



VACCINES
BEAT

THE EVOLVING LANDSCAPE OF PNEUMOCOCCAL DISEASE IN CHILDREN

Insights from Prof. Robert Cohen on serotype dynamics, vaccine strategies, and the critical role of enhanced surveillance

November
2025

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

WORLD HEALTH ORGANIZATION

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The evolving landscape of pneumococcal disease in children

Insights from Prof. Robert
Cohen on serotype
dynamics, vaccine strategies,
and the critical role of
enhanced surveillance



Dr. Robert Cohen is a distinguished Professor of Pediatrics and Pediatric Infectious Diseases specialist at the Intercommunal Hospital of Créteil, France. A graduate of the University of Paris VII Faculty of Medicine Lariboisière, Prof. Cohen has built an exceptional career dedicated to advancing the understanding, prevention, and treatment of community acquired infectious diseases in children. He currently is ambulatory pediatric in Saint-Maur, near Paris.

A recognized leader in pediatric infectious diseases, Prof. Cohen serves as President of the French Group of Pediatric Infectious Diseases (GPIP), President of the Conseil National Professionnel de Pédiatrie, and Scientific Director of the Association Clinique et Thérapeutique Infantile du Val-de-Marne (ACTIV), a renowned institute for research on community-acquired infections in children. He also directs InfoVac-France, a national vaccine information network for healthcare professionals, and acts as an expert for both the French and European medicinal agencies.

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LETTER FROM EDITOR

Welcome to Vaccines Beat 17th issue!

We are pleased to welcome **Pfizer** as a new sponsor of Vaccines Beat. Their trust and support strengthens our mission to share credible information, promote scientific dialogue, and highlight global efforts in immunization. We appreciate their commitment to advancing public health and look forward to continue providing valuable insights for our readers and partners.

In our *Coffee with an Expert* section, we had the honor of speaking with **Professor Dr. Robert Cohen**, a leading pediatric infectious diseases specialist at the Intermunicipal Hospital of Créteil, France. A graduate of the University of Paris VII, Dr. Cohen has served as President of the French Group of Pediatric Infectious Diseases (GPIP), the Conseil National Professionnel de Pédiatrie, and is the Scientific Director of ACTIV, a renowned research institute on community-acquired infections in children. He also directs InfoVac-France, a national vaccine information network for healthcare professionals, and serves as an expert advisor to both French and European medicinal agencies.

Author of over 450 scientific publications, Dr. Cohen shared insights on the epidemiology and management of acute otitis media, streptococcal pharyngitis, rhinosinusitis, meningitis, and vaccine development, particularly regarding the evolving serotype distribution of *Streptococcus pneumoniae* following the introduction of higher-valent conjugate vaccines, with emphasis on strengthening active surveillance—beginning at the physician level and enhanced through excellence in molecular diagnostics.

In this edition's **Editor's Corner**, we delve into "*Tuberculosis: The Never-Ending Epidemic — Current Control Strategies, the Central Role of Next-Generation Vaccines, and Future Pathways Toward Elimination Through Global Equity and Sustainable Investment.*" This feature examines the immense global impact of tuberculosis, the limitations of the century-old BCG vaccine, and the evolving landscape of next-generation vaccine candidates—currently encompassing 16 in development—along with their mycobacterial antigen targets.

Our **Best Practice** section features "*Japanese Encephalitis: Vaccination Strategies and Recommendations*," providing an overview of this arboviral disease—its epidemiology, available vaccines, and current immunization guidelines for both endemic regions and travelers.

Finally, in our **Guest Contributor** section, we are honored to feature an insightful editorial by **Dr. María Luisa Ávila Agüero**, a Pediatric Infectious Diseases Specialist, former Minister of Health of Costa Rica, and Past President of the Latin American Society for Pediatric Infectious Diseases (SLIPE). She is also a distinguished member of the National Academy of Sciences and the National Academy of Medicine of Costa Rica. In her piece, Dr. Ávila eloquently addresses the growing concern over the resurgence of pertussis in Latin America and worldwide exploring its underlying causes and underscoring the urgent need to strengthen better surveillance and vaccination coverage across all populations.

As always, this issue features carefully curated and up-to-date information on the '*Latest Scientific Publications*' along with the most recent and important '*News and Alerts*'.

We hope you find this November issue both informative and engaging, and we look forward to continuing this shared commitment to advancing global health and building a healthier planet.



Enrique Chacon-Cruz, M.D., MSc
Chief Editor



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.

He is an Overseas Fellow of the Royal Society of Medicine of the United Kingdom and a member of several international associations in Infectious Diseases. 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 a member of the Mexican Committee for the Elimination of Measles, Rubella, and Congenital Rubella, member of the Immunization Committee 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.

Editorial disclaimer: "The author/s assumes no responsibility or liability for any errors or omissions in the content of this publication. The information contained in this publication is provided on an "as is" basis with no guarantees of completeness, accuracy, usefulness or timeliness. The purpose of Vaccines Beat is purely academic, sponsors do not contribute to its content."

Coffee with the Expert

THE EVOLVING LANDSCAPE OF PNEUMOCOCCAL DISEASE IN CHILDREN

Insights from Prof. Robert Cohen on serotype dynamics, vaccine strategies, and the critical role of enhanced surveillance

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Dr. Robert Cohen is a distinguished Professor of Pediatrics and Pediatric Infectious Diseases specialist at the Intercommunal Hospital of Créteil, France. A graduate of the University of Paris VII Faculty of Medicine Lariboisière, Prof. Cohen has built an exceptional career dedicated to advancing the understanding, prevention, and treatment of community acquired infectious diseases in children. He currently is ambulatory pediatric in Saint-Maur, near Paris.

A recognized leader in pediatric infectious diseases, Prof. Cohen serves as President of the French Group of Pediatric Infectious Diseases (GPIP), President of the Conseil National Professionnel de Pédiatrie, and Scientific Director of the *Association Clinique et Thérapeutique Infantile du Val-de-Marne (ACTIV)*, a renowned institute for research on community-acquired infections in children. He also directs InfoVac-France, a national vaccine information network for healthcare professionals, and acts as an expert for both the French and European medicinal agencies.

Prof. Cohen's scientific leadership extends across Europe. He is a former board member of the European Society of Pediatric Infectious



Diseases (ESPID) and served as President of the ESPID Congress in Nice in 2010. His work has earned him international recognition, including the prestigious Bill Marshall Lecture Award from ESPID in 2020.

An accomplished researcher, Prof. Cohen has authored more than 1000 scientific publications, including over 450 in English, in the field of pediatric infectious diseases. His research focuses on the epidemiology and clinical management of acute otitis media, group A streptococcal pharyngitis, rhinosinusitis, meningitis, and vaccine development, as well as on host-pathogen interactions in pediatric infections. His studies have significantly influenced pediatric vaccination strategies and infectious disease management across Europe. Beyond his prolific academic output, Prof. Cohen serves on editorial boards and as a peer reviewer for numerous national and international medical journals. His ongoing commitment to research, education, and public

health policy has made him one of Europe's foremost voices in pediatric infectious diseases.

Through his multifaceted roles as clinician, researcher, and leader, Prof. Robert Cohen continues to advance the frontiers of pediatric infectious disease care and to mentor the next generation of pediatricians in France and beyond.

First steps

Prof. Cohen was the first French pediatric infectious diseases specialist to work in a microbiology laboratory that also served as the National Reference Center for pneumococci. In the late 1990s, pneumococcal resistance became a major concern, particularly resistance to beta-lactams, with high minimum inhibitory concentrations (MICs).

He and his team began conducting studies on the impact of antibiotics on the nasopharyngeal flora and particularly on pneumococcal resistance. However, when the first pneumococcal protein-conjugate vaccine (PCV) became available, they shifted the focus of their research to examining the vaccine's effect on the nasopharyngeal flora, particularly pneumococcus and vaccine-serotypes.

They then went on to conduct large-scale studies on meningitis in France, establishing a network that included approximately 70% of pediatric wards nationwide, covering nearly two-thirds of all pneumococcal meningitis cases.

“But also we performed studies on bacteremia and pneumonia, and now we have a really good system of surveillance of pneumococcal disease, starting from nasopharyngeal flora to otitis media, to pneumonia, to bacteremia, and the summit of the iceberg: meningitis,” he explains.

Prof. Cohen believes that the success of the research program lies in a combination of imagination, scientific rigor, strong relationships leading to large collaboration.

ACTIV

As the Scientific Director of ACTIV, an independent non-profit research organization, Prof. Cohen collaborates on numerous studies with a broad range of sponsors, including industry partners as well as national and European health authorities.

He and his team manage approximately 40 to 70 studies each year, with a primary focus on community-acquired infections. This year, the main research priorities center on pneumococcus and Respiratory Syncytial Virus (RSV).

He emphasizes the importance of studying these two pathogens, noting that RSV is associated with approximately 20% of all infections. Collaborating closely with national reference centers for major pathogens, his team collects and analyzes both bacterial and viral samples. For example, in cases of otitis media, they have determined that RSV is the most common viral agent, while non-typable *Haemophilus influenzae* is the leading bacterial cause.

As an expert in nasopharyngeal colonization, pneumococcal conjugate vaccines (PCVs), and otitis media, Prof. Cohen has closely observed significant shifts in etiology, clinical presentation, and epidemiology, driven largely by advances in PCV implementation.

“I think it is important to consider this point: if you take samples from healthy children, the pneumococcal carriage rate is approximately 30%. [But], if you work on children with acute otitis media, the carriage rate [climbs to] 60 to 70%,” he says. “So to detect pneumococcus efficiently, it is better to focus on fewer samples from patients where carriage is more frequent.”

One of Prof. Cohen's distinguishing approaches is his focus on patients at high risk for pneumococcal carriage, enabling a more accurate evaluation of antibiotic or vaccine effects. His extensive clinical network supports this strategy: around 80% of the investigators involved are clinicians and pediatricians, while 20% are microbiologists, ensuring optimal diagnostic precision.

“Our main study [focuses on] changes in nasopharyngeal flora among patients with acute otitis media because we know exactly the carriage rates, the serotypes before vaccination, and the carriage [dynamics] of other bacteria. With the introduction of PCV7, we have seen that most vaccine-type strains nearly disappeared,” he reports.

From PCV7 to PCV21

According to Prof. Cohen, after the introduction of PCV7, only one serotype among those included in the vaccine continued to be carried: serotype 19F. When PCV13 was later introduced, noting that France did not implement PCV10, nearly all PCV13-covered serotypes disappeared, with the exception of serotypes 3 and 19A. Over time, serotypes 19F, 19A, and 3 continued to be associated with invasive disease in older children and adults, as their carriage did not fully disappear.

This suggests that when a serotype remains carried in children, it may still cause disease in non-vaccinated groups, including adults. Therefore, while PCVs have had a significant positive effect on reducing nasopharyngeal carriage, this impact has not been uniform across all serotypes. For this reason, it is crucial to monitor which serotypes emerge in the nasopharyngeal flora of children when designing new vaccines.

These emerging serotypes may become responsible for infections not only in unvaccinated populations but also in adults. Monitoring this evolution can inform serotype selection for next-generation vaccines while also helping detect newly appearing serotypes or variants within existing serotypes. With the progressive rollout of PCV15, PCV20, and soon PCV21, and even more extensive formulations expected within a few years, establishing robust baseline data is essential to understand epidemiologic shifts.

“Their surveillance system offers a unique opportunity, covering meningitis, pneumonia, bacteremia, and otitis media. This allows the team to evaluate and compare the disease potential of each strain within the same age groups,” Prof. Cohen emphasizes. “If a serotype is carried, what is its probability of causing disease?”

Many experts now agree that determining which serotypes to include in future vaccines should consider not only their frequency in invasive pneumococcal disease (IPD) or carriage, but also their capacity to cause severe disease.

After 25 years of PCV use, it is clear that nasopharyngeal carriage of pneumococcus will continue, but the goal is to favor carriage

by strains with lower pathogenicity, less likely to cause meningitis or other forms of IPD. Understanding the relationship between carriage and disease is therefore key to anticipating epidemiological trends and evaluating the ongoing impact of PCVs.

Another essential consideration is that increasing the number of serotypes in a PCV formulation often reduces immunogenicity per serotype. Currently, vaccines are assessed primarily based on immunogenicity, but evidence shows a trade-off:

- PCV10 is less immunogenic than PCV7
- PCV13 is less immunogenic than PCV7
- PCV15 shows reduced immunogenicity for several serotypes compared with PCV13
- PCV20 demonstrates further reduced immunogenicity

The balance between more serotype and less immunogenicity for serotype included in the vaccine is very important to consider. And the only fashion, the only manner to understand is to have very quickly the impact on invasive disease, invasive disease certainly, but also in the rhinopharyngeal flora. And the assessment by FDA or EMA at the beginning is only immunogenicity.

Thus, balancing broader serotype coverage with maintained immunogenicity is critical. While regulatory evaluations by agencies such as the FDA and EMA begin with immunogenicity data, immunogenicity levels for individual serotypes are not yet fully defined. Early immunogenicity data remain essential, but rapid real-world evaluation of impact on both IPD and nasopharyngeal carriage is equally necessary.

Prof. Cohen concludes that having a surveillance system that simultaneously tracks IPD and nasopharyngeal flora provides a crucial advantage, ensuring that when new vaccines are introduced, pre-existing baseline data enable accurate interpretation of epidemiological changes.

Newly added serotypes for vaccines

Since the conjugation process between polysaccharides and carrier proteins becomes less efficient as the number of serotypes

increases, leading to reduced immunogenicity, and because pneumococcal conjugate vaccine (PCV) development is largely guided by correlates of protection, an important question arises: Are PCVs still the best long-term strategy for pneumococcal vaccination, or should alternative approaches be pursued, such as improved conjugation methods or protein-based vaccines?

“We have seen that when you increase the number of serotypes, you decrease the immunogenicity,” Prof. Cohen states. “[There are] two hypotheses: the first one is that the immune system [becomes] saturated, [although] this does not [appear to be] the case. The second hypothesis is that the [same carrier] protein is [used] for all serotypes, [creating interference] between the immune response to the carrier protein and the serotype.”

One potential strategy for future vaccines is to use different carrier proteins tailored to specific serotypes, including pneumococcal protein carriers. Prof. Cohen anticipates that within the coming years, vaccines may include multiple carrier proteins without compromising immunogenicity.

Another challenge relates to the pneumococcus’s ability to undergo genetic modifications. Protection is primarily conferred against the capsular polysaccharide of each serotype, but genetic changes within a serotype may alter disease potential. Additionally, capsular switching can occur when the genetic background of the bacterium changes while maintaining the same capsule, or vice versa.

“Over time, the genetic background for the same serotype [can evolve], or the genetic background could change [while retaining the] capsule. [Therefore], it is very important to have the possibility to [monitor] the change, not only in nasopharyngeal flora but also in disease [severity and] potential. [Today], we are able to assess the changes [within] two to three years,” he says.

Prof. Cohen emphasizes that pneumococcal vaccines are among the most complex pediatric vaccines, largely because epidemiological dynamics are unpredictable. Continuous surveillance is therefore critical, as trends vary significantly between countries, primarily due to differences in vaccine

programs and serotype distribution.

Antibiotic resistance

Group A streptococcus (GAS) and pharyngitis remain leading drivers of antibiotic use, making the development of a vaccine a significant priority. GAS can cause a wide spectrum of illnesses, from pharyngitis and impetigo to severe invasive infections and rheumatic heart disease. With antibiotic resistance continuing to be a major concern, the two primary strategies to reduce antibiotic use are immunization and accurate diagnosis.

“And one way to reduce antibiotic prescription is to have a vaccine against the main bacterial species. For this reason, I believe group B streptococcus and group A streptococcus vaccines are very important to consider. But, if you look at the portfolios of all the big manufacturers of vaccines, GAS is not at the top,” Prof. Cohen notes, adding that the introduction of PCV7 and PCV13 led to a 20–25% reduction in antibiotic use among young children.

Prof. Cohen explains that traditional large-scale clinical trials, once used for meningococcal C and early pneumococcal vaccines, have become increasingly difficult or even unethical due to low disease incidence and the need to avoid leaving control groups unvaccinated. Consequently, regulatory agencies now rely more heavily on immunological surrogate markers rather than direct clinical efficacy trials.

“However, this is complicated for pneumococcal vaccines because there are around 100 serotypes, each potentially requiring different protective antibody levels. However, if you consider a period of 10 years and one region or country 30 to 40 serotypes are responsible of more than 95% of IPD cases. While surrogate markers are generally useful, they are imprecise for certain serotypes, and unexpected variations in vaccine effectiveness, for example serotypes 19A, 19F, and 3, remain difficult to fully explain,” he adds.

Prof. Cohen emphasizes that vaccine safety, demonstrated immune response, and real-world effectiveness data collected shortly after implementation are essential for regulatory decision-making. He highlights that protection before the booster dose depends not only on

the number of doses but also on the age at which vaccination begins, as even a one-month difference in infancy can significantly affect immune response. After booster doses, protection becomes robust, and with high vaccine coverage, herd immunity benefits the broader population.

“Given the complexity of introducing new vaccines, the ability to [introduce and] implement them depends largely on [our ability to] design vaccination schedules with the fewest doses possible, guided by immunogenicity data. For example, the optimal pneumococcal schedule is at three, five, and twelve months of age,” he explains.

Overall, Prof. Cohen suggests that policy frameworks should support reliance on surrogate immune markers, rapid post-implementation monitoring, and careful consideration of vaccination schedules to optimize vaccine performance and enhance disease control, including reductions in antimicrobial resistance.

Immunity debt

Almost 99% of children are infected with RSV, rhinovirus, and influenza before the age of two. Prof. Cohen observed that, in the

months following the onset of the COVID-19 pandemic, there was a dramatic reduction in the incidence of these infections. However, once non-pharmaceutical interventions (NPIs) were lifted, a rebound of several pathogens occurred in infants, including during periods that are normally considered ‘out-of-season.’

“While the term of ‘immunity debt’ remains debated, the resulting epidemiological impact with dramatic decline and rebound is undeniable,” he shares. “And there are only two ways to [achieve] immunity: [through] natural immunization or vaccination. There is no other option.” He adds that immunity debt is not only pathogen-specific but also reflects interactions between multiple pathogens circulating simultaneously.

Prof. Cohen notes that some vaccines do not prevent carriage, they protect against disease and its consequences.

“For example, the pertussis vaccine is critically important because infection during the first month of life can be extremely dangerous. Currently, acellular pertussis vaccines provide no adequate mucosal immunity and therefore prevent disease but do not prevent bacterial carriage,” he concludes.



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.

GNG: Improving access to evidence to support countries decision making on vaccines.

Published: October 2025.

<https://www.nitag-resource.org/compendium>

WHO: Last Ebola patient in Democratic Republic of the Congo discharged.

Published: October 19, 2025.

<https://www.afro.who.int/news/last-ebola-patient-democratic-republic-congo-discharged#:~:text=Bulape%20%E2%80%93%20The%20last%20Ebola%20patient%20in,over%20if%20no%20further%20cases%20are%20confirmed>

A surprise bonus from COVID-19 vaccines: bolstering cancer treatment.

Patients who got shots of mRNA before starting a type of cancer immunotherapy lived much longer. The innovative messenger RNA (mRNA) vaccines that thwarted the ravages of COVID-19 may also help fight tumors in cancer patients, according to a new analysis of medical records and studies in mice. People with cancer who coincidentally received the mRNA shots before starting drugs designed to unleash the immune system against tumors lived significantly longer than those who didn't get vaccinated, a research team announced yesterday at the European Society for Medical Oncology Congress in Berlin.

Published: October 23, 2025.

<https://www.science.org/content/article/surprise-bonus-covid-19-vaccines-bolstering-cancer-treatment>

Nepal reports the most Japanese encephalitis cases in years.

The Nepal Ministry of Health and Population report 133 Japanese encephalitis (JE) cases in the country since the summer, including 31 deaths. Both deaths and the number of infections is at their highest levels in recent years, health officials say.

Published: October 17, 2025.

<https://outbreaknewstoday.substack.com/p/nepal-reports-the-most-japanese-encephalitis>

CEPI: Serum Institute of India and CEPI supercharge pandemic response preparedness targeting H5N1.

CEPI is collaborating with the world's largest vaccine manufacturer, Pune-based Serum Institute of India (SII) Pvt. Ltd., part of Cyrus Poonawalla Group, to boost pandemic response preparedness using a baculovirus vaccine platform to target H5N1 bird flu as a prototype for a potential Disease X—an as-yet-unknown pathogen with pandemic potential.

Published: October 13, 2025.

<https://cepi.net/serum-institute-india-and-cepi-supercharge-pandemic-response-preparedness-targeting-h5n1#:~:text=Share,use%20in%20unpredictable%20outbreak%20situations>

PAHO highlights 31 years without polio in the Americas and calls to strengthen vaccination efforts.

On World Polio Day (October 24), the Pan American Health Organization (PAHO) celebrates

over three decades without wild poliovirus cases in the Americas. PAHO continues to highlight the importance of strengthening vaccination coverage to prevent a possible resurgence of this preventable disease.

Published: October 23, 2025.

<https://www.paho.org/en/news/23-10-2025-paho-highlights-31-years-without-polio-americas-and-calls-strengthen-vaccination>

Resurgence of Zoonotic H5N1 Avian Influenza in Cambodia: Findings from National and International One Health Surveillance Efforts.

“Resurgence of Zoonotic Highly Pathogenic Avian Influenza A(H5N1) Virus in Cambodia” (DOI: 10.1056/NEJMc2504302) details sixteen laboratory-confirmed human infections detected between February 2023 and August 2024, primarily among children and adolescents exposed to infected poultry.

Published: October 23, 2025.

<https://www.pasteur-kh.org/2025/10/23/nejm-article/>

Big increase in DENV-3 Dengue serotype reported in Santa Catarina, Brazil.

Santa Catarina state is facing a significant increase in cases of the DENV-3 dengue serotype this year. DENV-3 can cause symptoms similar to those of other serotypes, but it has the potential to lead to severe dengue if exposed to a different serotype later. Infections with DENV-3 are also associated with immune enhancement phenomena that can worsen symptoms if exposed to other serotypes in the future.

Published: October 27, 2025.

<https://outbreaknewstoday.substack.com/p/big-increase-in-denv-3-dengue-serotype>

Brazil: Chikungunya exceeds 10,000 confirmed cases in Cuiabá, Mato Grosso state in 2025.

According to the State Health Department’s (SES) Epidemiological Bulletin, there have been 10,978 confirmed cases in Cuiabá in 2025, with an incidence of 1,240.7 cases per 100,000 inhabitants. In addition, 27 chikungunya deaths have also been reported.

Published: October 24, 2025.

<https://outbreaknewstoday.substack.com/p/brazil-chikungunya-exceeds-10000>

Zambia Launches Malaria Vaccine to Protect Over Half Million Children.

The Ministry of Health also presented the Costed Primary Health Care (PHC) Strategy 2025–2031 and its Operational Plan (2025–2026).

Published: October 28, 2025.

<https://www.unicef.org/zambia/press-releases/zambia-launches-malaria-vaccine-protect-over-half-million-children>

New Phase 3 Data Show Takeda’s Dengue Vaccine Delivers 7 Years of Sustained Protection Against Infection and Hospitalization.

Findings Reinforce QDENGAs Long-Term Safety Profile and Two-Dose Vaccination Schedule.

QDENGAs Longest-Studied Dengue Vaccine and the Only Approved for Use Regardless of Prior Disease Exposure. Takeda is Expanding Global Access to QDENGAs in Partnership with National Immunization Programs, Private Payors and Public Health Coalitions, with 18.6 million Doses Distributed in 11 Endemic Countries.

Published: November 3, 2025.

<https://www.takeda.com/newsroom/newsreleases/2025/dengue-vaccine/>

International collaborative effort to understand dengue and Zika.

The Dengue and Zika Immunology and Genomics Multi-Country Network (DeZi) is led by Imperial and received £5.65 million core funding from a Wellcome Trust Infectious Disease Award. This was supplemented by £600 thousand funding from Temasek and £600 thousand contribution from Singapore National Environment Agency’s Environmental Health Institute through UNITEDengue.

Published: November 4, 2025.

<https://www.imperial.ac.uk/news/269973/international-collaborative-effort-understand-dengue-zika/>

Gavi and partners commence design of RSV maternal vaccine programme.

Gavi, the Vaccine Alliance (Gavi), in collaboration with global health partners, has commenced the design phase of a new maternal vaccine programme targeting respiratory syncytial virus (RSV) burden in lower-income countries. This milestone, which coincides with RSV Awareness Week 2025, is a critical step towards protecting the most at-risk newborns and infants around the world from one of the leading causes of infant respiratory illness and hospitalisation.

Published: November 5, 2025.

<https://www.gavi.org/news/media-room/gavi-and-partners-commence-design-rsv-maternal-vaccine-programme#:~:text=Geneva%252C%25205%2520November%25202025%2520%E2%80%93%2520Gavi,burden%2520in%2520lower%2520Dincome%2520countries>

Diphtheria case reported at Swiss asylum centre.

There has been an outbreak of the infectious disease diphtheria at the federal asylum centre in Embrach, canton Zurich. One person is in hospital.

Published: November 4, 2025.

https://www.swissinfo.ch/eng/various/diphtheria-outbreak-at-the-federal-asylum-centre-in-embrach-zh/90274306?utm_source=multiple&utm_campaign=swi-rss&utm_medium=rss&utm_content=0

Valneva Reports Positive Results for Phase 1 Trial of Second-Generation Zika Vaccine Candidate.

Valneva SE (Nasdaq: VALN; Euronext Paris: VLA), a specialty vaccine company, today announced positive results of its Phase 1 clinical trial investigating the safety and immunogenicity of VLA1601, its second-generation adjuvanted inactivated vaccine candidate against the Zika virus (ZIKV).

Published: November 4, 2025.

<https://valneva.com/press-release/valneva-reports-positive-results-for-phase-1-trial-of-second-generation-zika-vaccine-candidate/>

How nasal vaccines could reduce the spread of disease.

That's why scientists in the NOSEVAC project, led by the European Vaccine Initiative (EVI), are exploring ways of giving more vaccines through the nose. It would also be relatively painless, potentially improving vaccine uptake – at least among people with a fear of needles.

Published: October 23, 2025.

<https://www.vaccinestoday.eu/stories/how-nasal-vaccines-could-reduce-the-spread-of-disease/>

Papua New Guinea strengthens immunisation following detection of vaccine-derived poliovirus. P

Papua New Guinea (PNG) is responding to a new outbreak of circulating vaccine-derived poliovirus type 2 (cVDPV2), which was detected earlier this

year in environmental samples and in healthy children from Lae City, Morobe Province. The outbreak marks the first detection of cVDPV2 since the country's last circulating vaccine-derived poliovirus type 1 (cVDPV1) outbreak in 2018.

Published: November 6, 2025.

<https://ncirs.org.au/papua-new-guinea-strengthens-immunisation-following-detection-vaccine-derived-poliovirus>

WHO voices concerns about equitable access to novel TB vaccines.

A new report from the World Health Organization (WHO) is calling for bold steps to ensure equitable access to future tuberculosis (TB) vaccines. As of September 2025, there are 16 candidate vaccines in clinical development, with 6 in phase 3 trials, and high-burden countries are starting to prepare for the rollout of a TB vaccine in coming years.

Published: November 6, 2025.

<https://www.cidrap.umn.edu/tuberculosis/who-voices-concerns-about-equitable-access-novel-tb-vaccines>

Seasonal surveillance of chikungunya virus disease in the EU/EEA, weekly report.

Since the beginning of 2025 and as of 5 November 2025, two countries in Europe have reported cases of chikungunya virus disease: France (776) and Italy (374). In the past week, France has reported eight new locally acquired cases of chikungunya virus disease. The cumulative number of locally acquired cases in France has reached 776, distributed across 77 clusters. Italy reported four new locally acquired cases of chikungunya virus disease. The cumulative number of locally acquired cases in Italy is 374, distributed across six clusters. Three clusters are currently active.

Published: November 5, 2025.

<https://www.ecdc.europa.eu/en/chikungunya-virus-disease/surveillance-and-updates/seasonal-surveillance>

CEPI: Rift Valley Fever. Rift Valley fever is a disease whose epidemic potential lies in the intersection of global climate, trade and health security.

CEPI invests in a range of research programs aiming to address the threat, including a vaccine for humans.

<https://cepi.net/rift-valley-fever#:~:text=In%20>

[livestock%2C%20Rift%20Valley%20fever,Rift%20Valley%20fever%20vaccine%20candidates](#)

PAHO calls for regional action after the loss of measles elimination status in the Americas.

As of November 7, 2025, 12,596 confirmed cases of measles have been reported in ten countries (approximately 95% of the region's cases are concentrated in Canada, Mexico, and the United States), representing a 30-fold increase compared to 2024. In addition, 28 deaths have been recorded: 23 in Mexico, three in the United States, and two in Canada.

Published: November 10, 2025.

<https://www.paho.org/en/news/10-11-2025-paho-calls-regional-action-americas-lose-measles-elimination-status>

Should Florida Authorize a Second-Generation Dengue Vaccine.

As of November 11, 2025, the PAHO has confirmed more than 4.1 million dengue cases and 2,041 associated deaths. And in the United States, the U.S. CDC reported in late September 2025 that 2,560 locally acquired dengue cases had been documented across four jurisdictions this year. Traditionally, Miami-Dade County, Florida, has reported the most local dengue cases. However, during 2025, Brevard County (35) has surpassed Miami-Dade (16). Given the 180-mile distance along Florida's east coast between these counties, there could be many undetected cases of dengue. Since the CDC's vaccine committee appears not to be taking action to approve QDENG A in 2025, should Joseph A. Ladapo, MD, PhD, Florida's Surgeon General, pave his own path and approve QDENG A? Ladapo has already provided distinct guidance regarding COVID-19 and measles vaccinations this year. Don Hackett, VBT's publisher, asks.... as winter vacations are being planned for dengue-outbreak destinations in the Americas, isn't it good

public health policy to ensure that international travelers have an option in 2025 to protect themselves against this serious disease?

Published: November 11, 2025.

<https://www.vax-before-travel.com/should-florida-authorize-second-generation-dengue-vaccine-2025-11-11>

WHO: Ethiopia confirms first outbreak of Marburg virus disease.

Ethiopia's Ministry of Health has confirmed an outbreak of Marburg virus disease in the South Ethiopia Region, the first of its kind in the country, following laboratory testing of samples from a cluster of suspected cases of viral hemorrhagic fever.

Published: November 14, 2025.

<https://www.afro.who.int/pt/node/22429#:~:text=Addis%20Ababa%E2%80%94Ethiopia's%20Ministry%20of,cases%20of%20viral%20haemorrhagic%20fever.>

The First Known Human Case of H5N5 Bird Flu (in the US), What We Know So Far.

In early November 2025, public health authorities in Washington state confirmed what appears to be the first ever human infection by the H5N5 strain of avian influenza. Further laboratory testing identified the virus as H5N5 — a subtype previously seen in animals but never documented in humans. The confirmed case involves an older adult with significant underlying health issues. According to state officials, the patient developed high fever, confusion, and respiratory distress. The individual remains hospitalized, and authorities are closely monitoring health workers and others who have contact though so far, no additional infections have been identified.

Published: November 17, 2025.

<https://seasia.co/2025/11/17/the-first-known-human-case-of-h5n5-bird-flu-what-we-know-so-far.>



Latest Relevant Publications

LATEST PUBLISHED PAPERS AND COMMENTARIES FROM THE CHIEF EDITOR

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

Dokal K, Channon-Wells S, Davis C, Estrada-Rivadeneira D, Huse KK, Lias A, Hamilton S, Guy RL, Lamagni T, Nichols S, Taylor A, Agyeman PKA, Anpananthar A, Basmaci R, Carrol ED, Carter MJ, De T, de Jonge MI, Emonts M, Elorrieta LE, Fidler K, Kolnik M, Kuijpers TW, Martinon-Torres F, Moll H, Mommert-Tripon M, Neshat S, Nyirenda-Nyang'wa M, O'Riordan S, Owens DR, Pathan N, Paulus S, Peters MJ, Pokorn M, Pollard AJ, Rivero-Calle I, Rojo P, Romani L, Rughani P, Schlapbach LJ, Schweintzger NA, Shen CF, Sulik A, Tsolia M, Usuf E, van der Flier M, Vermont C, von Both U, Wellman P, Wright VJ, Yeung S, Zavadská D, Cunnington AJ, Fink C, Herberg J, Kaforou M, Sriskandan S, Levin M, Parks T; PERFORM and DIAMONDS consortiums. **Immunity to *Streptococcus pyogenes* and Common Respiratory Viruses at Age 0 to 4 Years After COVID-19 Restrictions.** *JAMA Netw Open.* 2025 Oct 1;8(10):e2537808.

doi: <https://doi.org/10.1001/jamanetworkopen.2025.37808>

Editorial comment: In a cross-sectional study of 1,942 children, those aged 3–4 years sampled after COVID-19 restrictions showed markedly lower immunity to *Streptococcus pyogenes* and RSV compared with pre-pandemic peers. The findings suggest that masking, distancing, and isolation may have limited natural immune development, leaving young children more susceptible—a phenomenon known as “immunity debt.”

02

Callaghan T, Wise LA, Regan AK. **Intention to Use RSVpreF Vaccine or Nirsevimab to Prevent Infant RSV Among Pregnant Individuals.** *Pediatr Infect Dis J.* 2025 Nov 1;44(11):1126–1133.

doi: <https://doi.org/10.1097/INF.0000000000004889>

Editorial comment: In a US, nationally representative survey of pregnant individuals (Sept 20–Oct 3, 2023), researchers assessed intentions to receive the RSVpreF vaccine during pregnancy or to immunize infants with nirsevimab. Findings: 45% intended to receive RSVpreF, 51% intended to give their infants nirsevimab, while 41% planned to use neither. Intent was significantly higher among those already aware of the products and who perceived them as safe, effective, and important. The main reasons for hesitancy included concerns about side effects, potential impact on infants, and the perception that the immunizations were too new.

03

Olarte L, Musher DM, Rodriguez-Barradas MC. **Higher-Valent Pneumococcal Conjugate Vaccines—Perspective for 2026.** *JAMA Intern Med.* 2025 Oct 20.

doi: <https://doi.org/10.1001/jamainternmed.2025.5436>

Editorial comment: This concise mini-review examines the potential risks associated with expanding serotype coverage in protein-conjugate pneumococcal vaccines (PCVs)—notably the possibility of impaired conjugation efficiency and reduced immunogenicity. It also provides an overview of both current and emerging PCVs in development.

04

Fong Y, Huang Y, Huang Y, Woo W, McGarry A, Áñez G, Dunkle LM, Cho I, Houchens CR, Martins K, Jayashankar L, Castellino F, Petropoulos CJ, Leith A, Haugaard D, Webb W, Lu Y, Yu C, Carpp LN, Randhawa AK, Andrasik MP, Kublin JG, Hutter J, Keshtkar-Jahromi M, Beresnev TH, Rodriguez CA, Tapia M, Turley CB, Zorrilla CD, Cohen SH, Kline SE, Barranco E, Corey L, Neuzil KM, Follmann D, Ake JA, Gay CL, Kotloff KL, Jones T, Koup RA, Donis RO, Gilbert PB. **Analysis of antibody markers as immune correlates of risk of severe COVID-19 in the PREVENT-19 efficacy trial of the NVX-CoV2373 recombinant protein vaccine.** *Clin Infect Dis.* 2025 Oct 25:ciaf558.

doi: <https://doi.org/10.1093/cid/ciaf558>

Editorial comment: In this study, individuals who did not develop COVID-19 had markedly higher peak antibody levels than those with severe disease (all Delta variant). Ancestral-specific anti-Spike IgG concentrations and neutralizing antibody titers (nAb-ID50) were 209.5 AU/mL (95% CI: 176.1–249.1) in non-cases versus 9.6 AU/mL (95% CI: 2.4–38.6) in severe cases. Post-vaccination antibody levels following NVX-CoV2373 were strong predictors of protection against severe COVID-19, with low antibody responses signaling increased vulnerability.

05

Fafi I, Levy C, Birgy A, Bechet S, Werner A, Batard C, Franji B, Lassoued Y, Cahn Sellem F, Basmaci R, Kaguclidou F, Ouldali N, Cohen R. **Impact of RSV immunization on the rate of pediatric acute otitis media: a time-series analysis.** *Clin Infect Dis.* 2025 Oct 9:ciaf564.

doi: <https://doi.org/10.1093/cid/ciaf564>

Editorial comment: In this large French study including 70,452 cases of AOM, 13,284 bronchiolitis, and 814 UTIs, the rate of acute otitis media (AOM) per 1,000 visits among infants <12 months decreased by 23.7% (95% CI: -37.6 to -9.7; $p = 0.0014$) following RSV immunization implementation, with no significant change in older age groups. Similar trends were observed for bronchiolitis. RSV immunization led to a strong reduction of AOM rate in infants aged < 12 months. Beyond its efficacy in preventing RSV-related lower respiratory infections in infants aged < 12 months, RSV immunization may contribute to reducing the burden of AOM in children.

06

Chalkias S, Dennis P, Petersen D, Radhakrishnan K, Vaughan L, Handforth R, Rossi A, Wahid R, Edwards DK, Feng J, Deng W, Zhou H, De Windt E, Urdaneta V, Paila Y, Girard B, Faust SN, Walsh SR, Cosgrove CA, Miller J, Das R. **Efficacy, immunogenicity, and safety of a next-generation mRNA-1283 COVID-19 vaccine compared with the mRNA-1273 vaccine (NextCOVE): results from a phase 3, randomised, observer-blind, active-controlled trial.** *Lancet Infect Dis.* 2025 Nov;25(11):1230-1242.

doi: [https://doi.org/10.1016/S1473-3099\(25\)00236-1](https://doi.org/10.1016/S1473-3099(25)00236-1)

Editorial comment: mRNA-1283 is an investigational, next-generation COVID-19 vaccine that encodes only the immunodominant regions of the SARS-CoV-2 spike, the receptor-binding domain (RBD), and the N-terminal domain rather than the full-length spike used in currently authorized mRNA vaccines (mRNA-1273). 1177 confirmed COVID-19 events occurred up to Jan 31, 2024 (560 [9.9%] of 5679 in mRNA1283 and 617 [10.8%] of 5687 in mRNA-1273). Local and systemic adverse reactions were similar between mRNA-1283 and mRNA-1273. mRNA-1283 was well-tolerated. The rVE and immunogenicity non-inferiority criteria were met, with higher antibody responses for mRNA-1283 versus mRNA-1273.

07

Scott J, Abers MS, Marwah HK, McCann NC, Meyerowitz EA, Richterman A, Fleming DF, Holmes EJ, Moat LE, Redepenning SG, Smith EA, Stoddart CJ, Sundaram ME, Ulrich AK, Alba C, Anderson CJ, Arpey MK, Borre E, Ladines-Lim J, Mehr AJ, Rich K, Watts C, Basta NE, Jarolimova J, Walensky RP, Dugdale CM. **Updated Evidence for Covid-19, RSV, and Influenza Vaccines for 2025-2026.** *N Engl J Med.* 2025 Oct 29.

doi: <https://doi.org/10.1056/NEJMsa2514268>

Editorial comment: The authors conducted a systematic review of U.S.-licensed vaccines against COVID-19, respiratory syncytial virus (RSV), and influenza using PubMed, Embase, and Web of Science. COVID-19 mRNA vaccines targeting the XBB.1.5 subvariant showed pooled vaccine effectiveness (VE) against hospitalization of 46-50% in adults and 37% in immunocompromised adults; the KP.2 vaccine demonstrated 68% VE. Maternal RSV vaccination, nirsevimab in infants, and RSV vaccines in adults ≥60 years each showed VE ≥68% against hospitalization. Influenza vaccines showed pooled VE of 48% in adults and 67% in children. Safety profiles were consistent with prior evaluations: myocarditis occurred in 1.3-3.1 per 100,000 male adolescents after COVID-19 vaccination, and RSVPreF vaccination was linked to 18.2 excess Guillain-Barré cases per million doses in older adults, with no significant association with preterm birth. Overall, current evidence supports the continued safety and effectiveness of these immunizations for the 2025-2026 season.

08

McCann N, Paganotti Vicentine M, Ebrahimi N, Greenland M, Angus B, Collins AM, Darton T, Emary K, Faust SN, Flaxman A, Maria N, Green CA, Juarez Molina C, Paidisetti R, Lazarus R, Macaulay GC, McLean F, Mohan VK, Naidu MG, Ramasamy MN, Rao DY, Singh N, Vernon S, Kim YC, Levine MM, Liu X, Pollard AJ; VASP Study Team. **Safety, Efficacy, and Immunogenicity of a Salmonella Paratyphi A Vaccine.** *N Engl J Med.* 2025 Oct 30;393(17):1704-1714.

doi: <https://doi.org/10.1056/NEJMoa2502992>

Editorial comment: In this human challenge trial, a total of 72 participants were randomized, of whom 34 in the live, attenuated *Salmonella* Paratyphi A vaccine (CVD 1902) group and 36 in the placebo group underwent challenge with *S. Paratyphi* A. In the intention-to-treat population, *S. Paratyphi* A infection was diagnosed within 14 days after challenge in 21% of participants in the CVD 1902 group and in 75% of those in the placebo group ($P < 0.001$), corresponding to a vaccine efficacy of 73% (95% confidence interval [CI], 46-86). In the per-protocol analysis, vaccine efficacy was 69% (95% CI, 42-84).

09

Lassen MCH, Johansen ND, Christensen SH, Aliabadi N, Skaarup KG, Modin D, Claggett BL, Larsen CS, Larsen L, Wiese L, Dalager-Pedersen M, Lindholm MG, Jensen AMR, Dons M, Bernholm KF, Davidovski FS, Duus LS, Ottosen CI, Nielsen AB, Borchsenius JH, Espersen C, Köse G, Fusing FH, Pareek M, Køber L, Solomon SD, Jensen JUS, Martel CJ, Gessner BD, Schwarz C, Gonzalez E, Skovdal M, Moulton LH, Zhang P, Begier E, Biering-Sørensen T. **Bivalent RSV Prefusion F Protein-Based Vaccine for Preventing Cardiovascular Hospitalizations in Older Adults: A Prespecified Analysis of the DAN-RSV Trial.** *JAMA.* 2025 Oct 28;334(16):1431-1441.

doi: <https://doi.org/10.1001/jama.2025.15405>

Editorial comment: In this Danish study of 131,276 participants, incidence rates of all-cause cardiovascular hospitalization were 16.4 and 17.7 events per 1,000 person-years in the RSVpreF and control groups, respectively (vaccine effectiveness, 7.4% [95% CI, -5.5% to 18.8%]; $P = .24$). Stroke incidence rates were 3.0 and 3.8 events per 1,000 person-years (vaccine effectiveness, 19.4% [95% CI, -8.6% to 40.4%]; $P = .14$). No significant differences were observed between groups for myocardial infarction, heart failure hospitalization, or atrial fibrillation. Among adults aged 60 years or older, however, all-cause cardiorespiratory hospitalization was significantly lower with RSVpreF vaccination than with no vaccine.

10

Shih YH, Yang CY, Lung CC. **SARS-CoV-2 infection heightens the risk of developing HPV-related carcinoma in situ and cancer.** *Discov Oncol.* 2025 Aug 14;16(1):1552.

doi: <https://doi.org/10.1007/s12672-025-03403-4>

Editorial comment: This study used data from TriNetX, a global database encompassing 106 healthcare organizations across 15 countries, with information from over 124 million individuals. A total of 4,872,295 patients were included: 1,281,997 with SARS-CoV-2 infection and 3,590,298 without infection. After propensity score matching, both groups included 1,281,997 patients. Over a 3-year follow-up, SARS-CoV-2 infection was associated with significantly higher risks of HPV-related cancers, including cervical, vaginal, vulvar, anal, and oropharyngeal cancers, as well as carcinoma in situ. These associations were consistent across age and racial groups.

11

Raffl S, Springer DN, Aberle SW, Florian DM, Kundi M, Stiasny K, Aberle JH. **Tick-borne encephalitis: Burden of disease and impact of vaccination, Austria (2000–2024).** *Vaccine.* 2025 Nov 14;66:127854.

doi: <https://doi.org/10.1016/j.vaccine.2025.127854>

Editorial comment: In this Austrian retrospective analysis of 2,260 hospitalized tick-borne encephalitis (TBE) cases, 12% occurred in children (1–15 years), 47% in adults (16–59 years), and 41% in older adults (≥ 60 years). Severe disease was reported in 47% of patients, with a mortality rate of 1.2%. TBE vaccination provided excellent protection—99% with regular and over 90% with irregular schedules—and was estimated to have prevented more than 10,000 hospitalizations, 4,000 severe cases, and 80 deaths between 2000 and 2024.

12

Ramay BM, Yoder J, Castillo C, Fahsen N, Grajeda L, Santos LF, Romero JC, Lopez MR, Palmer GH, Cordon-Rosales C, Call DR. **Assessing effects of pneumococcal vaccination (PCV13) and rotavirus vaccination (RV) on colonization with extended-spectrum cephalosporin-resistant Enterobacterales (ESCrE) in Guatemalan children.** *Vaccine*. 2025 Nov 14;66:127852. doi: <https://doi.org/10.1016/j.vaccine.2025.127852>

Editorial comment: This study examined whether vaccination against rotavirus (RV) or pneumococcus (PCV13) was associated with reduced colonization by extended-spectrum cephalosporin-resistant *Enterobacterales* (ESCrE) among children under 15 years of age in Guatemala. Among 406 participants, PCV13 vaccination showed an indirect negative association with ESCrE colonization (-0.092 , $P < 0.01$), mediated through reduced clinic visits (-0.461 , $P < 0.01$). Antibiotic use increased clinic visits ($P < 0.01$) but did not significantly affect ESCrE colonization. The effect of RV vaccination was inconclusive due to the small number of unvaccinated children. Overall, pneumococcal vaccination was linked to lower rates of ESCrE bacterial colonization.

13

Janiak S, Piszczek E, Buczkowska A, Buczkowski K. **Parental Vaccine Hesitancy, Trust in Physicians, and Future Vaccination Intentions: A PACV Cross-Sectional Study.** *Vaccines*. 2025; 13(11):1127. doi: <https://doi.org/10.3390/vaccines13111127>

Editorial comment: This Polish study examined socio-demographic predictors of parental pro- and anti-vaccination behaviors and their association with intentions for future child immunizations. Surveys from 1,046 parents covering 1,701 children showed that trust in physicians was strongly linked to both current attitudes and future vaccination intentions. Trust-based, patient-centered communication may foster more positive views toward vaccination, though longitudinal studies are needed to confirm whether such trust can lead to lasting behavioral change, particularly as parental attitudes may shift with subsequent children.

14

Callaghan T, Wise LA, Regan AK. **Intention to Use RSVpreF Vaccine or Nirsevimab to Prevent Infant RSV Among Pregnant Individuals.** *Pediatr Infect Dis J*. 2025 Nov 1;44(11):1126–1133. doi: <https://doi.org/10.1097/INF.0000000000004889>

Editorial comment: The authors conducted a nationally representative U.S. survey of pregnant individuals, weighted to the U.S. population of births, between September 20 and October 3, 2023. Primary outcomes assessed participants' intentions to receive the RSVpreF vaccine during pregnancy and to immunize their infants with nirsevimab. Nearly 45% intended to receive the RSVpreF vaccine, and 51% planned to give their infants nirsevimab, while 41% did not intend to use either product. Intent to use the RSVpreF vaccine or nirsevimab was significantly higher among respondents who were already aware of these products and who perceived them as safe, effective, and important.

15

Decker V, Qureshi K, Roberts L, Powell N, Marchesi JR, Mullish BH, Alexander JL. **The emerging role of the gut microbiota in vaccination responses.** *Gut Microbes.* 2025 Dec;17(1):2549585.

doi: <https://doi.org/10.1080/19490976.2025.2549585>

Editorial comment: The gut microbiota has emerged as a crucial modulator of host immune function, with growing evidence indicating its influence on vaccine-induced immunity. This review summarizes current findings linking gut microbial composition to vaccine responses, particularly for vaccines against SARS-CoV-2, hepatitis B virus, and influenza. Factors such as antibiotic exposure, diet, and prebiotic or probiotic use can alter the microbiota and, in turn, affect vaccine efficacy, underscoring the dynamic interplay between the gut and the immune system. Experimental models support these associations, demonstrating reduced immune responses in germ-free or antibiotic-treated animals and enhanced responses following microbiota-based interventions.

16

Ndeketa L, Haine V, Debois M, Asante KP, Agyapong PD, Kaali S, Devadiga R, Harrison SBE, Boahen O, French N, Kayan K, Ogutu B, Adeniji E, Kariuki S, Owusu-Agyei S, Olewe F, Jere TM, Maleta K, Mategula D, Mzanga P, Phiri VK, Ansah PO, Orimbo J, Ansah NA, Orsini M, Ong'echa JM, Oduro AR, Sifuna PM, Azongo DK, Otieno W, Bangre O, Kaburise MB, Ababio LO, Oyieko JN, Sing'oei V, Amoit SK, Nyangulu W, Schuerman L, Awuni D, Ochieng BO, Onyango I, Odera-Ojwang P, Oguk EA, Mendoza YG, Cherop RY, Okoth GO, Cravcenco C, Chipatala R, Roman F, Oneko M, Savic M; RTS,S Epidemiology EPI-MAL-003 Study Group. **Effectiveness of the RTS,S/AS01E malaria vaccine in a real-world setting over 1 year of follow-up after the three-dose primary schedule: an interim analysis of a phase 4 study in Ghana, Kenya, and Malawi.** *Lancet Glob Health.* 2025 Nov 6:S2214-109X(25)00415-2.

doi: [https://doi.org/10.1016/S2214-109X\(25\)00415-2](https://doi.org/10.1016/S2214-109X(25)00415-2)

Editorial comment: RTS,S/AS01E was introduced in Ghana, Kenya, and Malawi through the Malaria Vaccine Implementation Programme. The phase 4 EPI-MAL-003 study evaluated its real-world safety and effectiveness in children under 18 months across 12 sites. Compared with unvaccinated children, vaccinated participants had significantly lower rates of malaria: 30% reduction in any malaria, 58% in severe malaria, 36% in malaria-related hospitalizations, and 21% in all-cause hospitalizations. No significant difference was seen in all-cause mortality. After one year of follow-up, RTS,S/AS01E demonstrated substantial real-world impact in reducing malaria burden among young children.

17

Branda F, Kandu H, Pandey K, Pun SB, Acharya KP. **Cholera in Nepal: policy priorities and regional lessons.** *Lancet Infect Dis.* 2025 Nov;25(11):e626.

doi: [https://doi.org/10.1016/S1473-3099\(25\)00564-X](https://doi.org/10.1016/S1473-3099(25)00564-X)

Editorial comment: Cholera remains a test of equity, resilience, and preparedness. Nepal's paradox—access without safety, progress without protection—illustrates the danger of mistaking infrastructure expansion for true resilience. Without systemic reform, the next outbreak could once again escalate from a local crisis to a global emergency. This thoughtful editorial explores these challenges and other critical aspects of the current situation.

18

Dereje N, Aragaw M, Mercy K, Moges H, Shaweno T, Tsague LD, Tanui C, Kifle Tessema S, Raji T, Boum Y, Fallah MP, Ngongo N, Kaseya J. **Addressing the Recurrent and Protracted Cholera Outbreaks in Africa: Challenges and the Way Forward.** *Nat Commun.* 2025 Nov 6;16(1):9792.

doi: <https://doi.org/10.1038/s41467-025-64789-x>

Editorial comment: This review analyzes the ongoing and protracted cholera outbreaks in Africa, highlighting the urgent need for coordinated, multi-sectoral interventions. Increased investment in water, sanitation, and hygiene (WASH); strengthened vaccination efforts; enhanced intersectoral response coordination; and sustained political commitment are all critical to effectively controlling and preventing future outbreaks.

19

Deming ME, Toapanta FR, Pasetti M, Golding H, Khurana S, Hamouda T, Fattom A, Liang Y, Tennant SM, McGilvray MF, Bernal PJ, Oshinsky JJ, Datta S, Booth JP, Coughlan L, Neuzil KM, Costley CD, Kotloff KL, Szein MB, Ortiz JR; rH5 Writing Group. **An intranasal adjuvanted, recombinant influenza A/H5 vaccine primes against diverse H5N1 clades: a phase I trial.** *Nat Commun.* 2025 Nov 6;16(1):9321.

doi: <https://doi.org/10.1038/s41467-025-64686-3>

Editorial comment: In this phase I clinical trial, the authors evaluated a recombinant influenza A/H5 (A/Indonesia/05/2005, clade 2.1) hemagglutinin vaccine formulated with the nanoemulsion adjuvant W805EC. The findings demonstrated effective mucosal priming and broad cross-clade immune responses. This intranasal vaccine represents a promising platform for further investigation of mucosal immune biomarkers and may help accelerate the development of next-generation intranasal influenza vaccines.

20

Galiza EP, Nakebembe E, Mboizi R, Okek E, Le Doare K. **Maternal vaccination to prevent neonatal infections and combat antimicrobial resistance.** *Semin Fetal Neonatal Med.* 2025 Oct 24:101680.

doi: <https://doi.org/10.1016/j.siny.2025.101680>

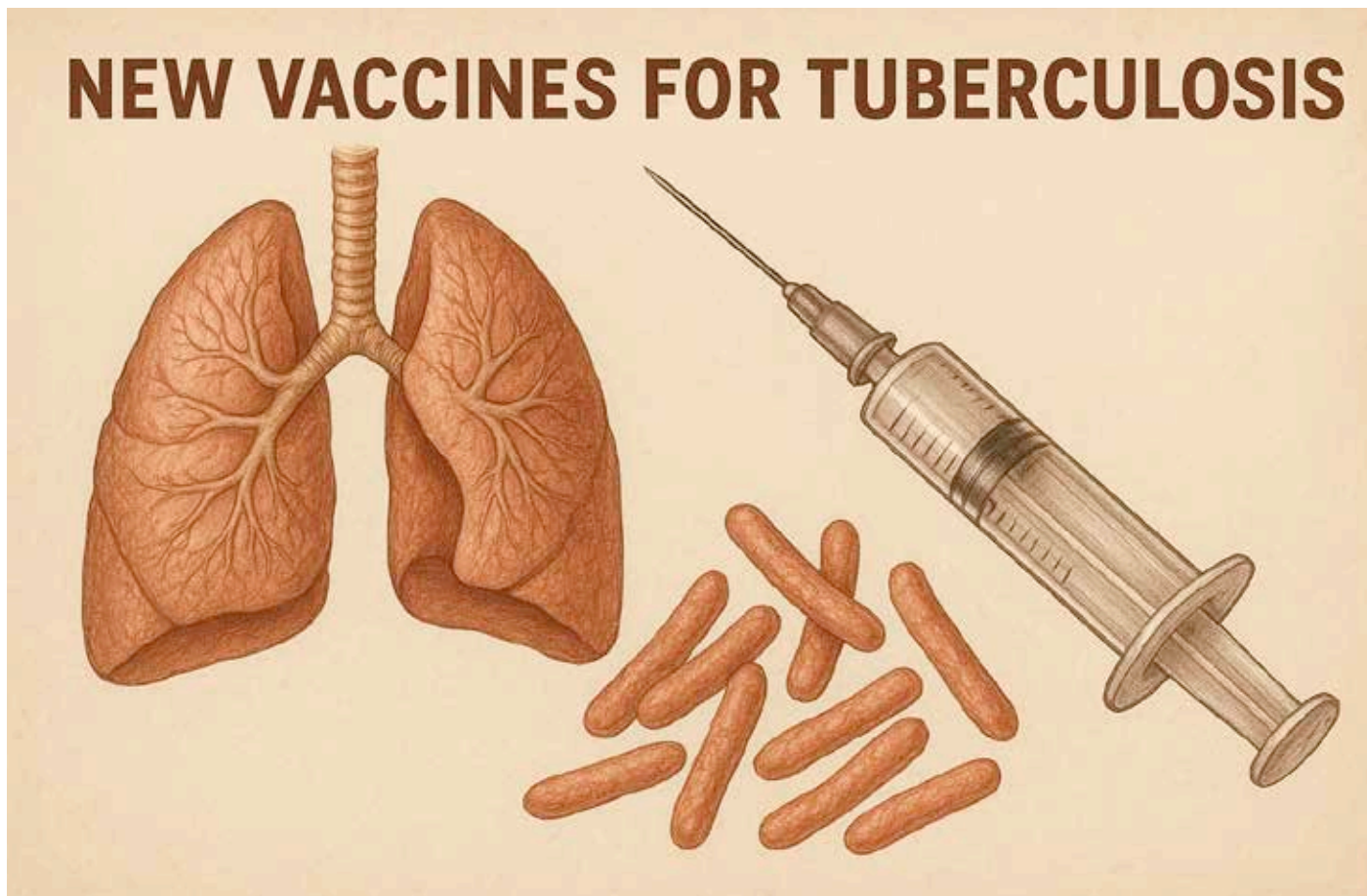
Editorial comment: There is substantial evidence supporting the role of maternal vaccination in preventing numerous neonatal infections that would otherwise require medical intervention. By protecting both mothers and their infants from infectious diseases, maternal immunization contributes not only to improved perinatal outcomes but also to a reduction in antimicrobial use and, consequently, antimicrobial resistance. When integrated into comprehensive antibiotic stewardship and infection-prevention strategies, maternal vaccination represents a practical and scalable approach to minimizing perinatal antibiotic exposure.



Editor's Corner

TUBERCULOSIS: THE NEVER-ENDING EPIDEMIC — CURRENT CONTROL STRATEGIES, THE CENTRAL ROLE OF NEXT-GENERATION VACCINES, AND FUTURE PATHWAYS TOWARD ELIMINATION THROUGH GLOBAL EQUITY AND SUSTAINABLE INVESTMENT

NEW VACCINES FOR TUBERCULOSIS



Introduction

Tuberculosis (TB) remains the world's leading infectious killer and a major driver of antimicrobial resistance. Nearly one-quarter of the global population is infected with *Mycobacterium tuberculosis* (Mtb), and an estimated 5–10% of those infected will develop active TB disease during their lifetime—imposing a profound health and economic burden worldwide. In 2023 alone, approximately 1.8 million people developed TB, leading to 1.25 million deaths despite decades of global control efforts.

Between 2015 and 2023, global TB incidence and mortality rates declined by only 8.3% and 23%, respectively falling short of the World Health Organization (WHO) “End TB Strategy” milestones of a 50% reduction in incidence and 75% reduction in deaths by 2025.

Advancing the Fight: Current Tools and Strategies to Control TB

While the WHO envisions TB elimination by 2035, achieving this goal will require transformative progress in the following:

1. Diagnosis

Despite remarkable scientific progress, many diagnostic approaches for TB remain rooted in the past. The Ziehl–Neelsen stain, developed in 1882, continues to be used in many parts of the world despite its limited sensitivity and inability to prevent transmission through early detection. Similarly, the Mantoux tuberculin skin test, introduced in the 1920s, is still employed to detect latent TB infection, even though far more accurate and rapid tools are now available. A major breakthrough came in 2010 with the introduction of the Xpert MTB/RIF assay (Cepheid Inc., Sunnyvale, CA, USA), the first WHO–endorsed, fully automated molecular test providing rapid diagnosis and rifampicin resistance detection. Its successor, Xpert Ultra (2017), offered further improvements in sensitivity and accuracy. Yet, according to the WHO Global Tuberculosis Report, only about 50% of TB cases worldwide are diagnosed using WHO–recommended molecular methods. The proportion of bacteriologically confirmed cases has also plateaued at roughly 60% between 2015 and 2023,

underscoring persistent challenges in culturing Mtb in routine practice. Meanwhile, traditional skin testing has been complemented—and in many contexts surpassed—by interferon–gamma release assays (IGRAs) such as T-SPOT (Oxford Immunotec, Abingdon, UK) and QuantiFERON (Qiagen, Hilden, Germany), which provide greater specificity for Mtb infection. However, the long-held assumption that immunological reactivity equals latent TB is increasingly being challenged. Emerging evidence suggests that Mtb infection exists along a dynamic continuum, rather than a simple “latent versus active” dichotomy.

2. Treatment

In recent years, TB treatment has undergone remarkable transformation, particularly for multidrug-resistant (MDR) and extensively drug-resistant (XDR) forms. Historically, TB therapy depended on lengthy and toxic regimens with limited efficacy, but innovative drug combinations are rapidly reshaping the therapeutic landscape. Landmark trials such as Nix-TB and ZeNix have demonstrated that a 6-month, all-oral regimen comprising bedaquiline, pretomanid, and linezolid (BPaL) can achieve superior outcomes compared to traditional, prolonged MDR-TB regimens—substantially improving cure rates while reducing both toxicity and treatment duration. Encouragingly, evidence is also emerging that shorter regimens may be effective for rifampicin-sensitive TB. Studies such as the TB-PRACTECAL, SimpliTB, and SHINE trials (the latter conducted in children) have shown that fluoroquinolone-based or optimized 4-month regimens can match the efficacy of standard 6-month therapy, offering the prospect of shorter, more manageable treatment courses for many patients. The TB drug development pipeline is now more robust than ever, with several promising candidates under evaluation through global collaborations such as the UNITE4TB initiative, which focuses on novel drug classes and mechanisms—including agents targeting ethionamide activation and cell-wall synthesis pathways. However, emerging resistance to newer drugs, particularly bedaquiline, is a growing concern. This underscores a persistent challenge in TB control: Mtb continues to develop resistance faster than the pace at which new antimycobacterial

agents are brought into clinical use—highlighting the urgent need for sustained innovation, stewardship, and global access strategies.

3. Vaccines

The persistent inequities in access to diagnostic tools and effective treatments, compounded by the ongoing challenges of malnutrition, poverty, and broader social determinants of health, continue to hinder global progress toward tuberculosis (TB) elimination. Moreover, the rapidly evolving

resistance to existing anti-TB drugs threatens to undermine recent therapeutic advances and further complicates disease management, particularly in low- and middle-income settings. At the same time, the growing understanding of TB pathogenesis and immune responses underscores an urgent need to reorient efforts toward prevention. Strengthening **preventive strategies—particularly through the development and equitable deployment of effective vaccines—**remains essential to achieving lasting control and eventual eradication of TB worldwide.

Table 1: Current landscape of TB vaccines: Name of the vaccine, company and/or organization, platform, and ages.

(Modified from Maani AA, et al. *IJID Reg.* 2025 Mar 19;14(Suppl 2):100595. doi: 10.1016/j.ijregi.2025.100595 and Shaji A, et al. *Front Immunol.* 2025 Jul 30;16:1608104. doi: 10.3389/fimmu.2025.1608104).

Phase I	Phase IIa	Phase IIb	Phase III
BNT164a1 BNT164b1 BioNtech SE® (Both mRNA)	ChAdOx185AMVA85A University of Oxford (Viral vector)	DAR-901 booster Dartmouth, St. Louis University (Whole Mycobacterial extract) Includes adolescents	GamTBvac Ministry of Health, Russian Federation (Protein- adjuvant)
TB/FLU-05E RIBSP® (Viral vector)	ID93 + GLA SE(QTP101) Quratis®, U.S. NIH/NIAID (Protein-adjuvant)	RUTI Archivel Farma, S.L® (Detoxified Mycobacterial liposomal fragments)	MIP/Immuvac ICMR, Cadila Pharmaceuticals® (Heat-inactivated Mycobacterium) Includes children
H107e/CAF 10b SSI® (Protein-adjuvant)	AEC/BC02 Anhui Zhifei Longcom® (Protein-adjuvant)	H4:IC31 (AERA- 404) SSI® (Protein-adjuvant)	M72/AS01E GSK®, Gates MRI (Protein-adjuvant) Includes adolescents
			MTBVAC Biofabri®, University of Zaragoza, IAVI, TBVI (Recombinant BCG mutant) Includes infants
			VPM1002 SIPL®, VPM® (Live Mycobacterium) Includes infants and adolescents
			BCG Re-vaccination to prevent infection (TIPI) HJF® (Live Mycobacterium)
			SRL172 (Non-TB Mycobacterium) SII®

Vaccines for TB

The bacillus Calmette–Guérin (BCG) vaccine, introduced in the 1920s, remains the only widely used vaccine for TB. While BCG provides strong protection against severe childhood manifestations of the disease—such as TB meningitis and disseminated TB—its efficacy against pulmonary TB, the most prevalent and transmissible form in adults, is notably limited. The variable and often inconsistent performance of BCG, particularly in high-burden settings, highlights the urgent need for next-generation vaccines capable of providing broader, more durable, and reliable protection across all age groups and geographic regions.

A novel TB vaccine must have the potential to reduce TB incidence, prevent the progression from latent infection to active disease, and curb the transmission of drug-resistant strains, making it a critical component of global TB control strategies, especially the WHO End TB goal.

Significant progress has been achieved in TB vaccine research over the past decade, driven by the ambitious global goal of licensing at least one new vaccine within the next five years. As of August 2024, a total of 15 vaccine candidates were in clinical development, each targeting different components of the immune response to *Mtb*. Of these, four are in Phase I, five in Phase II, and six in Phase III clinical trials (see Table 1), reflecting a dynamic and increasingly mature vaccine pipeline that brings renewed optimism for the future of TB prevention.

Conclusions

New TB vaccines represent the cornerstone of global efforts to eliminate this devastating disease. Although the timeline for a fully effective vaccine remains uncertain, the

remarkable progress achieved in recent years offers renewed optimism and momentum. With sustained research investment, increased funding, and stronger international collaboration, next-generation TB vaccines have the potential to dramatically reduce disease incidence, curb the rise of drug resistance, and bring the world closer to achieving the World Health Organization's (WHO) End TB Strategy and long-term elimination goals.

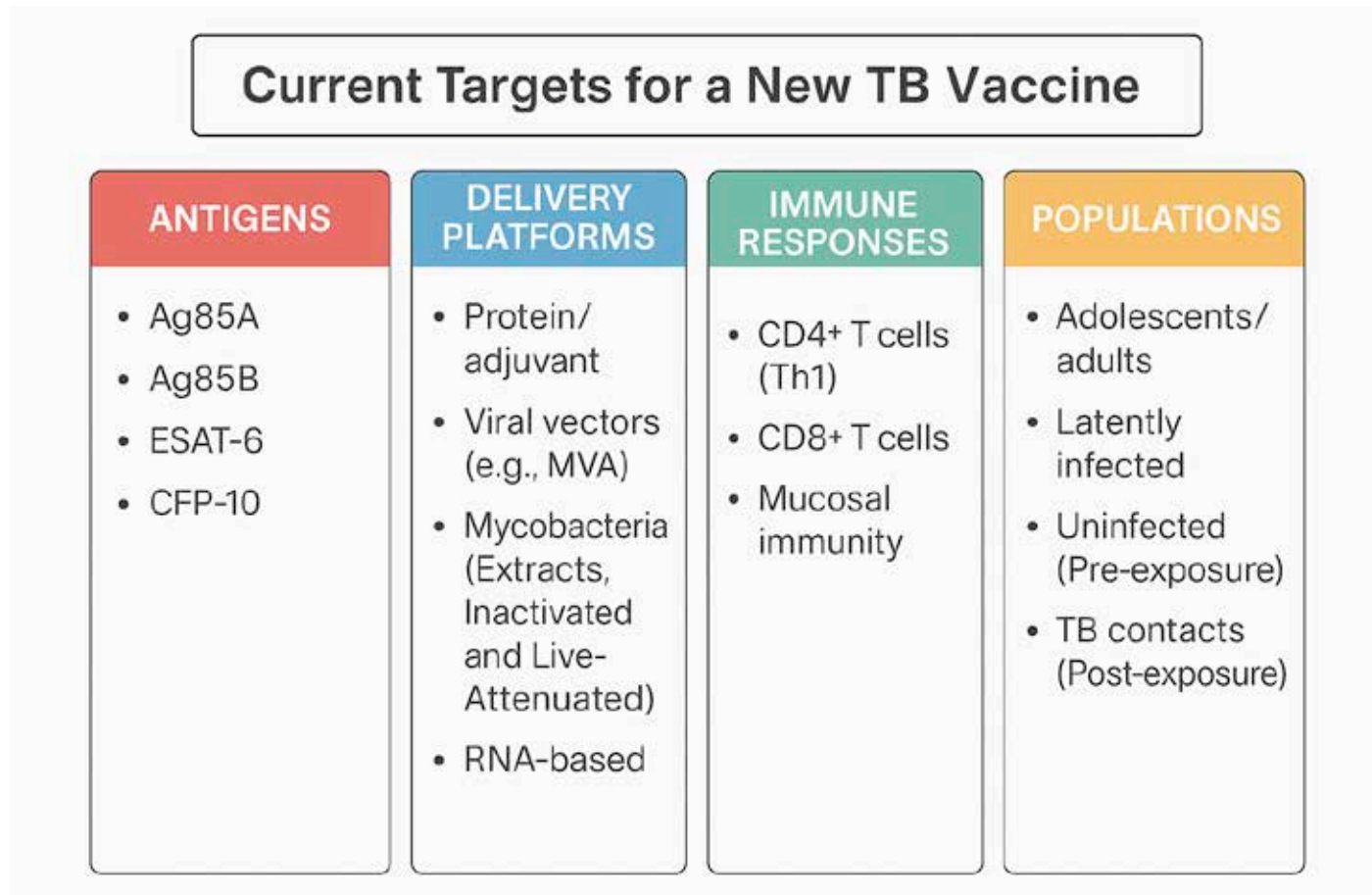
Public-private partnerships, such as the Global Vaccine Alliance (Gavi), the Bill & Melinda Gates Foundation, and the Stop TB Partnership, play a crucial role in accelerating research and ensuring equitable access to new vaccines in resource-limited settings. At the same time, countries with high TB burdens are increasingly investing in TB research, while collaborations between pharmaceutical companies, academic institutions, and international organizations are expediting vaccine development. Together, these combined efforts aim to overcome the scientific, financial, and logistical barriers that have long impeded progress—bringing the goal of impactful, accessible TB vaccines closer to reality.

For the millions currently affected by TB—and the billions at risk of infection—the promise of a new vaccine represents more than scientific progress; it symbolizes hope for a healthier and more equitable future. However, the success of these scientific breakthroughs will depend on our collective ability to ensure that global health equity remains central to TB vaccine research and delivery. Without deliberate efforts to guarantee affordable access and equitable distribution, particularly in low- and middle-income countries where the TB burden is greatest, advances in research and clinical development will have limited real-world impact.

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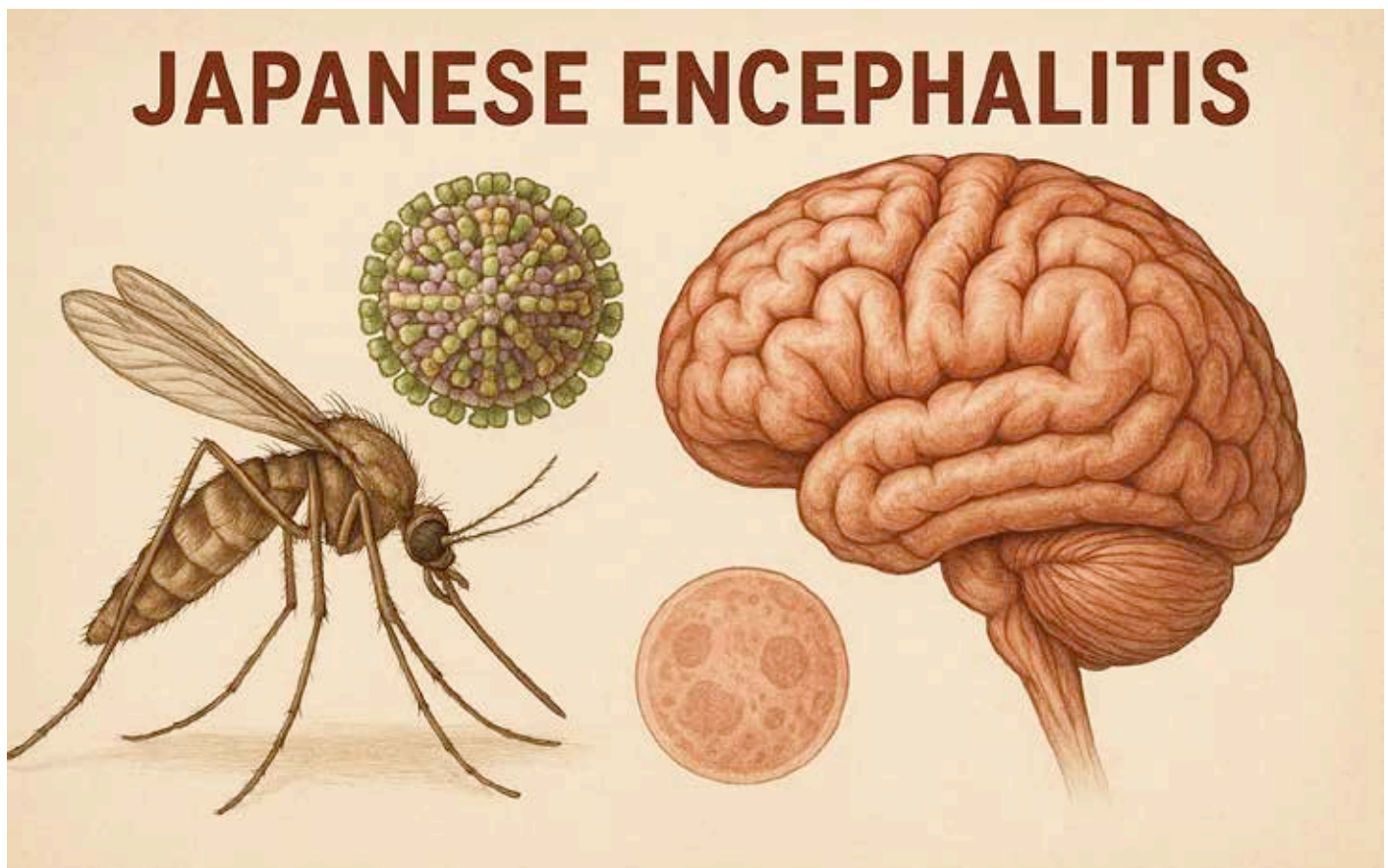
Figure-1: Figure 1. Overview of current immunological and molecular targets guiding the development of next-generation TB vaccines:



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Best Practice

JAPANESE ENCEPHALITIS: VACCINATION STRATEGIES AND RECOMMENDATIONS



Introduction:

Japanese encephalitis virus (JEV), a neurotropic member of the *Flaviviridae* family and *Orthoflavivirus* genus which also includes dengue, Zika, yellow fever, and West Nile viruses., remains a leading cause of viral encephalitis throughout Asia and the Western Pacific.

Between 1998 and 2011, an estimated 67,900 cases of Japanese encephalitis (JE) occurred annually across 24 endemic countries, corresponding to an overall incidence of 1.8 per 100,000

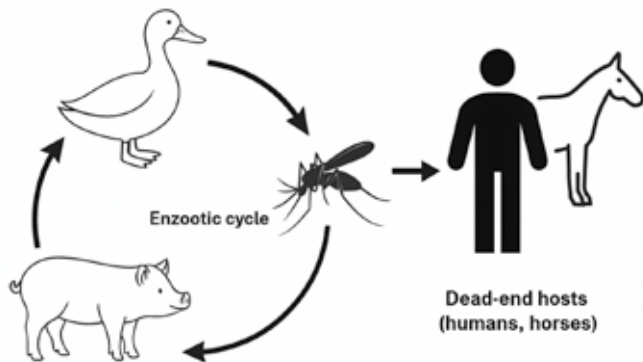
population. Based on WHO surveillance data, published case reports, and national health statistics from endemic regions between 2017 and 2023, the reported incidence declined to 0.5–1 per 1,000,000 population. The estimated annual number of locally acquired cases ranged from approximately 4,668 in 2017 to 1,886 in 2022. However, underreporting remains likely, given variations in surveillance capacity and diagnostic infrastructure across endemic areas.

Transmission to humans occurs through

the bites of infected *Culex* species, primarily *C. tritaeniorhynchus*, but also *C. vishnui*, *C. gelidus*, and *C. pipiens*.

The main vertebrate hosts—pigs and aquatic wading birds—serve as amplifying reservoirs, while humans are incidental, dead-end hosts, as person-to-person transmission does not occur (Figure 1).

Figure 1. Japanese Encephalitis Transmission Cycle:



Approximately 99% of JEV infections are asymptomatic. When symptomatic, following an incubation period of 4–14 days, individuals typically develop nonspecific prodromal symptoms such as high-grade fever, chills, headache, and myalgia, which may progress to neurological manifestations (encephalitis), including confusion, seizures, coma, and, in severe cases, death. The case-fatality rate among symptomatic patients is estimated at ~30%, and up to 50% of survivors experience long-term neurological sequelae. Currently, no specific antiviral treatment exists; management remains supportive.

Areas of Japanese Encephalitis:

WHO case reports, published case reports, and endemic country health control statistics from 2017 to 2023 revealed that there has been a decrease in the incidence of JE among both residents and travelers, but the majority of countries where the JEV is still endemic are popular travel destinations, including India, China, Vietnam, Myanmar, Malaysia, the

Philippines, Thailand, Indonesia, and possibly north of Australia, South Korea, Pakistan, Brunei, Cambodia, and Papua New Guinea, among others.

Interestingly, India reported a notably high rate of Japanese encephalitis virus (JEV) infection among local residents between 2017 and 2021, with nearly 2,500 cases in 2019 alone. China followed with approximately 1,800 cases reported in 2018. Between 2017 and 2018, both the Philippines and Vietnam documented substantial case numbers—up to 361 and 313, respectively [4]. In contrast, Thailand reported consistently low case counts, with 14, 17, 8, 9, and 3 cases recorded annually from 2017 to 2022, respectively [8–10]. Overall, the incidence of JEV infection in Thailand, the Philippines, China, India, and Vietnam demonstrated a steady decline during the 2017–2022 period.

The decline in new JEV infections among residents can be attributed to several factors, including strengthened surveillance systems, the successful implementation of non-pharmaceutical interventions (NPIs), and changes in lifestyle patterns. Furthermore, the transformation of rural regions into peri-urban areas and the relocation or encroachment of pig farms near residential zones may also have influenced this downward trend.

Japanese Encephalitis Vaccine Implications for Travelers Visiting JE-Endemic Areas:

Over the past 30 years, the estimated annual incidence of JE among American travelers has been less than one case per one million individuals. The estimated risk of JEV infection during one month of travel to rural areas in the transmission season ranges between 1 in 5,000 and 1 in 200,000 per week. Among Swedish and Finnish travelers to Thailand, the risk—regardless of travel type or duration—was estimated at 1 per 257,000 to 1 per 400,000 travelers. Between 1973 and 2023, only 85 travel-associated JE cases were identified among travelers visiting endemic regions across 15 countries, none of whom had been vaccinated against JE. Of these, 26 cases occurred in travelers to Thailand, followed by Indonesia (13), the Philippines (11), China (9), Vietnam (4), Japan (4), and South Korea (2).

Table 1: Geographical Distribution and Seasonal Patterns of Japanese Encephalitis Transmission by Country

(modified from CDC: <https://www.cdc.gov/japanese-encephalitis/prevention/japanese-encephalitis-vaccine.html>):

Country	Risk areas	Transmission season
Australia	Outer Torres Strait Islands, Tiwi Islands, and some areas of mainland (parts of New South Wales, Victoria, Queensland, South Australia, and Northern Territory)	November–May
Bangladesh	Widespread	Year-round with most cases reported July–November
Bhutan	Presumed widespread in nonmountainous areas	Unknown
Brunei Darussalam	Presumed widespread	Unknown
Burma (Myanmar)	Widespread	Year-round with most cases reported May–September
Cambodia	Widespread	Year-round with peak season May–October
China	All provinces except Xinjiang and Qinghai	Peak season June–October
India	Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Goa, Haryana, Jharkhand, Karnataka, Kerala, Maharashtra, Manipur, Meghalaya, Nagaland, Odisha, Punjab, Tamil Nadu, Telangana, Tripura, Uttar Pradesh, Uttarakhand, West Bengal	Peak season May–November, especially in northern India; the season may be extended or year-round in some areas, especially in southern India
Indonesia	Widespread	Year-round, with peak season varying by island
Japan	All islands	June–October
Lao People's Democratic Republic	Widespread	Year-round with peak season June–September
Malaysia	Widespread	Year-round, with peak season in Sarawak from October–December
Nepal	Southern lowlands (Terai), some hill and mountain districts	Peak season June–October
North Korea	Presumed widespread	Unknown Proximity to South Korea suggests peak transmission May–November
Pakistan	Unknown	Unknown
Papua New Guinea	Widespread	Presumed year-round
Philippines	Widespread	Year-round with peak season April–August
Russia	Primorsky Krai	June–September

Country	Risk areas	Transmission season
Singapore	Presumed in focal areas	Year-round
South Korea	Widespread	May–November
Sri Lanka	Widespread except in mountainous areas	Year-round with peak season November–February
Taiwan	Widespread	Peak season May–October
Thailand	Widespread	Year-round with peak season May–October, especially in northern Thailand
Timor–Leste	Presumed widespread	No data Proximity to West Timor suggests year-round
Vietnam	Widespread	Year-round with peak season May–October, especially in northern Viet Nam

Single cases were also reported in travelers to Myanmar, Malaysia, Taiwan, Singapore, Papua New Guinea, Hong Kong, Cambodia, and Nepal. However, because of the high case–fatality rate of JE once neurological symptoms develop—despite its low overall incidence—vaccination is recommended for certain travelers.

Japanese Encephalitis Vaccines:

Inactivated JE Vaccines:

A Vero cell–derived JE vaccine (JE–VC) from the attenuated SA–14–14–2 strain was introduced in 2009 (IXIARO® in the U.S., JESPECT® in Australia/New Zealand, JEEV® in India) and licensed for U.S. children ≥2 months in 2013. An accelerated two–dose regimen within one–week elicited seroconversion rates of 99–100%, comparable to the standard 28–day schedule. Seroprotection 10–12 months later was 94% in the accelerated group and 88% in the conventional group. For the standard schedule, seroprotection declined from 96% at one month to 48% at 24 months, with long–term antibodies persisting in ~82% at 60 months; in adults >65 years, protection decreased after six weeks. A single JE–VC dose achieved 41% seroconversion at day 28, rising to 100% after a 15–month booster, with 96% protection maintained at 76 months.

JENVAC®, licensed in India since 2014, uses the JEV Kolar–821564XY strain grown in Vero

cells. Two doses 28 days apart produced >90% seroprotection, persisting >60% over two years. A single dose yielded 92.4% seroprotection at four weeks and >80% at two years.

Live attenuated JE vaccines:

Only two newly introduced live JE vaccines (JE–LVs) are currently available. The first, CD. JEVAX®, contains the attenuated SA 14–14–2 virus grown in hamster kidney cell culture. A single dose in children provided 94.5% effectiveness at six months and 96.2% at five years. The second, IMOJEV®, is a recombinant chimeric vaccine combining the yellow fever 17D–204 backbone with JE virus components, introduced in 2012. Neutralizing antibodies were detected in 99% of recipients 28 days post–vaccination, with seroprotection persisting at 93% for up to five years. Studies indicate that a single dose of IMOJEV® confers long–term protection in adults for at least ten years. It is currently licensed in Australia, Thailand, Malaysia, the Philippines, Hong Kong, and Singapore.

Vaccine Candidates in Development:

Recent studies have identified three promising JE vaccine candidates. Virus–like particles (VLPs): Produced *in vitro* using *Pichia pastoris* to express the JEV envelope protein, these VLPs induced strong humoral and cellular immune responses in mice and pigs, providing complete protection

in immunodeficient mice and high neutralizing antibody titers in pigs even without an adjuvant. JEV-ΔNS1 live-attenuated strain: This replication-deficient variant, lacking the NS1 region, showed excellent safety, genetic stability, and reduced neurovirulence in mice. A single dose elicited robust immunity comparable to the SA14-14-2 vaccine. DNA vaccine (pV-JP3ME): Based on the virulent JEV P3 strain and subcloned into the pVAX1 vector, this candidate induced high IgG and neutralizing antibody levels in mice.

Japanese Encephalitis Vaccine Recommendations:

As a reminding, since JE vaccination does

not induce herd immunity (humans are dead-end hosts), achieving and sustaining high vaccination coverage is essential for populations at risk of disease. Therefore, JE vaccination should be integrated into national immunization schedules in all areas where JE is considered a public health priority.

The WHO recommends the following dosing schedules and age of administration for JE vaccines:

- Live attenuated vaccine: A single dose administered at ≥ 8 months of age
- Live recombinant vaccine: A single dose

Table 2. Summary of Licensed Japanese Encephalitis Vaccines

(Modified from Asawapaithulsert P, et al. *Vaccines*. 2023 Nov 2;11(11):1683. doi: 10.3390/vaccines11111683:

Vaccine Type	Platform / Cell Substrate	Trade Name (Manufacturer)	Licensure (Year / Region)	Schedule	Regions / Countries
Inactivated (Mouse Brain)	Mouse brain	BIKEN® / JE-VAX (BIKEN, Osaka, Japan)	Japan, 1954	Days 0, 7, 28 at 12–24 mo; booster after 1 yr, then every 3–5 yrs	Japan, EU, US, India, Malaysia, South Korea, Taiwan, Thailand, Vietnam
Inactivated	Hamster kidney cells	– (China)	China, 1968	–	China
Inactivated (Freeze-dried)	Vero cells	JEBIK® (BIKEN, Japan)	Japan, 2009	Days 0, 7, 28 at 12–24 mo; booster every 3–5 yrs	Japan
Inactivated	Vero cells	ENCEVAC® (KAKETSUKEN, Japan)	Japan, 2011	Same as above	Japan, South Korea
Inactivated	Vero cells	JEVAC™ (Liaoning Cheng Da, China)	China, 2008	Day 0, 1–4 wks; booster at 1 yr	China
Inactivated	Vero cells	IXIARO® / JESPECT® / JEEV® (Valneva, UK; Biological E, India)	USA, EU, AUS, 2009	Days 0, 28 (≥ 2 mo); booster at 1 yr; accelerated 0,7	Worldwide (EU, US, India, Japan, Pacific, SE Asia)
Inactivated	Vero cells	JENVAC® (Bharat Biotech, India)	India, 2014	Days 0, 28 (≥ 6 mo)	India
Live Attenuated	Hamster kidney cells	CD.JEVAX® (Chengdu Institute, China)	China, 1988	Single dose ≥ 8 mo; booster after 3–12 mo if needed	China, India, Nepal, Sri Lanka, Thailand
Chimeric (Recombinant)	Vero cells	IMOJEV® (GPO-Mérieux / Sanofi Pasteur)	Australia, Thailand, 2012	Single dose ≥ 9 mo; booster after 12–24 mo	Australia, Thailand

- administered at ≥ 9 months of age
- Inactivated Vero cell-derived vaccine: The primary series should follow the manufacturer's guidance, typically involving two doses four weeks apart, with the first dose starting at ≥ 6 months of age in endemic areas

The need for a booster dose in endemic areas has not yet been clearly established for these vaccines.

The most effective immunization strategy in JE endemic areas involves a one-time campaign targeting the primary at-risk population, as defined by local epidemiology (typically children aged < 15 years of age). This should be followed by incorporation of JE vaccination into the routine childhood immunization program.

The CDC (USA): Travelers to areas with risk for Japanese encephalitis should discuss the need for vaccination with their healthcare provider. The discussion should include:

- risks related to the specific travel itinerary,
- likelihood of future travel to countries where Japanese encephalitis virus occurs,
- possible severe outcomes of Japanese encephalitis, and
- information about the vaccine including cost and possible side effects.

Japanese encephalitis vaccine is **recommended** for persons moving to a Japanese encephalitis-endemic country to live, longer-term (e.g., 1

month or longer) travelers, and frequent travelers to Japanese encephalitis-endemic areas.

Japanese encephalitis vaccine also should be **considered for**:

- shorter-term (e.g., less than 1 month) travelers with an increased risk of Japanese encephalitis based on planned travel duration, season, location, activities, and accommodations, and
- for travelers who are uncertain of specific duration of travel, destinations, or activities.

Japanese encephalitis vaccine is not recommended for travelers with very low risk itineraries, such as shorter-term travel limited to urban areas or travel that occurs outside of a well-defined Japanese encephalitis virus transmission season.

The European Medicines Agency (EMA) recommends the JE vaccine for individuals at risk of exposure to the virus, particularly in endemic areas.

- Target Population:
- Travelers to regions where Japanese encephalitis is common, especially rural areas in Asia.
- Individuals working in laboratories handling the virus.
- Residents in endemic areas.
- Vaccination is recommended for those staying in endemic areas for an extended period or during outbreaks.

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Guest Contributors

PERTUSSIS IN LATIN AMERICA: RESURGENCE, IMMUNIZATION GAPS, AND OPPORTUNITIES FOR ACTION

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Pertussis has accompanied humanity for centuries, often hidden behind a persistent cough that rarely draws the attention of clinicians or surveillance systems. Before the COVID-19 pandemic, the cyclical patterns characteristic of *Bordetella pertussis* were well known, with peaks every three to five years and a disproportionate burden in infants. However, during the initial years of the pandemic, this natural cycle appeared to halt. Physical distancing, widespread mask use, and decreased mobility sharply reduced the transmission of multiple respiratory pathogens, including pertussis. For the first time in decades, the continent reported exceptionally low figures: 3,283 cases in 2022, the lowest number recorded in the Region of the Americas in recent years.

But this decline was illusory. Once mitigation measures were relaxed, the scenario shifted rapidly. In 2023, cases increased to 4,139, and in 2024, the region reported 43,751 cases. Provisional data from the Pan American Health Organization (PAHO) indicate 18,595 cases and 128 deaths during the first seven months of 2025 across nine countries. This abrupt rise underscores that the disease never disappeared—it merely lost its capacity to circulate temporarily. The fuel behind this resurgence had been accumulating silently for years: widening immunization gaps, delays in childhood vaccination schedules, declining vaccination during pregnancy, and weakened surveillance systems.

The setback in coverage is particularly striking: Latin America went from being a global leader

in childhood immunization with 93% DTP3 coverage in 2012 to only 75% in 2021, the greatest decline documented in any region during that period. By 2024, the region had accumulated the equivalent of 1.5 million zero-dose children. Behind these percentages lie communities where vaccination became inaccessible, pregnant women who could not receive Tdap, health systems unable to recover delayed schedules after the pandemic, and clinical services that failed to suspect pertussis in adolescents and adults—fueling invisible chains of transmission.

Surveillance represents another critical weakness. The region continues to use heterogeneous case definitions, with varying levels of access to PCR, limited clinical suspicion in older age groups, and uneven laboratory capacity across countries. As a result, underreporting is significant, and the true magnitude of the epidemic far exceeds the numbers captured in official records. This underestimation not only hinders epidemiologic understanding but also delays essential programmatic decisions. In parallel, another threat emerged: the detection of macrolide-resistant pertussis strains in several countries, a worrisome signal that reinforces the need for prevention rather than relying on increasingly complex diagnosis and treatment.

In this context, acellular pertussis-containing combination vaccines have become a fundamental tool. Their lower reactogenicity, greater acceptability among caregivers and health professionals, and reduced number of injections

per visit improve adherence and timeliness of childhood immunization. Countries that have implemented these vaccines report better tolerance, improved maternal and infant acceptance, and a positive impact on coverage recovery. Moreover, their use in boosters for adolescents, adults, and pregnant women is essential for a life-course immunization strategy that reduces community transmission and protects young infants—the group at highest risk.

Today, the region faces a decisive moment. Rising case numbers, the reemergence of severe complications, and the circulation of resistant strains make it clear that we cannot continue doing the same and expect different results. Pertussis is a vaccine-preventable disease; addressing it requires collective will and coordinated regional action.

Achieving meaningful progress demands four urgent and structural transformations:

1. Unifying the pertussis case definition across the region, using harmonized clinical and laboratory criteria to enable comparability and improve epidemiologic accuracy.
2. Strengthening diagnostic capacity, ensuring broad access to PCR and enhancing clinical training to increase suspicion of pertussis at all ages.

3. Sustainably increasing vaccination coverage, particularly through the use of acellular pertussis-containing combination vaccines, which enhance acceptability among infants, children, adolescents, adults, and pregnant women.
4. Closing territorial and social gaps, ensuring that no child remains unprotected due to limited access, logistical barriers, or misinformation.

Pertussis reminds us that the region's immunization systems possess strengths, but also profound vulnerabilities. The pandemic demonstrated that population behaviors can change dramatically in a short time; now, that capacity must be redirected toward rebuilding trust in vaccines, modernizing surveillance, and protecting the youngest members of society. This is not only about recovering coverage—it is about preventing history from repeating itself. Every infant hospitalized with a vaccine-preventable disease represents a chain of preventable failures. Latin America has the tools, the science, and the experience. What is needed now is decisive, cohesive, forward-looking action.

This is the moment—because if we continue doing the same, the results will not change. And the region cannot afford to repeat this cycle.

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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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