

Vaccines: An Important Tool in the Fight Against Antimicrobial Resistance (AMR)

Antimicrobial resistance (AMR) occurs when pathogens change and find ways to resist the effects of antibiotics. As a result, standard treatments become ineffective, infections persist and may spread to others.¹

AMR is a global threat with serious implications on our health, healthcare systems and economies.

AMR is estimated to be responsible for **700,000 deaths per year globally**.² Inaction is projected to cause millions of deaths around the world and it has been estimated that, by 2050, AMR might cause more deaths than cancer if no action is taken.³

Globally, studies have estimated the economic burden of AMR to be **more than \$3 trillion in GDP loss per year**.⁴



700,000
ANTIMICROBIAL
RESISTANCE
DEATHS PER YEAR

In the next several decades, AMR will have a tremendous impact on the global economy if no action is taken to curb the spread.

As antibiotics become less effective and AMR continues to rise, healthcare around the world will be severely impacted.

In its 2015 Global Action on Antimicrobial Resistance, the World Health Organization outlined a three-step approach to reducing AMR threats.⁵

1

Reduce the incidence of infection

2

Optimize the use of antimicrobial agents

3

Develop the economic case for sustainable investment in new medicines, diagnostic tools, and vaccines



The continued rise in the global overuse and misuse of antibiotics is a factor in **antibiotics** becoming less **effective**.



Vaccines are an important tool in the fight against AMR that help to prevent infections in the first place and, thus, reduce the burden of infectious disease and related need for use of antibiotics.



Existing vaccines have already helped to reduce the burden of AMR. For example, resistance is not a significant clinical problem for diphtheria and pertussis, two transmissible bacterial infections that we have vaccinated against for decades, likely because they are rarely seen and thus rarely treated.⁶

Vaccination can play multiple roles in AMR stewardship strategies, including:

1.

Reducing the overuse of antibiotics by helping to prevent bacterial infections including those that may carry resistance

2.

Reducing the overuse of antibiotics by helping to prevent viral diseases which lead to secondary bacterial infections requiring antibiotic treatment

3.

Reducing the misuse of antibiotics by helping to prevent viral diseases for which antibiotics are inappropriately prescribed

4.

Helping to prevent antimicrobial resistant infections from spreading

Vaccines are critical in helping to combat the growing AMR crisis.

1 The World Health Organization. Antimicrobial Resistance Key Facts. Available at <https://www.who.int/en/news-room/fact-sheets/detail/antimicrobial-resistance>
2 The European Commission. A European One Health Action Plan Against Antimicrobial Resistance (AMR), 2017. Available at: https://ec.europa.eu/health/amr/sites/amr/files/amr_action_plan_2017_en.pdf.
3 The European Commission. A European One Health Action Plan Against Antimicrobial Resistance (AMR), 2017. Available at: https://ec.europa.eu/health/amr/sites/amr/files/amr_action_plan_2017_en.pdf.
4 Naylor NR, Atun R, Zhu N, et al. Estimating the burden of antimicrobial resistance: a systematic literature review. *Antimicrobial Resistance and Infection Control*. 2018; 7:58. doi:10.1186/s13756-018-0336-y.
5 The World Health Organization. Global Action Plan on Antimicrobial Resistance. Available at: <http://www.who.int/antimicrobial-resistance/global-action-plan/en/>
6 Lipsitch M, Siber GR. How can vaccines contribute to solving the antimicrobial resistance problem? 2016. doi:10.1128/mBio.00428-16. Available at: <http://mbio.asm.org/content/7/3/e00428-16.full>.