Making the economic case: the value of investing in AMR surveillance

August 2026

Acknowledgements

This publication has been authored by Nduta Kamere, Jennifer Armitage and Kristina Aluzaite, with important contributions from Ijeoma Edoka and stakeholders listed below. It was developed through an iterative process of review and refinement. Stakeholder consultation included individuals who generously shared their expertise, experience and insights throughout this process; their contributions have strengthened the analytical framing and practical relevance of this work:

- Anafi Mataka, Mouiche Moctar, Sylvester Zibusiso Moyo, African Society for Laboratory Medicine (ASLM)
- Deepak Karki, Foreign, Commonwealth and Development Office (FCDO) Nepal
- Arnold Kabbale, FCDO Uganda
- Paul Turner, Mahidol Oxford Tropical Medicine Research Unit (MORU) Tropical Health Network
- Judith Nanyondo, Bashiru Adams, Palladium, Tackling Deadly Diseases in Africa Programme 2 (TDDAP2)
- Helena Rosado and Maxencia Nabiryo, Commonwealth Pharmacists Association (CPA)
- Dr Tracie Muraya, ReAct (Action on Antibiotic Resistance) Africa
- Jorrit Kabel, Rijksinstituut voor Volksgezondheid en Milieu (RIVM) – National Institute for Public Health and the Environment, The Netherlands
- Archie Drake, Rebecca Maudling, Tim Shorten and Cheryl Brown, Itad Evaluation team members.

The publication was produced for Itad, the evaluation partner for the Fleming Fund, with internal quality assurance conducted by Tim Shorten and Lamiaa Shehata. It was funded by the UK Department of Health and Social Care's (DHSC's) Fleming Fund using UK aid. The authors would like to thank all those who contributed time and expertise to the development of this product and who carefully reviewed and gave feedback on the content, including the DHSC Fleming Fund Project team. Any remaining errors or omissions are the responsibility of the authors.

Disclaimer

Acronyms

AHLE	Animal Health Loss Envelope
AMC	Antimicrobial Consumption
AMR	Antimicrobial Resistance
AMS	Antimicrobial Stewardship
AMU	Antimicrobial Use
ASLM	African Society for Laboratory Medicine
AST	Antimicrobial Susceptibility Testing
AWaRe	Access, Watch, Reserve
CAMO-Net	Centres for Antimicrobial Optimisation Network
CwPAMS	Commonwealth Partnerships for Antimicrobial Stewardship
DALY	Disability-Adjusted Life Year
DDD/DDDVet	Defined Daily Dose / Defined Daily Dose for animals
DHSC	Department of Health and Social Care
DOT	Days Of Therapy
EQA	External Quality Assessment
FAO	Food and Agriculture Organization of the United Nations
FCDO	Foreign, Commonwealth and Development Office
GLASS	Global Antimicrobial Resistance and Use Surveillance System
IHME	Institute for Health Metrics and Evaluation
IPC	Infection Prevention and Control
LMIC	Low and Middle-Income Country
mg	Milligrams
MORU	Mahidol Oxford Tropical Medicine Research Unit
NAP	National Action Plan
PCU	Population Correction Unit
PPS	Point Prevalence Studies
RIVM	Rijksinstituut voor Volksgezondheid en Milieu
SPARC	Surveillance and Prescribing Support for Antimicrobial Stewardship Resource Capacity Building
QALY	Quality-Adjusted Life Year
TF	Treatment Frequency (number of treatment days per animal)
TI	Treatment incidence (percentage of animals treated over time)
UDD	Used Daily Dose
WGS	Whole Genome Sequencing
WOAH	World Organisation for Animal Health

Summary

The Fleming Fund was a flagship investment by the UK's Department of Health and Social Care (DHSC), which strengthened national antimicrobial resistance (AMR) surveillance systems in low and middle-income countries (LMICs) across Africa and Asia. Following a design phase, the fund was implemented through two phases of funding from 2018 to 2026 (**Section 2** presents further details of the Fleming Fund's approach to supporting AMR surveillance).

AMR surveillance's specific contribution to health, economic and system-level outcomes has been inadequately studied. This paper is one of a set of learning products published by Itad, the evaluation partner of the Fleming Fund (see page 19). It reflects on the challenges in estimating the value of AMR surveillance and offers a **'menu of benefits'** and practical tools for investment cases. Written for those involved in generating, interpreting and using evidence to inform investment decisions in AMR surveillance systems, including policymakers, planners, programme managers, technical analysts and researchers, this paper is the result of a collaborative writing process that benefited from contributions from outside of the Fleming Fund's evaluation team (see **Acknowledgements**).

The authors have adopted a specific analytical lens focused on the economic evidence base and the 'quantifiable benefits' associated with AMR surveillance investments. This publication does not assume that all quantifiable benefits identified in the literature have been realised through Fleming Fund investments or that all benefits enabled by the programme are fully captured in existing studies. Instead, it draws from Fleming Fund outputs, outcomes and early impacts, alongside global literature, to present a structured menu of quantifiable benefits associated with AMR surveillance systems. Determining how these associated benefits can be measured, including the analytical choices required to do so, falls outside the scope of this paper. Further work is needed to explore how these benefits can be quantified and attributed using modelling where decisions about analytical perspective are required.

Key takeaways

Practical tools exist to make an investment case for AMR surveillance.

This publication provides a structured framework for translating AMR surveillance evidence into investment arguments that resonate with **technical analysts responsible for assessing, prioritising and justifying AMR surveillance investments**.

We begin by establishing why AMR surveillance matters and why current economic estimates undervalue it (**Section 1**), and we describe how laboratory system strengthening can create the conditions for AMR surveillance to generate measurable returns (**Section 2**).

Drawing on Fleming Fund learning, evaluation findings and wider literature, we present a **menu of quantifiable benefits** (**Section 3**) that links AMR surveillance investments to measurable health, economic and system-level outcomes. The framework is supported by practical considerations for designing, measuring and communicating AMR surveillance investments (**Section 4**) and additional resources and tools (**Section 5**) to help decision makers move from AMR **surveillance data to informed action and stronger investment decisions.**

Readers interested primarily in identifying and communicating the value of AMR surveillance investments may wish to begin with **Section 3** and refer to earlier sections for additional context and supporting evidence as needed.

A broad view of AMR surveillance benefits is needed to move beyond the current narrow perception of limited economic value.

Current approaches for estimating the economic value of AMR surveillance remain limited. They often focus on direct and immediate outcomes – such as improvements to antimicrobial consumption, clinical outcomes and treatment guidelines – while overlooking indirect, system-wide and cross-sectoral impacts, including reduced outbreak containment costs, improved laboratory efficiency, or productivity gains from reduced disease burden in livestock systems.

Existing evidence is concentrated in human health settings and frequently fails to capture the broader One Health value of surveillance across human, animal and environmental systems. The consequences of this narrow perspective extend beyond methodological limitations. **When AMR surveillance is undervalued, investments can be deprioritised, data remains underused, and opportunities for action are missed**. As a result, **AMR surveillance is often perceived as a cost rather than an investment**, making it difficult to justify against more visible and immediate health system priorities.

Credible pathways from AMR surveillance to quantifiable benefits can be traced.

The value of AMR surveillance is realised through action. Benefits emerge when data is trusted, interpreted, shared and used to inform clinical, public health, veterinary, food safety and policy decisions. However, these links between AMR surveillance data and action are not always fully realised in practice. As a result, the benefits documented in existing evidence may underestimate what AMR surveillance can achieve when data is effectively used. Recognising this dependency, and its implications for understanding the value of AMR surveillance, is therefore a central contribution of this paper.

Fleming Fund learning shows that when AMR surveillance is assessed as an investment rather than a stand-alone activity, credible pathways to measurable value can be identified across multiple domains (see Figure 3 on page 12). In many settings, AMR surveillance investments also strengthen laboratory systems, diagnostics, data infrastructure and cross-sector coordination mechanisms, generating benefits that extend beyond AMR and contribute to broader health system resilience and health security.

1. AMR surveillance: why it matters and why its value is difficult to measure

AMR burden (with the focus on LMICs)

AMR poses a major and growing threat to global health, with the highest burden in low-resource settings. Globally, bacterial AMR was associated with an estimated 4.71 million deaths in 2021, including 1.14 million deaths directly attributable to resistant infections (Naghavi *et al.*, 2024),[1] with the highest mortality rates in sub-Saharan Africa and South Asia (Antimicrobial Resistance Collaborators, 2022).[2] LMICs are disproportionately affected because resistant infections occur in contexts of high infectious disease burden, constrained health system capacity, and limited access to diagnostics and effective treatment. Over the past two decades, antibiotic consumption has increased substantially in many LMICs as access has expanded, but this increase has been uneven and coexists with persistent unmet need and major inequities in access to appropriate antibiotics (OECD, 2023). The economic consequences extend well beyond human health. AMR impacts on livestock could reduce global GDP by $40 billion per year, and human healthcare costs due to AMR could rise to $159 billion per year globally (McDonnell *et al.*, 2024).

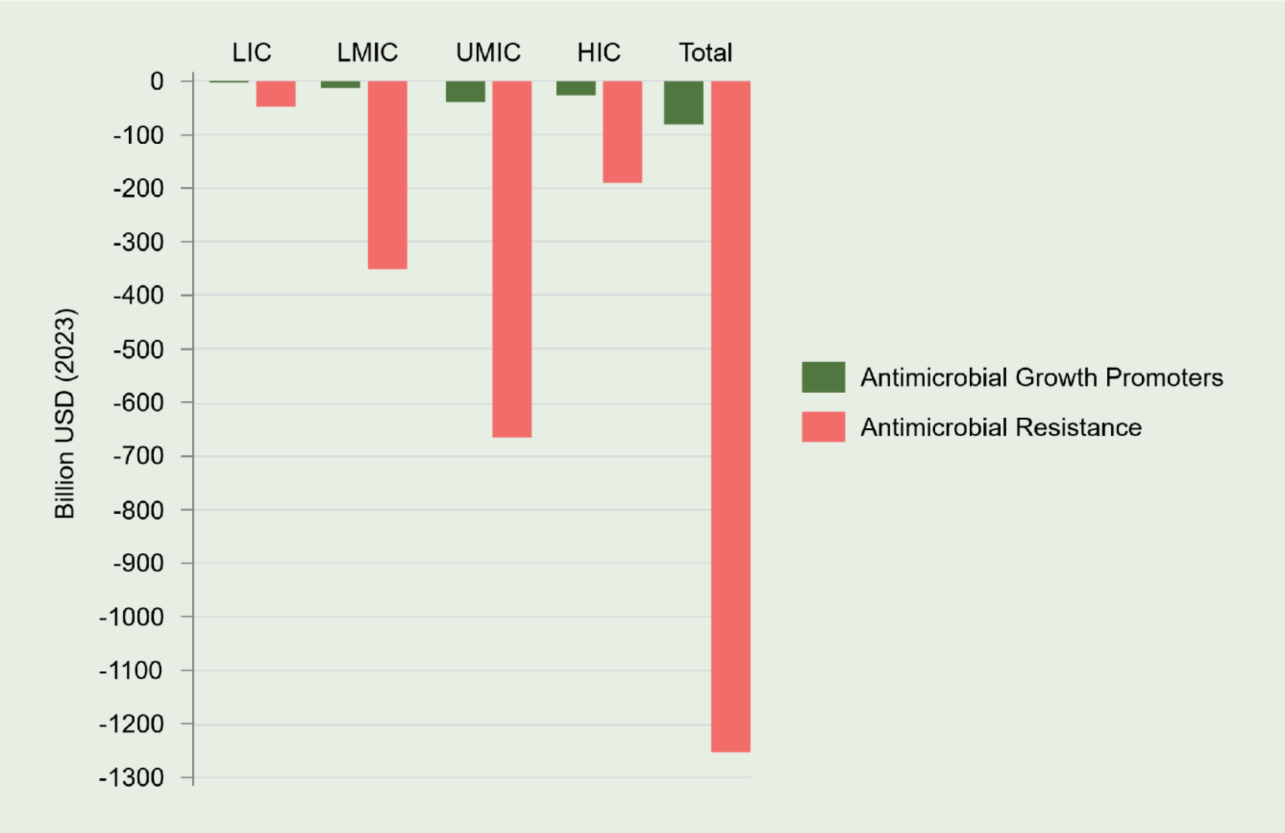
Resistant infections are associated with longer hospital stays, increased healthcare resource use and higher treatment costs (OECD, 2023; Chuchu *et al.*, 2025; Otieku, 2024; FAO, 2026). Evidence from hospital-based studies in LMICs indicates that AMR already places substantial strain on health systems (World Bank, 2017). The World Bank estimates that without effective containment, AMR could push up to 28 million people into extreme poverty by 2050 and reduce global GDP by up to 3.8%, with the largest economic losses borne by LMICs. The Food and Agriculture Organization of the United Nations (FAO) has quantified the economic cost of inaction and finds that it far outweighs the cost of action (see Figure 1). This macroeconomic framing accentuates that AMR is not only a health system challenge but a broader multisectoral, economic, development and environmental issue, with implications for food systems, livelihoods, trade and sustainable development (McDonnell *et al.*, 2024).

---

[1] Deaths “associated with” bacterial AMR include deaths occurring in people with drug-resistant bacterial infections, regardless of whether resistance was the direct cause of death. Deaths “attributable to” bacterial AMR refer to deaths that would have been prevented if resistant infections had instead been drug-susceptible infections. These annual estimates are projected to rise to approximately 8.22 million associated deaths and 1.91 million attributable deaths by 2050 if current trends continue.

[2] However, these regions lack robust historical data, which may limit the ability to assess temporal trends in AMR burden.

Figure 1. Economic welfare losses by income group under antimicrobial growth promoters (AGP) and AMR scenarios (2025–2040). This figure presents modelled global welfare losses by income group under the highest impact scenarios. The figure displays cumulative losses over the period 2025–2040, expressed in constant 2023 USD billions and disaggregated by World Bank income classification. Under a rising AMR scenario cost of inaction scenario, welfare losses reach about USE 1.25 trillion whereas under a phasing out of AGPs, cost of action scenario, welfare losses are about USD 80 billion. (Acosta et al, 2026, https://creativecommons.org/licenses/by-nc-nd/4.0/*)*



Why AMR surveillance matters

In many settings, people seek care late, antibiotics are often purchased without prescription, and clinicians are forced to treat serious infections without access to reliable diagnostics. As a result, broad-spectrum antibiotics are frequently used as a default, resistant infections go undetected until they are severe, and treatment failures become common. Limited AMR surveillance coverage (see Box 1) further constrains the detection of resistant trends at the national and subnational levels, delays response to outbreaks, and prevents updating of treatment guidelines in a timely manner, weakening health systems and clinical decision making (Naghavi *et al.*, 2024; McDonnell *et al.*, 2024; Chuchu *et al.*, 2025; World Bank, 2017).

This burden affects both patients and health systems; patients face longer illness, higher out-of-pocket costs and catastrophic health expenditure, and health facilities incur the costs of prolonged hospital stays, repeated referrals, and more expensive second-line or third-line treatments.

Box 1. What is AMR surveillance?

Public health surveillance is defined as the **ongoing, systematic collection, analysis and interpretation of data relating to public health** (WHO, 2020). **AMR surveillance** applies these principles to monitor AMR patterns, resistant organisms and, where relevant, antimicrobial use (AMU) and antimicrobial consumption (AMC) across human, animal and environmental sectors (ASLM, Africa CDC, ECSA-HC and WAHO, 2024). In practice, AMR surveillance:

- detects emerging resistance threats and monitors trends over time
- informs treatment guidelines, antibiotic formularies and stewardship programmes
- supports infection prevention and control measures and outbreak response
- monitors the effectiveness of AMR policies and interventions
- generates evidence to support planning, resource allocation and policy decisions (Tacconelli *et al.*, 2018; Palmer and Buckley, 2021; Pallett *et al.*, 2023).

The WHO Global Action Plan and the Global Antimicrobial Resistance and Use Surveillance System (GLASS) identify surveillance as a cornerstone of effective AMR response because it provides the **evidence needed to guide action**.

Evidence limitations

Despite the scale of the problem, robust evidence on the economic value of AMR investments remains limited, particularly in LMICs (World Bank, 2017). Systematic reviews of economic evaluations consistently show that most studies are conducted in high-income settings (Painter *et al.*, 2023), revealing a pronounced geographic imbalance in the evidence base. There are also very few evaluations adopting a cross-sectoral One Health[3] perspective or explicitly assessing intervention effects beyond the human health sector. Although the One Health approach is widely recognised as central to addressing AMR (Aenishaenslin *et al.*, 2021), the available evidence remains disproportionately weighted toward human health systems, with comparatively limited evidence from animal and, particularly, environmental health sectors. In part, this reflects broader gaps in AMR surveillance infrastructure, analytical tools and published evidence across sectors rather than the absence of relevance or impact. As more AMR surveillance data emerges from LMICs, strengthening these analytical approaches should become a priority.

Within this broader evidence gap, a critical yet underexplored component of AMR response is AMR surveillance. Although surveillance is widely recognised as foundational to AMR control, its specific contribution to health, economic and system-level outcomes remains insufficiently understood and poorly quantified, because it is rarely evaluated as a distinct intervention. Most studies assess broader intervention packages in which AMR surveillance is only one component, making it difficult to isolate the specific costs and associated impacts of AMR surveillance. This challenge is compounded by the complex, cross-sectoral nature of AMR and persistent methodological gaps in evaluating how AMR surveillance contributes to outcomes across human, animal and environmental systems. These challenges cannot be fully addressed through additional data or modelling alone.

[3] See for example https://www.who.int/news-room/fact-sheets/detail/one-health

Only a limited number of studies have explicitly assessed the impacts of AMR surveillance interventions, reflecting broader gaps in the evidence base on AMR surveillance-specific outcomes (see Box 2).

Box 2. Reasons why AMR surveillance is often undervalued

- The value of AMR surveillance is indirect and realised through action rather than data generation alone.
- Quantifiable benefits frequently emerge over long time horizons and across multiple sectors.
- Traditional economic evaluation methods often fail to capture indirect, system-level and spillover effects.
- AMR is a One Health challenge affecting human health, animal health, food systems, trade, livelihoods and wider development outcomes.
- Investments in laboratory, diagnostic and data systems often generate broader health system and health security benefits that are difficult to attribute and therefore are frequently omitted from investment cases.
- As a result, AMR surveillance is often perceived as a cost rather than an investment, particularly when competing against more immediate and visible spending priorities.

(Aluzaite, Dione, Belay, Robotham *et al.*, 2025; Aluzaite, Dione, Belay *et al.*, 2025; Aluzaite, Soares, Hewitt, Robotham *et al.*, 2025)

Methodological gaps in valuing AMR surveillance benefits

There is limited methodological guidance on how to quantify the broader effects of AMR interventions, including which outcomes and costs should be incorporated and scope (Aluzaite, Soares, Hewitt, Hope *et al.*, 2025). A critical methods review conducted in 2025 (Aluzaite, Soares, Hewitt, Robotham *et al.*, 2025) found that most studies adopt narrow time horizons and restricted spatial perspectives, failing to capture longer-term and system-wide impacts. Few evaluations incorporated transmission dynamics, limiting the consideration of indirect effects, complex effects and spillovers beyond healthcare settings. In addition, only a small proportion adopted a societal perspective, constraining the assessment of wider economic and health consequences. Uncertainty is also insufficiently explored, with relatively few studies undertaking comprehensive analyses, which reduces confidence in findings and inadequately reflects the complexity of AMR.

Global strategies emphasise cost-effective AMR action, but the methods needed to evaluate both costs and effects remain underdeveloped. As a result, prioritisation exercises are constrained in their ability to draw on robust evidence to inform AMR action plans. Countries updating National Action Plans (NAPs) lack reliable approaches to quantify the benefits of investing in AMR interventions, with the consequences most pronounced in resource-constrained settings.

These limitations have direct implications for decision making. By restricting analytical scope, **current evaluations omit key pathways through which interventions may influence resistance**, health outcomes and costs (Aluzaite, Soares, Hewitt, Robotham *et al.*, 2025), introducing a structural bias towards direct, short-term effects and against indirect, system-mediated impacts (Coast *et al.*, 2002). This leads to interventions such as AMR surveillance and prevention not being identified as cost-effective. A separate constraint holds regardless of evaluation quality:

measured benefits reflect the action actually taken in response to surveillance data, rather than the full benefits that could potentially be achieved through more complete use of the data.

From AMR surveillance to action: sustaining impact

As countries revise and reprioritise NAPs on AMR, surveillance remains a cornerstone intervention (WHO, 2026a), but making a compelling stand-alone investment case for AMR surveillance remains complex and challenging (Palmer and Buckley, 2021).

Although there is broad consensus on priority interventions (WHO, 2026b), NAPs with extensive 'long list' plans are hard to operationalise. As NAPs mature, attention is shifting from identifying actions to determining which investments offer the greatest value and are most feasible to sustain over time (WHO, 2023). For ministries responsible for planning and financing universal health coverage, this creates a difficult reality. AMR surveillance is widely recognised as important, but it competes with more immediately visible priorities such as service expansion, medicines procurement, and workforce salaries. It is often difficult to defend in budget negotiations because many of its benefits are indirect, delayed, preventive, or realised across sectors beyond health. Without credible ways to demonstrate how AMR surveillance investments translate into avoided treatment costs, better patient outcomes or system efficiencies, AMR surveillance is often viewed as a technical add-on rather than a core health system function.

Strengthening AMR surveillance capacities globally, including in LMICs, is a central pillar of AMR control and is captured explicitly in the Global Action Plan on AMR (WHO, 2015; FAO, 2026; FAO *et al.*, 2022). The World Bank (2017) has further noted that the creation of national AMR surveillance networks is becoming increasingly feasible and affordable for many countries, particularly through growing laboratory capacity to detect and characterise resistant organisms through antimicrobial susceptibility testing (AST), appropriate criteria and mechanisms for reporting, and effective oversight by a reference laboratory.

Crucially, **AMR surveillance generates data, but data alone does not generate impact**. This complicates efforts to quantify its value within conventional economic evaluation frameworks (Gelband *et al.*, 2016). Its value is realised only when paired with effective response, notably infection prevention and control (IPC), antimicrobial stewardship (AMS) and outbreak detection and containment. Where impact appears limited, this often reflects not only a lack of intrinsic value of AMR surveillance but also insufficient action and weak linkages to response. When AMR surveillance is not linked to action, investments risk generating data without meaningful health or economic impact. However, where AMR surveillance systems are weak or absent, uncertainty dominates clinical and policy decision making. As noted by the Fleming Fund programme, without AMR surveillance the world is "flying blind" (MAAP, 2022, cited in Leslie *et al.*, 2025, p.1).

This disconnect also limits the ability of governments and funders to compare AMR surveillance investments with other public health priorities on a consistent basis. This has implications globally, but the consequences may be more pronounced in LMICs, where tighter resource constraints and more lean system buffers heighten the importance of effectively translating AMR surveillance into actionable responses.

In these contexts, resource constraints can limit the scale and quality of AMR surveillance systems, reducing the availability of reliable AMR data to inform clinical practice, public health action, and policy decisions. At the same time, broader health system challenges shape how antimicrobials are used in practice.

Thus a consistent and credible approach to quantifying benefits enables governments to move beyond abstract arguments about AMR risk. It supports ministries of health and technical agencies to make clearer cases to ministries of finance, to engage international funders using comparable economic language, and to weigh AMR surveillance investments alongside other pressing health demands. This learning product seeks to contribute to the missing analytical bridge between analysis of AMR surveillance investments and the everyday decisions that shape health system performance in resource-constrained settings.

The financing challenge this creates is not limited to ministries of health. In animal and environmental health sectors, the investment case for AMR surveillance is even less developed and the evidence base is thinner. Where animal and environmental examples are less represented in this learning product, this echoes the current paucity of published evidence rather than an absence of impact or relevance.

2. Fleming Fund approach: how laboratory systems strengthen AMR surveillance

The Fleming Fund adopted a laboratory-centred, system strengthening approach grounded in the premise that effective AMR surveillance requires robust laboratory and data systems embedded within broader governance and workforce structures rather than stand-alone data collection activities. This approach reflected both global evidence and the realities of LMIC health systems, where the Fleming Fund's investments delivered multiple system functions for AMR surveillance to be viable and sustainable (see Maragno (2026) for lessons from the Fleming Fund on sustainable surveillance systems).

Over a nine-year period and across 23 countries in Africa and Asia, the Fleming Fund focused on strengthening core diagnostics and AMR surveillance capacities that enabled AMR data to be generated, interpreted and used. This approach was characterised by sustained investment in foundational systems rather than short-term, disease-specific surveillance activities.

These investments expanded access to microbiology diagnostics, including routine blood cultures and AST, while strengthening laboratory infrastructure, quality assurance systems and national reference laboratory networks across human and animal health. At the same time, the programme has built human capacity across laboratory and clinical functions, as well as IPC and AMS, through training, mentorship and institutional partnerships. Complementary investments in data systems, reporting platforms and governance mechanisms improved the reliability, comparability and usability of AMR data, enabling its use for clinical guidance, AMR programmes and public health decision making in resource-limited settings.

Relevance for resource-limited settings

In LMIC contexts, where diagnostic access is often limited and empirical treatment is common, the laboratory-strengthening approach delivers additional system-level value beyond AMR surveillance alone. In addition to the decision-making functions that AMR surveillance is designed to inform, there are broader system-level effects that arise as a byproduct of strengthening laboratory and data infrastructure. Strengthened diagnostics reduce reliance on broad-spectrum antibiotics, improved clinical decision making and lower referral and treatment delays. Evidence from modelling studies in low-resource settings (for example blood culture in sepsis management) indicates that even narrowly focused diagnostic interventions may avert substantial mortality in contexts where baseline diagnostic access is low (Penno, Baird and Crump, 2015).

At the same time, significant asymmetries often exist between the resources required to establish and sustain microbiology laboratory systems and the wider resource constraints facing the same facilities, reinforcing the importance of prioritisation and phased implementation approaches. In the broader sense of AMR surveillance, understood as data use rather than data generation alone, the risks of underinvestment are considerably larger than laboratory gaps by themselves suggest. Where labs are under-resourced or data governance processes are not in place, AMR surveillance investments may fail to complete the pathway from data to action, regardless of the quality of the underlying laboratory system. Further discussion of broader laboratory-based AMR surveillance system strengthening considerations is explored in another publication from the Itad evaluation team (Maragno, 2026).

The Fleming Fund approach was supported by a commitment to placing countries on a more equitable footing with respect to AMR data systems, enabling access to quality, actionable AMR surveillance data that can inform treatment, guideline development and policy decisions, rather than this remaining a privilege only for settings with pre-existing laboratory capacity. This approach recognised that countries begin from different baselines. Laboratory-centred AMR surveillance was feasible and appropriate in many settings, but alternative AMR surveillance models may be *required* where laboratory access remains (Painter *et al.*, 2024). The design and scale of AMR surveillance systems should therefore be context-sensitive rather than based on a one-size-fits-all model to reflect the differing laboratory capacity, epidemiological priorities, digital infrastructure, governance maturity and available resources. In all cases the emphasis needs to be on strengthening the quality, reliability and usability of AMR data, irrespective of the AMR surveillance model employed.

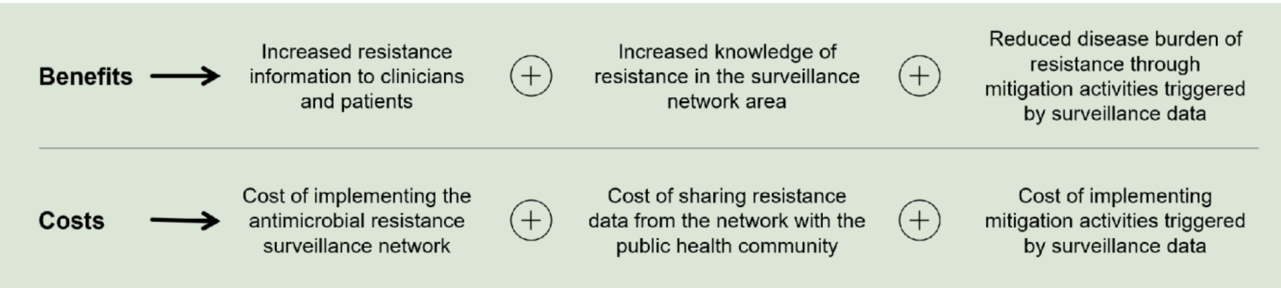
3. Menu of quantifiable benefits: from AMR surveillance to value

The menu of quantifiable benefits presented in Table 1 is the central resource within this publication. It provides a practical framework for identifying, measuring and communicating the health, economic and system-level benefits associated with AMR surveillance investments. The term "associated" is used deliberately, recognising that isolating the precise contribution of AMR surveillance requires careful consideration in complex systems.

The economic value of AMR surveillance

Using data for decisions turns actions into value. AMR surveillance does not create value directly; it generates **decision-grade data**. This data enables clinical, policy and system **action** leading to measurable economic and health **benefits**. The political nature of acting in response to AMR data is discussed in another learning publication from Itad (Drake *et al)*.[4] Quantifying the economic value of AMR surveillance is inherently challenging. This reflects not only the complexity of AMR as a 'knotty problem' but also the limitations of traditional economic models in capturing indirect, system-wide and long-term benefits. Conventional economic evaluation approaches often fail to distinguish between direct measurable outcomes and the indirect, system-level benefits that AMR surveillance generates through the actions it triggers, such as implementing mitigation activities and reducing disease burden. However, these indirect pathways explain a big part of the true value of AMR surveillance, as illustrated in Figure 2.

Figure 2. An example of how the costs and benefits of AMR surveillance occur at multiple levels (World Bank, 2017, http://creativecommons.org/licenses/by/3.0/igo)



As highlighted in Box 2, many of the benefits of AMR surveillance do not arise directly from the system itself but from the beneficial actions it enables, such as improved treatment decisions, stewardship practices and policy responses; this makes attribution difficult. Also, benefits are often realised over time, across sectors, and at multiple levels of the system. Where this **link** between data and action is weak or absent, the consequence is **inaction**, with AMR surveillance investments generating data that goes unused, resistance trends going unaddressed, and the potential value of AMR surveillance never being realised. As a result, AMR surveillance is frequently undervalued in investment decisions, particularly when compared to interventions with more immediate and visible returns.

[4] See also the forthcoming article 'Surveillance Data Use through the Fleming Fund: informing action on AMR in LMICs' in the Fleming Fund-sponsored supplement in *Clinical Infectious Diseases*, 'Antimicrobial Resistance (AMR) surveillance: Ten Years On'.

Connecting data to action and outcomes is therefore essential for communicating the value of AMR surveillance. A practical example is the use of resistance data to update national treatment guidelines, for instance changes in first-line therapy for sepsis, urinary tract infections or neonatal infections based on local resistance patterns. Early signals – such as reduced use of broad-spectrum antibiotics, increased prescribing of Access, Watch, Reserve (AWaRe) Access antibiotics (part of the WHO AWaRe classification system), or reduced stock-outs of appropriate agents – can serve as measurable intermediate indicators of impact along this pathway.

Figure 3. Surveillance: information to action pathway[5]

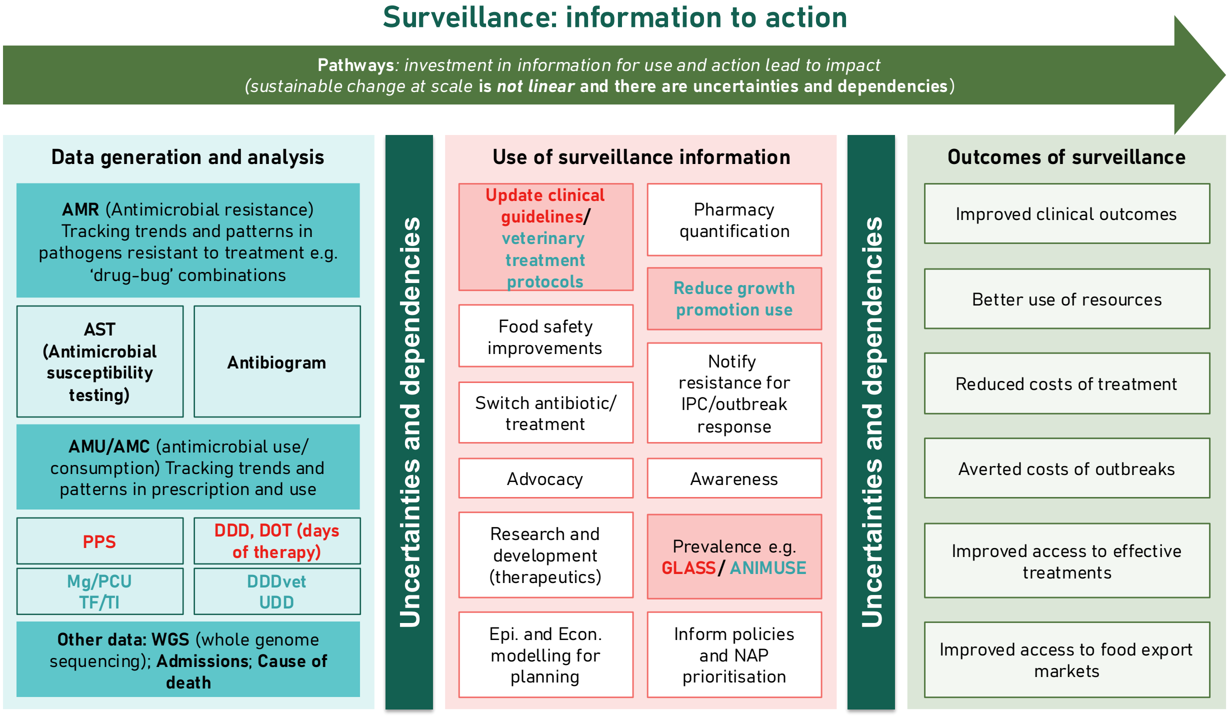


Figure 3 summarises how AMR surveillance drives impact in the human health sector, (rose text) the animal health sector (teal) and both sectors (black) through stages of data generation and analysis (including point prevalence surveys (PPS), defined daily doses (DDD and DDDvet) and other AMU metrics), translation into action, and resulting health, economic and system-level benefits. Impact depends on health system strength, because AMR surveillance adds value by enabling informed, timely decisions. The **"menu of benefits"** presented in Table 1 offers a structured framework for capturing the range of impacts that AMR surveillance can deliver across different contexts. It recognises that different stakeholders – clinicians, policymakers, laboratory managers and agricultural actors – will prioritise different outcomes depending on their roles and decision needs. For each benefit category, the menu outlines the role of AMR surveillance, identifies quantifiable metrics, and provides illustrative examples drawn from the literature and Fleming Fund experience. A table of quantifiable benefits and outcomes, with references to external studies and Fleming Fund publications, can be found in **Annex 1**. Given that the value of AMR surveillance is not stand-alone but depends on the actions taken within a system, the framework also highlights where **additional or related value emerges from system integration**, interconnections and broader uses of the mechanisms involved in AMR surveillance.

[5] Days of therapy (DOT) is a useful measure to compare data from multiple populations and the preferred measure in a number of countries for reporting national data. DOT is broadly applicable to paediatrics (including neonates) however it is difficult to measure accurately and requires computerised medication management systems. When this information is not readily available, DDD methodology for measurement of drug consumption is used together with point-prevalence auditing to understand quality and quantity of AMU. (Dalton *et al*, 2015; NCAS, 2025; WHO, 2019).

Table 1. Menu of quantifiable benefits of AMR surveillance

Domain	Benefit category	Role of AMR surveillance	Quantifiable metrics	Example pathway	Added value of integration
Human Health	Health Gains	Informs treatment guidelines and stewardship protocols, improving treatment success and reducing morbidity and mortality.	Deaths averted; quality-adjusted life years (QALYs) gained/ disability-adjusted life years (DALYs) averted; reduction in treatment failure rates; length of hospital stay.	Aggregated AMR surveillance data identifies local resistance patterns that inform empiric treatment guidelines and stewardship protocols, enabling more appropriate antibiotic prescribing at scale and reducing mortality, treatment failure and hospital stays.	Routine microbiology diagnostics guiding patient-level treatment decisions can also feed aggregated data into AMR surveillance systems, improving both patient care and AMR surveillance value simultaneously.
Human Health	Health System Cost Savings	Optimises allocation of medicines, consumables, workforce, and hospital capacity, improving efficiency and containing costs.	Cost per patient episode; bed-days saved; antibiotic expenditure; second-line and third-line treatment costs avoided; outbreak duration; number of patients infected.	Better prescribing reduces unnecessary use of expensive reserve antibiotics and shortens hospital stays. Earlier outbreak detection reduces isolation costs, outbreak duration and infections.	Linking AMR surveillance with IPC and AMS programmes enables action through existing systems, often representing a marginal addition to existing investments rather than requiring stand-alone funding.
Human Health	Patient and Household Economic Benefits	Reduces the financial and livelihood burden of AMR by improving timeliness and effectiveness of treatment.	Out-of-pocket expenditure; treatment costs per episode; healthcare visits; time to effective treatment; workdays lost; catastrophic health expenditure.	AMR surveillance-informed treatment guidelines reduce ineffective prescribing, prolonged illness, repeated care-seeking, and escalation to more expensive therapies.	Routine diagnostics improve treatment effectiveness while simultaneously generating AMR surveillance data, creating efficiencies across patient care and public health functions.

One Health	Stewardship Gains	Reduces unnecessary AMU across human and animal health systems, slowing resistance, lowering drug costs, and improving prescribing practices.	Reduction in inappropriate antimicrobial use; DDD in human health; milligrams (mg) of antibiotic active ingredient per Population Correction Unit (PCU) or treatment incidence in animal health; shifts from broad-spectrum to targeted antibiotics.	Facility antibiograms reduce broad-spectrum prescribing; AMU surveys identify overuse and enable measurable prescribing reductions. In livestock systems, AMR surveillance supports targeted treatment and reduced prophylactic use.	Integrating AMR surveillance with AMS programmes, veterinary extension services, and AMU monitoring systems enables data-driven action through established mechanisms while helping target restrictions more precisely over time.
One Health	Outbreak Prevention and Control	Enables earlier detection of outbreaks and emerging resistance patterns, supporting faster and more targeted responses.	Time to outbreak detection; cases or infections averted; outbreak duration; containment costs avoided. For example, earlier detection through WGS may reduce outbreak duration, prevent additional cases, and lower the costs associated with outbreak containment and hospital bed-days.	Genomic and laboratory AMR surveillance systems detect outbreaks earlier, enabling timely IPC measures that reduce outbreak size, duration, and service disruption.	Embedding AMR surveillance within outbreak response systems strengthens routine event-based and indicator-based AMR surveillance without requiring parallel systems.
One Health	Cross-Sector (One Health) Spillovers	Strengthens coordination across human, animal and environmental systems, improving detection and response to AMR and other threats.	Cross-sector data sharing frequency; number of joint initiatives; time to zoonotic risk detection; coordinated response actions triggered.	Integrated AMR surveillance linking human and animal data identifies shared resistance patterns and transmission pathways, informing coordinated interventions.	Integration strengthens One Health capacities, including laboratory systems, coordination mechanisms, and AMR surveillance platforms transferable to broader health security threats.

Animal Health	Agricultural and Livestock Productivity	Supports improved animal health management, reducing disease burden, AMU, and productivity losses.	Milk yield or growth rates; livestock mortality; culling rates; treatment costs per animal; production losses avoided.	Mastitis monitoring and AMR surveillance support targeted treatment and preventive measures, improving yields and reducing veterinary input costs.	Integrating AMR surveillance into veterinary extension and herd health programmes improves farm management practices through existing systems.
System Level	System Efficiency and Return on Investment	Improves utilisation of existing laboratory and data systems, increasing efficiency and maximising returns on prior investments.	Cost per sample or test; laboratory utilisation rates; sample throughput; turnaround times.	Increasing sample volumes and improving data use reduce unit costs and improve value derived from existing infrastructure and workforce investments.	Strengthening links between AMR surveillance, laboratory networks and data systems improves the use of existing capacity without substantial additional capital investment.
System Level	Policy and Allocative Efficiency	Provides evidence to prioritise interventions and allocate resources more effectively across systems.	Resource reallocation towards high-burden areas; cost-effectiveness ratios; reductions in duplication of interventions or AMR surveillance activities.	AMR surveillance identifies resistance hotspots and priority pathogens, enabling governments to target diagnostics, stewardship and IPC investments more effectively.	Embedding AMR surveillance within planning and budgeting mechanisms supports more informed and coordinated investment decisions.

4. Designing AMR surveillance investments for impact

AMR surveillance investments are more likely to showcase value when impact pathways and measurement approaches are considered from the outset. The considerations in Table 2 can help governments, implementers and funders design AMR surveillance investments that generate evidence of both performance and impact. This will strengthen the case for sustainable investment in AMR surveillance (Maragno, 2026).

Designing AMR surveillance investments to generate measurable benefits is only one part of the equation. Equally important is the ability to **adapt design to political realities** and **communicate** those benefits in ways that resonate with decision makers responsible for allocating resources (Drake *et al.*, 2026). Investment cases are often more persuasive when AMR surveillance is presented not as a technical activity but as an enabler of better health outcomes, more efficient resource use and stronger system resilience. In the next section we present a set of useful resources, identified through the stakeholder consultation on this publication, which cover these aspects of design and communication in more depth.

Table 2. Design considerations to generate evidence of performance and impact of AMR surveillance

Consideration	Why this matters
Design for use, not only data production	Each AMR surveillance investment should define who will use the data, what decision it will inform, and what action is expected. Without this, benefits remain theoretical.
Build a measurement framework at baseline	Record baseline values for sample volume, cost per sample, turnaround time, guideline use, data completeness, External Quality Assessment (EQA) participation, and cross-sector sharing frequency.
Separate outputs, outcomes and benefits	Connect trained staff and installed tools to the changes in practice, policy or efficiency they enable.
Use contribution analysis where attribution is difficult	AMR surveillance rarely works alone. A credible case can show how AMR surveillance contributed to IPC, AMS, guideline revision or outbreak response alongside other interventions.
Include One Health spillovers	Animal health, food safety and environmental AMR surveillance may generate benefits through risk reduction, safer production systems and better targeted AMU policies, even where patient-level health outcomes are not measured.

Budget for recurrent costs	Costing should distinguish initial capital investment from recurrent needs such as reagents, maintenance, EQA, staff time and data-system support.
Plan for donor transition	Investment cases should show how domestic financing will protect core AMR surveillance functions when donor grants decline.
Invest in local leadership and stewardship networks	Trusted national networks are critical for translating AMR surveillance findings into locally led action and sustaining system improvements beyond programme cycles.
Plan for maintenance and analytical capacity	Laboratories and data systems require ongoing investment in maintenance, staffing and analytical skills. Without these, data quality deteriorates and benefits are not realised.
Integrate digitalisation with accountability	Digital tools should be accompanied by the organisational culture, accountability mechanisms and analytical capacity needed to act on data consistently.

5. Resources for developing AMR surveillance investment cases

The following resources have been identified as particularly useful in our work on building the economic case for developing AMR surveillance investment cases, including materials contributed by our collaborators and contributors, see also Annex 2.

(i) Understanding and strengthening AMR surveillance

Commonwealth Partnerships for Antimicrobial Stewardship (CwPAMS) – programme experience on AMR surveillance-to-action pathways and stewardship capacity building.

InFARM System – FAO's InFARM IT platform provides access to interactive data visualisations based on AMR data.

Surveillance and Prescribing Support for Antimicrobial Stewardship Resource Capacity Building (SPARC) – practical resources for stewardship implementation in resource-limited settings.

WHO (2020). *GLOSSARY of Health Emergency and Disaster Risk Management Terminology*.

WHO (2023). *GLASS manual for antimicrobial resistance surveillance in common bacteria causing human infection* – this manual is designed to inform GLASS implementation.

WHO Library of AMR NAPs – the library contains NAPs which have been officially approved.

World Organisation for Animal Health (WOAH) ANIMUSE – the global database on animal AMU.

(ii) Building and communicating the investment case for AMR surveillance

Centres for Antimicrobial Optimisation Network (CAMO-Net) (2025). *The Economic Burden of Antimicrobial Resistance on the Human Health Sector in Uganda: Insights from a Cost-of-Illness Study* (Technical Brief).

Cost-effectiveness of maintaining an active hospital microbiology laboratory service in Timor-Leste (Appendix 4 has unit costs per sample).

Fleming Fund (2025). Economic benefits of AMR surveillance in Papua New Guinea. https://webarchive.nationalarchives.gov.uk/ukgwa/20260618135900/https://www.flemingfund.org/publications/economic-benefits-of-amr-surveillance-in-papua-new-guinea/ (accessed 12 August 2026).

Fleming Fund (2026). *The cost of sustaining AMR surveillance systems in human health: Case Study from Zambia*.

Forecasting the Economic Fallout from AMR – research from the Center for Global Development, to estimate the future economic burden of AMR by 2050.

ReAct – Action on Antibiotic Resistance (2025). *Unlocking AMR financing: Optimizing international resources for an accelerated response to antibiotic resistance* (Policy Brief).

The Institute for Health Metrics and Evaluation (IHME) – datasets created by IHME for their research projects and publications.

WHO Costing and Budgeting Tool for National Action Plans on Antimicrobial Resistance – an online course on using the tool is also available from the same website.

WOAH (2024). The Animal Health Loss Envelope (AHLE) framework – published as Gilbert, W. (2024). Interpretation and utility of the Animal Health Loss Envelope as part of the Global Burden of Animal Diseases (GBADs) analytical process. *Scientific and Technical Review* 43.

(iii) Additional evidence from Fleming Fund implementation and rapid global literature reviews (see also References)

Fleming Fund (2022) *Antimicrobial Resistance: Fleming Fund Policy Brief: Uganda* – summarising the cost of AMR surveillance in Uganda.

Kumar, P., Sundermann, A.J., Martin, E.M. *et al.* (2021). Method for economic evaluation of bacterial whole genome sequencing surveillance compared to standard of care in detecting hospital outbreaks. *Clinical Infectious Diseases* 73: e9–e18.

Lee, X.J., Elliott, T.M., Harris, P.N. *et al.* (2020). Clinical and economic outcomes of genome sequencing availability on containing a hospital outbreak of resistant *Escherichia coli* in Australia. *Value in Health* 23: 994–1002.

Worth, T., Fenwick, S., Whitaker, D., *et al.* (2026). *Optimising AMR surveillance in animal health: A Case Study Review*. https://doi.org/10.48060/tghn.189.

Worth, T., Whitaker, D., Leslie, T., et al. (2026) 'The cost of sustaining AMR surveillance systems in human health: Case Study from Zambia'. Available from https://media.tghn.org/medialibrary/2026/06/Cost_of_sustaining_AMR_surveillance_Human_Health_Full_Report.pdf (accessed 19 July 2026).

Finding Fleming Fund publications

A collection of the Fleming Fund's learning products is hosted on The Global Health Network in a dedicated Fleming Fund Knowledge Hub. Forthcoming Itad-led learning products and journal articles on data use, sustainability, the Fleming Fellowship Schemes, and One Health will be made available through the Fleming Fund Knowledge Hub.

Fleming Fund phase 1 and 2 evaluations

At the end of each phase of the Fleming Fund, Itad (the Fund's evaluation partner) produced a summative evaluation report, assessing how far the Fleming Fund contributed to its intended outcomes and impact. The report on phase 2 is forthcoming and will be made available from the Fleming Fund Knowledge Hub.

References

Acosta, A., Tirkaso, W., Artavia, M., Nicolli, F., Chatzopoulos, T., Araujo-Enciso, S.R., Cicowiez, M., Eskander, S., Laxminarayan, R. and Song, J. (2026). Antimicrobial use in livestock: The economic cost of action or inaction. *Journal of Agricultural Economics* 1–23. https://doi.org/10.1111/1477-9552.70041

Aenishaenslin, C., Häsler, B., Ravel, A., Parmley, E.J., Mediouni, S., Bennani, H., Stärk, K.D.C. and Buckeridge, D.L. (2021). Evaluating the Integration of One Health in Surveillance Systems for Antimicrobial Use and Resistance: A Conceptual Framework. *Front. Vet. Sci*. 8: 611931. https://doi.org/10.3389/fvets.2021.611931

Aluzaite, K., Dione, M., Belay, D., Robotham, J.V., Guitian, J., Chan, D., Emes, E., Endalew, Y.G., White, P.J., Ramponi, F., and Knight, G.M. (2025). *One Health Criteria to support decision-making on antimicrobial resistance interventions*. https://www.woah.org/en/document/one-health-criteria-to-support-decision-making-on-antimicrobial-resistance-interventions/ (accessed 11 July 2026)

Aluzaite, K., Soares, M.O., Hewitt, C., Hope, W., Robotham, J. and Woods, B. (2025). Antimicrobial Resistance (AMR) Development Map: A Conceptual Map and a Tool to Support Economic Evaluation of AMR Interventions. *Appl Health Econ Health Policy* 23: 767–77. https://doi.org/10.1007/s40258-025-00969-6

Aluzaite, K., Soares, M.O., Hewitt, C., Robotham, J., Painter, C. and Woods, B. (2025). Economic Evaluation of Interventions to Reduce Antimicrobial Resistance: A Systematic Literature Review of Methods. *PharmacoEconomics* 43: 631–46. https://doi.org/10.1007/s40273-024-01468-7

Antimicrobial Resistance Collaborators (2022). Global burden of bacterial antimicrobial resistance in 2019: a systematic analysis. *The Lancet* 399: 629–55. https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(21)02724-0/fulltext (accessed 12 August 2026)

ASLM, Africa CDC, ECSA-HC and WAHO (2024). *Antimicrobial Resistance Surveillance Guidance for the African Region: A Guide on the Collection, Management and Analysis of Data for Antimicrobial Resistance, Consumption, and Use in Africa. First edition*. https://aslm.org/3d-flip-book/antimicrobial-resistance-surveillance-guidance-for-the-african-region-first-edition-2024/ (accessed 20 July 2026)

Chuchu, V., Sayianka, S., Teresa, I., Inwani, I., Oyugi, J., Thumbi, S.M. and Omulo, S. (2026). Burden of Antibiotic Resistance in Hospitalized Children in Kenya: Associations with Mortality, Hospital Stay, and Treatment Costs. *Am J Trop Med Hyg* 114(2): 216–23. https://doi.org/10.4269/ajtmh.25-0440

Coast, J., Smith, R., Karcher, A.M., Wilton, P. and Millar, M. (2002). Superbugs II: how should economic evaluation be conducted for interventions which aim to contain antimicrobial resistance? *Health Econ*. 11(7): 637-47. https://doi.org/10.1002/hec.693

Dalton, B. R., MacTavish, S. J., Bresee, L. C., Rajapakse, N., Vanderkooi, O., Vayalumkal, J. and Conly, J. (2015). Antimicrobial Use Over a Four-Year Period Using Days of Therapy Measurement at a Canadian Pediatric Acute Care Hospital, *Canadian Journal of Infectious Diseases and Medical Microbiology*, 26, 835209. https://doi.org/10.1155/2015/835209

FAO (2026). 'Antimicrobial Resistance: Surveillance and Monitoring'. https://www.fao.org/antimicrobial-resistance/key-sectors/surveillance-and-monitoring/en/ (accessed 11 July 2026)

FAO, UNEP, WHO and WOAH (2022). *One Health Joint Plan of Action (2022–2026). Working together for the health of humans, animals, plants and the environment*. https://openknowledge.fao.org/items/fddae6a2-e7ef-4a2a-ad54-2463dbbb0b32 (accessed 11 July 2026)

Gelband, H. *et al.* (2016). *East Africa Public Health Laboratory Networking Project: Strengthening the role of laboratories in tracking antimicrobial drug resistance in East Africa*. Washington, DC: Center for Disease Dynamics, Economics & Policy. https://ecsahc.org/wp-content/uploads/2025/08/AMR-report-for-EAPHLNP-with-CCDEPwb_report_32-1.pdf (accessed 12 August 2026)

Leslie, T., Donoghue, M., Wildfire, J. and Onasanya, S. (2025). *Strengthening AMR surveillance systems in low and middle-income countries: A Change Story. 2028-2022*. https://doi.org/10.48060/tghn.205

Maragno, M. (2026). [FORTHCOMING] *Designing sustainable surveillance systems, Lessons from the Fleming Fund for future antimicrobial resistance and broader disease surveillance programmes*. Itad. To be available from the Fleming Fund Knowledge Hub.

McDonnell, A., Countryman, A., Laurence, T., Gulliver, S., Drake, T., Edwards, S., Kenny, C., Lamberti, O., Morton, A., Shafira, A., Smith, R. and Guzman, J. (2024). *Forecasting the Fallout from AMR: Economic Impacts of Antimicrobial Resistance in Humans. A report from the EcoAMR series*. Paris (France) and Washington, DC (United States of America): WOAH and World Bank. https://doi.org/10.20506/ecoAMR.3539

Naghavi, M., Vollset, S., Ikuta, K. *et al.* (2024). Global burden of bacterial antimicrobial resistance 1990–2021: a systematic analysis with forecasts to 2050. *The Lancet* 404: 1199–1226. https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(24)01867-1/fulltext (accessed 12 August 2026)

NCAS (2025). 'Antimicrobial Stewardship'. https://www.ncas-australia.org/measurement (accessed 12 August 2026)

Palmer, G.H. and Buckley, G.J. (eds) (2021). *Combating Antimicrobial Resistance and Protecting the Miracle of Modern Medicine*. National Academies Press: Washington, DC, USA. https://www.ncbi.nlm.nih.gov/books/NBK577274/ (accessed 11 July 2026)

OECD (2023). *Embracing a One Health Framework to Fight Antimicrobial Resistance*. OECD Health Policy Studies, OECD Publishing, Paris. https://doi.org/10.1787/ce44c755-en (accessed 11 July 2026)

Otieku, E., Kurtzhals, J.A.L., Fenny, A.P., Ofori, A.O., Labi, A.K. and Enemark, U. (2024). Healthcare provider cost of antimicrobial resistance in two teaching hospitals in Ghana. *Health Policy Plan* 39(2): 178–87. https://doi.org/10.1093/heapol/czad114

Painter, C., Faradiba, D., Chavarina, K.K., Sari, E.N., Teerawattananon, Y., Aluzaite, K. and Ananthakrishnan, A. (2023). A systematic literature review of economic evaluation studies of interventions impacting antimicrobial resistance. *Antimicrob Resist Infect Control* 12: 69. https://doi.org/10.1186/s13756-023-01265-5

Painter, C., Limmathurotsakul, D., Roberts, T. *et al.* (2024). Sustainable antimicrobial resistance surveillance: time for a global funding mechanism. *The Lancet Infectious Diseases* 25: e99–e103. https://doi.org/10.1016/s1473-3099(24)00649-2

Pallett, S.J. *et al.* (2023). National action plans for antimicrobial resistance and variations in surveillance data platforms. *Bull World Health Organ* 101(8): 501–12F. https://doi.org/10.2471/blt.22.289403

Penno, E.C., Baird, S.J. and Crump, J.A. (2015). Cost-Effectiveness of Surveillance for Bloodstream Infections for Sepsis Management in Low-Resource Settings. *Am J Trop Med Hyg* 93(4): 850–60. https://doi.org/10.4269/ajtmh.15-0083

Tacconelli, E. *et al.* (2018). Surveillance for Control of Antimicrobial Resistance. *The Lancet Infectious Diseases* 18(3): e99–106. doi:10.1016/S1473-3099(17)30485-1.

WHO (2015). *Global action plan on antimicrobial resistance*. https://www.who.int/publications/i/item/9789241509763 (accessed 11 July 2026)

WHO (2019). *Antimicrobial stewardship programmes in health-care facilities in low- and middle-income countries: A WHO practical toolkit.* https://iris.who.int/server/api/core/bitstreams/e2e59ce4-c373-4066-9ff7-a0cce3e6ccdd/content (accessed 12 August 2026)

WHO (2020) *Glossary of Health Emergency and Disaster Risk Management Terminology*. https://iris.who.int/server/api/core/bitstreams/dbfceb27-3a32-469e-8c5a-aff559f6f74a/content (accessed 19 July 2026)

WHO (2023). *People-centred approach to addressing antimicrobial resistance in human health: WHO core package of interventions to support national action plans*. https://www.who.int/publications/i/item/9789240082496 (accessed 11 July 2026)

WHO (2026a). *Global Antimicrobial Resistance and Use Surveillance System (GLASS)*. https://www.who.int/initiatives/glass (accessed 11 July 2026)

WHO (2026b). *Draft updated global action plan on antimicrobial resistance 2026–2036* (A79/5 Add.2). Seventy-ninth World Health Assembly. https://apps.who.int/gb/ebwha/pdf_files/WHA79/A79_5Add2-en.pdf (accessed 11 July 2026)

World Bank (2017). *Drug-Resistant Infections: A Threat to Our Economic Future*. https://documents1.worldbank.org/curated/en/323311493396993758/pdf/final-report.pdf (accessed 11 July 2026)

Annex 1: Supporting evidence for quantifiable benefits and outcomes of AMR surveillance

Table 3. Studies and evidence of quantifiable benefits and outcomes

Quantifiable benefit	Example from the literature and Fleming Fund experience
Deaths averted	Naghavi, M., Vollset, S., Ikuta, K. *et al.* (2024). Global burden of bacterial antimicrobial resistance 1990–2021: a systematic analysis with forecasts to 2050. *The Lancet* 404: 1199–1226.
QALYs gained/DALYS averted	Naghavi, M., Vollset, S., Ikuta, K. *et al.* (2024). Global burden of bacterial antimicrobial resistance 1990–2021: a systematic analysis with forecasts to 2050. *The Lancet* 404: 1199–1226.
Economic losses	McDonnell, A., Countryman, A., Laurence, T., Gulliver, S., Drake, T., Edwards, S., Kenny, C., Lamberti, O., Morton, A., Shafira, A., Smith, R. and Guzman, J. (2024). *Forecasting the Fallout from AMR: Economic Impacts of Antimicrobial Resistance in Humans. A report from the EcoAMR series*. Paris (France) and Washington, DC (United States of America): WOAH and World Bank. https://doi.org/10.20506/ecoAMR.3539
Health care costs	Chuchu, V., Sayianka, S., Teresa, I., Inwani, I., Oyugi, J., Thumbi, S.M. and Omulo, S. (2026). Burden of Antibiotic Resistance in Hospitalized Children in Kenya: Associations with Mortality, Hospital Stay, and Treatment Costs. *Am J Trop Med Hyg* 114(2): 216–23. Lim, C., Maung Swe, M.M., Devine, A. *et al.* (2025). Cost-effectiveness of maintaining an active hospital microbiology laboratory service in Timor-Leste. *Lancet Reg Health Southeast Asia* 36: 100582, Appendix 4: Unit costs per sample. Noguerol Andrade, J.C.B., Santos, B.S. and Del Fiol, F.d.S. (2026). Impact of an Antimicrobial Stewardship Program on Antibiotic Consumption, Bacterial Susceptibility, and Costs in a High-Complexity Public Hospital. *Antibiotics* 15(3): 264. https://doi.org/10.3390/antibiotics15030264 Otieku, E., Kurtzhals, J.A.L., Fenny, A.P., Ofori, A.O., Labi, A.K. and Enemark, U. (2024). Healthcare provider cost of antimicrobial resistance in two teaching hospitals in Ghana. *Health Policy Plan* 39(2): 178–87. Worth, T., Whitaker, D., Leslie, T., et al. (2026). The cost of sustaining AMR surveillance systems in human health: Case Study from Zambia
Animal health and welfare	Leslie, T., Donoghue, M., Wildfire, J. and Onasanya, S. (2025). *Strengthening AMR surveillance systems in low and middle-income countries: A Change Story. 2018-2022*. https://doi.org/10.48060/tghn.205 Mumba, C., Mwasinga, W., Mudenda, N., Mataka, A. and Mouiche, M.M.M. (2026). Estimating the economic burden of mastitis and antimicrobial

	use in a commercial dairy system using the animal health loss envelope framework. *Front. Vet. Sci.* 13: 1763368.
Livestock mortality rates	Mumba, C., Mwasinga, W., Mudenda, N., Mataka, A. and Mouiche, M.M.M. (2026). Estimating the economic burden of mastitis and antimicrobial use in a commercial dairy system using the animal health loss envelope framework. *Front. Vet. Sci.* 13: 1763368.
Production losses	Acosta, A., Tirkaso, W., Artavia, M., Nicolli, F., Chatzopoulos, T., Araujo-Enciso, S.R., Cicowiez, M., Eskander, S., Laxminarayan, R. and Song, J. (2026). Antimicrobial use in livestock: The economic cost of action or inaction. *Journal of Agricultural Economics* 1–23. Jain, S., Mukhopadhyay, K. and Thomassin, P.J. (2018). An economic analysis of salmonella detection in fresh produce, poultry, and eggs using whole genome sequencing technology in Canada. *Food Res Int* 116: 802–09.

Quantifiable outcome	Example from the literature and Fleming Fund experience
Length of hospital stays	Chuchu, V., Sayianka, S., Teresa, I., Inwani, I., Oyugi, J., Thumbi, S.M. and Omulo, S. (2026). Burden of Antibiotic Resistance in Hospitalized Children in Kenya: Associations with Mortality, Hospital Stay, and Treatment Costs. *Am J Trop Med Hyg* 114(2): 216–23. Jain, S., Mukhopadhyay, K. and Thomassin, P.J. (2018). An economic analysis of salmonella detection in fresh produce, poultry, and eggs using whole genome sequencing technology in Canada. *Food Res Int* 116: 802–09.
Reduction in treatment failure rates	Ford, L., Glass, K., Williamson, D.A., Sintchenko, V., Robson, J.M.B., Lancsar, E., Stafford, R.J. and Kirk, M.D. (2021). Cost of whole genome sequencing for non-typhoidal Salmonella enterica. *PLoS One* 16(3): e0248561. Gordon, L.G., Elliott, T.M., Forde, B., Mitchell, B., Russo, P.L., Paterson, D. and Harris, P.N.A. (2021). Budget impact analysis of routinely using whole-genomic sequencing of six multidrug-resistant bacterial pathogens in Queensland, Australia. *BMJ Open* 11(2): e041968.
Outbreak length and number of patients infected	Dymond, A., Davies, H., Mealing, S., Pollit, V., Coll, F., Brown, N.M. and Peacock, S.J. (2020). Genomic surveillance of methicillin-resistant *Staphylococcus aureus*: a mathematical early modeling study of cost-effectiveness. *Clin Infect Dis* 70(8): 1613–19. Gordon, L.G., Elliott, T.M., Forde, B., Mitchell, B., Russo, P.L., Paterson, D. and Harris, P.N.A. (2021). Budget impact analysis of routinely using

	whole-genomic sequencing of six multidrug-resistant bacterial pathogens in Queensland, Australia. *BMJ Open* 11(2): e041968.
Culling rates	Mumba, C., Mwasinga, W., Mudenda, N., Mataka, A. and Mouiche, M.M.M. (2026). Estimating the economic burden of mastitis and antimicrobial use in a commercial dairy system using the animal health loss envelope framework. *Front. Vet. Sci.* 13: 1763368.
mg/PCU or treatment incidence in animal health	Penno, E.C., Baird, S.J. and Crump, J.A. (2015). Cost-Effectiveness of Surveillance for Bloodstream Infections for Sepsis Management in Low-Resource Settings. *Am J Trop Med Hyg* 93(4): 850-60.
Changes in milk yield or growth rates	Mumba, C., Mwasinga, W., Mudenda, N., Mataka, A. and Mouiche, M.M.M. (2026). Estimating the economic burden of mastitis and antimicrobial use in a commercial dairy system using the animal health loss envelope framework. *Front. Vet. Sci.* 13: 1763368.
Shifts from broad-spectrum to targeted antibiotics	Examples contributed by stakeholders during consultation on this paper: In-country Fleming Fund investments have supported improvements in laboratory-clinician linkages, enabling more targeted prescribing and increased use of AWaRe "Access" antibiotics. In Uganda, referral hospital strengthening enabled revival of laboratory services and improved clinician engagement with microbiology data, contributing to more appropriate antibiotic selection (CwPAMS). Regulatory action triggered by AMR surveillance evidence (drug governance): Nepal's surveillance-informed actions include two concrete regulatory policies: (i) restricting dispensing of Reserve-group antibiotics to hospital pharmacies only, and (ii) mandating red-line marking on antimicrobial packaging to deter misuse.

Annex 2: Advice on communicating the investment case for AMR surveillance

During the consultation on this learning product, the authors received this advice from stakeholders.

When presenting to ministries of finance, cabinet offices or international funders, technical teams often need to translate complex AMR arguments into plain, outcome-focused language. The phrases below are practical starting points, not replacements for rigorous analysis but accessible ways to open the conversation with non-technical decision makers:

- This investment helps prevent avoidable deaths and reduces prolonged hospital stays.
- AMR surveillance-informed stewardship cuts unnecessary antibiotic use and lowers treatment costs.
- Earlier outbreak detection means faster response, less spread and lower containment costs.
- Integrated AMR surveillance helps target limited resources where the resistance burden is highest.

Where country-specific data is available, **on bed-days saved, treatment costs avoided or lives protected**, these phrases should be matched with real figures to strengthen the case. The economic analyses in this learning product are designed to help technical teams make that translation from general argument to specific, evidence-based investment case.

A note for technical assistance providers: when supporting governments through budget negotiations or NAP planning, these phrases can serve as entry points for dialogue with finance and planning ministries. The goal is to move decision makers from acknowledging AMR risk in the abstract towards committing to AMR surveillance as a core health system investment, not a technical add-on.

itad

Solving complex challenges with evidence and learning

itad.com @ItadLtd Itad mail@itad.com

Itad UK
International House
Queens Road
Brighton, BN1 3XE
United Kingdom

Tel: +44 (0)1273 765250

Itad US
c/o Open Gov Hub
1100 13th St NW, Suite 800
Washington, DC, 20005
United States

Itad Kenya
1870/610 The Westwood Building
Vale Close
Westlands, Nairobi
Kenya