

Yuvaraj Krishnamoorthy

ESIC Medical College and Hospital, India

Yuvaraj Krishnamoorthy is an assistant professor of community medicine at ESIC Medical College and Hospital in India. Dr Krishnamoorthy's expertise includes health economics, evidence synthesis, and public health. Dr Krishnamoorthy has a bachelor's degree in medicine and surgery and received a Doctor of Medicine degree in Community Medicine from JIPMER, Puducherry. In 2022, Dr Krishnamoorthy received the Emerging Voices for Global Health fellowship and the India Health Policy and System Research Fellowship. In 2023, Dr Krishnamoorthy received the Foundation for Advancement of International Medical Education and Research Fellowship, Epidemiology Foundation of India's Young Scientist Award, and Best Researcher Award from The Tamil Nadu Dr. M.G.R. Medical University. He has more than 100 publications in national and international peer-reviewed journals. He is on the editorial board of various high-impact journals such as PLoS Global Public Health, PLoS One, BMC Public Health, Archives of Public Health, Heliyon, International Health, etc.

Project

Effectiveness and Cost-Effectiveness of Implementing Antimicrobial Stewardship Program at Tertiary Care Facilities in India: A Multi-Methods Study

Background:

Antimicrobial Resistance – Global and Indian Scenario

The emergence of antimicrobial resistance is a global public health problem. In the United States, the Centres for Disease Control reports that at least 2.8 million people get infected each year by resistant microbes and 35,000 die annually due to resistant infections.¹ Multi-Drug Resistant Tuberculosis (MDR-TB) is a major infection that leads to high levels of morbidity and mortality. The global incidence of MDR-TB is 3% of all newly diagnosed patients and 18% of all re-treatment patients.² In countries with high TB burden like India, this leads to a staggering number of patients who are difficult to treat with routine medications.² The crude infectious diseases mortality rate in India is 416 per 100,000 population, and this is two times greater than that in the United States.³ Previous study in India has shown that 66% of surgical site infections are caused by gram negative bacteria, and a significant proportion of them are resistant to many common antimicrobials. Higher antibiotics like colistin are increasingly used in many tertiary care hospitals in India to treat resistant microbes.⁴ Factors that led to the emergence of AMR in India are very similar to those globally.

Antimicrobial Stewardship Initiatives – Global and Indian Context

The World Health Assembly in 2015 endorsed the Global Action Plan on Antimicrobial Resistance (GAP-AMR).⁵ One of the five strategic objectives to be achieved to limit the AMR problem was antimicrobial stewardship. Antimicrobial Stewardship is defined as interventions that target the optimization of antimicrobial use, improve patient outcomes, reduce antimicrobial resistance, reduce healthcare-associated infections, and reduce overall healthcare costs.⁵ The Indian Council of Medical Research (ICMR) released the

Antimicrobial Stewardship Program Guidelines with various active and supplemental strategies in 2018.⁶

Study Rationale and Novelty

Despite the availability of guidelines with proposed strategies, most facilities in India have not implemented this program. A recent study conducted by our team across 18 public health facilities in a South Indian state has revealed that only one facility had an antimicrobial stewardship program. Hence, it is essential to understand the feasibility and demonstrate the effectiveness and cost-effectiveness of this program. This will enable the relevant stakeholders to implement antimicrobial stewardship initiatives in their facilities.

References:

1. Centers for Disease Control and Prevention. Antibiotic/Antimicrobial Resistance. 2020
2. Shivekar SS, et al. Prevalence and factors associated with multidrug-resistant tuberculosis in South India. *Scientific Reports*. 2020 Dec 16;10(1).
3. Laxminarayan R, et al. Antibiotic resistance—the need for global solutions. *The Lancet Infectious Diseases*. 2013;13(12).
4. Chatterjee D, et al. A questionnaire-based survey to ascertain the views of clinicians regarding rational use of antibiotics in teaching hospitals of Kolkata. *Indian J Pharmacol*. 2015;47(1):105-8
5. World Health Organization. Global action plan on antimicrobial resistance. Geneva; 2015.
6. Walia K, et al. Policy document on antimicrobial stewardship practices in India. *Indian J Med Res*. 2019;149:180–4.