VACCINES BEAT

EVIDENCE, SAFETY AND TRUST THAT SHAPE IMMUNIZATION

Prof. Thomas Verstraeten reflects on bridging rigorous epidemiology, vaccine safety and public health as essential components to the future of vaccinology

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"IMMUNIZATION IS A GLOBAL HEALTH AND DEVELOPMENT SUCCESS STORY SAVING MILLIONS OF LIVES EVERY YEAR"

WORLD HEALTH ORGANIZATION

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Dr. Thomas Verstraeten is a physician and internationally experienced vaccine epidemiologist whose career spans humanitarian medicine, public health, regulatory science, and the pharmaceutical industry. Trained in medicine and tropical medicine in Belgium, he began his career providing medical care to refugees and displaced populations in Africa with Médecins Sans Frontières. These early experiences shaped his commitment to disease prevention and led him toward epidemiology and vaccine safety.

He subsequently joined the US Centers for Disease Control and Prevention (CDC), where he worked in field epidemiology and vaccine safety, including investigations into adverse events following vaccination. He later joined GlaxoSmithKline (GSK), helping advance the integration of epidemiology and pharmacovigilance into vaccine development and post-marketing surveillance.

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LETTER FROM THE EDITORS

Welcome to the **28th issue of Vaccines Beat**!

In our **Coffee with the Expert** section of this issue of *Vaccines Beat*, we had the pleasure of speaking with **Prof. Thomas Verstraeten**, a distinguished epidemiologist whose remarkable career spans clinical medicine, humanitarian work in Africa, public health, and vaccine research at the CDC, GSK, and P95.

Our conversation highlighted the critical roles of **epidemiology, pharmacoepidemiology, and pharmacovigilance** throughout vaccine development, from understanding disease burden and optimizing clinical trials to monitoring vaccine effectiveness and safety through real-world evidence. We also explored the importance of **pharmacoeconomics** in assessing the broader value of vaccines and supporting evidence-based immunization policies and equitable access.

Prof. Verstraeten reflected **pandemic preparedness**, emphasizing the need for stronger surveillance systems, rapid vaccine development, international collaboration, and equitable access during future health emergencies. Finally, we discussed how emerging technologies, artificial intelligence, and real-world data may transform vaccine evaluation and public health decision-making.

Our conversation reinforces a fundamental message: developing safe and effective vaccines is only the beginning. Robust epidemiological, safety, and economic evidence is essential to maximize their public health impact, strengthen pandemic preparedness, and ensure equitable access worldwide.

In our **Editor's Corner** section, *"Vaccines Beyond Infectious Diseases: The New Frontier of Cancer Immunotherapy,"* we explore how advances in immunology and biotechnology are transforming vaccines into promising therapeutic tools against cancer, opening new opportunities for precision medicine by harnessing the immune system to recognize and target malignant cells.

In our **Best Practice** section, *"Measles Resurgence in 2026: Best Practices for Outbreak Control and Closing Immunization Gaps,"* we address the alarming global resurgence of measles, emphasizing the importance of achieving and sustaining at least 95% two-dose vaccination coverage globally, closing immunity gaps, and implementing effective outbreak control strategies to prevent transmission and advance measles elimination.

In our **Guest Contributor** section, *"New Challenges for NIP in Latin America: Evidence-Based Expansion and Vaccination Coverage,"* **Dr. Pilar Rubio**, Medical Director for Latin America at Biological E. Limited; **Dr. Otavio Cintra**, pediatric infectious diseases specialist; and **Marjorie Vásquez**, veterinarian and epidemiologist, explore the challenges facing national immunization programs across Latin America and the Caribbean. They highlight the importance of pairing new vaccine introductions with sustained high coverage, robust epidemiological surveillance, and equitable access to maximize public health impact.

As always, this issue also features carefully curated summaries of the **Latest Scientific Publications**, together with the most relevant and timely **News and Alerts** from the world of vaccines and infectious diseases.

We hope you find this **November 2026 Issue** both informative and engaging. We look forward to continuing our shared commitment to advancing immunization, strengthening public health, and contributing to a healthier and more resilient world.

Sincerely,

Enrique Chacon-Cruz, M.D., MSc
Chief Editor, *Vaccines Beat*

Felicitas Colombo, MPA.
Chief Editor, *Vaccines Beat*



Dr. Enrique Chacon-Cruz

Enrique Chacon-Cruz, M.D., MSc, Mexican-born medical doctor with a degree from Guadalajara, Mexico, and further specializations in Pediatrics and Infectious Diseases from institutions in Mexico City and the USA (Eastern Virginia Medical School). He also holds a Master's degree in Vaccinology and Drug Development from the University of Siena, Italy.

Currently, he is the CEO and Founder of "Think Vaccines" (Research, Education, and Consultancy for Vaccines and Vaccinology) based in Houston, Texas.

With over 140 research items published and/or presented at international meetings and more than 500 international lectures, all focused on vaccines, vaccination, clinical trials, and vaccine-preventable diseases. The latter conducted independently or in association with the Centers for Disease Control and Prevention (CDC), the University of California in San Diego, Eastern Virginia Medical School, and several other institutions.

Additionally, He is the President of the Immunization Committee of the Mexican Association of Pediatric Infectious Diseases, he is a member of the Mexican Committee for the Elimination of Measles, Rubella, and Congenital Rubella, member of the Immunization and of the Health Equity Committees of the European Society of Medicine and Overseas Fellow, Royal Society of Medicine, United Kingdom. He is also the former Director of the Mexican Active Surveillance Network for Bacterial Meningitis and the former Head of the Pediatric Infectious Diseases Department and the Research Department at the General Hospital of Tijuana, Baja-California, Mexico.



Felicitas Colombo

Felicitas Colombo, MPA.Intelligethics LLC. Public affairs and policy strategist with over 20 years of experience developing initiatives with regional and global impact while fostering multi-stakeholder collaboration to advance public policy. She holds a Bachelor's degree in Mass Communications and an Executive Master of Public Administration from the London School of Economics, with a concentration in regulatory analysis, policy design, and risk management.

Throughout her career, Felicitas has advised leading pharmaceutical companies and industry organizations on strategic communications, healthcare policy and market access. Her expertise spans regulatory analysis, government relations, stakeholder engagement, public-private partnerships, advocacy, and health education, with a focus on translating evidence into policy advancements and improving healthcare access. She also brings extensive experience in governance, ethics, transparency, compliance, and risk management at the intersection of public policy and private-sector engagement.

Felicitas is a member of the World Association of PPP Units and Professionals (WAPPP) and the OECD Auditors Alliance. She has also completed executive and specialized training in leadership, ethics, compliance, integrity, and collective action, including the *Leadership for the 21st Century: Chaos, Conflict and Courage* program at Harvard Kennedy School and the Anti-Corruption Collective Action Certificate at the International Anti-Corruption Academy (IACA).

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Coffee with the Expert

EVIDENCE, SAFETY AND TRUST THAT SHAPE IMMUNIZATION

Prof. Thomas Verstraeten reflects on bridging rigorous epidemiology, vaccine safety and public health as essential components to the future of vaccinology



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Felicitas Colombo , MPA
Dr. Enrique Chacon-Cruz , M.D., MSc

Dr. Thomas Verstraeten is a physician and internationally experienced vaccine epidemiologist whose career spans humanitarian medicine, public health, regulatory science, and the pharmaceutical industry. Trained in medicine and tropical medicine in Belgium, he began his career providing medical care to refugees and displaced populations in Africa with Médecins Sans Frontières. These early experiences shaped his commitment to disease prevention and led him toward epidemiology and vaccine safety.

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In 2011, he founded P95, an organization focused on epidemiology and real-world evidence, with an emphasis on generating robust evidence to inform vaccine development, safety assessment, and public health decision-making. His work has highlighted the importance of collaboration among industry, regulators, researchers, and public health institutions to strengthen evidence generation and improve immunization outcomes.

With expertise spanning vaccine safety, pharmacoepidemiology, disease burden assessment, and real-world evidence, Dr. Verstraeten brings a distinctive perspective to the challenges shaping modern vaccinology, from emerging technologies and data access to evidence-based policy and public trust in vaccination.

From treating patients to understanding populations

For Dr. Verstraeten, the path into vaccine epidemiology began with a straightforward ambition: helping people. After studying medicine in Belgium, he pursued tropical medicine and humanitarian work with Médecins Sans

Frontières, providing primary care to refugees and displaced populations in Africa. The experience gradually changed his understanding of what it meant to make a difference in public health.

"I realized that individual medicine is good, but it only goes so far," he recalls.

Working in communities where children suffered from measles and pertussis, and where vaccination could require travelling to villages without a cold chain, brought the broader impact of prevention into sharp focus and led him toward epidemiology and vaccination.

A fellowship with the CDC placed him within the field of vaccine safety. His subsequent experience at GSK, followed by the establishment of P95 in 2011, gave him a perspective spanning public health, vaccine development, pharmacovigilance, and health outcomes research.

"My career has been shaped by a recurring question: how can we generate the evidence needed to understand not only whether a vaccine works, but also whom it benefits, how safe it is in practice, and what its broader value means for society?" he says.

Epidemiology begins before the clinical trial

Vaccine development is often associated with laboratory breakthroughs, clinical trials, and regulatory milestones. Yet, as Dr. Verstraeten emphasizes, the process also depends on understanding the disease a vaccine is intended to prevent.

For well-characterized infections, establishing disease burden may be relatively straightforward. For other diseases -including meningococcal disease, dengue, respiratory syncytial virus (RSV), and norovirus- the epidemiological picture can be considerably more complex. Researchers need to understand where infections occur, which populations are affected, how frequently disease develops, and how these patterns change over time.

"And that's where epidemiology is really key, to help first of all understand the burden they are trying to prevent," he asserts. "This information has practical consequences for clinical development. If the anticipated incidence of disease is incorrect, a trial may recruit the wrong population or fail to accumulate enough cases to assess its endpoints.

Differences in age, socioeconomic circumstances, geographical distribution, and circulating pathogen strains can all influence the results. These mistakes can be costly, particularly when studies must be extended because too few endpoints have occurred. Dr. Verstraeten explains that epidemiological research is therefore not simply an additional expense; it is an investment in designing more informative and efficient clinical trials.

The choice of endpoints is equally important. As he notes, pneumococcal vaccine development initially focused on invasive disease, while outcomes such as pneumonia and otitis media became relevant in subsequent research. The endpoint must reflect the disease burden, the vaccine's intended benefits, and the evidence needed to support a meaningful public health decision.

Similarly, the European Medicines Agency's *Guideline on Clinical Evaluation of Vaccines* addresses the need to assess safety, immunogenicity, efficacy, and effectiveness in the context of vaccine development and use.

For Dr. Verstraeten, the lesson is clear: sound epidemiology helps researchers ask the right questions before committing substantial resources to answering them.

Vaccine safety is a lifecycle responsibility

One of the defining experiences of Dr. Verstraeten's early career was investigating intussusception following the introduction of an oral rotavirus vaccine withdrawn from the US market after evidence of an increased risk emerged.

He remembers the investigation vividly. Reports arrived at the CDC as the signal developed, and he was sent to Chicago to help investigate cases and interview families about

vaccination histories. The episode illustrates why vaccine safety assessment cannot end when a product receives regulatory authorization.

"Clinical trials can identify many adverse events, but their size and duration may not be sufficient to detect very rare outcomes or events that emerge in particular populations after widespread use," he points out.

The CDC's *Pink Book*, Chapter 4, explains the complementary role of post-licensure surveillance: identifying uncommon adverse reactions, monitoring changes in known risks, and investigating possible associations that require further evaluation.

Dr. Verstraeten argues that safety planning should begin early, with researchers anticipating which events may occur during a trial even when they are unrelated to vaccination.

"In a large study involving older adults, for example, some participants will inevitably experience cardiovascular events, cancers, autoimmune diseases, or deaths during follow-up," he says. "The challenge is to distinguish events that occur after vaccination from those caused by vaccination."

This requires appropriate background rates, clear protocols, independent data and safety monitoring, and predefined procedures for responding to potential signals.

"If you vaccinate enough people, you are going to have signals. It's actually odd if you don't have signals," he continues. "It means you may not have a sufficiently good quality system."

The distinction is important: a safety signal is a reason to investigate, not proof of causation. Its meaning depends on the strength of the evidence, the expected frequency of the event, the timing of its occurrence, and the results of further analyses.

Dr. Verstraeten also highlights the importance of developmental risk management plans. Rather than waiting until a vaccine is licensed to decide how potential risks will be monitored, developers should determine in advance what evidence they will need and what actions might be appropriate if a concern emerges.

"It's simple, you can do that openly and there is nothing wrong in saying, we have a signal. We're going to watch it," he acknowledges.

This proactive approach reflects the broader principle that vaccine safety is a continuous process involving clinical development, regulatory review, and post-authorization monitoring. The European Medicines Agency's guidance on COVID-19 vaccines, for example, describes ongoing safety assessment, risk management, and studies after authorization as integral parts of the regulatory system.

"The objective is not to eliminate uncertainty before it is scientifically possible to do so. It is to recognize uncertainty, investigate it rigorously, and act on the evidence," he states.

Real-world evidence: more data not necessarily better evidence

The expansion of electronic health records, healthcare databases, and digital technologies has created considerable expectations for real-world evidence. In principle, researchers should increasingly be able to use routinely collected information to assess vaccine safety, effectiveness, and population-level impact. Dr. Verstraeten admits that he once expected this transition to happen much faster.

"When I started P95, in 2011 or so, I thought in a couple of years, we will not do any prospective studies anymore. We will only rely on databases," he shares.

Reality proved more complicated. Although large databases offer important opportunities, they do not always contain the information needed to answer a specific research question. Data may be incomplete, variables may be poorly defined, vaccination records may not link reliably to clinical outcomes, and the populations represented may differ from those to which researchers hope to generalize their findings.

As a result, prospective observational studies, designed to collect information directly from defined populations, remain important. Dr. Verstraeten describes how his work evolved toward studies with carefully developed protocols,

investigator selection, site management, and logistical planning. Although these studies are non-interventional, their operational rigor can resemble that of clinical trials.

"That means that there's still a very big importance in having networks, of having established groups of people," he remarks.

His point is not that databases lack value, but that no single source of evidence is sufficient for every question. Researchers must select methods according to the question being investigated and the quality of the information available.

This is particularly relevant to vaccine safety, where rare outcomes may require large populations, long observation periods, or multiple complementary data sources. It is also important when evaluating vaccine effectiveness across different healthcare systems and epidemiological settings.

The COVID-19 pandemic demonstrated the value of rapidly generating and sharing evidence, while also highlighting the limitations of incomplete or inconsistent information. International research networks can help address these challenges by harmonizing methods and enabling comparisons across populations.

Dr. Verstraeten sees artificial intelligence as a potentially useful tool for integrating and analyzing information. However, technology cannot compensate for data that are inaccessible, unreliable, or poorly collected.

"AI may help us integrate, organize, and analyze data more efficiently, but it cannot generate reliable evidence without appropriate underlying data," he asserts.

The implication for the future is that investment in analytical technology must go hand in hand with investment in data quality, research infrastructure, and local expertise.

Value extends beyond price

Scientific evidence alone does not determine whether a vaccine will be introduced into a National Immunization Program (NIP). Governments must also consider affordability, competing health priorities, expected disease burden, and the benefits that vaccination may generate for individuals and communities. Health economics has shown how strongly economic evaluations can influence decisions.

"Whether you like it or not, healthcare, whether it's curative or preventive, will always be a matter of finance and affordability," Dr. Verstraeten acknowledges.

Cost-effectiveness, cost-utility, cost-benefit, and budget-impact analyses provide different perspectives on the resources required and the outcomes expected from vaccination. These assessments depend on assumptions about disease incidence, vaccine effectiveness, healthcare utilization, costs, and the duration of protection.

The challenge is that not every benefit is easy to quantify. A vaccine may prevent hospitalizations, reduce healthcare expenditure, protect people who are not directly vaccinated through indirect effects, and contribute to broader social and economic gains.

Dr. Verstraeten points to rotavirus vaccination as an example of how the understanding of a vaccine's impact can evolve as evidence accumulates. Initial assessments may not fully capture reductions in severe disease, hospitalizations, or indirect protection.

"I personally think vaccines are often under-valuated. A lot of vaccines are worth a lot more than what they are actually valuated at, because some of these effects are often looked at very conservatively. Herd immunity is often not considered," he shares.

His observation raises an important question for policymakers: are current assessment frameworks capturing the full value of vaccination?

The World Health Organization's 2023 paper, *The Full Value of Vaccine Assessments (FVVA): A Framework for Assessing and Communicating the Value of Vaccines for Investment and Introduction Decision-Making*, addresses this issue by proposing a broader framework for evaluating vaccine value, including wider socioeconomic and indirect effects.

At the same time, economic models must

remain transparent. Their conclusions depend on the quality of their inputs, the assumptions they make, and the perspectives they adopt. Making these assumptions explicit allows policymakers to understand why conclusions may differ between countries.

A vaccine that is affordable and cost-effective in one setting may be difficult to introduce elsewhere because of differences in disease burden, healthcare infrastructure, budget constraints, or competing priorities.

"The objective is not to remove economic considerations from immunization decisions, but to ensure that these decisions reflect the best available evidence and the full range of relevant benefits," he says.

Public trust starts with acknowledging uncertainty

Perhaps the most striking challenge concerns public confidence in vaccination. Dr. Verstraeten does not offer a quick solution to how trust can be strengthened. Instead, he returns to the importance of patience, careful communication, and honesty about scientific uncertainty.

"Because we are scientists, we are not 100% sure," he admits.

In his view, failing to communicate uncertainty at the outset can make subsequent changes appear contradictory, undermining confidence.

"People don't like it that you say you don't know, but that's the truth, right? And sometimes you just have to admit it, that you can never be 100% sure," he continues.

This is not an argument for indecision. Rather, it is a call for distinguishing what is known, what remains uncertain, and what evidence is still needed. Scientific recommendations should be communicated with appropriate confidence while making clear that they may evolve as new information becomes available.

The WHO's guidance on credible and trusted communication similarly emphasizes transparency, the acknowledgment of uncertainty, and the need to correct misconceptions openly. Research on communication during the COVID-19 pandemic has also found that inadequate explanations of uncertainty and incomplete information about risks and benefits can contribute to skepticism among vaccine-hesitant individuals.

For Dr. Verstraeten, education is central to this process. Trust, in this perspective, is not built by promising certainty where none exists. It is built by demonstrating how evidence is evaluated, how risks are investigated, and how recommendations respond to new findings.

"Rather than presenting the decision as a matter of unquestionable certainty, I prefer describing how the evidence is generated and why the available findings support the recommendation," he says.

For public health communicators, this requires more than correcting misinformation after it spreads. It requires explaining the reasoning behind decisions, listening to legitimate questions, and being prepared to acknowledge and correct mistakes.

Collaboration: more than good intentions

Dr. Verstraeten's experience across public health institutions, industry, and research networks has also shaped his view of collaboration. Different stakeholders may share the objective of improving health while facing different institutional priorities, commercial interests, regulatory responsibilities, and concerns about data ownership. For collaboration to work, he argues, the rules governing it must be clear.

"Collaboration across the various stakeholders can happen by being transparent and by having very good and well documented governance systems and processes," he remarks.

He describes the practical work required to establish research arrangements in which competing pharmaceutical companies can contribute to shared projects while understanding who can access data, how information will be governed, and what each participant is permitted to do.

Such arrangements demand time, investment, and carefully defined governance. They also require participants to accept that collaboration cannot depend exclusively on informal assurances. The value of these arrangements becomes particularly apparent during public-health emergencies, when fragmented data, competing priorities, and delayed information sharing can hinder the response.

"Effective collaboration does not require every stakeholder to have identical objectives," he says. "It requires a credible framework that establishes shared responsibilities, protects legitimate interests, and enables evidence to be generated and used appropriately, while maintaining scientific rigor."

For vaccine research, this means building networks that can operate across institutions and borders, with consistent methods and transparent governance. It also means recognizing the contribution of local researchers who understand the populations, health systems, and data sources on which meaningful conclusions depend.

Beyond the intended effects of vaccination

Dr. Verstraeten identifies a research area that particularly excites him: the possibility that some vaccines may have effects beyond their intended protection against specific pathogens.

"Maybe one thing that I've become very excited about now is the non-specific effects of vaccination," he declares.

He recalls discussions with epidemiologists who questioned whether safety research should examine only potential harms or also investigate positive health outcomes that might follow vaccination.

"When you are looking at unexpected effects in vaccination, you're mostly looking at safety signals but there may be other outcomes that your vaccines prevent that you're not aware," Dr. Verstraeten acknowledges.

The subject of non-specific effects remains an active area of scientific investigation. Researchers are exploring whether certain vaccines may influence susceptibility to infections or other outcomes beyond their target diseases, and how these effects might depend on vaccine type, the sequence of immunizations, age, and other contextual factors.

However, the evidence is not uniform across vaccines or outcomes. Observational findings may be affected by confounding, differences between populations, and the timing of other interventions. Carefully designed studies are therefore essential before broader effects can be translated into clinical or policy recommendations.

The wider lesson is that vaccine research must remain open to questions beyond the original indication while maintaining rigorous standards of evidence. Investigating potential benefits is as important as investigating potential risks, but neither should be assumed without appropriate data.

"This is one of the reasons vaccinology remains such a fascinating field: new questions emerge as understanding of immunology, disease, and population health evolves," concludes Dr. Verstraeten.



News & Alerts

MOST RELEVANT MONTHLY NEWS ON VACCINATION AND EMERGING DISEASES WITH BIBLIOGRAPHIC ALERTS

A summary of the latest News & Alerts in the fields of vaccinology, vaccines, vaccination, and vaccine-preventable diseases. We curate the latest information on regulatory updates, emerging trends, breakthroughs in vaccine technology, vaccine safety and efficacy, global immunization developments and outbreak alerts, as a resource to keep our community informed.

PAHO urges countries to step up efforts to stop measles outbreaks and move towards elimination in the Americas.

The Pan American Health Organization (PAHO) has confirmed: "The Region's measles resurgence has resulted in Bolivia, Mexico and the United States losing their measles elimination status, underscoring the urgent need to close vaccination gaps and strengthen surveillance and outbreak response." Measles elimination was the result of decades of scientific progress, systematic vaccination efforts, and a sustained commitment to public health. Losing this achievement represents a serious setback that demands accountability and immediate action.
Published: November 17, 2026.
https://pubmed.ncbi.nlm.nih.gov/43013819/

World Polio Day 2026: Americas mark 35 years free of wild poliovirus as vaccination gaps persist.

The Americas mark 35 years without a case of polio caused by wild poliovirus this World Polio Day, but vaccination coverage remains below the 95% target recommended by the Pan American Health Organization (PAHO), leaving the Region vulnerable to the reintroduction of the virus.
Published: October 23, 2026.
https://www.paho.org/en/news/23-10-2026-world-polio-day-2026-americas-mark-35-years-free-wild-poliovirus-vaccination-gaps

Vaccines deliver over US$ 30 billion in economic benefits for lower-income countries in 2025.

Gavi-supported immunisation generated more than US$ 30 billion in economic benefits in 2025, through lower healthcare costs and healthier, more productive populations.
Published: October 7, 2026.
https://www.gavi.org/news/media-room/vaccines-deliver-over-us-30-billion-economic-benefits-lower-income-countries-2025

How viruses hijack mosquito saliva to help them infect us.

Several viruses, including West Nile and Zika, release packages of genetic material that appear to suppress the body's innate immune defenses.
Published: October 23, 2026.
https://www.gavi.org/vaccineswork/how-viruses-hijack-mosquito-saliva-help-them-infect-us

AMA and EMA Issue Joint Guidance on Ebola Vaccine Development.

The African Medicines Agency (AMA) and EMA's Emergency Task Force (ETF) have published a joint position paper to support the advancement of Bundibugyo virus (BDBV) vaccines into clinical trials. The position paper, which was created following scientific consultation jointly convened by the AMA, EMA and the WHO on August 24, 2026, bringing together relevant expertise, provides guidance for the timely start of clinical trials to encourage the potential authorization of vaccines against Ebola disease caused by BDBV.
Published: October 23, 2026.
https://au-ama.africa/news_events/ama-and-ema-issue-joint-guidance-on-ebola-vaccine-development/

Personalized therapeutic cancer vaccine cuts risk of melanoma recurrence, opening door to new era of cancer treatment.
In a world-first international trial, adding a therapeutic cancer vaccine to standard immunotherapy after surgery for high-risk melanoma reduced the risk of recurrence or death by 42%.
Published: October 25, 2026.
https://melanoma.org.au/news/personalised-cancer-vaccine-cuts-risk-of-melanoma-recurrence/

Florida Dengue Cases Nearly Double A Month After Emergency Declared.
As of Oct. 22, Florida had reported 721 dengue cases this year, according to the U.S. Centers for Disease Control and Prevention (CDC). That count includes people who caught the virus in the state and those infected while traveling. That's nearly double the 392 cases the state logged in September. Hillsborough County, which includes Tampa, remains at the center of the outbreak.
Published: October 26, 2026.
https://www.usnews.com/news/health-news/articles/2026-10-26/florida-dengue-cases-nearly-double-a-month-after-emergency-declared

IAVI awarded $36 million from BARDA for Bundibugyo virus vaccine development.
Initial award funds process development, manufacturing, and clinical evaluation of a single-dose vaccine candidate through strategic partnerships with Hilleman Laboratories, SK bioscience, and IDT Biologika
Published: October 28, 2026.
https://www.iavi.org/press-release/iavi-awarded-36-million-from-barda-for-bundibugyo-virus-vaccine-development/

131 cases of Japanese encephalitis confirmed so far.
According to the latest status report from the Family Welfare Division under the Ministry of Health and Food Safety, 1,372 cases of acute encephalitis syndrome have been recorded in Nepal so far in 2026, with Japanese encephalitis (JE) confirmed in 131 of these cases.
Published: October 2026.
https://risingnepaldaily.com/news/87337

mRNA — From COVID Vaccines to Cancer Treatment.
How a tiny messenger could change the way we prevent and treat disease.
Published: November 1, 2026.
https://www.vadscorner.com/kc-mrna-vaccines-cancer.html

Seasonal surveillance of West Nile Virus infections – 2026 (weekly report). Since the beginning of the 2026 transmission season, and as at 28 October, 234 areas affected by West Nile virus (WNV) have been identified in 20 countries across Europe.
These 20 countries have reported 2 009 locally acquired human cases of WNV infection. This week, five areas have been reported as affected for the first time this season.
Published: October 30, 2026.
https://www.ecdc.europa.eu/en/public-health-events/2026-evd-00019/2026-10-30

Switzerland reports 4 locally acquired chikungunya cases in Ticino.
The Ticino Department of Health and Social Affairs reports four locally transmitted chikungunya cases this week, a first for Switzerland. The four individuals affected showed a "favorable clinical course." Aside from persistent joint pain, they are doing well.
Published: November 5, 2026.
https://outbreaknewstoday.substack.com/p/switzerland-reports-4-locally-acquired

Live Ebola Map.
Up to November 5, 2026, there have been 10.699 confirmed cases with 5,202 deaths in DRC + Uganda + imported cases.
Published: November 5, 2026.
https://www.liveebolamap.com/

Dengue fever.
Global disease surveillance — 44 countries reporting. Globally 963,298 cases in 44 countries.
Published: November 6, 2026.
https://enclai.net/disease/dengue-fever

Lung antibodies can be measured in exhaled breath.
For the first time, researchers have successfully measured antibodies against specific respiratory viruses in exhaled air, as demonstrated in a groundbreaking study involving Karolinska Institutet and published in *eBioMedicine*. This innovative, noninvasive approach opens

new opportunities to investigate mucosal immunity in the small airways of the lungs. Importantly, it could have significant implications for evaluating vaccine-induced immune responses against respiratory pathogens, identifying more reliable correlates of protection, and advancing the development and assessment of intranasal vaccines.
Published: November 5, 2026.
https://news.ki.se/lung-antibodies-can-be-measured-in-exhaled-breath

Science News. Scientists discover a surprising link between acorns and Lyme disease.
After more than 35 years of research, scientists have uncovered surprising clues about what really drives Lyme disease risk. Contrary to longstanding assumptions, deer populations appear less important than mice, which can fuel a 40% increase in tick numbers the following year. Even acorn production can predict tick population surges two years in advance, while extreme temperatures may be far less deadly to ticks than what scientists once believed.
Published: November 9, 2026.
https://sciencedaily.com/releases/2026/11/261106174518.htm

NiV Nipah Virus Tracker.
Last updated: November 16, 2026.
https://nipahtracker.online/

Chikungunya fever.
Global disease surveillance — 24 countries reporting.
Last updated: November 9, 2026.
https://enclai.net/disease/chikungunya-fever.

Yellow fever - WHO African Region.
Yellow fever transmission continues in the WHO African Region, with recent outbreak activity concentrated in parts of West Africa. Between 1 January and 12 October 2026, 67 confirmed cases, including 18 deaths, were recorded in nine countries in the Region: Burkina Faso, Cameroon, the Central African Republic, Côte d'Ivoire, Ghana, Guinea, Liberia, Nigeria and Togo.
Published: November 6, 2026.
https://www.who.int/emergencies/disease-outbreak-news/item/2026-DON624

HHS Vaccine Task Force Misses Report Deadline.
Now that the deadline has passed for an HHS vaccine task force to issue its report on the timing and sequencing of vaccines, public health advocates are concerned about what happens when the report eventually comes out.
Published: November 10, 2026.
https://www.medpagetoday.com/infectiousdisease/vaccines/123823?xid=nl_mpt_investigative2026-11-11&mh=78b9d767668ebce981a6966b422f64c4&zdee=gAAAAABm4ueYkZNJlwY53sI1rG6_jN7FF2M3EgH5lRHuJb_i8iGzNJ1mRKgUOMs1nOzVDpd2wgb-woUDLozoQ4y0Z5pYMm_74peOnIDehyX-K-eODyiUPmc%3D&utm_source=Sailthru&utm_medium=email&utm_campaign=PolicyPulse_11112026&utm_term=NL_Gen_Int_Policy_Pulse_Active&lctg=5612d4c03b35d0f6298b5791

World Pneumonia Day.
A Global Day of Action.
Published: November 12, 2026.
https://stoppneumonia.org/latest/world-pneumonia-day/

Climate Change Is Bringing Dengue Fever to the High Himalayas.
As Nepal's mountains warm, mosquitoes are spreading dengue, once strictly a lowland disease, to higher-elevation, densely populated areas.
Published: November 7, 2026.
https://insideclimatenews.org/news/07112026/nepal-himalayas-dengue-fever/

Ebola disease: Multi-country outbreak 2026.
As of 12 November 2026, the Democratic Republic of the Congo (DRC), where community transmission is ongoing, has reported a total of 11 197 confirmed cases, including 5 471 related deaths (from data up until 11 November). Since the beginning of the outbreak, eight provinces have been affected: Ituri, Nord-Kivu, Sud-Kivu, Tshopo, Haut-Uélé, Bas-Uélé, Sud Ubangi and Nord Ubangi. In Nigeria, one Ebola case was reported on 20 October 2026. The person has since been medically evacuated to Switzerland. The individual, who had travel history to Uganda, developed symptoms on 7 October, sought medical care on 11 October, and tested positive on 20 October. A total of 62 contacts in the case have been identified. In Kenya, a total of nine confirmed cases, including two deaths, have been reported, all linked to the first case. The last case was reported on 20 October

2026, and the second death was reported on 23 October 2026. As of 11 November, seven cases had recovered and all identified contacts under monitoring completed 21 days of quarantine.
Published: Updated November 13, 2026.
https://www.ecdc.europa.eu/en/ebola-disease-multi-country-outbreak-2026

LynchVax update: November 2026. The first part of the INTERCEPT-Lynch vaccine trial is now full.
Another Lynch syndrome (a genetic condition that raises the risk of many types of cancer, especially colon cancer and endometrial cancer) vaccine is heading for a large international trial, and there is wider news from cancer vaccine research, both good and bad.xford LynchVax team has published the latest issue of its newsletter (Issue 7, November 2026), and there is plenty of encouraging news for the Lynch syndrome community.
Published: November 10, 2026.
https://www.lynch-syndrome-uk.org/post/lynchvax-update-november-2026

RSV vaccines slash infections: data show jabs' staggering success against dangerous virus.
Vaccines and monoclonal-antibody injections are cutting hospitalizations linked to the respiratory virus. On 1 October 2025, Denmark introduced a nationwide policy of vaccinating pregnant people against RSV — a respiratory pathogen that usually causes mild symptoms but can lead to severe disease and even death in vulnerable people, including infants and older adults. Maternal antibodies induced by the vaccine cross the placenta to protect babies for around the first six months of their lives, when they are most at risk. Newborns at high risk of severe disease, including premature infants, whose mothers had not been vaccinated, were given injections of monoclonal antibodies. Johannesen, a vaccine researcher at Nordsjællands Hospital in Hillerød, Denmark, found that infant hospital admissions plummeted.
Published: November 13, 2026.
https://www.nature.com/articles/d41586-026-03573-3



Latest Relevant Publications

LATEST PUBLISHED PAPERS AND COMMENTARIES FROM THE CHIEF EDITORS

Latest impactful scientific publications that stand out for their potential bearing on healthcare. We introduce groundbreaking research findings, innovative treatment modalities, results from phase 1 to 3 vaccine clinical trials, or paradigm-shifting discoveries that redefine our understanding of infectious diseases and therapeutic approaches for all vaccine-preventable diseases.

01

Vashishtha VM. **BCG at 100: The Paradox of an Indispensable Vaccine.** *Indian Pediatr.* 2026 Oct 22.
doi: https://doi.org/10.1007/s13312-026-00433-1

Editorial comment: More than a century after its introduction, BCG remains essential for protecting infants against severe forms of tuberculosis, with 60–80% efficacy, while potentially offering additional benefits through trained immunity. However, its limited and variable protection against pulmonary tuberculosis in adolescents and adults remains a major challenge for global TB control.

This perspective examines whether BCG remains indispensable, how its effectiveness could be improved, and whether its benefits extend beyond tuberculosis. It also highlights promising next-generation vaccines, particularly MTBVAC as a potential BCG replacement in infants and M72/AS01E for adolescents and adults. The challenge is no longer simply to maintain BCG vaccination, but to develop more effective vaccines capable of preventing disease and reducing tuberculosis transmission worldwide.

02

Zou W, Zhou H, Williams D, Lees A, Xu HH, Chen W. **Simplified Capsular Polysaccharide Isolation and Alternative Conjugation Enable the Development of a Protective Glycoconjugate Vaccine Against KL49 *Acinetobacter baumannii*.** *Vaccines*. 2026; 14(11):921.
doi: https://doi.org/10.3390/vaccines14110921

Editorial comment: As carbapenem-resistant *Acinetobacter baumannii* increasingly threatens intensive care patients, vaccines may offer a valuable preventive strategy. A novel KL49 capsular polysaccharide conjugate vaccine demonstrated strong antibody responses and protection against lethal infections caused by different *A. baumannii* strains in mice. Although still preclinical, these findings represent a promising step toward vaccines against this major antimicrobial-resistant pathogen.

03

GBD 2023 Measles Collaborators. **Global and regional burden of measles and vaccine coverage among children under 5 years, 1990-2023: a Global Burden of Disease Study.** *Nat Med.* 2026 Oct 21.
doi: https://doi.org/10.1038/s41591-026-04661-7

Editorial comment: Despite decades of progress, measles is resurging worldwide. A GBD 2023 analysis estimated 15.6 million cases and 118,000 deaths in children under five in 2023, representing increases of 40% and 12%, respectively, compared with 2019. Sub-Saharan Africa and South Asia remain disproportionately affected, while global first-dose measles vaccine coverage declined to 81%.

These findings highlight the fragility of immunization gains and the urgent need to restore vaccination coverage, close immunity gaps, and strengthen outbreak preparedness worldwide.

04

Wang X, Pan W, Huang J, Zhou Y, Nalinratana N, Rojsitthisak P, Lin Y, Zhao K. Oral vaccine delivery systems: **Gastrointestinal barriers, gut microbiota, and emerging engineering strategies.** *Cell Rep.* 2026 Sep 25;45(10):118038.
doi: https://doi.org/10.1016/j.celrep.2026.118038

Editorial comment: Oral vaccines offer important advantages, including ease of administration, improved acceptance, and the potential to induce both mucosal and systemic immunity. However, gastrointestinal barriers, immune tolerance, and gut microbiota variability continue to limit their development and effectiveness. This review highlights promising advances in oral vaccine delivery, particularly engineered nanocarriers, microbial vectors, and nonliving bacterial derivatives designed to improve antigen protection and immune responses. These innovations could help overcome longstanding challenges and expand the role of oral immunization in global public health, although further clinical validation of their efficacy and safety remains essential.

05

Hooper JW, Lesko S, Principe L, Josleyn M, Kwilas S, Norris S, Tomashek KM, Paulsen G. **Evaluation of Andes virus vaccine-derived human antibody for protection in Syrian hamsters: a passive transfer study using phase 1 trial sera.** *EBioMedicine.* 2026 Oct 27;133:106535.
doi: https://doi.org/10.1016/j.ebiom.2026.106535

Editorial comment: Andes virus (ANDV), a cause of severe hantavirus pulmonary syndrome and capable of person-to-person transmission, remains a major public health concern without licensed vaccines or specific therapeutics. This study demonstrates that neutralizing antibodies induced in humans by an investigational DNA vaccine targeting the Gn/Gc envelope proteins provide significant protection against lethal ANDV infection in a hamster model. Importantly, the findings suggest that neutralizing antibody titers could serve as potential correlates of protection and surrogate endpoints in future vaccine trials. Although further validation is needed, these results represent an encouraging step toward developing effective hantavirus vaccines.

06

McClymont E, Blitz S, Nicolls S, Lee M, Coutlée F, Walmsley S, Trottier S, Smaill F, Loutfy M, Yudin MH, Klein MB, Harris M, Stone S, Martinez-Cajas JL, Money D; CTN 236 HPV in HIV Study Team. **Long-term immunogenicity and efficacy of the quadrivalent human papillomavirus vaccine in women with HIV: a longitudinal cohort study.** *Lancet HIV.* 2026 Nov;13(11):e779-e787.
doi: https://doi.org/10.1016/S2352-3018(26)00204-3 Epub 2026 Oct 5. PMID: 42833230.

Editorial comment: Women living with HIV face a disproportionately high burden of HPV infection and cervical cancer, making effective vaccination essential for cervical cancer elimination. This Canadian multicenter study demonstrates sustained immunogenicity of the quadrivalent HPV vaccine for up to nine years, with antibody levels comparable to those in women without HIV. Importantly, vaccinated participants experienced low rates of persistent HPV infection and genital warts, with no CIN2+ cases observed in the per-protocol cohort. Sustained HIV viral suppression was associated with better antibody persistence, highlighting the importance of effective antiretroviral treatment. These encouraging findings reinforce the value of HPV vaccination in women living with HIV and its critical role in advancing equitable cervical cancer prevention worldwide.

07

Rouzine IM. **Vaccination accelerates the race of influenza virus against collective immunity.** *PLoS Pathog.* 2026 Oct 12;22(10):e1014311.
doi: https://doi.org/10.1371/journal.ppat.1014311

Editorial comment: The continuous evolution of respiratory viruses, particularly influenza, remains a major challenge for vaccine development. Using an epidemiological and evolutionary model informed by influenza data, this study suggests that vaccination could accelerate viral evolution and, under certain theoretical conditions, even increase infection incidence. However, these outcomes may be avoided through vaccines that induce broader neutralizing immunity or anticipate emerging viral variants. Although these findings are based on mathematical modeling rather than clinical evidence, they highlight the potential importance of integrating viral evolutionary forecasting into vaccine design. Combining predictive approaches with the development of broadly neutralizing vaccines could represent a promising strategy for improving long-term vaccine effectiveness against rapidly evolving respiratory viruses.

08

Odio CD, Aogo RA, Firdous S, Voirin C, Blanco-Rivera S, Lowman KE, Asante N, Broderson Y, Konda K, Hasund CM, Martinez-Perez A, Mpingabo PI, Law M, Jarvis C, Callier V, Hunsberger S, Abad Fernandez M, de Silva A, Kattappuram R, Bhushan G, Yek C, Manning J, Durbin AP, Cohen JI, Weiskopf D, Whitehead SS, Katzelnick LC. **Dengue virus controlled human challenge reveals that preexisting immunity shapes viral replication and broadly protective responses.** *Sci Transl Med.* 2026 Oct 28;18(873):eaei5117.
doi: https://doi.org/10.1126/scitranslmed.aei5117

Editorial comment: Dengue represents a unique challenge in vaccinology, as preexisting immunity can either protect against infection or contribute to disease severity. This Phase 1 controlled human challenge study demonstrates that secondary heterotypic dengue infection produces higher viremia and stronger immune responses, while revealing important differences in immune protection. Notably, preexisting antibodies that enhanced viral replication were associated with delayed immune activation and less durable responses, whereas broadly reactive antibodies against nonstructural protein 1 (NS1) were associated with early viral control and sustained B- and T-cell immunity. These findings provide valuable insights into the complex interplay between antibody-dependent enhancement and protective immunity, highlighting the importance of inducing balanced, broadly protective, and durable immune responses in future dengue vaccines. Importantly, controlled human infection models may help identify reliable correlates of protection and accelerate the development of safer and more effective dengue vaccines.

09

Coppi MM, Graciotti M, Digklia A, Kandalaft LE. **Strategies to develop therapeutic cancer vaccines for pancreatic cancer.** *Lancet Gastroenterol Hepatol.* 2026 Oct 14:S2468-1253(26)00149-4.
doi: https://doi.org/10.1016/S2468-1253(26)00149-4

Editorial comment: Pancreatic ductal adenocarcinoma (PDAC) remains one of the most lethal cancers, with limited responses to conventional immunotherapies due to its immunosuppressive tumor microenvironment. This comprehensive review of 120 clinical trials highlights the growing potential of therapeutic cancer vaccines, including cell-based, peptide, nucleic acid, and microbial platforms. Although most approaches have demonstrated favorable safety profiles and tumor-specific immune responses, clinical benefits remain limited. Particularly promising are personalized mRNA neoantigen vaccines, which have induced robust and persistent CD8+ T-cell responses, alongside emerging strategies targeting shared mutations such as KRAS. These findings underscore the potential of next-generation cancer vaccines, particularly when combined with other immunotherapies, while emphasizing the need for larger, biomarker-guided clinical trials to establish meaningful survival benefits.

10

Thomas A, Ho TKC, Chishimba S, Kurtovic L, Rünz T, D'Souza CS, Beeson JG. **Evaluating a Potential Dose-Sparing Self-Amplifying RNA Vaccine for Induction of Functional Antibodies to Blood-Stage *Plasmodium falciparum* Malaria**. *Vaccines*. 2026; 14(11):948.
doi: https://doi.org/10.3390/vaccines14110948

Editorial comment: The development of more effective and durable malaria vaccines remains a global health priority. This preclinical study explores a promising self-amplifying RNA (saRNA) vaccine targeting *Plasmodium falciparum* merozoite surface protein 2 (PfMSP2), an important antigen associated with protective immunity. In mice, the lipid nanoparticle-formulated vaccine induced robust antigen-specific antibodies with functional activities, including complement fixation and Fc receptor binding, after only two doses. Notably, comparable immune responses were achieved with both low- and high-dose regimens, suggesting potential dose-sparing advantages. These findings highlight the promise of saRNA technology for next-generation malaria vaccines, although further studies are needed to establish protective efficacy, durability, and clinical applicability in humans.

11

Hughes BL, Clifton RG, Metz TD, Yee L, de Voest JA, Longo M, O'Shea TM, Clark K, Mallett G, Rouse DJ, Tita ATN, Gibson KS, Mendez-Figueroa H, Simhan HN, Thorp JM Jr, Parry S, Norton ME, Reddy UM, Eppes CS, Kilpatrick SJ, Saade GR; National Institute of Child Health and Human Development Maternal-Fetal Medicine Units Network. **SARS-CoV-2 mRNA Vaccination in Pregnancy and Child Neurodevelopment at 18 to 30 Months**. *JAMA Pediatr.* 2026 Nov 2.
doi: https://doi.org/10.1001/jamapediatrics.2026.5142

Editorial comment: This multicenter prospective study found no significant differences in neurodevelopmental or behavioral outcomes among children aged 18–30 months whose mothers received SARS-CoV-2 mRNA vaccines during or shortly before pregnancy compared with unexposed children. These reassuring findings provide further evidence supporting the safety of maternal COVID-19 vaccination and reinforce its importance in protecting pregnant women without compromising early childhood neurodevelopment.

12

Kimberly Davis, Kirsty Le Doare, Johan Vekemans, Pierre Gsell, Annelies Wilder-Smith, Annette Kraus, Somyoung Cho, Liesl Zühlke, Scott H. Wirth, Joselyn Rwebembera, James Marangou, Marco Cavaleri, Yasir Bin Nisar, Christopher J. Gregory, Chris Van Beneden, Shiranee Sriskandan, Edwin Asturias, Alma Fulurija, Jim Ackland, Andrea Beaton, Joshua Osowicki, Jonathan Carapetis, Jerome H. Kim, Andrew Steer. **Clinical endpoints for trials of Strep A vaccines: report of two expert meetings**. *Vaccine*. 2027; 96: 129262.
doi: https://doi.org/10.1016/j.vaccine.2026.129262

Editorial comment: Despite the substantial global burden of Group A *Streptococcus*, including rheumatic heart disease affecting over 55 million people, no licensed vaccine is available. WHO and the Strep A Vaccine Global Consortium have proposed a pragmatic clinical development pathway, prioritizing prevention of childhood pharyngitis as an initial efficacy endpoint, with impetigo and early rheumatic heart disease as additional potential outcomes. This coordinated strategy represents an important step toward accelerating Strep A vaccine development, regulatory approval, and equitable access, particularly in low- and middle-income countries where the disease burden is greatest.

13

Idoko OT, Vargas SL, Bueso A, Rivera D, Edward H, Banooni P, Berger S, Janicot S, Vercasson C, Pallardy S, Nteene R, Adhikarla H, Gerchman E, Gasparotto M, Gallichan S, Rivas E, Buchholz UJ, Sesay S, Gurunathan S, De Bruijn I, Dhingra MS. **Immunogenicity and shedding of live-attenuated intranasal respiratory syncytial virus vaccine in children aged 6-18 months by baseline serostatus: a multicentre, randomised, placebo-controlled, phase 1/2 trial.** *Lancet Microbe*. 2026 Oct 13:101447.
doi: https://doi.org/10.1016/j.lanmic.2026.101447

Editorial comment: This Phase 1/2 trial evaluated a live-attenuated intranasal RSV vaccine (RSVt) in children aged 6–18 months, demonstrating favorable immunogenicity and no vaccine-related serious adverse events. Neutralizing antibody responses were substantially stronger in RSV-naive children, particularly those without maternal antibodies, highlighting the influence of baseline serostatus. Vaccine virus shedding confirmed replication but did not consistently correlate with antibody responses. These findings support further development of intranasal RSV vaccines while emphasizing the importance of preexisting immunity and the need for broader correlates of protection beyond serum antibodies.

14

Karron RA, Krubiner CB, Faden RR. **Inclusion of pregnant and lactating women in the Tumaini vaccine efficacy trial: a landmark advance.** *Lancet*. 2026 Nov 4:S0140-6736(26)02155-0.
doi: https://doi.org/10.1016/S0140-6736(26)02155-0

Editorial comment: The Tumaini trial protocol (NCT07842107) developed by the National Institute of Biomedical Research of the Democratic Republic of the Congo and partners to evaluate the efficacy of vaccines against Bundibugyo virus (BDBV) includes pregnant and lactating women. This trial represents a groundbreaking ethical and public health advance for two reasons: (1) it addresses the substantial threat of severe disease and death for pregnant women in the BDBV outbreak; and (2) it reverses a historical pattern of exclusion of pregnant and lactating women from trials of epidemic vaccines, which has led to delayed access to efficacious vaccines because pregnancy and lactation-specific evidence was unavailable.

15

Pollock KM, Saunders JE, Fowler J, Camara S, Kakai I, Eordogh A, Plested G, Green CM, da Silva CF, de Whalley P, Islam MK, Marchevsky NG, Belij-Rammerstorfer S, Lambe T; CCHF01 Study Team. **Safety and immunogenicity of an adenoviral-vectored vaccine against Crimean-Congo haemorrhagic fever in the UK (CCHF01): an open-label, first-in-human, non-randomised, phase 1 clinical trial.** *Lancet Infect Dis*. 2026 Oct 23:S1473-3099(26)00471-8.
doi: https://doi.org/10.1016/S1473-3099(26)00471-8

Editorial comment: With no widely approved vaccines against Crimean-Congo hemorrhagic fever, a WHO priority pathogen, this first-in-human Phase 1 trial of the ChAdOx2 CCHF vaccine represents an encouraging advance. In 46 healthy adults, the two-dose adenoviral-vectored vaccine demonstrated acceptable tolerability, no serious adverse events, and robust antibody responses, particularly after the second dose. These promising findings support further clinical development, although larger trials are essential to establish protective efficacy, long-term safety, and durability of immunity against this potentially fatal disease.

16

Jacobson KB, Watson AJ, Liao LD, Stephens SC, Merchant M, Zerbo O, Klein NP. **Maternal Vaccination vs Nirsevimab Use and Respiratory Syncytial Virus Infection Among Full-Term Infants.** *JAMA Netw Open*. 2026 Oct 1;9(10):e2636760.
doi: https://doi.org/10.1001/jamanetworkopen.2026.36760

Editorial comment: This large real-world cohort study found that both maternal RSVpreF vaccination and infant nirsevimab administration significantly reduced RSV infections and hospitalizations during the first six months of life compared with no protection. No statistically significant differences in effectiveness were observed between the two strategies. These reassuring findings reinforce current recommendations and highlight the importance of ensuring equitable access to either preventive approach to protect infants against RSV-associated disease and hospitalization.

17

Del Rosario JMM, Vishwanath S, Frost SDW, Sujit SB, Ashokan SK, Vendramelli R, Ferrari M, Carnell GW, Vianello L, Pagliari M, Ramzi S, Panzarin VM, Mazzacan E, Fortin A, Vascellari M, Truong T, Tonks P, Ortiz AL, Huang CQ, Einhauser S, Schachtner M, Asbach B, Storisteanu DML, Temperton NJ, Davies MN, Moss D, Kinsley R, Wagner R, Kobasa D, Bonfante F, Heeney JL. **Broad vaccine protection against globally diverse influenza A/H5Nx viruses.** *Cell Rep Med.* 2026 Nov 5:103131.
doi: https://doi.org/10.1016/j.xcrm.2026.103131

Editorial comment: The continued evolution and reassortment of highly pathogenic avian influenza H5Nx viruses pose a significant pandemic threat, challenging conventional strain-specific vaccines. This preclinical study introduces DVX-panH5Nx, a computationally optimized multivalent mRNA vaccine targeting HA, NA, and M2 antigens. In mice and ferrets, it induced broad immune responses and demonstrated superior protection against diverse H5N1 strains compared with WHO candidate vaccine viruses. These promising findings highlight the potential of computationally designed mRNA vaccines to overcome viral antigenic diversity and strengthen global pandemic preparedness, although clinical validation remains essential.

18

Wolpert MD, Liang Y, Fitzpatrick MC, Ortiz JR. **Testing the 40% to 60% Influenza Vaccine Effectiveness Heuristic: A Meta-Analysis.** *JAMA Netw Open.* 2026;9(11):e2642906.
doi: https://doi.org/10.1001/jamanetworkopen.2026.42906

Editorial comment: This meta-analysis of 18 influenza seasons in the United States, involving more than 96,000 participants, found an overall vaccine effectiveness of 41.3%, decreasing to 36.2% during seasons with antigenic mismatch, compared with 50.4% without mismatch. Importantly, mismatch occurred in 61% of seasons. These findings highlight the variability of influenza vaccine effectiveness and reinforce the need for improved vaccine platforms offering broader and more durable protection. Nevertheless, seasonal influenza vaccination remains an essential public health intervention, particularly for preventing severe disease.

19

Perlis RH, Santillana M, Baum MA, Druckman JN, Ognyanova K, Lazer D. **Knowledge and Misinformation Regarding Autism Risk Factors in a Survey of US Adults.** *JAMA Health Forum.* 2026 Nov 6;7(11):e264105.
doi: https://doi.org/10.1001/jamahealthforum.2026.4105

Editorial comment: A nationwide survey of more than 30,000 US adults revealed alarming misconceptions about autism risk factors: 26.6% incorrectly believed childhood vaccines cause autism, while 23.1% identified acetaminophen use during pregnancy as a risk factor. These beliefs were strongly associated with political affiliation and demographic characteristics. Despite overwhelming scientific evidence refuting a causal relationship between vaccines and autism, misinformation remains widespread. These findings underscore the urgent need for targeted, evidence-based public health communication to restore trust in vaccines and protect immunization programs.

20

Mietz J, Merlotti A, de Fougerolles A, Demaria O, Vivier E. **Programming immunity in situ: A new frontier of in vivo cell engineering.** *Sci Immunol.* 2026 Nov 6;11(125):eaed1027.
doi: https://doi.org/10.1126/sciimmunol.aed1027

Editorial comment: In vivo immune cell engineering represents a promising breakthrough in personalized medicine, enabling immune cells to be genetically programmed directly inside the body using lipid nanoparticles or viral vectors. Early clinical studies in cancer and autoimmune diseases demonstrate its growing feasibility, potentially making cell therapies more accessible, scalable, and cost-effective. However, precise cell targeting, controlled therapeutic activity, and prevention of off-target effects and immune-related toxicity remain major challenges. Overcoming these barriers could revolutionize the treatment of diseases currently resistant to conventional therapies.

21

Kline M, Wyllie AL, McElwee K, Trammel J, Sabra A, MacLennan CA, Theilacker C, Moïsi JC. **Safety and Immunogenicity of 20-Valent Pneumococcal Conjugate Vaccine According to Number and Timing of Primary Series Doses**. *Pediatr Infect Dis J.* 2026 Dec 1;45(12):1089-1096.
doi: https://doi.org/10.1097/INF.0000000000005291

Editorial comment: A post hoc analysis of two phase 3 trials evaluating PCV20 in infants highlights the importance of vaccination timing in optimizing immune responses. Under a 2+1 schedule, administering primary doses at 3 and 5 months produced higher serotype-specific IgG responses across all 20 serotypes than vaccination at 2 and 4 months. Importantly, both schedules generated robust booster responses, with post-booster antibody levels comparable to those achieved with a 3+1 schedule. PCV20 was safe and well tolerated regardless of timing. These findings suggest that modest adjustments in primary dose timing may enhance PCV20 immunogenicity, although further studies are needed to determine whether these differences translate into improved clinical protection.

22

Prendergast L, Begley E, Savoury M, Stielke A, Bastías M, Cresswell K, Collins B, Dyakova M, Salas D. **Exploring the broader social value outcomes reported in economic evaluations of vaccination programmes across the life course: A scoping review**. *Vaccine*. 2026 Dec; 94: 129226.
doi: https://doi.org/10.1016/j.vaccine.2026.129226

Editorial comment: A scoping review of 171 studies highlights how traditional economic evaluations underestimate the true value of vaccination by focusing primarily on healthcare costs and quality-adjusted life years (QALYs). Vaccines provide broader benefits, including improved productivity, reduced long-term disability and care needs, lower out-of-pocket expenses, and substantial societal and economic gains. Yet these benefits remain inadequately captured in current assessments. Recognizing the full value of vaccination is essential to inform immunization policies, strengthen investment decisions, and demonstrate that vaccines are not merely healthcare expenditures, but long-term investments in societal well-being and economic development.

23

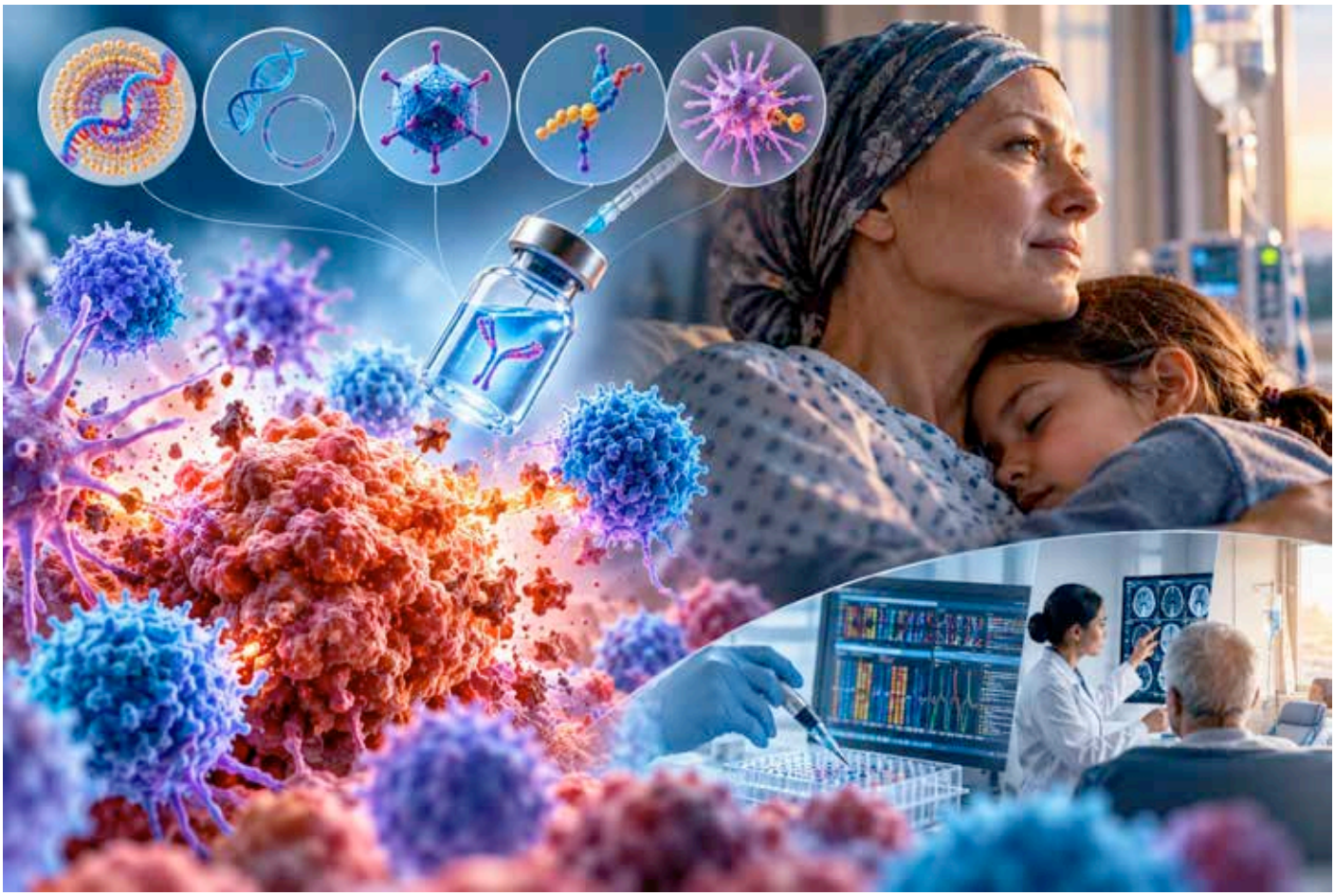
Tchouatieu AM, Wells TNC, Achan J. **Preventing Malaria Infections and Moving toward Malaria Elimination.** *N Engl J Med*. 2026 Nov 12;395(19):1932-1943.
doi: https://doi.org/10.1056/NEJMra2508563

Editorial comment: Malaria remains a major global health threat, with an estimated 282 million cases and 610,000 deaths in 2024, disproportionately affecting African children. Despite stalled progress, prevention is entering a promising new era with the introduction of RTS,S/AS01 and R21/Matrix-M vaccines, improved insecticide-treated nets, and expanded chemoprevention. Emerging strategies, including long-acting monoclonal antibodies and transmission-blocking interventions, offer additional opportunities. However, vaccines alone will not eliminate malaria. Sustainable progress requires integrating vaccination with vector control, chemoprevention, and surveillance, supported by adequate funding, strong national leadership, and strategies tailored to endemic populations.



Editors' Corner

VACCINES BEYOND INFECTIOUS DISEASES: THE NEW FRONTIER OF CANCER IMMUNOTHERAPY.



Introduction

Vaccines have traditionally been associated with preventing infectious diseases. Today, advances in immunology, molecular biology, and biotechnology are expanding their potential into cancer treatment. Therapeutic cancer vaccines represent a new frontier in precision medicine, offering the possibility of training the immune system to recognize and eliminate malignant cells.

From preventing infections to treating cancer

The relationship between vaccination and cancer is not entirely new. Vaccines against human papillomavirus (HPV) and hepatitis B virus (HBV) have already demonstrated that preventing infections can also prevent certain

malignancies. However, therapeutic cancer vaccines pursue a fundamentally different objective: stimulating immune responses against tumors that have already developed.

Unlike conventional preventive vaccines, therapeutic cancer vaccines must overcome a particularly challenging biological environment. Cancer cells originate from the body's own tissues, making them difficult for the immune system to distinguish from healthy cells. Moreover, tumors develop sophisticated mechanisms to escape immune surveillance, including suppression of T-cell activity and alterations in antigen presentation.

Recent advances in tumor immunology have renewed interest in therapeutic vaccination. Researchers can now identify tumor-associated antigens and tumor-specific neoantigens, creating opportunities to generate targeted immune responses against malignant cells. The objective is not simply to produce antibodies but, importantly, to activate cytotoxic CD8+ T lymphocytes capable of recognizing and destroying cancer cells [1,2].

The emergence of personalized cancer vaccines

One of the most promising developments is the emergence of personalized neoantigen vaccines. These vaccines are designed using the genetic characteristics of an individual patient's tumor.

Through tumor sequencing and bioinformatics, researchers identify mutations that produce abnormal proteins, known as neoantigens. Because these neoantigens are generally absent from normal tissues, they can provide highly specific targets for immune recognition.

Once selected, neoantigens can be incorporated into different vaccine platforms, including messenger RNA (mRNA), synthetic peptides, DNA, viral vectors, and dendritic cell-based vaccines.

Among these technologies, mRNA has attracted particular attention because of its flexibility, ability to encode multiple antigens, and potential for relatively rapid manufacturing. Importantly, personalized vaccines may address the biological heterogeneity of cancer, recognizing that two patients with the same type of malignancy may harbor substantially different tumor mutations.

Nevertheless, personalization introduces challenges involving manufacturing time, cost, antigen selection, and the ability to deliver treatment before disease progression.

The scientific significance of this approach extends beyond oncology: it represents a transition from standardized vaccination toward immunization strategies adapted to the molecular characteristics of an individual patient [1,2].

Melanoma: a leading example of clinical progress

Melanoma has become one of the most important models for therapeutic cancer vaccine development because of its relatively high mutational burden and responsiveness to immunotherapy.

A particularly relevant clinical study evaluated the individualized mRNA-based neoantigen therapy mRNA-4157 (V940) combined with pembrolizumab, an anti-PD-1 immune checkpoint inhibitor, in patients with completely resected high-risk melanoma.

In this randomized phase 2b trial, the combination reduced the risk of recurrence or death compared with pembrolizumab alone. These findings provided encouraging clinical evidence that personalized vaccination could enhance the effectiveness of established cancer immunotherapy [3].

The biological rationale is compelling. While vaccination stimulates tumor-specific T-cell responses, checkpoint inhibitors help restore the activity of immune cells suppressed by tumor-associated inhibitory pathways. Their combination may therefore provide complementary mechanisms of action.

However, these findings should not be interpreted as definitive evidence that personalized melanoma vaccines are ready for routine clinical use. Larger randomized trials, longer follow-up, and robust overall survival data remain essential.

Pancreatic cancer: an unexpected opportunity

Pancreatic cancer represents another important area of investigation. Traditionally considered poorly responsive to immunotherapy, pancreatic ductal adenocarcinoma has a highly immunosuppressive tumor

microenvironment and relatively limited sensitivity to immune checkpoint inhibitors.

Nevertheless, a phase I study published in Nature demonstrated that personalized mRNA neoantigen vaccination could stimulate substantial tumor-specific T-cell responses in patients who had undergone pancreatic cancer surgery.

Eight of 16 vaccinated patients developed measurable vaccine-induced T-cell responses. Importantly, these responses were associated with delayed disease recurrence, although the small sample size and nonrandomized design prevent definitive conclusions about clinical efficacy [4].

These observations are particularly relevant because they suggest that therapeutic vaccination may be feasible even against tumors historically considered immunologically resistant.

An emerging concept is that cancer vaccines may be most effective when administered after surgical removal of the primary tumor, when the remaining malignant cell burden is relatively small. In this setting, vaccine-induced immune responses might help eliminate microscopic residual disease and reduce the risk of recurrence.

Beyond mRNA: different platforms and established precedents

Although mRNA vaccines dominate much of the current scientific discussion, therapeutic cancer vaccination encompasses several distinct technologies.

Peptide-based vaccines deliver selected tumor antigens, while DNA and viral-vector vaccines introduce genetic instructions for antigen production. Dendritic cell vaccines use specialized antigen-presenting cells to stimulate antitumor immunity.

Indeed, therapeutic cancer vaccination is not entirely experimental. Sipuleucel-T, an autologous cellular immunotherapy approved by the U.S. Food and Drug Administration in 2010, is used for selected patients with metastatic castration-resistant prostate cancer. Its approval established an important clinical precedent for therapeutic cancer vaccines.

Oncolytic virus therapies, including talimogene laherparepvec (T-VEC) for selected patients with melanoma, represent a related but distinct immunotherapeutic strategy, combining tumor destruction with immune stimulation [5].

The diversity of available platforms illustrates an important principle: no single vaccine technology is likely to be optimal for every cancer. Tumor biology, antigen expression, disease stage, and immune competence will influence the most appropriate approach.

Artificial intelligence: accelerating the discovery of cancer vaccine targets

Artificial intelligence (AI) and machine learning are becoming increasingly important in the development of personalized cancer vaccines.

Identifying a tumor mutation is relatively straightforward compared with determining whether the resulting neoantigen will be processed, presented by human leukocyte antigen molecules, recognized by T lymphocytes, and capable of generating a meaningful antitumor response.

AI-based computational models can analyze large genomic and immunological datasets, predict antigen presentation, and prioritize potentially immunogenic epitopes. These approaches may reduce the number of unsuitable candidates and improve the efficiency of vaccine design [6].

However, computational predictions do not automatically translate into biological effectiveness. Algorithms require rigorous experimental validation, and their performance may vary across cancer types and genetically diverse populations.

The integration of AI with tumor sequencing, immunopeptidomics, and clinical immunology could nevertheless substantially improve the precision and speed of personalized vaccine development.

Combining cancer vaccines with other immunotherapies

One of the most important lessons emerging from cancer immunotherapy research is that vaccination alone may not be sufficient.

Tumors can suppress immune responses through multiple mechanisms, including checkpoint signaling, impaired antigen presentation, and the recruitment of immunosuppressive cells.

Consequently, therapeutic cancer vaccines are increasingly being investigated alongside immune checkpoint inhibitors, chemotherapy, radiotherapy, and other immunomodulatory treatments.

This combination approach seeks to achieve two complementary objectives: generate or expand tumor-specific T cells through vaccination and create conditions that allow these cells to recognize and eliminate malignant cells.

In particular, vaccines may help transform immunologically inactive tumors into tumors more susceptible to immune-based treatment. However, determining the optimal sequence, timing, and combination of therapies remains a major research priority [7].

Scientific challenges and the importance of equitable access

Despite remarkable technological progress, several barriers must be overcome before therapeutic cancer vaccines can become widely implemented.

First, tumor heterogeneity complicates antigen selection. Different cancer cells within the same tumor may express different mutations, allowing some malignant populations to escape immune recognition.

Second, tumors can evolve under immune pressure, losing relevant antigens or disrupting the pathways required for antigen presentation.

Third, the presence of vaccine-induced immune responses does not necessarily establish meaningful clinical benefit. Improved recurrence-free survival, overall survival, and quality of life must remain central measures of clinical success.

Finally, personalized cancer vaccines introduce substantial logistical and economic challenges. Tumor sequencing, computational analysis, individualized manufacturing, quality control, and timely treatment delivery require sophisticated infrastructure.

These considerations raise an important global health question: will personalized cancer vaccines become accessible to patients worldwide, or will their benefits remain concentrated in countries with advanced oncology services?

Research into shared tumor antigens, standardized manufacturing processes, and more efficient vaccine platforms may help address these challenges. Equitable access should be considered during development rather than only after regulatory approval [8].

Conclusions

Therapeutic cancer vaccines are expanding the boundaries of vaccinology, bringing immunization into the era of precision oncology. Advances in mRNA technology, neoantigen identification, artificial intelligence, and combination immunotherapy offer promising opportunities, although substantial clinical and implementation challenges remain.

The future of vaccination may involve not only preventing disease but also helping the immune system treat cancer. Ensuring that these innovations become clinically effective, affordable, and globally accessible must be a shared scientific and public health priority.

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Best Practice

MEASLES RESURGENCE IN 2026: BEST PRACTICES FOR OUTBREAK CONTROL AND CLOSING IMMUNIZATION GAPS



Introduction

Measles remains one of the most contagious human infectious diseases and one of the clearest indicators of weaknesses in national immunization programs. Despite the availability of a safe, highly effective, and affordable vaccine for more than six decades, measles continues to cause substantial morbidity, hospitalizations, and preventable deaths worldwide.

The resurgence of measles in 2025–2026 represents a serious setback to global elimination efforts. According to the World Health Organization (WHO), an estimated 95,000 people died from measles in 2024, predominantly unvaccinated or undervaccinated children younger than five years. Between 2000 and 2024, measles vaccination prevented approximately 59 million deaths worldwide. (1)

However, the central challenge extends beyond achieving high national vaccination coverage. Measles elimination requires sustained coverage of at least 95% with both doses of measles-containing vaccine (MCV1 and MCV2), with homogeneous protection across districts, communities, and population subgroups. Even countries reporting high national coverage may experience major outbreaks when unvaccinated individuals are geographically or socially clustered. (2,3)

This Best Practice review examines the global measles situation in 2026, the importance of eliminating immunity gaps, and the practical clinical and public health interventions required to interrupt transmission and advance equitable immunization.

1. Global epidemiological situation in 2026

WHO provisional surveillance data indicates substantial measles activity across multiple regions, including South and Southeast Asia, Africa, and the Americas.

These data demonstrate that measles resurgence is not restricted to low-income countries. Transmission also affects middle-income and high-income settings, particularly where immunization gaps have accumulated.

WHO emphasizes that provisional surveillance data underestimate the true number of infections because of underdiagnosis, incomplete reporting, and reporting delays, frequently extending one to two months. (5)

Table 1. Countries reporting the highest measles case counts worldwide

WHO provisional surveillance data, March–August 2026; reported as of October 2026.

Country	Reported cases
Bangladesh	65,439
Indonesia	46,578
Guatemala	31,222
India	18,863
Yemen	12,931
Pakistan	9,130
Mexico	6,844
Cameroon	6,099
South Africa	5,209
Sudan	4,285

Source: WHO provisional monthly measles surveillance, reproduced in the CDC Global Measles Outbreaks report dated October 13, 2026. Figures cover March–August 2026, not the entire calendar year, and represent provisional reported cases. (4,5)

2. The 95% vaccination threshold: necessary but not sufficient

Measles has an exceptionally high basic reproduction number (R_0), commonly estimated at approximately 12–18 in fully susceptible populations. Consequently, extremely high population immunity is required to interrupt sustained transmission.

WHO recommends maintaining at least 95% coverage with both MCV1 and MCV2, ideally throughout every district and community, rather than exclusively at the national level. (2,6) Yet global vaccination coverage remains considerably below this target.

In 2025, approximately 84% of children worldwide received the first dose of measles-containing vaccine, while only 77% received the second. These figures highlight the

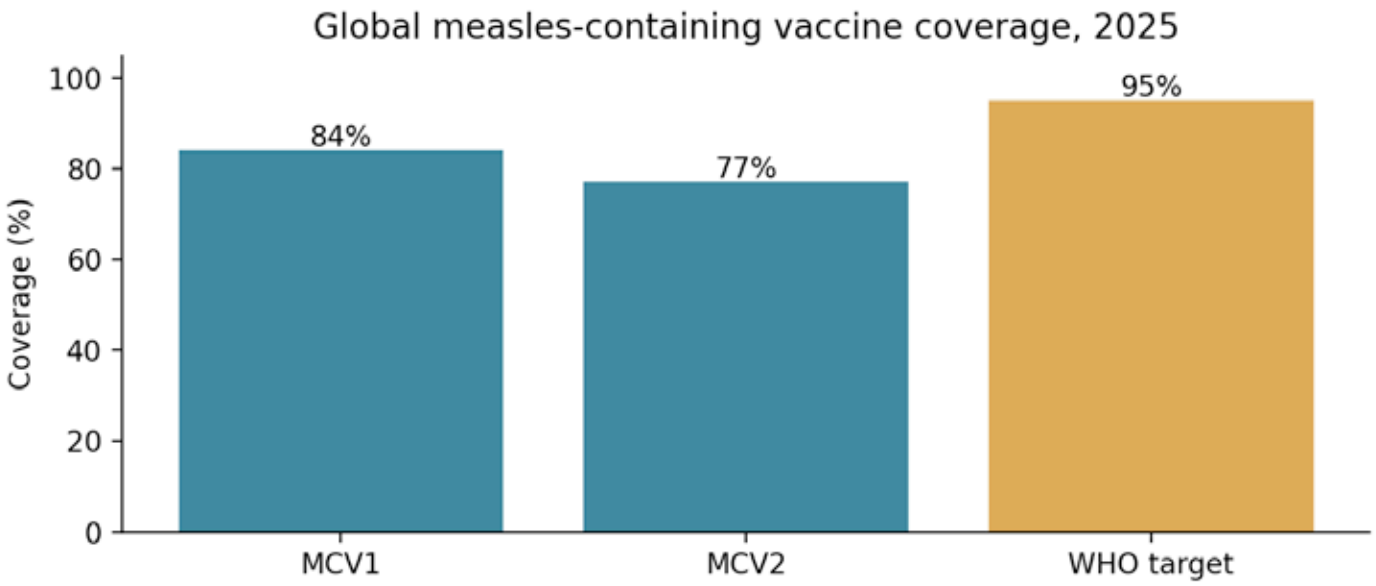


Figure 1. Global MCV1 and MCV2 coverage compared with the 95% target. WHO/UNICEF estimates published July 2026. (7)

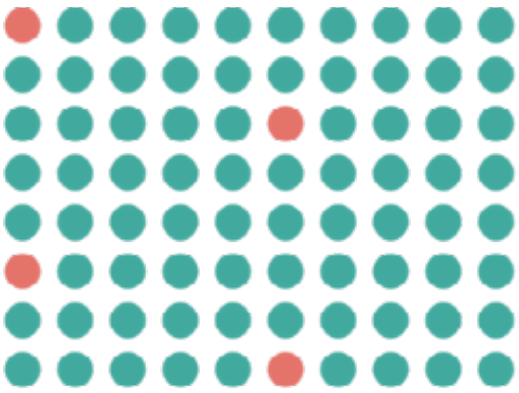
persistent vulnerability of millions of children and the importance of completing the recommended vaccination schedule.

Why national averages can be misleading

A country may report 95–97% national vaccination coverage while still having communities where coverage is substantially lower. For example, a hypothetical country with 96% national coverage could have certain districts with only 65–70% coverage. Such districts may sustain substantial outbreaks following the introduction of measles virus, even when the national average appears satisfactory.

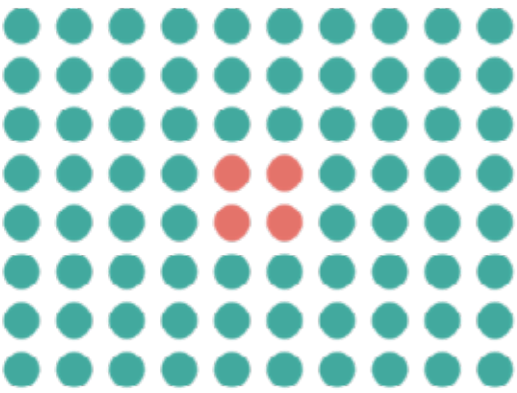
Research examining measles transmission in

Figure 2: Illustrative example: identical national averages, different distribution of susceptibility.



Dispersed susceptibility

Unvaccinated individuals are scattered



Clustered susceptibility

Unvaccinated individuals are concentrated

France demonstrated that subnational differences in vaccination coverage and population immunity can influence outbreak persistence, even when national coverage appears relatively high. (8) The implication is fundamental: immunization programs must measure not only how many people are vaccinated, but also where susceptible individuals are concentrated.

3. Best practices for measles prevention and outbreak control

A. Achieve and sustain high two-dose coverage

Routine immunization programs should prioritize timely administration of MCV1 and MCV2 according to national schedules, with systematic identification of children who have missed either dose. Vaccination status should be assessed during every appropriate healthcare encounter, including primary care visits, hospital encounters, school health assessments, and community outreach activities. Catch-up vaccination should be routinely offered to eligible children, adolescents, and adults without adequate evidence of immunity. (2,3)

B. Identify and eliminate clusters of unvaccinated individuals

One of the most important priorities is identifying populations where susceptibility accumulates. National immunization programs should routinely analyze vaccination coverage at district, municipal, school, and community levels, where reliable data are available. Particular attention should be given to zero-dose children, migrant and displaced populations, geographically isolated communities, and populations experiencing persistent barriers to healthcare. Targeted vaccination campaigns should complement, rather than replace, strong routine immunization services. (3,9).

C. Strengthen clinical, molecular, and epidemiological surveillance

Measles surveillance must be sufficiently sensitive to identify suspected cases promptly, including those occurring in previously measles-free areas. Best practices include rapid case notification, appropriate serological testing, molecular confirmation using RT-PCR, and genomic characterization where indicated. Molecular surveillance is particularly valuable for understanding transmission chains, investigating imported cases, and supporting documentation of measles elimination. Close integration between clinicians, laboratories, epidemiologists, and immunization programs is essential. (5,10)

D. Implement rapid outbreak response and post-exposure prophylaxis

Every suspected measles case should trigger immediate public health action, without waiting unnecessarily for laboratory confirmation. Key interventions include airborne isolation, rapid contact identification, assessment of immunity, and appropriate post-exposure prophylaxis. For susceptible individuals without contraindications, measles-containing vaccine administered within 72 hours of exposure may provide protection. Immunoglobulin administered within six days may be indicated for selected high-risk contacts, including susceptible infants, pregnant individuals, and severely immunocompromised patients, according to national guidelines. (6,11) Outbreak response vaccination should be adapted to the local epidemiology, age distribution, and accumulated immunity gaps.

E. Prevent healthcare-associated transmission

Healthcare facilities can amplify measles transmission when cases are not recognized and isolated promptly. All healthcare personnel should have appropriate evidence of measles immunity, and facilities should maintain clear protocols for airborne precautions, patient triage, exposure management, and occupational health follow-up. Suspected cases should be separated immediately from other patients, particularly infants, pregnant individuals, and immunocompromised patients. (6,11)

F. Improve communication and address vaccine hesitancy

Measles vaccination programs must combine evidence-based communication with practical improvements in access. Healthcare professionals remain essential sources of trusted information. However, vaccine hesitancy should not be considered the sole explanation for underimmunization. Transportation difficulties, poverty, migration, limited healthcare access, service disruptions, and missed vaccination opportunities can be equally important contributors. Successful interventions require culturally appropriate communication,

convenient vaccination services, and sustained engagement with local communities. (3,9)

4. Health equity: no community should be left behind

Measles outbreaks frequently reveal broader structural inequalities within healthcare systems. Children living in poverty, displaced populations, migrants, residents of conflict-affected areas, and communities with limited access to routine healthcare may experience disproportionately high risks of remaining unvaccinated.

WHO recognizes measles outbreaks as an important indicator of weaknesses in primary healthcare and inequities in immunization services. (3) An equitable measles elimination strategy must therefore incorporate identifying underserved communities, removing financial and administrative barriers, expanding mobile vaccination and outreach services, ensuring vaccine availability, and monitoring disparities in vaccination coverage.

Importantly, public health authorities should distinguish between individuals who decline vaccination and those who remain unvaccinated because healthcare systems have failed to reach them. A child who has never been offered a vaccine represents a different public health challenge from a child whose family has declined vaccination. Both require attention, but the interventions must be different.

5. Practical indicators for national immunization programs

Indicator	Recommended objective
MCV1 coverage	≥95% nationally and in every district
MCV2 coverage	≥95% nationally and in every district
Zero-dose children	Identify, reach, and progressively reduce the number
Geographic immunity gaps	Identify and close clusters of susceptibility
Missed vaccination opportunities	Routinely assess and minimize
Surveillance sensitivity	Timely detection and investigation of suspected cases
Molecular surveillance	Appropriate laboratory confirmation and characterization
Outbreak response	Immediate investigation and rapid implementation of control measures
Healthcare-worker immunity	Document immunity and close identified gaps
Equity indicators	Monitor coverage by geography, socioeconomic status, and access barriers

Conclusions:

The global resurgence of measles in 2026 demonstrates that the existence of an effective vaccine, and even apparently satisfactory national vaccination coverage, does not guarantee sustained protection against outbreaks.

For measles, 95% coverage is not merely a statistical target; it must translate into consistently high population immunity across communities, districts, and countries. The accumulation of susceptible individuals in geographically or socially clustered populations can undermine decades of progress toward elimination.

Strong routine immunization programs, timely catch-up vaccination, sensitive epidemiological and molecular surveillance, rapid outbreak response, and equitable access to vaccination must remain central priorities. Ultimately, measles elimination requires moving beyond national averages toward a more precise understanding of population immunity and the social and geographic distribution of susceptibility.

Measles elimination will not be achieved

simply when countries reach 95% vaccination coverage nationally. It will be achieved when sustained high coverage is accompanied by the identification and protection of communities that have been systematically left behind (12).

Bolivia, Mexico, and the United States have now lost their measles elimination status, underscoring the urgent need to close immunization gaps, strengthen epidemiological surveillance, and enhance outbreak preparedness and response to prevent further transmission (12).



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Guest Contributors

NEW CHALLENGES FOR NIP IN LATIN AMERICA: EVIDENCE-BASED EXPANSION AND VACCINATION COVERAGE

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In recent years, the National Immunization Program (NIP) in Latin America and the Caribbean (LAC) has expanded rapidly through the inclusion of new vaccines (PAHO n.d.). However, the increase in expenditure, driven by the incorporation of high-cost vaccines, is not resolving and at times conceals the weakening of the pillars that have sustained the success of NIP: high and sustained coverage together with robust epidemiological surveillance.

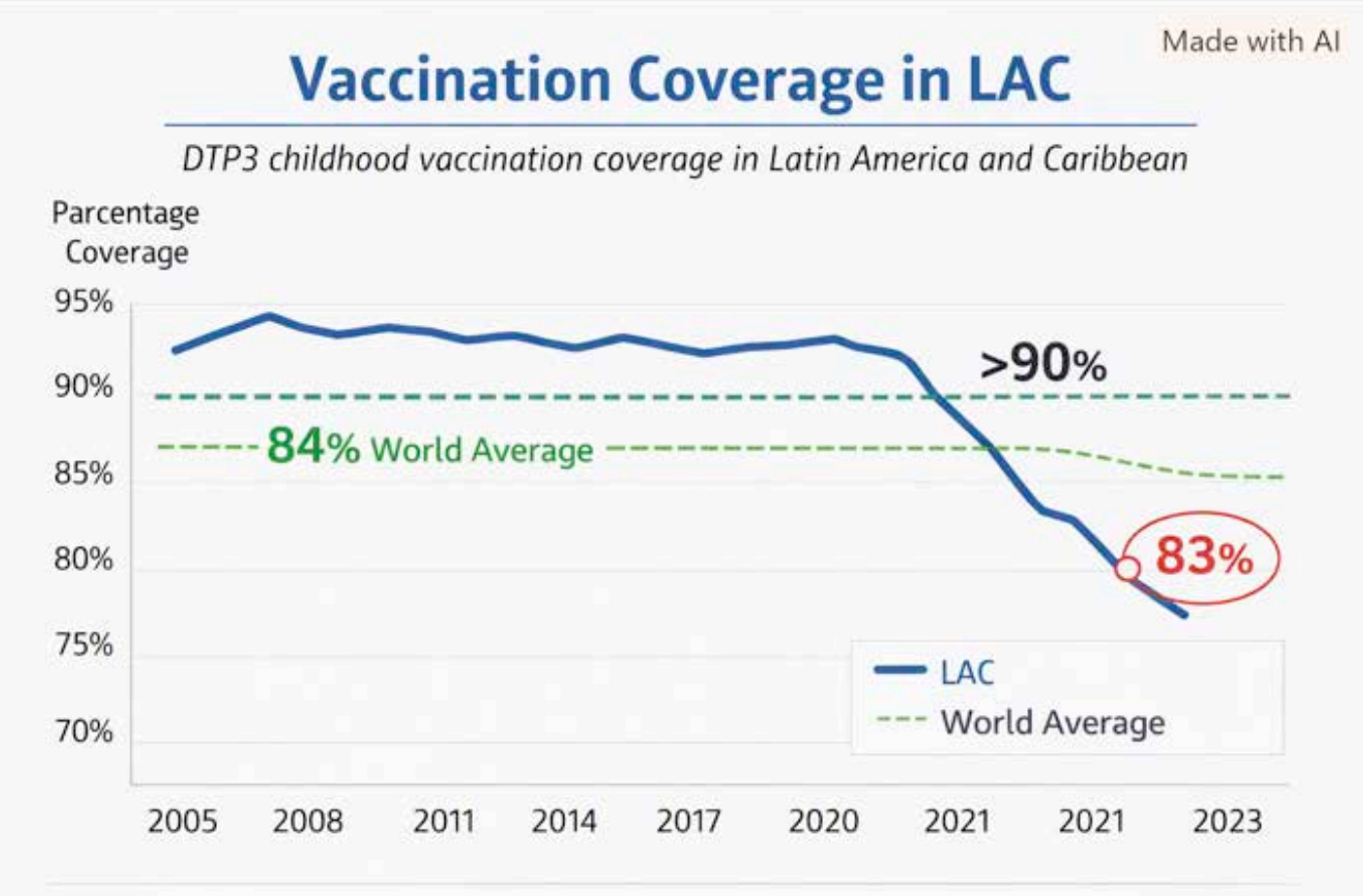
More investment does not guarantee greater impact if the foundations of NIP are weakened.

Countries in LAC are incorporating increasingly expensive vaccines, while the operational base that ensures health outcomes—such as sustained and homogeneous coverage, completion of schedules (particularly booster doses), and surveillance systems capable of measuring impact—has been eroding year after year (PAHO n.d.). Recent outbreaks of measles and pertussis are clear examples of the vulnerability of NIP in the region (PAHO, 2026a).

Low immunization coverage, coupled with deficient surveillance systems, not only poses health risks to the population but also undermines confidence in the achievements attained thus far (PAHO n.d.).

The region has lost its historical advantage in coverage. Basic childhood vaccination coverage in LAC fell to 83% in 2023, below the global average (84%) and far below the >90% sustained for 17 years. Although coverage has been slowly increasing, it remains far from the 95% target. It is estimated that ~1.7 million children are "zero-dose" and ~2 million remain vulnerable to vaccine-preventable diseases (PAHO, 2026b; Fene et al., 2025).

This decline coincided with the era of new vaccines. The Global Burden of Disease 2020 analysis found that between 2010 and 2019—the period of successful introduction and scale-up of new vaccines—increases in routine vaccine coverage were minimal, with LAC showing particularly striking stagnation (GBD 2020, Release 1, Vaccine Coverage Collaborators, 2021). The pandemic further exacerbated this problem, and countries have yet to reach expected levels (PAHO, 2026a; PAHO, 2026b; PAHO, 2026c). It is possible that focus was lost



Source: Chart created by AI using data published by Fene et al., 2025

as efforts shifted toward implementing new vaccines, which, while necessary, must be introduced with the support of methodologically sound data and studies (PAHO, 2026f).

Unfortunately, the trend persists. GBD 2023 identifies LAC among the regions that must reverse recent declines to recover previous levels, particularly in DTP1, DTP3, and Pol3. Coverage remains below required thresholds (GBD 2023 Vaccine Coverage Collaborators, 2025).

Pediatric protection does not end with the primary series.

PAHO has recommended monitoring coverage of the primary series of 17 childhood vaccines as a direct indicator of NIP performance. Management considers dropout rates, defined as the percentage of the population that, after initiating a schedule, does not complete the required doses according to the recommended calendar. Currently, coverage of second and third doses of vaccines such as DTP, pneumococcus, polio, and measles is affected by dropout rates across LAC (GBD 2023 Vaccine Coverage Collaborators, 2025; PAHO, 2026b).

Pediatric vaccine booster doses—administered during the second year of life and at school age — are essential for achieving both direct and collective protection (herd immunity) against vaccine-preventable diseases; yet, regrettably, they are not included among management indicators (WHO, 2025). Paradoxically, the most significant drops in coverage occur with these booster doses in the region (PAHO, 2026b). Given this situation, a regional group of experts has emphasized the importance of increasing coverage for childhood vaccine boosters and strengthening surveillance, both of which are necessary to prevent the re-emergence of diseases that can be averted in infants, regardless of whether or not these doses are used as management benchmarks (Ávila et al., 2023; WHO, 2025).

More budget does not equal more coverage.

An analysis of vaccination coverage trends in LAC and their relationship with government financing found a moderate association between gross national income per capita and vaccination coverage, and a weak-to-moderate correlation between vaccine expenditure and DTP3 coverage rates. In 2017, despite self-sufficiency in vaccine financing, fewer countries achieved 90% coverage in five vaccines compared to 2013 (Llau et al., 2021).

The purchase of new vaccines, even the most expensive, does not automatically buy the capacity to deliver them fully and equitably. Coverage depends on the strength of primary health care, public trust, logistical capacity, and cold chain systems—not necessarily on increased budgets for expanding with higher-cost vaccines (PAHO, 2026c; PAHO, 2026f).

Expenditure on childhood immunization has grown steadily.

LAC became the region with the highest

Estimated Immunization Expenditure per Surviving Infant (2000–2017)

Country	Expenditure per Infant (US$)		Annual growth rate (AROC)	% Funded by Government 2017
	2000	2017		
Argentina	~158	420	5,9%	82%
Brazil	~157	366	5,1%	90%
Peru	~48	170	7,7%	95%
Colombia	~46	106	5,1%	94%
Mexico	~44	131	6,7%	96%
Ecuador	~34	160	9,6%	96%

Source: Estimates derived from total immunization expenditure per surviving infant in 2017 and its annual rate of change (2000–2017), adjusted to 2019 US dollars (Ikilezi et al., *The Lancet*, 2021). Values for ~2000 are approximations based on these rates.

spending per surviving infant in 2017: US$213 (range 187–243), with governments financing nearly all this expenditure (Ikilezi et al., 2021). Between 2000 and 2017, spending grew at annual rates of 5–10% depending on the country, meaning several countries doubled or tripled their investment per infant in less than two decades (Ikilezi et al., 2021).

Despite this, coverage stagnated or declined—a paradox that demands scrutiny of how investments are executed. Indeed, LAC is among the regions where, in a significant proportion of countries, coverage of vaccines such as pentavalent or measles decreased while government spending increased (Ikilezi et al., 2021).

The following table illustrates the magnitude of the increase, comparing the total immunization expenditure per surviving infant (in 2019 US dollars, adjusted for inflation) estimated for the year 2000 versus 2017 in selected countries

Spending has doubled or tripled, but coverage has either declined or stagnated—a paradox that necessitates a review of how investments are implemented. In fact, Latin America and the Caribbean (LAC) is among the regions where, in many countries, coverage for vaccines such as the pentavalent or measles vaccine has decreased, even as government spending has risen (Ikilezi et al., 2021). The public health imperative to maintain vaccination coverage above 95% has been lost

In parallel, some countries have opted to include higher-valency pneumococcal conjugate vaccines (PCVs) in pediatric populations without thoroughly assessing the real health gains of the additional serotypes. The potential population benefit of a PCV depends not only on the number of serotypes included, but also on the frequency, invasiveness, and disease burden associated with those serotypes in each country under evaluation (Lagousi et al., 2021).

Systematic reviews of economic evaluations of pediatric PCVs highlight variations in models, vaccination strategies, assumptions, and conclusions, underscoring the importance of considering local epidemiology, vaccine prices, analytical perspective, and uncertainty when interpreting results (Vo et al., 2024; Shono et al., 2025). Conventional cost-effectiveness outcomes must be interpreted alongside total program expenditure, net monetary benefit, uncertainty, affordability, and opportunity costs (Mauskopf et al., 2018).

Thus, the economic value of expanded serotype coverage cannot be generalized across settings based solely on valency, especially in pediatric vaccination. In practice, this often translates into significant expenditures for products whose real public health benefit is not always demonstrated, while basic coverage continues to decline (ISPPD, 2026; Principi et al., 2025).

Without adequate surveillance, there is no way to measure impact.

Several LAC countries have seen their epidemiological surveillance systems weaken due to insufficient financial resources. Small expert groups have managed to secure short-term funding, but these efforts are not enough to sustain comprehensive systems. This leaves countries without adequate data for evidence-based decision-making (PAHO, 2026f).
The most concerning aspect is that costly vaccines are being adopted without updated epidemiological diagnostics to evaluate their health impact (PAHO, 2026c; PAHO, 2026d).

This is the most critical consequence for public health decision-making. In many settings, it is not possible to measure vaccination impact due to lack of investment in strengthening health information systems and surveillance. Networks such as rotavirus surveillance and pneumococcal initiatives have been precisely those that documented vaccine impact and supported investment before governments and funders (PAHO, 2026f). Currently, several countries lack updated, real-time information. This is another paradox: countries invest in more expensive vaccines without investing in surveillance and therefore cannot demonstrate whether adopted decisions were correct. Inconsistent surveillance quality and data scarcity force reliance on mathematical models to estimate impact (Li et al., 2021). Health impact becomes invisible, and what is invisible cannot be defended or financed in the long term (PAHO, 2026f).

The Proposal: Evidence-based expansion and vaccination coverage

- Restore coverage levels to 95% for NIP vaccines in LAC, including both primary series and childhood booster doses (WHO, 2025).

- Invest in strengthening surveillance as the foundation for health decision-making and evaluation of strategies adopted according to epidemiology of vaccine-preventable diseases (PAHO, 2026f).
- Condition each new vaccine introduction on simultaneous strengthening of coverage, cold chain, electronic vaccination registries, and surveillance (Ávila Agüero et al., 2023).
- Prioritize subnational equity and zero-dose children, where lack of vaccination overlaps with other health service gaps (Fene et al., 2025).
- Integrate immunization information systems to ensure reliable denominators and disaggregated data (Velandia et al., 2021).

The challenge for the next decade in LAC NIP will not only be how many new vaccines are included, but how the foundations are strengthened: coverage of primary series and boosters, and robust surveillance systems.

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VACCINES BEAT

Who we are

At Vaccines Beat, we understand that vaccines and immunization have become a crucial topic of discussion at the center of any public health analysis. Therefore, timely, relevant, accessible, and well-curated information for all vaccine preventable diseases is key to advancing better health policies.

For this reason, a team of passionate vaccine professionals has created Vaccines Beat and each month diligently works to share with the healthcare ecosystem information, knowledge, and insights to improve global health.

Vision

Vaccines Beat aims to become the beacon of insight in the public health ecosystem through its distinctive monthly newsletter. With an in-depth 360 perspective, carefully curated information and expert analysis, this novel platform fosters collaboration among a diverse global network of stakeholders.

Mission

Vaccines Beat's main task is to inform through the review of the most recent developments in vaccines, immunization, and vaccine preventable diseases. Our mission extends to sharing best practices from successful initiatives worldwide while building bridges through editorial collaboration with regional and international stakeholders.

Vaccines Beat highlights the importance of information sharing & collaborative efforts within the public health community to boost vaccination campaigns, R&D, public policy, access, awareness, and equity.

Vaccines Beat encourages stakeholders to take action and promote sustainable commitment with continued support through multi-stakeholder synergies.

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