Letter to the Editor

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Improving AMR reporting in low- and middle-income countries: a public health priority

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Antimicrobial resistance (AMR), the phenomenon in which microorganisms become unresponsive to antimicrobial agents, has emerged as a critical public health threat[1]. Bacterial AMR is estimated to be associated with approximately 5.0 million deaths annually worldwide, with 4.3 million of these deaths occurring in low- and middle-income countries (LMICs), highlighting disproportionately high burden in these regions[2,3]. This statistics is likely to be significantly underestimated, as many LMICs have limited diagnostic capacity and weak surveillance systems, leading to underreporting of AMR-related infections and fatalities.

LMICs often have poor healthcare infrastructure in addition to suboptimal healthcare utilization rates[4]. In these settings, individuals often seek medical services only when experiencing severe illness, while those with less severe conditions often self-medicate with over-the-counter antimicrobials without hospital visits[5]. This practice increases the risk of inappropriate antimicrobial use, treatment failure and preventable death[6]. Unfortunately, these cases are typically unreported in AMR mortality statistics as they do not undergo AMR testing. In addition, deficiencies in healthcare surveillance systems contribute to the underreporting of AMR cases in LMICs. Routine microbiologic culture and antimicrobial susceptibility testing are often unavailable, particularly in rural or under-resourced healthcare centers and hospitals, due to shortage of trained personnel, diagnostic equipment, and funding[7,8].

These diagnostic gaps give rise to several interrelated challenges in measuring and understanding the true burden of antimicrobial resistance (AMR). First, deaths caused by drug-resistant infections are often misclassified as generic infection-related fatalities rather than AMR-specific outcomes due to the lack of AMR testing facilities. Second, the majority of AMR research focuses predominantly on bacterial resistance, leaving antifungal, antiviral, and antiparasitic resistance underexplored despite their growing clinical significance. Third, patients in communities who have undertaken antimicrobials over-the-counter and who may have partial resistance (could take antimicrobials for an extended period) are often missed from the AMR surveillance data. Patients in remote and far-flung areas may also never attend formal health services, and are therefore likely to be under-reported in AMR mortality data. Collectively, these behavioral and systemic factors lead to a substantial underestimation of AMR-related fatalities in LMICs, inadvertently offering misinformation, limiting evidence-based clinical decision-making, and undermining the development of effective AMR control policies.

This situation underscores the urgent need for investment in additional AMR surveillance systems among all cases of morbidities and mortalities attributed to infections. This should include proactive surveillance for AMR in hospital settings, including exploring the magnitude of missed opportunities to establish AMR among infectious disease cases and related deaths in the communities. Field-based research to explore both hospital-based and community-based infection-related deaths can be an initial way forward. Strengthening data collection and analysis would allow for more accurate estimation of the AMR burden and guide the development of effective treatment protocols and control strategies. Critically, accurate determination of causes of death is needed to differentiate death directly attributable to AMR from those merely involving pathogens alone and other concomitant infections. Without such detailed AMR mortality data, the true extent of AMR mortality in LMICs will remain substantially underestimated, thereby limiting the effectiveness of public health interventions.

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