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From Paper To Patient: Allocative Inefficiency and the Governance Gap in African Antimicrobial Stewardship

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Introduction

Antimicrobial Resistance (AMR), the ability of microbes to withstand treatments designed to eliminate them, poses a significant threat to modern healthcare, undermining decades of medical progress. This burden, which falls disproportionately on children, the elderly, and immunocompromised populations, is projected to cause up to 10 million deaths annually and cost the global economy $100 trillion by 2050 (Tadesse *et al.,* 2017). Crucially, resistant pathogens "do not respect borders," rendering AMR a global concern irrespective of income level (Tadesse *et al.,* 2017). However, in African healthcare systems, the persistence of AMR is not primarily due to a lack of policy intent, but a deeper economic dilemma regarding allocation of scarce resources. Due to severe financial and diagnostic constraints, empiric antibiotic prescribing, that is, prescriptions based on guesses, has become the norm (Siachalinga *et al.,* 2023). While often perceived as a low-cost necessity, this practice entrenches allocative inefficiency by accelerating resistance and inflating downstream costs. This essay argues that reallocating expenditure from broad-spectrum antibiotic procurement to diagnostic stewardship, particularly point-of-care testing, is the most economically sustainable response to AMR in resource-limited African settings (D'Hulster *et al.,* 2023).

The Economic Illusion of Empiric Prescribing

The perception that untargeted, empiric antibiotic prescriptions are fiscally prudent necessities creates a perilous economic illusion. In reality, this approach generates massive waste via clinically ineffective procedures. This systemic "allocative inefficiency" is proven by the sheer volume of redundant consumption. Siachalinga *et al.* (2023) reported that the prevalence of antibiotic use in African hospitals reached 80.1%, with surgical prophylaxis routinely extending beyond the recommended 24 hours. While this minimizes diagnostic spending, the return on investment is negligible because the drugs used are increasingly futile. Resistance to first-line agents, such as *amoxicillin,* has reached a median resistance rate

of 88.1%, indicating that hospitals incur costs with near certainty of failure (Tadesse *et al.,*2017). As Allel *et al.* (2024) demonstrate, bed-days constitute up to 90% of total inpatient costs, far outweighing drug prices. Therefore, the cost of a diagnostic test is significantly lower than the aggregate expense of prolonged hospitalization caused by blind prescribing (D'Hulster *et al.,* 2023).

Correcting Market Failure Through Stewardship

Diagnostic stewardship requires upfront capital, which presents financial barriers for African healthcare systems. However, health economic data confirm that point-of-care interventions (POCIs) are a cost-effective and often dominant strategy compared to standard care. D'Hulster *et al.* (2023) highlighted that C-reactive protein testing dominates usual care as it simultaneously improves health outcomes while reducing expenditures. A study by Luangasanatip *et al.* in middle-income settings found that hygienic interventions in healthcare resulted in a reduction in Methicillin-resistant Staphylococcus Aureus (MRSA) infections— a bloodstream infection—and reported incremental cost-effective ratios (ICER) as low as $1,160 per quality-adjusted life year (QALY), significantly below the willingness-to-pay thresholds of most health systems (Allel *et al.,* 2024). Traditional budgeting systems often fail to recognize these savings, considering that they treat antibiotic consumption as an isolated occurrence rather than an economic externality, where medication used by one person imposes costs on third parties (D'Hulster *et al.,* 2023). This omission reflects a market failure, with significant consequences for antibiotic policy. D'Hulster *et al.* (2023) reported that when the specific societal cost of resistance—estimated at $4.42 per prescription—is factored into economic models, the case for diagnostic testing shifts from optional to undeniable. By ignoring this hidden "tax" on every prescription, healthcare systems perceive antibiotics as a low-cost option, whereas they are actually accruing long-term debt that diagnostic stewardship can prevent. Consequently, shifting expenditures towards diagnostic

stewardship does not constitute an additional financial burden but rather a correction of a fundamental market oversight. Given that interventions can save a QALY for as low as $1,160 while averting the estimated $4.42 societal cost of resistance per prescription, the perception that diagnostics are unaffordable is economically unsound when African healthcare systems cannot afford the compounding debt of resistance associated with the status quo (D'Hulster *et al.,* 2023; Allel *et al*., 2024).

The One Health Imperative: Agricultural and Economic Oversight

While the focus remains on optimizing healthcare expenditures, it is critical to note that despite the recognition of interconnected health systems in the One Health approach, efforts to rationalize antibiotic spending in hospitals are economically undermined by the transfer of resistance from animals to humans via unregulated agricultural antibiotic use. *Campylobacter spp.,* a zoonotic pathogen capable of transferring from animals to humans, presents high resistance rates across sub-Saharan Africa, with resistance rates as high as 63% for *ampicillin,* driven by indiscriminate use in husbandry (Hlashwayo *et al.,* 2021). This transfer is facilitated by a regulatory paradox: while hospital prescribers are restricted by **Act 101 of 1965,** Shabangu *et al.* (2025) reveal that **Act 36 of 1947** allows farmers to bypass this control entirely, purchasing *oxytetracyclines* and *nitrofurantoins* over the counter. This absence of agricultural regulation functions as a hidden economic subsidy, privatizing the profits of meat production while socializing costs of treating resistant zoonoses onto the healthcare budget. Altogether, implementing legislative reform between the health and agricultural sectors is a necessity, not just as an environmental goal, but as a prerequisite for fiscal efficiency in healthcare, as the human health budget effectively offsets the agricultural sector's negligence.

Conclusion

While diagnostic stewardship demands upfront capital, the choice between it and

“cheap” access is an economic illusion because it mistakes upfront price for total cost; effective stewardship is the only viable path towards preserving long-term access. To efficiently implement this, Ministries of Finance must transition from AMR being “funded by default,” which leaves systems dependent on donors, to having dedicated budget lines (Shabangu *et al*., 2025). Furthermore, legislative harmonization between the health and agricultural sectors is required to stop the economic leakage of unregulated antibiotics (Shabangu *et al.,* 2025), and surveillance must be prioritized not as an operational cost, but as a fiscal asset to guide efficient resource allocation (Godman *et al.,* 2022). Ultimately, African health policy must embrace this economic reality, recognizing that saving pennies on diagnostics today results in wasting pounds on resistant infections tomorrow.

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