Overall, cephalosporins and penicillins together accounted for the majority of antibiotic prescriptions in both study settings.

DISCUSSION

This prospective observational study compared antibiotic prescribing patterns among hospitalized paediatric patients at a government and a private tertiary care hospital in Karnataka and found several clinically meaningful differences, despite broadly comparable demographic and diagnostic profiles. The government hospital drew predominantly rural, lower-socioeconomic-status patients, while the private hospital served a largely urban, higher-socioeconomic population ($p<0.001$ for both). This divergence in catchment population is consistent with the well-documented two-tier structure of Indian tertiary care, where government facilities absorb a disproportionate share of economically disadvantaged and geographically remote patients who have limited access to private care. [12]

Despite enrolling equal numbers of patients (200 per site), the private hospital generated substantially more antibiotic prescriptions (380 vs. 250) and a higher average number of antimicrobials per encounter (1.90 vs. 1.25) and drugs per patient (3.6 vs. 2.8). This pattern — higher per-patient antibiotic intensity in the private sector — mirrors findings from central India, where point-prevalence and drug-utilisation studies have similarly found greater antibiotic consumption and heavier use of newer, broader-spectrum agents in the private sector compared with public institutions.[6, 7] Financial incentives linked to prescribing, greater availability of newer branded formulations, and lower threshold for "covering" empirically in a fee-for-service setting have all been proposed as drivers of this pattern in Indian private hospitals.

Cephalosporins, chiefly ceftriaxone, dominated prescribing at both sites but more markedly so in the private hospital (59.2% vs. 46.0% of all antibiotic prescriptions; ceftriaxone alone 34.2% vs. 24.0%) same pattern was found in other studies as well.[9, 10]The relatively higher metronidazole/nitroimidazole use in the government hospital (8.0% vs. 2.6%) likely reflects the greater proportion of gastrointestinal/enteric infections managed empirically without confirmatory stool or blood culture data, a resource constraint more common in public-sector settings. longer overall length of stay in the government hospital (6.5 vs. 4.2 days), likely delays in obtaining culture and sensitivity results that would otherwise permit early de-escalation or discontinuation,

Both hospitals achieved 100% generic-name documentation, but the private hospital additionally recorded brand names alongside generics, a practice that has previously been linked in Indian studies to lower rates of true generic dispensing and higher out-of-pocket drug costs for families, since brand-name anchoring at the point of prescription can influence pharmacy substitution practices even when a generic name is technically recorded.[6] Overall, the findings demonstrate distinct antibiotic prescribing patterns between the two tertiary care settings despite comparable clinical profiles of hospitalized children. The private hospital was characterized by a higher intensity of antibiotic use, greater reliance on broad-spectrum cephalosporins, and more frequent prescribing per patient, whereas the government hospital showed comparatively fewer antibiotic prescriptions but longer treatment duration and greater use of nitroimidazoles. These differences likely reflect variations in patient characteristics, healthcare infrastructure, prescribing practices, and availability of diagnostic support rather than differences in disease severity alone. The findings highlight the need for context-specific antimicrobial stewardship strategies that address the unique prescribing behaviours and resource constraints of each healthcare setting, while promoting the rational use of antibiotics.

Generalizability

Generalizability is limited because the study was conducted in only one government and one private hospital, and prescribing patterns may vary across different states, rural and urban settings, teaching and non-teaching institutions, and hospitals with established antimicrobial stewardship programmes. Therefore, the results should be interpreted cautiously and may not represent antibiotic prescribing practices in all Indian healthcare settings.

CONCLUSION

This study highlights that the differences in antibiotic prescribing between government and private tertiary care hospitals extend beyond the choice of antibiotics and reflect variations in healthcare resources, patient populations, and clinical practice. Private hospitals demonstrated higher antibiotic prescribing intensity. Adopting a uniform approach, interventions to improve antibiotic use should address the specific needs and constraints of each healthcare sector. Targeted antimicrobial stewardship, supported by timely diagnostic services and regular prescription audits, will be crucial to ensuring effective treatment for children while helping to preserve the effectiveness of antibiotics for future generations.

Limitations

The study was conducted in only two tertiary care hospitals in Karnataka, which may limit the generalizability of the findings to other healthcare settings. The study relied on medical record documentation and did not evaluate the appropriateness of antibiotic prescriptions, microbiological culture results, or clinical outcomes.

Recommendation

Antimicrobial stewardship programmes should be strengthened in both government and private healthcare settings, with emphasis on evidence-based prescribing, regular prescription audits, and adherence to national and WHO antibiotic guidelines. Improving access to timely microbiological diagnostic services and promoting continuous education of healthcare professionals may further optimize antibiotic use and reduce antimicrobial resistance.

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List of abbreviations

AMR - Antimicrobial Resistance
AWaRe - Access, Watch and Reserve Classification
WHO- World Health Organization

Source of funding

The study had no funding.

Conflict of interest

The authors declare no conflict of interest.

Data availability

Data are available upon request from the author.

Author contributions

Dr. Girish Hiremath: Conceptualization, supervision, methodology, manuscript review.
Dr. Shashikant: Study design, patient recruitment, clinical supervision, manuscript review.
Dr. Harsha: Data collection, patient recruitment, clinical data validation.
Dr. Nikita Sudhir Kulgod: Literature review, data interpretation, manuscript drafting and editing.
Dr. Akash Gadgade: Conceptualization, methodology, statistical analysis, data interpretation, manuscript preparation, and final approval of the manuscript.
Dr. Sagar Chidanand Duganavar: Data analysis, literature review, manuscript editing, and critical revision.

REFERENCES

1. Priyadharsini RP, Kesavan R. Antibiotic prescribing pattern among paediatric patients attending tertiary care hospital in South India. International Journal of Basic & Clinical Pharmacology. 2020 Jun 26;9:1028. https://doi.org/10.18203/2319-2003.ijbcp20202935
2. Ramaiah J, Narayana G, Reddy Y, Alameri T, Pradeepkumar B. Assessment of Antibiotic Prescribing Pattern in Pediatric Patients: A Cross-Sectional Hospital-Based Survey. CHRISMED Journal of Health and Research. 2017;4(4):235-237. T Rajavardhana, A Naga Jyothi, G Naresh Babu. Prescribing Patterns of Antibiotics in Pediatric Patients of Tertiary Care Hospital in South Indian Resource Limited Settings. Inventi Impact: Pharmacy Practice, 2019(2):76-81, 2019.Murray CJL, Ikuta KS, Sharara F, et al. Global burden of bacterial antimicrobial resistance in 2019: a systematic analysis. Lancet. 2022;399(10325):629-655. https://doi.org/10.1016/S0140-6736(21)02724-0
3. Mukwege D, Mitangala P, Byabene A, Busha E, Laethem YV, Vandenberg O. Global burden of antimicrobial resistance: essential pieces of a global puzzle. The Lancet. 2022 Jun 25;399(10344):2348. doi:10.1016/S0140-6736(22)00944-8 https://doi.org/10.1016/S0140-6736(22)00944-8

4. Sharma M, Damlin A, Sharma A, et al. Antibiotic prescribing among pediatric inpatients with potential infections in two private sector hospitals in Central India. PLoS One. 2015;10(11):e0142317. https://doi.org/10.1371/journal.pone.0142317
5. Skender K, Singh V, Stalsby-Lundborg C, Sharma M. Trends and patterns of antibiotic prescribing at orthopedic inpatient departments of two private-sector hospitals in Central India: A 10-year observational study. Karunasagar I, editor. PLoS ONE. 2021 Jan 27;16(1):e0245902. https://doi.org/10.1371/journal.pone.0245902
6. Sharma M, Weyer SVD, Lundborg CS. 10-year diagnosis-specific antibiotic prescribing trends among paediatric inpatients at two private-sector hospitals in central India: a prospective observational study. BMJ Open. 2025 Mar 1;15(3):e087901. https://doi.org/10.1136/bmjopen-2024-087901
7. Sheikh S, Saleem Z, Afzal S, Qamar MU, Raza AA, Haider Naqvi SZ, et al. Identifying targets for antibiotic stewardship interventions in pediatric patients in Punjab, Pakistan: point prevalence surveys using AWaRe guidance. Front Pediatr. 2025 Jan 10;12. Bhattacharjee S, Mothsara C, Shafiq N, Panda PK, Rohilla R, Kaore SN, et al. Antimicrobial prescription patterns in tertiary care centres in India: a multicentric point prevalence survey. eClinicalMedicine. 2025 Apr 1;82. Rajendran R, Mahadeva K, Bhandarkar S, Khader MA, Balakrishnan JM, Nair S, et al. Patterns of antibiotic use in Indian secondary care hospitals: Results from a multicenter point prevalence survey. International Journal of Infectious Diseases. 2026 Sep 1;170:108880. https://doi.org/10.3389/fped.2024.1469766
8. 2019 WHO AWaRe Classification Database of Antibiotics for evaluation and monitoring of use [Internet]. Available from: https://www.who.int/publications/i/item/WHOEMPIAU2019.11
9. Abdelsalam Elshenawy R, Umaru N, Aslanpour Z. WHO AWaRe classification for antibiotic stewardship: tackling antimicrobial resistance - a descriptive study from an English NHS Foundation Trust before and during the COVID-19 pandemic. Front Microbiol. 2023 Dec 11;14:1298858. https://doi.org/10.3389/fmicb.2023.1298858

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