

## GLOBAL CHALLENGES

### REVIVING ANTIBIOTIC INNOVATION

## THE AMR CHALLENGE OF THE BRAIN DRAIN

Drug-resistant infections are now one of the world's biggest killers, associated with more than 4.7 million deaths globally a year and rising. A major contributing factor to this is the diminishing number of effective antibiotics, following three decades of pharmaceutical industry withdrawal from antimicrobial research and development (R&D). As resistance erodes the effectiveness of existing treatments, there is an urgent need to revive antimicrobial R&D, to ensure the supply of innovative new antibiotics as existing treatments become less effective in the face of drug resistance.

However, rebuilding the antibiotic pipeline requires more than investment. Decades of industry withdrawal have also led to a loss of scientific knowledge, technical expertise and institutional memory, as experienced researchers and specialists retired or moved into other fields. This erosion of expertise has made antibiotic innovation slower and more challenging just as the need for new treatments has become more urgent. Strengthening and reconnecting the global antimicrobial R&D community is therefore essential to ensuring that the next generation of antibiotics can be discovered, developed and delivered.

## THE DECLINE OF ANTIMICROBIAL R&D EXPERTISE

The global antimicrobial R&D workforce has shrunk dramatically over the past two decades. Today, there are only around 3,000 active antimicrobial researchers worldwide, compared with approximately 46,000 working in cancer research. The consequences of this decline are visible throughout the field. An analysis by the AMR Industry Alliance found that among researchers employed by companies that exited antimicrobial R&D, only around 10% remained in the field by their second subsequent job change, highlighting a significant scientific brain drain.

As large pharmaceutical companies have withdrawn from antibiotics, much of the remaining research effort has shifted to academia and small biotechnology companies, many of them university spinouts. More than 50 small and medium-sized enterprises (SMEs) are developing new treatments for drug-resistant infections, yet according to the WHO, nearly half have fewer than ten employees and less than 12 months of funding. This leaves the pipeline heavily dependent on small, financially vulnerable organizations.

The decline in expertise is also reflected in scientific output. The number of authors contributing to AMR publications fell from 3,599 in 1995 to 1,827 in 2020, alongside an overall decline in publications. In 2022, there were 35 times more scientific papers published on cancer than on WHO priority bacterial pathogens, and 20 times more patents awarded for cancer than for antibiotics.

These trends create a difficult environment for attracting and retaining talent. Young researchers often see greater career opportunities, funding prospects and scientific support in other disease areas. At the same time, the antimicrobial R&D community has become increasingly fragmented, with many researchers lacking immediate peer networks within their institutions. As experienced scientists retire or move elsewhere, valuable knowledge and expertise are lost, further weakening the field's capacity to discover and develop the antibiotics the world urgently needs.

## HOW GARDP IS HELPING TO REBUILD THE ANTIMICROBIAL SCIENTIFIC COMMUNITY

As part of its mission to develop and make accessible much-needed antibiotic treatments, GARDP recognizes that scientific progress depends on



collaboration and shared expertise. To this end, GARDP's Scientific Affairs programme established REVIVE as a global platform to support researchers working across antimicrobial R&D. Originally proposed by stakeholders in 2016 and launched in 2018, REVIVE was one of GARDP's earliest initiatives and remains a core part of its efforts to strengthen the broader innovation ecosystem.

REVIVE provides researchers around the world with free access to specialized knowledge, training and expert insight spanning the full R&D pathway—from discovery and preclinical development through to clinical research, regulation, access and stewardship. Its resources are designed to tackle practical challenges faced by researchers, helping to accelerate progress and spread expertise more widely across the field.

At the heart of REVIVE is a commitment to openness and global inclusion. Through webinars, conferences, articles, an online encyclopaedia and an international expert network, researchers can learn directly from leading specialists regardless of where they are based. This helps democratize access to knowledge and creates opportunities for scientists, clinicians and developers from different disciplines and regions to engage with one another.

REVIVE also serves as a convening platform, connecting people and organizations that might not otherwise interact. By fostering dialogue and collaboration across academia, industry, government and the non-profit sector, it helps strengthen the networks that underpin successful antimicrobial innovation.

Looking ahead, REVIVE is building on this foundation by expanding opportunities for expert advice, mentorship and community engagement. The goal is to create an even more connected and supportive environment for researchers working to develop new tools against drug-resistant infections.

By investing in knowledge sharing, professional networks and scientific collaboration, REVIVE complements efforts to develop new antibiotics directly. Together, these activities help create the conditions needed for innovation to thrive and for promising ideas to progress more rapidly towards public health impact.



LEARN MORE: [REVIVE.GARDP.ORG](https://revive.gardp.org)



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**80+**  
Viewpoint articles



**6 online**  
Antimicrobial Chemotherapy  
Conferences (ACC)



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Encyclopaedia entries



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