Urgent Action Needed to Spur Antibiotic Innovation

Updated research from Pew and the WHO in the Global AMR R&D Hub's Dynamic Dashboard shows not enough drugs are in development to meet patient needs

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This spring, The Pew Charitable Trusts and the World Health Organization (WHO) each released updated analyses concluding that the global pipeline of antibacterials in clinical development is insufficient to combat the growing threat of antibiotic resistance (AR). These findings, consolidated within a Dynamic Dashboard created by the Global AMR R&D Hub, paint a stark picture of a broken antibiotics market unable to keep pace with the need for new drugs.

Antibiotics don't simply cure infections, they underpin modern medicine, keeping patients safe during lifesaving treatments such as organ transplants, hip replacements, and chemotherapy. But the emergence and rise of AR, fuelled in large part by the imprudent use of these medicines, challenges the efficacy of available antibiotics. This makes preserving existing antibiotics, and developing new ones, essential for combating bacterial infections now and into the future, as pathogens continue to evolve and become more dangerous.

Bringing a new antibiotic to market is a scientifically challenging and resource-intensive endeavor with a relatively low return on investment. As a result, major pharmaceutical companies have backed away from antibiotic development, and the enterprises remaining in the space struggle to sustain their operations.

This was reflected in the two recently published pipeline analyses by Pew and the WHO. These analyses indicate a lack of novel (innovative) antibiotics in development to combat the world's most dangerous infections. There is a particularly notable lack of drugs that would prove effective against infections caused by the WHO bacterial priority pathogens and the U.S.-focused Centers for Disease Control and Prevention's list of bacterial threats. In fact, almost all antibiotics available today are based on discoveries from more than 35 years ago, giving pathogens decades of opportunities to outsmart the existing antibiotics arsenal.

Though antibiotic candidates in preclinical development could one day feed into the global pipeline, only a small fraction will ever come to market. To supplement antibiotics, nontraditional products in development to treat bacterial infections, such as bacteriophages and immunotherapies, could provide patients with new treatment options. However, such products are unlikely to fully substitute or replace antibiotic use.

Thus, policymakers and innovation stakeholders must continue to monitor the antibacterial pipeline—a process simplified by tools such as the Global AMR R&D Hub's Dynamic Dashboard—and prioritize policy-based support on a global scale for antibacterial innovation. Such efforts should include additional funding for early-stage and clinical antibiotic development through initiatives such as CARB-X and the newly created AMR Action Fund as well as innovative solutions to address the broken antibiotic market through "pull," or post-market, incentives.

Ongoing collaborative efforts such as public-private partnerships, as modeled by the Global Antibiotic Research and Development Partnership (GARDP), will continue to play a key part in spurring urgently needed antibiotic innovation. GARDP is developing new treatments for drug-resistant infections that pose the greatest threat to health.

Ultimately, the growing threat of AR combined with a stagnant pipeline poses a grave danger to public health. As the COVID-19 pandemic has made all too clear, preparedness is essential when combating global health emergencies. By taking actions now to encourage antibacterial innovation, stakeholders can help combat the silent pandemic of AR before it's too late.

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The WHO is committed to shaping the public health R&D priority setting agenda to combat antimicrobial resistance and will continue to review the preclinical and clinical antibacterial pipeline annually. In addition, the WHO is expanding its pipeline analyses to include a review of the antifungal pipeline. As a first step to achieve this, the WHO is currently developing the first global fungal priority pathogens list.

The Pew Charitable Trusts tracks the global antibiotic pipeline to shed light on the status of antibiotic development, to evaluate and advocate for public policies, and to bring researchers together to spur new drug discovery. Pew also works to reduce the inappropriate use of antibiotics in human medicine and animal agriculture that accelerates drug resistance.

The Global AMR R&D Hub collects and presents information on AMR R&D investments across the One Health continuum as well as information on antibacterial products in the clinical development pipeline and market interventions. This information is intended for countries, foundations, organizations and initiatives to help set priorities and maximize the impact of resources invested in R&D to mitigate the AMR threat.