GARDP

Global Antibiotic Research & Development Partnership

GLOBAL CHALLENGES

PANDEMIC PREPAREDNESS AND RESPONSE

THE IMPACT OF DRUG RESISTANCE IN A PANDEMIC

This century, we have already witnessed at least eight major viral outbreaks, including H1N1, Ebola, SARS-CoV-2 (COVID-19) and mpox. Of these, three were newly emerged viruses and two escalated into pandemics—most notably COVID-19, which led to the deaths of more than seven million people and severely impacted health systems and economies across the world. In response, and amid increasing concern about future pandemics, governments have now committed to take action to ensure that all countries are better able to prevent, prepare for, and respond to future pandemic threats and emergencies. However, one major challenge to achieving pandemic preparedness is the rise and spread of drug-resistant infections.

Pandemic preparedness entails a broad range of activities, from the surveillance of zoonotic disease and the regulation of the wildlife trade, to health system strengthening, and ensuring that everyone has timely access to countermeasures, like vaccinations, diagnostics and treatments. Crucially, this includes access to effective antibiotics, to protect people from secondary bacterial infections. As we saw during the COVID-19 pandemic, secondary infections significantly increase the risk of death, with one study finding that it led to a threefold increase. With drug resistance making infections increasingly difficult to treat, it is likely to become even more challenging to protect people during a pandemic.

THE INTERPLAY BETWEEN DRUG-RESISTANT INFECTIONS AND PANDEMICS

As bacteria continue to evolve, they develop natural defence mechanisms against potential threats, including antibiotics. Over time this antimicrobial resistance (AMR) has rendered many antibiotics increasingly less effective or even ineffective. To make matters worse, new antibiotics are no longer being developed at scale by the pharmaceutical industry, which has steadily withdrawn from this market. All this is leaving clinicians with vanishingly few treatment options.

Adding to this is the fact that even when antibiotics remain effective against multidrug-resistant infections, too often people don't have access to them. There are a multitude of reasons for this, from supply chain bottlenecks and shortages to the fact that often new antibiotics are usually only registered in a handful of predominantly wealthy nations. Whatever the reason, a lack of access to effective antibiotics threatens to undermine one of our most critical lines of defence during a pandemic, because it means patients with secondary bacterial infections are less likely to receive the treatment they need.

This has profound implications for our ability to respond to future health emergencies, because our dependence on antibiotics during a pandemic typically increases with the need to treat secondary infections. So, ironically, despite a lack of access to essential antibiotics across the globe, we often see a spike in their use, by as much as 20% during COVID-19. What this means is that while AMR is bad news for pandemics, pandemics can also exacerbate AMR. Because they can lead to an increase in the use and inappropriate use of antibiotics, therefore threatening to drive up the rise and spread of drug-resistant infections and accelerate AMR.

GARDP'S RESPONSE

The work GARDP is doing will directly help to mitigate the threat that AMR poses to pandemic preparedness. We do this by working towards solutions aimed at ensuring that everyone has timely access to appropriate and

effective antibiotics. Our work is focused primarily on the development of new antibiotic treatments that target World Health Organization (WHO) priority pathogens—multidrug-resistant infections that pose the greatest threat to public health—and on improving access to these and other essential antibiotics.

Our unique public-private partnership approach makes both these objectives possible by prioritizing public health impact, affordability and high-burden countries. This enables us to ensure that the antibiotics most needed are developed and support the efforts of governments in providing people most in need with timely access to effective treatments, during a pandemic or otherwise.

GARDP's model also involves the development of innovative new treatments and the evaluation of existing antibiotics for use against priority infections. By generating new clinical evidence on existing antibiotics or combinations, or by expanding access to new treatments, we hope to rapidly revive the global antibiotic pipeline and improve access to it.

Currently, global access is far from equitable. In low- and middle-income countries, where the burden of AMR is greatest, fewer than 1 in 15 people with multidrug-infections receive the right treatment because of a lack of access. GARDP aims to change that by factoring access into every stage of the drug development process, from scientific discovery and R&D, right through to the manufacturing, registration and last mile delivery of antibiotics.

This is necessary to ensure that the right antibiotics are developed, clinically suitable for all populations and are affordable for all countries. GARDP also works with local partners to help fill vital data gaps in disease surveillance and to identify the antibiotic needs of key high-burden countries, enabling us to remove barriers to access and help countries introduce antibiotics.

During a pandemic, when people have timely access to the antibiotics they need, it not only saves lives, it reduces the inappropriate use of antibiotics and so helps to tackle the rise and spread of AMR. So, by addressing AMR as an urgent priority in pandemic preparedness strategies we can safeguard public health and ensure that we have the tools needed to combat infections.

Now is the time for decisive action—join GARDP in making the fight against AMR a global priority, to protect lives and strengthen our response to future pandemic threats.

MAJOR VIRAL OUTBREAKS THIS CENTURY

2002-2003	West Nile virus	14,018 cases; 548 deaths
2003-2003	SARS-CoV	8,422 cases; 916 deaths
2009-2010	H1N1	700 million - 1.4 billion cases; 151,700 - 575,400 deaths
2012-present	MERS-CoV	2,626 cases; 947 deaths
2014-2016	Ebola	28,600 cases; 11,325 deaths
2015-2016	Zika	1.6+ million reported cases
2020-present	SARS-CoV-2 (COVID-19)	748 million confirmed cases; 7+ million deaths
2023-present	mpox	142,000 cases; 328 deaths