

## The antimicrobial crisis: enough advocacy, more action

Global advocacy has been successful in mobilising attention to antimicrobial resistance (AMR) by governments and agencies worldwide. Indeed, in the past decade, there has been a steady flow of reports, action plans, declarations, initiatives, and resolutions on what should be done. Inadequate access to antimicrobials and AMR are formidable threats to both human and animal health. The World Economic Forum's annual meeting in Davos (Jan 21–25) will raise the profile of AMR again, but has this global advocacy translated into global action? In a word, no.

On Jan 17, WHO published two reports on its clinical and preclinical antibacterial pipelines. Of 52 antibiotics in the clinical pipeline, 32 target WHO's priority pathogens, but most have little benefit compared with existing antibiotics. Only two of these agents are active against difficult-to-treat Gram-negative bacteria, such as *Klebsiella pneumoniae* and *Escherichia coli*. Because of public and philanthropic funding of small biotech companies and start-ups, the preclinical pipeline shows more promise, with 252 agents active against WHO's priority pathogens. However, large pharmaceutical companies are needed to take discoveries through to clinical development, and investment for late-stage research and development of antibiotics, antivirals, antiparasitics, antifungals, and vaccines has declined sharply. In the past year, two biotech companies have already gone bankrupt, and large pharmaceutical companies (such as Novartis) are exiting the field. The increasing reliance on just a handful of companies means the antibiotic pipeline is fragile.

Too little action has been taken to address the market failure in antibiotic development. 2020 marks the 30th anniversary of Davos, and the World Economic Forum will release a new manifesto to mark the occasion. One tenet is that: "A company is more than an economic unit generating wealth. It fulfils human and societal aspirations as part of the broader social system". Yet, this vision has failed in AMR. Pharmaceutical companies have abandoned the market because of a lack of financial return and the rapid development of resistance to new drugs, despite the centrality of antibiotics to preserving human health. Infections disproportionately affect the poor and are usually cured with one course of treatment, limiting their attractiveness for investment. Industry and governments must urgently work together on sustainable

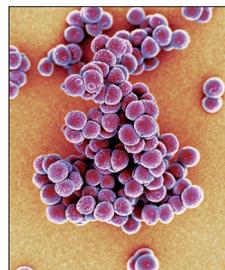
solutions to improve the commercial environment. Otherwise, private investment will continue to decline.

Access to antimicrobials remains a substantial challenge, especially in low-income and middle-income countries (LMICs). According to the Access to Medicine Foundation, antibiotics are not being made widely available in LMICs through registration filings or supply strategies: only three of the 13 patented antibiotics in their analysis are filed for sales registration in more than ten of the 102 countries where better access is urgently needed; and companies are supplying just 14 of 30 older, but still useful, antibiotics to low-income countries.

Antimicrobial stewardship efforts and improving access to diagnostics are vital to avert the antimicrobial crisis, as is improving hygiene and implementing infection prevention control at health facilities, which would reduce transmission of pathogens. Transforming agriculture practices to reduce the use of antibiotics would also help. More attention should be given to the role of bacterial vaccines to prevent infections and hence prevent development of resistance, including making the investment case for such vaccines.

The next steps must include joint action by the human and animal health sectors. However, it will not be easy—the bottom line for human health is saving lives and ensuring access to vaccines and antimicrobials, whereas for the agriculture sector it is saving lives of animals in line with planetary sustainability and animal welfare targets while also making a profit by using the least costly approach, which in some instances has been increased use of antibiotics.

Addressing antimicrobial resistance is a complex issue. The formal tripartite of WHO, the Food and Agriculture Organization, and the World Organisation for Animal Health must have a major role in identifying and promoting the implementation of feasible strategies to tackle AMR, eventually leading to a global governance mechanism whereby evidence-based interventions that are feasible and acceptable can be enshrined. One idea mooted is a legally binding global treaty akin to the Framework Convention on Tobacco Control. Without an overarching global mechanism, to which countries commit, efforts to slow the evolution of antimicrobial resistance will continue to be piecemeal and not meet the scale and urgency that this global challenge demands. ■ *The Lancet*



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For more on **WHO's clinical antibacterial pipeline** see <https://apps.who.int/iris/bitstream/handle/10665/330420/9789240000193-eng.pdf>

For more on **WHO's preclinical antibacterial pipeline** see <https://apps.who.int/iris/bitstream/handle/10665/330290/WHO-EMP-IAU-2019.12-eng.pdf>

For more on the **decline in R&D investment** see <https://www.amrindustryalliance.org/wp-content/uploads/2020/01/AMR-Industry-Alliance-2020-Progress-Report-publication-1.pdf>

For more on **bankrupt biotechs** see <https://www.statnews.com/2020/01/07/antibiotics-need-a-special-place-in-the-drug-pricing-debate/>

For the **Access to Medicine Foundation's report on access to antibiotics** see [https://accessmedicinefoundation.org/media/uploads/downloads/5e26f1ea2cf44\\_Antimicrobial\\_Resistance\\_Benchmark\\_2020.pdf](https://accessmedicinefoundation.org/media/uploads/downloads/5e26f1ea2cf44_Antimicrobial_Resistance_Benchmark_2020.pdf)

For more on **vaccines for AMR** see <https://www.chathamhouse.org/expert/comment/new-vaccines-are-essential-fighting-antimicrobial-resistance>

For more on a **global treaty for AMR** see <https://www.chathamhouse.org/expert/comment/preserve-effectiveness-antibiotics-global-treaty>