

Vaccines are Key in Combating Antimicrobial Resistance (AMR)

New evidence shows how vaccines are one promising way to combat the global spread of antimicrobial resistance

Antimicrobial resistance (AMR) is one of the most urgent threats currently facing global health [1]. Antimicrobials are medicines used to prevent and treat infections in humans, animals and plants and include antibiotics, antivirals, antifungals and antiparasitics. AMR occurs when bacteria, viruses, fungi, and parasites no longer respond to antimicrobial medicines. When pathogens become drug resistant, antibiotics and other medicines become ineffective and infections become increasingly difficult or even impossible to treat. Without effective medicines, infections can become more severe causing debilitating and costly illness and risk of death.

This is why the World Health Organization named AMR one of the ten threats to global health in 2019.

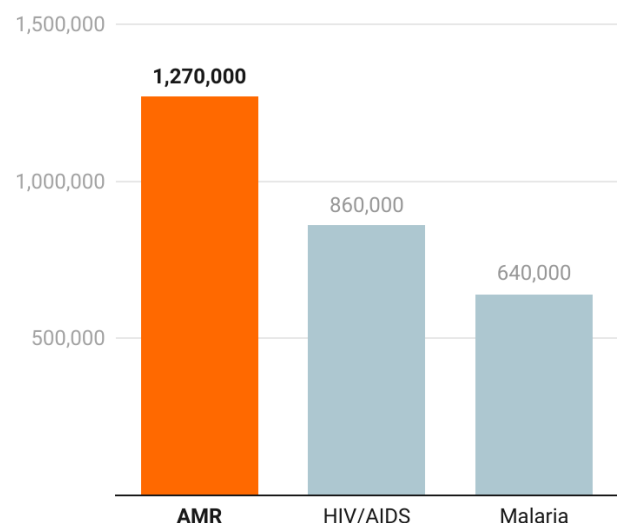
AMR is a Major Threat to Child Health

AMR is a leading cause of death around the world, with the highest burdens in low-resource settings.

- Among children under five who die from AMR, **over 99%** live in low- or middle-income countries.
- Children living in low-resource settings with limited access to health and immunization services face some of the greatest risks of exposure to AMR. **Children in sub-Saharan Africa are 58 times more likely than those in high-income countries to die of AMR.**
- An estimated 254,000 children under five die from AMR each year. **This equates to one child dying of AMR nearly every two minutes.**

Global AMR Deaths, 2019

An analysis of 204 countries and territories finds that AMR is a major global health threat, with AMR causing an estimated 1.27 million deaths worldwide in 2019 - more than HIV/AIDS and malaria [2].



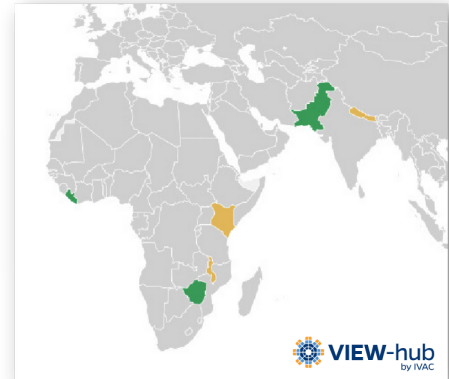
Murray et al. "Global Burden of Bacterial Antimicrobial Resistance in 2019: A Systematic Analysis." The Lancet. [https://doi.org/10.1016/S0140-6736\(21\)02724-0](https://doi.org/10.1016/S0140-6736(21)02724-0)

An AMR Vaccine Success Story: XDR Typhoid

The Salmonella Typhi (S. Typhi) bacterium causes typhoid, an illness that kills between 128,000 and 161,000 people every year and sickens another 11–20 million people. **Almost one-third of all Typhoid Fever cases are among children under five years of age.**

Typhoid fever can be treated with antibiotics, however, an increasing resistance to antibiotics is making treatment for typhoid more difficult. Drug-resistant typhoid is an increasing threat for some countries, including Pakistan. **Extensively drug-resistant (XDR) typhoid** is resistant to five of the six available oral antibiotics, making these infections much more difficult and costly to treat.

Typhoid Vaccine Introductions



Data and maps on the latest typhoid vaccine introduction status are available at <https://view-hub.org/>

A 2021 study of **typhoid conjugate vaccine (TCV)** immunization for children in Pakistan found that **typhoid vaccines can be highly effective against drug-resistant typhoid [3].**

- TCV was 95% effective against culture-confirmed typhoid infection
- TCV was 97% effective against XDR typhoid strains
- TCV was 98% effective against non-XDR typhoid strains

Estimations of typhoid cases averted in Pakistan over 10 years with typhoid vaccine introduction [4]

3,695,000

Estimated number of typhoid cases



1,272,000

Estimated number of typhoid cases averted

2,600,000

Estimated number of extensively drug resistant typhoid cases



895,000

Estimated number of extensively drug resistant typhoid cases averted

Evidence from the VoICE Compendium

Antimicrobial-resistant infections are expensive to treat and place an economic burden on families and health systems

The pneumococcal conjugate vaccine has been shown to significantly reduce the rate of drug resistant strains of pneumococcal disease

Vaccines are a critical step in controlling the occurrence of antibiotic-resistant infections, reducing illness and healthcare visits

Additional information and resources on vaccines and AMR available at <https://immunizationevidence.org/>

References

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Global Issues

► Antibiotic Resistance

VoICE Compendium References

<https://immunizationevidence.org/subtopics/antibiotic-resistance/>

