

PANMURE HOUSE DIALOGUES

MARKET SOLUTIONS FOR
ANTIMICROBIAL
EFFECTIVENESS

REPORT ON ENGAGING INVESTORS IN
ANTIMICROBIAL EFFECTIVENESS

INSTITUTE OF ECONOMIC
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ADAM SMITH'S
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Foreword

The **Panmure House Dialogues on Market Solutions for Antimicrobial Effectiveness (AME)** brought together experts from healthcare, policy, academia and finance to explore how investors can play a pivotal role in conserving and enhancing AME at a time when its erosion poses growing systemic risks.

At Panmure House, we explore today's most pressing challenges through the lens of Adam Smith's timeless principles. As the final residence of the philosopher and economist, Panmure House serves as a centre for economic and social research and debate. Antimicrobial resistance (AMR) is a challenge that Adam Smith would have cared deeply about. Antimicrobials are vital guardians against infectious diseases and have become the backbone of modern healthcare and food systems. However, markets fail to capture both their immense social value and the long-term costs of growing resistance; this threatens human welfare and the stability of economic systems. While Smith championed markets, he argued that they require good rules, aligned incentives and collective action to function in the public interest. For a thinker concerned with how nations flourish, the erosion of such a foundational resource would be an unmistakable call to action.

Sitting in Panmure House, in the rooms where Smith spent his final years revising his major works and debating ideas and policy with fellow thinkers of the Scottish Enlightenment, we sought to reflect their tradition of challenging assumptions and engaging in intellectual exchange across disciplines. Conversations were lively, often difficult and always thoughtful. By uniting diverse perspectives, we created a space where actors with different incentives, constraints, and levers could come together, understand their interdependencies, and explore new ways of acting together.

What emerged was a clearer sense of both the problem and the path forward. The dialogue helped to set out a shared framework for action, one that recognises AME as a form of global economic infrastructure and emphasises the need for coordinated efforts across markets, policy, and practice. While the work ahead is demanding, the exchange brought greater clarity about where action is most needed and how different actors can contribute.

This dialogue is just the beginning of an ongoing programme of engagement. We hope that the insights captured in this report will inform policy debate, guide future collaboration, and support the development of market-based solutions capable of conserving AME for generations to come.

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Henry Skinner – AMR Action Fund

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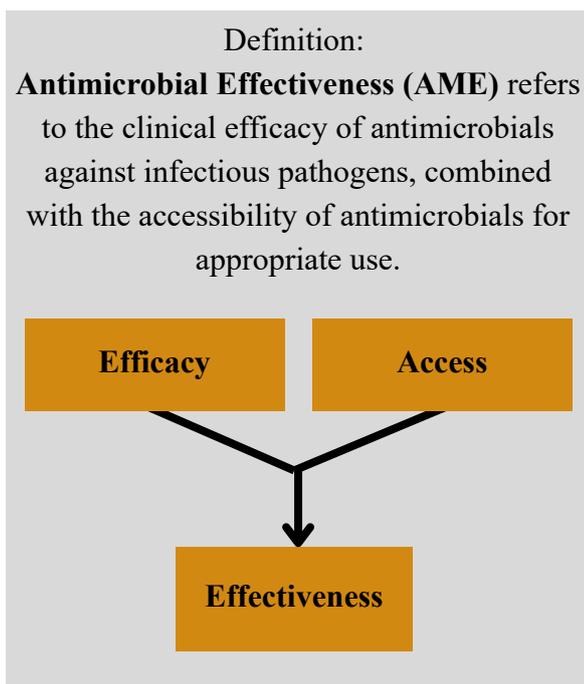
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Any remaining errors or omissions are the responsibility of the author.



1 Executive Summary

The Panmure House Dialogues on Market Solutions for Antimicrobial Effectiveness (AME) convened experts from healthcare, policy, academia and finance to explore how investors and other economic actors can play a pivotal role in conserving and strengthening AME. By bringing together diverse perspectives, the dialogue created a space where actors with different incentives, constraints, and levers can come together, understand their interdependencies, and explore new ways of acting together to address a growing global risk.



AME is a cornerstone of modern health systems and food systems, vital for economic prosperity and stability. Yet its value remains largely invisible in financial and corporate decision-making. As antimicrobial resistance (AMR) grows and access challenges persist, this essential resource is being quietly depleted, exposing stakeholders across sectors to mounting operational, financial, and systemic risks.

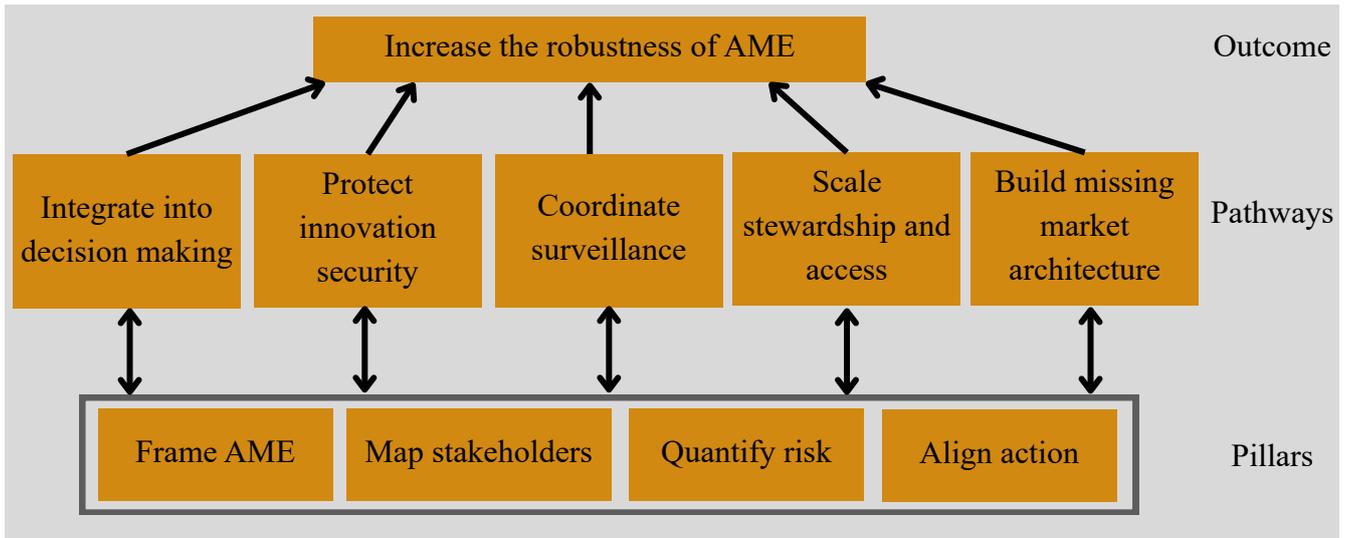
The economic consequences of inaction are

significant. As highlighted by the EcoAMR series, failure to contain AMR could result in an estimated US\$1.7 trillion reduction in annual global economic output by 2050, equivalent to a 0.88% decrease in global GDP (McDonnell 2024). At the same time, the economic case for action is compelling. Investments in conserving antimicrobial efficacy and promoting access are estimated to generate returns of 28:1, with the potential to boost the global economy of US\$960 billion by 2050 (McDonnell 2024). Despite this, AME is rarely treated as a strategic economic asset.

It is time to make the invisible visible. To realise these gains, AME-related risks and benefits must be identified, their financial materiality quantified, and their role embedded within investment, corporate and policy decision-making. This requires a granular understanding of how value is created, preserved and eroded across interconnected systems, combined with clear pathways through which different actors can contribute to conserving AME.

A shared framework for action

The dialogue informed a shared framework for action that clarifies how AME can be conserved and strengthened through coordinated, system-wide efforts. The framework recognises AME as a form of global economic infrastructure that delivers value across health systems, food systems, and overall economic activity, and whose erosion poses systemic risks. It is designed to support informed decision-making by making the value of AME explicit, translating it into decision-relevant information, and aligning actors with different mandates and incentives around common objectives.



The framework comprises four foundational pillars and five shared pathways to progress (see Figure 1). The pillars represent the enabling capacities required to act. The pathways describe the practical routes through which stakeholders can work together to integrate AME into economic and financial decision-making. Together, the pillars and pathways reinforce one another through feedback loops that enhance resilience and reduce systemic risk, providing a coherent structure for investment, policy and corporate action.

Foundational Pillars:

Pillar 1: Frame AME. AME should be framed as essential economic infrastructure to highlight its systemic value across sectors and scales.

Pillar 2: Map stakeholders. Stakeholders who benefit from and/or deplete AME should be identified, and the operational, financial, and systemic risks they face as AME erodes should be estimated.

Pillar 3: Quantify risks. AME-related benefits and risks should be quantified to demonstrate the financial materiality of AME and to enable AME to be built into corporate strategy.

Pillar 4: Align action. All stakeholders that rely on and/or deplete AME should engage in

Figure 1: A shared framework for action

established cross-sectoral dialogue to facilitate the sharing of information, alignment of incentives and coordination of targeted actions to conserve antimicrobial effectiveness.

Shared Pathways to Progress:

The pathways outline how investors, global institutions, academics, companies, policymakers, governments, regulators, health systems, and food systems can act together.

Pathway 1: Integrate AME into decision-making. Build shared language and tools that enable AME to enter economic decision-making as infrastructure.

Pathway 2: Protect innovation security. Reframe AME as a horizontal innovation infrastructure which enables value creation across sectors.

Pathway 3: Coordinating surveillance and system intelligence. Build shared responsibility for maintaining, governing, and acting on surveillance systems.

Pathway 4: Scale stewardship, access, and vaccines. Frame stewardship, access, vaccines and infection prevention as system outcomes, not individual moral obligations.

Pathway 5: Build the missing market architecture. Build functioning markets for AME as a shared institutional task.

Building foundational pillars and advancing shared pathways to progress will enable AME to be embedded across systems and protected as a vital economic infrastructure.

2 Policy Context

Since the discovery of penicillin in 1928, antimicrobials have played a unique and transformative role across society. Beyond treating infectious diseases – the major cause of death at all ages in the pre-antibiotic era – antimicrobials have enabled major medical advances and agricultural progress that are foundational to modern health systems and food systems. Antimicrobials have added an estimated 20 years to average life expectancy and are a vital component of present-day institutions and economies (Davies 2017).

AME refers to both the clinical efficacy of antimicrobials against infectious pathogens and their accessibility for appropriate use. Both efficacy and accessibility are essential for antimicrobials to deliver health and economic benefits. Many communities in low- and middle-income countries still lack access to appropriate antimicrobials; thus, many sustainable development benefits remain out of reach. Further, the global spread of antimicrobial resistance (AMR) diminishes the efficacy of existing antimicrobials, threatening to reverse decades of progress around the world.

Consequently, conservation of AME is essential to protect public health and preserve economic prosperity and stability. Over the past decade, significant progress has been made in elevating AMR on the global policy agenda. International cross-sector coordination has strengthened through the Quadripartite Joint Secretariat (QJS) on AMR, which brings together the WHO, WOA, FAO, and UNEP,

and unites member countries under a One Health agenda. National Action Plans on AMR have now been adopted by 178 countries, recognising country-specific challenges and establishing goals for the sustainable management of antimicrobials.

Pursuit of AME conservation efforts is expanding across human, animal and environmental health. Infection prevention, surveillance and stewardship interventions seek, respectively, to reduce contagion of infectious diseases, monitor antimicrobial use and resistance, and protect efficacy by ensuring that the right antimicrobial is used for a given infection. Targeted push and pull incentives endeavour to support antimicrobial research and development into novel antimicrobials to ensure efficacious last-line options, whilst innovation in diagnostics and alternative therapies seeks to contribute to stewardship efforts to relieve resistance pressure through reducing and better targeting antimicrobial use. Meanwhile, access initiatives strive to address persistent inequities, both to help communities derive the health and economic benefits that AME promises and to protect global AME against potential reservoirs of AMR disease. Whilst there has been progress across these areas, significantly more needs to be done to holistically integrate AME across systems.

These efforts have largely focused on public health delivery, regulation, and innovation policy, with governments, NGOs, and foundations and charities coming together to solve failures in the market. However, the market itself holds significant potential to contribute to solutions. Economic thought has long championed the power of markets, with Adam Smith's 'Invisible Hand' suggesting that within well-functioning markets, self-interested individual behaviour can promote

the social good. However, where imperfect information and incomplete markets disrupt market functioning, broader social costs, benefits and risks are not adequately accounted for, and the social good suffers. Adam Smith recognised this market failure in the case of public goods; one solution he proposed was for the sovereign to provide them directly. A second solution is to strengthen the functioning of the market itself by enhancing information availability and internalising externalities, thus improving the ability of market actors to promote social welfare.

AME exhibits many of the characteristics of a public good: its benefits and risks are not fully quantified or incorporated within key market processes. Market actors lack awareness of the salience and financial materiality of the issue for their operations; consequently, the systemic value of AME exhibits many of the

The Invisible Hand

In functioning markets, private incentives can generate social benefit.

‘...by pursuing his own interest [the individual] frequently promotes that of the society more effectually than when he really intends to promote it.’

(Wealth of Nations, Book 4, Ch 2)

Systemic Value and Market Failures

Where benefits are widespread and returns cannot be fully captured, markets underprovide.

‘...duty of the sovereign...is that of erecting and maintaining those public institutions and those public works, which, though they may be in the highest degree advantageous to a great society, are, however, of such a nature that the profit could never repay the expense to any individual...’

(Wealth of Nations, Book 5, Ch 1, Pt 3)

characteristics of a public good: its benefits and risks are not fully quantified or incorporated within key market processes. Market actors lack awareness of the salience and financial materiality of the issue for their operations; consequently, the systemic value of AME and the risks associated with its erosion remain insufficiently integrated into financial, investment, and corporate decision-making.

Developing the foundational pillars is key to providing necessary market information, whilst advancing shared pathways is key to building complete markets that fully account for the externalities of AME depletion. Engaging a broader set of private market actors, including investors, companies and asset owners, will help to implement the shared framework for action, promoting a sustainable approach to AME conservation.

3 Shared Framework for Action

System-level resilience requires that AME be comprehensively integrated into decision-making processes throughout the economy. To achieve this, key barriers must be overcome, and key capabilities must be developed. In what follows, we highlight four foundational pillars essential for overcoming barriers and for catalysing system-wide progress. We subsequently lay out five shared pathways to progress, highlighting the need for cross-sectoral engagement and action to protect system-wide resilience.

3.1 Building Foundational Pillars

Discussions highlighted that barriers to effective policy and investor engagement in conserving AME stem from the sub-optimal

framing of the issue, the limited visibility of the systemic role that AME plays throughout the economy, and the lack of granular financial analysis of AME-related risks. To overcome these barriers and enable system-wide progress, four foundational pillars are required. These pillars develop the capabilities needed for action and underpin the shared pathways that follow.

Pillar 1: Frame AME

Effective framing must be tailored to decision-makers. For policymakers, the message needs to be simple, locally applied, politically salient and aligned with national priorities such as economic resilience, food security, industrial policy and health system stability. For investors and companies, this message must clearly link AME to financial materiality, highlighting the effects on operational risk, portfolio exposure, value preservation and long-term resilience. Framing the importance of AME in the appropriate language is vital for stakeholders to understand how they are affected and to inform their strategic response.

Framing AME as vital global economic infrastructure captures both its systemic value and its economic characteristics. AME underpins modern healthcare and food systems, vital for economic prosperity and stability, delivering positive externalities and downstream benefits to stakeholders throughout the economy. However, like other forms of infrastructure, AME is a non-excludible and limitedly non-rival public good, creating collective action challenges whereby those who benefit from AME have limited individual incentives to contribute to its conservation, resulting in underinvestment and depletion.

AMR is often framed as a public health issue

and described in terms of disease burden, resistance patterns, and health impact. To mobilise the full range of actors whose decisions affect AME, it is vital to capture this systemic value of AME. Effective framing of value and characteristics informs a framework for action which can account for the difficulties of collective action dilemmas and complex systems.

Action 1: AME should be framed as essential economic infrastructure to highlight its systemic value across sectors and scales.

Pillar 2: Map Stakeholders

To reinforce and operationalise the infrastructure framing, it is important to identify the stakeholders who benefit from and/or deplete AME and to understand how risks and externalities are distributed across the system. Mapping stakeholders clarifies dependencies, exposes risk transmission pathways, and supports more resilient, evidence-based decision-making.

AME plays a significant role in healthcare, both to fight infections and to prophylactically prevent infections during high-risk procedures, enabling modern medical treatments such as cancer chemotherapy, surgery, and intensive care. The degree of dependence on AME varies by procedure, patient vulnerability, and local infectious disease environments. Wherever antimicrobials are used, the patient is both benefiting from AME and depleting it. Further benefits flow beyond the patient to the payers and insurers of healthcare, the manufacturers and innovators of treatments, the investors in these companies, and the broader beneficiaries of an effective healthcare system, while depletion costs are shared across the system.

Risk-exposure rankings can inform the allocation of resources within medical settings to mitigate these risks, highlighting the value of strong infection prevention and control measures, comprehensive patient histories, robust diagnostic capabilities, and the inclusion of infection specialists on multidisciplinary teams for high-risk procedures. Such a ranking can also inform market interventions that internalise AMR externalities, for example, introducing overheads on procedures to compensate for AME depletion and channelling fees into conservation initiatives.

AME also plays a significant role throughout food systems. Farmers, producers, processors, retailers, investors and consumers benefit from AME, whilst also facing risks from rising resistance. Thus, the same principle extends throughout the food supply chain. Mapping stakeholders across the supply chain enables identification of risks associated with different animals and breeds, farming practices, biosecurity measures and supply chain processes, and highlights opportunities for farmers to adapt their practices to reduce reliance upon antimicrobials, incorporate stronger biosecurity measures, and minimise externalities such as environmental contamination from antimicrobial-laden manure. Further, a risk ranking can identify target points for effective policy intervention to internalise AMR externalities.

Existing surveillance mechanisms across human, animal and environmental health can provide critical data to support stakeholder mapping. Global databases such as WHO's GLASS help to coordinate, standardise and share surveillance data.

Surveillance programs run by national health

systems, industry, and non-governmental or philanthropic organisations have improved significantly. As these systems continue to develop, their insights must be shared, funded, and acted upon by all sectors that depend on AME.

Action 2: Stakeholders who benefit from and/or deplete AME should be identified, and the operational, financial, and systemic risks they face as AME erodes should be estimated.

Pillar 3: Quantify Risks

To motivate proactive engagement by companies, investors, and asset owners, AME-related risks and benefits must be translated into financially meaningful terms. Estimating exposure to AMR-related costs and comparing these to the costs of risk mitigation is essential for informed decision-making.

Conservation of AME will look different across sectors, geographies, and income levels; thus, quantification needs to be context-specific, capturing how AMR affects revenues, costs, asset values, and long-term growth prospects. Case study 1 estimates that AMR in bloodstream infections among patients with haematological malignancies in Italy results in an economic cost of around \$114.7 million, reflecting lost health benefits and additional healthcare costs. As resistance continues to grow, this cost will rise as a greater proportion of patients face complications. Eventually, such treatments would be deemed too risky. Investing in better infection prevention and AME conservation could reduce these costs, whilst also providing an opportunity for the oncology company to enter new markets with greater infection risks and AMR prevalence.

Quantification allows stakeholders to move

from abstract concern to actionable insight. Investors can incorporate AME risks into their portfolio analysis, guide corporate engagement, and support strategies that protect long-term value. Similarly, companies can identify where operational and financial exposure to AMR exists, and where mitigation or investment will yield the greatest return.

CASE STUDY 1:

ARMoR – Exploring the Economic Impacts of Drug-Resistant Infections on Cancer Care (McKinney 2026)

Trecarichi, et al. 2023 investigate bloodstream infections due to Gram-negative bacteria in patients with haematological malignancies in Italy. ARMoR extrapolates these findings to the national level, estimating that 2,559 patients contract an infection; of these, 786 (30.7%) patients contract drug-resistant infections, and of these, 208 (26.5%) patients die.

ARMoR estimates the economic impacts of this. They calculate that the lost benefit of treatment is \$26 million, the lost DALY value is \$72 million, and the additional hospital cost from drug-resistant infections is \$16.7 million (McKinney 2026).

Developing shared tools, metrics, and methodologies will help standardise risk assessment across sectors, lower barriers to engagement, and highlight the significance of AME for decision-makers. By making AME risks visible and quantifiable, stakeholders can prioritise interventions and align strategies with system-wide resilience goals.

Action 3: AME-related benefits and risks should be quantified to demonstrate the financial materiality of AME and to enable AME to be built into corporate strategy.

Pillar 4: Align action

To promote system-level resilience, stakeholders across sectors and scales must recognise their interdependencies and develop ways of acting together towards shared objectives. Acknowledging the incentive structures and constraints facing different actors is important to clarify their roles within the system and the levers they can pull to conserve AME.

Governments shape the rules of the game through regulation and market interventions that influence incentives across the system, while operating within political, fiscal and administrative constraints. Investors allocate capital and steward assets to manage risk and deliver long-term returns, within the constraints of fiduciary duty, time horizons and limited decision-useful information. Companies translate capital into goods, services and innovation, operating under commercial pressures, competitive dynamics and regulatory requirements. When these levers align, collective-action barriers are reduced, and system-level resilience becomes achievable.

Within complex systems, non-linearity is plentiful within processes and relations. Thus, small actions can bring about transformative change by generating positive spillovers, triggering reinforcing feedback loops, and catalysing wider engagement across the system. Progress often stems from individual opportunities that demonstrate what is

possible, build confidence, and generate momentum.

A single company may identify a commercially viable opportunity to conserve AME and protect its revenue stream from AME-related risks. Investors can amplify this by recognising such actions, spreading good practice across portfolios, and accelerating emerging norms. In this way, incremental initiatives can build confidence, lower barriers for others, and scale into system-level impact.

As momentum builds, sustained cross-sector dialogue becomes essential. Global mechanisms such as the Quadripartite Joint Secretariat (QJS) on AMR and its four initiatives - the Global Leaders Group (GLG), the Multi-Stakeholder Partnership Platform, the Multi-Partner Trust Fund, and the Independent Panel for Evidence for Action (IPEA) – provide institutional infrastructure to connect actions, share evidence, and support alignment towards socially optimal outcomes. To further strengthen these efforts, increasing engagement with the private sector is critical, ensuring that cross-sector collaboration encompasses public institutions but also investors, companies and innovators.

Action 4: All stakeholders that rely on and/or deplete AME should engage in cross-sectoral dialogue to facilitate the sharing of information, alignment of incentives and coordination of targeted actions to conserve antimicrobial effectiveness.

3.2 Paving Pathways for Progress

Recognising, measuring, and incorporating AME into decision-making across sectors and scales requires bringing actors out of their silos. Creating space for actors with different incentives, constraints and levers to come together, understand their interdependencies and explore new ways of acting together along shared pathways. The pathways below set out priority actions for different actors to take individually and in coordination, building on the foundational pillars to strengthen AME and system-level resilience.

Pathway 1: Making AME visible and financially understandable

Narrative shift: Build shared language and tools that enable AME to enter economic decision-making as infrastructure.

Who moves together: Investors, global institutions, academics, companies, policymakers.

- *Investors, global institutions, and academics* co-develop metrics, dashboards, and portfolio-level analyses that translate AME erosion into financial and operational risk.
- *Companies* provide operational data, clinical dependencies, and real-world insights to ground these models, revealing how procedures, pipelines and supply chains rely on antimicrobials.
- *Governments and regulators* signal where such metrics will increasingly matter (e.g., procurement, reimbursement, industrial and innovation policy)

Pathway 2: Protecting innovation security across sectors

Narrative shift: Reframe AME as part of a horizontal innovation infrastructure which enables value creation across sectors.

Who moves together: Life science companies, healthcare systems, investors, policymakers.

- *Companies* in oncology, surgical robotics, transplant medicine, diagnostics and advanced therapeutics recognise AME as a shared dependency critical to business continuity and innovation.
- *Health systems* integrate AME considerations into clinical guidelines, hospital regulations and processes.
- *Investors* encourage companies to consider AME within their strategies and connect companies whose business models depend on AME, promoting cross-portfolio learning and collaboration on AME-related risks.
- *Policymakers* embed AME considerations into innovation, industrial and resilience strategies.

Pathway 3: Coordinating surveillance and system intelligence

Narrative shift: Build shared responsibility for maintaining, governing, and acting on surveillance systems.

Who moves together: Health systems, companies, investors, global institutions, policymakers.

- *Companies* whose business models rely heavily on effective antimicrobials contribute financially, technically and/or analytically to surveillance systems that protect the infrastructure they depend upon.
- *Investors* help to surface these shared dependencies, connect beneficiaries across portfolios, and reinforce expectations of collective responsibility.
- *Global institutions* support burden-sharing between actors who initiated surveillance systems and the companies and investors who reap benefits from them.

CASE STUDY 2:

Baillie Gifford engagement with Dexcom

Dexcom is a medical device company who focus on realtime continuous glucose monitors (CGM) for diabetes management. Baillie Gifford conducted an engagement with Dexcom focusing on the value proposition of linking health awareness, such as immunisation programmes, to their diabetes management system.

Diabetic patients face higher risks from infectious diseases, particularly respiratory viruses, with higher rates of hospitalisation, healthcare costs, and mortality rates. Immunisation can reduce risk exposure for these patients. This benefits health systems and economies due to better public health. It also benefits Dexcom by improving patient health outcomes, increasing patient retention, and attracting new patients through demonstrating value beyond diabetes.

Pathway 4: Scaling stewardship, access, vaccines and prevention as global system properties

Narrative shift: Frame stewardship, access, vaccines and infection prevention as system outcomes, not individual moral obligations.

Who moves together: healthcare providers, pharma, global institutions (WHO, FAO, WOA, UNEP), investors, governments.

- *Governments* and *global institutions* continue to lead on priority-setting, stewardship integration and access pathways, building on National Action Plans.
- *DFIs* and *multilaterals* play a catalytic role by de-risking supply webs, local manufacturing, and distribution systems in LMICs.

- *Companies* contribute through aligned access strategies, supply reliability, technology transfer where appropriate, and participation in coordinated stewardship and vaccination programs.
- *Investors* support this ecosystem indirectly by reinforcing credible, coordinated approaches through engagement and capital allocation, prioritising engagement with companies that adapt stewardship, access, vaccines, diagnostics and prevention to geographic differences, and using comparative learning to identify and share resilient business models.

CASE STUDY 3:

FAIRR engagement with the quick-service restaurant (QSR) sector (Berntman 2024)

Engagement supported by 71 investors representing \$15.2 trillion in combined assets.

Initiated in 2016 with 20 QSRs to address risks associated with routine antibiotic use in their animal protein supply chains.

Requested companies to implement antibiotic policies across all of their animal food products aligned with WHO's guidance on use of medically important antimicrobials in food producing animals, to monitor adherence throughout their supply chain, and to disclose information to investors. By 2019, 19 out of 20 companies had at least one antibiotic policy in place.

By 2019, 19 out of 20 companies had implemented at least one antimicrobial policy.

Pathway 5: Building the missing market architecture

Narrative shift: Build functioning markets for AME as a shared institutional task.

Who moves together: Governments,

multilaterals, DFIs, public capital, companies, investors.

- *Governments* and *multilaterals* can better define the rules of the game (e.g., revenue guarantees, AMCs, procurement guarantees, supply-chain resilience incentives)
- *DFIs* and *public capital* absorb early risk and attract private investment, particularly where global public goods and LMIC access intersect
- *Companies* innovate business models that fit these structures across human health, animal health, and environmental pathways.
- *Investors* scale successful approaches, discipline underperformers, and translate pilots into durable market norms.

4 Conclusion

This report has translated insights from the first Panmure House Dialogues on Market Solutions for AME into a shared framework for action. The framework recognises the market failures undermining AME and sets out foundational pillars to strengthen market mechanisms, overcome barriers to engagement, and enable AME to be built into decision-making. It further emphasises the value of coordinated engagements by establishing shared pathways to progress which recognise the diverse incentives, constraints, and levers of different stakeholders, while aligning action around shared system-level goals.

This dialogue marks the beginning of an ongoing series. The insights captured in this report are intended to inform policy debate, guide future collaboration, and support the development of market-based solutions capable of conserving AME for generations to come.

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