

Commentary On A Research Paper Outlining The Successes Of Global Immunization Plans

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Introduction

Peter Hotez's 2019 commentary on vaccine diplomacy reviewed major achievements in global immunization and argued that scientific cooperation can protect health even when political relations are difficult. The original response celebrates progress but includes errors: HIV/AIDS is not a neglected tropical disease, influenza mortality was not reduced through one unified childhood plan, and predictions made for 2020 should not be reported as current outcomes. By 2025, global coverage with three doses of diphtheria-tetanus-pertussis vaccine was about 85%, while 13.5 million children remained completely unvaccinated. The Immunization Agenda 2030 mid-term review found that most targets were off track despite millions of deaths averted and important vaccine introductions. A current commentary must therefore hold two truths together: vaccination is one of public health's greatest achievements, and unequal access, conflict, misinformation, financing pressure, and weak health systems continue to leave large immunity gaps.

The Paper's Central Idea

Vaccine diplomacy refers to international cooperation in vaccine research, development, manufacturing, delivery, or disease control. Hotez links it to historical programs in which countries with political differences collaborated against shared pathogens. The concept includes formal institutions such as the World Health Organization, UNICEF, Gavi, national agencies, laboratories, and manufacturers, as well as scientific relationships. Its strength is the recognition that microbes cross borders and that cooperation can create mutual benefit. Its weakness is that the word diplomacy can conceal unequal power over funding, patents, manufacturing, and agenda setting. (World Health Organization, 2026)

Achievements of Routine Immunization

Vaccines have reduced illness and death from smallpox, polio, measles, tetanus, pertussis, diphtheria, hepatitis B, meningitis, pneumonia, rotavirus disease, and other infections. Smallpox eradication remains the clearest global success. Polio has been eliminated from most countries, although transmission has not ended everywhere. Introduction of pneumococcal, rotavirus, HPV, malaria, and other vaccines has expanded the meaning of routine immunization. These achievements result from discovery plus manufacturing, cold chains, trained workers, surveillance, financing, and public

participation.

Current Coverage

WHO reported that in 2025 approximately 85% of infants received all three DTP doses. The percentage was stable rather than sufficient. About 13.5 million children were “zero-dose,” and millions more started but did not complete schedules. First-dose measles coverage was 84%, below the level needed to prevent outbreaks in many settings. Global first-dose HPV coverage among girls reached 33%, a substantial improvement from 2019 but far from the 2030 target. Global averages hide major differences between and within countries.

Immunization Agenda 2030

IA2030 is the global strategy for 2021–2030 and aims for everyone, at every age, to benefit from vaccines. It emphasizes country ownership, primary health care, equity, life-course vaccination, outbreak control, sustainable supply, and innovation. The 2025 mid-term review concluded that most targets were off track after the COVID-19 pandemic, conflict, climate disruptions, and financial constraints. It called for stronger country programs, better data, priority for zero-dose children, and support for fragile and middle-income settings. A plan should be judged by coverage and disease outcomes, not only by doses financed. (World Health Organization, 2025)

Zero-Dose Children and Equity

A zero-dose child has not received the first DTP-containing vaccine, a marker of exclusion from essential health services. These children are often concentrated in remote communities, informal settlements, conflict zones, displaced populations, and marginalized groups. National coverage can appear high while particular districts remain dangerously under-vaccinated. Reaching them requires mapping, community health workers, mobile services, reliable supply, and integration with nutrition and primary care. Equity is not an optional moral addition; pockets of low coverage permit outbreaks that threaten wider populations.

Conflict and Humanitarian Settings

War destroys clinics, interrupts electricity and transport, displaces families, and endangers health workers. Parties may distrust campaigns or manipulate access. Negotiated days of tranquility and cross-border coordination have supported past vaccination efforts, but short campaigns cannot replace a functioning health system. Programs must protect neutrality, train local staff, maintain records across displacement, and plan catch-up schedules. Vaccine diplomacy is most credible when communities participate in decisions rather than receiving externally designed operations without

accountability.

Supply, Manufacturing, and Financing

A vaccine can be licensed yet unavailable because production is concentrated, demand forecasts are uncertain, or countries cannot finance procurement and delivery. Diversified manufacturing and technology transfer can improve security, but facilities require quality systems, skilled personnel, reliable demand, and regulatory capacity. Gavi and other mechanisms have expanded access, while countries transitioning from donor support face fiscal pressure. Sustainable programs fund routine staff and logistics rather than depending only on emergency campaigns.

Research and Neglected Diseases

Hotez has emphasized vaccines for diseases associated with poverty. Research pipelines often underinvest in products that offer limited commercial return. Public, philanthropic, and international partnerships can share risk. HIV remains a major global infection but is not classified as a neglected tropical disease, and a preventive HIV vaccine has remained scientifically difficult. The term “neglected” should be applied accurately. Research priority should consider disease burden, feasibility, equity, and the needs of affected communities.

Trust and Misinformation

Coverage depends on confidence in institutions as well as supply. Rumors may draw on genuine histories of exclusion, medical abuse, political conflict, or poor communication. Calling all hesitant people ignorant can deepen resistance. Programs should disclose benefits, risks, uncertainty, adverse-event monitoring, and compensation mechanisms. Trusted local clinicians, religious leaders, teachers, and community organizations can answer questions. Digital misinformation requires rapid correction, but censorship alone cannot create trust.

Safety and Surveillance

Vaccines are evaluated before authorization and monitored afterward because rare adverse events may become visible only when millions of doses are used. Countries need reporting systems, laboratory investigation, expert review, and communication that distinguishes events occurring after vaccination from events caused by it. Hiding uncertainty undermines confidence, while sensationalizing unverified reports causes preventable fear. Strong pharmacovigilance is part of immunization success, not evidence that vaccines are unsafe. (Hotez, 2019)

Integration with Primary Health Care

A campaign can raise coverage quickly, but routine immunization requires repeated contact with families. Integrating vaccination with antenatal care, birth registration, growth monitoring, and other services improves continuity. It also prevents programs from extracting data or delivering one product while ignoring broader needs. However, adding too many tasks to underfunded workers can reduce quality. Integration must be supported with staffing, time, and interoperable records.

Measuring Success

Counting administered doses is necessary but incomplete. Programs should measure timely completion, geographic and socioeconomic equity, disease incidence, outbreak response, vaccine wastage, stockouts, safety, and public confidence. Coverage estimates combine country reports and surveys and contain uncertainty. Subnational data are essential, but they must be protected from misuse and interpreted with local knowledge. An impressive global number can coexist with preventable deaths in excluded communities.

The Role of Diplomacy

Diplomacy can sustain surveillance, share pathogen samples, harmonize regulation, finance common goods, and keep supply routes open. It can also become competitive, as governments use vaccine donations for influence or restrict exports during crisis. Ethical diplomacy requires transparency, reciprocity, and attention to recipient priorities. Scientific collaboration is more durable when local institutions gain capacity rather than remaining dependent on external missions.

Measles and Outbreak Risk

Measles coverage is an especially useful test of whether immunization systems are reaching children consistently. The virus spreads so efficiently that modest immunity gaps can produce large outbreaks. In 2025, first-dose measles coverage was about 84%, and second-dose coverage remained lower in many settings. National averages can therefore appear acceptable while districts, displaced populations, or urban settlements remain vulnerable. Outbreak response should include rapid case confirmation, contact investigation, supplementary vaccination where indicated, and clear communication about risk. However, repeated emergency campaigns are a warning that routine services are not reaching families on time. Sustainable success means preventing the accumulation of susceptible children rather than responding only after hospitals and communities are already under pressure.

Life-Course Immunization and New Vaccines

Modern immunization policy extends beyond early childhood. Adolescents may need HPV vaccination, pregnant people may be offered vaccines that protect both parent and infant, health workers require occupational protection, and older adults or people with chronic conditions may benefit from influenza, pneumococcal, COVID-19, shingles, or other vaccines according to national guidance. New malaria vaccines also demonstrate that product development can address diseases long concentrated in lower-income countries, although introduction requires financing, supply planning, surveillance, and integration with other malaria-control measures. A life-course approach makes programmes more comprehensive, but it should not divert attention from children who still miss basic doses. Countries need schedules based on local disease burden, cost-effectiveness, feasibility, and equity rather than adopting every available product without implementation capacity.

Governance, Intellectual Property, and Local Capacity

Vaccine diplomacy is credible only when governance arrangements are transparent. During shortages, governments and manufacturers may prioritize domestic markets, negotiate confidential prices, or protect technology in ways that limit access elsewhere. Intellectual-property rules are one part of this debate, but manufacturing also depends on specialized knowledge, quality control, raw materials, regulatory oversight, and stable purchasing commitments. Technology transfer should therefore include training, validated processes, regulatory strengthening, and long-term demand, not merely a license announcement. Regional production can reduce vulnerability, yet poorly planned facilities may remain underused or financially unsustainable. International partnerships should disclose decision criteria, include affected countries in governance, and build institutions capable of conducting research, authorizing products, monitoring safety, and managing supply independently over time.

From Catch-Up Campaigns to Resilient Systems

Catch-up initiatives are necessary when crises interrupt vaccination, but they should lead back to reliable routine care. A resilient programme knows which children missed doses, maintains cold-chain equipment, protects health workers, communicates across languages, and can continue during floods, conflict, migration, or economic disruption. Digital registries may improve follow-up, but they require privacy safeguards, accurate identity matching, electricity, connectivity, and alternatives for people without documents. Community participation is equally important. Families can identify inconvenient clinic hours, transport barriers, disrespectful treatment, or rumors that central planners may not see. Resilience is therefore not only technical preparedness; it is the ability of institutions to learn from communities and maintain trusted services under stress.

Conclusion

Global immunization plans have prevented extraordinary amounts of disease, but the current picture is not a steady march toward universal coverage. In 2025, DTP3 coverage remained about 85%, millions of children missed doses, and most IA2030 targets were off track. Hotez's concept of vaccine diplomacy remains valuable because cooperation can protect populations despite political division. It must be joined with strong national programs, equitable financing, distributed manufacturing, reliable safety systems, primary care, and community trust. Success is not the announcement of a target or the invention of a vaccine; it is timely protection that reaches people excluded by poverty, conflict, geography, and discrimination. The next phase of immunization requires preserving past achievements while confronting these persistent gaps honestly.

References

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