VACCINES BEAT

NAVIGATING AND PROTECTING GLOBAL HEALTH IN UNCERTAIN TIMES

Insights from Prof. Alejandro Cravioto's leadership at WHO's SAGE during COVID-19

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

WORLD HEALTH ORGANIZATION

Navigating and protecting Global Health in uncertain times

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Prof. Alejandro Cravioto is a distinguished physician, researcher, and global health leader with decades of experience in medical education, pediatric infectious diseases, and vaccine development. He currently serves as a Professor at the Faculty of Medicine of the National Autonomous University of Mexico (UNAM) in Mexico City, where he also earned his medical degree with honors. Prof. Cravioto completed his specialization in Pediatrics at the National Institute of Pediatrics in Mexico City, and furthered his academic training at the London School of Hygiene and Tropical Medicine, University of London, where he obtained a Diploma in Tropical Public Health and a Ph.D.

From 1995 to 2003, Prof. Cravioto served as Dean of the Faculty of Medicine at UNAM, where he played a pivotal role in advancing medical education, research infrastructure, and academic exchange. Following his tenure in academic leadership in Mexico, he took on an influential global role as Executive Director of the International Centre for Diarrhoeal Disease Research, Bangladesh (icddr,b) from 2005 to 2012. Under his leadership, icddr,b strengthened its position as one of the world's premier research institutions focused on infectious diseases, nutrition, and child health.

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LETTER FROM EDITOR

WELCOME TO OUR 14TH ISSUE OF VACCINES BEAT AND SUBSCRIBE FOR FREE!

In our *Coffee with an Expert* section, we had the distinct honor of speaking with Professor Dr. Alejandro Cravioto — a distinguished physician, researcher, and global health leader with decades of experience in medical education, pediatric infectious diseases, and vaccine development. Prof. Cravioto has served as Dean of the Faculty of Medicine at the National Autonomous University of Mexico (UNAM), Executive Director of the International Centre for Diarrhoeal Disease Research, Bangladesh, and Chief Scientific Officer at the International Vaccine Institute (IVI) in Seoul, Republic of Korea (2010–2014). A recognized authority in global immunization policy, Dr. Cravioto chaired the Strategic Advisory Group of Experts (SAGE) on Immunization for the World Health Organization (WHO) from 2015 to 2022, guiding vaccine policy and implementation during an era of rapid innovation and deployment. He currently serves on the Gavi Vaccine Investment Strategy 2024 Advisory Group and WHO's Product Development for Vaccines Advisory Committee (PDVAC). In 2025, he was invited to join the Technical Advisory Group of Experts on Diseases Preventable by Vaccination for the Pan American Health Organization (PAHO), continuing his long-standing contributions to vaccine policy and regional health security.

In this edition's *Editor's Corner*, we explore the life-saving global mission of the Coalition for Epidemic Preparedness Innovations (CEPI) and its 100 Days Mission for rapid vaccine development in future pandemics, alongside the evolving landscape of HIV vaccination.

Our *Best Practice* section features a comprehensive overview of current recommendations for the Respiratory Syncytial Virus (RSV) vaccine in adults.

Finally, in our *Guest Contributor* section, we are pleased to present an insightful editorial by Dr. Frédéric W. Nikiéma from the Direction Régionale de l'Ouest, Institut de Recherche en Sciences de la Santé, Bobo-Dioulasso, Burkina Faso: *"Neonatal Tetanus in Burkina Faso: The Persistent Shadow and the Need for Refined Prevention Strategies*."

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

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

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

Dr. Enrique Chacon-Cruz

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

He is an Overseas Fellow of the Royal Society of Medicine of the United Kingdom and a member of several international associations in Infectious Diseases. Currently, he is the CEO and Founder of "Think Vaccines" (Research, Education, and Consultancy for Vaccines and Vaccinology) based in Houston, Texas.

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

Additionally, he is a member of the Mexican Committee for the Elimination of Measles, Rubella, and Congenital Rubella, and the Scientific Committee on Health Issues of the Mexican Government in Baja-California. 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

NAVIGATING AND PROTECTING GLOBAL HEALTH IN UNCERTAIN TIMES

Insights from Prof. Cravioto's leadership at WHO's SAGE during COVID-19

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Felicitas Colombo, MPA

Prof. Alejandro Cravioto is a distinguished physician, researcher, and global health leader with decades of experience in medical education, pediatric infectious diseases, and vaccine development. He currently serves as a Professor at the Faculty of Medicine of the National Autonomous University of Mexico (UNAM) in Mexico City, where he also earned his medical degree with honors. Prof. Cravioto completed his specialization in Pediatrics at the National Institute of Pediatrics in Mexico City, and furthered his academic training at the London School of Hygiene and Tropical Medicine, University of London, where he obtained a Diploma in Tropical Public Health and a Ph.D.

From 1995 to 2003, Prof. Cravioto served as Dean of the Faculty of Medicine at UNAM, where he played a pivotal role in advancing medical education, research infrastructure, and academic exchange. Following his tenure in academic leadership in Mexico, he took on an influential global role as Executive Director of the International Centre for Diarrhoeal Disease Research, Bangladesh (icddr,b) from 2005 to 2012. Under his leadership, icddr,b strengthened its position as one of the world's premier research institutions focused on infectious diseases, nutrition, and child health.

From 2012 to 2014, Prof. Cravioto served as Chief Scientific Officer at the International Vaccine Institute (IVI) in Seoul, Republic of Korea, where he contributed to the institute's mission to develop and deliver safe, effective, and affordable vaccines for people in developing countries.

Prof. Cravioto's primary research interests have centered on the interaction between infection and growth in infants and young children, and the molecular pathogenesis of enteric bacterial infections. His groundbreaking work on Enterotoxigenic and Enteropathogenic Escherichia coli (ETEC and EPEC) has significantly advanced the understanding of diarrheal disease and laid the scientific foundation for the development of targeted vaccines. His laboratory and field-based studies have also served as vital training platforms for over 150 professionals, including physicians, scientists, and public health specialists from around the world.

A recognized leader in the field of global immunization policy, Prof. Cravioto was

appointed Chair of the Strategic Advisory Group of Experts (SAGE) on Immunization of the World Health Organization (WHO) from 2015 to 2022, where he helped guide global vaccine policy and implementation strategies during a period of rapid vaccine innovation and deployment. He currently serves as a member of the Gavi Vaccine Investment Strategy 2024 advisory group and WHO's Product Development for Vaccines Advisory Committee (PDVAC).

In 2025, Prof. Cravioto was invited to join the Technical Advisory Group of Experts on Diseases Preventable by Vaccination for the Pan American Health Organization (PAHO), continuing his long-standing contribution to vaccine policy and regional health security.

Prof. Cravioto is a member of Mexico's National Academies of Sciences, Medicine, and Pediatrics, and has been honored with honorary professorships from University Ricardo Palma in Peru and University of Cape Town in South Africa, in recognition of his contributions to medical science and public health.

Throughout his career, Prof. Cravioto has combined academic excellence, scientific innovation, and international leadership to address some of the most pressing global health challenges, particularly those affecting vulnerable children in low-resource settings.

Early days

Following in his father's footsteps, Prof. Cravioto discovered early in his medical career that his passion lay in infectious diseases. He chose to specialize in pediatrics and, by the late 1970s, earned a scholarship to attend the London School of Hygiene and Tropical Medicine. There, he completed a master's degree in public health followed by a PhD in microbiology, during which he worked on identifying the five main adhesive factors used by enterotoxigenic *E. coli* to attach to the intestinal lining.

"And those factors, to date, are the basis of the vaccines against *E. coli* that are being tested and used, which is something that I'm very proud of being able to contribute in that sense to the field," says Prof. Cravioto.

One of the most significant changes Prof. Cravioto has observed in public health and science education is access to information. He recalls visiting libraries and combing through the massive *Index Medicus* volumes to see whether a journal had arrived.

In 1995, when he became Dean of the Faculty of Medicine at UNAM, he helped establish three computing centers connected by a fiber optic network, linking various hospitals in Mexico City affiliated with the university. It became one of the few medical schools in the region with internet access.

"It meant that the students were looking into a new technology that was going to revolutionize the way we taught medicine and the way science in general is now shared," he said.

Landscape on vaccines against Enterobacteriaceae

Enterobacteriaceae, a large family of Gram-negative bacteria, includes several significant pathogens such as *Klebsiella*, *Enterobacter*, *Citrobacter*, *Salmonella*, *Escherichia coli*, *Shigella*, *Proteus*, *Serratia*, among others. These organisms are commonly associated with urinary tract infections (UTIs), and some species are also major causes of diarrheal diseases.

Prof. Cravioto's pioneering research on ETEC and EPEC has been instrumental in deepening scientific understanding of diarrheal diseases and shaping the development of targeted vaccines.

When analyzing global disease burden studies focused on enteric diseases, there has been a notable decrease in diarrheal illnesses worldwide. However, these diseases remain prevalent in countries where access to clean water and proper sanitation is still a challenge. A major turning point came with the widespread introduction of the rotavirus vaccine in the early 2000s, which led to a significant decline in diarrheal cases in urban areas.

"So, in a sense, it is not the same for a bacteria to move through the water supply -like cholera or enterotoxigenic E. coli- as other types of pathogens that move from [person to person]. And in that sense, rotavirus, Shigella, are really human-to-human pathogens that are not easy to control," he asserts.

He points out that while cholera and enterotoxigenic *E. coli* (ETEC) require approximately 100,000 organisms to cause disease, this is not the case for pathogens with lower infectious doses, making their transmission routes and public health implications very different.

"For the big outbreaks, especially for cholera, we have been lucky enough to have a very useful oral vaccine that has really had public health impact," he recalls. "The problem now is that we started [with] three producers and we ended up just having one."

This manufacturing bottleneck reflects broader challenges in vaccine development and distribution within the Enterobacteriaceae family, including limited R&D funding. The recent decision by the United States to withdraw support for Gavi, the Vaccine Alliance, further complicates the future of vaccine access. This uncertainty casts doubt on how many new vaccines, such as those for RSV or *Shigella*, will be added to Gavi's portfolio, and which might be excluded due to resource constraints.

"New vaccines, especially combination vaccines, are the future," emphasizes Prof. Cravioto. "We need to reduce the number of shots we give, especially to small children, by combining them."

Misinformation vs. evidence

Although global acceptance of vaccination as a vital public health measure remains high, there is a growing segment of the population that expresses hesitancy about vaccinating themselves or their children. Misinformation, combined with a rising mistrust in institutions, plays a significant role in fueling this reluctance.

"The [anti-vaccine] movement in the United States is something that worries us very much because there is now the power to affect a number of [policy] changes that might be very harmful both for the U.S. and for the whole world," affirms Prof. Cravioto, who notes that due to increasing skepticism and ethical concerns, conducting phase three placebo-controlled trials has now become nearly impossible in many contexts.

Prof. Cravioto sustains that the WHO's Strategic Advisory Group of Experts (SAGE) on Immunization looks at the evidence for each recommended vaccine in an utmost thorough way. He explains that the evidence is not just analyzed but graded. But the critical question remains: how strong is the evidence to support a decision?

To determine the strength of the evidence, SAGE uses a highly structured and transparent process known as the GRADE approach -Grading of Recommendations, Assessment, Development and Evaluation. This process ensures that recommendations are grounded in best available science, while also considering public health realities.

After this evidence is thoroughly analyzed, a technical working group drafts recommendations, which are then presented to the 15-member advisory group. Following internal deliberations and final approval, the recommendation is passed on to the WHO Director-General and ultimately becomes WHO policy.

"The system is set up to create confidence and I don't think we talk about it enough," he emphasizes.

WHO protocols during the pandemic

As Chair of SAGE during the COVID-19 pandemic, Prof. Cravioto faced unprecedented challenges and responsibilities. Unlike previous vaccine evaluations, the urgency and scale of the crisis required a much larger and more agile response.

"We were evaluating vaccines that were in development and they had not been tested like the other ones we normally have, in which a small working group of experts of 10 or 12 people is enough to assess the safety and all the things we look at," he recalls.

To meet the moment, SAGE expanded its working group, which met three times a week via Zoom, to include key stakeholders. They brought in the head of the WHO Product Development Committee, vaccine regulators responsible for approval pathways, and the chairs of the regional advisory groups of the five regional WHO offices. This structure allowed real-time feedback on how proposed recommendations would function in different parts of the world. It also ensured direct collaboration with the U.S. Centers for Disease Control and Prevention (CDC), and other organizations.

Importantly, SAGE decided not to exclude vaccine manufacturers from the process. By working closely with the producers, a major

departure from traditional practice normally done through independent working groups, they were able to recommend 13 new vaccines for emergency use during the pandemic. Industry had a place in the room, invited to the conversation to present their data, yet not as active participants in the discussions.

"We realized early on that there had to be an engagement with the producers while they were testing the vaccine, which is something that we normally never did. [Usually] We waited until they finished. We waited until they had the follow-up studies," he candidly shares. "Anybody who produced the vaccine was invited. And, in a sense, that dynamic was unique."

This early and open engagement gave the working group critical insights into the progress of clinical trials, enabling them to recommend the inclusion of essential elements for data collection and safety monitoring, information needed to make sound policy decisions in real time.

"Each vaccine went through the whole process of safety and efficacy, as we do with everything else, and the approval was just for emergency use. It wasn't a full license. We made sure the vaccines were safe, first of all, and that the vaccines provided a degree of protection of at least 50%," he notes.

Prof. Cravioto believes one of the group's greatest successes was fostering trust among all stakeholders which, up to that moment of intense global uncertainty, had been unattainable.

"And then, of course, the world was able to accept our recommendations," he commends.

WHO challenges

In today's politically and ideologically polarized world, one of the WHO's most pressing challenges is funding. While it is clear that traditional models and institutional frameworks must evolve to meet modern global health needs, Prof. Cravioto emphasizes that organizations like the WHO must continue to uphold the founding principles and the outstanding legacy of public health work built over decades.

"The mood within the Department of Immunizations, Vaccines and Biologicals is one of sadness because they first lost all their secondments from the CDC, which had to go back to the U.S. Then, they had to reduce their activities so that they comply with the [limited] amount of money available," Prof. Cravioto describes.

Due to budget constraints, the SAGE committees involved in vaccine development, safety, policy, and pipeline evaluation can no longer meet in person. While committee members work voluntarily, the cost of managing the full process, from reviewing data to producing official position papers, is significant.

"The amount of work that can be done is [directly] correlated to the amount of funds you have," he notes.

Transparency and integrity remain central to SAGE's operations. Every committee member is vetted for conflicts of interest. During the COVID-19 pandemic, five of the 15 members were actively involved in vaccine research. Although they were allowed to contribute to discussions due to their expertise, they were excluded from decision-making. Prof. Cravioto stresses the importance of this practice.

"In that sense, that is something that is being lost in [current] discussions because [there's a growing assumption that] everybody seems to be tainted and that is not true," he explains.

He warns that halting key institutional functions due to funding cuts has long-term consequences. Research pipelines, expert collaboration, and institutional memory are all at risk -and these aren't easily rebuilt once lost. The loss of skilled human capital and program continuity is particularly damaging.

"The other misconception is how the decisions are made and who makes the decisions," he clarifies. "It is the World Health Assembly that defines the work for WHO. It is not the director of WHO."

Prof. Cravioto argues that by defunding the WHO, countries -particularly the United States- risk losing both influence and alignment with global health strategies.

"The big fear that we all have is not just that the U.S. is stepping back in the sense of money," he concludes. "It's that we are losing the expertise that your country has in the whole world in the sense of participation [expertise, experience, and critical influence]."

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 warns of dangerous mosquito-borne virus.

The World Health Organization (WHO) has issued a pressing call to action to prevent a resurgence of the Chikungunya virus epidemic, reminiscent of the widespread outbreak that gripped the world two decades ago. The latest surge began in early 2025, with significant outbreaks reported on the Indian Ocean islands previously impacted, including La Reunion, Mayotte, and Mauritius. Alarmingly, about one-third of La Reunion's population has already been infected. The virus is rapidly spreading to countries such as Madagascar, Somalia, and Kenya, with epidemic transmission confirmed in Southeast Asia, including India. European health authorities are also growing increasingly concerned as imported cases rise. Since May 1, France has recorded approximately 800 imported chikungunya cases. More worryingly, there have been 12 documented local transmission clusters in southern France, where individuals were infected by local mosquitoes without travel to endemic regions. A case was also recently confirmed in Italy.
Published: July 24, 2025.
https://caliber.az/en/post/who-warns-of-dangerous-mosquito-borne-virus

Expanding human papillomavirus vaccine options.

To accelerate HPV vaccine introduction, all available and affordable vaccines should be deployed to meet WHO elimination targets. Delays in vaccine introduction result in substantial health losses, particularly for those ageing out of current target cohorts.
Published: August, 2025.
https://www.thelancet.com/journals/laninf/article/PIIS1473-3099(25)00144-6/fulltext?dgcid=raven_jbs_etoc_email.

China's Southeast Coast Reports Chikungunya Outbreak.

China's Centre for Health Protection (CHP) of the Department of Health (DH) announced today that an outbreak of the mosquito-transmitted Chikungunya fever (CF) has occurred in Shunde, Guangdong, which began in July 2025 and was triggered by imported cases. As of July 15, 2025, a total of 478 confirmed cases have been reported, all of which exhibited mild symptoms.
Published: July 16, 2025.
https://www.vax-before-travel.com/2025/07/16/chinas-southeast-coast-reports-chikungunya-outbreak#:~:text=China's%20Centre%20for%20Health%20Protection,was%20triggered%20by%20imported%20cases

Major new study finds no health risks from aluminium in childhood vaccines

A study of over one million children over 24 years found no increased risk of autism, asthma or autoimmune diseases in children receiving aluminium-containing vaccines.
Published: July 24, 2025.
https://www.gavi.org/vaccineswork/major-new-study-finds-no-health-risks-aluminium-childhood-vaccines#:~:text=safe%20for%20children.-,Analysing%20data%20from%20over%201.2%20million%20children%20born%20in%20Denmark,asthma%2C%20

allergies%20or%20autoimmune%20disorders

Western Cuba Confirms Chikungunya Outbreak.
While the Pan American Health Organization has reported over 200,000 Chikungunya cases in 2025, none were confirmed in the Republic of Cuba. However, as of July 28, 2025, local media are reporting that the Pedro Kourí Institute of Tropical Medicine has stated a Chikungunya outbreak has been reported in the España Republicana neighborhood of Matanzas municipality, specifically in the Perico area.
Published: July 28, 2025.
https://www.vax-before-travel.com/2025/07/28/western-cuba-confirms-chikungunya-outbreak

Chikungunya Cases Surge Sixfold in South China City in a Week.
A sudden surge of chikungunya cases has been reported in Foshan city in China, increasing from 478 cases to almost 3000 cases within a week, according to South China Morning Post. France has reported over 53,000 cases in its overseas territories this year, reflecting a wider outbreak trend.
Published: July 31, 2025.
https://medicalxpress.com/news/2025-08-chikungunya-cases-surge-sixfold-south.html

World-first library of vaccine-enhancing adjuvants launches.
The UK's Medicines and Healthcare products Regulatory Agency (MHRA) will host a repository of 25 vaccine-enhancing adjuvants that can be 'taken off the shelf' and used in new vaccines being developed against epidemic and pandemic threats. This includes diseases like mpox, COVID-19 and Ebola, as well as a novel or as-yet-unidentified Disease X. The $2.5 million project—funded and led by the Coalition for Epidemic Preparedness Innovations (CEPI)—will act as a matchmaking service, helping vaccine developers select the best vaccine-adjuvant combination to make their vaccines more potent and effective.
Published: July 3, 2025.
https://cepi.net/world-first-library-vaccine-enhancing-adjuvants-launches

This vaccine uses dental floss instead of needles.
Scientists have discovered that flossing between your teeth could one day help vaccinate you. By targeting a uniquely permeable gum tissue called the junctional epithelium, this new method stimulates immunity right where many infections enter: the mouth, nose, and lungs.
Published: August 3, 2025.
https://www.sciencedaily.com/releases/2025/08/250803011820.htm

Sleeping' cancer cells in the lungs can be roused by COVID and flu.
Hidden in the lungs of some breast cancer survivors are tumour cells that can remain dormant for decades — until they one day trigger a relapse. Now, experiments in mice show that these rogue cells can be roused from their slumber by common respiratory illnesses such as COVID-19 or the flu.
Published: July 30, 2025.
https://www.nature.com/articles/d41586-025-02420-1

WHO: Guidelines for the international packaging and shipping of vaccines, 7th ed.
Published: July 2025.

European Vaccines Hub for Pandemic Readiness, a new European partnership for public health-relevant vaccine development.
The Health Emergency Preparedness and Response Authority (HERA) of the European Commission, through the European Health and Digital Executive Agency (HaDEA) supports the establishment of the "European Vaccines Hub (EVH) for Pandemic Readiness", a pan-European center dedicated to advancing public-health–relevant vaccine development. The Grant Agreement has been signed today, marking a transformative step in public-health–relevant vaccine development. The EVH project contributes to the development of an agreed set of pandemic-prototype vaccines and scalable technologies through a consortium of major EU Vaccine R&D institutions and manufacturers, ensuring effective coordination of national vaccine research programs. Structured around four pillars supporting key activities and infrastructures of the vaccine development pipeline, EVH integrates leading European institutions with distinct expertise and in charge of pandemic preparedness in their own countries. In detail: Pillar 1 on "Discovery" is led by Fondazione Biotecnopolo di Siena (Italy), Pillar 2 on "Preclinical studies" by Institut Pasteur (France), Pillar 3 on "Clinical studies" by Vaccinopolis (UAntwerpen, Belgium), and Pillar 4 on "Manufacturing" by DZIF and ZEPAI (Germany).
Published: May 26, 2025.
https://www.izsvenezie.com/european-vaccines-hub-launch/

Chikungunya cases double in Singapore as virus spreads.
With most cases reported in southern China's Guangdong province, viral fever recorded in Hong Kong, Taiwan, Singapore.
Published: August 8, 2025.
https://www.aa.com.tr/en/health/chikungunya-cases-double-in-singapore-as-virus-spreads/3653635#:~:text=Singapore%2520recorded%252017%2520cases%2520from,15%252C%E2%80%9D%2520said%2520the%2520report

CDC director Oks new RSV immunization for infants.
Merck's clesrovimab (Enflonsia) is a long-acting monoclonal antibody similar to nirsevimab (Beyfortus) from Sanofi and AstraZeneca. The CDC recommends using it for infants under 8 months of age born during or entering their first RSV season who are not protected by maternal vaccination.
Published: August 7, 2025.
https://publications.aap.org/aapnews/news/32796/CDC-director-OKs-new-RSV-immunization-for-infants?searchresult=1?autologincheck=redirected

WHO: Hepatitis B.
Published: July 23, 2025.
https://www.who.int/news-room/fact-sheets/detail/hepatitis-b

4th Legionnaires' death reported; Harlem Hospital, CUNY among NYC buildings found with bacteria.
Four people have died as a result of a Legionnaires' disease outbreak in Harlem that has sickened nearly 100 people, and officials revealed the cooling towers that tested positive for the bacteria that causes the illness — some of which are at properties owned by New York City, including a hospital and an academic building.
Published: August 14, 2025.
https://www.nbcnewyork.com/manhattan/legionnaires-disease-symptoms-harlem-update-today-nyc-health-department/6367665/

Cholera Vaccines Meeting Outbreak Demands.
After decades of progress against cholera outbreaks, cases are again on the rise, even in countries that had not seen the disease in years. And with a multi-year vaccine shortage, health leaders were confronted with significant challenges. According to the World Health Organization (WHO), 44 countries reported cholera cases in 2022, a 25% increase from the 35 countries that reported cases in 2021.
Published: August 15, 2025.
https://www.vax-before-travel.com/2025/08/15/cholera-vaccines-meeting-outbreak-demands

Vaccination Falls, Diseases Return.
Published: July 31, 2025.
https://www.vaccinestoday.eu/stories/vaccination-falls-diseases-return/

World Mosquito Program: World Mosquito Day 2025. 20th August.
https://www.worldmosquitoprogram.org/world-mosquito-day

WHO: Nepal eliminates rubella.
Published: August 18, 2025.
https://www.who.int/southeastasia/news/detail/18-08-2025-nepal-eliminates-rubella

Rise in dengue fever outbreaks across the Pacific driven by the climate crisis, experts say.
Samoa, Fiji and Tonga among the worst affected amid warning the disease and others will become 'more common and more serious as the planet warms.
Published: August 11, 2025.
https://www.theguardian.com/world/2025/aug/12/dengue-fever-outbreaks-samoa-fiji-tonga-climate-crisis?CMP=share_btn_url

Synchronized dynamics of dengue across the Americas
Published: August 20, 2025
https://www.science.org/doi/10.1126/scitranslmed.adq4326

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

Agbenyega T, Schuind AE, Adjei S, Antony K, Aponte JJ, Buabeng PBY, Clemens JD, Hossain L, Kemp TJ, Mercer LD, Pinto LA, Qadri F, Sukraw K, Bhat N, Zaman K. **Immunogenicity and safety of an Escherichia coli-produced bivalent human papillomavirus vaccine (Cecolin) in girls aged 9-14 years in Ghana and Bangladesh: a randomised, controlled, open-label, non-inferiority, phase 3 trial**. *Lancet Infect Dis*. 2025 Mar 19:S1473-3099(25)00031-3.
doi: https://doi.org/10.1016/S1473-3099(25)00031-3

Editorial comment: This randomized, controlled, open-label, phase 3 non-inferiority trial enrolled healthy girls aged 9–14 years at single study sites in Ghana and Bangladesh. Participants were randomly assigned, via an interactive web response system, in equal proportions to one of five study groups, stratified by site: two doses of the bivalent HPV vaccine (2vHPV, types 16 and 18) administered at baseline and at 6, 12, or 24 months; a single dose of the quadrivalent HPV vaccine (4vHPV) at baseline followed by 2vHPV at 24 months; or the reference schedule of two doses of 4vHPV administered 6 months apart.

HPV-16 and HPV-18 specific binding antibody levels were measured by ELISA at baseline, immediately before, and one month after the second dose. The extended two-dose regimens of 2vHPV demonstrated non-inferior immune responses, supporting greater dosing flexibility. Notably, a single dose of 2vHPV induced antibody responses comparable to those of a single dose of 4vHPV—which has demonstrated clinical efficacy—further supporting the potential for a single-dose 2vHPV schedule. These findings are particularly significant given the substantially lower cost of this new bivalent HPV vaccine, offering a promising and affordable option for broader implementation, especially in low- and middle-income countries.

02

Heidecker B, Libby P, Vassiliou VS, Roubille F, Vardeny O, Hassager C, Gatzoulis MA, Mamas MA, Cooper LT, Schoenrath F, Metra M, Amir O, Solomon SD, Landmesser U, Lüscher TF. **Vaccination as a new form of cardiovascular prevention: a European Society of Cardiology clinical consensus statement**. *Eur Heart J*. 2025 Jun 30:ehaf384.
doi: https://doi.org/10.1093/eurheartj/ehaf384

Editorial comment: This clinical consensus statement from the European Society of Cardiology reviews current literature and available evidence to provide practical guidance on vaccination timing and target populations, with a particular focus on individuals with cardiovascular conditions. It addresses complex clinical scenarios and offers recommendations for vaccinating vulnerable groups, including immunocompromised individuals, patients with congenital heart disease, and pregnant women. The document also discusses vaccine safety and potential complications in these populations.

03

Asl FM, Ghaffari P, Safari M. **The relationship between the recurrence rate of genital warts and administration of quadrivalent human papilloma virus vaccine in women.** *Diagn Microbiol Infect Dis.* 2025 Feb;111(2):116607.
doi: https://doi.org/10.1016/j.diagmicrobio.2024.116607

Editorial comment: In this cohort study conducted in Iran, 203 women with genital warts who were referred to the gynecology clinic at Shahid Muftah Hospital in Yasuj between 2019 and 2022 were examined and treated by a gynecologist. After treatment, participants were trained and advised to receive three doses of the Gardasil vaccine. Of the initial cohort, 138 women completed the study. They were divided into two groups: those who received all three doses of the Gardasil vaccine (vaccinated group) and those who did not (unvaccinated group).

Recurrence of genital warts was observed in 8 women (11.6%) in the vaccinated group, compared to 15 women (21.7%) in the unvaccinated group ($p = 0.11$). Overall, recurrence occurred in 23 participants (16.7%). The average time to recurrence was significantly longer in the vaccinated group (43.6 ± 24.7 weeks) compared to the unvaccinated group (16.4 ± 16.5 weeks; $p \leq 0.017$), highlighting the potential preventive effect of the Gardasil vaccine against recurrence of genital warts.

04

Dong C, Li Z, Tan D, Sun H, Liang J, Wei D, Zheng Y, Zhang L, Liu S, Zhang Y, et al. **Research and Clinical Progress of Therapeutic Tumor Vaccines.** *Vaccines.* 2025; 13(7):672.
doi: https://doi.org/10.3390/vaccines13070672

Editorial comment: This excellent review summarizes the latest developments in immunotherapy and therapeutic vaccines for various solid tumors, while also providing insights into future directions in the field.

05

Muthukutty P, Woo HY, Yoo SY. **Therapeutic Colorectal Cancer Vaccines: Emerging Modalities and Translational Opportunities.** *Vaccines.* 2025; 13(7):689.
doi: https://doi.org/10.3390/vaccines13070689

Editorial comment: New vaccine platforms and translational advances in colorectal cancer therapy.

06

Shim I, Rogowski L, Venketaraman V. **Progress and Recent Developments in HIV Vaccine Research.** *Vaccines.* 2025; 13(7):690.
doi: https://doi.org/10.3390/vaccines13070690

Editorial comment: A strong review of the lessons learned, and the current and future landscape of HIV vaccine development.

07

Mutua MM, Kathiiko C, Wachira MN, Muriithi B, Nyangao J, Khamadi SA, Komoto S, Morita K, Ichinose Y, Wandera EA. **Epidemiological trends of diarrheal viruses in central and western Kenya before and after Rotavirus vaccine introduction.** *Trop Med Health.* 2025 Apr 27;53(1):60.
doi: https://doi.org/10.1186/s41182-025-00716-6

Editorial comment: In this retrospective, population-based study conducted in Kenya, mass rotavirus vaccination did not alter the prevalence of adenovirus, astrovirus, or norovirus-related diarrhea. However, a shift in the age distribution of diarrheal cases was observed in some regions. These findings highlight the ongoing burden and evolving epidemiology of enteric viruses in Western and Central Kenya, underscoring the importance of continued surveillance to inform the design and implementation of effective public health interventions.

08

Ingrole RSJ, Shakya AK, Joshi G, Lee CH, Nesovic LD, Compans RW, Gill HS. **Floss-based vaccination targets the gingival sulcus for mucosal and systemic immunization**. *Nat Biomed Eng*. 2025 Jul 22.
doi: https://doi.org/10.1038/s41551-025-01451-3

Editorial comment: In this study, in mice, gold nanoparticles functionalized with a peptide derived from the ectodomain of the transmembrane matrix 2 protein of human influenza virus stimulated local lymph nodes, increased CD4+T cells in lymph nodes, lungs and spleen, and boosted antibody-secreting cells in the bone marrow. Floss-based immunization induced strong and sustained immune activation across multiple organs, robust systemic and mucosal antibody responses, and durable protection against lethal influenza infection, independent of age, food and liquid consumption. Floss-based vaccination was superior to sublingual and comparable with intranasal vaccination. In human participants, fluorescent dye delivered via floss picks effectively reached gingival sulcus, supporting clinical feasibility. These findings establish floss-based vaccination as a simple, needle-free strategy that enhances vaccine delivery and immune activation compared with existing mucosal immunization methods.

09

El Hindi T, Anugulruengkitt S, Lapphra K, Limkittikul K, Tangsathapornpong A, Galindo-Tsoukas C, Hellwig M, Roubinis N, Schuring R, Biswal S, Folschweiller N. **Immunogenicity and safety of the live-attenuated tetravalent dengue vaccine (TAK-003) co-administered with recombinant 9-valent human papillomavirus vaccine**. *Vaccine*. 2025 Jul 31;62:127558.
doi: https://doi.org/10.1016/j.vaccine.2025.127558

Editorial comment: In this phase 3, open-label, randomized, multicenter trial was conducted in Thailand to investigate the immunogenicity and safety of co-administration of TAK-003 with 9vHPV in healthy participants aged ≥9 to <15 years, the concurrent administration of both vaccines resulted in same immunogenicity and similar safety profiles.

10

Mallapaty S. **mRNA vaccines for HIV trigger strong immune response in people**. *Nature*. 2025 Aug 1.
doi: https://doi.org/10.1038/d41586-025-02439-4

Editorial comment: Results from early-stage trial show that 80% of participants who received one of two HIV vaccine candidates produced antibodies against viral proteins. Two vaccine candidates using mRNA technology elicit a potent immune response against HIV, according to an early-stage clinical trial1.

The trial is only the third to test mRNA vaccines against HIV.

11

Latham, Ned H et al. **Clinical features of mpox in fully vaccinated people in New South Wales, Australia: an outbreak investigation and retrospective cohort study**. *The Lancet Primary Care, Volume 0, Issue 0, 100018.*

Editorial comment: In this study, 674 people (673 [99%] assigned male at birth and 669 [99%] identified as men; 17 [3%] identified as Aboriginal or Torres Strait Islander) were diagnosed with mpox (excluding one reinfection). In fully vaccinated people, the median time between dose two and symptom onset was 21·8 months (IQR 19·5–23·0). Compared with unvaccinated people, fully vaccinated people were less likely to be hospitalized (risk ratio 0·11 [95% CI 0·03–0·43]), have extragenital lesions (0·45 [0·36–0·56]) or systemic symptoms (0·72 [0·64–0·80]). A two-dose MVA-BN series continued to protect against extragenital lesions, systemic symptoms, and hospitalization beyond the point at which antibodies have been found to wane.

12

Chia SB, Johnson BJ, Hu J, Valença-Pereira F, Chadeau-Hyam M, Guntoro F, Montgomery H, Boorgula MP, Sreekanth V, Goodspeed A, Davenport B, De Dominici M, Zaberezhnyy V, Schleicher WE, Gao D, Cadar AN, Petriz-Otaño L, Papanicolaou M, Beheshti A, Baylin SB, Guarnieri JW, Wallace DC, Costello JC, Bartley JM, Morrison TE, Vermeulen R, Aguirre-Ghiso JA, Rincon M, DeGregori J. **Respiratory viral infections awaken metastatic breast cancer cells in lungs**. *Nature*. 2025 Jul 30.
doi: https://doi.org/10.1038/s41586-025-09332-0

Editorial comment: In this study performed in mice, phenotypic transitions and expansions are interleukin-6 dependent. The authors showed that dormant disseminated cancer cells (DCCs) impair lung T cell activation and that CD4+ T cells sustain the pulmonary metastatic burden after the influenza infection by inhibiting CD8+ T cell activation and cytotoxicity. Crucially, these experimental findings align with human observational data. Analyses of cancer survivors from the UK Biobank (all cancers) and Flatiron Health (breast cancer) databases reveal that SARS-CoV-2 infection substantially increases the risk of cancer-related mortality and lung metastasis compared with uninfected cancer survivors.

13

Kulkarni PS, Potey AV, Kapse D, Bhamare C, Gawande A, Munshi R, Pawar S, Gogtay NJ, Agarwal A, Tambe M, Thakre S, Samuel CJ, Khan SMS, S RH, Rana D, Singh N, Kamath V, Bhalla HL, Poonawalla CS, Mani RS, Gunale B; RAB-04 study group. **Post-exposure prophylaxis regimen of rabies monoclonal antibody and vaccine in category 3 potential exposure patients: a phase 4, open-label, randomised, active-controlled trial**. *Lancet*. 2025 Aug 9;406(10503):627-635.
doi: https://doi.org/10.1016/S0140-6736(25)00735-4

Editorial comment: In this clinical trial, 3,994 participants received post-exposure prophylaxis (PEP) (3,001 male and 993 female). Of these, 2,996 were treated with rabies monoclonal antibody (RmAb) plus purified Vero cell rabies vaccine (PVRV), and 998 received equine rabies immunoglobulin (ERIG) plus PVRV. A total of 3,622 participants (90.7%) completed the one-year follow-up. RmAb was safe and well tolerated and showed protective efficacy against rabies. A PEP regimen containing RmAb plus PVRV was immunogenic with long-term persistence of immune response.

14

Fakhraei R, Fell DB, El-Chaâr D, Thampi N, Sander B, Brown KA, Crowcroft N, Bolotin S, Barrett J, Darling EK, Fittipaldi N, Lamagni T, McGeer A, Murti M, Sadarangani M, Schwartz KL, Yasseen A, Tunis M, Petrcich W, Wilson K. **Group B Streptococcus disease during infancy and risk of subsequent neurodevelopmental impairments in young children: a population-based cohort study in Ontario, Canada**. *Lancet Reg Health Am*. 2025 Jul 2;48:101170.
doi: https://doi.org/10.1016/j.lana.2025.101170

Editorial comment: In this study, researchers from Canada performed a population-based cohort study of liveborn infants in Ontario between April 2012 and March 2018, using linked birth registry, laboratory, and health administrative databases. GBS disease in the first year of life was ascertained through culture results and diagnostic codes. NDIs, encompassing cognitive, motor, sensory (hearing, vision), and social/behavioral domains, were ascertained up to five years of age using diagnostic codes. Of 764,934 infants, 771 had a history of GBS disease. GBS survivors had a twofold increased risk of any NDI (adjusted hazard ratio [aHR]: 2.18 [95% CI: 1.88, 2.54]) and higher rates of cognitive (aHR: 2.79 [95% CI: 2.37, 3.30]), motor (aHR: 7.08 [95% CI: 2.93, 17.08]), social/behavioural (aHR: 1.60 [95% CI: 1.20, 2.14]), and sensory (aHR: 1.64 [95% CI: 1.02, 2.64]) impairments.

15

da Cruz Ferreira DA, Freitas LP, Lowe R, Souza GD, Fujiwara RT, Martins Lana R. **Introduction, establishment, and distribution of Aedes aegypti and dengue in a temperate capital of Brazil: a retrospective surveillance-based study**. *Lancet Reg Health Am.* 2025 Jun 23;48:101153.
doi: https://doi.org/10.1016/j.lana.2025.101153

Editorial comment: Ae. aegypti successfully established and spread within a temperate city in Brazil. The presence of vectors, a susceptible population and socio-environmental characteristics conducive to mosquito proliferation resulted in autochthonous transmission of dengue fever after the continuous introduction of imported cases. The climatic barrier to dengue transmission in the south of Brazil has shifted southward, coinciding with the colonisation of Ae. aegypti and the emergence of dengue in recent years in Porto Alegre.

16

Jia X, Deng JZ, Winters MA, Paulines MJ, Tong W, Cannon E, Biba M, Zhuang P. **Characterization of pneumococcal conjugates in vaccine process development by multi-detection hydrodynamic chromatography**. *J Pharm Biomed Anal.* 2025 Aug 15;261:116826.
doi: https://doi.org/10.1016/j.jpba.2025.116826

Editorial comment: Proper protein–polysaccharide conjugation is essential for eliciting a stronger immune response and providing higher and longer-lasting protection in all current pneumococcal vaccines. This study demonstrates, using multidetection hydrodynamic chromatography, that this complex process reduces separation and promotes a more stable and durable binding.
Hernandez-Ruiz YG, Lopatynsky-Reyes EZ, Ulloa-Gutierrez R, Avila-Agüero ML, Rodriguez-

17

Makhoul M, Abu-Raddad LJ. **Vaccination as a strategy for Chlamydia trachomatis control: a global mathematical modeling analysis**. *BMC Glob Public Health.* 2025 Jul 25;3(1):65.
doi: https://doi.org/10.1186/s44263-025-00181-7

Editorial comment: Using a deterministic, age-structured mathematical model, vaccinating individuals aged 15–49 years starting in 2030 with a vaccine of 50% efficacy and 20-year duration of protection, scaled to 80% coverage by 2040, is projected to reduce global Chlamydia trachomatis prevalence, incidence, and annual new infections in 2050 by 26.2%, 32.3%, and 26.5%, respectively. In total, 717 million infections are estimated to be averted by 2050.

18

Beyrer C, Ratevosian J, Gelderblom H, Rosenberg NE. **The HIV/AIDS pandemic: where are we now?** *AIDS.* 2025 Sep 1;39(11):1497-1504.
doi: https://doi.org/10.1097/QAD.0000000000004308

Editorial comment: Despite expanded access to antiretroviral therapy (ART) and the growing availability of prevention tools such as oral and long-acting pre-exposure prophylaxis (PrEP), progress toward the UNAIDS 2025 targets has stalled. HIV incidence remains unacceptably high in key populations and regions, while treatment coverage gaps and preventable deaths persist. The abrupt suspension in 2025 of U.S. foreign aid programs—including the President's Emergency Plan for AIDS Relief (PEPFAR) and the United States Agency for International Development (USAID)—has further disrupted service delivery, especially for prevention initiatives and marginalized groups. This editorial examines the structural, political, and programmatic shortcomings that contributed to the missed targets and underscores the heightened risks posed by these policy reversals.

19

Hernandez-Ruiz YG, Lopatynsky-Reyes EZ, Ulloa-Gutierrez R, Avila-Agüero ML, Rodriguez-Morales AJ, Basa JE, Nikiema FW, Chacon-Cruz E. **100-Day Mission for Future Pandemic Vaccines, Viewed Through the Lens of Low- and Middle-Income Countries (LMICs).** *Vaccines*. 2025 Jul 21;13(7):773.
doi: https://doi.org/10.3390/vaccines13070773

Editorial comment: The 100-Day Mission, spearheaded by the Coalition for Epidemic Preparedness Innovations (CEPI) and endorsed by major international stakeholders, seeks to reduce the time required to develop and deploy vaccines to within 100 days of identifying a novel pathogen. This ambitious target is presented as a critical first step toward strengthening global pandemic preparedness. This review examines the mission's potential for implementation and the challenges it may face, with particular attention to low- and middle-income countries (LMICs), where barriers to equitable vaccine access remain significant. Drawing on lessons from past pandemics—including the Spanish flu, H1N1, and COVID-19—this article explores the scientific, economic, political, and social dimensions that could shape the mission's success.

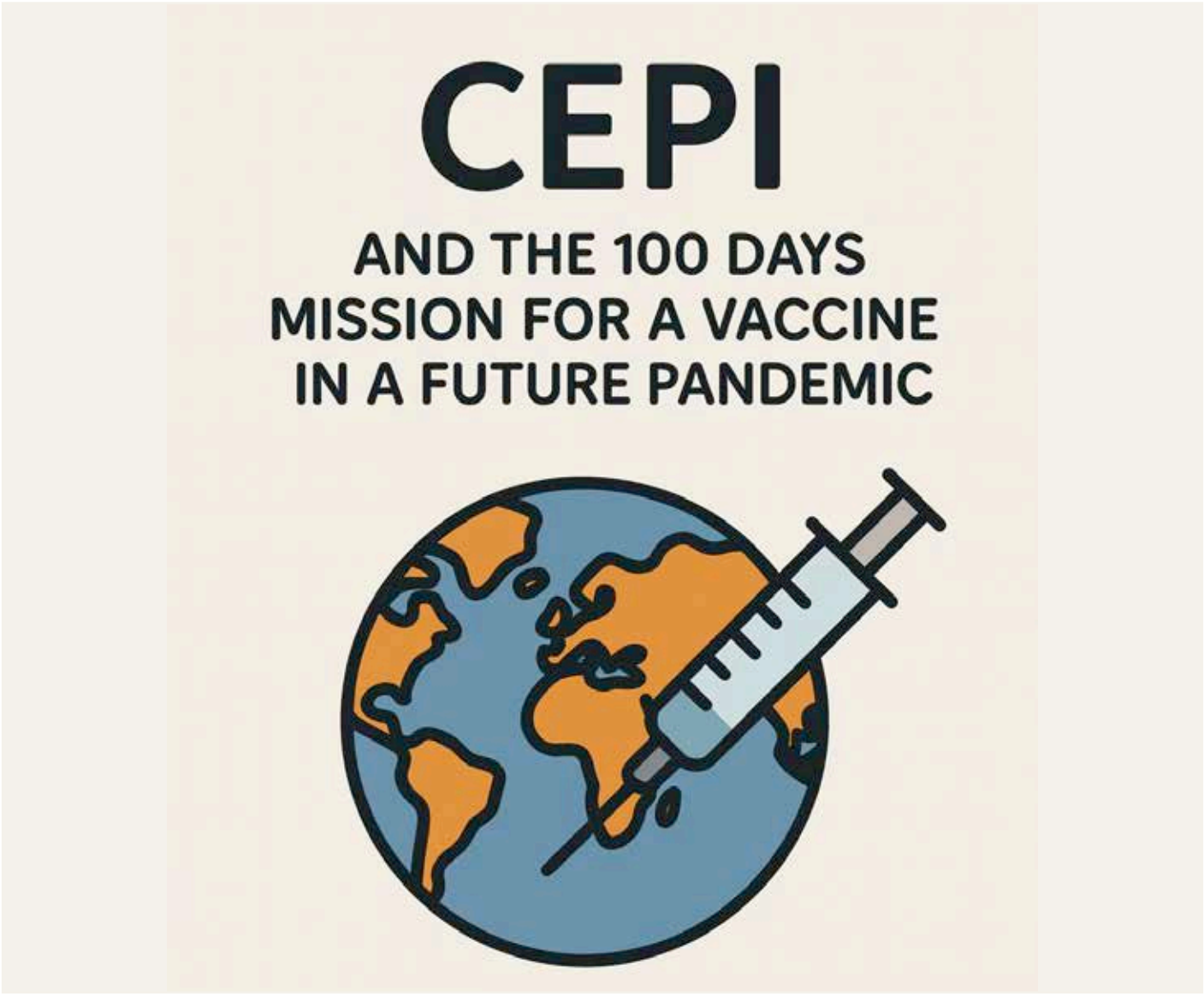
20

Ortiz-Prado E, Kyriakidis NC, López-Cortés A, Vasconez-Gonzalez J, Suarez I, Pazmiño-Almeida J, Barriga-Collantes M, Cadena MP, Reascos-Arteaga M, Acosta-Muñoz E, Acosta-Muñoz MC, Villarreal K, Izquierdo-Condoy JS. **Current and emerging Mpox vaccine strategies: A comprehensive review.** *Vaccine*. 2025 Aug 9;62:127598.
doi: https://doi.org/10.1016/j.vaccine.2025.127598

Editorial comment: This comprehensive review covers not only the three currently licensed vaccines against MPOX but also highlights the next generation of vaccine candidates in development—including mRNA, subunit, nanovaccine, and other innovative platforms—targeting this critical global public health challenge.

Editor's Corner

THE COALITION FOR EPIDEMIC PREPAREDNESS INNOVATIONS (CEPI) AND THE 100 DAYS MISSION FOR A VACCINE IN A FUTURE PANDEMIC: A GLOBAL, NOT REGIONAL, NECESSITY



The Spanish flu of 1918 was one of the deadliest pandemics in history, claiming about 50 million lives worldwide. This event remains a cornerstone for understanding pandemics, especially since it exposed the devastating impact of inadequate public health infrastructure. Poor housing, overcrowding, military conflicts (e.g., the First World War, the Mexican Revolution), and a severe lack of resources, minimal understanding of public health prevention strategies, and the absence of a vaccine all significantly contributed to the pandemic's severity.

During the spring of 2009, when the World Health Organization (WHO) announced the AH1N1 influenza pandemic, it served yet another reminder of these vulnerabilities. This time, researchers achieved the creation of a vaccine, yet it was insufficient to stop the early stages of the pandemic. Millions became infected because of the delayed production and distribution of vaccinations, healthcare systems were strained, and economic losses scaled as infection and fear rates increased. The Centers for Disease Control and Prevention (CDC) and WHO estimate that between 151,700 and 575,400 people died worldwide during the first year of the AH1N1 pandemic.

Another significant event occurred in January 2020, when the WHO declared the COVID-19 pandemic a Public Health Emergency of International Concern. In contrast with previous pandemics, the scientific community achieved vaccine development through modern technology, such as mRNA platforms. COVID-19 vaccines were authorized for emergency use less than a year after studying the virus's genetic sequence, demonstrating the powers of technology, innovation, and international cooperation. Despite this, unequal vaccination distribution revealed political and economic divides, exposing low-income nations and highlighting the need for a more efficient and fair response system.

As the most efficient way to contain and manage infectious diseases, vaccines are the mainstay of contemporary defenses against pandemics. Time is of the essence: the quicker a vaccine is created and implemented, the quicker a possible pandemic may be contained. Based on these insights, the Coalition for Epidemic Preparedness Innovations (CEPI) disclosed the ambitious 100-Day Mission. This mission aims to transform global preparedness by creating vaccines within 100 days of discovering a new pathogen. It seeks to control the pandemic by utilizing scientific advancements and international cooperation before it worsens. The following section explores this revolutionary mission's vision, structure, and possible impact.

The vision of the 100-Day Mission

The 100-Day Mission, led by CEPI and supported by international organizations such as the G7 and G20, is a bold attempt to transform vaccine development timeframes. This project uses cutting-edge technology and global collaboration to reduce the risk of future pandemics by aiming to develop a vaccine for the next Disease X in as little as 100 days. This mission is to prevent outbreaks before they worsen, reducing their devastating impact on health, society, and the economy.

The following are the key pillars to achieve the 100-Day Mission:

A. Pre-existing Prototype Vaccines

The cornerstone of the 100-day Mission is the foundation of a "vaccine library", a collection of prototype vaccines prepared for quick adaption and distribution against new threats.

The vaccine library currently seeks to keep up with varying pathogens by focusing on viral families with demonstrated pandemic potential, such as Paramyxoviridae, Flaviviridae, Togaviridae, Filoviridae, Bunyaviridae, Arenaviridae, Paramyxoviridae, Picornaviridae, among others.

B. Global Clinical Trial Infrastructure and Readiness

CEPI highlights that a global clinical trials network with pre-approved protocols is essential to accelerating vaccine development. CEPI intends to facilitate rapid responses to new threats by integrating worldwide manufacturing facilities and accelerating clinical trial procedures. A strong clinical laboratory network guarantees quick

data readouts, allowing for prompt judgments on the efficacy and safety of vaccines.

Additionally, CEPI is creating a collection of prototype vaccines targeting important virus families, tested through Phase 1 clinical trials, to be able to adapt and respond to arising threats. This initiative enhances the global ability to adapt swiftly to new threats while maintaining a high standard of safety and efficacy.

C. Earlier Biomarkers of Immune Response

Accelerating vaccine timelines requires the identification of early biomarkers of a strong immune response and protection. Instead of the conventional 14–21-day period, immunological markers can now offer quicker signs of vaccine effectiveness.

D. Rapid Manufacturing Capacity

CEPI aims to streamline manufacturing procedures for quick initial and scale output. Within days, rapid activation is guaranteed via a network of manufacturing facilities with capacity set aside for several platforms. Further bolstering rapid vaccine manufacture and delivery are developments in next-generation vaccine technologies, including mRNA.

E. Early Characterization of Pathogens

Enhancements in surveillance capacity are essential for early outbreak detection and response. CEPI prioritizes standardizing global procedures for sharing genetic sequences and initiating outbreak alarms. During the early stages of an outbreak, sophisticated technologies like in-silico modeling are essential for determining correlates of protection and evaluating possible toxicity. These innovative techniques offer crucial information to support prompt and efficient reactions.

Benefits Across Sectors

Economic Impacts of the 100-Day Mission

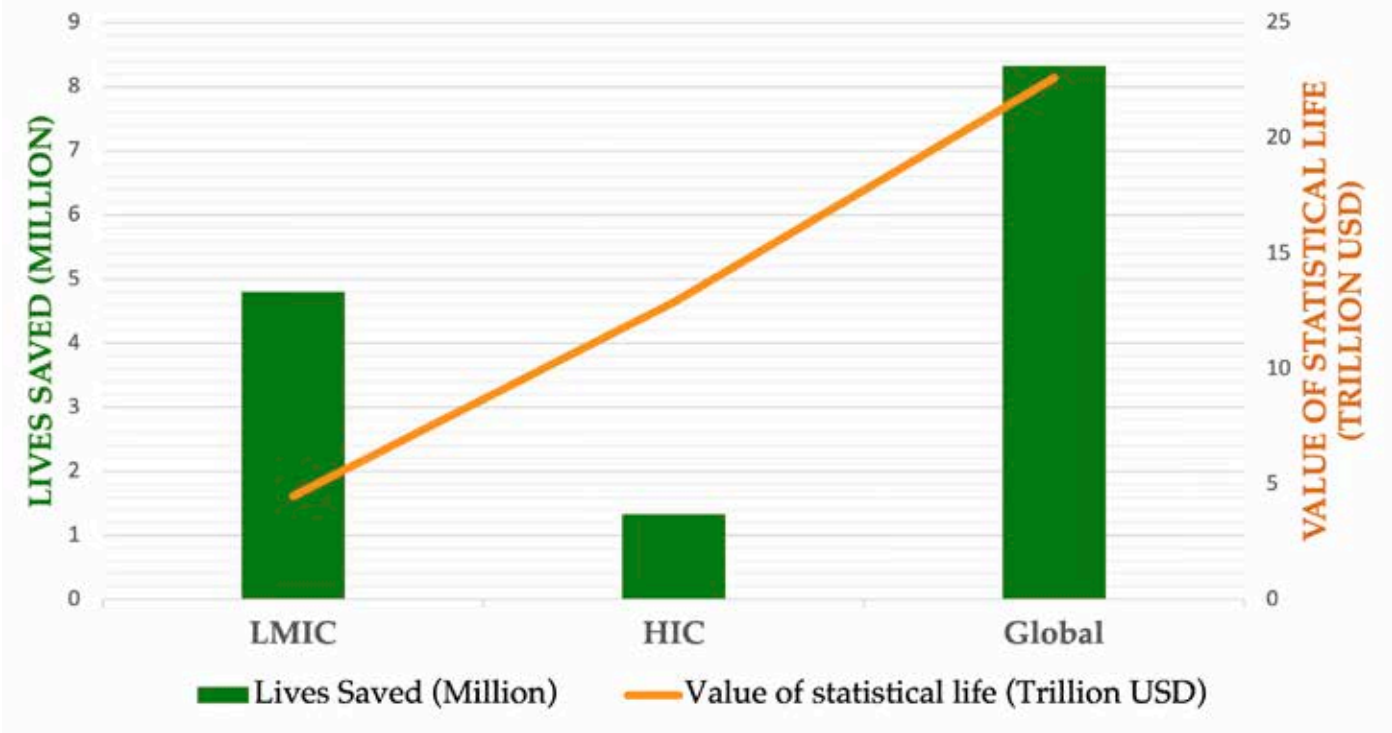
Besides being a revolutionary method for pandemic preparedness, the 100-Day Mission is also a crucial economic strategy. Pandemics have historically caused significant financial damage. For example, the COVID-19 pandemic cost the global economy $12.5 trillion by 2024 due to lost productivity, healthcare expenses, supply chain disruptions, and decreased customer confidence. Besides, it caused a 3.4% drop in global gross domestic product (GDP) in 2020, equating to over $2 trillion in lost output. If countries had implemented non-pharmaceutical interventions (NPIs) as effectively as they did historically, the 100-Day Mission could have prevented an estimated 8.33 million deaths (95% credible interval [CrI]: 7.70–8.68 million) globally, with the majority occurring in lower-middle-income countries. This would equate to a monetary benefit of approximately US$14.35 trillion (95% CrI: 12.96–17.87 trillion) based on the value of statistical life-years saved. Additionally, investments in manufacturing and health systems could further increase the number of deaths averted to 11.01 million (95% CrI: 10.60–11.49 million).

A postponed vaccination response during AH1N1 resulted in a heavy burden on healthcare systems and lost chances to stop deaths. On the other hand, the COVID-19 pandemic has brought to light the potential of rapid vaccine rollout to save billions of dollars in economic expenses and millions of lives.

Figure 1 presents a comparison of the estimated outcomes of vaccine deployment during the 100-Day Mission in terms of lives saved and financial gains in U.S. dollars. As shown, averted deaths would be higher on low-middle-income-countries (LMICs) than high-income-countries (HICs), nonetheless, as expected due to the higher quality of life, the value of statistical life is expected to be higher when prompt vaccination is implemented in High income countries.

International collaborations are essential to guaranteeing the equitable distribution of the resources and expertise required to implement the 100-Day Mission. International financial responsibilities, including investment in infrastructure, research, and innovation, address the difference between high- and low-income countries. During pandemics, these collaborations reduce inequities, guaranteeing universal vaccine access and promoting international economic stability .

Figure 1. Estimated impact of lives saved and economic benefits across pandemic scenarios with prompt vaccine deployment (100-Day Mission).
(Data obtained from: Barnsley G, Olivera Mesa D, Hogan AB, Winskill P, Torkelson



AA, Walker DG, et al. Impact of the 100 days mission for vaccines on COVID-19: a mathematical modelling study. Lancet Glob Health. 2024 Nov;12(11): e1764–74.)

In addition, the economic benefits of the 100-Day Mission extend across numerous sectors such as healthcare, tourism, education, and many others.

Conclusion

The 100-day Mission is a bold and necessary step forward regarding pandemic preparedness. By focusing on speed, scalability, commitment from stakeholders and governments, and overall equity, the strategy could help mitigate the catastrophic effects of future pandemics, preserve social cohesion and economic stability, and safeguard global health. The stakes of pandemic preparedness make the world more interconnected. The 100-day Mission is a road map for a more resilient, post-Covid world in which lessons learned from the past inform an aggressive and integrated response to future health challenges.

Furthermore, safety must never be sacrificed for speed. Incorporating Phase 4 post-marketing surveillance is crucial for tracking the safety and efficacy of vaccines throughout time, particularly in varied populations. In addition to enhancing accountability and promoting public trust, this long-term monitoring ensures that the rapid rollout of vaccines stays morally and scientifically reliable.

Finally, implementation of better surveillance methods and microbiological libraries, in addition to the speed of vaccine manufacturing, regulatory approval, capacity building, education, and implementation in LMICs in the event of a future pandemic remains uncertain, highlighting the urgent need for comprehensive and equitable structural adaptations.

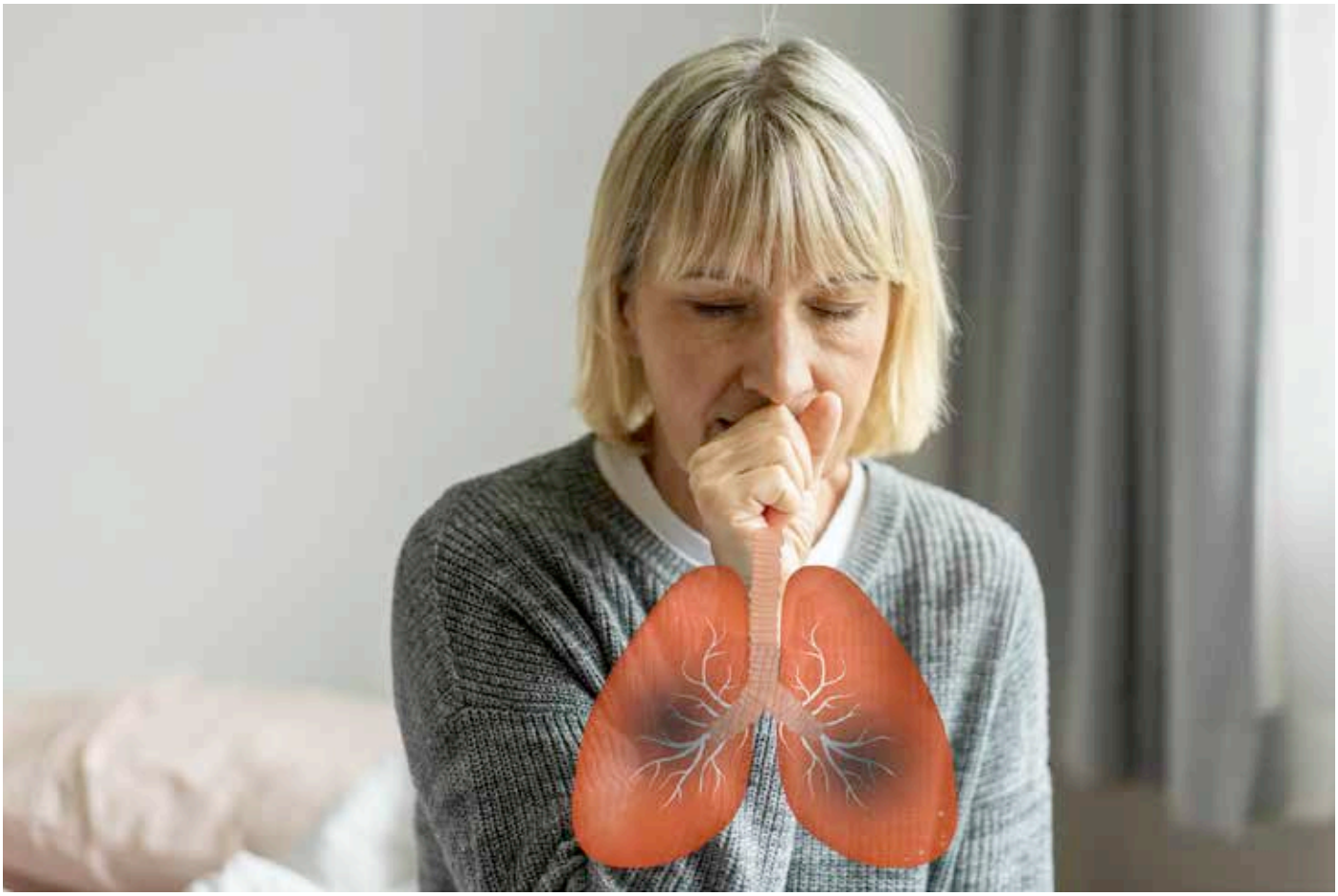
Acknowledgements:
To Dr. Yodira Guadalupe Hernandez-Ruiz from the School of Medicine, University of Monterrey, Mexico for the intense collaboration in the research and writing of this section.

References

1. Aligne CA. Lost Lessons of the 1918 Influenza: The 1920s Working Hypothesis, the Public Health Paradigm, and the Prevention of Deadly Pandemics. Am J Public Health. 2022 Oct;112(10):1454–64.
2. Morens DM, Taubenberger JK, Harvey HA, Memoli MJ. The 1918 influenza pandemic: Lessons for 2009 and the future: Crit Care Med. 2010 Apr;38:e10–20.
3. CDC. Centers for Disease Control and Prevention. 2019 [cited 2024 Dec 9]. 2009 H1N1 Pandemic (H1N1pdm09 virus). Available from: https://archive.cdc.gov/flu/pandemic-resources/2009-h1n1-pandemic.html
4. Khazeni N, Hutton DW, Garber AM, Hupert N, Owens DK. Effectiveness and Cost-Effectiveness of Vaccination against Pandemic (H1N1) 2009. Ann Intern Med. 2009 Dec 15;151(12):829–39.
5. Al Hajjar S, McIntosh K. The first influenza pandemic of the 21st century. Ann Saudi Med. 2010;30(1):1–10.
6. Figueroa JP, Hotez PJ, Batista C, Amor YB, Ergonul O, Gilbert S, et al. Achieving global equity for COVID-19 vaccines: Stronger international partnerships and greater advocacy and solidarity are needed. PLOS Med. 2021 Sep 13;18(9):e1003772.
7. Gouglas D, Christodoulou M, Hatchett R. The 100 Days Mission—2022 Global Pandemic Preparedness Summit. Emerg Infect Dis [Internet]. 2023 Mar [cited 2024 Dec 2];29(3). Available from: https://wwwnc.cdc.gov/eid/article/29/3/22-1142_article
8. Hatchett R. CEPI. Developing pandemic busting vaccines in 100 days. Available from: https://cepi.net//100-days
9. Bipartisan Commission on Biodefense. The Apollo Program for Biodefense: Winning the Race Against Biological Threats [Internet]. 2021. Available from: https://biodefensecommission.org/reports/the-apollo-program-for-biodefense-winning-the-race-against-biological-threats/
10. Li L, Wei Y, Yang H, Yan J, Li X, Li Z, et al. Advances in Next-Generation Coronavirus Vaccines in Response to Future Virus Evolution. Vaccines. 2022 Nov 29;10(12):2035.
11. Verma SK, Mahajan P, Singh NK, Gupta A, Aggarwal R, Rappuoli R, et al. New-age vaccine adjuvants, their development, and future perspective. Front Immunol. 2023 Feb 24;14:1043109.
12. Joe CCD, Segireddy RR, Oliveira C, Berg A, Li Y, Doultsinos D, et al. Accelerated and intensified manufacturing of an adenovirus‐vectored vaccine to enable rapid outbreak response. Biotechnol Bioeng. 2024 Jan;121(1):176–91.
13. Morabito KM, Cassetti MC, DeRocco AJ, Deschamps AM, Pierson TC. Viral Prototypes for Pandemic Preparedness: The Road Ahead. J Infect Dis. 2023 Oct 18;228(Supplement_6):S460–4.
14. Deschamps AM, DeRocco AJ, Bok K, Patterson LJ. Prototype Pathogens for Vaccine and Monoclonal Antibody Countermeasure Development: NIAID Workshop Process and Outcomes for Viral Families of Pandemic Potential. J Infect Dis. 2023 Oct 18;228(Supplement_6):S355–8.
15. Coalition for Epidemic Preparedness Innovations. Delivering Pandemic Vaccines in 100 Days. 2022.
16. Coalition for Epidemic Preparedness Innovations. CEPI. 2021 [cited 2024 Dec 2]. CEPI launches plan to tackle risk of future pandemics and epidemics. Available from: https://cepi.net//cepi-launches-plan-tackle-risk-future-pandemics-and-epidemics
17. Moore KA, Leighton T, Ostrowsky JT, Anderson CJ, Danila RN, Ulrich AK, et al. A research and development (R&D) roadmap for broadly protective coronavirus vaccines: A pandemic preparedness strategy. Vaccine. 2023 Mar;41(13):2101–12.
18. Cassetti MC, Pierson TC, Patterson LJ, Bok K, DeRocco AJ, Deschamps AM, et al. Prototype Pathogen Approach for Vaccine and Monoclonal Antibody Development: A Critical Component of the NIAID Plan for Pandemic Preparedness. J Infect Dis. 2023 Jun 15;227(12):1433–41.
19. International Pandemic Preparedness Secretariat. 100 days mission – Third Implementation Report [Internet]. 2024 [cited 2024 Dec 3]. Available from: https://ippsecretariat.org/publication/third-implementation-report/
20. Dyvik EH. Statista. 2024 [cited 2024 Dec 4]. Impact of the coronavirus pandemic on the global economy - Statistics & Facts. Available from: https://www.statista.com/topics/6139/covid-19-impact-on-the-global-economy/#topicOverview
21. Barnsley G, Olivera Mesa D, Hogan AB, Winskill P, Torkelson AA, Walker DG, et al. Impact of the 100 days mission for vaccines on COVID-19: a mathematical modelling study. Lancet Glob Health. 2024 Nov;12(11): e1764–74.
22. Farlow A, Torreele E, Gray G, Ruxrungtham K, Rees H, Prasad S, et al. The Future of Epidemic and Pandemic Vaccines to Serve Global Public Health Needs. Vaccines. 2023 Mar 17;11(3):690.
23. Li K, Al-Amin M, Rosko MD. Early Financial Impact of the COVID-19 Pandemic on U.S. Hospitals. J Healthc Manag. 2023 Jul;68(4):268–83.
24. Nayak J, Mishra M, Naik B, Swapnarekha H, Cengiz K, Shanmuganathan V. An impact study of COVID 19 on six different industries: Automobile, energy and power, agriculture, education, travel and tourism and consumer electronics. Expert Syst. 2022 Mar;39(3):e12677.
25. Salmanton-García J, Wipfler P, Leckler J, Nauclér P, Mallon PW, Bruijning-Verhagen PCJL, et al. Predicting the next pandemic: VACCELERATE ranking of the World Health Organization's Blueprint for Action to Prevent Epidemics. Travel Med Infect Dis. 2024 Jan;57:102676.
26. Saville M, Cramer JP, Downham M, Hacker A, Lurie N, Veken LV der, et al. Delivering Pandemic Vaccines in 100 Days — What Will It Take? N Engl J Med. 2022 Jul 13;387(2):e3.
27. Hernandez-Ruiz YG, Lopatynsky-Reyes EZ, Ulloa-Gutierrez R, Avila-Agüero ML, Rodriguez-Morales AJ, Basa JE, Nikiema FW, Chacon-Cruz E. 100-Day Mission for Future Pandemic Vaccines, Viewed Through the Lens of Low- and Middle-Income Countries (LMICs). Vaccines. 2025; 13(7):773. https://doi.org/10.3390/vaccines13070773
28. Hernandez-Ruiz YG, Lopatynsky-Reyes EZ, Ulloa-Gutierrez R, Avila-Agüero ML, Rodriguez-Morales AJ, Basa JE, Nikiema FW, Chacon-Cruz E. 100-Day Mission for Future Pandemic Vaccines, Viewed Through the Lens of Low- and Middle-Income Countries (LMICs). Vaccines (Basel). 2025 Jul 21;13(7):773. doi: 10.3390/vaccines13070773.

Best Practice

RESPIRATORY SYNCICIAL VIRUS VACCINATION IN ADULTS



Introduction:

Respiratory syncytial virus (RSV) is a leading cause of lower respiratory tract infections (LRTIs) and acute respiratory infections (ARIs), and poses a significant health threat, particularly to young children and older adults. RSV typically causes seasonal epidemics, with outbreaks generally occurring between October and May in the Northern Hemisphere and between May and September in the Southern Hemisphere. However, the timing and intensity of RSV epidemics can vary from year to year and across different geographic regions.

In healthy adults, RSV infection typically presents with mild, cold-like symptoms. However, in older adults and other vulnerable populations, it can lead to severe respiratory illness and acute cardiovascular complications. The U.S. Centers for Disease Control and Prevention (CDC) has identified several conditions that increase the risk of severe RSV disease in adults. These include cardiovascular disease, chronic respiratory

disease, renal disease, diabetes, neuromuscular disorders, chronic liver and hematologic conditions, severe obesity, moderate to severe immunocompromise, and residence in nursing homes or remote/rural communities. While these general risk factors provide a useful framework, it is essential for individual countries to assess and identify context-specific risk factors relevant to their populations and healthcare systems.

According to data from the Global Burden of Disease study, an estimated 338,495 deaths were attributed to RSV infection worldwide in 2019—an increase from 76,000 in 2016. Notably, in 2019, the mortality rate among adults aged over 70 years exceeded that of children under 5 years of age. While targeted interventions in young children have significantly reduced RSV-related mortality in this age group over time, RSV has emerged as a growing threat to older adults and individuals with comorbidities. The disease burden of RSV in older adults is now comparable to that of influenza, with similar rates of hospitalization and mortality, underscoring the urgent need for effective prevention strategies in this population.

Definitive diagnosis of RSV infection can be achieved through several methods, including viral culture, antigen detection, serologic testing for acute infection, and molecular techniques. Among these, molecular methods are preferred due to their high sensitivity, high specificity, and rapid turnaround time—often yielding results within a few hours. Real-time polymerase chain reaction (RT-PCR), particularly "singleplex" assays, is considered the most sensitive and reliable diagnostic tool for detecting RSV in adults.

The primary approach to managing RSV infection is supportive care, which may include oxygen therapy, antipyretics, chest physiotherapy, and measures to prevent complications such as pressure ulcers. Although various antiviral agents have been investigated, no specific antiviral treatment for RSV has been approved for routine clinical use.

Prevention of RSV infection, vaccines:

RSV is primarily transmitted through direct contact with respiratory secretions from infected individuals and, to a lesser extent, via droplets and contaminated surfaces. Standard infection prevention measures—such as hand hygiene, mask use, eye protection, and patient isolation—are recommended to reduce the spread of RSV.

Two monoclonal antibodies are currently approved for passive immunoprophylaxis in children: palivizumab, for high-risk infants, and nirsevimab, for broader use in infants and young children. However, there is a lack of robust data on the efficacy and cost-effectiveness of passive immunoprophylaxis in adult populations, including the elderly and those with comorbidities.

Currently, approximately 30 RSV vaccine candidates are undergoing clinical trials globally, with over 30 additional candidates in preclinical development. To date, three vaccines have been approved for active immunization in adults: **RSVPreF3**, **RSVpreF**, and **mRNA-1345**.

The **RSVPreF3** vaccine contains a recombinant RSV F glycoprotein stabilized in its prefusion conformation (PreF), combined with the AS01E adjuvant system. In contrast, **RSVpreF** is an adjuvant-free, bivalent vaccine that includes prefusion F proteins from both RSV subtypes A and B. While **RSVPreF3** is not technically bivalent, clinical studies have shown it provides strong protection against both RSV A and B subtypes.

The **mRNA-1345** vaccine is an unadjuvanted, mRNA-based formulation. It consists of lipid nanoparticles encapsulating a linear mRNA sequence that encodes the RSV prefusion F protein. Like RSVpreF, it offers protection against both RSV A and B subtypes.

In all randomized, placebo-controlled clinical trials, the three approved RSV vaccines have demonstrated over **60% vaccine efficacy (VE)** against all LRTIs compared to placebo, and over **90% efficacy** against **severe LRTIs**.

In a recent systematic review, Ricco et al. noted that a pooled meta-analysis was not feasible due to follow-up data on the three approved RSV vaccines being collected during different seasonal periods. However, they provided cumulative vaccine efficacy (VE) estimates across seasons separately for each vaccine. The VE against LRTIs with ≥3 symptoms was estimated at 78.38% for RSVPreF3, 84.36% for RSVpreF, and 62.88% for mRNA-1345. For protection against RSV-related ARIs, the VE estimates were 67.73%, 52.42%, and 53.59%, respectively.

The general characteristics of these vaccines are summarized in Table 1[1]

Attribute	RSVPreF3 (Arexvy)	RSVpreF (Abrysvo®)	mRNA-1345 (mResvia™)
Manufacturer	GlaxoSmithKline Biologicals SA	Pfizer Inc.	ModernaTX, Inc
FDA Approval Date	2023	2023	2024
Adjuvant	AS01E adjuvant	None	None
Mechanism	Subunit (protein) based	Subunit (protein) based	mRNA based
Indication	• Individuals ≥60 years of age • Individuals 50–59 years at increased risk for RSV-LRTI	• Individuals ≥60 years of age • Individuals 18–59 years at increased risk for RSV-LRTI • Pregnant women at 32–36 weeks gestational age	• Individuals ≥60 years of age
Contraindication	History of severe allergic reaction (e.g., anaphylaxis) to any component of the vaccine	Same as RSVPreF3	Same as RSVPreF3
Administration	Single dose; 0.5 mL; intramuscular	Single dose; 0.5 mL; intramuscular	Single dose; 0.5 mL; intramuscular

All studies have consistently confirmed a satisfactory safety profile for the RSV vaccines.

Moreover, RSV imposes a substantial economic burden, with hospitalization costs accounting for the majority of total expenses. In the United States, the annual direct medical cost associated with RSV-related hospitalizations in adults is estimated at approximately $1.3 billion US dollars.

A recent report assessed the socioeconomic value of adult immunization programs targeting four infections—influenza, pneumococcal disease, herpes zoster, and RSV—across 10 countries: Australia, Brazil, France, Germany, Italy, Japan, Poland, South Africa, Thailand, and the United States. The study found that cost-benefit analyses indicate these adult vaccines can deliver returns of up to 19 times the initial investment to society.

Conclusion:

RSV is a significant health concern not only in children but also in adults, particularly the elderly. With the increased use of advanced diagnostic methods, the true burden of RSV infections in older adults has become clearer through accumulating epidemiological data.

Preventing RSV infections in adults offers substantial benefits both at the individual and societal levels. Therefore, based on the latest scientific evidence and global practice recommendations, RSV vaccination should be incorporated into adult immunization programs as part of a comprehensive, lifelong vaccination strategy.

Bibliography:
1. Tanriover MD, Azap A, Cakir Edis E, Ozger HS, Pullukcu H, Sonmezer MC, Dursun OU, Merter S, Sayiner A. Respiratory syncytial virus (RSV) infections in adults: Current trends and recommendations for prevention - a global challenge from a local perspective. Hum Vaccin Immunother. 2025 Dec;21(1):2514357. doi: 10.1080/21645515.2025.2514357.
2. D'Ambrosio F, Lomazzi M, Moore M, Maida A, Ricciardi R, Munno L, Lettieri M, De Vito E, Ricciardi W, Calabrò GE. Addressing the Underestimated Burden of RSV in Older Adults in Europe: Epidemiology, Surveillance Gaps, and Public Health Implications. Vaccines (Basel). 2025 May 12;13(5):510. doi: 10.3390/vaccines13050510.
3. Papi A, Ison MG, Langley JM, Lee DG, Leroux-Roels I, Martinon-Torres F, Schwarz TF, van Zyl-Smit RN, Campora L, Dezutter N, de Schrevel N, Fissette L, David MP, Van der Wielen M, Kostanyan L, Hulstrøm V; AReSVi-006 Study Group. Respiratory Syncytial Virus Prefusion F Protein Vaccine in Older Adults. N Engl J Med. 2023 Feb 16;388(7):595-608. doi: 10.1056/NEJMoa2209604.

Table 2: Respiratory Syncytial Virus (RSV) Vaccination Recommendations in Adults (not including pregnancy) by Advisory Committees and Health Authorities Across Different Countries[1]:

Country	General Population (Age, years)	At Risk / Special Conditions (Age / Criteria)
USA	≥75	60–74 / At increased risk for severe RSV disease
Canada	≥75	≥60 / Residents of nursing homes & chronic care facilities 60–74 / Individual decision with provider consultation
UK	≥75	
Ireland	≥65	
Germany	≥75	
France	≥75	≥65 / With chronic respiratory or heart conditions
Belgium	>60	With ≥1 risk factor for severe RSV disease
Austria	≥60	≥18 / With underlying medical conditions
Norway	≥75	≥60 / With underlying medical conditions
Sweden	≥75	≥60 / With certain underlying diseases
Switzerland	≥75	≥60 / With increased risk of complications 18–59 / Individual decision with provider consultation
Poland	≥60	
Italy	≥75	≥60 / With increased risk of complications
Greece	≥75	≥60 / With concomitant medical conditions
Australia	≥75	≥60 / Aboriginal & Torres Strait Islander people ≥60 / With risk factors for severe RSV disease
Saudi Arabia	≥60	

4. Ison MG, Papi A, Athan E, Feldman RG, Langley JM, Lee DG, Leroux-Roels I, Martinon-Torres F, Schwarz TF, van Zyl-Smit RN, Verheust C, Dezutter N, Gruselle O, Fissette L, David MP, Kostanyan L, Hulstrøm V, Olivier A, Van der Wielen M, Descamps D; AReSVi-006 Study Group. Efficacy and Safety of Respiratory Syncytial Virus (RSV) Prefusion F Protein Vaccine (RSVPreF3 OA) in Older Adults Over 2 RSV Seasons. Clin Infect Dis. 2024 Jun 14;78(6):1732-1744. doi: 10.1093/cid/ciae010.
5. Walsh EE, Pérez Marc G, Zareba AM, Falsey AR, Jiang Q, Patton M, Polack FP, Llapur C, Doreski PA, Ilangovan K, Rämet M, Fukushima Y, Hussen N, Bont LJ, Cardona J, DeHaan E, Castillo Villa G, Ingilizova M, Eiras D, Mikati T, Shah RN, Schneider K, Cooper D, Koury K, Lino MM, Anderson AS, Jansen KU, Swanson KA, Gurtman A, Gruber WC, Schmoele-Thoma B; RENOIR Clinical Trial Group. Efficacy and Safety of a Bivalent RSV Prefusion F Vaccine in Older Adults. N Engl J Med. 2023 Apr 20;388(16):1465-1477. doi: 10.1056/NEJMoa2213836.
6. Walsh EE, Pérez Marc G, Falsey AR, Jiang Q, Eiras D, Patton M, Polack FP, Llapur C, Doreski PA, Zareba AM, Ilangovan K, Rämet M, Fukushima Y, Hussen N, Bont LJ, Cardona J, DeHaan E, Mikati T, Shah RN, Schneider K, Cooper D, Koury K, Lino MM, Anderson AS, Jansen KU, Swanson KA, Gruber WC, Schmoele-Thoma B, Gurtman A. RENOIR Trial - RSVpreF Vaccine Efficacy over Two Seasons. N Engl J Med. 2024 Oct 17;391(15):1459-1460. doi: 10.1056/NEJMc2311560.
7. Wilson E, Goswami J, Baqui AH, Doreski PA, Perez-Marc G, Zaman K, Monroy J, Duncan CJA, Ujiie M, Rämet M, Pérez-Breva L, Falsey AR, Walsh EE, Dhar R, Wilson L, Du J, Ghaswalla P, Kapoor A, Lan L, Mehta S, Mithani R, Panozzo CA, Simorellis AK, Kuter BJ, Schödel F, Huang W, Reuter C, Slobod K, Stoszek SK, Shaw CA, Miller JM, Das R, Chen GL; ConquerRSV Study Group. Efficacy and Safety of an mRNA-Based RSV PreF Vaccine in Older Adults. N Engl J Med. 2023 Dec 14;389(24):2233-2244. doi: 10.1056/NEJMoa2307079.
8. Riccò M, Cascio A, Corrado S, Bottazzoli M, Marchesi F, Gili R, Giuri PG, Gori D, Manzoni P. Efficacy of Respiratory Syncytial Virus Vaccination to Prevent Lower Respiratory Tract Illness in Older Adults: A Systematic Review and Meta-Analysis of Randomized Controlled Trials. Vaccines (Basel). 2024 May 5;12(5):500. doi: 10.3390/vaccines12050500.
9. Office of Health Economics (OHE). Contract Research Report. The Socio-Economic Values of Adult Immunisation Programmes, April 2024. Last accessed August 15, 2025. chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.ohe.org/wp-content/uploads/2024/04/Socio-Economic-Value-of-Adult-Immunisation.pdf.
10. CDC-RSV Vaccine Guidance for Adults, July 8, 2025. Last accessed August 15, 2025. https://www.cdc.gov/rsv/hcp/vaccine-clinical-guidance/adults.html.
11. Duan Y, Liu Z, Zang N, Cong B, Shi Y, Xu L, Jiang M, Wang P, Zou J, Zhang H, Feng Z, Feng L, Ren L, Liu E, Li Y, Zhang Y, Xie Z. Landscape of respiratory syncytial virus. Chin Med J (Engl). 2024 Dec 20;137(24):2953-2978. doi: 10.1097/CM9.0000000000003354.

Guest Contributors

NEONATAL TETANUS IN BURKINA FASO: THE PERSISTENT SHADOW AND THE NEED FOR REFINED PREVENTION STRATEGIES

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Introduction

Neonatal tetanus (NT), a brutal and preventable killer, continues to cast a long shadow over newborns in Burkina Faso. Despite significant global progress towards the elimination of Maternal and Neonatal Tetanus (MNT), defined as less than one NT case per 1000 live births annually at the district level, this agonizing disease remains a stark reality in many regions, including Burkina Faso. While official reports from areas like Bobo Dioulasso may show periods without cases, serological investigations reveal a more nuanced and concerning picture: pockets of vulnerability persist, threatening the hard-won gains and demanding renewed, targeted action.

The scope of the problem: a preventable tragedy

Tetanus, caused by the toxin of *Clostridium tetani* spores ubiquitous in the environment, is not transmitted person-to-person but enters through wounds, notably the unhealed umbilical stump of newborns born to non-immune mothers. Neonatal tetanus manifests as an inability to suck, rigidity, and painful spasms within the first 28 days of life. Even with intensive care, case fatality rates approach 100% without medical intervention. Globally, NT deaths have plummeted from an estimated 787,000 in 1988 to around 25,000 in 2018, a testament to the power of vaccination and clean delivery practices. However, this progress is uneven. In Burkina Faso, NT historically accounted for about half of all reported tetanus deaths, underscoring its disproportionate burden on the nation's infants. The Centers for Disease Control and Prevention (CDC) estimate over 270,000 NT deaths occur annually worldwide (deaths that are almost entirely preventable).

Why does NT persist in Burkina Faso? unpacking the challenges

The path to NT elimination hinges on two pillars: high tetanus toxoid-containing vaccine (TTCV) coverage among women of childbearing age (especially pregnant women) and ensuring clean delivery and cord care practices. Burkina Faso, like many resource-limited settings, faces formidable challenges on both fronts:

1. **Low and inequitable TTCV coverage:** achieving and sustaining high vaccination coverage is complex. Barriers include:

- **Limited access to Prenatal Care (PNC):** many women, particularly in rural areas, have limited access to or utilize PNC services consistently. Without regular PNC contact, receiving the recommended 2+ doses of TTCV during pregnancy becomes difficult.
- **Low maternal literacy:** as highlighted in the recent Bobo Dioulasso serosurvey (74% illiteracy rate among participants),

low education levels correlate with lower health-seeking behaviour and understanding of vaccine importance, impacting PNC attendance and vaccine acceptance.

- **Inconsistent vaccination schedules:** the study revealed a critical issue: while many women received multiple TTCV doses over successive pregnancies, these doses were often not administered according to the WHO-recommended schedule (e.g., adequate spacing between doses). This ad-hoc approach, driven by reliance on pregnancy as the main point of contact rather than a structured life-course immunization plan, significantly compromises the development and longevity of protective immunity. The research found no significant correlation between the total number of lifetime doses received and current antibody levels, emphasizing that timing and schedule adherence are paramount.
- **Weak record keeping:** inadequate vaccination records make it difficult to determine a woman's immune status and ensure she receives the correct number of doses at the right intervals.

2. **Suboptimal delivery and cord care practices:** despite efforts, unhygienic deliveries, sometimes attended by untrained birth attendants or family members using non-sterile instruments to cut the cord, persist. Contaminated materials used on the umbilical stump remain a significant risk factor.

3. **Health System Constraints:** weak health infrastructure, shortages of skilled birth attendants, inadequate supply chains for vaccines and sterile delivery kits, and logistical challenges in reaching remote populations compound the difficulties.

The serosurvey: illuminating immunity gaps

The serological investigation conducted in Bobo Dioulasso provides valuable insights beyond simple case reporting. Testing paired maternal and cord blood samples revealed:

1. **Generally good immunity:** the geometric mean titer (GMT) was 3.69 IU/mL in mothers and 3.76 IU/mL in newborns, indicating that most women receiving some vaccination during pregnancy achieved levels considered protective (>0.51 IU/mL by the ELISA test used).

2. **Strong correlation:** a highly significant correlation (Spearman's coefficient=0.86) between maternal and neonatal antibody levels confirmed efficient transplacental transfer in this healthy cohort.

3. **Alarming vulnerabilities:** crucially, 7% of mothers and 8% of newborns had no detectable tetanus antibodies. These infants were utterly unprotected in their most vulnerable period. Analysis of these cases pointed towards key risk factors: maternal illiteracy and, most significantly, failure to receive any TTCV doses during the current pregnancy (5/7 seronegative mothers received zero doses). One protected newborn was born to a mother with a very low titer (1 IU/mL).

4. **The dose and schedule imperative:** the study confirmed that receiving TTCV doses during the current pregnancy was moderately correlated with higher antibody levels (Spearman's coefficient=0.3). However, it starkly highlighted that simply accumulating doses over multiple pregnancies without adhering to the recommended schedule does not guarantee sustained, high-level protection. The number of doses received in the specific current pregnancy was the stronger predictor than the total lifetime doses.

The way forward: precision interventions for elimination

The persistence of non-immune mothers and newborns, even amidst overall reasonable GMTs, signals that Burkina Faso's MNT elimination strategy needs refinement. Elimination is a binary target: one unprotected infant is one too many. Building on current efforts, here are key recommendations:

5. **Strengthen lifelong TTCV immunization:** Move beyond relying solely on pregnancy for vaccination. Integrate TTCV into routine adolescent and adult women's health services. Ensure girls completing childhood vaccination receive adolescent boosters. Implement a robust system to track TTCV doses throughout a woman's life, using durable, portable records. Vaccination during pregnancy should focus on completing schedules or providing boosters based on documented prior history, not just giving doses indiscriminately at every pregnancy contact.

6. **Targeted outreach for zero-dose mothers:** Identify and actively reach women who miss PNC or vaccinations during pregnancy. Community health workers are vital for tracing, educating, and facilitating access. The serosurvey clearly identifies these women as the highest risk group for delivering unprotected newborns.

7. **Enhanced health education:** Develop culturally appropriate, simple messaging (using local languages and concepts) addressing illiteracy barriers. Focus on the importance of at least two correctly timed TTCV doses in each pregnancy, clean delivery, and hygienic cord care. Engage communities, men, and traditional leaders.

8. **Invest in clean births:** Scale up training and deployment of skilled birth attendants. Ensure consistent availability of sterile delivery kits (including clean blades and cord clamps) at all delivery points, including homes. Promote facility births where possible.

9. **Robust surveillance and seromonitoring:** Continue and strengthen NT case surveillance. Supplement clinical reporting with periodic serosurveys like the one in Bobo Dioulasso to identify immunity gaps at the sub-national or district level, allowing for micro-targeting of SIAs or outreach programs.

10. **Leverage existing platforms:** Integrate TTCV promotion and delivery into other high-contact maternal and child health programs (e.g., malaria IPTp distribution, nutrition programs, family planning).

Conclusion

Neonatal tetanus in Burkina Faso is not a mystery; it is a failure of access, systems, and sometimes, implementation precision. The tragedy lies in its preventability. The study, we conducted, shines a light on the critical gap: women slipping through the net and receiving no vaccine during their pregnancy, leaving their newborns defenseless. While commendable progress has been made, true elimination demands moving beyond aggregate coverage figures. It requires a relentless focus on finding every at-risk woman, ensuring she receives at least two properly spaced TTCV doses in each pregnancy based on her lifelong immunization record, and guaranteeing a clean birth for her child. By refining strategies to address these specific vulnerabilities with precision and sustained commitment, Burkina Faso can finally consign neonatal tetanus to the history books, ensuring every child has the chance to survive and thrive free from this devastating disease. The shadow can be lifted.

Sourced from:

1. **Frederic Nikiema,** Serge Yerbanga, Aminata Fofana, Fabrice Some, Zachari Kabre, Jean-Bosco Ouedraogo. **Immunization against tetanus during pregnancy: Serological investigation for maternal and neonatal antibodies in west region of Burkina Faso, Bobo Dioulasso**. 65th Annual Meeting of the American Society of Tropical Medicine and Hyigiene (ASTMH), Atlanta, Georgia, 2019, poster #464, doi: 10.13140/RG.2.2.34828.51843.

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