Morbidity and complications associated with vaccine-preventable diseases

Vaccine-preventable diseases (VPDs) contribute substantial morbidity and mortality across age groups, and remain a major global health concern[1]



Infants are particularly vulnerable to *severe disease* owing to their *immature immune* systems[2]



Adolescents and young adults serve as *carriers of certain infections* and play a critical role in the *maintenance and transmission* of VPDs within populations[3]



VPDs can result in substantial morbidity, long-term complications, and life-threatening outcomes.[4]

Respiratory diseases

RSV*	Prior to RSV prevention strategies, **58K-80K** hospitalizations/yr in children <5 yo[5] and 2%–3% in infants aged <3 months[6]
Influenza*	**7K-26K** hospitalizations/yr in children <5 yo;[7] **280** pediatric deaths reported in 2024-2025 season[8]
Pneumococcal disease*	**~17K** cases and **200** deaths/yr in children <5 yo[9]
Pertussis*	**200K** cases/yr[10]

Invasive† and neurological diseases

Hib*	**~20K** cases and **~1K** deaths/yr in children <5 yo[11]
Meningococcal disease	**10–15%** case-fatality rate; **long-term sequelae** (hearing loss, neurological damage, limb amputation) in **~20%** of survivors[12]
Poliomyelitis	Acute flaccid paralysis and post-polio syndrome[13]

Gastrointestinal/ enteric diseases

Rotavirus*	**55K–70K** hospitalizations and 20–60 deaths/yr in children <5 yo[14]
Hepatitis A*	**15–20** cases per 100K children 2–18 yo[15]

Exanthematous (rash) viral diseases

Measles*	**3–4** million cases and **400–500** deaths/yr[16]
Chickenpox*	**~10K–13K** hospitalizations/yr[17] (~4 million cases)

Systemic infection

Hepatitis B	Up to **90%** of infected infants develop chronic Hep B infection[18]
	Increased risk of hepatocellular carcinoma and liver failure[19]

Mucosal infection

Human Papillomavirus	**~49K** HPV-associated cancers annually[20]
	Includes cervical, anogenital, head and neck cancers[21]

*During pre-vaccine era

†Pneumococcal disease can also result in rare invasive outcomes

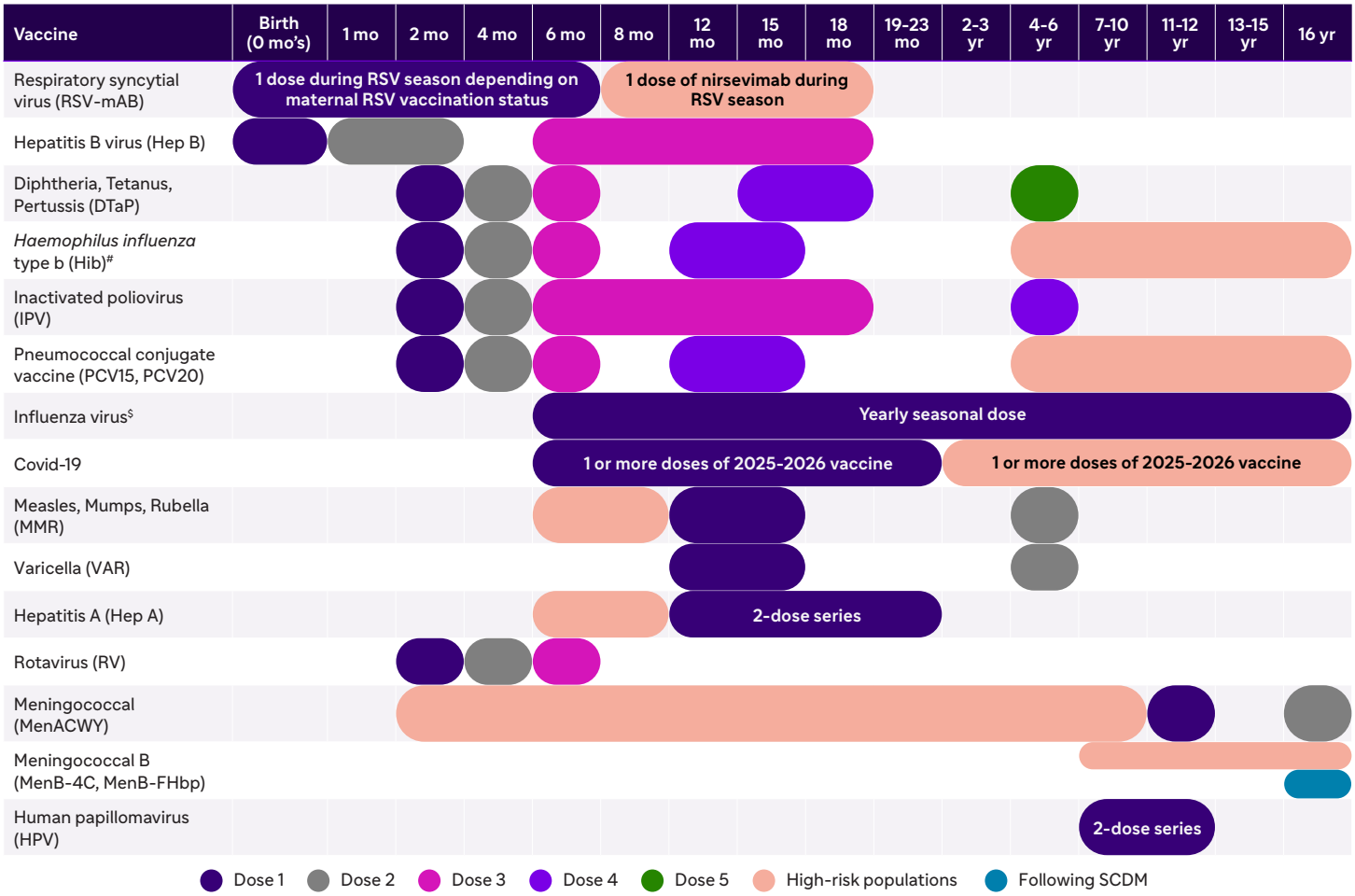
Immunization lowers disease burden across populations spanning all age groups[4,22]

sanofi

MAT-US-2608767 – v1.0 – 01/31/2027

An Evidence-Based Approach to Comprehensive and Timely Immunization

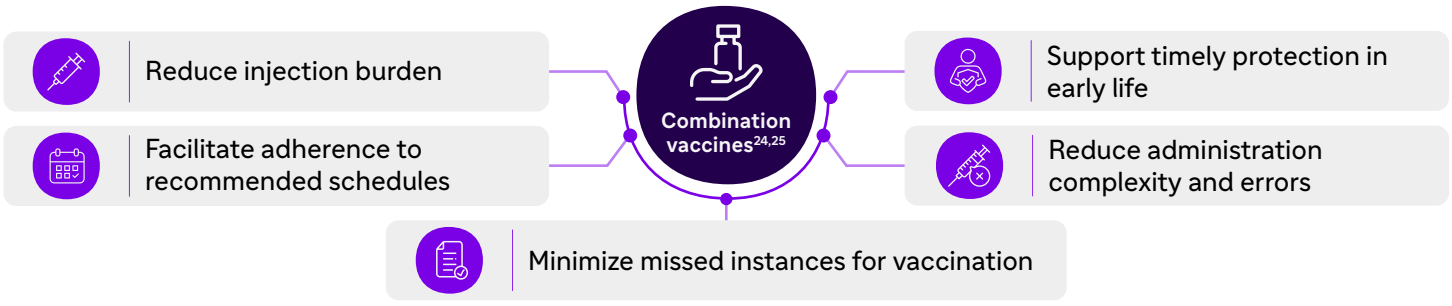
AAP Recommended Child and Adolescent Immunization Schedule, 2026[23]



This is an adapted version of the 2026 AAP immunization schedule. Refer to the complete AAP schedule for detailed recommendations regarding catch-up immunization, special medical conditions, and clinical decision-making. #Hib vaccination schedules vary by vaccine product and age at first dose. High-risk populations (asplenia, HIV, immunodeficiencies) may require additional doses. $Annual influenza vaccination is recommended for most children. Children aged 6 months to 8 years who have received fewer than 2 influenza vaccine doses before July 1, 2025, or have unknown vaccination history should receive 2 doses at least 4 weeks apart.

Scientific advancements have enabled new approaches to preventing VPDs that can affect children early in life.[24] However, administering each vaccine as a separate injection can complicate the immunization schedule and reduce accessibility.

Combination vaccines simplify immunization programs by providing protection against multiple pathogens in fewer injections, making vaccination schedules easier to manage.[24,25]



Examples of combination vaccines include

- DTaP-IPV
- DTaP-IPV/Hib
- DTaP-IPV/Hib-Hep B
- MMR and MMRV
- Tdap

AAP, American Academy of Pediatrics; Covid-19, coronavirus disease 2019; DTaP, diphtheria, tetanus, and acellular pertussis; Hib, haemophilus influenzae type B; Hep A, hepatitis A; Hep B, hepatitis B; HPV, papillomavirus virus; IPV, inactivated poliovirus vaccine; K, a thousand; MMR, measles, mumps, and rubella; MMRV, measles, mumps, rubella and varicella; RSV, respiratory syncytial virus; SCDM, shared clinical decision-making;; Tdap, tetanus reduced-dose diphtheria and acellular pertussis.; VPDs, vaccine-preventable diseases; yr, years; yo, years old

References: **1.** WHO. Vaccines and Immunization https://www.who.int/health-topics/vaccines-and-immunization/#tab=tab_1; **2.** Siegrist CA. Vaccine immunology. In: Orenstein WA, Offit PA, Edwards KM, Plotkin SA, editors. Plotkin's Vaccines. 8th ed. Philadelphia, PA: Elsevier; 2023; **3.** AAP. Overview of Managing Infectious Diseases in Child Care and Schools. In: Managing Infectious Diseases in Child Care and Schools: A Quick Reference Guide. 6th ed. American Academy of Pediatrics; 2023; **4.** Talbird SE, et al. Impact of Routine Childhood Immunization in Reducing Vaccine-Preventable Diseases in the United States. Pediatrics. 2022;150(3):e2021056013; **5.** CDC. RSV in_Infants and Young Children https://www.cdc.gov/rsv/infants-young-children/index.html; **6.** Moulia et al. MMWR Morb Mortal Wkly Rep. 2025;74(32):508-514; **7.** CDC. Influenza https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-12-influenza.html; **8.** Reinhart K et al. MMWR Morb Mortal Wkly Rep. 2025;74(36):565-569; **9.** CDC. Pneumococcal Disease https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-17-pneumococcal-disease.html; **10.** CDC. Pertussis Surveillance and Trends. https://www.cdc.gov/pertussis/php/surveillance/index.html; **11.** CDC. Types of Hib Vaccines https://www.cdc.gov/hi-disease/vaccines/types.html; **12.** CDC. Meningococcal Disease https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-14-meningococcal-disease.html; **13.** CDC. Clinical Overview of Poliomyelitis https://www.cdc.gov/polio/hcp/clinical-overview/; **14.** CDC. Clinical Overview of Rotavirus https://www.cdc.gov/rotavirus/hcp/clinical-overview/index.html; **15.** CDC. Hepatitis A https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-9-hepatitis-a.html; **16.** CDC. Questions About Measles https://www.cdc.gov/measles/about/questions.html; **17.** CDC. Impact of U.S. Chickenpox Vaccination Program https://www.cdc.gov/chickenpox/vaccination-impact/index.html; **18.** CDC. Clinical Overview of Perinatal Hepatitis B https://www.cdc.gov/hepatitis-b/hcp/perinatal-provider-overview/index.html; **19.** CDC. Clinical Signs and Symptoms of Hepatitis B https://www.cdc.gov/hepatitis-b/hcp/clinical-signs/index.html; **20.** CDC. Cancers Associated with Human Papillomavirus https://www.cdc.gov/united-states-cancer-statistics/publications/hpv-associated-cancers.html; **21.** CDC. Basic Information about HPV and Cancer https://www.cdc.gov/cancer/hpv/basic-information.html; **22.** CDC. Vaccine-Preventable Adult Diseases https://www.cdc.gov/vaccines-adults/diseases/index.html; **23.** AAP Recommended Child and Adolescent Immunization Schedule for Ages 18 Years or Younger https://downloads.aap.org/AAP/PDF/AAP-Immunization-Schedule.pdf?_gl=1*; **24.** Hausdor WP, et al. Facilitating the Development of Urgently Required Combination Vaccines. Lancet Glob Health. 2024;12(6):e1059-e1067; **25.** CDC. Combination Vaccines https://www.cdc.gov/vaccines-children/about/combination-vaccines.html