

Inclusion of next-generation leaders and cost-effective precision diagnostic techniques are vital in combatting antimicrobial resistance in low- and middle-income countries

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Sir,
Various reports have highlighted the importance of global commitment and consensus to strengthen collaboration for sustainable governance of global antimicrobial stewardship.^{1–3} Regarding the issue of antimicrobial resistance (AMR), despite the different circumstances that every country is facing, they share the common issue of the growing burden of AMR. An inter-disciplinary global momentum, involving high-level political willingness, continuous multi-sectoral and multi-stakeholder discussions, improved surveillance systems and the strict implementation of a monitoring and evaluation framework through a One Health approach, would be effective to control and contain AMR across the world.² However, the inter-sectoral collaboration between One Health stakeholders like animal health, human health and environmental health professionals are underdeveloped in low- and middle-income countries (LMICs).³ Despite some initial efforts of governmental and non-governmental organizations to promote inter-sectoral collaboration to combat AMR, very little progress has been made to date.^{4,5}

Here we propose some simple yet crucial initiatives for combatting AMR problems in LMICs by fostering a comprehensive communication strategy.

Firstly, raising awareness among the general public, policy-makers, prescribers, farmers and other stakeholders at regional and national levels regarding AMR issues will be beneficial in improving behavioural change and in promoting inter-sectoral communication among various One Health stakeholders. Similarly, increasing the level of awareness and knowledge of the importance of improved sanitation and hygiene as well as improving infection prevention and control (IPC) practices could be the cornerstones of prevention, control and containment of AMR.^{6,7} A study by Ershova *et al.*⁸ in Russia has shown that awareness of healthcare professionals of good IPC practices and implementation of such measures in the neuro-ICU has reduced nosocomial infection by 200%. Similarly, other studies have also shown a

significant effect of the awareness of improved sanitation and hygiene on lowering the burden of AMR.^{9,10} Mass AMR awareness can be achieved by using digital and social media platforms like Facebook, Twitter, Instagram, FM radio, newspapers, regional magazines etc. These social media platforms can reach large audiences in a short duration of time, which could create momentum for controlling AMR. The data published by techjury (<https://techjury.net/stats-about/mobile-gaming/#gref>) suggest that the number of active mobile gamers worldwide was approximately 2.2 billion in 2019 and users spend more than 43% of their 'smartphone time' playing games. Therefore, designing new AMR-related smartphone games seems to be a novel, innovative and feasible idea. Additionally, AMR-themed movies and advertisements would play a significant role in reaching a larger audience and influencing their thoughts.

Secondly, introducing AMR-related topics in school and college curricula could provide some insights into the growing minds of students and trigger a mindset change at a young age. This will enable a new generation to benefit from a better understanding of the root causes of AMR and therefore change the mindsets and behaviour of people. Schoolchildren and college students would be able to advise their family members to use antibiotics more rationally and improve sanitation and hygiene, even when their family members are illiterate and are out of the reach of awareness campaigns and programmes on AMR issues. So, such strategies could be cost-effective approaches for combatting AMR at large and are especially relevant for LMICs.^{11,12}

Thirdly, LMICs bear a considerable burden of MDR bacteria, but they lack adequate phenotypic and genomic diagnostic tools and surveillance systems to curb the spread of such bacteria.¹³ LMICs urgently need on-site rapid, accurate and cost-effective phenotypic and genomic technologies to identify country/region-specific AMR determinants.^{13,14} The methodologies should be timely, simple, user-friendly and accordant with local economic and social constraints.¹³ Such precision diagnostic techniques can efficiently

be utilized by LMICs to identify potential nosocomial outbreaks in a real-time fashion in a cost-effective manner. This will enable IPC personnel to rapidly implement effective measures to limit the spread of resistant bacteria in the LMIC hospital setting.

In conclusion, to conquer AMR in LMICs, we propose innovative ideas for raising AMR awareness and promoting behavioural changes in the general population by using mass media. The inclusion of next-generation leaders seems to be an ideal, innovative and cost-effective pathway to combat AMR threats. Additionally, early detection and control of the spread of high-risk clones by the precise use of genomic surveillance systems in LMICs are crucial.

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Transparency declarations

None to declare.

Supplementary data

Reviewer report 1 is available as [Supplementary data](#) at JAC-AMR Online.

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