

1. About this briefing note

This page can help fund managers and investors to familiarise themselves with antimicrobial resistance (AMR) – a significant risk to human and animal health affecting multiple industry sectors. It gives an overview of the topic as well as some high-level recommendations for the key sectors of influence. It is not intended to be a detailed technical guidance document. Leading sources of research and information can be found in the *Further resources* section.

2. Introduction

What is AMR and what are its causes?

AMR is an umbrella term for resistance to antibacterial, antiviral, antiparasitic, and antifungal drugs. It occurs when a disease-causing microbe develops the ability to survive an antimicrobial treatment, such as an antibiotic, so that it is no longer effective. AMR is an increasingly serious threat to human and animal health that requires action across all sectors and society. People and animals with antibiotic-resistant infections are more difficult to treat and may be sick for longer, require more expensive healthcare, and need further treatments that may cause more harmful side effects. Governments, international development organisations, development banks and major drug manufacturers now recognise AMR as one of the pre-eminent threats to human health globally. Some of the most commonly-known drug-resistant illnesses include MRSA (methicillin-resistant *Staphylococcus aureus*) and multidrug-resistant tuberculosis.

Microbes become naturally resistant to antimicrobials over time. However, AMR is being accelerated at each stage of the value chain by the misuse and overuse of medical and veterinary drugs. Poor regulation around sales and distribution – plus inadequate rapid diagnostics – means antimicrobials are regularly sold, prescribed or used incorrectly. The spread of infectious diseases in many countries through poor water, sanitation and hygiene (WASH) and low access to primary healthcare means antimicrobials are often used to fight illnesses that could have been avoided or do not require antimicrobials. In agriculture and aquaculture, antimicrobials are often used preventively or to promote faster growth. Additionally, untreated wastewater from pharmaceutical manufacturing facilities, hospitals and farms means that antimicrobials enter the environment and contribute further to resistance.

While overuse is the main cause of resistance on the demand side, not enough new antimicrobials are being developed on the supply side to cure the resistant infections. This

is because failure rates in antibiotic drug development are high, and the costs incurred in research and development (R&D) are high compared to the limited potential revenues from taking a new antibiotic to market. As a result, most major pharmaceutical companies have reduced or abandoned antibiotic R&D, and many smaller antibiotic developers are struggling to survive.

Effects of AMR

AMR exists in all countries and can affect anyone. The impacts of unchecked AMR are wide-ranging and extremely costly - not just financially, but also for global health and socio-economic development:

- **Global health:** Drug resistance is already causing an estimated 500,000 to 700,000 deaths each year, of which 200,000 are infants. If not addressed, AMR could lead to as many as ten million deaths annually by 2050.
- **Economic impact:** If unabated, additional expenditures caused by AMR in the healthcare sector alone would increase to \$1.2 trillion annually by 2050, and world trade could shrink by between 1.1 per cent and 3.8 per cent. Similarly, the impact on global animal production could lead to a decline of between 2.6 per cent and 7.5 per cent annually, as drugs no longer work effectively against certain diseases.
- **Sustainable Development Goals:** Besides the obvious effects on SDG 3, “Ensure healthy lives and promote wellbeing”, AMR poses a major threat to the delivery of the 2030 Agenda for Sustainable Development as a whole. Several goals - including ending poverty, ending hunger, and achieving sustained economic growth - are particularly at risk. AMR could push an additional 24 million people into extreme poverty by 2030, threatening SDG 1. AMR’s effects on achieving sustainable development are so important that the World Health Organization has proposed an indicator to track AMR within the SDG framework.

COVID-19 has exposed weaknesses in the global response to infectious diseases, and underlines the urgency with which AMR needs to be addressed to prevent another global health catastrophe with the potential to impact markets globally. Investors therefore have a critical role to play in enabling and scaling better practices, both in and across the private sector.

Where does AMR pose most risk?

India, Brazil, China and the United States collectively represent nearly 75 per cent of total antibiotic consumption worldwide. Nevertheless, the impacts associated with increased resistance not only affect these countries but are felt globally, disproportionately affecting lower-income countries.

If AMR goes unchecked in low-income countries, by 2050, GDP could fall up to 5.8 per cent, and animal production could fall by up to 11 per cent annually, as a consequence of shocks to labour supply caused by people and animals being unable to resist infections and diseases. Also, healthcare expenditures in 2050 would be as much as 25 per cent higher than the baseline values for low-income countries, compared to 15 per cent higher for middle-income countries and 6 per cent higher for high-income countries.

3. Why companies and fund managers should address this topic

In order to overcome AMR, unnecessary discharge in the environment must be stopped, inappropriate consumption must be reduced, and new antimicrobials must be developed. The private sector has a role to play on all sides. But while only a few companies are involved in the development of new medicines, many are operating in sectors that can slow the spread of AMR, and all companies can promote public awareness and improved hygiene.

As AMR awareness grows, consumers are increasingly placing pressure on companies to commit to antimicrobial reduction both in their operations and their supply chain. At the same time, momentum is growing for the regulation of antimicrobials across sectors, and some industries have platforms that set standards for their use. Proactively identifying and managing AMR risks and impacts can put companies ahead of the curve and avoid regulatory penalties or public censure.

Investors are in a unique position to set market-leading requirements linked to AMR, and to support companies through the implementation and monitoring of those requirements: “Investors recognise that companies actively seeking to reduce the use of antibiotics are better positioned to create long-term value”.

- [COVID-19 and AMR](#)

The COVID-19 pandemic has brought to light the importance of vaccination, the need for functional antimicrobials, as well as the necessity for supporting research into understanding and controlling infectious agents. It has also had an immense impact on public understanding of infection prevention and control.

Throughout the world, people are practicing improved hand-washing techniques and social distancing, and other intervention measures to prevent infection. Nevertheless, AMR is likely to increase due to a rise in secondary infections leading to misuse and overuse of antibiotics in the treatment of COVID-19 patients. In fact, studies on hospitalised COVID-19 patients have shown that while 72 per cent of patients received antibiotics, only 8 per cent demonstrated superimposed bacterial or fungal co-infections. Therefore, new therapeutics and treatments (including antimicrobials) should be investigated in the context of COVID-19. The pandemic represents an opportunity to bring attention to AMR as a human, economic, and business continuity risk.

4. Advice for fund managers, investors and investees

Investors should adopt an AMR lens when making investment decisions. This means they should assess the extent to which AMR risks are evident in an investment as well as how these risks are identified and managed by the investee. In some cases, this may simply be through an active approach to water, sanitation and hygiene management for workers and communities in line with existing due diligence and portfolio management processes. In other cases, depending on the sector, AMR could be a material risk to the company or impact of its operations.

- [Sectors with highest AMR risks and impacts](#)
 - **Pharmaceutical:** Particularly manufacturers that produce antibiotic active pharmaceutical ingredients (APIs), companies that distribute or sell antimicrobials, or companies where future revenues depend on effective antimicrobials (e.g. cancer medicines).
 - **Healthcare:** Especially hospitals, where the risk of disease spread is high and proper awareness raising, diagnostics, infection control, waste management and hygiene are essential.
 - **Agriculture:** Principally livestock production (specifically factory farming), and including aquaculture, which accounts for nearly three-quarters of all antimicrobials sold globally.¹ Most are used preventively or as growth promoters rather than to treat specific illnesses, leading to increased antimicrobials in sewage and water systems and higher risk of antimicrobial-resistant disease

among the animals. There is also growing concern about the use of antimicrobials, particularly antifungals, in crop culture.

¹ [ScienceMag: Global trends in antimicrobial resistance in animals in low- and middle-income countries \(2019\)](#)

Generally, environmental and social due diligence (ESDD) for potential investments in the above sectors should include specific and detailed assessment of the risk of AMR, as well as any control measures that need to be implemented.

- [Measures to reduce risk of AMR](#)
 - **Diagnostics:** Rapid diagnostics can reduce the unnecessary prescription of antimicrobials.
 - **Biomedical R&D:** The development of vaccines can reduce illness and the need for related antimicrobials.
 - **Pharmaceutical R&D and access planning:** There is a large market need for new antibiotics, although the current commercial return structure discourages significant investment in this area. With a small pipeline of candidate antibiotics, the need for ensuring access must be a priority.
 - **Awareness:** Making AMR a core component of training and continuing education in the health, pharmaceutical manufacturing and agricultural sectors will help to ensure proper understanding and awareness among professionals.
 - **Prudent and responsible use:** Much of the global use of antibiotics is not for treating human and animal infections, but rather to prevent infections or simply to promote growth. It is fundamental to reduce the unnecessary use of antibiotics.
 - **Monitoring and surveillance:** Understanding how resistance develops and spreads – including how resistance circulates between humans and animals and through food, water and the environment – is important for the development of new tools, policies and regulations.
 - **Effective sanitation, hygiene and infection prevention measures:** Better

sanitation, hand washing, and food and water safety must be core components of infectious disease prevention that can be required by all investors and implemented in all company operations.

5. Initiatives

Governments, international development organisations, development banks and major drug manufacturers now recognise AMR as one of the pre-eminent threats to human health globally. They have been putting together resources and capabilities to strengthen and accelerate antimicrobials R&D, and to encourage best practice among stakeholders. Some examples include:

Initiative	Organisation	Description
AMR Action Fund	20 biopharmaceutical companies in collaboration with EIB, Wellcome Trust and WHO.	Investing \$1 billion through equity or debt in smaller biotech companies and providing industry expertise to support the clinical development of novel antibiotics.
Global Antimicrobial Resistance Surveillance System (GLASS)	WHO	Standardised approach to collect, analyse and share AMR-related data. 92 countries, territories and areas are enrolled in GLASS.
Global Investment Framework	World Bank	Costing priority AMR interventions at country, regional and global levels. Integrating AMR activities and funding into finance mechanisms.
Surveillance Partnership to Improve Data for Action on Antimicrobial Resistance (SPIDAAR)	Wellcome Trust, Pfizer Inc. and governments of Ghana, Kenya, Malawi and Uganda.	Collaboration to provide valuable data on the impact of drug-resistant infections on patients.

Initiative	Organisation	Description
Investor Action on AMR	FAIRR Initiative, the Access to Medicine Foundation, the Principles for Responsible Investment, and the UK government.	Aligns investors' approach to assess and integrate AMR-related risks, opportunities and impacts through a common lens. Priorities include (i) responsible use of antibiotics in food production, (ii) responsible waste disposal of antibiotics, and (iii) encouraging new antibiotic research and development.[2]
Global Investor Statement of Antibiotics Stewardship	FAIRR Initiative currently supported by 75 investor signatories collectively managing over \$3 trillion of assets.	Through the statement, signatories enclose a best practice policy antibiotics stewardship across all livestock, seafood and poultry supply chains.
Antimicrobial Resistance Benchmark	Access to Medicine Foundation.	Compares actions taken by pharmaceutical companies to address AMR and limit drug-resistant infections. Covers R&D, responsible manufacturing, appropriate access and stewardship.

² [Responsible Investor: 2020 The Investor Year of Action on Antibiotics? \(2020\)](#)

6. Further resources

- [Further information and guidance](#)
 - [Antimicrobial Resistance & Infection Control](#)
 - [Centers for Disease Control and Prevention: Antimicrobial Resistance in Bacteria from Livestock and Companion Animals](#)
 - FAIRR Initiative: [Antimicrobial Resistance and Investors](#)
 - [HM Government: Antimicrobial resistance \(AMR\) Information and resources on the UK's plans to see antimicrobial resistance contained and controlled by 2040](#)
 - HM Government's Department of Health and Social Care policy paper: [Antimicrobial resistance review: government response](#)

- Joint Programming Initiative on Antimicrobial Resistance: [Considerations for AMR in the Covid-19 pandemic](#)
- [Review on Antimicrobial Resistance](#)
- ScienceMag: [Global trends in antimicrobial resistance in animals in low- and middle-income countries](#)
- World Bank: [Drug-Resistant Infections: A Threat to Our Economic Future](#)
- [World Health Organization: No Time to Wait: Securing the Future from Drug-Resistant Infections](#)

- [Organisations](#)
 - [Access to Medicine Foundation](#)
 - [FAIRR Initiative](#)
 - [Investor Action on AMR](#)
 - [World Health Organization](#)