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TRIANGULATE HEALTH

AMR NAVIGATOR

SPOTLIGHT ON VACCINES FOR AMR

AMR: A VACCINE TREATABLE THREAT

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AMR: A vaccine-treatable threat

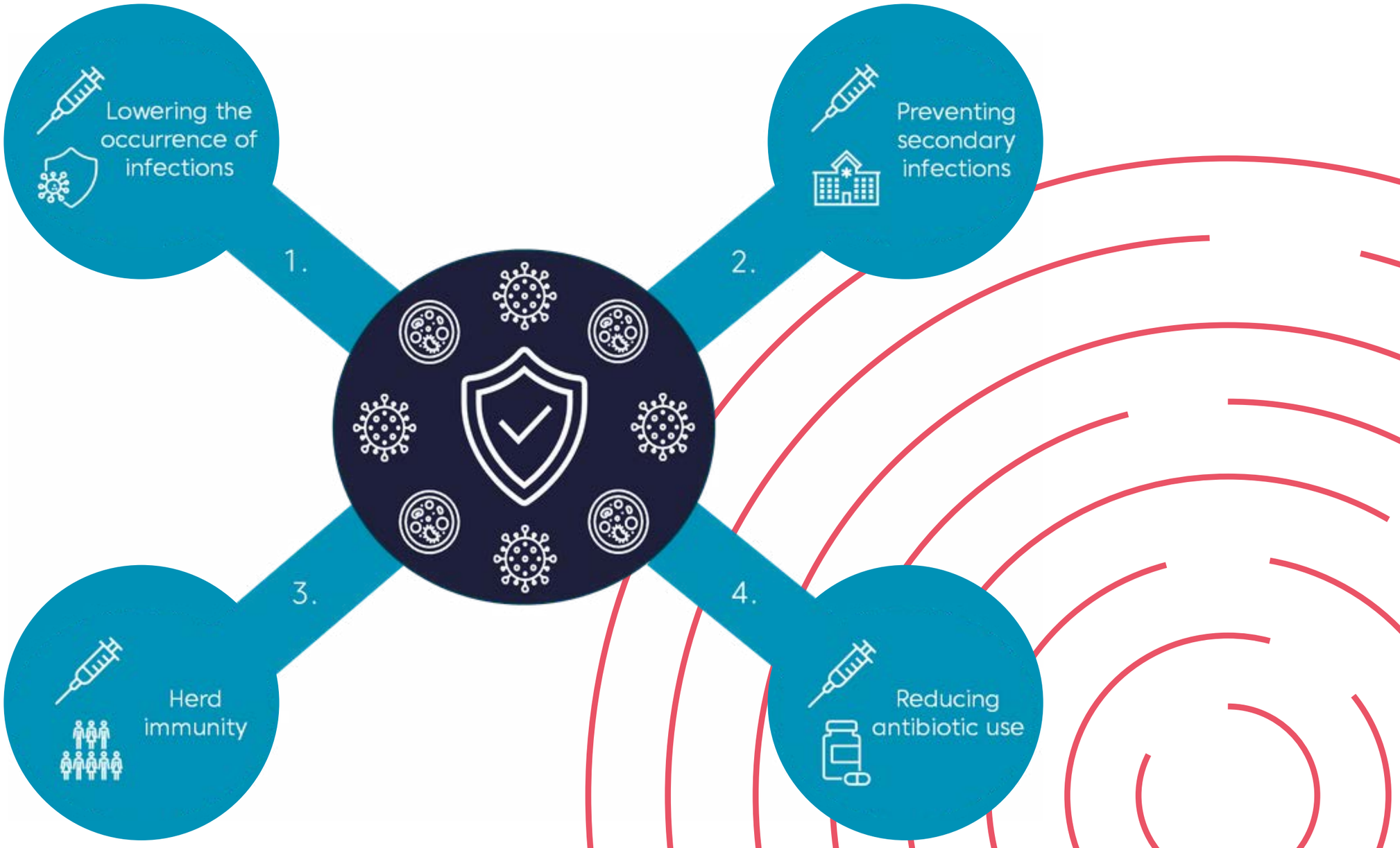
Vaccines are a vital tool in preventing antimicrobial resistance (AMR), helping reduce the misuse of antibiotics that fuels resistance.

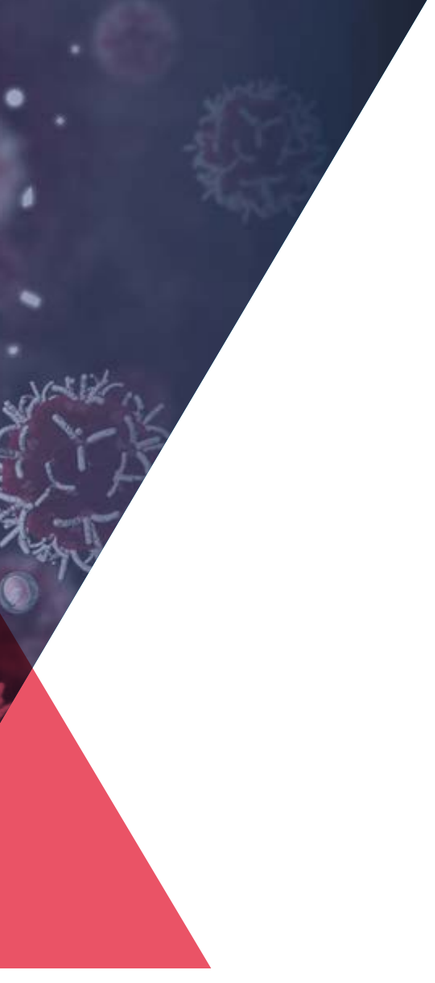
Vanessa Carter's story shows the human cost of AMR. After a car accident, she faced years of antibiotic-resistant infections, losing part of her facial prosthetic and missing out on further surgeries. She reflects, *"We never think AMR is going to happen to us."*

AMR can affect anyone, turning routine infections into life-threatening battles. In 2019 alone, bacterial AMR was linked to nearly **5 million deaths** globally.

Vaccines help the immune system fight specific pathogens and play a key role in preventing antimicrobial resistance (AMR).

They reduce infections, both drug-susceptible and drug-resistant, lowering illness, death, and treatment costs. Vaccines also prevent secondary infections and protect communities through herd immunity. By reducing the need for antibiotics, they help slow the development of resistance.





How effective are vaccines in preventing AMR?

Expanding vaccine coverage in low- and middle-income countries (LMICs) could significantly reduce antibiotic use.

A recent modelling study found that universal access to key vaccines, including PCVs, Hib, maternal RSV, influenza, rotavirus, and RTS,S (in malaria-endemic areas), could cut antibiotic consumption by over **1.6 billion defined daily doses** annually among children, representing **15% of current use**.

The development of vaccines is a challenging pursuit

Developing vaccines to combat AMR presents significant challenges due to research & development (R&D), logistical, and regulatory complexities.

Funding gaps hinder vaccine development for AMR.

Laura Plant from the International Vaccine Institute (IVI) highlighted that only **20% of the $4.5 billion** invested in bacterial vaccine R&D (2007–2024) goes to LMICs, despite these countries bearing the greatest disease burden. She stressed the need for increased investment in LMICs and the role of partnerships like IVI in directing funding where it's most needed.

What’s in the pipeline?

A 2021 WHO analysis found 61 bacterial vaccine candidates in clinical trials and 94 in preclinical stages. However, several pathogens, like A. baumannii and P. aeruginosa, pose low feasibility due to biological and development challenges. In 2023, WHO updated its list of 17 priority drug-resistant pathogens for vaccine R&D. Five, M. tuberculosis, HIV-1, K. pneumoniae, S. aureus, and extra-intestinal E. coli, were common across all regions.

A vaccine for M. tuberculosis with 80% efficacy could have prevented **118,000 deaths** and **4.6 million DALYs** linked to AMR in 2019, while reducing antibiotic use by up to **1.9 billion doses** annually.

Laura Plant from IVI highlighted the potential of a gonococcal vaccine, calling it a “game changer” due to rising drug resistance and limited treatment options.

Economic impact of AMR

AMR carries a heavy economic burden, but vaccines can help reduce costs.

Drug-resistant infections often require longer, more expensive treatments. Globally, AMR-related hospital costs are estimated at **US$730 billion** annually. WHO estimates that pneumococcal vaccines alone could save **US$0.6 billion** in hospital costs and **US$2.6 billion** in productivity losses each year.

In LMICs, increasing PCV coverage shows major savings:

Indonesia:
Up to **US$4 million** in reduced treatment failure costs over five years

China:
Up to **US$586 million** in reduced AMR-related expenses

Ethiopia:
Up to **US$11.4 million** in annual savings with higher vaccine uptake

Capturing the full value of vaccines in future economic evaluations

To fully understand vaccines' value in fighting AMR, their impact on antibiotic use must be included in cost-effectiveness studies.

This area remains under-researched, with few real-world data points. One key study (Ozawa et al., 2021) showed the economic value of pneumococcal vaccines in reducing AMR in Africa.

Laura Plant from IVI stressed the need for better data to influence policy: *"We need to show how vaccines reduce disease, healthcare costs, and antibiotic use. Right now, there's a lot of modelling, but little real-world evidence."*

IVI's 'Mind the Gap' project aims to bridge this divide by uniting AMR and vaccine communities in LMICs. However, funding remains a challenge, only **~13%** of vaccine R&D funding targets bacterial infections.

Shifting the balance: a call for greater vaccine investment

Vaccination is a key yet underused tool in the fight against AMR.

Laura Plant from IVI called it the “lowest hanging fruit,” noting that vaccine R&D receives far less funding than therapeutics. She stressed the need to rebalance investment and build real-world studies that show how vaccines reduce disease, healthcare costs, and antibiotic use.

Future research should:

- Include AMR-related outcomes in vaccine cost-effectiveness studies
- Develop frameworks to capture vaccines’ broader economic impact
- Explore how viral vaccines influence antibiotic prescribing and misuse

Despite efforts like IVI’s Mind the Gap project to unite AMR and vaccine communities, funding for bacterial vaccines remains low, just **~13%** of total vaccine R&D.

Next Issue

Our next edition will explore how medical devices help prevent infections and curb AMR.

From ventilator-associated pneumonia to prosthetic joint infections, antibacterial devices play a crucial yet often overlooked role in infection control.

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