

2023

Vaccines & Antimicrobial Resistance (AMR):

Considerations for AMR Policy and Practice in Low- and Middle-Income Countries

Webinar Summary



MINISTRY OF FOREIGN AFFAIRS
OF DENMARK

Denmark in South Korea



International
Vaccine
Institute



INTERNATIONAL CENTRE FOR
ANTIMICROBIAL RESISTANCE
SOLUTIONS

Executive Summary

Antimicrobial Resistance (AMR) is a global challenge that transcends borders. Its effects ripple through societies, economies, and ecologies on a worldwide scale.

In 2017, a [World Bank report](#) forecasted that AMR's economic consequences would surpass those of the 2008/9 financial crisis, enduring longer and exacerbating inequalities within countries, particularly affecting Low- and Middle-Income Countries (LMICs). In January 2022, the [GRAM/IHME report](#) underscored bacterial AMR's global toll in 2019, claiming 1.27 million lives, surpassing both malaria and HIV. Meanwhile, the COVID-19 pandemic served as a poignant reminder of the pivotal role played by vaccines in safeguarding global health.

Recently, the World Health Organization (WHO) unveiled a [framework](#) advocating for vaccines in addressing AMR. Beyond reducing infectious diseases, vaccines can curtail antibiotic misuse, consequently limiting the emergence and transmission of AMR. Despite prioritising pediatric vaccines in LMICs, their potential to mitigate AMR gained prominence only recently, necessitating validation through real-world data.

In Africa and Asia, the last decade witnessed the swift integration of pediatric vaccines (Hib, PCV, RVV, TCV) into National Immunisation Programs (NIPs). These vaccines not only mitigate targeted diseases but also hold promise in AMR prevention. However, the evidence linking vaccines to AMR requires more than predictive models.

On March 23, 2023, a collaborative policy and implementation webinar, hosted by Denmark's Ministry of Foreign Affairs, the International Vaccine Institute (IVI), and the International Centre for Antimicrobial Resistance Solutions (ICARS), aimed to align vaccine and AMR strategies within the context of LMICs.

This report summarises the discussions among policymakers, disease experts, researchers, civil society, pharmaceutical innovators, and industry representatives. The full agenda is available [here](#).



Speakers



Dr Jerome Kim

Director General
IVI



Dr Robert Skov

Scientific Director
ICARS



HE Svend Olling

Ambassador of Denmark to
the Republic of Korea



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AMR Advisor
ICARS



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Technical Officer (IVB)
WHO HQ



Dr Raphaël Zellweger

Senior Research Scientist
IVI



Dr John Paget

Senior Researcher
NIVEL

Vaccines & AMR



"Vaccines can be part of the solution to AMR, with the mission to discover, develop and deliver safe, effective, and affordable vaccines for global health. They should be incorporated as tools to combat AMR in national action plans and national immunisation strategies."

Dr Jerome Kim



"Collaboration is needed to unite the vaccine and AMR agendas. Through strategic partnerships, we can align our efforts to advance public health and bridge the gap between vaccine and AMR priorities, particularly in LMICs."

Dr Robert Skov



"Raising awareness and researching AMR is central to preventing it from becoming the next pandemic. Broader vaccine implementation in LMICs can help curb the evolution of AMR. We must increase public funding and attention to secure access to proper treatment for all."

HE Svend Olling

Vaccines & AMR

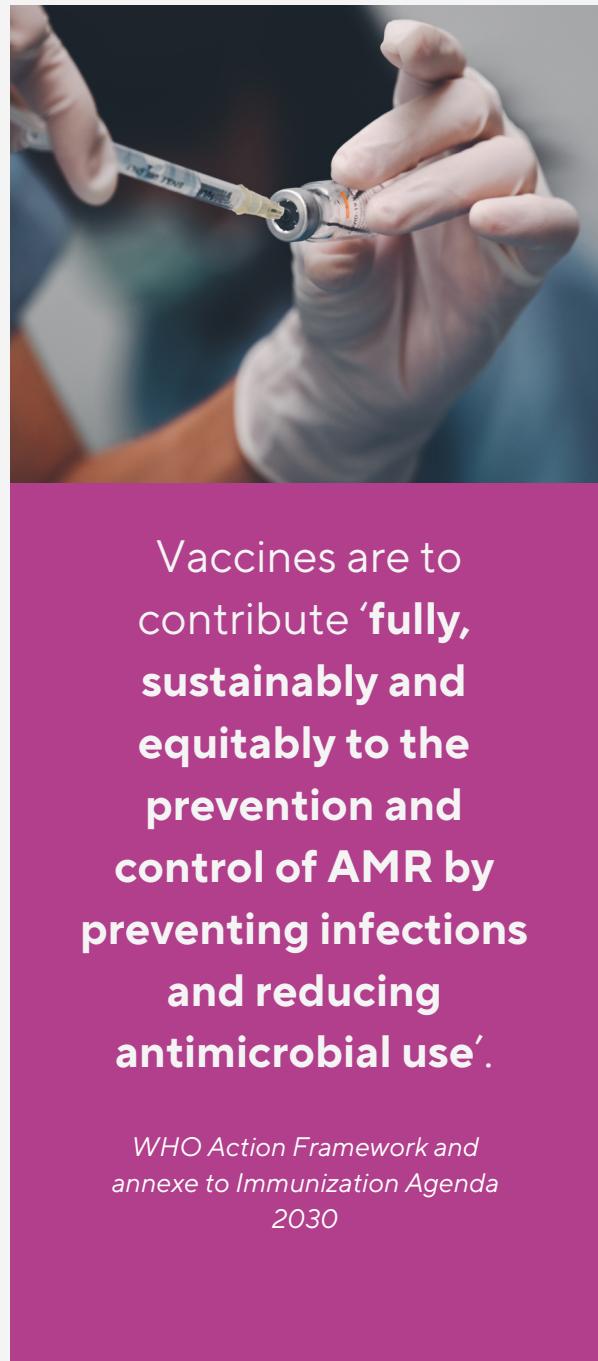
Background information

Resistance to vaccines is rare, making them even more **valuable to AMR**.

Vaccines are acknowledged in two of the five objectives of the **Global action plan for antimicrobial resistance** (GAP 2015) and are referenced in several countries' **National Action Plans** (NAPs).

In January 2021, the World Health Organization launched a strategy to articulate the **role of vaccines against AMR**.

This annex to the Immunization Agenda 2030 is an **action framework** that describes a vision for vaccines to contribute '*fully, sustainably and equitably to the prevention and control of AMR by preventing infections and reducing antimicrobial use*'.



Vaccines are to contribute '**fully, sustainably and equitably to the prevention and control of AMR by preventing infections and reducing antimicrobial use**'.

WHO Action Framework and annexe to Immunization Agenda 2030

Vaccines & AMR

Background information



We must '**assess the impact of vaccines on preventing colonisation and infection by resistant pathogens (...) and on reducing the overall use of antimicrobial medicines, health-care encounters and health system costs among adults and children, and across socioeconomic settings**'.

WHO Global research agenda for antimicrobial resistance in human health

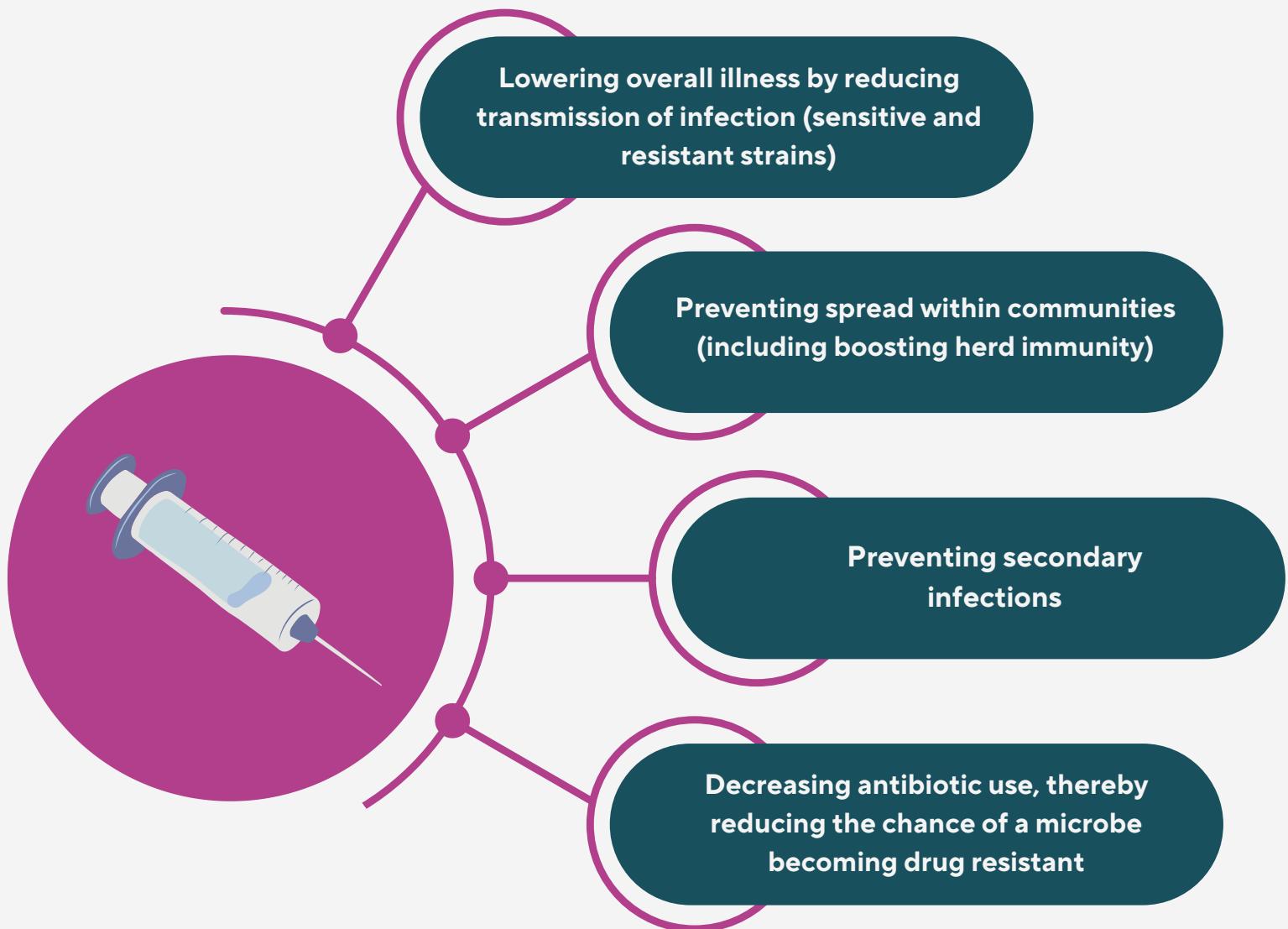
In June 2023, WHO unveiled its **Global research agenda for antimicrobial resistance in human health**, comprising 40 research priority areas grouped into 5 thematic domains based on identified knowledge gaps.

Under the "Prevention" research priority, is highlighted the necessity to "*assess the impact of vaccines on preventing colonisation and infection by resistant pathogens (whether specifically targeted by the vaccine or not) and on reducing the overall use of antimicrobial medicines, health-care encounters and health system costs among adults and children, and across socioeconomic settings*."

Vaccines & AMR

Background information

Value of vaccines & AMR mitigation



Case Study



TYPHOID

CHALLENGE

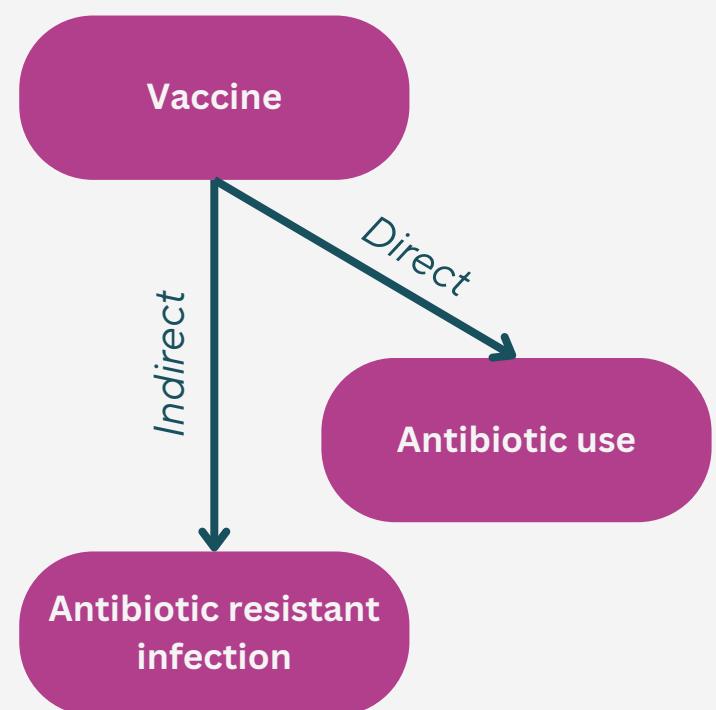
Globally, between 11-20 million people are infected with typhoid, mainly in Low-Income Countries. Overuse of antibiotics enables the emergence of resistant clades, which are then spread around the world via international travel.

MITIGATION

Vaccines can reduce AMR via two mechanisms: by reducing the transmission of resistant infections (directly), and by reducing the selective pressure for AMR (indirectly).

"Typhoid is a double-edged menace. It fuels the indirect use of antibiotics, thereby fostering the emergence of resistance. Simultaneously, it propels the direct application of antibiotics upon diagnosis. It is a catalyst for both the selection and escalation of antibiotic resistance, amplifying the urgency to address this multifaceted threat."

Prof Gordon Dougan



Based on Prof Gordon Dougan's intervention

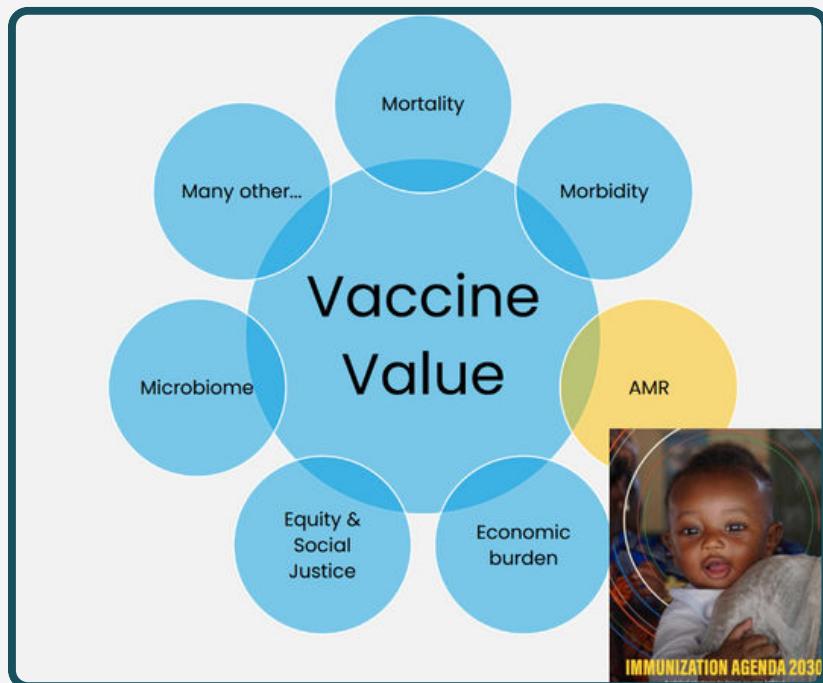


AMR as a key component of the full value of vaccines

"The value of vaccines encompasses a **range of elements**: mortality, morbidity, economic ramifications, effects on equity and social justice, and the microbiome. In this **holistic assessment** of the value of vaccines, the **burden of antimicrobial resistance** finds its rightful place."



Dr Mateusz Hasso-Agopsowicz



Using AMR data to guide vaccine introductions at scale

"There is a lack of **local data tailored to each country's unique context**. While acknowledging the interrelation between immunisation, vaccines, and their significant impact on AMR, the message needs to **reach beyond the academic community**. It is vital for policymakers, decision-makers, and the wider public to grasp the importance of country-specific data, fostering collective action."



Dr Erta Kalanxhi



Approaches for measuring impact

*"There is an imperative to prioritise **the inclusion of AMR**, even as a secondary or exploratory endpoint, in **vaccine trials**. By doing so, we ensure a comprehensive assessment that accounts for the potential impact of vaccines on mitigating AMR."*



Dr Birkneh Tadesse



Opportunities and challenges



Dr Firdausi Qadri

*"In developing countries with antibiotic overuse, the short-term solution is to **use available vaccines against infectious diseases**. However, we must also work on antimicrobial resistance management, policy changes, and improving vaccine access in LMICs, with pharmaceutical companies and healthcare providers playing critical roles."*





Vaccination & Water, Sanitation and Hygiene



Dr Mukta Sharma

*"Hygiene practices and long-term improvements require extensive coordination beyond the health sector. In many countries, **achieving immediate progress is challenging**. Vaccination becomes crucial, serving as the key strategy to address outbreaks. It allows to focus on long-term goals while swiftly reducing cases."*



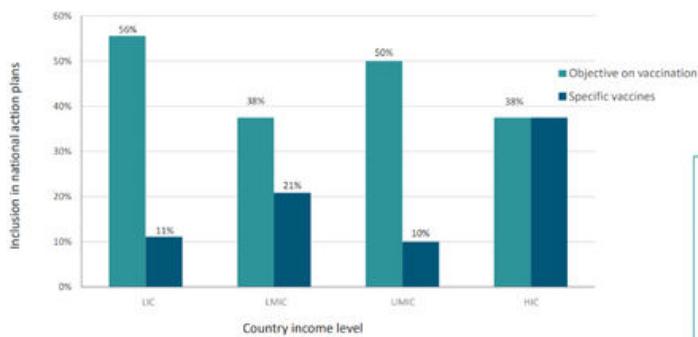
Vaccination and National AMR Action Plans

*"Vaccination should be a **core element of National Action Plans**. Key recommendations for updating NAPs include making vaccination more explicit, incorporating strategic objectives to promote vaccination, and targeting specific vaccines in vaccination programs."*



Dr John Paget

Vaccination in 77 AMR National Action Plans



Low Income: n = 9
Lower-Middle Income: n = 24
Upper-Middle Income: n = 20
High Income: n = 24

Moderators' summary

Call to action



Dr Raphaël Zellweger



Dr Jyoti Joshi

Vaccines present a unique opportunity to address the burden of both AMR and infectious diseases simultaneously. Nevertheless, **stronger advocacy is needed to align both agendas in LMICs.**

Limited awareness, political commitment, and resource allocation pose challenges. However, there are clear pathways to leverage vaccines, which are proven and tested public health interventions to effectively mitigate AMR, especially in LMICs.

Efforts should focus on examining real-world benefits of licensed vaccines in NIPs through coordinated researcher-led implementation research projects, in collaboration with vaccine and AMR departments within national agencies.

Furthermore, including the AMR benefits of vaccines in their value proposition at the discovery and in clinical trials will establish the rationale for integrating them in the arsenal for mitigating AMR. Typhoid is an illustrative example for converging the AMR and vaccination efforts in LMICs for double benefits.

The webinar provided valuable insights to chart a way forward by fostering key partnerships among all stakeholders (government and private) at global and national levels in the fields of AMR and vaccines.

Such partnerships that utilise not only pathogen-based but AMR-based surveillance data to guide vaccination strategies present a significant opportunity to leverage the momentum gained in the post-COVID era for using vaccines to address AMR.

Producing more data is essential to quantify the influence of vaccines on AMR and provide guidance for policymaking.

Acknowledgements

This report synthesises insights shared by all the speakers who participated in the 2023 webinar on Vaccines & AMR: Considerations for AMR Policy and Practice in Low- and Middle-Income Countries.

The webinar, jointly hosted by Denmark's Ministry of Foreign Affairs, IVI, and ICARS, brought together experts to delve into the vital connection between vaccines and antimicrobial resistance within the context of Low- and Middle-Income Countries.

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