VACCINES BEAT

PREVENTING RSV FROM BIRTH: THE POWER OF MATERNAL IMMUNIZATION

Prof. Susanna Esposito on RSV prevention, maternal immunization, and the future of infant respiratory protection

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Preventing RSV from Birth: The Power of Maternal Immunization

Prof. Susanna Esposito on RSV prevention, maternal immunization, and the future of infant respiratory protection

Prof. Susanna Esposito is Full Professor of Pediatrics at the School of Medicine of the University of Parma, Italy. She is President and Founder of the World Association for Infectious Diseases and Immunological Disorders (WAidid), a position she has held since 2014, and Chair of the Committee on Infectious Diseases of the Italian Society of Pediatrics

Prof. Esposito has held numerous leadership positions in pediatric infectious diseases and vaccination. She served as President of the Italian Society of Pediatric Infectious Diseases (SITIP) from 2011 to 2014 and has been a member of the Steering Committee on Vaccination of the Italian Society of Pediatrics and the Steering Committee on Vaccines of the Italian Society of Allergy and Immunology. She has also served as President of the WHO Committee for measles and rubella eradication and was Chair of the Vaccines Group of the European Society for Clinical Microbiology and Infectious Diseases (EVASG), and served on the European Society for Pediatric Infectious Diseases (ESPID) Steering Committee and its Training and Research Committees.

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LETTER FROM THE EDITOR

Welcome to the **26th issue of Vaccines Beat**!

In this issue's **Coffee with the Expert**, we are honored to welcome **Prof. Susanna Esposito** who is Full Professor of Pediatrics at the Department of Medicine and Surgery, University of Parma, Italy, where she also serves as **Director of the Specialization School in Pediatrics** and **Director of the Pediatric Clinic at the Pietro Barilla Children's Hospital**. She is a pediatrician and infectious diseases specialist whose scientific career has focused particularly on **pediatric infectious diseases, vaccines and immunization, respiratory infections, antimicrobial therapy, and preventive pediatrics**.

She is the **founder and President of the World Association for Infectious Diseases and Immunological Disorders (WAidid)** and has held several leadership positions in national and international scientific organizations, including the Italian Society of Pediatric Infectious Diseases and European infectious-disease and vaccine groups. She has also contributed to WHO initiatives, including work related to measles and rubella elimination and maternal, neonatal, child and adolescent health.

Prof. Esposito has an extensive record in clinical and translational research, including major work on **influenza, pneumococcal and meningococcal disease, RSV, maternal immunization, and vaccination of children with chronic or immunocompromising conditions**. She has authored **more than 750 peer-reviewed publications** and has participated as principal investigator in more than 200 pediatric clinical studies.

In our conversation, we discussed her outstanding contributions to **pediatric infectious diseases and vaccinology**, with particular emphasis on **RSV prevention, maternal immunization, and her vision for the future of protecting infants against respiratory viral diseases**.

In our Editor's Corner, we examine **Vaccination Under Fire: Protecting Immunization During War**, exploring how armed conflict disrupts immunization programs, increases the risk of vaccine-preventable disease outbreaks, and threatens the health of already vulnerable populations.

In our Best Practice Section, we present **Adult Pneumococcal Vaccination in the Era of PCV20 and PCV21: Broader Coverage, Simpler Recommendations**, highlighting how higher-valency pneumococcal conjugate vaccines are expanding serotype coverage while helping simplify adult vaccination strategies.

In the ***Guest Contributor*** section, **Dr. Osvaldo Aguilera Batista, MD**, First-Degree Specialist in Family Medicine and Immunology and Professor at Vladimir I. Lenin University General Hospital in Holguín, Cuba, shares his expertise on **New Vaccine Platforms Against Arboviral Diseases**, exploring innovative technologies and emerging approaches that could shape the future of arbovirus prevention.

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

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

Sincerely,

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

Dr. Enrique Chacon-Cruz

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

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

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

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

Coffee with the Expert

PREVENTING RSV FROM BIRTH: THE POWER OF MATERNAL IMMUNIZATION.

Prof. Susanna Esposito on RSV prevention, maternal immunization, and the future of infant respiratory protection

Authors:

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

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Her academic and editorial experience includes serving as International Editor of *The Pediatric Infectious Disease Journal* and as Associate Editor of several international journals, including *BMC Infectious Diseases*, *Human Vaccines & Immunotherapeutics*, and the *Journal of Clinical Virology*. She has also served on the Editorial Board of *PLOS ONE*.

Prof. Esposito's research focuses on vaccines, respiratory tract infections, antimicrobial therapy, emerging infections, and preventive pediatrics. Her research has resulted in more than 500 publications in international peer-reviewed journals indexed in PubMed, with an h-index of 67.

Prevention

For Prof. Susanna Esposito, the value of vaccination begins with a simple principle: prevention must be designed around the children

and health systems it is intended to protect.

"The essential lesson has been that prevention must be designed around real children and real health systems. It is not sufficient to develop an effective product. We must understand who is most vulnerable, communicate clearly with families, monitor safety carefully and ensure that protection reaches children, regardless of where they are born," says Prof. Esposito reflecting on the lessons that have shaped her career.

A pediatric infectious disease specialist, researcher and advocate for immunization, Prof. Esposito has built her career at the intersection of clinical pediatrics, epidemiology, infectious diseases and vaccine research. Her work has included influenza, pneumococcal and meningococcal disease, pertussis, respiratory syncytial virus (RSV) and emerging respiratory viruses, as well as vaccine research involving premature infants, immunocompromised children and children with chronic diseases. Her international clinical experience, including work in Burundi, has also reinforced her perspective on health equity.

That philosophy is particularly relevant as the global health community enters a new era of RSV prevention, with both maternal vaccination and long-acting monoclonal antibodies providing opportunities to protect infants during the first months of life.

RSV: from seasonal bronchiolitis to a global health priority

RSV has long been recognized as an important cause of bronchiolitis and respiratory illness in young children. Increasing surveillance and improved diagnostic methods, however, have expanded our understanding of its global impact. In Prof. Esposito's view, the shift has been significant.

"Our understanding has evolved from viewing RSV primarily as a seasonal cause of bronchiolitis to recognizing it as a major global health problem," she points out.

RSV infection occurs widely in early childhood, and severe disease is not limited to premature infants or children with underlying medical conditions. Many hospitalized infants were previously healthy. It is estimated that RSV is associated with more than 3.6 million hospitalizations and approximately 100,000 deaths annually among children younger than five, with approximately half of deaths occurring during the first six months of life and the overwhelming majority occurring in low- and middle-income countries.

The implications extend beyond the acute episode. Although the precise causal relationships remain under investigation, RSV infection in early life has been associated with recurrent wheezing, repeated respiratory illness and possible longer-term effects on lung health.

"RSV prevention is therefore a public health priority because it can prevent severe disease precisely when infants are most vulnerable, reduce seasonal pressure on emergency departments and pediatric wards, and potentially narrow major global inequalities in infant survival," declares Prof. Esposito.

Thus, the arrival of effective infant-protection strategies represents more than a new vaccine opportunity. It creates the possibility of changing how RSV is managed as a public health issue.

Maternal immunization: protection before birth

One of the most important developments in infant RSV prevention is the ability to protect babies before they are born.

Maternal immunization works by stimulating the mother's immune response during pregnancy, allowing antibodies to cross the placenta and provide passive protection to the newborn. WHO now recommends either maternal RSV vaccination during the third trimester or a long-acting monoclonal antibody for infants, depending on the local context, feasibility, cost-effectiveness and expected coverage.

"Vaccinating during pregnancy raises maternal antibody concentrations and allows protective antibodies to cross the placenta. The infant is consequently protected from birth without having to generate an active immune response during a period when the immune system is still immature," Prof.

Esposito describes the biological rationale.

Clinical evidence has demonstrated protection against severe RSV disease in infants following maternal RSV vaccination. The phase 3 MATISSE trial, for example, demonstrated significant efficacy of maternal RSVpreF vaccination against severe RSV-associated lower respiratory tract illness in infants.

"Nevertheless, safety during pregnancy requires an especially rigorous standard," Prof. Esposito notes.

Her comments are particularly relevant to the history of maternal RSV vaccine development where experience illustrates why pregnancy trials require careful monitoring and why regulatory decisions must consider both efficacy and safety signals throughout development and after authorization.

For Prof. Esposito, the challenge is not simply developing the vaccine. Timing, access and communication are equally important.

"The challenges include choosing the optimal timing, ensuring sufficient time for placental antibody transfer, reaching women who receive limited alternative care, overcoming vaccine hesitancy, and coordinating obstetric and pediatric services," she acknowledges. "Communication is fundamental. Pregnant women must receive clear evidence-based information about both the benefits of vaccination and the risk RSV poses to their infants."

Beyond RSV: building a portfolio of maternal and passive protection

RSV is not the first example of maternal immunization protecting infants. Influenza vaccination during pregnancy can protect both the pregnant woman and her infant, while pertussis vaccination during pregnancy is widely used to provide passive protection to newborns. COVID-19 vaccination during pregnancy also protects against severe maternal disease and can result in the transfer of antibodies to the newborn.

Looking ahead, Prof. Esposito sees opportunities beyond the vaccines already in use.

"For future innovation, human metapneumovirus is particularly interesting because it belongs to the same viral family as RSV and causes significant lower respiratory tract disease in young children," she explains.

She also identifies parainfluenza viruses as potential targets and points to combination products and rapidly adaptable vaccine platforms as areas deserving attention. But she cautions against assuming that a single technology will solve every prevention challenge.

"The goal should be to create a flexible portfolio rather than assume that one technology will meet every need," she advises.

That portfolio could include maternal vaccines, infant vaccines and long-acting monoclonal antibodies, deployed according to epidemiology, health-system capacity and the characteristics of individual populations.

Maternal vaccination or monoclonal antibodies?

The emergence of long-acting monoclonal antibodies has added another dimension to infant RSV prevention.

Unlike maternal vaccination, monoclonal antibodies provide the infant directly with passive immunity. They can be administered shortly after birth or before the RSV season and do not depend on the mother's immune response or on transplacental antibody transfer. WHO recommends that countries consider either maternal vaccination or a long-acting monoclonal antibody according to local circumstances.

So which approach is better?

"There is no universal winner. The greatest benefit will come from the strategy that achieves the highest timely coverage in a particular population," Prof. Esposito answers deliberately pragmatic.

Maternal vaccination offers protection from birth and can be incorporated into antenatal care. It may be particularly sustainable in settings where antenatal-care coverage is high.

Monoclonal antibodies, meanwhile, offer a standardized dose directly to the infant and can

be particularly valuable for premature babies or infants whose mothers were not vaccinated, were vaccinated too close to delivery or did not mount an adequate immune response.

"A long-acting monoclonal antibody provides a standardized dose directly to the infant, acts rapidly, and does not depend on the mother's immune response," Prof. Esposito explains. "Monoclonal antibodies provide an essential complementary pathway for infants not adequately protected through pregnancy."

The two approaches should therefore not necessarily be viewed as competitors. Instead, they can provide complementary pathways for protecting infants who might otherwise remain vulnerable.

This distinction is increasingly reflected in global policy. WHO currently recommends either maternal RSV vaccination or a long-acting monoclonal antibody for the same mother-infant pair, with exceptions for specific circumstances.

The real challenge: implementation

For Prof. Esposito, scientific innovation alone is insufficient.

"The biggest barriers are price, financing, supply, and delivery infrastructure," she shares when asked about the major obstacles to equitable RSV prevention in low- and middle-income countries.

These challenges are compounded by differences in diagnostic surveillance, oxygen availability, birth settings, RSV seasonality and access to antenatal care. For countries with the highest RSV mortality, introducing a new intervention therefore requires much more than regulatory approval.

"International financing, pooled procurement, target pricing, technology transfer, and expanded regional manufacturing," Prof. Esposito emphasizes the list of needs for new interventions.

She also argues that RSV prevention should be incorporated into existing maternal and child-health systems rather than established as a completely separate programme. This is consistent with WHO's current approach, which emphasizes country-specific decisions based on feasibility, cost-effectiveness, expected coverage and health-system capacity.

"Universal impact will depend as much on implementation and affordability as on scientific efficacy," Prof. Esposito summarizes.

Regulation: innovation needs confidence

The same tension between innovation and implementation emerges when the conversation turns to the regulatory environment. Prof. Esposito anticipates continued development across several vaccine fields, including new pneumococcal conjugate vaccines, novel platforms, mRNA technologies, respiratory-virus vaccines and vaccines targeting diseases such as dengue. But she returns to the same central challenge.

"We have different products, but the problem is implementation. And the problem is represented by recommendation by public health authorities," she proclaims.

For her, consistency in public-health recommendations matters because fragmented recommendations can affect public confidence.

"When these recommendations are homogeneous, then coverage is high. But, especially for political reasons in several countries, there isn't an agreement or recommendations. And this creates vaccine hesitancy among the population," Prof. Esposito warns.

The regulatory environment, therefore, cannot be separated from the broader policy environment. Scientific evidence may establish what a vaccine can do, but public-health authorities must translate that evidence into coherent recommendations, targeted programmes and effective communication.

Pregnancy requires rigor, not lower standards

Regulatory requirements for clinical trials in pregnancy are controversial. Some believe they should become less stringent to facilitate broader maternal immunization. For Prof. Esposito the answer is unequivocal.

"No, I think that in pregnancy the regulation of the affairs is very important. So it is

very difficult to move forward without big clinical trials that assess safety," she says.

Her position highlights an important principle: expanding maternal immunization does not mean lowering the evidentiary threshold. Rather, it means investing in the research, surveillance and communication systems necessary to generate confidence in vaccines during pregnancy.

That is particularly important as maternal vaccination becomes an increasingly relevant strategy not only for RSV but also for influenza, pertussis and potentially other infectious diseases.

Rebuilding awareness of vaccine-preventable disease

For Prof. Esposito, one of the greatest challenges facing immunization today is paradoxically a consequence of its success.

"I think that it is very important to speak about the risk of vaccine preventable diseases, because usually we say that the problem of vaccines is represented by their success," she confides.

When diseases become rare, the memory of their consequences can fade. That can make the benefits of vaccination less visible while concerns about vaccination remain highly salient.

Her message is therefore not simply about developing new vaccines but also about preserving public understanding of why existing vaccines remain necessary.

Looking ahead: an integrated life-course approach

Prof. Esposito envisions respiratory-virus prevention over the next decades and describes a future in which different technologies work together.

"I envisage an integrated life-course approach beginning before birth," she envisions.

In this model, vaccination during pregnancy could protect both mother and infant; long-acting monoclonal antibodies could protect infants who are not adequately covered through maternal vaccination; and future active infant vaccination could extend protection later in life. She also sees potential in multivalent products targeting more than one respiratory pathogen.

But innovation must remain evidence-driven. New combinations and platforms will need to demonstrate safety, immunogenicity, affordability and practicality, while surveillance systems will need to evolve alongside them.

"Most importantly, innovation must be accompanied by equitable access," Prof. Esposito emphasizes adding her proposed measure of success. "Our success should not be measured only by how many [available] products with licenses, but by how many hospitalizations, deaths, and lifelong respiratory complications we are preventing in children worldwide."

For a field increasingly capable of protecting children before their first exposure to a pathogen, the next challenge may be less about whether the tools exist and more about whether health systems can deliver them equitably, consistently and with public trust.

For Prof. Esposito, prevention must ultimately be designed around "real children and real health systems. The future of infant immunization may depend on keeping both firmly at the center of innovation," she 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.

WHO: "Protect yourself. Protect your family. Protect your community": Bangladesh launches preventive cholera vaccination campaign.
Speech of the WHO Representative to Bangladesh, Dr Ahmed Jamsheed Mohamed, at the National Launch of the Preventive Oral Cholera Vaccination Campaign 2026, Nagar Bhaban Auditorium, Dhaka South City Corporation, Dhaka.
Published: August 20, 2026.
https://www.who.int/bangladesh/news/detail/20-08-2026-protect-yourself.-protect-your-family.-protect-your-community---bangladesh-launches-preventive-cholera-vaccination-campaign

African Bundibugyo ebolavirus vaccine candidate to be advanced to clinical trials.
Leading African biopharmaceutical company Minapharm Group, headquartered in Egypt with subsidiaries in Berlin, will receive up to US$16.5 million from the Coalition for Epidemic Preparedness Innovations (CEPI) to advance the development of a Bundibugyo ebolavirus vaccine candidate, strengthening efforts to develop vaccines to combat the fastest-growing and second-largest Ebola outbreak on record affecting the Democratic Republic of the Congo (DRC).
Published: August 27, 2026.
https://cepi.net/african-bundibugyo-ebolavirus-vaccine-candidate-be-advanced-clinical-trials

GSK to advance mRNA seasonal flu vaccine candidate to phase III following positive phase II data.
GSK plc (LSE/NYSE: GSK) presented positive phase II data for its mRNA seasonal influenza (flu) vaccine candidate at the OPTIONS XIII Conference for the Control of Influenza. GSK's vaccine candidate showed higher immune responses against all influenza strains tested compared to licensed standard dose and high dose inactivated flu vaccines in younger and older adults respectively and was generally well tolerated. Based on these results, GSK intends to start a phase III efficacy trial in September 2026.
Published: September 1, 2026.
https://www.gsk.com/en-gb/media/press-releases/gsk-to-advance-mrna-seasonal-flu-vaccine-candidate-to-phase-iii-following-positive-phase-ii-data/

IVI marks 25 years of its International Vaccinology Course with global training connecting Seoul, Kigali, and Stockholm.
The International Vaccine Institute (IVI) today opened its 25th International Vaccinology Course, marking a milestone for IVI's flagship training program covering the full spectrum of vaccinology, from vaccine science and development to delivery and use. Established in 2000, it is now one of Asia's longest-running courses of its kind and has since expanded into a global program connecting vaccine professionals across continents.
Published: August 31, 2026.
https://www.ivi.int/ivi-marks-25-years-of-its-international-vaccinology-course-with-global-

training-connecting-seoul-kigali-and-stockholm/

New design strategy expands nanoparticle vaccine approach to influenza viruses.
Scripps Research scientists develop a blueprint for stabilizing key influenza proteins and using them to make next-generation vaccine candidates. Influenza viruses are constantly evolving to escape recognition by the immune system. Much of this evolution involves hemagglutinin (HA), a key surface protein that enables the virus to attach to and enter human cells. Influenza can evade existing immunity through two major mechanisms: the gradual accumulation of mutations that alter HA and reduce immune recognition (antigenic drift), or more substantial genetic changes, including reassortment, that can generate novel viral characteristics and potentially contribute to pandemics (antigenic shift). Because circulating influenza viruses continue to evolve, seasonal vaccination remains the cornerstone of prevention, with vaccine composition regularly updated to provide the best possible match against the strains expected to predominate each season.Scientists at Scripps Research offer a blueprint for how to stabilize the various versions of influenza's HA protein and use it to build nanoparticle vaccine candidates. Influenza is the latest target made compatible with the nanoparticle technology, specifically called self-assembling protein nanoparticles (SApNPs), which work by organizing many copies of viral proteins into clusters that the immune system can more easily recognize. This framework could eventually be applied to inform design of next-generation vaccines across diverse flu viruses.
Published: September 1, 2026.
https://www.scripps.edu/news-events/news/new-design-strategy-expands-nanoparticle-vaccine-approach-to-influenza-viruses/

Does the shingles vaccine cut heart-disease risk?
Mounting evidence suggests a link. Large study finds that people who received the 'recombinant' vaccine for the viral condition had a lower risk of cardiovascular problems.
Published: August 26, 2027.
https://www.nature.com/articles/d41586-026-02663-6

WHO revises Typhoid Vaccine Advice.
Amid rising antibiotic resistance, the World Health Organization mid rising antibiotic resistance, the World Health Organization (WHO) has updated its guidance on typhoid conjugate vaccine (TCV), recommending the first dose at 9-24 months in settings with high or very high typhoid incidence.
Published: September 1, 2026.
https://timesofindia.indiatimes.com/india/who-revises-typhoid-vaccine-advice/articleshow/133675632.cms

How a new global mpox vaccine stockpile could help the world respond faster to outbreaks.
The launch of a global mpox vaccine stockpile creates a long-term mechanism to ensure timely and equitable access to vaccines during outbreaks.
Published: September 3, 2026.
https://www.gavi.org/vaccineswork/how-new-global-mpox-vaccine-stockpile-could-help-world-respond-faster-outbreaks

Over 1,000 Europeans infected by West Nile virus.
Europe has recorded 1,086 official cases of West Nile virus across 15 countries, according to the latest figures from the European Centre for Disease Prevention and Control.
Published: September 5, 2026.
https://www.brusselstimes.com/2303989/over-1000-europeans-infected-by-west-nile-virus

WHO validates Bhutan for eliminating dog-transmitted human rabies.
The World Health Organization (WHO) has validated Bhutan's elimination of dog-transmitted rabies as a public health problem in the country. Bhutan is the first country in the WHO South-East Asia Region to achieve this success.
Published: September 4, 2026.
https://www.who.int/news/item/04-09-2026-who-validates-bhutan-for-eliminating-dog-transmitted-human-rabies

Ebola outbreak intelligence. Independent tracker — official WHO & ministry data, refreshed every 2 minutes. Map heat reflects reported case density.
As of September 9, 2026, there have been 5,798 confirmed cases with 2,786 deaths mostly in the Democratic Republic of Congo followed by Uganda.
Published: ***September 9, 2026.***
https://ebola-cases.com/

European approval expands MenQuadfi meningococcal vaccination to infants from 6 weeks of age.
MenQuadfi has received an expanded European indication for immunization against invasive meningococcal disease caused by Neisseria meningitidis serogroups A, C, W, and Y, allowing vaccination to begin from 6 weeks of age.
Published: August 11, 2026.
https://touchinfectiousdiseases.com/insight/european-approval-expands-menquadfi-meningococcal-vaccination-to-infants-from-6-weeks-of-age/

The world has spent centuries forgetting the African history of immunization.
Historian Dr Elise Mitchell re-examines the early history of smallpox inoculation on both ends of the Atlantic slave trade.
Published: September 4, 2026.
https://www.gavi.org/vaccineswork/world-has-spent-centuries-forgetting-african-history-immunisation

A mosquito that can transmit Zika has bred in London – but that doesn't mean the virus is spreading in people there.
The immediate risk is very low. The discovery shows how warmer weather may change Britain's defences against mosquito-borne disease.
Published: September 7, 2026.
https://www.gavi.org/vaccineswork/mosquito-can-transmit-zika-has-bred-london-doesnt-mean-virus-spreading-people-there

DRC's Ebola outbreak has the potential to become a global pandemic. How to make sure it doesn't.
Given its speed, scale and scope, the Bundibugyo Ebola virus disease that broke out in the Democratic Republic of Congo in mid-2026 could become a global epidemic.
Published: September 7, 2026.
https://theconversation.com/drcs-ebola-outbreak-has-the-potential-to-become-a-global-pandemic-how-to-make-sure-it-doesnt-290965

Moderna cancer vaccine stops melanoma returning: what's next for personalized treatments?
Promising trial results suggest cancer vaccines work and could be used to target other tumours. A personalized mRNA vaccine for melanoma reduced the risk of the cancer returning in a phase III clinical trial, the companies behind the trial announced this week. The vaccine — which relies on the same mRNA technology used to develop COVID-19 shots — is the first mRNA-based cancer treatment to show success in a late-stage trial.
Published: August 20, 2026.
https://www.nature.com/articles/d41586-026-02612-3

Why multidose-vaccine vials could be a game-changer for global RSV prevention.
WHO has given its stamp of approval to a multidose formulation of the maternal RSV vaccine for protecting infants.
Published: September 7, 2026.
https://www.gavi.org/vaccineswork/why-multidose-vaccine-vials-could-be-game-changer-global-rsv-prevention

Clover's respiratory combo vaccines secure Phase II wins in elderly recipients.
The biotech says the mid-stage results for both of its combination respiratory vaccines support their continued development. In the multi-centre mid-stage study, which was conducted in Australia and recruited 420 adults aged between 60 and 85 years of age, Clover pitted the efficacy, safety and immunogenicity profile of two of its pipeline respiratory vaccines against a placebo. This includes SCB-1022 – a dual respiratory syncytial virus (RSV) and human metapneumovirus (hMPV) shot – as well as SCB-1033, which Clover designed to protect against RSV, hMPV and Parainfluenza virus type 3 (PIV3).
Published: September 7, 2026.
https://www.clinicaltrialsarena.com/news/clover-respiratory-combo-vaccines-phase-ii-wins-elderly-recipients/

Getting beyond awareness: 'learning by doing' to reach zero-dose children in India.
In Bihar and Uttar Pradesh, under-immunized urban communities are brought into a problem-solving process with a difference.
Published: September 2, 2026.
https://www.gavi.org/vaccineswork/getting-beyond-awareness-learning-doing-reach-zero-dose-children-india

Zambia reports anthrax outbreak, Dozens of animals and people affected.
Authorities have recorded deaths of 46

hippopotamuses, 5 buffaloes, 1 crocodile and 8 elephants since July 2026. Approximately a dozen human cases with signs consistent with anthrax have been reported in Nabwalya. The cases are reportedly linked to the consumption of meat from animals found dead in the Munyamadzi River area.
Published: September 13, 2026.
https://outbreaknewstoday.substack.com/p/zambia-reports-anthrax-outbreak-dozens

PAHO: Chile becomes first country in South America validated for eliminating dog-transmitted rabies as a public health problem.
Chile has become the first country in South America to receive the World Health Organization (WHO) validation for eliminating dog-transmitted rabies as a public health problem. The recognition highlights more than 50 years of progress without a human case of rabies and confirms the country's capacity to prevent transmission from re-emerging.
Published: September 14, 2026.
https://www.paho.org/en/news/14-9-2026-chile-becomes-first-country-south-america-validated-eliminating-dog-transmitted?fbclid=Iwb21leAUVYcxjbGNrBRVhxHBkb2YFZXh0bgNhZW0CMTEAc3J0YwZhcHBfaWQMMzUwNjg1NTMxNzI4AAEeZ3-jcKM6sJ8pk4ieEZ1GB4rbrkcfkM_U5rX3SO-J2Amh8lKczSQp_n229p0_aem_bDbBi1Ivlpa_PlUiDfuNHA

Asia on high alert as El Niño threatens new Dengue epidemic - The Telegraph.
Published: September 16, 2026.
https://internationly.com/news/asia-on-high-alert-as-el-nino-threatens-new-dengue-epidemic-the-telegraph

New "blockbuster" tuberculosis vaccines could save seven million lives by 2050.
Next-generation TB vaccines, expected to become available from 2029, could deliver major health and economic gains, helping to save an estimated 7.3 million lives, generate up to US$ 135 billion in economic benefits for low-and middle-income countries by 2050, and support efforts to combat antimicrobial resistance. Action must be taken now to ensure that countries with the highest disease burden are able to access vaccines in sufficient quantities Gavi CEO, Dr Sania Nishtar: "Novel TB vaccines could be the next blockbuster immunization tool, however they will only realize their potential if we can ensure sufficient, predictable and affordable supply for those countries that need them most."
Published: September 14, 2026.
https://www.gavi.org/news/media-room/new-blockbuster-tuberculosis-vaccines-could-save-seven-million-lives-2050

Free Disease Outbreak Tracking Website.
The most comprehensive disease outbreak tracking website for 2026. Monitor 200+ diseases in real-time with AI-powered alerts, wastewater surveillance data, and global outbreak maps. Free access to the intelligence healthcare systems trust.
https://chatgpt.com/c/6aa39e92-3ab0-83e8-84b3-540d07d3e3b5

Ontario Celebrates Grand Opening of Sanofi's Newest Biomanufacturing Facility.
Facility will strengthen province's leadership in life sciences and create 300 highly skilled jobs
Published: September 16, 2026.
https://news.ontario.ca/en/release/1008009/ontario-celebrates-grand-opening-of-sanofis-newest-biomanufacturing-facility

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

Pulendran B. **Systems vaccinology and the architecture of human immunity.** *Nature*. 2026 Aug;656(8129):833-842.
doi: https://doi.org/10.1038/s41586-026-10753-8

Editorial comment: Systems vaccinology is redefining how we understand and design vaccines. By integrating multi-omics, computational biology, and increasingly artificial intelligence, it reveals how genetics, metabolism, the microbiome, and coordinated immune networks determine vaccine responses. The next challenge is translation: turning these insights into safer, more effective vaccines and integrating them into clinical development and regulatory practice.

02

Kulkarni PS, Potey AV, Gupta SK, Kodre A, Basu I, Shukla V, Barge V, Munshi R, Mishra AC, Vadakkedath R, Oldach D, Reddy PS, Yeolekar L, Poonawalla CS, Dhere RM, Arankalle VA, Kulkarni R, Gunale B; Dengue-mAb-02 Study Group. **Safety and Preliminary Efficacy of Dengue Monoclonal Antibody in Adult Patients: A Randomized Clinical Trial**. *JAMA Netw Open*. 2026 Aug 3;9(8):e2629979.
doi: https://doi.org/10.1001/jamanetworkopen.2026.29979

Editorial comment: A promising milestone in dengue therapeutics. In this Phase 2 randomized trial, a pan-serotype monoclonal antibody was safe and produced rapid reductions in viremia and fever, particularly at 5–7 mg/kg. As the first therapeutic against wild-type dengue to demonstrate preliminary efficacy in humans, these findings could represent an important step toward a specific treatment for dengue, although larger clinical trials are needed.

03

Wong JM, Acevedo PK, Whitehead S, Durbin A, DeSale H, Jones FK, Medina FA, Rovira-Diaz E, Prutzman K, Leao IC, Wang T, Desilva A, Harris E, Katzelnick L, Salje H, Weiskopf D, Adams LE, Paz-Bailey G. **Dengue vaccines: The role of a correlate of protection in evaluating vaccine safety and risk.** *Vaccine*. 2026 Aug 13;88:128599.
doi: https://doi.org/10.1016/j.vaccine.2026.128599

Editorial comment: Dengue continues to expand globally, yet vaccine development remains constrained by the absence of a validated correlate of protection (CoP). Establishing a reliable CoP could reduce dependence on large and costly Phase 3 efficacy trials, accelerate vaccine licensure, and facilitate evaluation across different populations. Experts have identified serotype-specific neutralizing antibodies as the most promising biomarker, particularly in DENV-naïve individuals, while emphasizing the urgent need for standardized assays and regulatory alignment. Advancing CoP validation could be a critical step toward faster and broader access to safe and effective dengue vaccines.

04

Kazi F, Shapland CY, Spiga F, Villanueva G, Cornish RP, Henschke N, Cogo E, Sebastianski M, Aarabi M, Bergman H, Buckley B, Clayton GL, French CE, Liu J, Madley-Dowd P, Pelone F, Petkovic J, Probyn K, Saulle R, Savović J, Wilson R, Beck CR, Higgins JPT. **Implications for future pandemics from a living systematic review and critical evaluation of observational studies of the effectiveness of COVID-19 vaccination against the Omicron variant.** *Vaccine.* 2026 Sep 17;90:128993.
doi: https://doi.org/10.1016/j.vaccine.2026.128993

Editorial comment: This WHO-commissioned systematic review, including 79 studies and more than 53 million individuals, reinforces that COVID-19 vaccination remained strongly protective against severe or critical disease during Omicron predominance, particularly with mRNA vaccines. However, the high risk of bias across much of the observational evidence highlights an important lesson for future pandemics: better standardized surveillance, integrated data systems, and robust study designs are essential to generate reliable real-world vaccine effectiveness evidence.

05

Moran MC, Burnett E, Groome MJ, Michael F, Breiman RF, Robinson AL, Iniguez V, Mujuru HA, Goldfarb DM, Lungayo CL, Mandomando I, Bonkoungou IJO, Anwari P, Contreras-Roldán I, Enweronu-Laryea C, N'Zue K, Nalunkuma C, Trang NV, Gheorghita S, Sahakyan G, Nazurdinov A, Latipov R, Uwimana J, Rey-Benito G, Weldegebriel G, Mwenda JM, Parashar UD, Tate JE; **Multi-National Subpopulations Study to Evaluate Rotavirus Vaccines (MNSSTER-V) project working group. Rotavirus vaccine effectiveness against rotavirus and acute gastroenteritis mortality: an analysis of pooled case-control studies from the MNSSTER-V dataset.** *Lancet Child Adolesc Health.* 2026 Oct;10(10):699-709.
doi: https://doi.org/10.1016/S2352-4642(26)00158-6

Editorial comment: Rotavirus remains a major cause of diarrhoeal deaths in children under five. In this multinational study across 22 countries, rotavirus vaccination showed 75.8% effectiveness against rotavirus-positive acute gastroenteritis mortality. These findings reinforce that improving timely vaccine delivery and coverage remains essential to reducing preventable childhood deaths worldwide.

06

Cuello MA, Gomez-Valenzuela F, Wichmann I, Olawaiye AB. **Global feasibility of cervical cancer elimination: a multidimensional scenario-based modelling analysis across 175 countries.** *Lancet Glob Health.* 2026 Sep;14(9):104008.
doi: https://doi.org/10.1016/j.langlo.2026.104008

Editorial comment: Cervical cancer elimination will require more than HPV vaccination alone. Modeling across 175 countries found that structural readiness—including education, health-system capacity, governance, and financing—was a stronger predictor of elimination than national income. Comprehensive strategies addressing these barriers alongside vaccination offer the greatest opportunity to achieve WHO elimination targets by 2050.

07

Venezia O, Kane H, Du G, Coughlan HD, Johanson TM, Wang H, Tilstam P, Kazer SW, Gunner G, Hoagland DA, Basavappa MG, Ravichandran K, Ada E, Zhakyp A, Kumar S, Duizer C, Searle O, Provido CG, Joannas L, Yang S, Healy LB, Wang Q, Capocchi J, Dhillon BS, Slavoff S, Shan L, Henao-Mejia J, Franklin RA, Chiu IM, Ordovas-Montanes J, Jeffrey KL, Lieberman J, Allan RS, Kagan JC, Wu H, Jackson R. **Functional chimeric mRNAs encode proteins in mammalian immunity.** *Nature.* 2026 Sep 2.
doi: https://doi.org/10.1038/s41586-026-10982-x

Editorial comment: his study reveals a previously underappreciated mechanism regulating inflammation and immunity: protein-coding chimeric mRNAs generated through trans-splicing between distant genes. In macrophages, inflammation promotes interchromosomal interactions that facilitate these transcript-fusion events. Remarkably, a newly identified GSDMD–TMEM106A fusion protein enhances inflammasome-driven pore formation and IL-1 release. In vivo, it appears to act as a double-edged sword—strengthening antibacterial defense while potentially worsening lethal sepsis. These findings uncover an additional layer of immune regulation and provide new insight into the delicate balance between effective host defense and harmful immunopathology.

08

Batool R, Wang R, Obeid H, Kollmann TR, Langley JM, Lavoie PM, Abu-Raya B. **RSV Bivalent Prefusion F Protein Vaccine in Pregnancy and Protection Against RSV-Associated Illness in Infants: A Systematic Review and Meta-Analysis**. *JAMA Pediatr*. 2026 Sep 8.
doi: https://doi.org/10.1001/jamapediatrics.2026.4074

Editorial comment: Real-world evidence strongly supports maternal RSVpreF vaccination for protecting infants against severe RSV disease. In this meta-analysis of seven studies involving more than 7,000 infants, vaccination during pregnancy was 82% effective against RSV-associated hospitalization through 3 months of age and 78% effective through 6 months when administered at least 14 days before delivery. These findings reinforce maternal RSV vaccination as an effective strategy for protecting infants during their most vulnerable first months of life.

09

Kapelus DJ, Olwagen CP, Izu A, Ranchod H, Mukendi CK, Mutsaerts EAML, Koen A, Jose L, Kwatra G, Faustini SE, Richter AG, Madhi SA. **Immunogenicity up to age 5 years following a single-dose or two-dose infant primary series of 10-valent or 13-valent pneumococcal conjugate vaccine each followed by a booster dose in South Africa: extended follow-up of a single-centre, open-label, non-inferiority, randomised controlled trial.** *Lancet Child Adolesc Health*. 2026 Sep 8:S2352-4642(26)00164-1.
doi: https://doi.org/10.1016/S2352-4642(26)00164-1

Editorial comment: This extended follow-up supports the durability of a reduced 1+1 PCV13 schedule. Whether the primary dose was given at 6 or 14 weeks, serotype-specific immunity remained non-inferior to the conventional 2+1 schedule through 5 years of age. In contrast, PCV10 1+1 schedules failed to maintain non-inferiority beyond age 3 years. These findings provide important evidence supporting PCV13 schedule simplification in countries with well-established pneumococcal vaccination programs, and high vaccination coverages, potentially reducing doses while maintaining long-term immunity.

10

Ionescu IG, Ouakki M, Breton O, Panicker G, Unger ER, Gilca V, Sauvageau C. **Follow up immunogenicity of a mixed vaccination schedule with one dose of nonavalent and one dose of bivalent HPV vaccines 36 months post-vaccination among boys and girls**. *Vaccine*. 2026 Sep 3;92:129107.
doi: https://doi.org/10.1016/j.vaccine.2026.129107

Editorial comment: This study provides encouraging evidence for the interchangeability of HPV vaccines in two-dose schedules. In boys and girls aged 9–10 years, mixed 9vHPV/2vHPV schedules maintained robust immune responses through 36 months, with 100% retaining antibodies against HPV16 and HPV18 and responses comparable to the homologous two-dose 9vHPV schedule. These findings support the potential flexibility of mixed HPV vaccination schedules, although clinical effectiveness and implementation data are still needed before broader policy decisions can be made.

11

Vázquez-Narváez JA, Avilés-Robles M, Espinosa-Sotero C, Martínez-Longoria CA, Moreno-Espinosa S, Reyes-Berlanga ML, Chacon-Cruz E. **Advancing Chikungunya Prevention and Vaccination in Mexico: A Position Paper by the Immunization Committee of the Mexican Association of Pediatric Infectious Diseases**. *Vaccines*. 2026; 14(9):756.
doi: https://doi.org/10.3390/vaccines14090756

Editorial comment: Chikungunya is an expanding global health threat, with the potential to cause persistent musculoskeletal disease and long-term disability well beyond the acute infection. Recent vaccine advances, including live-attenuated and VLP platforms, offer new opportunities for prevention. However, vaccination should be integrated with vector control, strengthened surveillance, and rapid outbreak detection. This position paper provides evidence-based recommendations to help guide future chikungunya vaccination and prevention policies in Mexico.

12

Lee W, Lee J, Lee SM, Kim EH. **Intranasal Adenoviral Vector Vaccination Induces Durable Antibody and T Cell Responses in the Respiratory Tract.** *Vaccines*. 2026; 14(9):793.
doi: https://doi.org/10.3390/vaccines14090793

Editorial comment: Intranasal vaccination could address a major limitation of current respiratory vaccines: limited mucosal immunity. In this mouse study, a single intranasal adenoviral-vector dose generated robust systemic and respiratory IgA and CD8 T-cell responses, including lung-resident T cells, sustained for up to four months. Although clinical studies are needed, these findings support intranasal adenoviral vectors as a promising strategy for achieving durable immunity directly at the respiratory mucosa—the portal of entry for many respiratory pathogens.

13

Janes H, Gao F, Buchbinder S, Wiysonge CS, Louis K, Napoleon B, Mfiki A, Mapp D, Gray G. **A Population-Based HIV Vaccine Efficacy Trial Design: Statistical Framework and Design Considerations.** *Vaccines*. 2026; 14(9):794.
doi: https://doi.org/10.3390/vaccines14090794

Editorial comment: As HIV vaccine development advances toward broadly neutralizing antibody–based strategies, future efficacy trials face a new challenge: evaluating vaccines ethically in an era of highly effective HIV prevention. This proposal outlines a population-based, randomized proof-of-concept design integrating external data, decentralized trial methods, and strong community partnerships. Importantly, it could simultaneously assess vaccine efficacy and validate neutralizing antibodies as an immune correlate of protection, helping pave the way toward future HIV vaccine licensure.

14

Thurau NM, Tometten I, Lübke N, Michels BE, Höfler D, Rosing F, Sehr P, Remke K, Timm J, Silling S, Waterboer T, Schramm D, Freitag N. **Immunologic Response and Clinical Course After Off-label Nonavalent HPV Vaccination in Juvenile-onset Recurrent Respiratory Papillomatosis Patients.** *Pediatr Infect Dis J.* 2026 Aug 26.
doi: https://doi.org/10.1097/INF.0000000000005381

Editorial comment: This small case series provides intriguing evidence for a potential therapeutic role of HPV vaccination in juvenile-onset recurrent respiratory papillomatosis (JoRRP). In two children, nonavalent HPV vaccination induced robust neutralizing antibody responses and was temporally associated with undetectable HPV DNA in the airways and clinical stabilization without new papilloma growth. Although larger studies are essential, these findings support further investigation of HPV vaccination as an adjunctive strategy for this challenging HPV-associated disease.

15

Ferreira CDN, Royer CA, Confortin C, Marques NFQ, Presibella MM, Freund AA, Campos KR, Sacchi CT, Abbud A, de Lima GB, de Morais CNL, da Silva VG, E Silva KMP, da Costa MMOM, Gonçalves S, Araújo SIR, Rovaris DB, Delatorre E, Ribeiro-Rodrigues R, Alves PA, Strottmann DM, Zanluca C, Duarte Dos Santos CN, Naveca FG, Wallau GDL, Alcantara DMC, Fernandez Grillo ZDC, Santos HGG, Bello G, Gräf T; DENV study group. **Genomic epidemiology of dengue virus serotype 3 lineage 3III_B.3.2 in Brazil: insights into its spread and dengue severity amid co-circulation of multiple dengue serotypes.** *Lancet Reg Health Am.* 2026 Jun 2;61:101521.
doi: https://doi.org/10.1016/j.lana.2026.101521

Editorial comment: The reemergence of DENV-3 in Brazil after more than a decade of limited circulation highlights the rapidly changing landscape of dengue in hyperendemic settings. Genomic surveillance identified at least 14 introductions of the emerging 3III_B.3.2 lineage during 2023–2024, followed by diversification into six regional clades. Importantly, compared with DENV-1, DENV-3 was associated with higher odds of severe dengue (adjusted OR 1.47–1.94), as was DENV-2 (OR 1.24–1.71). Although secondary infections may partly explain these associations, the findings reinforce the risks created by co-circulation of multiple serotypes and underscore the importance of sustained genomic and epidemiological surveillance to anticipate severe dengue epidemics.

16

Mhanna D, Salman B, El Hakim R, et al. **Therapeutic melanoma vaccines: Platforms, neoantigen strategies, and emerging combination immunotherapies.** *Therapeutic Advances in Vaccines and Immunotherapy.* 2026;14.
doi: https://doi.org/10.1177/25151355261488241

Editorial comment: Therapeutic melanoma vaccines are emerging as a promising frontier in personalized cancer immunotherapy. Advances in tumor genomics, mRNA and other vaccine platforms, together with AI-assisted neoantigen identification, are enabling vaccines tailored to individual tumors. Particularly promising is their combination with immune checkpoint inhibitors, which may enhance tumor-specific T-cell responses. While tumor heterogeneity, immune escape, biomarkers, and manufacturing remain important challenges, melanoma vaccines could become an increasingly important component of precision oncology.

17

Na H, Lee SM, Ahn SH, Lee HK, Lee J, Choi KC. **T cell-mediated tumor suppression by a self-amplifying mRNA-based melanoma vaccine in a syngeneic mouse model.** *J Control Release.* 2026 Aug 10;396:115040.
doi: https://doi.org/10.1016/j.jconrel.2026.115040

Editorial comment: Self-amplifying mRNA represents an exciting platform for therapeutic cancer vaccines. In a mouse melanoma model, a Melan-A–targeted saRNA vaccine formulated with lipid inorganic nanoparticles suppressed tumor growth and enhanced tumor-infiltrating cytotoxic T-cell responses. Preventive vaccination also delayed tumor progression and promoted antigen-specific and memory T-cell responses. Although still preclinical, these findings highlight the potential of saRNA technology to expand the emerging field of melanoma immunotherapy.

18

Xu Z, Li J, Zhang Z, Fan J, Liu X, Pan H, Mao S, Zhen Y, Wen X, Chang H, Chen W, Zhu M, Chen L, Zhao L, Liu L, Cao G, Jin B, Chen L, Zhang C, Wang Z, Wang W, Xu D, Zeng M. **Dynamic epidemiological changes of hand, foot, and mouth disease and real-world effectiveness of EV-A71 vaccination: A case study in Shanghai (2009-2023).** *Hum Vaccin Immunother.* 2026 Dec;22(1):2656515.
doi: https://doi.org/10.1080/21645515.2026.2656515

Editorial comment: The introduction of EV-A71 vaccination in China has substantially changed the epidemiology of hand-foot-mouth disease (HFMD). In Shanghai, vaccination was associated with a 56.7% reduction in incidence, 95.2% reduction in severe disease, and elimination of reported fatalities, while the two-dose schedule provided approximately 90% protection against EV-A71-associated disease. However, the subsequent shift toward non-EV-A71 serotypes, particularly CV-A6 and CV-A10, highlights the next challenge: developing multivalent vaccines capable of providing broader protection against HFMD.

19

Pungartnik PC, Parellada CI, Mayumi Usuda Prado Rocha D, Queijo RG, Bierrenbach AL, Orengo JC. **Premature mortality and years of potential productive life lost due to HPV-attributable cancers in Brazil and Mexico: 2011 Versus 2023.** *Hum Vaccin Immunother.* 2026 Dec 31;22(1):2728247.
doi: https://doi.org/10.1080/21645515.2026.2728247

Editorial comment: HPV-attributable cancers continue to impose a substantial and preventable burden of premature mortality in Brazil and Mexico. From 2011 to 2023, estimated HPV-attributable deaths increased from 6,515 to 9,533 in Brazil and from 4,303 to 4,997 in Mexico. In 2023 alone, these cancers accounted for 97,404 years of potential productive life lost in Brazil and 51,735 in Mexico, while cervical cancer remained the dominant contributor. These numbers reinforce the urgency of expanding HPV vaccination, screening, early diagnosis, and equitable treatment to accelerate the elimination of HPV-related cancers across Latin America.

20

Halbrook M, Merritt S, Hoff NA, Mukadi P, Kompany JP, Musene K, Beya M, Kalengi H, Tambu M, Kelly JD, Ball AH, To A, MacGill T, Orr R, Myers T, Woods CW, Nicholson BP, Wong TA, Hensley LE, Kindrachuk J, Lehrer AT, Mbala-Kingebeni P, Rimoin AW. **Bundibugyo virus glycoprotein seroreactivity following recombinant vesicular stomatitis virus-Zaire Ebola virus glycoprotein vaccination in outbreak-affected populations of the Democratic Republic of the Congo: a longitudinal cohort study.** *Lancet*. 2026 Sep 12;408(10559):1019-1028.
doi: https://doi.org/10.1016/S0140-6736(26)01608-9

Editorial comment: Although no licensed vaccine currently targets Bundibugyo virus (BDBV), encouraging evidence suggests that the rVSV-ZEBOV Ebola vaccine generates cross-reactive antibodies against BDBV. In two cohorts from the Democratic Republic of the Congo, antibody reactivity to both EBOV and BDBV remained above baseline for up to five years after vaccination. While the clinical significance of these cross-reactive antibodies remains uncertain, these findings support evaluating existing Ebola vaccines during BDBV outbreaks while BDBV-specific vaccines are developed.

21

Andraweera PH, Jeffs E, Wang B, Marshall HS. **Preparing for Future Group B *Streptococcus* Vaccines: Perspectives of Pregnant Women in Australia**. *Vaccines*. 2026; 14(9):807.
doi: https://doi.org/10.3390/vaccines14090807

Editorial comment: As maternal GBS vaccines approach potential implementation, understanding acceptance among pregnant women will be as important as demonstrating vaccine efficacy. In this Australian qualitative study of 31 pregnant women, infant wellbeing emerged as the strongest driver of vaccine acceptance, with participants generally preferring maternal vaccination over intrapartum antibiotic prophylaxis. However, concerns about vaccine safety and limited knowledge of GBS remained important barriers. The findings emphasize that successful maternal GBS vaccination programs will require more than vaccine availability: trusted healthcare providers, clear evidence-based communication, and accessible, flexible, woman-centered delivery strategies will be essential to translate a new vaccine into high uptake and meaningful protection for newborns.

22

Dudley MZ, Ali H, Villaescusa MR, Law B. **Incidence, risk factors, and association with vaccination of thrombocytopenia and immune thrombocytopenia (ITP): A scoping review.** *Vaccine*. 2026 Sep 3;92:129120.
doi: https://doi.org/10.1016/j.vaccine.2026.129120

Editorial comment: Thrombocytopenia is a rare event with multiple potential causes, making careful assessment essential when evaluating vaccine safety signals. This updated Brighton Collaboration review found background incidence estimates ranging widely from 1.6 to 92.1 cases per 100,000 person-years and identified numerous non-vaccine risk factors. Evidence consistently supports an increased risk of immune thrombocytopenia (ITP) following measles-containing vaccines, while several studies also identified increased risk after adenoviral COVID-19 vaccines. In contrast, most studies found no association with other vaccines, including mRNA and inactivated COVID-19 vaccines. These findings reinforce the importance of standardized case definitions and consideration of background risk when assessing adverse events following immunization.

23

Pickering A, Wise PH, Maldonado YB. **Pediatric Vaccination and Pandemic Preparedness in Humanitarian Settings.** *Pediatr Clin North Am*. 2026 Oct;73(5):953-964.
doi: https://doi.org/10.1016/j.pcl.2026.04.006

Editorial comment: Disease outbreaks are becoming more frequent and complex, with children in humanitarian and conflict-affected settings bearing a disproportionate burden. Millions of zero-dose children remain especially vulnerable to vaccine-preventable and emerging viral diseases. Protecting these populations requires more than vaccine availability: community engagement, effective infodemic management, resilient and integrated delivery systems, reliable surveillance, and context-adapted strategies are essential. Innovations such as mobile vaccination teams, novel financing, and stronger data coordination are promising but require further evidence. Lessons from COVID-19 reinforce the need for equitable, ethical, data-driven, and One Health-informed approaches that place children's right to health at the center of pandemic preparedness and global health security.

24

Essink BJ, Vermeulen W, Andrade C, Mazur M, de Rooij R, Heijnen E, Casula D, Xing R, Tovar MP, Garner V, Albano FR. **Immunogenicity and safety of an MF59-adjuvanted cell-derived higher-dose quadrivalent influenza vaccine (aQIVc) in adults aged 50 years or older: a phase 3 randomised controlled trial.** *Lancet Infect Dis.* 2026 Sep 10:S1473-3099(26)00410-X.
doi: https://doi.org/10.1016/S1473-3099(26)00410-X

Editorial comment: This large phase 3 trial involving more than 7,600 adults aged ≥50 years evaluated a novel MF59-adjuvanted, cell-derived, higher-dose quadrivalent influenza vaccine (aQIVc). The vaccine produced superior immune responses compared with standard-dose adjuvanted egg-derived vaccine for all four influenza strains. Compared with recombinant high-dose-antigen vaccine, non-inferiority was demonstrated for A/H1N1 and both B strains, but not A/H3N2. Although aQIVc caused more local and systemic reactions, these were predominantly mild-to-moderate and transient, with no safety concerns identified. These findings support combining cell-based manufacturing, higher antigen content, and adjuvantation as a promising strategy to enhance influenza immunity in older adults.

25

Bastian, A.R., Menten, J., Tolboom, J. *et al.* **Immune correlates of protection against RSV following Ad26.RSV.preF–RSV preF vaccination of adults aged >60 years.** *npj Vaccines.* Aug 2026:
doi: https://doi.org/10.1038/s41541-026-01557-y

Editorial comment: Identifying reliable correlates of protection (CoPs) against RSV remains a major goal in vaccinology. In adults >60 years vaccinated with an investigational Ad26.RSV.preF–RSV preF vaccine, increases in both preF-specific IgG and RSV-neutralizing antibodies were significantly associated with reduced RSV-mediated acute respiratory infection and lower respiratory tract disease. Importantly, these findings were validated in a second phase 3 efficacy trial, strengthening the evidence for both markers as potential CoPs. Additional antibody profiling suggested that preF-specific IgG3 and IgG2 may also contribute to protection. Establishing validated RSV CoPs could become an important tool for evaluating and accelerating future RSV vaccine development.

Editor's Corner

VACCINATION UNDER FIRE: PROTECTING IMMUNIZATION DURING WAR

War destroys far more than buildings. It fractures health systems, displaces families, interrupts electricity and refrigeration, separates children from vaccination records, drives health workers away, and transforms a missed vaccine appointment into months—or years—without protection.

Vaccination is sometimes regarded as a routine health service that can be postponed until security returns. History repeatedly shows the danger of that assumption. Measles, polio, diphtheria, pertussis, meningitis, and other vaccine-preventable diseases do not wait for ceasefires. They exploit overcrowded shelters, malnutrition, unsafe water, interrupted primary care, declining surveillance, and weakened population immunity.

Children living in fragile, conflict-affected, or humanitarian settings represent a disproportionate share of those left unvaccinated. Although approximately one-quarter of the world's infants live in 26 countries affected by fragility, conflict, or humanitarian crises, these countries account for around half of all unvaccinated children. The number of unvaccinated children in half of these countries increased from approximately 3.6 million in 2019 to 5.4 million in 2024.

The consequences are visible across several of today's major conflict settings.

Why war creates the ideal environment for outbreaks

The relationship between conflict and vaccine-preventable disease is not accidental. It follows a predictable chain:

Health facilities are damaged or closed. Routine vaccination becomes irregular, while antenatal care, birth-dose vaccination, and follow-up appointments decline.

Cold chains fail. Electricity shortages, fuel insecurity, damaged refrigerators, and blocked supply routes threaten vaccine potency and availability.

Families are displaced. Children lose vaccination

Selected conflict settings and vaccine-preventable disease risks

Conflict setting	Effect on immunization	Reported outbreaks or current signals	Main concern
Gaza Strip	Destruction of health infrastructure, mass displacement, overcrowding, sanitation failure, restricted access, and interruption of routine vaccination.	Circulating vaccine-derived poliovirus type 2 was detected in 2024, followed by a confirmed paralytic case and emergency vaccination campaigns. Approximately 559,000 children received a first campaign dose, and around 94% of the target population received a second dose despite severe operational constraints. A further campaign reached approximately 603,000 children in February 2025.	Polio re-emerged after decades without a recorded case, demonstrating how rapidly sanitation collapse and immunity gaps can reverse previous public health achievements.
Sudan	Attacks on health facilities, displacement, shortages of vaccines and personnel, disrupted cold chains, and limited surveillance.	WHO has reported simultaneous outbreaks of measles, diphtheria, pertussis, meningitis, cholera, and circulating vaccine-derived poliovirus. By August 2025, Sudan had reported more than 48,000 cholera or acute watery diarrhoea cases and over 1,000 deaths; by 2026, multiple outbreaks continued across several states.	Multiple epidemics can occur simultaneously when routine vaccination, nutrition, sanitation, and disease surveillance collapse together.
Eastern Democratic Republic of the Congo	Armed conflict and displacement have left many health facilities non-functional and populations repeatedly inaccessible to vaccination teams.	In 2025, the country reported approximately 67,000 measles cases and more than 1,000 associated deaths, alongside cholera, vaccine-derived poliovirus, yellow fever, and other public health emergencies. A cVDPV1 case was also reported in 2025.	Persistent conflict permits measles and poliovirus transmission to continue even when effective vaccines are available.
Yemen	Years of conflict have weakened routine immunization, reduced access to primary care, and created large numbers of zero-dose and incompletely vaccinated children.	Continued circulation of cVDPV2 led to repeated polio campaigns. A July 2025 campaign targeted more than 1.3 million children, while subsequent rounds reached approximately 1.4 million. Measles-rubella campaigns have also been required to close immunity gaps.	Emergency campaigns can temporarily reduce risk, but they cannot fully replace a functioning routine immunization programme.
Ukraine	Population displacement, damaged facilities, interrupted preventive services, and mobility across national borders have complicated vaccination and surveillance.	Ukraine continued responding to measles outbreaks in several regions, with close to 1,000 cases reported during the first five months of 2026. The broader WHO European Region recorded 127,350 measles cases in 2024, its highest total in more than 25 years.	Conflict-related immunity gaps can interact with wider regional declines in vaccine coverage and facilitate cross-border transmission.

Conflict setting	Effect on immunization	Reported outbreaks or current signals	Main concern
Myanmar	Continuing conflict, displacement, insecurity, and restrictions on access have reduced routine coverage and weakened outbreak detection.	WHO reported diphtheria and measles cases and a vaccine-derived poliovirus event during 2025. An estimated 1.5 million children younger than five years have missed basic vaccinations since 2018, although underreporting remains a major concern.	The cases reported may represent only the visible portion of a much larger problem because surveillance is weakest where disease risk is greatest.
Syria	Prolonged conflict, displacement, damaged hospitals, fragmented governance, and inaccessible communities have undermined routine vaccination for more than a decade.	Syria remains at risk of measles, diphtheria, polio, and other vaccine-preventable diseases. WHO and partners continue vaccinating hundreds of thousands of children in northern Syria, while the country remains vulnerable to renewed vaccine-derived poliovirus circulation.	Even after large outbreaks are controlled, immunity gaps and weakened infrastructure allow the threat to return.
South Sudan and surrounding conflict-affected areas	Internal instability, flooding, displacement, cross-border movement, and spillover from regional conflicts compromise routine vaccination and outbreak response.	By October 2025, WHO reported more than 15,000 suspected measles cases and 280 deaths, alongside a very large cholera outbreak.	Conflict, climate emergencies, and displacement increasingly act together rather than as separate threats.

Available numbers should be interpreted cautiously. In active conflict, disrupted laboratories, incomplete reporting, population movement, and inaccessible areas almost certainly result in undercounting.

cards, move repeatedly, and may be excluded from both their original health system and the one serving their temporary location.

Crowding accelerates transmission. Shelters, camps, hospitals, and informal settlements facilitate the spread of measles, pertussis, diphtheria, meningococcal disease, influenza, COVID-19, and other respiratory infections.

Malnutrition increases severity. A malnourished child is not only more susceptible to infection but also more likely to experience complications and death.

Sanitation deteriorates. Damage to water and sewage infrastructure creates conditions for poliovirus, cholera, hepatitis A, and other enteric pathogens to spread.

Surveillance becomes blind. When laboratories close and health workers cannot safely reach communities, the apparent absence of disease may simply reflect the absence of detection.

This last point deserves emphasis: **in war, lack of reported cases is rarely reassuring. It may be evidence that the surveillance system itself has become a casualty.**

Vaccination during conflict is possible

The experience in Gaza demonstrated that even under extreme conditions, temporary humanitarian pauses, careful microplanning, community engagement, and coordination among international agencies and local health workers can reach hundreds of thousands of children.

Syria's response to a vaccine-derived poliovirus outbreak likewise showed that negotiations with multiple parties and mass vaccination campaigns could reach millions of children, including those living in areas of active conflict.

These achievements are remarkable, but they should not be romanticized. Heroic emergency campaigns are expensive, dangerous, and less sustainable than uninterrupted routine immunization. Health workers should not have to risk their lives to provide an intervention that could have been delivered safely through functioning primary care.

The principal challenges

Humanitarian access must be treated as a health intervention

Vaccines cannot protect children if borders are closed, convoys are delayed, or vaccinators cannot safely enter communities. Negotiated humanitarian access and vaccination pauses should be regarded as essential components of outbreak control—not as political concessions.

Health workers and facilities require protection

Attacks on healthcare do more than cause immediate casualties. They remove vaccinators, laboratories, maternity services, refrigerators, records, and public trust. Their effects persist long after the attack itself.

Routine immunization must continue alongside campaigns

Emergency campaigns are essential during outbreaks, but repeatedly vaccinating against one pathogen while routine services collapse leaves children exposed to many others. Polio response should be integrated, where feasible, with measles, diphtheria, tetanus, pertussis, pneumococcal, rotavirus, and other age-appropriate vaccination.

Vaccination records must follow displaced people

Interoperable digital records, portable paper cards, simplified catch-up schedules, and policies that permit vaccination without complete documentation are crucial. In uncertainty, the risk of giving an additional vaccine dose is generally far smaller than the risk of leaving a child unprotected.

Surveillance must be adapted to conflict

Community-based reporting, environmental poliovirus surveillance, rapid diagnostic testing, mobile laboratories, and cross-border data sharing can partially compensate for damaged conventional systems.

Local communities must lead

International organizations provide financing, vaccines, logistics, and technical expertise, but local health workers, religious leaders, civil society organizations, and community representatives determine whether families trust and accept vaccination. Community participation should begin during planning, not after a campaign has already been designed.

Financing must be predictable, not reactive

Vaccination programmes cannot depend entirely on emergency appeals issued after an outbreak begins. Stockpiles, transport capacity, cold-chain equipment, security planning, and trained personnel must be funded before crises escalate.

A responsibility shared by all nations

Vaccination during war cannot be considered solely the responsibility of the affected country. Many governments experiencing conflict no longer control all their territory, health infrastructure, borders, or financial systems. Expecting them to preserve universal immunization without external assistance is unrealistic and inequitable.

A truly global response requires:

- Governments and parties to conflict to guarantee safe, sustained humanitarian access;
- WHO and UNICEF to coordinate technical guidance, surveillance, procurement, and emergency campaigns;
- Gavi and other financing institutions to provide flexible funding for routine and catch-up vaccination;
- Vaccine manufacturers to maintain emergency reserves, transparent allocation, and affordable pricing;
- Neighbouring countries to vaccinate refugees and displaced populations without administrative barriers;
- Donors to finance preparedness and routine services—not only highly visible outbreak responses;
- Academic institutions to generate practical evidence on vaccination schedules, cold-chain alternatives, and delivery strategies in unstable environments;
- Civil society and local leaders to participate equitably in decision-making;
- The international community to protect health workers and hold accountable those who attack healthcare.

Equity does not mean delivering the same intervention everywhere. It means providing more resources, flexibility, and protection where the obstacles are greatest.

Conclusion

War does not eliminate the need for vaccination; it intensifies it.

A child displaced by conflict has the same right to protection as a child living in peace. Borders, political status, ethnicity, religion, and the actions of governments or armed groups should never determine whether that child receives a measles, polio, diphtheria, pneumococcal, or other life-saving vaccine.

Vaccination in war settings is not simply a technical challenge. It is a test of global solidarity.

When the world fails to maintain immunization during conflict, outbreaks are not unexpected accidents. They are the foreseeable consequences of decisions: delayed access, insufficient funding, attacks on healthcare, fragmented coordination, and unequal concern for human life.

Vaccines cannot stop wars. But even in war, they can prevent suffering, disability, and death.

Protecting that possibility is a responsibility shared by every government, organization, manufacturer, donor, health professional, and community.

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Best Practice

ADULT PNEUMOCOCCAL VACCINATION IN THE ERA OF PCV20 AND PCV21: BROADER COVERAGE, SIMPLER RECOMMENDATIONS

Introduction

Streptococcus pneumoniae remains a major cause of vaccine-preventable morbidity and mortality worldwide. Despite the remarkable success of pediatric pneumococcal conjugate vaccination programs, pneumococcal disease continues to cause substantial burdens of invasive pneumococcal disease (IPD), community-acquired pneumonia, bacteremia, and meningitis among adults, particularly older individuals and those with chronic medical conditions.

The introduction of higher-valent pneumococcal conjugate vaccines (PCVs), specifically **PCV20**

(Prevnar 20®, Pfizer) and **PCV21 (Capvaxive®, Merck)**, represents one of the most important advances in adult vaccinology in recent years. These vaccines not only expand serotype coverage but also simplify vaccination recommendations, potentially improving vaccine uptake and reducing disease burden among adults at increased risk.

Why Adult Pneumococcal Disease Still Matters

Pneumococcal disease remains a leading cause of hospitalization and death among adults worldwide. Although widespread pediatric vaccination has generated substantial herd protection, the burden of disease persists because of aging populations, increasing prevalence of chronic diseases, and the emergence of non-vaccine serotypes.

Adults at greatest risk include:

- Adults ≥65 years
- Patients with chronic obstructive pulmonary disease (COPD)
- Patients with diabetes mellitus
- Chronic heart disease
- Chronic kidney disease
- Chronic liver disease
- Smokers
- Individuals with immuno-compromising conditions.

Invasive pneumococcal disease continues to be associated with significant mortality, particularly among older adults and immunocompromised individuals.

The Evolution of Adult Pneumococcal Vaccination

For many years, adult vaccination strategies relied on combinations of pneumococcal conjugate vaccines and the 23-valent pneumococcal polysaccharide vaccine (PPSV23). While effective, these schedules were often complex and difficult to implement.

The arrival of PCV20 and PCV21 has simplified adult pneumococcal vaccination by providing broader serotype coverage within a single conjugate vaccine formulation.

PCV20 (Prevnar 20®, Pfizer)

PCV20 contains the 13 serotypes included in PCV13 plus seven additional serotypes associated with substantial residual disease burden:

1, 3, 4, 5, 6A, 6B, 7F, 8, 9V, 10A, 11A, 12F, 14, 15B, 18C, 19A, 19F, 22F, 23F, and 33F.

PCV21 (Capvaxive®, Merck)

PCV21 contains:

3, 6A, 7F, 8, 9N, 10A, 11A, 12F, 15A, 15B, 16F, 17F, 19A, 20, 22F, 23A, 23B, 24F, 31, 33F, and 35B.[11]

Unlike previous pneumococcal conjugate vaccines, PCV21 was specifically developed using contemporary adult IPD epidemiology as the basis for serotype selection.

Adult-Specific Serotypes: A New Concept in Pneumococcal Prevention

One of the most important recent discoveries in pneumococcal epidemiology is that the serotypes currently causing disease in adults increasingly differ from those affecting children.

Historically, adult pneumococcal vaccination strategies were largely extensions of pediatric vaccine programs. However, successful childhood vaccination has dramatically reduced circulation of several traditional vaccine serotypes, resulting in a shift toward serotypes that disproportionately affect adults.

This observation led to the development of PCV21, which specifically targets serotypes responsible for a substantial proportion of contemporary adult invasive disease, including **15A, 16F, 20, 23A, 23B, 24F, 31, and 35B**, several of which are relatively uncommon in pediatric populations.

This represents an important conceptual shift in vaccinology, however, head to head studies comparing the efficacy and/or effectiveness of PCV21 vs PCV20 have not been done, and both vaccines are equally recommended.

Who Should Receive Pneumococcal Vaccination?

Adults ≥65 Years

All adults aged 65 years and older should receive pneumococcal vaccination regardless of underlying health conditions.

This recommendation reflects the substantial burden of pneumococcal disease in older adults and the increased risk of

hospitalization, complications, and death.

Adults 19–64 Years with Chronic Medical Conditions

Vaccination is strongly recommended for adults with:

- COPD
- Diabetes mellitus
- Chronic cardiovascular disease
- Chronic kidney disease
- Chronic liver disease
- Alcoholism
- Cigarette smoking.

Immunocompromised Adults

Immunocompromised individuals remain among the highest-risk groups for IPD and severe pneumococcal disease.

These include patients with:

- HIV infection
- Hematologic malignancies
- Solid tumors receiving chemotherapy
- Organ transplantation
- Primary immunodeficiencies
- Immunosuppressive therapies

Vaccination should be prioritized in these populations whenever possible.

Special Considerations for COPD

Among chronic medical conditions, COPD deserves particular attention.

Respiratory infections are major triggers of COPD exacerbations and contribute substantially to hospitalization, healthcare utilization, and mortality.

Pneumococcal vaccination is therefore considered a key preventive strategy in COPD management. Reducing vaccine-type pneumococcal infections may decrease severe respiratory complications and improve long-term outcomes.

Special Considerations for Diabetes

Diabetes mellitus is associated with impaired immune function and increased susceptibility to bacterial infections.

Adults with diabetes experience higher rates of pneumococcal pneumonia, invasive disease, hospitalization, and mortality than non-diabetic individuals.

As the global prevalence of diabetes continues to rise, pneumococcal vaccination should be considered a routine component of comprehensive diabetes care.

Simplifying Recommendations

Perhaps the greatest advantage of PCV20 and PCV21 is the simplification of adult vaccination recommendations.

Historically, multiple sequential schedules involving PCV13, PCV15, and PPSV23 created confusion among providers and patients. Higher-valent conjugate vaccines now allow a simpler approach:

Most adults who require pneumococcal vaccination can receive a single higher-valent conjugate vaccine according to current local recommendations.

Simplified schedules are expected to improve:

- Healthcare provider adherence
- Patient acceptance
- Vaccine coverage rates
- Public health impact

Table 1. Comparison of Current Adult Pneumococcal Conjugate Vaccines

Vaccine	Brand Name	Manufacturer	Number of Serotypes	Key Characteristic
PCV20	Prevnar 20®	Pfizer	20	Expansion of PCV13 with seven additional serotypes
PCV21	Capvaxive®	Merck	21	Adult-focused vaccine designed using contemporary adult IPD epidemiology

Table 2. Adults at Increased Risk for Pneumococcal Disease

Risk Group	Risk of IPD	Vaccination Recommended
Age ≥65 years	High	Yes
COPD	High	Yes
Diabetes mellitus	Moderate–High	Yes
Chronic heart disease	Moderate	Yes
Chronic kidney disease	High	Yes
Chronic liver disease	Moderate	Yes
Smokers	Moderate	Yes
HIV infection	Very High	Yes
Cancer patients	Very High	Yes
Transplant recipients	Very High	Yes

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Guest Contributors

NEW VACCINE PLATFORMS AGAINST ARBOVIRAL DISEASES

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The emergence and re-emergence of multiple arboviral diseases represent an increasingly important global public health challenge. Changes in climate, urbanization, human mobility, vector distribution, and population susceptibility have contributed to the geographic expansion and increasing incidence of several arboviral infections. Recognizing this growing threat, the World Health Organization (WHO) launched the Global Arbovirus Initiative in 2022, with the objective of strengthening global preparedness, surveillance, prevention, and control of epidemic-prone arboviruses (1).

Conventional vaccine platforms can contribute substantially to reducing the incidence and burden of arboviral diseases. However, innovative vaccine technologies may offer additional advantages, including improved safety, rapid development and manufacturing, enhanced immunogenicity, and the potential for broader protection against emerging or antigenically diverse viruses (1).

One particularly innovative approach involves insect-specific viruses (ISVs). These viruses naturally infect and replicate in insects but are unable to productively replicate in vertebrate cells. Examples include Eilat virus, Yada virus, Binjari virus, Aripo virus, YN15-283-02 virus, and Chaoyang virus (1). This intrinsic host restriction makes ISVs attractive candidates for the development of novel and potentially safer vaccine platforms.

Through genetic engineering, structural genes from ISVs can be replaced with the corresponding structural genes of pathogenic alphaviruses or orthoflaviviruses (1). The resulting chimeric viruses express structural proteins derived from the target pathogenic arbovirus while retaining the replication machinery and vertebrate host restriction of the ISV. Consequently, these chimeric viruses can replicate efficiently in mosquito-derived cells used for vaccine production but are unable to productively replicate in vertebrate cells (1). This approach combines the strong antigenic presentation associated with viral particles with an important biological safety mechanism.

Eilat virus represents an important example of this strategy. Eilat virus-based chimeric vaccine candidates have been developed against several medically important alphaviruses, including Mayaro virus, Venezuelan equine encephalitis virus, eastern equine encephalitis virus, and chikungunya virus. In experimental models, some of these non-adjuvanted vaccine candidates have provided protection after a single dose, including in mouse and non-human primate studies. Their immunogenicity may be partly related to activation of innate immune pathways, including type I interferon responses mediated through pattern-recognition receptors such as Toll-like receptors and RIG-I-like receptors (1).

Similarly, Tanelus and collaborators demonstrated that vaccination with the chimeric ARPV/ZIKV platform induced strong antibody responses together with cellular immune responses, further supporting the potential of ISV-based chimeric vaccines as a strategy against emerging arboviruses (2).

Another highly promising vaccine technology is messenger RNA (mRNA). The remarkable development and large-scale use of mRNA vaccines during the COVID-19 pandemic demonstrated the feasibility of rapidly designing, manufacturing, and deploying vaccines based on this platform. Rather than delivering the

antigen itself, mRNA vaccines provide genetic instructions encoding selected viral antigens, allowing host cells to transiently produce the antigenic proteins and subsequently stimulate both humoral and cellular immune responses (3).

mRNA vaccines offer several potential advantages over conventional vaccine technologies. Antigens do not need to be produced and purified through traditional manufacturing processes, and vaccine production does not require the propagation of large quantities of pathogenic virus. Moreover, mRNA platforms can induce both CD4+ and CD8+ T-cell responses, in addition to antibody responses. Because they do not contain replication-competent infectious agents, they may also offer important safety advantages for populations in whom live-attenuated vaccines may be contraindicated (3).

Several types of RNA-based vaccine technologies are currently being investigated, including non-replicating mRNA (nrRNA), virus-derived self-amplifying RNA (saRNA), trans-amplifying RNA (taRNA), and circular RNA (circRNA) platforms (3). These technologies differ in their mechanisms of antigen expression, duration of protein production, required RNA dose, and potential applications.

Following administration, lipid nanoparticle-formulated mRNA is taken up by cells, including antigen-presenting cells such as dendritic cells and macrophages, primarily through endocytic pathways. After endosomal escape, the mRNA reaches the cytoplasm, where host ribosomes translate it into the encoded antigen. The antigen can subsequently be processed into peptides and presented through MHC class I molecules to CD8+ T cells. Antigen uptake and processing through MHC class II pathways also promotes CD4+ T-cell activation, supporting antibody production and the development of coordinated cellular immunity (3).

The potential application of mRNA technology to arboviral vaccines is particularly promising. Experimental mRNA-LNP vaccines against dengue virus (DENV) encoding antigens such as envelope domain III and NS1 have demonstrated broad neutralizing antibody responses in animal models, including activity against all four DENV serotypes (3). Such approaches are particularly relevant for dengue, where vaccine development is complicated by the existence of four antigenically distinct serotypes and the potential consequences of unbalanced immunity.

Similarly, Richner and collaborators demonstrated that mRNA vaccination against Zika virus (ZIKV) can induce robust antigen-specific antibody responses, including IgG subclasses, together with cellular immune responses. These findings contributed important proof-of-concept evidence supporting mRNA technology as a platform for vaccines against emerging arboviruses.

Finally, self-assembling protein nanoparticles represent another innovative approach to vaccine antigen delivery (4). Among these, ferritin has attracted particular interest because of its ability to spontaneously assemble into highly organized nanoparticles capable of displaying multiple copies of an antigen. Ferritin is naturally present in both bacterial and mammalian systems, and bacterial ferritins can exhibit substantial resistance to thermal and chemical degradation. Ferritin nanoparticles were initially explored as vaccine platforms for influenza, where multivalent antigen presentation generated strong neutralizing antibody responses.

In the context of arboviral diseases, ferritin-based nanoparticle vaccines could similarly provide an efficient mechanism for presenting selected viral antigens to the immune system. For ZIKV, Pattnaik and collaborators developed a bacterial ferritin-based vaccine candidate displaying domain III of the ZIKV envelope protein (E-DIII). This approach generated neutralizing antibody responses without evidence of antibody-dependent enhancement (ADE), an especially important consideration in the development of vaccines against antigenically related flaviviruses (4).

Collectively, ISV-based chimeric vaccines, mRNA technologies, and self-assembling nanoparticle platforms such as ferritin illustrate how modern vaccine technology may expand the tools available to confront emerging and re-emerging arboviral diseases. These approaches offer opportunities to combine improved safety with potent humoral and cellular immunity,

rapid adaptability, and potentially broader protection. As arboviruses continue to expand geographically and epidemiologically, developing and evaluating such innovative vaccine platforms should remain an important component of global preparedness and prevention strategies.

Conclusion

The continued emergence and re-emergence of arboviral diseases demand vaccine strategies that are safe, adaptable, rapidly scalable, and capable of inducing broad and durable immunity. Innovative platforms, including ISV-based chimeric vaccines, mRNA technologies, and self-assembling ferritin nanoparticles, provide promising alternatives to conventional approaches. Although further clinical evaluation is required, these technologies could play an important role in strengthening global preparedness against both currently circulating and future emerging arboviruses.

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VACCINES BEAT

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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.

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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.

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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.

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