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Editorial

Repositioning Indian Pharmacists from Antimicrobial Dispensers to Stewards-A Call for Action (Dispenser AMSP Model)

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ABSTRACT

Pharmacists in India occupy a critical yet underutilized position in antimicrobial governance, functioning as the final checkpoint before antibiotics reach patients across community and hospital settings. Despite regulatory controls under Schedule H/H1, widespread nonprescription dispensing, inadequate counseling, and lack of audit mechanisms continue to fuel inappropriate antimicrobial use and Antimicrobial Resistance (AMR). Within the Integrated Antimicrobial Stewardship (IAS) framework advocated by Society of Antimicrobial Stewardship Practices, pharmacists are uniquely positioned to transition from passive dispensers to active stewards of antimicrobial use. This editorial proposes the DISPENSER Amsp model, a ten-point pharmacist-driven stewardship approach encompassing prescription validation, indication and regimen verification, AWaRe-aligned selection, patient education, safety vigilance, referral, record keeping, and stewardship participation with surveillance. By embedding these practices into routine pharmacy workflows across rural, urban, online, and hospital pharmacies, pharmacists in India can significantly reduce irrational antimicrobial exposure. Strengthening pharmacist stewardship is therefore essential for aligning local dispensing practices with national AMR priorities and global One Health containment efforts.

Keywords: AWaRe Classification, Antimicrobial Resistance, Antimicrobial Stewardship, Drug Dispensing, Pharmacy Practice.

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INTRODUCTION

Antimicrobial Resistance (AMR) has emerged as one of the most serious public health threats globally, with India contributing substantially to the burden of antimicrobial consumption and resistance due to its population size, fragmented healthcare delivery, and unregulated access to antibiotics (Akande-Sholabi *et al*., 2023; Nampoothiri *et al*., 2024). While stewardship efforts have traditionally focused on prescribers and hospitals, the role of pharmacists, particularly those operating in community and retail settings, remains inadequately defined and poorly integrated into antimicrobial governance frameworks.

In India, pharmacists represent the last checkpoint before an antimicrobial reaches the patient, yet paradoxically they remain among the least empowered and least regulated actors in antimicrobial stewardship. Despite antimicrobials being classified as Schedule H and H1 drugs, antibiotics continue to be dispensed widely without valid prescriptions across community pharmacies, hospital outlets, and increasingly through online platforms (Lambert *et al*., 2025; Raju *et al*., 2024). This practice driven by patient demand, weak enforcement, limited professional accountability, and commercial pressures, has unintentionally transformed pharmacists into amplifiers of antimicrobial misuse rather than protectors of rational therapy (Kumar *et al*., 2022; Nampoothiri *et al*., 2024).

Unlike clinicians, pharmacists directly influence access, continuity, substitution, duration, and adherence of antimicrobials. Inappropriate refilling, unsupervised repeat dispensing, brand or molecule substitution without bioequivalence consideration, and inadequate counseling on treatment duration or adverse effects contribute silently but substantially to the selection pressure driving Action Medical Research (Dharanindra *et al*., 2023; Walia *et al*., 2019). These risks are amplified in Low- and Middle-Income Country (LMIC) settings like India, where self-medication is common and healthcare access is uneven across rural and urban populations (Akande-Sholabi *et al*., 2023; Kumar *et al*., 2022).

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The Integrated Antimicrobial Stewardship (IAS) framework proposed by the Society of Antimicrobial Stewardship PractIces in India explicitly recognizes that stewardship cannot succeed if it begins and ends with prescribers alone (Akande-Sholabi *et al.*, 2023). Pharmacists must evolve from passive dispensers performing mechanical supply functions to active antimicrobial stewards who regulate access, reinforce prescription intent, educate patients, monitor safety, and feed dispensing data back into institutional and national AMR surveillance systems. Their stewardship role is therefore not optional; it is structural to the success of IAS and national AMR containment efforts (Akande-Sholabi *et al.*, 2023; Nampoothiri *et al.*, 2024; Singh *et al.*, 2024).

In this context, we propose DISPENSER Amsp, a pharmacist-centric, practice-orientated stewardship framework that redefines the professional responsibility of pharmacists across diverse settings: village shops, urban retail pharmacies, hospital dispensaries, and online platforms, positioning them as accountable partners in antimicrobial stewardship rather than peripheral actors.

From Counter to Care: Antimicrobial-Centric Stewardship by Pharmacists

Unlike clinicians, whose stewardship decisions are primarily patient- and diagnosis-centric, pharmacists operate at the antimicrobial access and continuity level. Every dispensing encounter determines whether an antibiotic reaches the patient appropriately, excessively, or unnecessarily. Pharmacists therefore function as the final regulatory interface between prescription intent and real-world antimicrobial exposure. Antimicrobial-centric stewardship acknowledges this unique position and reframes dispensing as a clinical safety act rather than a transactional process (Akande-Sholabi *et al.*, 2023; Nampoothiri *et al.*, 2024).

Demand Valid Prescription

Pharmacists must actively enforce Schedule H/H1 regulations by dispensing antimicrobials only against valid prescriptions issued by registered medical practitioners, authorized CHOs, or authenticated teleconsultation platforms. Routine OTC antibiotic sales, still widespread, undermine every upstream stewardship effort and directly fuel community-level resistance (Nampoothiri *et al.*, 2024; Raju *et al.*, 2024). Refusal to dispense without prescription should be accompanied by referral guidance, not substitution.

Indication Verification

While pharmacists do not diagnose, they are well positioned to assess whether the documented or stated indication reasonably aligns with antimicrobial use. Dispensing antibiotics for viral syndromes, nonspecific fever, or vague symptoms without diagnostic confirmation perpetuates irrational use. When indication is unclear, pharmacists should advise clinical review rather than default dispensing (Akande-Sholabi *et al.*, 2023; Dharanindra *et al.*, 2023).

Selection Rationality (AWaRe Aligned)

Pharmacists should apply the WHO AWaRe framework during dispensing to promote Access antibiotics and exercise heightened scrutiny for Watch and Reserve agents. Reserve antimicrobials, in particular, should trigger prescription verification or prescriber communication, reinforcing shared accountability for preserving last-line drugs (Dharanindra *et al.*, 2023; Lambert *et al.*, 2025).

Posology and Duration Check

Verification of dose, frequency, route, and duration is a critical pharmacist stewardship function. Errors in duration, especially prolonged or open-ended antibiotic courses, are common contributors to resistance and adverse outcomes. Pharmacists should ensure alignment with standard treatment guidelines and highlight deviations to prescribers when identified (Nampoothiri *et al.*, 2024; Walia *et al.*, 2019).

Educate for Adherence and Safe Use

Patient counseling remains one of the most underutilized stewardship tools. Clear instructions on dosing intervals, completion of full course, food interactions, and avoidance of leftover antibiotic reuse significantly improve adherence and reduce misuse. Evidence shows that lack of counseling contributes to premature discontinuation and unsupervised reuse of antibiotics in the community (Kumar *et al.*, 2022; Singh *et al.*, 2024).

No Substitution Without Prescriber Consent

Unapproved substitution, whether of molecule, strength, or formulation, can compromise therapeutic outcomes, particularly for serious infections or narrow-therapeutic-index antimicrobials. Pharmacists must refrain from substitution without prescriber consent, recognizing substitution as a clinical decision rather than a commercial one (Akande-Sholabi *et al.*, 2023; Dharanindra *et al.*, 2023).

Safety Vigilance

Active screening for drug allergies, interactions, and adverse effects is integral to antimicrobial stewardship. Pharmacists should encourage early reporting of suspected adverse drug reactions and formally notify the Pharmacovigilance Programme of India, strengthening national drug safety surveillance (National Medical Commission, 2024).

Escalation and Referral

Repeated antibiotic requests, lack of clinical improvement, or symptom worsening should prompt referral back to clinicians rather than empirical continuation or escalation. Pharmacists act

as critical safety sentinels by interrupting cycles of inappropriate repeat antimicrobial exposure (Akande-Sholabi *et al.*, 2023; Walia *et al.*, 2019).

Record Basic Dispensing Data

Maintaining simple records of antimicrobial dispensing: drug class, duration category, and prescription source, enables periodic review, self-audit, and contribution to local antimicrobial use surveillance. Even minimal data capture can reveal misuse patterns and inform corrective action (Akande-Sholabi *et al.*, 2023; World Health Organization, 2025).

Antimicrobial Stewardship Participation and Surveillance

Beyond individual encounters, pharmacists should actively participate in antimicrobial stewardship activities, including hospital AMS committees, formulary implementation, discharge counseling, and community awareness initiatives such as World AMR Awareness week. As given in an institutional action plan, the institute conducts pharmacy shop visits and aware them for active participation, is a real need of the hour (Panda *et al.*, 2026). Simultaneously, dispensing data should feed into institutional or district-level surveillance systems, linking pharmacy practice with national AMR monitoring and One Health efforts (Akande-Sholabi *et al.*, 2023; Lambert *et al.*, 2025; Singh *et al.*, 2024).

Local Pharmacy Actions to National and Global AMR Containment

Actions taken at individual pharmacy counters collectively shape antimicrobial exposure at the population level. When pharmacists enforce prescription validity, align dispensing with AWaRe principles, and document antimicrobial use, they transform routine transactions into surveillance nodes that reflect real-world antimicrobial consumption. Aggregated dispensing data can inform institutional audits, district drug control authorities, and national initiatives such as India's National Action Plan on AMR (NAP-AMR), complementing prescription- and laboratory-based surveillance systems (Akande-Sholabi *et al.*, 2023; Lambert *et al.*, 2025).

At a global level, pharmacist-generated antimicrobial use signals strengthen participation in WHO's antimicrobial consumption and resistance surveillance frameworks, bridging a critical gap between policy intent and community practice (Lambert *et al.*, 2025). Furthermore, pharmacists occupy a strategic position within the One Health ecosystem, interfacing human health, animal medicine product access, and environmental antimicrobial spillover through waste and improper disposal. By counseling against inappropriate antibiotic use across sectors and promoting safe disposal practices, pharmacists contribute directly to curbing environmental selection pressure for resistance. Thus, pharmacy-led stewardship extends beyond individual patients to influence hospitals, communities, national surveillance, and global AMR containment efforts, making pharmacists indispensable guardians of antimicrobial integrity across the One Health continuum (Box 1: DISPENSER Amsp model).

Box 1: DISPENSER Amsp model: ten pharmacist-driven antimicrobial stewardship actions

1. **Demand valid prescription:** Ensure antimicrobials are dispensed only against authorized prescriptions (Schedule H/H1), including valid teleconsultations.
2. **Indication verification:** Assess whether the stated clinical indication reasonably justifies antimicrobial use; discourage use for viral or nonspecific illnesses.
3. **Selection rationality (AWaRe aligned):** Prefer Access antibiotics and apply heightened scrutiny for Watch and Reserve agents, especially last-line drugs.
4. **Posology and duration check:** Verify dose, frequency, route, and duration against standard treatment guidelines before dispensing.
5. **Educate for adherence and safe use:** Counsel patients on correct administration, completion of course, avoidance of sharing or reuse, and recognition of adverse effects.
6. **No substitution without consent:** Avoid molecule, strength, or formulation substitution without prescriber approval, recognizing substitution as a clinical decision.
7. **Safety vigilance:** Screen for allergies, interactions, and adverse effects; promote and report Adverse Drug Reactions (ADRs) through Pharmacovigilance Programme of India (PvPI) mechanisms.
8. **Escalation and referral:** Refer patients back to clinicians when symptoms persist, worsen, or antibiotics are repeatedly requested without improvement.
9. **Record basic dispensing data:** Maintain minimal antimicrobial dispensing records to enable self-audit, trend analysis, and stewardship feedback.
10. **Antimicrobial stewardship participation and surveillance:** Engage in institutional or community AMS activities and contribute dispensing data to local, national, and One Health Antimicrobial Resistance (AMR) surveillance systems.

In India's fragmented healthcare landscape, pharmacists represent the final and often decisive checkpoint before antimicrobials enter human use. When confined to mechanical dispensing, they unintentionally amplify antimicrobial misuse; when empowered through stewardship, they become critical guardians of antimicrobial integrity. The DISPENSER Amsp model reframes pharmacy practice from a commercial end point to a clinical

and public health intervention, anchored in access control, prescription reinforcement, patient education, and surveillance.

Embedding pharmacists within the IAS framework ensures that stewardship does not end at prescription writing but extends through dispensing, adherence, and follow-up. By aligning daily pharmacy practices with national AMR priorities, WHO AWaRe principles, and One Health surveillance goals, pharmacists can significantly reduce inappropriate antimicrobial exposure across communities. Stewardship, therefore, is not an added responsibility for pharmacists, it is the ethical core of modern pharmacy practice in the era of antimicrobial resistance.

AUTHOR'S CONTRIBUTION

S, P and P. K. P. searched the literature, drafted statistically, critically reviewed, and approved the study.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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