

VACCINE DELIVERY RESEARCH DIGEST

UNIVERSITY OF WASHINGTON STRATEGIC ANALYSIS,
RESEARCH & TRAINING (START) CENTER

REPORT TO THE GATES FOUNDATION

PRODUCED BY: NOLAN, S. & SHARMA, M.

NOVEMBER 2025

Want the Vaccine Delivery Research Digest delivered directly to your inbox?

Subscribe on the Digest website: <http://uwstartcenter.org/publication-digests/vaccine-digest>

List of Articles

- 1 Advancing typhoid conjugate vaccine implementation in Asia: Regional policy priorities.
{[Abstract & START Commentary](#)} {[Full Article](#)}
 - Regional stakeholders examined typhoid burden, surveillance gaps, and key considerations for TCV introduction in Asia.
- 2 General knowledge and attitude of healthcare professionals and infrastructural readiness prior to implementation of malaria vaccine in selected hospitals in Tororo district, Uganda: a cross-sectional study.
{[Abstract & START Commentary](#)} {[Full Article](#)}
 - Health care professionals in Uganda report limited knowledge and inadequate system preparedness for the R21 rollout.
- 3 Harnessing artificial intelligence and digital technology for enhancing routine immunization among zero-dose children.
{[Abstract & START Commentary](#)} {[Full Article](#)}
 - AI-driven tools offer a wide range of applications to identify zero-dose children, support outreach efforts, and guide resource allocation.
- 4 Operationalizing African self-reliance in vaccine manufacturing.
{[Abstract & START Commentary](#)} {[Full Article](#)}
 - A seminar series underscored the need for sustainably funded, locally led vaccine manufacturing in Africa to address global inequities.
- 5 Innovative and sustainable solutions for reducing ‘zero-dose’ vaccination: How can the region respond?
{[Abstract & START Commentary](#)} {[Full Article](#)}
 - This discussion assessed the regional status of zero dose and exchanged strategies for reaching vulnerable populations.
- 6 Associations between integrated family planning, maternal and newborn health, and immunization services and adoption of postpartum family planning and immunization services in Ethiopia.
{[Abstract & START Commentary](#)} {[Full Article](#)}

- Integrated counseling during maternal and newborn health visits improved postpartum contraceptive use and infant vaccination in Ethiopia.
- 7 Caregiver experiences and perceptions of childhood vaccination information and messaging - a qualitative study in the urban informal settlements of Nairobi, Kenya.
{[Abstract & START Commentary](#)} {[Full Article](#)}
 - This qualitative study gathers key insights to improve childhood vaccination messaging from caregivers in informal settlements in Nairobi.
 - 8 Multilevel Analysis of Zero-Dose Children in Sub-Saharan Africa: A Three Delays Model Study.
{[Abstract & START Commentary](#)} {[Full Article](#)}
 - This multilevel analysis determines the prevalence of determinants of zero-dose in sub-Saharan Africa.
 - 9 Health economics and vaccine financing in the eastern Mediterranean region: A needs assessment.
{[Abstract & START Commentary](#)} {[Full Article](#)}
 - This regional survey evaluates how health economics and vaccine financing are integrated into EMR immunization programs.
 - 10 Unlocking insights from complex data: Leveraging heat maps for decision-making in LMIC.
{[Abstract & START Commentary](#)} {[Full Article](#)}
 - This study explores various applications of spatial heat maps for public health decision-making in Pakistan.
 - 11 Stakeholders' perspectives on lessons learnt from HPV mass vaccination in Nigeria.
{[Abstract & START Commentary](#)} {[Full Article](#)}
 - This is a qualitative review of community-driven strategies in Nigeria's HPV vaccination campaign.
 - 12 Routine immunisation coverage in the context of seasonal influenza vaccine introduction for children in Nakuru and Mombasa counties in Kenya, 2019-21: an observational study.
{[Abstract & START Commentary](#)} {[Full Article](#)}
 - This study evaluates how introducing seasonal childhood influenza vaccination in Kenya affected routine immunization coverage.

13 Bridging innovation and policy: comparative pathways of national vaccine development in low- and middle-income countries.

{[Abstract & START Commentary](#)} {[Full Article](#)}

- This review demonstrates how four LMICs built vaccine self-reliance during COVID-19.

[Additional Articles of Interest](#)

[Appendix](#)

Details of Articles

1. [Advancing typhoid conjugate vaccine implementation in Asia: Regional policy priorities.](#)

Carter A, Steele D, John J, Saha S, Laurens M, Minta A, et al.

Vaccine. 2025 Nov 01;66:127848.

PubMed ID: 41092802

ABSTRACT

Typhoid fever, a type of enteric fever transmitted through consumption of food or water contaminated with *Salmonella enterica* subspecies Typhi, continues to cause illness in Asia. Since the World Health Organization recommended use of typhoid conjugate vaccines in 2018, several countries have introduced or begun the decision-making process to use the vaccine in campaigns or by introduction into the routine immunization schedule. This paper describes the disease burden and vaccine implementation policy setting in the region, based on presentations and discussions at the second Asia Regional Meeting on Typhoid & TCV. Moving forward, typhoid control efforts must prioritize 1) working across health and finance ministries to finance vaccination programs, 2) strengthening surveillance to better understand disease burden, drug resistance trends, and vaccine impact, 3) developing improved diagnostic tests, 4) stewarding antimicrobial use to slow the spread of drug resistance, and 5) evaluating the durability of TCV protection.

WEB: [10.1016/j.vaccine.2025.127848](https://doi.org/10.1016/j.vaccine.2025.127848)

IMPACT FACTOR: 3.5

CITED HALF-LIFE: 8.2

START COMMENTARY

This article discusses how regional coordination is shaping typhoid conjugate vaccine (TCV) introduction efforts across Asia. The second Asia Regional Meeting on Typhoid & TCV brought together 75 key stakeholders representing Ministries of Health, national immunization advisory group (NITAG) members, and researchers to review updated burden data, emerging surveillance methods, and considerations for TCV rollout. Participants discussed the expanding development pipeline for new, multivalent vaccines targeting typhoid, paratyphoid, and iNTS which would offer broad protection against multiple pathogens which can be difficult to distinguish clinically. Participants also noted that TCV introduction can require at least two years of lead time so countries are encouraged to plan early so that subsidies can be provided during their Gavi eligibility window and discussed strategies to tackle increasing antimicrobial resistance.

Drivers of TCV introduction include increased awareness of typhoid, stronger evidence of disease burden and potential of vaccination, cost-effectiveness analyses, and concerns about increasing antimicrobial resistance. Barriers include competing vaccine priorities, increasingly crowded vaccination schedules, and the need for more data on TCV co-administration with other routine vaccines. Next steps center on improving subnational burden of disease data, strengthening diagnostics for clinical and surveillance use, and identifying opportunities to align TCV rollout with other immunization activities.

[Return to List of Articles](#)

2. [General knowledge and attitude of healthcare professionals and infrastructural readiness prior to implementation of malaria vaccine in selected hospitals in Tororo district, Uganda: a cross-sectional study.](#)

Asio L, Besigye I, Puleh S, Nazziwa N, Ocan M.

BMC Public Health. 2025 Oct 10;25(1):3437.

PubMed ID: 41068667

ABSTRACT

BACKGROUND: The introduction of malaria vaccines (RTS, S/SA01 and R21/Matrix-M) in malaria control brings hope for malaria burden reduction globally. Uganda is one of the countries that applied for support to introduce R21 malaria vaccine and expects to commence with its implementation in April/May 2025. However, as the country prepares for R21 malaria vaccine rollout, the extent to which hospitals are ready for its implementation remains unclear. This study therefore assessed the general knowledge, attitudes of all healthcare professionals regardless of their role in providing immunization services and infrastructural readiness prior to rolling out of R21 malaria vaccine in an endemic setting, Tororo district.

METHODS: This cross-sectional study was conducted at Tororo General hospital and St. Anthony Hospital in Tororo district. Data was collected before the vaccine was rolled out through interviews with purposively selected healthcare professionals irrespective of their role in vaccination programs. Additional data was collected through inspection of the hospital infrastructure for malaria vaccine implementation. Data on healthcare professionals' knowledge and attitudes was collected using self-administered questionnaires, while a checklist was used to capture data on the availability and functional state of the infrastructure in hospitals for vaccine roll-out. Fully completed questionnaires were entered into Epi-data version 4.7 for coding and cleaning, thereafter exported to STATA version 16 for analysis.

RESULTS: A total of 211 healthcare professionals were included into the study. The study participants had predominantly negative attitudes towards the malaria vaccine, with 70% (147/211, 95% CI: 63-76) displaying unfavorable attitudes compared to 30% (64/211, 95% CI: 25-37) with positive attitudes, and the overall mean score (SD) of 3.30 (0.489)., many of whom expressed concerns about its affordability, accessibility and effectiveness. Knowledge on the malaria vaccine was notably low, with 99% (208/211, 95% CI: 96-100) of respondents demonstrating poor knowledge, while only 1% (3/211, 95% CI: 0.5-4.4) had good knowledge.

CONCLUSION: The knowledge gap coupled with negative attitudes on malaria vaccine were prevalent among all healthcare professionals prior to the roll-out of R21 vaccine in Tororo district. There was limited preparedness as regards the infrastructure required for the malaria vaccine

implementation. The Ministry of Health should consider conducting targeted training programs for all healthcare professionals and provision of additional essential infrastructure to accommodate the inclusion of the malaria vaccine roll-out with other routine vaccines.

WEB: [10.1186/s12889-025-24545-8](https://doi.org/10.1186/s12889-025-24545-8)

IMPACT FACTOR: 3.6

CITED HALF-LIFE: 5.4

START COMMENTARY

The authors conducted a cross-sectional survey in a district with a high malaria burden to assess the readiness of Uganda's health care system as the country prepares for R21 vaccine rollout. Findings revealed low knowledge and generally negative attitudes toward the vaccine among health care professionals (HCPs). Nearly all HCPs had never heard of R21 and were unaware of its storage requirements, dosing schedule, or administration. The authors attribute this the malaria vaccine not yet having been implemented at the time of the survey, meaning participants had not yet received training on the vaccine. Infrastructure assessments also showed limited readiness. No additional amenities, equipment, or personnel had been prepared to support the new vaccine introduction. Refrigerators at participating sites were filled with routine vaccinations with minimal space to accommodate others, and only a small number of staff were dedicated to routine child immunizations. Facilities also lacked essential tools such as communication equipment, transportation resources, and immunization tallying materials. A key strength of this study is its focus on HCP knowledge, as much existing research centers on caregiver acceptance. However, the small number of study sites may limit generalizability. Findings emphasize the need for early information dissemination, targeted HCP training, and strengthened cold chain and reporting systems prior to R21 rollout in Uganda.

[Return to List of Articles](#)

3. [Harnessing artificial intelligence and digital technology for enhancing routine immunization among zero-dose children.](#)

Taseen S, Yousafzai M, Qureshi M.

Digit Health. 2025 Oct 03;11:20552076251382086.

PubMed ID: 41041463

ABSTRACT

OBJECTIVE: "Zero-dose children" remain a crucial burden to global health, particularly in low- and middle-income countries (LMICs) where vulnerable children have limited access to immunizations. This review explores the transformative potential of artificial intelligence (AI) in addressing this challenge and examines how AI can enhance routine childhood immunization.

METHODOLOGY: This narrative review synthesizes literature on AI, digital health innovations, vaccine delivery, and public health informatics. Literature was sourced from PubMed, Scopus, and Google Scholar, as well as institutional and authoritative reports such as the World Health Organization, the United Nations Children's Fund (UNICEF), and Gavi, the Vaccine Alliance.

RESULTS: AI applications have demonstrated utility in identifying zero-dose populations, optimizing vaccine delivery, and supporting data-driven decision-making. Tools such as digital health passports, predictive analytics, and real-time monitoring platforms (e.g. UNICEF's real-time vaccination monitoring and analysis) enhance immunization tracking and reduce inequities. AI-driven chatbots, mobile applications, and social listening tools address vaccine hesitancy by providing tailored communication and combating misinformation. Furthermore, geographic information systems (GISs) and AI-based behavioral analysis improve outreach to underserved populations. However, challenges remain, including data quality, scalability, and ethical considerations.

CONCLUSION: AI solutions allow efficient identification of potential pockets of non-vaccinated populations, enhance decision-making processes based on data, and reduce vaccine skepticism due to AI-based interventions. Examples of successful implementation of AI include digital health passports, continuous monitoring mechanisms, and GISs for vaccine administration and coverage. This review also discusses the challenges and ethical considerations associated with AI implementation in LMICs, as well as the ethical implications. Using the insights derived from the review, this paper calls for the targeted utilization of AI toward the realization of a healthier future for children in need to achieve the target of reducing the number of zero-dose children by 50% by the year 2030, not only in areas afflicted by immunization disparities but across the globe.

WEB: [10.1177/20552076251382086](https://doi.org/10.1177/20552076251382086)

IMPACT FACTOR: 3.3

CITED HALF-LIFE: 2.3

START COMMENTARY

This review outlines how methods in which AI can support routine immunization systems for zero-dose children in LMICs including predictive analytics, digital health platforms, behavioral tools, and supply-chain management. Notable applications include intelligent vaccine-reminder systems that tailor vaccine notification to caregivers by adjusting tone, language, and content based on parent's prior engagement with reminders. These tools also incorporate digital incentives and use gamification and social motivators to improve adherence. The review also notes that GIS-integrated AI tools can provide spatial mapping of vaccination coverage, population distribution, and health care infrastructure. AI tools use these capabilities to find zero-dose clusters, support microplanning and guide resource allocations in remote or underserved areas. AI-supported GIS systems can help programs plan outreach routes and target services efficiently by analyzing terrain, road networks, and access constraints. A key strength of this study is the comprehensive coverage of diverse AI tools and use cases. However, most examples are derived from small or context-specific pilots which limits generalizability. Larger, multi-setting evaluations are needed to assess long-term performance, scalability, and cost-effectiveness. The authors note that input data quality issues in LMIC settings remain a major barrier to effective AI use. Hybrid approaches that combine AI tools with human oversight, including CHW-supported data validation, may help mitigate these challenges.

[Return to List of Articles](#)

4. [Operationalizing African self-reliance in vaccine manufacturing.](#)

Mwila C, Ekström A, Kampmann B, Swartling Peterson S, Alexander N, Dereje N, et al.

Glob Health Action. 2025 Oct 03;18(1):2560209.

PubMed ID: 41040058

ABSTRACT

The COVID-19 pandemic underscored Africa's urgent need for vaccine security and self-reliance. In response, the African Union and Africa Centers for Disease Control and Prevention (CDC) established the Framework for Action (FFA) through the Platform for Harmonized African Health Products Manufacturing (PHAHM), with a goal of 60% local vaccine production by 2040. During 2024, Africa CDC, Karolinska Institutet, and Charité Universitätsmedizin Berlin organized a seminar series to discuss advancing this agenda, including a multidisciplinary international expert panel. The series concluded that achieving this requires a comprehensive approach to addressing gaps in the ecosystem, including research and development (R&D), workforce development, technology transfer, regulatory systems, demand creation, and coordination. Strengthening R&D entails investment, capacity building, and equitable academic partnerships. A skilled workforce is essential, necessitating a coordinated approach through Regional Capability and Capacity Networks (RCCNs), training of vaccine manufacturing personnel, and academic programmes for sustainable workforce development. Technology transfer requires building trust between technology holders and recipients, alongside a supportive environment for knowledge exchange. Robust regulatory frameworks, including regional harmonization and strengthened National Regulatory Authorities (NRAs), are crucial for vaccine quality and safety, with the Africa Medicines Agency (AMA) providing oversight. Necessary market shaping through demand creation is achieved by advocating for procurement of locally produced vaccines, enhancing outreach for public trust, and operationalizing the African Pooled Procurement Mechanism (APPM). Coordination mechanisms are needed to optimize resource allocation, promote information sharing, and avoid redundancy. Strategic investments and policy support will be instrumental in achieving Africa's vaccine manufacturing aspirations and long-term health security.

WEB: [10.1080/16549716.2025.2560209](https://doi.org/10.1080/16549716.2025.2560209)

IMPACT FACTOR: 2.6

CITED HALF-LIFE: 7.7

START COMMENTARY

A multi-organization seminar series examined barriers and opportunities for strengthening vaccine security and self-reliance in Africa. Discussions considered how the mpox emergency in Africa

mirrors inequities observed during the COVID-19 pandemic in which low-income countries faced delayed access to vaccines due to limited purchasing power and stockpiling of vaccines in high-income countries. New constraints involve humanitarian aid cuts that limit vaccine procurement and distribution and scale up of near-point-of-care diagnostics. The series emphasized the importance of investing in and building local manufacturing operations grounded in strong academic partnerships, capacity building across African institutions, and equitable collaborations between universities in the Global North and Global South. Achieving sustainable, autonomous vaccine production will require sustained funding from African governments and support from entities like Gavi's African Vaccine Manufacturing Accelerator.

[Return to List of Articles](#)

5. [Innovative and sustainable solutions for reducing 'zero-dose' vaccination: How can the region respond?](#)

Abdel Majeed Z, Ahmad N, Mere O, Farrukh S, Mohsni E, Derow M, et al.

Front Public Health. 2025 Oct 02;13:1652977.

PubMed ID: 41036126

ABSTRACT

BACKGROUND: This roundtable focused on the challenge of reaching zero-dose children in the Eastern Mediterranean Region (EMR) amid declining immunization rates and increasing health disparities. 'Zero-dose' children are concentrated in high-conflict or underserved areas, such as Pakistan, Afghanistan, Sudan, and Yemen, making them particularly vulnerable to vaccine-preventable diseases. This discussion convened key stakeholders, including public health experts, EPI managers, and representatives from organizations like WHO, Gavi, and CDC, to explore effective, sustainable solutions for reducing 'zero-dose' prevalence in the EMR.

PURPOSE: The roundtable aimed to assess regional barriers to immunization, examine country-specific initiatives to reach 'zero-dose' children, and recommend targeted strategies that align with global immunization goals, such as the Immunization Agenda 2030.

METHOD: Through expert presentations, panel discussions, and participant interaction, attendees analyzed key causes of 'zero-dose' prevalence, focusing on conflict-related disruptions, health system fragility, and socioeconomic challenges. Comparative insights were drawn from other regions, highlighting adaptable solutions from Sub-Saharan Africa and other high-burden areas.

RESULTS: Findings indicated that conflicts, infrastructure limitations, and social barriers are major drivers of low vaccination rates. Approximately 2.85 million 'zero-dose' children were identified in the EMR, primarily concentrated in a few high-burden countries. Country-specific efforts, such as the "Big Catch-Up" campaign, were acknowledged for their impact, but gaps in sustainable funding and operational capacity remain. Strategies focusing on community engagement, data-driven microplanning, and integration of immunization with broader health services were recommended to overcome access challenges.

CONCLUSION: To reach 'zero-dose' children, coordinated, tailored approaches are essential. Community-driven microplanning and enhanced political and financial support can bolster immunization efforts in fragile settings. The roundtable underscored the role of primary health systems in addressing vaccination gaps, contributing to universal health coverage, and fostering resilience in conflict-affected areas. Future policies should prioritize collaboration among sectors, sustainable funding, and innovative outreach to achieve immunization equity across the EMR.

WEB: [10.3389/fpubh.2025.1652977](https://doi.org/10.3389/fpubh.2025.1652977)

IMPACT FACTOR: 3.4

CITED HALF-LIFE: 2.7

START COMMENTARY

This roundtable discussion held by the Eastern Mediterranean Public Health Network (EMPHNET) assessed the regional status of zero-dose children, discussed efforts to reach these children, and facilitated the exchange of lessons learned between participating countries. A central theme was the role of sociopolitical instability and conflict as major drivers of zero-dose prevalence. Insights from countries experiencing conflict revealed that integrated health campaigns that address other issues in addition to vaccination can be especially effective. Somalia's integration of maternal and child health services with immunization as part of polio eradication efforts was highlighted as a successful model of this strategy. Participants also encouraged establishing partnerships with private sector actors to strengthen vaccine supply chains and expand access to robust data systems. These partnerships can help ensure sufficient vaccine stock and support operational continuity in fragile settings. Additionally, accurate regional data collection is essential to identify needs and coverage gaps, especially in regions where poor health infrastructure leads to variability in vaccine coverage. Stakeholders encouraged the use of cost-effective digital health tools for data collection to enable accurate, real-time insights and to enable health workers to adjust outreach strategies based on emerging needs. Future efforts could address gaps in sustaining community engagement during crises, measuring long-term impact of integrated service delivery, and designing resilient data systems that can function amid infrastructure disruptions.

[Return to List of Articles](#)

6. [Associations between integrated family planning, maternal and newborn health, and immunization services and adoption of postpartum family planning and immunization services in Ethiopia.](#)

Tiruneh G, Hunegnaw B, Enkubahiri S, Bogale B, Shewangzaw T, Fesseha N, et al.

BMC Public Health. 2025 Oct 02;25(1):3258.

PubMed ID: 41034791

ABSTRACT

BACKGROUND: Over the past 30 years, Ethiopia has significantly invested in its primary health care (PHC) system, improving access to health services and overall health outcomes. However, gaps persist in delivering comprehensive reproductive, maternal, newborn, and child health (RMNCH) services. Although Ethiopia's policy framework supports integrated PHC services, RMNCH programs often operate independently, resulting in fragmented care and missed opportunities, especially in rural and pastoral regions with limited access. This study examined current practices in integrated service delivery and the association between integrated service delivery and the adoption of postpartum family planning (PPFP) and immunization services.

METHODS: From July to August 2024, we conducted formative implementation science research utilizing household surveys and facility assessments. A stratified multistage sampling technique recruited 1,922 women with infants ages 0-11 months across agrarian and pastoral regions, along with data from 67 facilities. The study assessed the association between integrated family planning, maternal and newborn health, and immunization service delivery with postpartum family planning and immunization practices in Ethiopia. Data were analyzed using Stata 15.1, employing Pearson's chi-square test, post-stratification sampling weights, and random-intercept logistic regression models to estimate associations between individual- and community-level variables and the likelihood of adopting PPFP and child vaccination.

RESULTS: Overall, the availability and integration of essential job aids and services varied considerably by setting, with pastoral areas consistently showing lower coverage across RMNCH touchpoints. Approximately 45% of mothers adopted PPFP, with significant regional variations, particularly lower rates in pastoral areas. About one-third received PPFP counseling during antenatal care contacts, and over three-fourths received immunization counseling during childbirth. Women who received counseling about PPFP during childbirth had 2.6 times higher odds of adoption (AOR: 2.60; 95% CI: 1.61-4.20), while those counseled during both antenatal care (ANC) and childbirth had four times higher odds (AOR: 4.06; 95% CI: 2.49-6.63). Counseling on immunization during or after childbirth increased child vaccination odds threefold (AOR: 3.39; 95% CI: 1.80-6.41), while women who did not receive integrated services during childbirth had 78% lower odds of vaccination (AOR:

0.22; 95% CI: 0.14-0.34). Women in agrarian communities and those receiving postpartum care within six weeks also had higher odds of adopting PPFP and vaccination services.

CONCLUSIONS: The study highlights observed associations between service integration and uptake of maternal and child health services, indicating variation across contexts and the importance of considering these patterns in efforts to improve service delivery.

WEB: [10.1186/s12889-025-24576-1](https://doi.org/10.1186/s12889-025-24576-1)

IMPACT FACTOR: 3.6

CITED HALF-LIFE: 5.4

START COMMENTARY

This study examined whether integrating family planning, maternal and newborn health (MNH), and immunization services affects postpartum family planning (PPFP) use and infant vaccination in agrarian and pastoral areas of Ethiopia. Integration of services at MNH contact points was associated with four times higher odds of PPFP use and child vaccination. In contrast, PPFP counseling offered only during antenatal care did not significantly impact contraceptive uptake. Women in pastoral communities were less likely to receive integrated counseling and had lower use of contraception and immunization services. This gap is due to limited autonomy, traditional beliefs, and health system barriers. The cross-sectional design of this study limits causal inference and there is potential for maternal recall bias, additionally the focus on selected regions limits generalizability. The findings underscore frequent missed opportunities to deliver integrated counseling at delivery and early child-care visits and suggest that repeated counseling across multiple MNH touchpoints is more influential than ANC counseling alone. Further implementation research is needed to identify context-appropriate integrated strategies, especially in underserved pastoral communities.

[Return to List of Articles](#)

7. [Caregiver experiences and perceptions of childhood vaccination information and messaging - a qualitative study in the urban informal settlements of Nairobi, Kenya.](#)

Gichuki J, Ngoye B, Wafula F.

BMC Public Health. 2025 Oct 01;25(1):3184.

PubMed ID: 41029367

ABSTRACT

BACKGROUND: Despite overall progress in childhood vaccination, disparities remain across socioeconomic groups, with children from low-income communities experiencing lower coverage rates. Vaccination communication plays an important role in building trust and enhancing knowledge and awareness about the importance of vaccination. Vaccination communication strategies can shape how caregivers interpret or act on immunization messages. Previous evidence highlights gaps in vaccination messaging, especially in low-resource settings. Developing effective messaging requires careful consideration of caregiver beliefs and social dynamics. Exploring caregiver perceptions of various vaccination messaging strategies as well as the sources from which they receive this information is essential in improving childhood vaccination uptake.

PURPOSE: This study explored caregiver experiences and perceptions of childhood vaccination information and messaging in a low-income urban setting in Nairobi, Kenya.

METHODS: Five focus group discussions (FGDs) were conducted with female and male caregivers of children under five to explore their experiences and perceptions of childhood vaccination information and messaging. A picture elicitation exercise explored caregiver perceptions of different visual communication techniques. The FGD audio recordings were transcribed verbatim in Swahili and then translated into English. An inductive coding process was used to review and summarize the transcripts into major thematic areas.

RESULTS: Thirty-nine caregivers participated in the FGDs. Primary sources of information on vaccination included one-on-one communications with healthcare workers, mass media, mother/child booklets, and door-to-door visits by community health volunteers. These sources helped to shape caregivers' perceptions by providing information and reminders about vaccination. Participants identified healthcare workers and community health volunteers as trusted messengers in delivering vaccine information. Most participants expressed the need for more in-depth vaccine information to assist in decision-making. Findings highlighted the need for clarity and simplicity in messaging and the role of emotional appeal in vaccination images and messaging.

CONCLUSION: The findings underscore the importance of tailoring childhood vaccination communication strategies to resonate with caregivers' diverse needs and preferences. An ongoing

and responsive approach to incorporating caregiver feedback in developing health messaging can ensure that communication strategies support caregiver needs. Healthcare workers and community health volunteers must also be equipped with practical communication tools and training to support caregivers in making informed vaccination decisions for their children.

WEB: [10.1186/s12889-025-24512-3](https://doi.org/10.1186/s12889-025-24512-3)

IMPACT FACTOR: 3.6

CITED HALF-LIFE: 5.4

START COMMENTARY

This study conducted focus group discussions (FGDs) to assess caregiver perceptions of childhood vaccination communication and messaging in informal settlements in Nairobi. All participants felt the information they received on vaccinations was inadequate, stating that most of the information focused only on the vaccine schedule. Participants desired more in-depth information on the vaccines themselves, vaccine preventable disease, and side-effects. Notably, male caregivers reported feeling uninformed and excluded by existing communication efforts, highlighting the need for male inclusion in messaging. When FGDs explored reactions to messaging materials, participants responded especially positively to images portraying male support in childcare. A key strength of the study is its purposive sampling across areas with varying coverage and inclusion of caregivers with both timely and delayed vaccination histories, helping to capture a range of perspectives. However, its focus on one urban setting and reliance on CHVs for recruitment may limit generalizability. Overall, the findings argue for revising vaccine communication content to support informed decision-making and adopting gender-responsive strategies, including male champions and targeted community platforms, to strengthen uptake.

[Return to List of Articles](#)

8. [Multilevel Analysis of Zero-Dose Children in Sub-Saharan Africa: A Three Delays Model Study.](#)

Wiysonge C, Uthman M, Ndwandwe D, Uthman O.

Vaccines (Basel). 2025 Sep 27;13(9).

PubMed ID: 41012190

ABSTRACT

BACKGROUND: Zero-dose children represent a critical challenge for achieving universal immunization coverage in sub-Saharan Africa. This study applies the Three Delays Model to examine multilevel factors associated with zero-dose children.

METHODS: We analyzed data from 30,500 children aged 12-23 months across 28 sub-Saharan African countries using demographic and health surveys (2015-2024). Zero-dose status was defined as not receiving the first dose of diphtheria-tetanus-pertussis vaccine. Multilevel logistic regression models examined individual-, community-, and country-level determinants.

RESULTS: Overall, zero-dose prevalence was 12.19% (95% confidence interval: 11.82-12.56), ranging from 0.51% in Rwanda to 40.00% in Chad. Poor maternal health-seeking behavior showed the strongest association (odds ratio (OR) 12.00, 95% credible interval: 9.78-14.55). Paternal education demonstrated clear gradients, with no formal education increasing odds 1.52-fold. Maternal empowerment factors were significant: lack of decision-making power (OR = 1.23), financial barriers (OR = 1.98), and no media access (OR = 1.32). Low community literacy and low country-level health expenditure were associated with increased zero-dose prevalence. Substantial clustering persisted at community (19.5%) and country (18.7%) levels.

CONCLUSIONS: Zero-dose children concentrate among the most disadvantaged populations, with maternal health-seeking behavior as the strongest predictor. Immediate policy actions should integrate antenatal care with vaccination services, target high-parity mothers, eliminate financial barriers, and increase health expenditure to 15% of national budgets.

WEB: [10.3390/vaccines13090987](https://doi.org/10.3390/vaccines13090987)

IMPACT FACTOR: 3.4

CITED HALF-LIFE: 2.8

START COMMENTARY

This cross-sectional study analyzed multilevel determinants of zero-dose children in sub-Saharan Africa using DHS data. Authors used the Three Delays Model, which conceptualizes delays in the decision to seek care, reaching care, and receiving quality care. Notably, at the country level, zero-

dose children tended to live in settings with higher GDP per capita but lower health expenditure as a percentage of national spending. Children in countries with health expenditure below the median had higher odds of being zero-dose, indicating that inadequate national investment in health is associated with poorer vaccination coverage. However, individual-level factors like health seeking behavior and educational attainment emerged as the strongest predictors of zero-dose. This pattern shows that while context is important, household characteristics are the primary drivers of zero-dose. Strengths of this study include a large, regionally diverse sample of 30,500 children across 28 countries and use of multilevel analysis. Limitations of this study are its cross-sectional design, limiting causal inference, and partial reliance on parental recall for vaccination status. Findings suggest supporting integrated approaches that link antenatal and immunization services to improve maternal health-seeking behaviors. To address low-literacy households, CHWs should priorities families with limited parental education and provide tailored support. The increased odds of zero-dose status in low–health expenditure settings strengthen the case for greater domestic investment in primary healthcare and immunization

[Return to List of Articles](#)

9. [Health economics and vaccine financing in the eastern Mediterranean region: A needs assessment.](#)

Anwari P, Sume G, Meshreky W, Maele N, Sim S, Yeung K, et al.

Vaccine. 2025 Oct 18;65:127780.

PubMed ID: 41004947

ABSTRACT

INTRODUCTION: The World Health Organization Eastern Mediterranean Region (EMR) faces a high burden of vaccine-preventable diseases requiring efficient use of limited resources. A regional needs assessment was conducted to evaluate the current application of health economics and vaccine financing in national immunization programmes and policy formulation, identify capacity gaps, and inform tailored technical support.

METHODS: A structured online survey was administered between January 28 and February 18, 2025. It targeted expanded programme on immunization (EPI) managers and National Immunization Technical Advisory Group (NITAG) chairs across all 22 EMR countries. The questionnaire explored five thematic areas: current capacity in health economics and vaccine financing, training and capacity-building needs, demand for technical support, data availability and use in decision-making, and strategic planning for vaccine financing among immunization stakeholders at Ministry of Health and in NITAGs. The survey used multiple-choice, Likert-scale, and open-ended questions. Results were analyzed using descriptive statistics and disaggregated by income level.

RESULTS: The response rate was 73 % (16/22 countries). Only three countries (19 %) reported full integration of health economics within their immunization programmes, while 56 % (n = 9) reported minimal or no integration. Three countries had a dedicated health economics focal person for immunization. In two high-income countries immunization programmes demonstrated stronger capacity in health economics, whereas the rest of countries demonstrated low to moderate levels. Ten countries (63 %) rated their capacity in financial forecasting and planning for immunization as moderate or high, but eleven (69 %) rated their capacity in cost-effectiveness analysis and vaccine financial sustainability as low to none. Access to data varied, with 25 % of countries finding it easily accessible.

CONCLUSION: The findings highlight the need to strengthen the integration of health economics and vaccine financing into immunization programmes and policy decision-making across the EMR, irrespective of income level. Tailored capacity-building, technical support, and cross-sectoral collaboration, particularly with academia, are essential.

WEB: [10.1016/j.vaccine.2025.127780](https://doi.org/10.1016/j.vaccine.2025.127780)

IMPACT FACTOR: 3.5

CITED HALF-LIFE: 8.2

START COMMENTARY

This study assessed the extent to which health economics and vaccine financing are currently integrated into immunization programs across Eastern Mediterranean Region (EMR) countries. Authors conducted an online survey completed by EPI managers and NITAG chairs that assessed health economics and vaccine financing practices in the region. Only 19% of countries reported full integration of health economics into immunization decision-making and 25% reported no integration at all. Findings revealed variation in goals when using health economics and vaccine financing across income groups. High-income countries emphasized cost-effectiveness systems, forecasting tools, and formal health technology assessments. Upper-middle-income countries focused on efficient resource use, sustained funding for vaccines, and incorporating health economic analysis into their National Immunization Strategies. Lower-middle-income countries prioritized preparing for Gavi transition, introducing new vaccines, sustaining coverage, and reducing dependency on external aid. Low-income countries concentrated on expanding coverage among vulnerable populations and strengthening basic health infrastructure. Notably, the degree of integration of health economics and vaccine financing did not correlate with countries' income levels which highlights the crucial role of institutional support, political will, and stakeholder investment in integrating health economics into public health decision making. Strengths of this study included its high response rate and mixed-methods survey design. Limitations involved reliance on self-reported data and inconsistent levels of responder expertise. Findings from this study highlight the need for targeted capacity strengthening and developing evidence-based strategies for sustainable domestic financing, especially for countries transitioning away from donor support.

[Return to List of Articles](#)

10. [Unlocking insights from complex data: Leveraging heat maps for decision-making in LMIC.](#)

Ibrahim M, Naz O, Mohiuddin A, Rehman H, Khan A.

PLoS One. 2025 Sep 26;20(9):e0332394.

PubMed ID: 41004421

ABSTRACT

INTRODUCTION: In low- and middle-income countries (LMICs), health outcomes are often constrained by inadequate or misdirected resource allocation and limited access to services such as contraception and immunization. We explore the use of spatial heat maps to analyze the stock availability and dispensation/vaccination patterns of contraceptives and vaccines in Pakistan.

METHODS: We used data from national contraceptive (cLMIS) and vaccine logistics management information systems (vLMIS). We applied univariate, bivariate, and trivariate spatial heat maps to assess contraceptive and vaccine stock levels, dispensation/vaccination, and wastage across districts. For contraception, we standardized stocks per 100,000 married women of reproductive age (MWRA) and dispensation rates. In immunization, we focused on Pentavalent-3 (Penta3) vaccine outreach, dropout rates, and Bacillus Calmette-Guérin (BCG) vaccine wastage.

RESULTS: Temporal and spatial variations highlighted regional disparities, revealing that developed regions like Punjab had better stock availability, while underserved areas like Balochistan faced higher dispensation rates and stockouts. We also show the effect of inputs (supplies, outreach) on dispensation and utilization of contraceptives and vaccines, respectively. Finally, we depict how these visualizations can help track changes in programming over time.

CONCLUSIONS: Our findings show that integrating spatial data visualization with health logistics data identifies critical gaps in health service supply and demand, guiding policymakers in resource allocation, stock management, and service outreach. This scalable approach suits systems with limited analytical resources, as many analyses can be automated and embedded in datasets, providing policymakers with a focused set of visualizations for interpretation, avoiding the need for extensive training or deploying analysis teams at local levels. By leveraging spatial and temporal data, this method supports efficient health system strengthening and resource allocation in LMIC.

WEB: [10.1371/journal.pone.0332394](https://doi.org/10.1371/journal.pone.0332394)

IMPACT FACTOR: 2.6

CITED HALF-LIFE: 8.5

START COMMENTARY

This study explores how spatial heat maps can translate complex data into accessible, actionable insights for health program decision-makers in Pakistan or other LMIC settings. The authors demonstrate a wide range of heat map applications, including bivariate visualizations that integrate spatial and temporal data to show changes in the rate of Penta3 dropout as a factor of community outreach over time. For example, the Tharparkar district had persistently low outreach and persistently high Penta3 dropout, particularly during times of the year when outreach activities further declined. These patterns can help identify seasonal fluctuations or gaps in implementation. Trivariate spatial maps incorporated vaccine stock levels, coverage, and wastage. Findings from this map showed that, although adjusted stock levels were sufficient across districts, vaccination and wastage varied substantially. High wastage emerged as a notable supply chain issue (see Figure). Limitations include reliance on secondary national databases vulnerable to reporting inconsistencies or delays, and the fact that heat maps, while effective for visual interpretation, do not provide causal insights. The study illustrates the potential of spatial heat maps as practical decision-making support tools for district and provincial managers. The authors recommend future investment in GIS interpretation and spatial decision-making training to fully integrate these tools into program management.

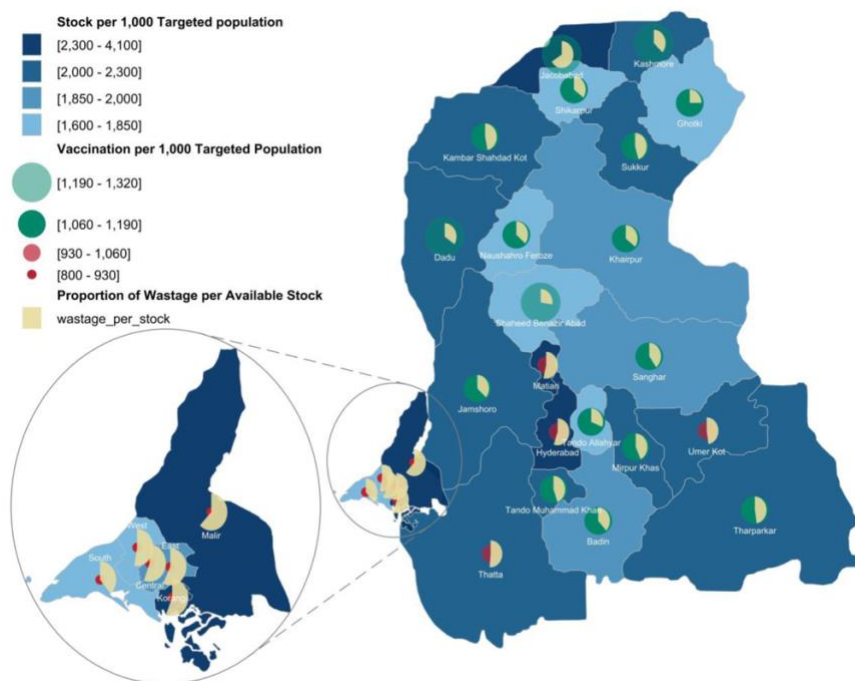


Figure. Geospatial Mapping of BCG Vaccine Distribution, Uptake, and Wastage in Sindh

[Return to List of Articles](#)

11. [Stakeholders' perspectives on lessons learnt from HPV mass vaccination in Nigeria.](#)

Kubura D, Sampson S, Erekosima G, Dauda M, Atobatele S, Oni M, et al.

BMC Public Health. 2025 Sep 25;25(1):3062.

PubMed ID: 40993642

ABSTRACT

BACKGROUND: To effectively reduce the risk of cervical cancer, Nigeria launched the HPV vaccine introduction using a phased approach; first phase in October 2023 across 16 states and the second phase across 21 states in May 2024. This initiative aimed to protect girls aged 9-14 from HPV infections, a primary cause of cervical cancer, through strategic planning and targeted implementation. This paper aims to share the Stakeholders' perspectives from nine states in Nigeria on lessons learnt during HPV vaccination that could be adopted in future campaigns and vaccinations.

METHODS: The study adopted a qualitative research design to evaluate the strategies deployed, challenges encountered, and lessons learned from the HPV Phase II vaccination campaign. Key informant interviews and in-depth interviews were conducted with officers of the healthcare agencies at the national, state, local government and ward levels and representatives of CSOs, who had key information about the strategies and those who implemented policies during the HPV mass vaccination in nine states in Nigeria. The qualitative data was validated, transcribed, coded and analyzed thematically.

RESULTS: Key components of the campaign included the establishment of fixed and temporary vaccination posts, strategic school and community engagement, and targeted communication efforts via social media, influencers, and local leaders. Cultural sensitivity, trained health workers, and data-driven micro plans were emphasized to enhance the program's effectiveness. The campaign successfully raised awareness and increased vaccination coverage across the nine targeted states. Effective strategies included leveraging cultural sensitivity, utilizing trained health workers, and employing data-driven micro plans to address logistical challenges. Despite these successes, significant challenges were encountered. Vaccine hesitancy fueled by misinformation about sterility, limited resources, security concerns, and difficulties accessing remote areas posed barriers to achieving wider coverage. Key lessons from the campaign highlighted the importance of early planning, effective rumor management through existing networks, and the crucial role of influential community members in amplifying the message and encouraging participation.

CONCLUSION: The findings highlight critical lessons for future vaccination programs. Early planning, proactive social mobilization, effective rumor management, and leveraging community networks were instrumental in enhancing vaccine acceptance and coverage. These strategies serve

as a model for overcoming barriers to public health interventions and should be prioritized in future efforts to improve HPV and other vaccination programs in Nigeria.

WEB: [10.1186/s12889-025-24418-0](https://doi.org/10.1186/s12889-025-24418-0)

IMPACT FACTOR: 3.6

CITED HALF-LIFE: 5.4

START COMMENTARY

This qualitative study examined implementation strategies, challenges, and lessons learned from an HPV vaccination campaign across nine states in Nigeria to identify practices that can strengthen future public health interventions. The campaign achieved high uptake using creative, community-driven approaches. Notably, vaccine champions, influencers, and even schoolgirls played a role in dispelling myths, generating demand, and fostering community ownership of the program. In some states, school essay competitions fostered enthusiasm and empowered girls to become champions for HPV vaccination which added a unique and engaging dimension to social mobilization efforts. This is one of a few studies to qualitatively examine the HPV vaccine introduction program in Nigeria. Limitations of this research include being restricted to nine states and focusing primarily on campaign outcomes rather than long-term impacts on cervical cancer or sustained vaccine uptake. The findings point to the need for timely and reliable funding to prevent implementation delays and the importance of early engagement with trusted local leaders to reduce hesitancy and improve acceptance. Future research should incorporate mechanisms for evaluating the longer-term effects of HPV vaccination efforts, including monitoring coverage retention and disease outcomes, to guide sustained cervical cancer prevention in Nigeria.

[Return to List of Articles](#)

12. [Routine immunisation coverage in the context of seasonal influenza vaccine introduction for children in Nakuru and Mombasa counties in Kenya, 2019-21: an observational study.](#)

Igboh L, Ayugi J, Nyawanda B, Otieno N, Ondeng'e K, Dawa J, et al.

Lancet Glob Health. 2025 Sep 20;13(10):e1737-e1749.

PubMed ID: 40975081

ABSTRACT

BACKGROUND: Data on how the introduction of seasonal influenza vaccination for children might affect the coverage for other routine childhood immunisations are scarce. We assessed how introducing a new influenza vaccine for children aged 6-23 months in two counties in Kenya (Mombasa and Nakuru) affected the coverage rate for the diphtheria-tetanus-pertussis-hepatitis B-Haemophilus influenzae type b (pentavalent [Penta]) vaccine, measles-rubella (MR) vaccine, and vitamin A supplementation.

METHODS: In this observational study, we compared data from two sub-counties in Kenya that implemented a year-round (ie, annual routine immunisation) influenza vaccine delivery strategy and two that implemented a campaign-mode delivery strategy with data from two control sub-counties where no influenza vaccine was provided. We used facility-level immunisation tally sheets to obtain counts of monthly vaccine and supplement doses given and monthly summary data to estimate the coverage rates. We collected data for 1 year before (from Nov 1, 2018 to Oct 31, 2019) and during the seasonal influenza vaccine demonstration period (from Nov 1, 2019 to Oct 31, 2021). We used negative binomial Bayesian models, adjusted for time period (before vs during the demonstration project), facility ownership, and level of health facility, to compare coverage rates for routine immunisations between health facilities that participated in the influenza vaccine demonstration project and those that did not.

FINDINGS: Our study included 64 health facilities: 28 (44%) year-round, 12 (19%) campaign-mode, and 24 (38%) control sites. 42 (66%) of the facilities were level 2 (secondary) and 36 (56%) facilities were government owned. Before and during the influenza vaccine demonstration period, coverage rates for Penta doses one, two, and three and MR dose one were more than 65% in all the intervention sites; for comparison, in the control sites coverage was 62·9% (95% CI 62·1-63·8) for Penta dose one and 64·0% (63·1-64·9) for MR dose one. The coverage rate for MR dose one was significantly higher in the year-round sites versus the control sites across the timespan of the study (adjusted rate ratio 1·38, 95% CI 1·27-1·49), and the coverage rates for Penta dose two (aRR 0·24 [0·05-0·65]) and MR dose one (aRR 0·98 [0·82-0·97]) were significantly lower in the campaign-mode sites versus the control sites. There were no other significant differences in coverage rates for other routine vaccine or supplementation doses in the intervention (year-round and campaign-mode)

versus the control sites. When comparing coverage before and during implementation of the influenza vaccination project, MR dose one coverage at the campaign-mode sites was significantly lower during the demonstration than before (rate ratio [RR] 0·75 [95% CI 0·70-0·80]), and MR dose two (RR 1·15, 1·06-1·24) and vitamin A dose two (RR 2·14 [2·00-2·29]) at the campaign-mode sites were significantly higher; none of the other changes before and during implementation at the other sites or for other doses were statistically significant.

INTERPRETATION: The introduction of seasonal influenza vaccine for eligible children had a minimal effect on the uptake for routine vaccines in Kenya's Expanded Programme on Immunization.

FUNDING: The Task Force for Global Health and The Centers for Disease Control and Prevention.

WEB: [10.1016/S2214-109X\(25\)00265-7](https://doi.org/10.1016/S2214-109X(25)00265-7)

IMPACT FACTOR: 18.0

CITED HALF-LIFE: 4.8

START COMMENTARY

This observational study assessed the impact of introducing seasonal childhood influenza vaccination in two counties in Kenya on routine immunization coverage within the existing EPI schedule. The study compared routine vaccination coverage outcomes across sub-countries offering year-round influenza vaccination and campaign-mode strategies vs. control sites offering no influenza vaccination. Routine vaccination coverage at year-round influenza sites was similar to control sites, though there was a small, non-significant decline in Penta coverage during the program. This drop likely reflects COVID-19–related clinic closures and health-worker strikes, which disrupted routine services more at those sites compared to campaign sites. Despite this dip, year-round influenza delivery may have supported higher MR uptake by creating more frequent contact with the health system at ages when MR is due, unlike Penta, which is given earlier in infancy. A strength of the study was its inclusion of counties with distinct demographic and sociocultural contexts. However, the use of tally sheets and uncertain catchment population estimates reduced the accuracy of coverage data and limits generalizability. The study provides evidence that integrating seasonal influenza vaccination into Kenya's EPI can be done without undermining existing services. Additionally, the added touchpoints created by new vaccine delivery may offer opportunities to improve uptake of other routine vaccines through co-administration and improved service delivery.

[Return to List of Articles](#)

13. [Bridging innovation and policy: comparative pathways of national vaccine development in low- and middle-income countries.](#)

Marandi V.

Osong Public Health Res Perspect. 2025 Sep 16.

PubMed ID: 40957855

ABSTRACT

OBJECTIVES: To examine how national innovation and policy configurations enabled vaccine development in Brazil, Cuba, India, and Iran, and to distil lessons for low- and middle-income country (LMIC) vaccine sovereignty.

METHODS: Narrative review of peer-reviewed and grey literature (2020-2023), guided by a structured search and screening approach; synthesis mapped to national and sectoral innovation system perspectives and technology readiness levels.

RESULTS: Cuba and Iran leveraged mission-oriented public research and development (R&D) and domestic platforms; India combined indigenous R&D with large-scale licensed manufacturing; Brazil's scientific capacity was constrained by fragmented governance and supply-chain dependence. Adaptive regulation (e.g., emergency use authorization/conditional approvals), targeted technology transfer, and South-South partnerships accelerated progress but raised longer-term questions about intellectual property (IP) control and economic sustainability.

CONCLUSION: Institutional coherence, strategic IP management, and regional manufacturing alliances are as critical as scientific capacity for LMIC vaccine self-reliance. Policy priorities include pre-negotiated tech-transfer frameworks, regulatory preparedness, and investment in public R&D linked to distributed manufacturing.

WEB: [10.24171/j.phrp.2025.0208](https://doi.org/10.24171/j.phrp.2025.0208)

IMPACT FACTOR: 1.6

CITED HALF-LIFE: 6.5

START COMMENTARY

This review uses four case studies from selected LMICs to assess how countries demonstrated meaningful degrees of vaccine self-reliance during the COVID-19 pandemic. The review offers insight into how structural constraints can be navigated during global emergencies. Authors emphasize how public-private partnerships and South-South collaborations served as enablers for vaccine development and scale-up. Brazil and India shared knowledge and manufacturing capacity multilaterally, and India used its role as a major manufacturing hub to serve as a diplomatic actor

during the pandemic. Because many LMICs lacked access to key technologies, such as mRNA platforms, they collaborated or created their own solutions to build domestic capacity. Partnerships such as the Cuba-Iran collaboration helped reduce reliance on high-income countries. Sanctions, intellectual property barriers, and limited funding served as both obstacles and drivers that pushed these LMICs toward more autonomous and sustainable pandemic preparedness and vaccine development strategies. A strength of this study is its selection of case studies representing LMICs with geographical and geopolitical diversity across Latin America, South Asia, and the Middle East. Findings point to prioritizing sustained support for domestic R&D, regulatory systems that can adapt quickly in emergencies, and closer regional collaboration. Global entities like the WHO can support these efforts by building pooled R&D platforms and ensuring equitable access to critical inputs.

[Return to List of Articles](#)

Additional Articles of Interest

- 1 Hepatitis B vaccination status, knowledge and associated factors among healthcare professionals in Dongola, Sudan, 2024: a cross-sectional study. [{Full Article}](#)
- 2 Modelling the determinants of uptake of complete immunization of children in Ghana. [{Full Article}](#)
- 3 Feasibility and Acceptability of Respiratory Syncytial Virus Vaccination in Mothers for Infant Protection at Edward Francis Small Teaching Hospital, the Gambia. [{Full Article}](#)
- 4 Awareness and acceptability of human papillomavirus vaccination among parents in Tshwane, South Africa. [{Full Article}](#)
- 5 Socio-demographic factors associated with incomplete vaccination or non-vaccination among children aged 12-23 months in Sierra Leone. [{Full Article}](#)
- 6 Vaccination models of delivery for refugees and migrants: a global scoping review. [{Full Article}](#)
- 7 Costs, delivery strategies and implementation challenges for malaria vaccines: a rapid review of literature. [{Full Article}](#)
- 8 Immunization Coverage and Its Determinants Among Children Aged 12-23 Months in East Africa: A Bayesian Hierarchical Modeling Approach Based on DHS 2019-2022. [{Full Article}](#)
- 9 Knowledge and attitude of parents towards the human papillomavirus vaccine for their daughters and associated factors in Debre Tabor town, northwest Ethiopia: a community-based cross-sectional study. [{Full Article}](#)
- 10 Assessing the psychometric properties of a modified vaccine hesitancy scale for measuring hepatitis B vaccine hesitancy among healthcare workers in Southern Ghana. [{Full Article}](#)
- 11 Dengue dynamics: A holistic predictive model considering epidemic, vaccination, and environmental factors. [{Full Article}](#)
- 12 Immunization safety monitoring: addressing vaccine hesitancy and enhancing coverage in crisis-affected regions-insights from Lebanon, Ukraine, and Sudan. [{Full Article}](#)
- 13 Behavioural and social drivers of routine childhood immunization in selected low coverage areas in the Philippines. [{Full Article}](#)
- 14 Knowledge, attitude, and challenges about standard safety precautions and vaccination among health care professionals: A cross-sectional study. [{Full Article}](#)
- 15 Immunoinformatics-driven construction of a next-generation epitope-based vaccine from conserved hypothetical proteins of M. tuberculosis for enhanced TB control. [{Full Article}](#)
- 16 Understanding the influence of religious and safety concerns on childhood measles and pertussis vaccination: a study conducted in Aceh, Indonesia, 2022. [{Full Article}](#)
- 17 Development of SARS-CoV-2 as a viral vector: A novel intranasal bivalent vaccine for SARS-CoV-2 and RSV. [{Full Article}](#)

- 18 Parental perspectives: a mixed method study on perceived risk, self-efficacy, vaccine response efficacy, and willingness for adolescent HPV vaccination in Puducherry, South India. [{Full Article}](#)
- 19 Family spillover effects in cost-effectiveness analyses of vaccines. [{Full Article}](#)
- 20 Determinants of COVID-19 vaccine hesitancy among healthcare personnel in a secondary-level health facility in Ghana. [{Full Article}](#)
- 21 Global variations in immunisation strategies against pertussis in infancy. [{Full Article}](#)
- 22 New Doc on the Block: Scoping Review of AI Systems Delivering Motivational Interviewing for Health Behavior Change. [{Full Article}](#)
- 23 A feasibility study: Using mobile phone-based tools to collect community-level Behavioral and Social Drivers (BeSD) of vaccination data in Zambia. [{Full Article}](#)

Appendix

The literature search for the November 2025 Vaccine Delivery Research Digest was conducted on October 28, 2025. We searched English language articles indexed by the US National Library of Medicine and published between September 15, 2025 and October 14, 2025. The search resulted in 500 items.

SEARCH TERMS

(((((“vaccine”[tiab] OR “vaccines”[tiab] OR “vaccination”[tiab] OR “immunization”[tiab] OR “immunisation”[tiab] OR “vaccines”[MeSH Terms] OR (“vaccination”[MeSH Terms] OR “immunization”[MeSH Terms])) AND (“logistics”[tiab] OR “supply”[tiab] OR “supply chain”[tiab] OR “implementation”[tiab] OR “expenditures”[tiab] OR “financing”[tiab] OR “economics”[tiab] OR “Cost effectiveness”[tiab] OR “coverage”[tiab] OR “attitudes”[tiab] OR “belief”[tiab] OR “beliefs”[tiab] OR “refusal”[tiab] OR “Procurement”[tiab] OR “timeliness”[tiab] OR “systems”[tiab])) OR “vaccine delivery”[tiab] OR “vaccination refusal”[MeSH Terms] OR “immunization programs”[MeSH Terms] OR “zero dose”[tiab] OR “unvaccinated children”[tiab] OR “gavi”[tiab]) NOT (“in vitro”[tiab] OR “immune response”[tiab] OR “gene”[tiab] OR “chemistry”[tiab] OR “genotox”[tiab] OR “sequencing”[tiab] OR “nanoparticle”[tiab] OR “bacteriophage”[tiab] OR “exome”[tiab] OR “exogenous”[tiab] OR “electropor”[tiab] OR “systems biology”[tiab] OR “animal model”[tiab] OR “cattle”[tiab] OR “sheep”[tiab] OR “goat”[tiab] OR “rat”[tiab] OR “pig”[tiab] OR “mice”[tiab] OR “mouse”[tiab] OR “murine”[tiab] OR “porcine”[tiab] OR “ovine”[tiab] OR “rodent”[tiab] OR “fish”[tiab])) AND “English”[Language] AND 2025/09/15:2025/10/14[Date - Publication]