Opportunities for Outcomes Based Financing to Augment Antimicrobial Stewardship Efforts

PATH

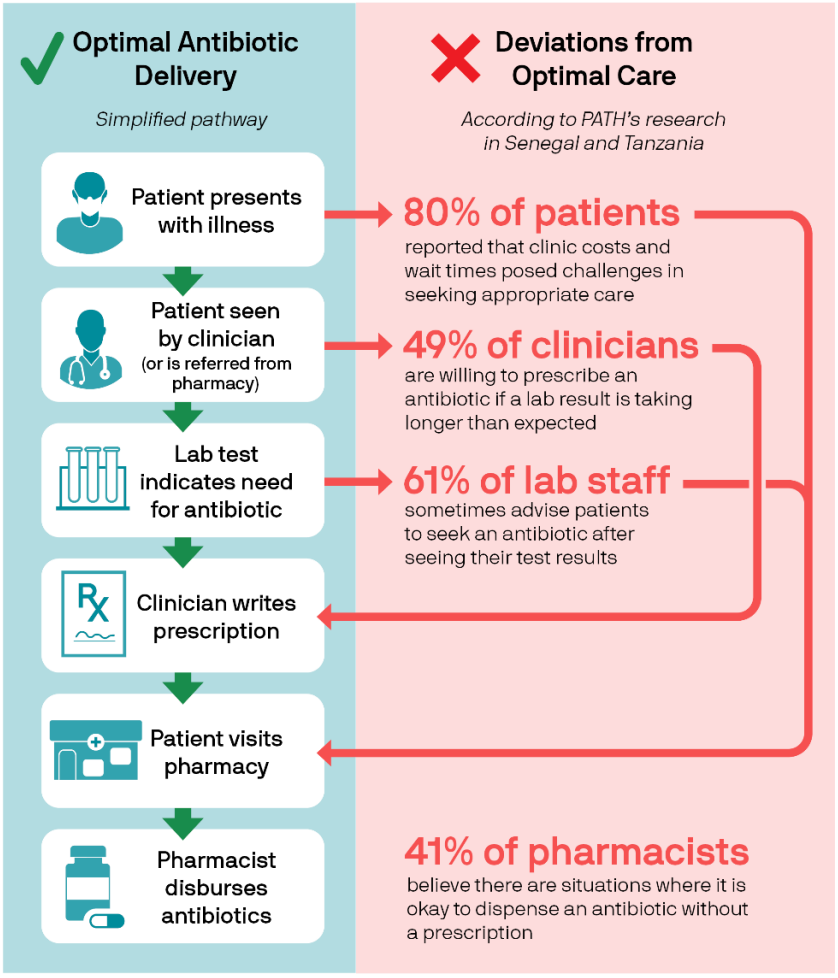
Introduction

Antimicrobial resistance (AMR), caused by overuse or inappropriate use of antimicrobial agents, has emerged as one of the leading public health threats of the twenty-first century. Bacterial AMR threatens the ability to treat common infections by reducing or eliminating the effectiveness of antibiotics against bacteria. Over the last three decades, the estimated number of lives lost annually due to AMR has increased from 1.06 million in 1990 to 1.2 million in recent years—more than HIV/AIDS and malaria.[1]

The burden of AMR is greatest in low and lower-middle income countries (LMICs) with sub-Saharan Africa carrying the highest burden.[2]

In LMIC settings, AMR is not only a public health threat but is also associated with several negative health outcomes at an individual level, including increased intensive care unit admissions and prolonged hospital stays.[3] These outcomes negatively impact individual quality of life.[1]

In the absence of any course correction, global mortality is expected to reach almost 2 million per year by 2050, with another 46.5 million years of healthy life lost (equivalent to over 650,000 individual average life spans).[1] Outcomes-based financing (OBF) is an incentive system that could complement



PATH is a global nonprofit dedicated to achieving health equity. With more than 40 years of experience forging multisector partnerships, and with expertise in science, economics, technology, advocacy, and dozens of other specialties, PATH develops and scales up innovative solutions to the world's most pressing health challenges.

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stewardship activities by directly addressing the behavioral and financial drivers of misuse. OBF allows donors and implementers to direct the attention of service providers to desired outputs and outcomes of stewardship efforts versus the traditional focus of donor grants on upfront inputs. The growing burden of AMR mandates innovation and exploration of novel solutions, but OBF has yet to be leveraged as a tool to augment stewardship efforts.

Current efforts and limitations

Antimicrobial stewardship (AMS) programs have traditionally focused on training healthcare providers, strengthening surveillance systems, and building clinical capacity. While these efforts are essential, they often fail to address key behavioral and financial drivers of inappropriate antibiotic use, particularly in LMICs.[4,5] Prescribers, especially in private practice, may continue overprescribing due to patient demand, financial incentives, or a lack of alternatives.[6] Meanwhile, a significant portion of antibiotic sales occur through unregulated pharmacies, where stewardship efforts have minimal reach, allowing patients to bypass clinicians entirely.[7]

Financial barriers further limit AMS effectiveness. Current programs do not incentivize compliance, and hospitals risk revenue losses when reducing antibiotic prescriptions.[8] Patients also face financial hurdles—data from Senegal and Tanzania show that long wait times and cost concerns deter them from seeking care, despite the availability of affordable services.[9] Unlike HIV or maternal health programs, AMS has yet to leverage economic incentives such as outcomes-based financing to drive sustainable behavior change.[10] Without integrating financial and patient-centered solutions, AMS programs will struggle to close these critical gaps, incentivizing compliance and reducing patient barriers.

The opportunity

Current guidance around country-level AMR reduction is largely clinical in nature, though various financial and behavioral motivations driving overuse of antibiotics have been well documented.[11,12] AMS efforts, however, have not addressed these drivers, reflecting an underappreciation of the market forces that contribute to misuse.

While incentive structures to reduce AMR have been explored and successfully implemented in high-income countries such as the United Kingdom and Japan, limited investments have been made in exploring similar models in LMICs.[13,14] PATH and our partners are eager to generate evidence for how to leverage OBF so that incentives and behaviors are better aligned with best practices for AMS. This body of work augments PATH's 10+ years of experience successfully implementing AMS programs to improve clinical training, surveillance, and lab infrastructure. The addition of OBF enhances these efforts by focusing on the financial and behavioral contributors to AMR, which have often been overlooked in traditional stewardship efforts. Without addressing these behavioral and market forces, new tools will be exposed to the same patterns of misuse and hence risk the same lack of effectiveness. A successful OBF intervention can complement AMS efforts.

The immediate impact resulting from this initiative is evidence of successful OBF mechanisms which reduce empirical prescriptions and antibiotics dispensed without a prescription as well as increase referrals to clinicians for patients seeking an antibiotic without a prescription. Longer-term, widespread uptake of such tested OBF interventions could result in decreased misuse of antibiotics, improved market fundamentals, increased effectiveness of current and future antibiotics, and reduced mortality and morbidity associated with AMR.

The proof points

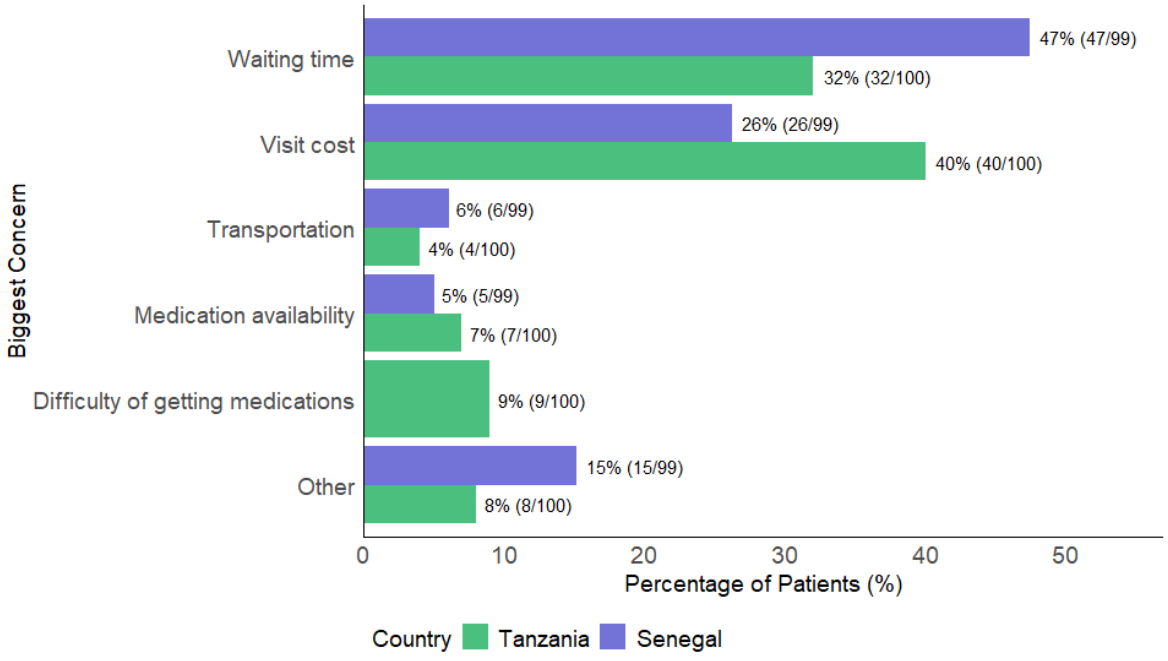
Any approach to identify key intervention points that properly address behavioral change and incentive structures must deeply understand the local context and market ecosystems. To do this, PATH, in collaboration with the MOHs of Senegal and Tanzania, interviewed over 140 patients and healthcare providers in each country to understand their perceptions and motivations around stewardship efforts, healthcare seeking behavior, and healthcare delivery experiences. This research was approved by the national ethical committees in each country and granted exemption by the WCG Institutional Review Board.

The research primarily endeavored to validate and characterize the drivers of antibiotic misuse at public and private facilities in the target catchment areas of each country (Dakar and Dar es Salaam) as well as identify potential OBF interventions that would counteract these drivers. This was a critical first step to understanding the opportunity space for OBF.

The research included 29 facilities (11 in Senegal and 18 in Tanzania), 98 provider (Senegal = 40, Tanzania = 58), and 199 patient (Senegal = 99, Tanzania = 100) interviews. Of the provider interviews, 29 were clinicians (Senegal = 14 and Tanzania = 15), 34 were pharmacists (Senegal = 12, Tanzania = 22), and 35 were lab staff (Senegal = 14, Tanzania = 21).

The key findings from the research highlighted several areas where leveraging novel financing mechanisms (e.g., OBF) could affect system-level change. Notably, we confirmed that current practices are not always aligned with national guidelines. For example, many pharmacists in the private sector dispense antibiotics without a prescription and many clinicians are willing to prescribe an antibiotic without a confirmed lab test result. Patients likewise face many challenges in seeking optimal care, conflicting with stewardship efforts and creating incentives for patients to directly approach pharmacies. We found that clinic wait time and visit cost were major barriers in seeking clinical care, incentivizing deviation from the appropriate care pathway (Figure 1).

Figure 1. Patient-reported main challenge to seeking care.



These structural barriers, however, are not addressed by current AMS efforts, which are largely clinical in nature, leaving such efforts vulnerable to continued underperformance.

In both countries, patients experienced waiting times above their average willingness to wait in public sector facilities (though this was not necessarily true in private sector facilities) (Table 1). This highlights a major disincentive for patients to first seek care from a clinician, particularly for those who are not willing to pay extra to seek care from private sector facilities. This was especially true in Tanzania, where visit cost is also a larger concern than wait time (Figure 1).

Table 1. Patient experience vs. willingness to wait.

Country	Proportion of Patients	Reported Experience	Average Willingness
Senegal	41%	>60 minutes	60 minutes
Tanzania	53%	>30 minutes	10 minutes

While costs were reported as the primary and secondary concerns for seeing a clinician in Senegal and Tanzania respectively, the actual costs of the visit were at or below the patients' self-reported willingness to pay (though participants were recruited from clinics, and anyone unwilling to pay more than the current visit cost likely wouldn't seek care at the facilities). Similarly, almost all patients stated they would pay for a lab test with acceptable costs for most patients ranging from $3-20 USD in both countries. This was true in both the public and private sector. Despite the general acceptability of clinic visit costs and willingness to pay for lab tests, most people expressed the feeling that their access to health care is limited by income at least some of the time, regardless of their income level. These factors may help explain why approximately half of the places from which patients access antibiotics are directly from a pharmacy (without necessarily having seen a clinician). This behavior, coupled with low awareness of the risks of antibiotic misuse and willingness to pay for better services, highlights a market opportunity for private sector engagement to address a primary driver of inappropriate antibiotic use.

By reducing waiting times, we can increase the likelihood that a patient will present themselves to a health provider prior to seeking treatment at a pharmacy. OBF can do this by supporting the healthcare providers' testing capabilities and rewarding evidenced improvements in performance that result in shorter wait times for patients.

On the provider side, we found that many practitioners are willing to deviate from current stewardship guidelines under specific circumstances. Twenty to thirty percent of clinicians in each country are willing to prescribe an antibiotic if test results are not available quickly enough. Challenges with turnaround time are compounded by the fact that in Tanzania, over half of providers in public sector labs report patients leaving the lab without being tested because the wait is too long, though this rarely happens in Senegal. Moreover, over half of the lab staff in Tanzania and over a third in Senegal reported advising patients to seek an antibiotic after seeing their test results. In both countries, many pharmacists in the private sector are willing to dispense antibiotics without a prescription, and despite largely believing that patients will go to a clinic if referred, they do not frequently refer patients to a clinician. Taken together, each divergence from the optimal care pathway (test results not being available, clinicians prescribing because the test result isn't available, lab staff advising patients to seek antibiotics, and private sector pharmacists dispensing antibiotics without a prescription) compound to drive patients towards accessing antibiotics inappropriately.

OBF has the potential to address some of these provider-side challenges, by creating incentives for providers to clearly demonstrate adherence to the right protocols, ultimately reducing divergences from the optimal care pathway.

The untapped value of OBF

Despite the existing AMS efforts, delivery and financing challenges remain in the sector. OBF has a proven track record in solving some of the present challenges to drive better outcomes, as exemplified by the case studies in Table 2.

Table 2. Identified challenges and possible OBF solutions.

Challenge Type	Current Challenge	Possible OBF Solution	Case Study
Delivery	Funding is predominantly tied to inputs, which prevents flexibility and exploring what truly drives outcomes	Connecting funding to outcomes, instead of inputs, increases flexibility of service design	Financing for Jobs Development Impact Bond (DIB) in Palestine enabled significant service delivery flexibility by rewarding service providers for job outcomes, rather than paying for training
	Limited integration between public and private health systems fragments stewardship efforts	Encourage alignment across the health system by creating a common set of outcomes for both public and private facilities	Cameroon Kangaroo Mother Care (KMC) DIB used a common set of outcomes to deliver KMC in both public and private hospitals
	Intervention design to date is not sufficiently patient-centric, failing to address patient needs and behaviors	Create patient centric outcomes that incentivize delivery methods which are focused on meeting patient needs	Cameroon Kangaroo Mother Care DIB used patient centric outcomes to ensure that service delivery was focused on addressing patient needs
Financing	Implementing AMS in LMICs relies predominantly on donor funding, which hinders ownership and sustainability	OBF can help unlock additional domestic funding by tying funding to results, which helps drive accountability whilst also demonstrating value for money	IMAGINE Social Impact Bond in South Africa unlocked domestic funding, with the National Department of Health as an Outcomes Payor
	External programs are fragmented and insufficiently integrated with local health systems	By creating clear outcomes targets, OBF can prevent fragmentation by aligning multiple funding sources around a shared definition of success	Mine Fields to Rice Fields DIB in Cambodia created shared outcomes to address fragmentation across agriculture and de-mining funding

Progress achieved to date

Following completion of the research, PATH, in collaboration with our partners and country Ministries of Health (MOHs), has begun designing potential OBF mechanisms to be tested in future pilot implementations. Each design element, such as deliverables and desired outcomes, evidence and verification requirements, and payment terms is being informed by a rigorous analysis to determine the most effective and feasible approach.

In parallel, the project team is engaging potential funders to solicit support for Phase 3 pilot implementation. As part of this effort, PATH and partners seek technical input and co-financing to support the pilot phase. These engagements aim to build alignment around the OBF model and catalyze financial support for implementation.

We need your help to continue this exciting initiative. Early engagement from funders and partners who are interested in co-designing a solution with us will be critical to successfully demonstrate how OBF can improve AMS efforts, offering a sustainable solution to one of the most persistent public health challenges of our time.

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