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A TIERED ANTIMICROBIAL STEWARDSHIP FRAMEWORK FOR INDIA'S PUBLIC HEALTH SYSTEM :

A RESEARCH BRIEF OF AMRES PROJECT

Need of a tiered Antimicribial stewardship framework for Indian public healthcare system

Antimicrobial resistance (AMR) is a major and growing threat to health systems worldwide, with particularly high burdens in low- and middle-income countries (LMIC), including India. Inappropriate and excessive use of antimicrobials in humans, animals and the environment is a key driver of this trend. To address AMR effectively, a multifaceted approach involving education, regulation, and improved healthcare infrastructure is essential, especially in vulnerable regions like India.

India has taken important steps to address AMR through the National Action Plan on AMR, Ayushman Bharat, Vision 2035 for health surveillance, and Indian Council of Medical Research (ICMR) initiatives on AMR surveillance and stewardship. However, implementation remains uneven. The existing antimicrobial stewardship program is mostly tertiary hospital centric. Primary and secondary care hospitals, though being the first point of treatment/referral for majority of the rural population, are still weakly integrated into stewardship efforts. India is a major antibiotic consumer. National and sub-national studies have reported high levels of outpatient and inpatient antibiotic use, often discordant with standard treatment guidelines. Important drivers include uncertainty in clinical decision-making, inadequate diagnostic support, patient expectations for “strong” medicines, pharmaceutical promotion, weak oversight of over-the-counter (OTC) antibiotic sales, and long-standing gaps in staffing, diagnostics and drug supply in public facilities. At primary-care sites, antibiotic use is largely empirical. Prescribers rely on syndromic assessment in the context of limited diagnostic support and demands of antimicrobials from patients, infrastructural limitations, absence of dedicated training sessions on antimicrobial resistance and interventions to tackle it, less visibility and hence, utility of existing standard treatment guidelines. Though secondary tier hospitals, have better infrastructure in comparison to primary care hospitals, antibiotic use at that tier also has similar contextual factors. Tertiary tier is the strongest in terms of infrastructure, technical resources, however, uptake of the entire prescribed package of AMS interventions at one go is difficult. Customizing AMS interventions according to the current resources, infrastructure for each tier along with identifying short term and long-term action points in this regard may be the key for introduction & implementation of AMSP in primary and secondary tiered hospitals and implementing it in tertiary tiered hospitals.

Key policy messages

- AMR in India is a health-system problem, not only a microbiological one. Stewardship must be built into governance, training, financing, and health information systems at all tiers.
- Tertiary centres have the strongest infrastructure but do not yet fully act as technical hubs for district and primary facilities.
- Secondary hospitals are the “missing middle” – they have staff and some diagnostics, but weak and irregular stewardship processes.
- Primary care facilities are the most neglected and underutilized category in the structured stewardship program to rationalize antimicrobial use despite high antibiotic usage volumes.
- A tier-specific AMSP package, grounded in AMRES evidence and aligned with the NAP-AMR Module for Prescribers, offers a realistic roadmap for national and state adoption.

Identified Tier-specific priorities for uptake of customized AMSP

Tertiary tier Hospitals

Standardise prospective audit and feedback and adopt practice of antimicrobial time-outs for admitted patients.

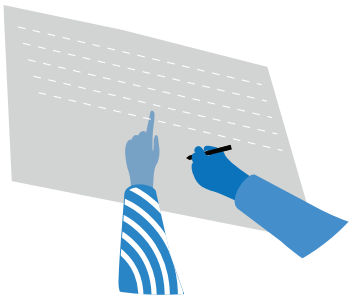
- Generate antibiograms and share them with linked departments/facilities if any.
- Begin routine use of antibiotic consumption metrics such as DDD per 1000 patient-days and AWaRe profiles in management and procurement meetings.
- Develop e-learning modules and mentorship programs for healthcare staff, link them to career progression scheme.

Secondary level (district and sub-district hospitals, State general hospitals)

- Establish or revitalise AMS committees, integrating them with hospital infection-prevention & control structures.
- Introduce simple, regular prescription audits with feedback.
- Strengthening laboratory infrastructure, inclusion of regular microbiological testing facilities.
- Strengthen laboratory–clinician communication, including agreed protocols for culture requests, result reporting and therapy changes.
- Use simplified treatment algorithms anchored in antibiograms either generated locally or through nearest Government facility.

Primary level (CHCs / BPHCs)

- Display clear, pictorial algorithms showing when antibiotics are and are not indicated for common conditions.
- Train PHC medical officers, nurses and mid-level providers in practical stewardship skills, including when to prescribe, which drug to choose, counselling and referral.
- Use existing OPD registers to track a small number of antibiotic indicators, such as the proportion of acute respiratory infections treated with systemic antibiotics.
- Integrate AMR messages into Ayushman Bharat activities, Village Health and Nutrition Days, school health sessions and other community programmes.
- Establish AMS committees, integrating them with hospital infection-prevention & control structures.
- Use simplified treatment algorithms anchored in antibiograms generated through nearest Government facility.



Implementation Roadmap for multi tiered antimicrobial stewardship program

PHASE 1

Foundational (within 1 year)

- Governance: Formalize AMS committees in all tiers with clear accountability.
- Tools: Disseminate user-friendly SOPs for prescription audits; antimicrobial “time-outs”.
- Visibility: Display of clear management flow of common infections in OPD & general wards

PHASE 2

Operational (within 3 years)

- Digital Integration: Transition stewardship documentation to digital health records.
- Preauthorization: Operationalize pre-authorization for “Reserve” group antibiotics in tertiary and district / Sub-district hospitals.
- Feedback Loops: Ensure communication with clinician’s post pre scription audit rounds; communicate local AST patterns to clinicians in regular intervals.
- Capacity: Link AMS training to formal career progression and continuing medical education (CME).

PHASE 3

Institutionalized (within 5 years)

- Quality Metrics: Embed stewardship adherence into hospital accreditation and performance reviews.
- Surveillance Dashboards: Integrate consolidated antimicrobial consumption and resistance data.
- Hub-and-Spoke Model: Fully functional mentoring where tertiary centers provide diagnostic support and troubleshooting for linked primary facilities.

Recommendations

To ensure sustainability, the government must adopt the following shifts:

Core Integration

Treat AMS as a core health-system function—linked to patient safety and quality—rather than a standalone project.

Dedicated Financing

Establish budget lines for laboratory infrastructure, diagnostics, and digital AMS tools.

Human Resource Incentives

Recognize stewardship contributions in staff appraisals and institutional accreditation (e.g., NQAS/NABH).

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