International Journal of Medical and Health Research
www.medicalsciencejournal.com
ISSN: 2454-9142
Received: 10-03-2026, Accepted: 10-04-2026, Published: 25-04-2026
Volume 12, Issue 2, 2026, Page No. 20-23

An audit of antibiotic prescriptions at National Hospital for Respiratory Diseases Welisara, Sri Lanka

Darshana G K P[1], Senapathi S[2], Ponweera P A D D S[3], Diyelegoda K[4], Kannangara P D C N[5]
[1] Deputy Director, North Colombo Teaching Hospital Ragama, Ministry of health, Sri Lanka
[2] Deputy Director, Lady Ridgeway Hospital Colombo, Ministry of health, Ragama, Sri Lanka
[3] Deputy Director, Ministry of Health Colombo, Ministry of health, Ragama, Sri Lanka
[4] Consultant Microbiologist, National Hospital for Respiratory Diseases, Ministry of health, Welisara, Sri Lanka
[5] Medical Officer, Ministry of Health, Colombo, Sri Lanka

Abstract
Background
A retrospective audit was conducted in September 2024 in 10 wards to identify the prevalence and antibiotic prescription patterns at National Hospital for Respiratory Diseases (NHRD), Sri Lanka. This audit aim to improve rational use of the Antibiotic usage at National Hospital for Respiratory Diseases, Welisara, Sri Lanka.
Method
Data on antibiotic use was extracted from Bed Head Tickets (BHTs) from each unit using a standard questionnaire form.
Result
A retrospective analysis of 142 patient records revealed a female representation of 37.32% (n=53) and a mean cohort age of 54.64 years. Antimicrobial therapy was administered to 115 patients (81%), with the highest prevalence of use observed within surgical units. The majority of these prescriptions were attributed to community-acquired infections.
The primary clinical indications for antibiotic initiation were:
Secondary respiratory infections in smear-positive post-tuberculosis patients: 34.61%
Pneumonia: 20.15%
Post-plural effusion respiratory infections: 9.0%
Empiric prescribing accounted for 69.5% (n=80) of all instances. Regarding administration routes, 96 patients received intravenous (IV) therapy and 88 received oral therapy, with a subset receiving concurrent IV and oral treatments. Multi-drug regimens were common; 57.39% (n=66) of patients were prescribed two antibiotics, while 3.4% (n=4) received three or more.
The most frequently utilized medications were:
Oral: Co-amoxiclav (n=38) and Clarithromycin (n=30).
Intravenous: Ceftriaxone (n=26) and Meropenem (n=18).
Notably, the clinical rationale for starting antibiotics was undocumented in 9.2% (n=12) of cases. While no sub-therapeutic dosing was reported, significant gaps in diagnostics were identified: appropriate microbiological cultures were not requested for 25 patients, and relevant data were missing from 30 Bed Head Tickets (BHTs).
Conclusion
This audit highlights a high prevalence of antibiotic utilization and identifies specific lapses in the documentation of clinical indications. Fluctuations in prescribing patterns were observed, likely secondary to the transfer of medical officers and consultants.
To strengthen antibiotic stewardship, it is imperative to enforce adherence to national guidelines for empirical and prophylactic therapy. Furthermore, regular reviews of indications, dosages, and treatment duration by a Consultant Microbiologist are recommended to foster more rational antimicrobial prescribing.

Keywords: Antibiotic audit, inappropriate use, antimicrobial resistance, antibiotic stewardship program

Introduction
Antimicrobial resistance (AMR) represents a critical and escalating threat to global public health [1]. Infections caused by multidrug-resistant organisms (MDROs) are consistently associated with prolonged hospitalizations, increased mortality rates, and a substantial escalation in healthcare expenditures [2]. Among the various drivers of AMR, the inappropriate use of antimicrobial agents remains a primary modifiable risk factor [1, 2, 3]. Consequently, robust hospital-based antimicrobial stewardship programs (ASPs)—which integrate systematic data collection on resistance patterns, prescription audits, and clinical feedback—are essential to mitigating this crisis [3, 4].
Current data indicate a high prevalence of resistant pathogens across Asia and other low- and middle-income countries. Specifically, there are rising rates of extended-spectrum beta-lactamase (ESBL)-producing organisms, methicillin-resistant Staphylococcus aureus (MRSA), carbapenem-resistant Enterobacteriaceae (including New Delhi metallo-beta-lactamase), vancomycin-resistant Enterococci (VRE), and multidrug-resistant Acinetobacter and Pseudomonas species [3]. In Sri Lanka, surveillance data reflects a high, albeit varying, prevalence of MDRO infections across different clinical settings [3, 5, 6]. Furthermore, a national survey highlighted a disproportionate reliance on beta-lactams and fluoroquinolones within the private sector [6]. A recent point-prevalence study corroborated these concerns, revealing that over half of hospital inpatients—and nearly all patients in intensive care units—were receiving antibiotics, with

approximately one-third of these prescriptions categorized as potentially inappropriate [5].

Despite these national trends, the National Hospital for Respiratory Disease currently lacks a well-established antimicrobial stewardship program. Furthermore, there is a significant paucity of site-specific data regarding antibiotic prescription patterns and the overall prevalence of antimicrobial use among inpatients.

Method

The study was conducted at the National Hospital for Respiratory Diseases (NHRD) in Sri Lanka, a specialized secondary care institution with a 643-bed capacity. The NHRD serves the Gampaha District and surrounding regions, providing comprehensive respiratory care through dedicated medical, surgical, and tuberculosis (TB) wards, alongside an Intensive Care Unit (ICU) and High Dependency Units (HDU). Annually, the facility manages approximately 13,962 inpatient admissions and 68,519 outpatient consultations.

Study Design and Data Collection

A retrospective clinical audit was performed across the respiratory medical, surgical, and TB units. Data were extracted from Bed Head Tickets (BHTs) into a standardized questionnaire. Collected parameters included:

Demographics: Age, gender, and documented comorbidities.

Clinical Data: Primary diagnosis, microbiological investigation results, and patient follow-up details.

Prescription Patterns: Antibiotic name, dosage, route of administration, frequency, and the total number of concurrent antibiotics prescribed per patient.

Pre-treatment Protocol: Documentation of whether clinical cultures were obtained prior to the initiation of antimicrobial therapy.

Definitions and Classifications

Antiotic prescriptions were categorized based on the clinical context at the time of order:

Empirical Therapy: Prescriptions initiated when the causative pathogen remained unidentified.

Targeted Therapy: Prescriptions adjusted or initiated based on definitive pathogen identification.

Community-Acquired Infection (CAI): Infections contracted outside the healthcare setting or diagnosed within 48 hours of admission in patients with no recent hospital encounters.

Prophylactic Antibiotics: Administration of antimicrobials for surgical or medical prevention, evaluated against established standard guidelines.

Data Analysis

Data were entered into the Excel sheet and descriptive statistical analysis was carried out.

Results

A total of 142 patient records were analyzed. The cohort consisted of 89 males (62.68%) and 53 females (37.32%), with an overall mean age of 54.64 years. Regarding age distribution, the majority of the sample was aged 61 years or older (n = 75; 52.8%), while 65 patients (45.7%) fell within the 15 to 60-year age bracket.

Table 1: Demographic characteristics of patients enrolled for the study in NHRD

Characteristics		**N (%)**
Total BHTs		142
	Confirmed or possible Infective cases	115 (81%)
	Non-Infective cases	27 (19 %)
Gender		
	Male	89
	Female	53
Age		
	<14 years	2 (1.4%)
	15-60 years	65 (45.7%)
	>61years	75 (52.8%)
Units		
	Medical unit	55(38.73%)
	Surgical unit	45(31.69%)
	TB ward-Male	28(19.71%)
	TB ward -Female	14(9.8%)

Documented Indication for Antibiotics	
Yes	103 (89.56%)
No	12 (10.44%)
Appropriate Dose	
Yes	142(100%)
No	0(0%)
Antimicrobials (Quantity and types)	
Single	45(39.1%)
Two antibiotics	66(57.4%)
Three or more antibiotics	4(3.5%)
Method of delivery	
Intravenous	96 (52.18%)
Oral	88 (47.82%)
Written Prescription	
Generic	142 (100%)
Commercial	0 (0%)
Appropriate specimen sent (Sputum, Blood and site-specific cultures)	
Culture sent	60 (52.17%)
No cultures sent	25 (21.75%)
Not documented	30 (26.08%)

Table 2: Number of Oral Antibiotics doses

Name of the Antibiotics	**Total**
Co amoxyclav	38
Cefuroxime	8
Clarytromycin	30
Azytromycin	1
Clindamycin	9
Flucloxacilin	1
erythomycin 250mg tds	1
	88

The 142 analyzed patient records revealed a cohort of 89 males (62.68%) and 53 females (37.32%), with an average age of 54.64 years across the group. In terms of age demographics, over half the participants were 61 years or older (n = 75; 52.8%), whereas 65 patients (45.7%) were between the ages of 15 and 60.

Table 3: Number of IV Antibiotics doses

Name of the Antibiotics	Total
Co amoxyclave	11
Cefuroxime	7
Imipenum	1
Cefotaxime	7
Ceftriaxone	26
Ceftaxidine	2
Ticacillin 3.2g clavelunic acid	5
Piperacillin taz	13
Vancomycin	2
Clindamycin	3
Ticaplanin	4
Merapenum	18
	96

At the National Hospital for Respiratory Deseases (NHRD), Ceftriaxone [26] and Meropenem [18] stand out as the most frequently prescribed intravenous antibiotics.

Discussion

Since their introduction in the 1940s, antibiotics have become the cornerstone of modern Western medicine, providing the primary defense against bacterial infections. However, the World Health Organization (WHO) identifies antimicrobial resistance (AMR) as one of the most significant global threats to public health and development. In 2019 alone, bacterial AMR was directly implicated in an estimated 1.27 million deaths globally [19, 20].

Clinical Findings and Prescription Patterns

The results of this audit indicate a high volume of antibiotic use, with 81% (n=115) of patients receiving one or more treatments. This aligns with trends in primary care settings within low- and middle-income countries, where usage frequently exceeds 50% [3, 5], and mirrors findings from point prevalence studies in public health hospitals in Sri Lanka's Southern Province [12].

Explore

In our study, the majority of antibiotics were administered empirically across all units. While appropriate cultures were generally obtained prior to treatment initiation, formal consultations with the microbiology department remained infrequent.

Documentation and Stewardship

A review of Bed Head Tickets (BHTs) revealed average standards of clinical documentation. However, concerning gaps were identified:

10.44% of records lacked a clear clinical indication for starting antibiotic therapy.

Several BHTs omitted the identity of the prescribing clinician.

At the National Hospital, Ratnapura (NHRD), the most frequently prescribed antibiotics were amoxicillin-clavulanate and clarithromycin. In contrast, data from the North Colombo Teaching Hospital (June 2023) showed an Outpatient Department (OPD) antibiotic prevalence of 38.2%, with amoxicillin (34.6%) and cephalexin being the most common. In surgical wards, ceftriaxone (30.76%) and metronidazole (21.42%) predominated, while medical wards favored ceftriaxone (38.48%) and clarithromycin (19.23%) [21].

Recommendations and Limitations

To mitigate unnecessary use, institutional policies must be strengthened, particularly regarding the duration of surgical prophylaxis [17]. Effective Antimicrobial Stewardship (AMS) at NHRD should prioritize:

Improving medical officers' knowledge of rational prescribing.

Mandating clear documentation of indications for therapy.

Implementing restrictive guidelines for specific antibiotics.

Enhancing supervision through regular surveillance and multidisciplinary team management.

Conclusion and Recommendations

Conclusion

This study highlights a high prevalence of antibiotic utilization within the clinical setting, coupled with significant gaps in documentation regarding the clinical indications for initiating therapy. A notable fluctuation in antibiotic prescription patterns was observed, primarily driven by the high turnover and transfer of medical officers and consultants. Furthermore, the efficacy of institutional stewardship was hampered by suboptimal participation in educational awareness programs among senior medical staff. These findings underscore the urgent need for a standardized approach to mitigate inconsistent prescribing behaviors and improve clinical accountability.

Recommendations

To optimize antibiotic stewardship and foster rational prescribing practices, the following measures are recommended:

Guideline Adherence: Strict institutional adherence to national guidelines for both empirical and prophylactic antibiotic therapy should be mandated to reduce variability in care.

Specialist Oversight: Regular review of antibiotic indications, dosages, and durations by a Consultant Microbiologist should be integrated into ward rounds to ensure evidence-based practice.

Documentation Infrastructure: The introduction of a dedicated Antibiotic Prescription Chart for both Outpatient Departments (OPD) and inpatient wards is essential to formalize the monitoring system and ensure clear clinical reasoning is recorded.

Continuous Education: Strengthening mandatory participation in antimicrobial stewardship (AMS) workshops is vital for maintaining a cohesive strategy across rotating medical staff.

Funding: None to declare**.**

References

1. Prestinaci F, Pezzotti P, Pantosti A. Antimicrobial resistance: a global multifaceted phenomenon. Pathog Glob Health,2015:109(7):309–318.
2. Ahmad M, Khan AU. Global economic impact of antibiotic resistance: A review. J Glob Antimicrob Resist,2019:19:313-316.
3. Sulis G, Adam P, Nafade V *et al.* Antibiotic prescription practices in primary care in low- and middle-income countries: A systematic review and meta-analysis. PLoS Med 17(6):1003139.
4. World Health Organization. Global action plan on antimicrobial resistance, 2016.
5. Zhang HL, Bodinayake C, Wijayaratne GB *et al.* Point-prevalence survey of outpatient antibiotic prescription at a tertiary medical center in Sri Lanka: opportunities

to improve prescribing practices for respiratory illnesses. BMC Infect Dis,2021:21:97.
6. Sri Ranganathan S, Wanigatunge C, Senadheera GPSG, Beneragama BVSH. A national survey of antibacterial consumption in Sri Lanka. Plos one,2021:16(9):0257424.
7. The Sri Lanka college of microbiologist in collaboration with other professional college in Health care and the Ministry of Health, Nutrition and the Indegenous medicine. Empirical and prophylactic use of Antimicrobials: National guidelines, 2016.
8. Hood G, Hand KS, Cramp E, Howard P, Hopkins S, Ashiru-Oredope D. Measuring Appropriate Antibiotic Prescribing in Acute Hospitals: Development of a National Audit Tool Through a Delphi Consensus. Antibiotics (Basel),2019:8(2):49.
9. Circular No.01-56/2016. Introduction of authorization of prescribing “Red light” antibiotics, 2016. Ministry of Health, Nutrition and Indegenous Medicine. Colombo.
10. World Health Organization. Prevention of hospital-acquired infections. Practical Guide. 2nd Edition, 2002.
11. Siegel JD *et al*. Management of multi drug resistant organisms in health care setting. Center for Disease control and prevention, 2006.
12. Sheng T, Wijerathne GB, Dabrera TM *et al*. Point prevalence study of antimicrobial use in public hospitals in southern Sri Lanka identifies opportunities for improving prescribing practices. Infect Control Hospi Epidemiol,2019:40(2):224-227.
13. Nakkawita WMID, Thuduwage VS, Wallin SS, Samarasinghe SATS. Clinical audit on antibiotic prescribing: Aim to improve antibiotic stewardship at University Hospital KDU. https://www.researchgate.net /publication/348296816 clinical audit on antibiotic prescribing Aim to improve Antibiotic Stewardship at University Hospital KDU
14. Aly NY, Omar AA, Badawy DA, Al-Mousa HH, Sadek AA. Audit of physicians' adherence to the antibiotic policy guidelines in Kuwait. Med Princ Pract,2012:21(4):310-317.
15. Lee TH, Lye DC, Chung DR *et al*. Antimicrobial stewardship capacity and manpower needs in the Asia Pacific. J Glob Antimicrob Resist,2021:24:387-394.
16. Chate RA, White S, Hale LR *et al*. The impact of clinical audit on antibiotic prescribing in general dental practice. Br Dent J,2006:201(10):635-41.
17. Clinical practice guidelines for antimicrobial prophylaxis in surgery (Archived). American Journal of Health-System Pharmacy,2013:70(3):195-283.
18. Mullish BH, Williams HR. *Clostridium difficile* infection and antibioticassociated diarrhea. Clin Med (Lond),2018:18(3):237–241.
19. Robin F, Kathrin H, Elka S. Academic of science and Humanities in Haburg German National Academy of Sciences Leopoldina (2013): Antibiotics research: problems and perspectives. Halle (Saale), 2013, 1-9.
20. WHO, Antimicrobial Resistance Collaborators. Glogal burden of bacterial antimicrobial resistence in 2019: a systematic analysis. The Lancet,2022:399(10325):629-655.
21. Microbiology Department, North Colombo Teaching Hospital. Audit report, 2023, 15-18.