The Value of Vaccines in Mitigating Antimicrobial Resistance in Kenya

GARP-Kenya Chair - Dr. Robert S. Onsare

GARP - Kenya Policy Brief

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ONE HEALTH TRUST
5636 Connecticut Ave NW
PO Box 42735
Washington, DC, 20015
United States of America

ONE HEALTH TRUST, INDIA
Nimay Valley, Site No.47
Motlur Cross, Jadalathimmanahalli,
Chikkaballapur,
Karnataka – 562103, India

In Search of Better Health

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Global Antibiotic Resistance Partnership (GARP)-Kenya
A Kenya Medical Research Institute (KEMRI) – OHT Initiative

GARP-Kenya Technical Work Group Members & Institutional Affiliations:

Chairperson:
Dr. Robert Onsare, Ag. Deputy Director, One Health Approach Research Program & Principal Research Scientist, KEMRI

Members:
Prof. Samuel Kariuki, Eastern Africa Director, DNDi
Prof. Gunturu Revathi, Aga Khun University Hospital
Dr. Sylvia Gachoka, Defense Forces Memorial Hospital
Dr. Annemarie Macharia, University of Nairobi (UoN)
Dr. Anthony Sifuna, Masinde Muliro University
Dr. Andrew Nyerere, Jomo Kenyatta University
Dr. Patrick Irungu, UoN
Dr. Christine Karanja Chege, Kenyatta University
Dr. David Githanga, Nairobi Hospital
Dr. Marybeth C. Maritim, UoN
Dr. Christine Makena, KEMRI (GARP - Kenya Project Coordinator)

One Health Trust:
Dr. Erta Kalanxhi, Dr. Oluwatosin Ajayi, Mr. Felix Bahati, Mr. Rishi Bhagawati, Dr. Oluoma Agiri, Ms. Simran More, Dr. Samantha Serrano

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AGE	acute gastroenteritis
AIDS	acquired immunodeficiency syndrome
AMR	antimicrobial resistance
DALY	disability-adjusted life year
FQNS	Fluoroquinolone nonsusceptible
GARP	Global Antibiotic Resistance Partnership
GAVI	Vaccine Alliance (formerly the Global Alliance for Vaccines and Immunization)
Hib	*Haemophilus influenzae* type B
HIV	human immunodeficiency virus
IPD	invasive pneumococcal disease
KEMRI	Kenya Medical Research Institute
MCV	measles-containing vaccine
MDR	multidrug resistant
NAP	National Action Plan
NTDs	neglected tropical diseases
OPV	oral polio vaccine
PCV	pneumococcal conjugate vaccine
PI	prediction interval
PLHIV	people living with HIV
RR-TB	rifampicin-resistant tuberculosis
RV	rotavirus vaccine
TB	tuberculosis
TCV	typhoid conjugate vaccine
WASH	water, sanitation, and hygiene

EXECUTIVE SUMMARY

Antimicrobial resistance (AMR) is a growing global public health crisis that threatens to undo decades of progress. In 2019, an estimated 1.27 million deaths were directly attributed to bacterial AMR globally, with sub-Saharan Africa bearing the highest burden. Adults aged 70+ have experienced a more than 80 percent increase in AMR-related mortality, underscoring the heightened vulnerability of older populations. AMR occurs when microorganisms, such as bacteria, viruses, parasites, or fungi, become resistant to antimicrobial treatments to which they were susceptible. One primary driver of AMR is the overuse and misuse of antibiotics in both human medicine and agriculture. In many countries, including Kenya, antibiotics are sometimes prescribed unnecessarily or used incorrectly. This can lead to the survival and proliferation of resistant bacteria, complicating treatment outcomes and increasing disease burden.

The best approach to mitigate the rising AMR burden is to significantly reduce infection vulnerabilities across human and animal populations through prevention measures. Vaccines represent a solution that prevents infections and their onward transmission, whether they are antimicrobial-resistant or not. This reduces the need for antimicrobial treatments, which lowers the selective pressure on microbial populations that drives the development and spread of AMR. The vaccination approach is cost-effective and an appropriate strategy in Kenya, where healthcare resources are limited and health systems already under significant financial strain. Prominent examples of the impact of vaccines on infectious disease and AMR include a 92 percent reduction in PCV-10-type invasive pneumococcal disease (IPD) among children under five years by 2019 and a decline in penicillin-resistant *Streptococcus pneumoniae* prevalence from 28 percent in 2009 to 12 percent in 2014, following the introduction of the pneumococcal conjugate vaccine (PCV) in 2011. Efforts to combat AMR in humans through vaccination require a One Health approach, with similar vaccination efforts extended to animals.

Although the role of vaccines in combating AMR is well recognized, it remains underutilized in national AMR action plans. For instance, Kenya's 2023–2027 plan emphasizes investment in research for new medicines and vaccines but lacks a defined strategy for adopting and integrating available vaccines into AMR control efforts. Addressing this gap through explicit vaccine deployment strategies is essential for strengthening the AMR mitigation framework. This policy brief leverages local expertise and current data to highlight Kenya's AMR status and propose vaccine adoption as a solution to the growing AMR threat.

Key Emphasis of the Technical Working Group on the Adoption of Vaccines as an AMR Mitigation Tool

1. Vaccination should be leveraged to combat AMR by preventing infections and reducing antibiotic misuse.

2. Addressing vaccine hesitancy is critical for the success of immunization programs.

3. Maintaining or increasing coverage for vaccines within Kenya's immunization schedule is essential for a sustained public health impact.

4. Introducing new vaccines with an impact on AMR and antibiotic use, such as the recently introduced typhoid conjugate vaccine (TCV), should be prioritized to address endemic diseases and reduce the burden on healthcare systems.

5. Addressing gaps in vaccine accessibility and distribution is necessary to achieve equitable health outcomes and strengthen AMR mitigation efforts.

COUNTRY PROFILE

Kenya, a country with a population of 55.3 million, has seen a steady increase in life expectancy at birth, reaching 64 years in 2023. However, communicable diseases, along with maternal, prenatal, and nutritional-related conditions, accounted for approximately 50 percent of deaths in 2019 (IHME 2020). By 2021, the leading causes of death included malaria, lower respiratory infections, and neonatal disorders (IHME 2020; WHO 2022a). In 2023, communicable diseases remained the leading cause of mortality, responsible for 43.4 percent of total deaths (Kenya Civil Registration Services 2024).

Kenya's healthcare expenditure is projected to increase to US$27.85 per capita by 2050 due to rising healthcare costs and population growth (World Bank 2023a). Despite efforts such as Universal Health Coverage programs and the abolition of user fees in public health facilities, the burden of out-of-pocket costs remains high (Salari et al. 2019). These costs contribute to barriers in healthcare access and are linked to an under-five mortality rate of 41.1 deaths per 1,000 live births in 2021 (UNICEF 2021).

Access to essential services remains uneven, particularly in rural areas. In 2019, the mortality rate attributed to unsafe water, sanitation, and lack of hygiene was 23.5 per 100,000 (WHO 2023). By 2022, 68 percent of the population had access to basic drinking water services, but only 51 percent had access to basic handwashing facilities at their premises (Kenya National Bureau of Statistics and ICF International 2023). Limited access to water, sanitation, and hygiene (WASH) facilities has been associated with high rates of infectious diseases and contributes to the growing challenge of AMR (Prüss-Ustün et al. 2014). In response, Kenya has implemented a National Action Plan (NAP) on AMR that incorporates a One Health approach; it includes surveillance, infection prevention and control, and antimicrobial stewardship programs (Government of Kenya 2023).

ANTIMICROBIAL RESISTANCE IN KENYA

In 2019, Kenya recorded 8,500 deaths directly attributable to and 37,300 deaths associated with antimicrobial resistance (AMR) (Murray et al. 2022). The country ranked 28th out of 204 nations in terms of age-standardized mortality rate due to AMR, highlighting the scale of the crisis within national borders. Five key pathogens were associated with AMR-related mortality: *Klebsiella pneumoniae* (6,200 deaths), *Escherichia coli* (5,900 deaths), *Streptococcus pneumoniae* (5,600 deaths), *Staphylococcus aureus* (5,000 deaths), and *Salmonella typhi* (2,400 deaths) (Murray et al. 2022; Antimicrobial Resistance Collaborators 2022). Among children under five, the leading causes of death include dehydration and sepsis from diarrheal pathogens and bacterial pneumonia, both largely preventable by vaccines (Bassat et al. 2023; Breiman et al. 2021). The high burden of vaccine-preventable bacterial infections reinforces the critical role of immunization in reducing AMR, by decreasing infection incidence and curbing unnecessary antibiotic use.

The high levels of extended-spectrum cephalosporin resistance and multidrug resistance (MDR) among *Enterobacteriaceae* isolates in Kenya are particularly concerning (Lord et al. 2021).These resistance patterns undermine the effectiveness of commonly used antibiotics and complicate treatment outcomes, especially in vulnerable patient populations.

More than 68 percent of fever cases are empirically treated with antibiotics, often without confirmatory diagnostics (Hooft et al. 2021). This practice is widespread in both public and private health facilities, where clinicians frequently prescribe antibiotics as a precautionary measure, especially for undifferentiated fever.

However, many of these fevers are caused by viral or nonbacterial illnesses, including malaria, dengue fever, Rift Valley Fever, and chikungunya, for which antibiotics are ineffective; empirical treatment leads to antibiotic misuse, accelerating the development of AMR (Auta et al. 2019; WHO 2022b). Improved WASH can prevent diarrheal diseases, which are often treated with antibiotics despite being primarily viral (Bassat et al. 2023).

Table 1. Vaccine-Preventable Disease Burden and AMR in Kenya

Disease (Pathogen)	Vulnerable Population	Key Statistics/ Burden	AMR/ Treatment Challenges
Pneumonia (*S. pneumoniae*)	Children (5–14), Adults	11.7 percent of pediatric admissions; 7.9 percent mortality in children (Macpherson et al. 2019)	Resistance in children: chloramphenicol, cotrimoxazole; adults: doxycycline, penicillin; beta-lactam (Kobayashi et al. 2017)
Typhoid Fever (*S. typhi*)	Children, Adults	126,098 cases (2019); 1,568 deaths (2019), 54 percent <15 yrs (Simiyu and Jamka 2018; Coalition Against Typhoid 2021)	82.4 percent resistant to 5 common antibiotics; 43 percent to ciprofloxacin; rising fluoroquinolone resistance (Kasiano et al. 2024)
Tuberculosis (*M. tuberculosis*)	General; especially HIV+ (~35,000 cases/year) (Waruru et al. 2022)	~139,000 new cases; 21,600 deaths/year (Stop TB Partnership 2025)	Multidrug resistant: 3.6 percent new, 18 percent retreatment cases; overall 5.6 percent (MacNeil 2019)
Rotavirus (Rotavirus A)	Children <5 (pre-vaccine)	~4,471 deaths, 8,781 hospitalizations/year; $10.8M annual cost (Wandera et al. 2017)	34.2 percent inappropriate antibiotic use; high rates of missed appropriate treatment in dysentery cases (Saqeeb et al. 2024)

Table 1. Vaccine-Preventable Disease Burden and AMR in Kenya (continued)

Disease (Pathogen)	Vulnerable Population	Key Statistics/Burden	AMR/Treatment Challenges
Malaria (*Plasmodium spp.*)	>70 percent of population at risk; mainly <5 yrs (Sultana et al. 2017)	~6.7M cases/year; ~4,000 deaths; 13–15 percent of outpatient visits. (Elnour et al. 2023)	Resistance to chloroquine and sulfadoxine-pyrimethamine documented (Akala et al. 2011; Conrad and Rosenthal 2019)

The rising threat of AMR in Kenya is particularly concerning, as it is already grappling with multiple systemic health and social challenges. First, a significant proportion of the population lives in poverty, and access to quality healthcare remains a challenge, especially in rural and marginalized regions (World Bank 2023b). Second, the public healthcare system is under immense strain due to high workloads, frequent healthcare worker strikes, recurring shortages of essential medicines and supplies, and a lack of capacity for routine microbiological diagnostics and antimicrobial susceptibility testing (Omulo et al. 2015; Kenya Ministry of Health 2023). Kenya also faces other pressing health issues, including elevated rates of maternal and child mortality and a substantial burden of infectious diseases, such as human immunodeficiency virus (HIV), tuberculosis (TB), and malaria (IHME 2020; WHO 2023). As a result, the rise in AMR to commonly used first-line drugs and increasing infections from life-threatening pathogens demand urgent attention (Murray et al. 2022).

Infectious diseases comprise a significant proportion of avertable disability and mortality (IHME 2020; UNICEF 2021). The top causes of the national infectious disease burden include HIV, TB, malaria, acute respiratory tract infections, and diarrheal diseases (WHO 2022a; Kenya National Bureau of Statistics 2022) (Table 2). Many of these diseases are preventable through vaccines already available or in development (WHO 2021; Plotkin et al. 2017).

Table 2. Infectious Disease Burden in Kenya

Rank[a]	Category	Percentage of total deaths	Percentage of total DALYs
1	Respiratory infections, TB	29.15	20.04
3	HIV/AIDS, STIs	9.23	9.81
8	Enteric infections	4.24	5.48
12	NTD, malaria	2.36	3.92
14	Other infectious diseases	2.21	2.57

Source: Global Burden of Disease (IHME 2025).
DALYs describes disease burden in terms of years of life lost prematurely and loss of productive years due to ill health.
a) Rank represents each infectious disease category's contribution to total DALYs compared to all other causes.
NTD – neglected tropical disease; STI – sexually transmitted infection
DALYs – disability-adjusted life years; TB – Tuberculosis; HIV – human immunodeficiency virus; AIDS – acquired immunodeficiency syndrome

THE ROLE OF VACCINES IN MITIGATING AMR

Vaccines are among the key strategies for fighting infectious diseases and reducing AMR. By preventing infections, they reduce the overall use of antimicrobials and, consequently, the selective pressure that drives resistance (Figure 1) (Laxminarayan et al. 2016).

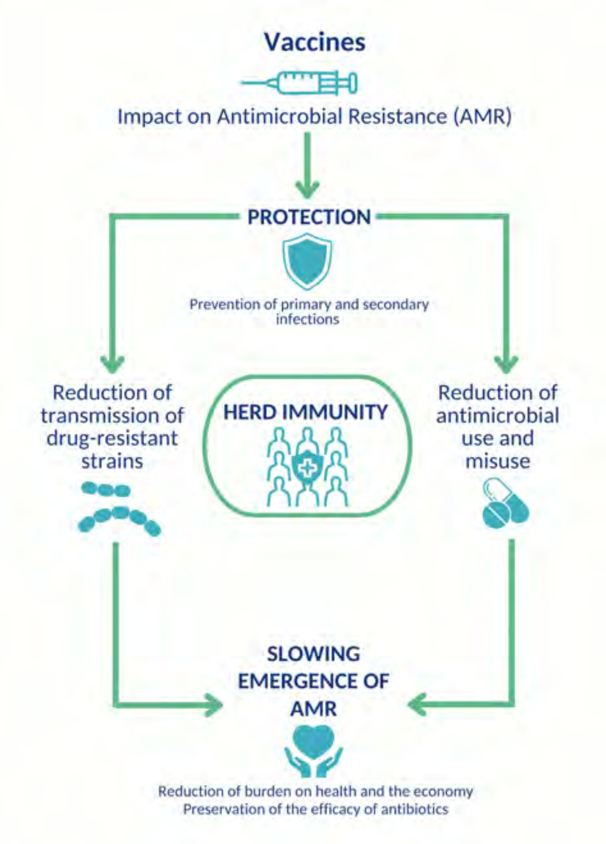

Figure 1. How vaccination reduces AMR burden
Source: Kalanxhi et al. 2023

The COVID-19 pandemic underscored the critical importance of vaccination, as the rapid development of safe and effective vaccines became an urgent global priority to curb the spread of the SARS-CoV-2 virus (WHO 2021; Corey et al. 2020). The pandemic demonstrated the power of coordinated scientific efforts to deliver effective vaccines in record time and highlighted their role in protecting populations and health systems.

Unlike antibiotics, which are designed against specific microbial targets and subject to rapid resistance development, vaccines typically target multiple antigens, making resistance much less likely (Rappuoli et al. 2017). Furthermore, the long duration of vaccine-induced protection and the benefits of herd immunity enhance their role as more sustainable and reliable tools than antibiotics in the fight against infectious diseases and AMR (Plotkin et al. 2017).

Kenya is facing the phased withdrawal of donor funding for antiretroviral medications, leading to increased viral replication, disease progression, and higher HIV-related morbidity and mortality. People living with HIV (PLHIV) are at higher risk of severe outcomes from opportunistic infections, such as influenza, pneumococcal disease, and hepatitis B (Samaha et al. 2024). These often lead to hospitalizations, prolonged illness, and increased antibiotic exposure, further driving AMR. Pneumococcal vaccines (PCV and PPSV23) significantly lower the incidence of IPD, a common cause of morbidity in PLHIV, especially in Africa, where *S. pneumoniae* is endemic (French et al. 2016). Adult vaccination needs to be mainstreamed, especially for those who have HIV, have chronic diseases, or are elderly, with weakened immunity.

VACCINE IMPACT ON AMR IN KENYA

Three large Phase 3 efficacy trials in Bangladesh, Malawi, and Nepal showed that TCV prevented 85, 84, and 79 percent of typhoid cases in children aged 9 months to 16 years, respectively (Qadri et al. 2021). KEMRI launched a Phase 3 trial of European Union TCV, a new candidate, in Kericho in 2022. Modeling studies predict that routine immunization with TCV at 9 months, along with a catch-up campaign up to age 15, could avert 46–74 percent of all typhoid cases in Gavi-supported countries and reduce antimicrobial-resistant typhoid by 16 percent (Birger et al. 2022). Over 10 years, TCV introduction is projected to avert 151,000 AMR cases and 1,266 deaths due to fluoroquinolone-nonsusceptible typhoid and 570,000 AMR cases and 4,674 deaths from multidrug-resistant typhoid fever (Birger et al. 2022), Table 3. In July 2025, Kenya added the TCV vaccine to its routine immunization schedule and launched a nationwide campaign to introduce the TCV to over 21 million children aged 9 months to 14 years (Kenya Ministry of Health 2025). The initiative aims to reduce drug-resistant typhoid (Kenya Ministry of Health 2025).

Table 3. Estimated Impact of Vaccines on AMR-Related Cases and Deaths

Vaccine	Averted AMR cases		Averted deaths		DALYs
	Number	%	Number	%	
TCV[a] (10-year prediction)	***Fluoroquinolone-nonsusceptible (FQNS) typhoid fever***				
Kenya[a]	151,000	71.2	1,266	76.3	65,000
Sub-Saharan Africa	6,819,000	68.8	65,762	65.8	3,093,000
Lower-income countries[b]	42,515,000	61	506,026	59.6	27,923,000
TCV[a] (10-year prediction)	***Multidrug-resistant (MDR) typhoid fever***				
Kenya	570,000	74.8	4,674	73.3	243,000
Sub-Saharan Africa	14,392,000	68	173,735	65.9	8,019,000
Lower-income countries[b]	21,218,000	65.8	342,725	71.5	16,508,000
TB[c] **vaccine** (15-year prediction)	***Rifampicin-resistant TB (RR-TB)***				
Kenya	2,100	8	460	6.3	—
Africa	66,000	7.7	18,000	6.5	—
Global[d]	620,000	10	119,000	7.3	—

Table 3. Estimated Impact of Vaccines on AMR-Related Cases and Deaths (continued)

Vaccine	Averted AMR cases		Averted deaths		DALYs
	Number	%	Number	%	
TB vaccine plus improved RR-TB management (15-year prediction)	*RR-TB*				
Kenya[c]	2,200	8.3	900	12	—
Africa	101,000	12	48,000	18	—
Global[d]	831,000	14	499,000	31	—

a) Estimates of typhoid conjugate vaccines on FQNS and MDR typhoid fever, Birger et al. (2022)
b) Average for 73 Gavi-eligible lower-income countries (Birger et al. 2022)
c) Estimates of the effect of TB vaccines with and without an additional improvement program for RR-TB management, Fu et al. (2021)
d) Average for the top 30 countries contributing 90 percent of global RR-TB burden (Fu et al. 2021)

Before PCV10 was introduced in 2011 in Kenya, the annual incidence of clinically defined pneumonia was 1,220 per 100,000. This was reduced to 329 per 100,000 when PCV10 was introduced in Kilifi County (Silaba et al. 2019). Reports indicate a 92 percent reduction in PCV10-type IPD among children under five and 74 percent among unvaccinated children aged 5–14 (Hammitt. 2019).

Projections suggest that if PCV use had ceased in 2022, the IPD incidence would nearly double by 2032, increasing from 8.5 to 16.2 per 100,000 due to waning population immunity (Ojal et al. 2019). Continuing the PCV program could prevent more than 101,513 cases and 14,329 deaths over the next decade.

In 2018, a Phase IIb trial of the M72/AS01E TB vaccine showed 50 percent efficacy (95 percent CI: 2–74 percent) in preventing pulmonary TB in infected adults aged 18–50 (Tait et al. 2019). If successfully deployed, this vaccine could significantly reduce TB incidence, lower antibiotic use, and help mitigate AMR in high-burden settings, such as Kenya (Table 3).

Before vaccine introduction, *Haemophilus influenzae* type B (Hib) was responsible for 50–60 percent of bacterial meningitis cases in Kenyan children under five (Cowgill et al. 2006). A study in Kilifi observed an 88 percent reduction in Hib meningitis post-vaccine; national data showed a more than 90 percent reduction in Hib pneumonia and meningitis in vaccinated children (Akumu et al. 2007). The vaccine has played a vital role in reducing antibiotic demand by preventing Hib infections.

A surveillance study on the impact of rotavirus vaccine (RV) in Kenya showed a 75.3 percent decline in monthly median acute gastroenteritis (AGE) cases (from 97 to 24) and a 53.4 percent reduction in rotavirus-specific AGE (Otieno et al. 2020). The largest reductions occurred in children under 12 months, the vaccine-eligible group. Between 2014 and 2033, RV is projected to prevent 60,935 deaths, 216,454 hospital admissions, and US$30 million in healthcare costs (Sigei et al. 2015). Table 4 summarizes the specific role of vaccines in reducing disease burden and AMR.

Table 4. Key Vaccines in Reducing Infectious Diseases and AMR in Kenya

Vaccine/ Disease	Key Findings	Impact/Projection	Source(s)
PCV10 (Pneumococcal infections)	Pre-2011 pneumonia incidence: 1,220/100,000; reduced to 329/100,000 post-PCV10	92 percent reduction in invasive pneumococcal disease (IPD) (5 yrs), 74 percent reduction in unvaccinated (5–14 yrs); stopping PCV could double IPD by 2032; continuation may prevent 101,513 cases and 14,329 deaths over 10 years	(Hammitt et al. 2019; Silaba et al. 2019; Ojal et al. 2019)
M72/AS01E (Tuberculosis [TB])	50 percent efficacy in adults (18–50 yrs) with latent TB	Could reduce TB burden and antibiotic use in Kenya	(Tait et al. 2019)
Hib *(Haemophilus influenzae* type B)	50–60 percent of meningitis cases in under-5s prevaccine	88 percent reduction in meningitis (Kilifi County); >90 percent national reduction in pneumonia & meningitis	(Cowgill et al. 2006; Akumu et al. 2007)
Rotavirus	75.3 percent drop in median monthly AGE cases (from 97 to 24); 53.4 percent drop in rotavirus-specific acute gastroenteritis	Projected to prevent 60,935 deaths, 216,454 hospitalizations	(Otieno et al. 2020; Sigei et al. 2015)

THE ECONOMIC IMPACT OF VACCINES

The economic burden of AMR is substantial, straining healthcare systems and national economies. Investing in vaccines offers a cost-saving intervention by reducing the incidence of resistant infections and the associated treatment expenses, as summarized in Table 5.

Table 5. Cost-Effectiveness and Projected Impacts of Vaccination Strategies in Kenya

Vaccine/ Intervention	Target Disease/Outcome	Economic/Cost-Effectiveness Findings	Reference
Pneumococcal Conjugate Vaccine (PCV)	Invasive pneumococcal disease	Incremental cost per DALY averted: **US$153** (95 percent PI: US$70–411). Transitioning to PCV13 improves cost-effectiveness ratios by approximately **20 percent**, and including indirect effects (e.g., herd immunity) further enhances cost-effectiveness by **43–56 percent**.	(Ojal et al. 2019; Ayieko et al. 2013)
Rotavirus Vaccine (2-dose series)	Rotavirus infection (diarrhea in children <5 years)	Vaccination can avert 60,935 deaths and 216,454 hospital admissions, among children <5 years. Over 20 years, US$80 million vaccine investment would save the government US$30 million in healthcare costs and US$38 per DALY averted.	(Tate et al. 2009; Sigei et al. 2015)
Malaria Vaccine	Malaria (in children and infants)	Incremental cost-effectiveness ratio: **US$200 and US$225 per DALY averted** for child and infant vaccination, respectively. These ratios represent **14 and 17 percent** of the gross domestic product per capita thresholds, respectively, indicating high cost-effectiveness.	(Ochieng 2023; Sauboin et al. 2019)
M72 TB Vaccine	Pulmonary TB	Over 25 years, a vaccine with at least 50 percent efficacy could prevent up to **76 million new cases and 8.5 million deaths.** It could also avert **42 million courses of antibiotic treatment** and prevent **US$41.5 billion** in TB-related catastrophic household costs.	(Otieno et al. 2020; Sigei et al. 2015)
***Haemophilus influenzae* type B (Hib) Vaccine**	Hib disease (meningitis, invasive disease, pneumonia in children <5 years)	Cost per discounted DALY averted: **US$38.** Cost per death averted: **US$1,197.** Determined to be a cost-effective intervention.	(Tate et al. 2009; Sigei et al. 2015)
Measles Vaccination Outreach	Measles in hard-to-reach children	Cost per DALY averted was estimated at **US$76** when 25 percent received measles-containing vaccine (MCV) and **US$122** when 50 percent received MCV.	(Tate et al. 2009; Sigei et al. 2015)

IMMUNIZATION PROGRAMS IN KENYA

Kenya has made immunization a health priority, introducing new vaccines ahead of many other low- and middle-income countries in sub-Saharan Africa, such as PCV in 2011 and RV in 2014 (Sambala et al. 2019). As of 2020, the routine childhood immunization schedule included one dose each of Bacillus Calmette-Guérin and oral polio vaccine (OPV) at birth; three doses each of diphtheria–tetanus–whole cell pertussis–*Hemophilus influenzae* type b–hepatitis B (pentavalent), OPV, and PCV at 6, 10, and 14 weeks; two doses of RV at 6 and 10 weeks; one dose of inactivated polio vaccine at 14 weeks; and two doses of measles and rubella at 9 and 18 months (Janusz et al. 2021). Although vaccine coverage is heterogeneous, some vaccines have achieved high rates, as shown in Figure 2.

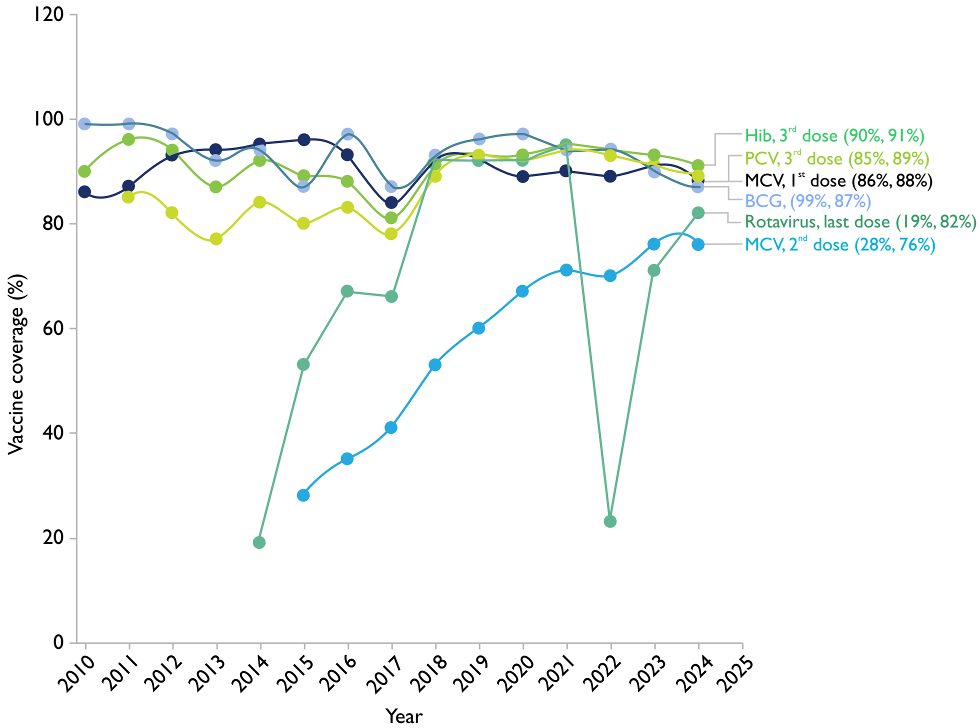

Figure 2: Vaccination Coverage for Selected Vaccine-Preventable Diseases in Kenya (2010–2024)

Values in brackets indicate coverage at the initial year of reporting and most recently (2024). The graph was generated based on the World Health Organization WUENIC (2025) immunization coverage data.

Table 6. Insights and Recommendations from the GARP - Kenya Technical Working Group

Category	Issue	Intervention
1. Policy and Strategic Planning		
Policy and Strategic Goals	Weak implementation of AMR and vaccine policies	Develop actionable, measurable policies and create advocacy networks.
One Health Approach	Lack of coordination across sectors	Foster multisectoral collaboration (human, veterinary, environmental health).
2. Antibiotic Use and Antimicrobial Resistance (AMR)		
Antibiotic Use	Poor regulation, high cost and lack of policy guidelines	Develop antimicrobial guidelines and national frameworks modeled after TB/HIV programs.
AMR Threat	Low awareness and poor policymaker engagement	Conduct awareness campaigns and data-driven advocacy.
Hospital Oversight	Overprescription and weak stewardship policies	Enforce stewardship, train staff, and strengthen pharmacy boards.
Inappropriate Treatment	Inadequate outpatient care	Strengthen outpatient and emergency care systems.
3. Health System Strengthening		
Limited County Hospital Resources	Limited diagnostics and reliance on first-line drugs	Improve diagnostics, and streamline treatment options.
Diagnostics	Dependence on clinical diagnosis	Invest in rapid diagnostics
Funding and Resources	High cost of diagnostics and vaccines	Secure sustainable funding, and integrate vaccines in insurance schemes.
4. Vaccine Challenges and Opportunities		
Vaccine Development & Self-Reliance	Dependence on foreign suppliers	Promote local manufacturing and technology transfer.
Vaccine Hesitancy	Cultural resistance and misinformation	Engage community/religious leaders, and fund tailored advocacy campaigns.
Stakeholder Engagement	Weak engagement for universal vaccination	Involve insurers, youth groups, and community promoters.
Targeted Vaccination Programs	Lack of coordination across sectors	Foster multisectoral collaboration (human, veterinary, environmental health).
5. Education and Awareness		
Education and Public Awareness	Misinformation among public and healthcare workers	Educate both groups on AMR, vaccine benefits, and appropriate antibiotic use.

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Initiated in 2008, the Global Antibiotic Resistance Partnership (GARP) has played a critical role in advancing country-led national strategies and policies to address antimicrobial resistance (AMR) in several countries in Africa and Asia.

GARP's current focus is generating cross-disciplinary evidence highlighting the impact of vaccines on AMR in country-specific contexts.

This policy brief lays out the situation in Kenya and recommends policy measures to use vaccines as tools to control AMR in the country.

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One Health Trust
5636 Connecticut Ave NW
PO Box 42735
Washington, DC, 20015
United States of America

One Health Trust, India
Nimay Valley, Site No.47
Motlur Cross, Jadalathimmanahalli,
Chikkaballapur,
Karnataka – 562103, India