Adult Immunization

Editors
Tushar P Shah
Niranjan Shendurnikar
Abhay K Shah
Naveen Thacker



Forewords
Stanley A Plotkin
M Singaravelu

2nd Edition

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CHAPTER 1

Adult Immunization: An Unmet Need

Banshi Saboo

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Q1. What is the rationale for adult immunization?

Vaccination in childhood has shifted disease patterns, with many infections now occurring in adults due to waning immunity or lack of natural boosting. Major outbreaks and disease burdens in adults include diphtheria, measles, mumps, rubella, pneumococcal pneumonia, influenza, hepatitis B, and tetanus. Adults, especially those over 18 years, are a key target for immunization to prevent outbreaks, control disease transmission, and protect high-risk groups such as travelers, immunocompromised individuals, and healthcare workers. WHO's Strategic Advisory Group of Experts (SAGE) recommends expanding immunization efforts beyond infancy for disease elimination and control.

Adult immunization is a vital public health strategy to address rising vaccine-preventable diseases (VPDs), aging population, and antimicrobial resistance. India has the highest population globally, with the elderly population (8.6% in 2011) increasing rapidly. Aging leads to immunosenescence, reducing immune response and vaccine efficacy. There is a high burden of mortality/morbidity from VPDs such as influenza, pneumonia, typhoid, and cervical cancer. VPDs cause significant health costs; over 80% of these costs occur among the unvaccinated. Waning immunity from childhood vaccines and incomplete immunization coverage in adults make them vulnerable to various VPDs. Increased vulnerability due to chronic diseases, exposure from children, and rising antimicrobial resistance complicates treatment and increases costs.

Q2. Why are adults and elderly persons being recognized as potential candidates to benefit from vaccines and immunization?

India continues to have a well-managed immunization program for infants, children, and pregnant women for more than five decades now. Frequent outbreaks of Japanese B encephalitis in North East India in the past few years, the H1N1 pandemic in 2009, and the recent COVID pandemic in 2020 expanded the use of vaccines beyond childhood in adults. These diseases also contributed to increased awareness of the need for vaccines in adults and special populations. Many of the adults who may not have completed scheduled childhood immunizations would have been exposed to some of the infectious diseases and acquired immunity against them by subclinical/clinical infections around them. However, not all adults, especially those at high risk, would be protected in this way, adding to immunity gaps/lack of adequate protection in adults. A few examples of such VPDs include hepatitis A, varicella, and mumps. Besides, antigenic drift (e.g., influenza virus) can offer

protection for a limited period, and hence, annual influenza vaccination has become a routine in many developed countries.

Thus, there is a growing need for the selective use of vaccines that are conventionally used for children to be used in adults against VPDs, some of which can have increased morbidity and mortality in adults and elderly populations.

Q3. What are the barriers to adult immunization?

Adult immunization in India faces multiple challenges that limit its widespread adoption. There is limited awareness among both healthcare providers and the general public about the significance of adult VPDs, along with doubts regarding vaccine efficacy and safety in adults. Vaccination practices are often selective, focusing on specific high-risk groups rather than being universally implemented. Reaching healthy adults remains difficult due to their poor integration into public health systems, and most adult vaccines are not included in routine government programs [National Immunization Program (NIP)].

Financial constraints, high vaccine costs, and lack of insurance coverage, compounded by insufficient data on the burden of adult VPDs in India, further hinder expansion. Additionally, there is a pressing need for increased research and development to create affordable, safe, and effective vaccines. Historically, the absence of uniform national guidelines and the exclusion of adult immunization from the 2011 National Vaccine Policy reflect limited political will and commitment, with no dedicated adult immunization program in place.

Other barriers include scarce cost-effectiveness data, vaccine hesitancy, infrastructure gaps such as lack of adult immunization centers and tracking systems, and operational challenges such as stock management, absence of standing orders, and vaccine wastage concerns. Consequently, the reliance on out-of-pocket payments imposes a significant financial burden on individuals and society.

Q4. What are the unmet needs of adult immunization?

Adult vaccination coverage is significantly lower than childhood immunization rates. Many adults remain unvaccinated or partially vaccinated. The key factors and unmet needs are as follows:

Policy-level gaps

- Lack of a national adult immunization schedule
- Limited integration into primary healthcare
- Low prioritization in national programs

Health system barriers

- Absence of adult vaccination clinics
- Poor tracking and recall systems
- Inadequate physician recommendation

Economic barriers

- High out-of-pocket expenditure
- Low willingness to pay for adult vaccines

Awareness and behavioral barriers

- Lack of awareness
- Fear of side effects
- Perception of "not needed"

Sociocultural barriers

- Misconceptions (e.g., HPV as only for females)
- Vaccine hesitancy fueled by misinformation

Q5. What are the strategies to address the unmet needs?

The need for an effective immunization program and implementation would need a

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multisectoral approach and is long overdue to extend the benefits to a significant number of adult populations. Though vaccines and immunization have been a quintessential part of preventive health for children, having remained child centric, an effective and structured ecosystem needs to evolve over a period of time to make an effective headway in this direction. It must also be emphasized that the need for vaccines extends well beyond childhood thus paving the way to extend it as a life-course immunization. The strategies would thus include:

Policy interventions

- Develop National Adult Immunization Program
- Integrate into Ayushman Bharat/primary care

Healthcare system strengthening

- Establish adult vaccination clinics
- Digital immunization records

Physician engagement

- Strong recommendation by doctors significantly improves uptake.

Public awareness

- Mass campaigns
- Workplace vaccination programs

Financial strategies

- Subsidies or insurance coverage
- Public–private partnerships

Life-course immunization model

- Proposed frameworks like YUVA initiative for young adults

Q6. What evidence and data support adult vaccination?

A modeling study from South Africa demonstrated that the use of pneumococcal conjugate vaccine (PCV13) in adults is cost-effective, with an incremental cost-effectiveness ratio (ICER) of approximately $711 per quality-adjusted life year (QALY) gained for pneumococcal disease prevention. This cost-effectiveness evidence supports the economic viability of adult pneumococcal vaccination programs in middle-income settings. There is a need for similar data in India to support adult immunization efforts.

Q7. What are the programmatic interventions needed to address these challenges?

To address these challenges, several programmatic strategies have been proposed:

- *Behavior change communication (BCC):* Targeted public health messaging to improve vaccine acceptance
- *Health system strengthening:* Ensuring cold chain, logistics, and vaccine availability
- *Policy integration*: Inclusion of adult vaccines under schemes such as Ayushman Bharat
- *Capacity building*: Training healthcare workers to recommend and administer vaccines
- Establishing disease registries and surveillance systems for adverse events is critical.

The current status underscores the critical gaps in adult immunization practices and the substantial and multifactorial barriers to providing optimal vaccination coverage to adults in India. As immunizations remain a part of preventive medicine, a framework of enhanced public awareness, optimized healthcare policies, public–private partnerships, and the establishment of accessible vaccination centers would go a long way to establish a long-overdue policy for adult immunization. It would be a forward step for India to ensure and put in place a more effective and resilient public healthcare system.

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Key Messages

- Vaccination is widely recognized as one of the most effective public health interventions, significantly reducing morbidity and mortality associated with infectious diseases.
- The exact burden of VPDs in India is not well established, but it is crucial to explore this area further to strengthen the evidence supporting the need for adult immunization.
- Studies from other countries, such as the United States and Canada, have demonstrated the cost-effectiveness of adult vaccination programs.
- To improve coverage, public health campaigns should focus on educating adults about the benefits of vaccination and dispelling myths through media, social networks, and community engagement. Training and incentivizing healthcare providers to recommend and administer vaccines can also play a crucial role.

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Adult Immunization

Vaccination is no longer confined to childhood. The growing recognition of the benefits of immunization across adolescence, adulthood, and older age has made life-course immunization an essential component of preventive healthcare.

This second edition provides a practical, evidence-based resource for healthcare professionals to understand, recommend, communicate, and implement vaccination across all stages of life.

Salient Features

- Life-course approach to immunization: Highlights the expanding role of vaccination beyond childhood, with emphasis on adolescents, adults, and older adults
- Comprehensive and up to date: Covers the fundamentals of vaccinology and immunology, current recommendations, evolving concepts, and practical immunization strategies
- Practical FAQ-based format: Addresses important clinical questions in a simple, accessible format that facilitates understanding, recall, and application in everyday practice
- Expert-authored content: Comprises 33 chapters contributed by experts in infectious diseases, vaccinology, and immunization, covering scientific, clinical, and practical aspects of vaccination
- A ready reference for clinical practice: Provides a concise and practical resource to help healthcare professionals confidently understand, recommend, and implement immunization
- Bridging science and practice: Goes beyond vaccine science to address vaccine communication, confidence, acceptance, and strategies to improve immunization coverage across the life course

Tushar P Shah MD (Pediatrics) FIAP LLB MBA is Chief Consultant and Director, Navkar Children Hospital and Vaccination Centre, Vadodara; Director, Department of Clinical Research, Kashiben Gordhandas Patel Children Hospital, Vadodara; and Founder and Director, emVac Healthcare Solutions Private Limited. He was President of the Academy of Pediatrics, Gujarat (2024); has served on the COVID-19 Task Force, Gujarat; and is a recipient of the prestigious FIAP Award (2025). His professional interests include immunization, vaccinology, clinical research, and adolescent and adult vaccination.

Niranjan Shendurnikar MD (Pediatrics) FIAP is a child health consultant and former Associate Professor of Pediatrics at Government Medical College, Vadodara, Gujarat, India. With over 35 years of experience in pediatrics, he has authored and edited several books, chapters, scientific articles, and educational resources. A recipient of the FIAP Award (1998), he has served multiple terms on the Executive Board of the Indian Academy of Pediatrics and contributed extensively to pediatric education, immunization, and evidence-based practice.

Abhay K Shah MD (Pediatrics) D Ped FIAP is a senior pediatrician and infectious diseases consultant with over 40 years of experience in pediatric practice in Ahmedabad, Gujarat. He is Director of Dr Abhay K Shah Children Hospital in Ahmedabad and a recipient of the FIAP Award (2012). He is Past President of the Academy of Pediatrics, Gujarat, and Past Chairperson of the Infectious Diseases Chapter of the Indian Academy of Pediatrics. He was also a member of ACVIP in 2018–19 and 2020–21. His areas of interest include vaccines and vaccinology, infectious diseases, pulmonology, and community pediatrics.

Naveen Thacker MD (Pediatrics) FIAP is a senior pediatrician, vaccinology expert, and global child health leader with over 35 years of experience in pediatrics, immunization, polio eradication, and public health. He is Executive Director of the International Pediatric Association, Director of Deep Children Hospital and Research Centre, Gandhidham, Gujarat; Co-Chair of the IPA Immunization Program Area; and Scientific Committee Member of ADVAC, France. He was also President of the IPA (International Pediatric Association) in 2023–25. He has held several national and international leadership positions and has contributed extensively to vaccine policy, advocacy, communication, and evidence-based immunization practices.

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