

REPORT TO THE LEGISLATURE
BY THE CALIFORNIA DEPARTMENT OF PUBLIC HEALTH
AS MANDATED BY CHAPTER 745, STATUTES OF 2001, SECTION 150 FOR REPORTING
PERIODS 2011-2013 AND 2013-2015

THE IMMUNIZATION STATUS OF YOUNG CHILDREN IN CALIFORNIA
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IMMUNIZATION OF YOUNG CHILDREN IN CALIFORNIA

CALIFORNIA DEPARTMENT OF PUBLIC HEALTH

2011-2013 AND 2013-2015

MANDATE FOR THE REPORT

This report complies with Health and Safety Code §120475, which was enacted into law by Senate Bill (SB) 1360 (Chapter 415, Statutes of 1995). Under the provisions of this statute, as amended by SB 1191 (Chapter 745, Statutes of 2001), the Department of Health Services (DHS)* is required to submit a biennial report to the legislature covering the following topics:

- I. The immunization status of young children in the State, based on available data
- II. The steps taken to strengthen immunization efforts, particularly through the Child Health and Disability Prevention (CHDP) program
- III. The steps taken to improve immunization levels among currently underserved minority children, young children in family daycare and other childcare settings, and children with no health insurance coverage
- IV. The improvements made in ongoing methods of immunization outreach and education in communities where immunization levels are disproportionately low

This report incorporates DHS's (now CDPH's) recommendations for a comprehensive strategy for fully immunizing all California children and its analysis of the funding necessary to implement this strategy. This report covers two biennial reporting periods 2011-2013 and 2013-2015. During these reporting periods the CDPH immunization program has been in the midst of several major epidemic and outbreaks including measles, whooping cough, influenza, EV-D68, and Ebola that have necessitated the redirection of resources to response from other areas including report creation.

*§120475 directs DHS to submit this report, but in July 2007, DHS split into two new agencies, the Department of Public Health and the Department of Health Care Services. The Department of Public Health has taken responsibility for this report.

EXECUTIVE SUMMARY

Immunization Status of Young Children: Neither California nor the United States as a whole has met the *Healthy People 2010* goal of on-time vaccination for 90% of two-year-olds and 95% of school-age children. In the 2013 National Immunization Survey, which is the most recent, 78.8% of California two-year-olds had received all doses of DTaP (diphtheria, tetanus, pertussis), MMR (measles, mumps, rubella) and polio vaccines – collectively known as the 4:3:1 series – that are recommended before the age of two. Slightly fewer (78.3%) had received that series as well as the recommended doses of hepatitis B and Hib (*Haemophilus influenzae* type b) vaccines. California slightly exceeds the national average rates on both measures, which are 76.9% and 74.1%, respectively.

Steps to Strengthen Immunization Efforts: CDPH coordinates extensive efforts to facilitate and encourage immunization, involving not only the Department itself but other State agencies and private enterprise. An annual appropriation of \$7.3M for vaccine purchase was restored beginning in 2011-12. Additionally, the Patient Protection and Affordable Care Act (ACA) may improve immunization rates. CDPH is working closely with the Department of Health Care Services (DHCS), as well as Medi-Cal and other providers so that Californians can take full advantage of the ACA as it applies to immunization coverage.

CDPH also provides vaccines directly to the public via local health department clinics and renders technical assistance to public and nonprofit health clinics, including periodic evaluations of areas in which those clinics can improve their performance. CDPH participates in the California Immunization Committee, which engages the medical community, and in the California Immunization Coalition, which brings together many public and private entities involved with immunization. The Department assists schools and child care centers in following state law on immunization requirements; creates professional education materials for healthcare providers; and informs parents about vaccine issues through a variety of traditional and new media projects.

CDPH receives invaluable support from several State programs in pursuing the immunization of children. The Women, Infants, and Children (WIC) Supplemental Nutrition Program, which serves more than 60% of infants born in California, includes immunization screening and education as a regular part of its interactions with clients. The Child Health and Disability Prevention (CHDP) Program provides preventive health services, including immunizations, to low-income children and adolescents; its local branches frequently collaborate with local immunization programs by sharing information, training healthcare providers in vaccine-related procedures, and conducting public outreach to promote immunization.

The federal government provides assistance through the Vaccines for Children (VFC) program, which grants federal funds to states for the purchase of vaccine for uninsured children and children eligible for Medi-Cal. The State of California bought more than ten million doses of vaccine with VFC funds in 2014. VFC-purchased vaccine is distributed through both public and private healthcare providers.

Steps to Improve Immunization of Minority and Uninsured Children: Immunization surveys indicate that Hispanic and African-American children in California are less likely to be immunized on-time. CDPH has sponsored statewide campaigns to promote vaccination among Hispanic families, and is working to design outreach materials specifically oriented to African-Americans.

Several programs facilitate the immunization of uninsured children in California. They are eligible to receive VFC vaccine from VFC-enrolled providers, which may be public clinics or private practitioners; an eligible child who lacks transportation to a VFC provider may be vaccinated for free at a local health department. The CHDP Program, which includes uninsured children, screens participants for immunization status at every health assessment visit. Many uninsured children are WIC enrollees and are screened through that program as well.

Improvements in Outreach and Education: CDPH produces a variety of educational materials for families, particularly those who are hesitant to vaccinate. In crafting content and in selecting from media options, the Department takes a research-based approach, maximizing impact and cost-effectiveness. Recent educational projects include *One Shot Heroes*, a mini-series of videos for pre-teen audiences; *Shot By Shot*, an online repository of true stories about personal experiences with vaccine-preventable disease; *iChoose*, a web-based social marketing campaign to reinforce the idea that vaccination is a good choice; and EZIZ, interactive web-based training for medical assistants who work with vaccines, which is now used by all 50 states and internationally.

Strategy Recommendation and Funding Analysis: As of 2014, state general funds supporting immunization activities in California are no longer available, other than for influenza vaccine purchase. However, there are many other funding opportunities for immunizations for Californians as outlined in this report.

BACKGROUND: VACCINE-PREVENTABLE DISEASES

Thanks in large part to the development and widespread use of vaccines, deadly diseases such as polio and diphtheria have entirely, or almost entirely, disappeared in the United States. Immunization not only saves lives and reduces pain, suffering and disability; it saves money. According to the Centers for Disease Control and Prevention (CDC), among 78.6 million children born during 1994–2013, immunization will potentially avert \$402 billion in direct costs and \$1.5 trillion in societal costs because of prevented illnesses.* In 2009, each dollar invested in vaccines and their administration in the U.S., resulted in an estimated \$3 in direct benefits and \$10 in benefits when societal costs are included.*

According to data from the Office of Statewide Health Planning and Development, more than 3,000 Californians infected with hepatitis B virus were hospitalized for liver disease, liver cancer, or liver transplant in 2010. These hospital stays cost an estimated \$293 million, with more than 30% of this expense covered by Medi-Cal. These costs are almost entirely avoidable through vaccination. Immunization has reduced vaccine-preventable diseases compared to the pre-vaccination era, but there are still opportunities for improvement.

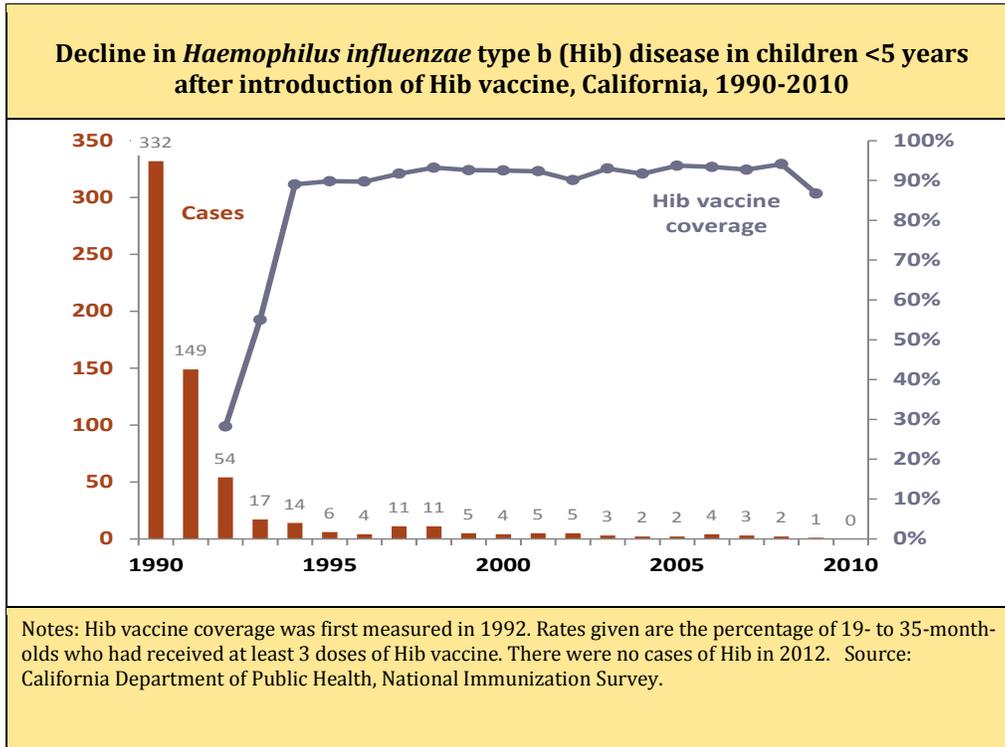
The percentage of California students with all required immunizations at school entry decreased from 90.7%, in the 2010-11 school year, to 90.4%, in the 2014-15 school year.

Cases of Selected Vaccine-Preventable Diseases in California: 2013, 2000, and Historic Highs			
	2013	2000	Historic High (year)
Measles	18	19	39,201 (1961)
Mumps	30	84	26,216 (1960)
Rubella	0	6	9,539 (1967)
Diphtheria	0	0	1,299 (1945)
Pertussis	2,011	672	21,344 (1941)
Tetanus	4	9	26 (1963)
Hepatitis A	255	2,785	8,270 (1986)
Hepatitis B (acute)	138	982	5,969 (1985)
Polio	0	0	2,574 (1952)
Hib ¹	0	4	697 (1990)
* <i>Haemophilus influenzae</i> type b Source: California Department of Public Health			

*CDC. Benefits from Immunization During the Vaccines for Children Program Era — United States, 1994–2013. MMWR. April 25, 2014 / 63(16); 352-355.

<http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6316a4.htm>

Achievements in the Control of Vaccine Preventable Diseases

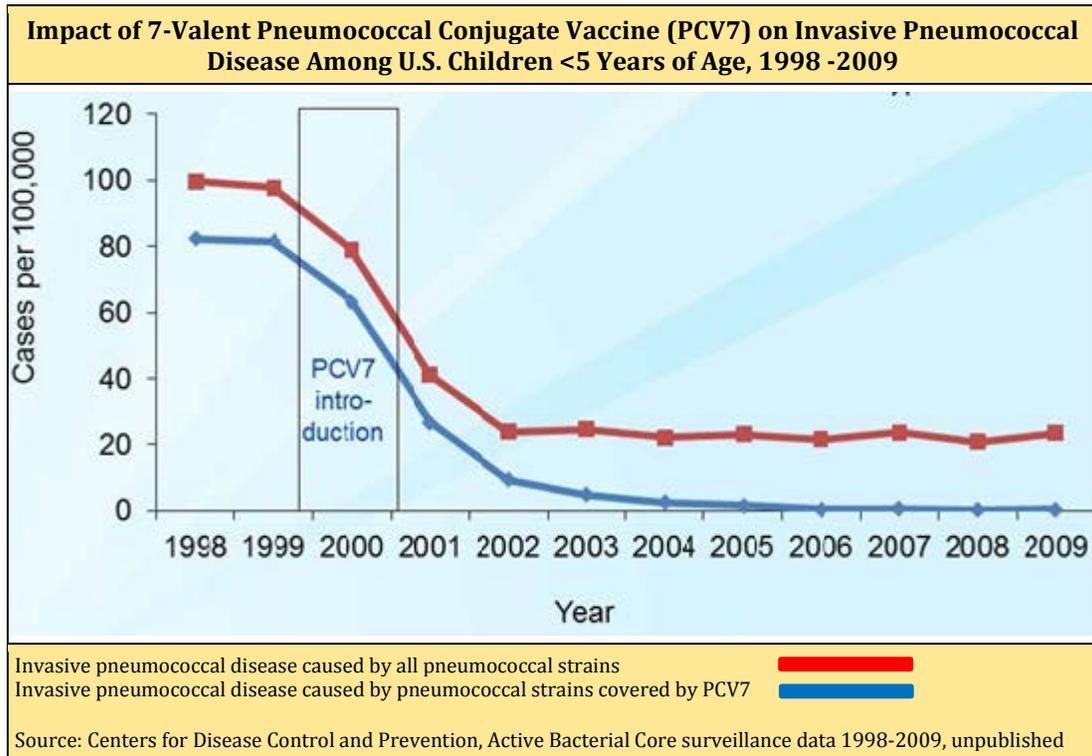


Hepatitis A: Hepatitis A vaccine was first licensed in 1995 and was recommended for all California children in 1999. The incidence of hepatitis A has declined from 20 cases per 100,000 population in 1995, to less than 1 per 100,000 population in 2013. Hepatitis A has become less common among all age groups since the vaccine was recommended for children, suggesting that in addition to preventing hepatitis in children, the vaccine has interrupted transmission of the disease from children to adults.

Hepatitis B: Most cases of chronic hepatitis B are the result of an infected mother passing the virus to her infant at birth. When acquired during infancy or childhood, hepatitis B infection is particularly likely to result in cirrhosis or liver cancer many years later. In 1990, one year before hepatitis B vaccine was recommended for all infants, California had 224 reported acute cases of hepatitis B in persons less than 19 years of age. Since 1999, California has had a program in place to ensure identification of pregnant women infected with hepatitis B virus and treatment of their infants at birth to prevent infection.

Pneumococcal disease: Since the introduction of the 7-valent pneumococcal conjugate vaccine in 2000 and the 13-valent vaccine in 2010, the incidence of invasive pneumococcal disease has dropped markedly among the infants and toddlers who were previously at greatest risk for these infections. During this time, there has also been a reduced incidence of pneumococcal disease in adults, particularly among the elderly—a phenomenon attributable to vaccinated children no

longer exposing older people to vaccine-preventable strains of pneumococcal bacteria that cause the most serious disease.



Polio: While the global eradication of polio did not occur as planned in 2010, polio remains fully controlled in California and the rest of the United States. Since 1979, there have been no domestic cases of polio infection in the United States associated with wild poliovirus.

Mumps: The currently used live attenuated mumps vaccine was licensed in 1967. Although domestic mumps transmission has not been eliminated in the U.S., most cases and outbreaks can be traced to importation from countries where mumps is more widespread. There were 30 reported mumps cases in California in 2013, which indicates that mumps is effectively controlled in the state.

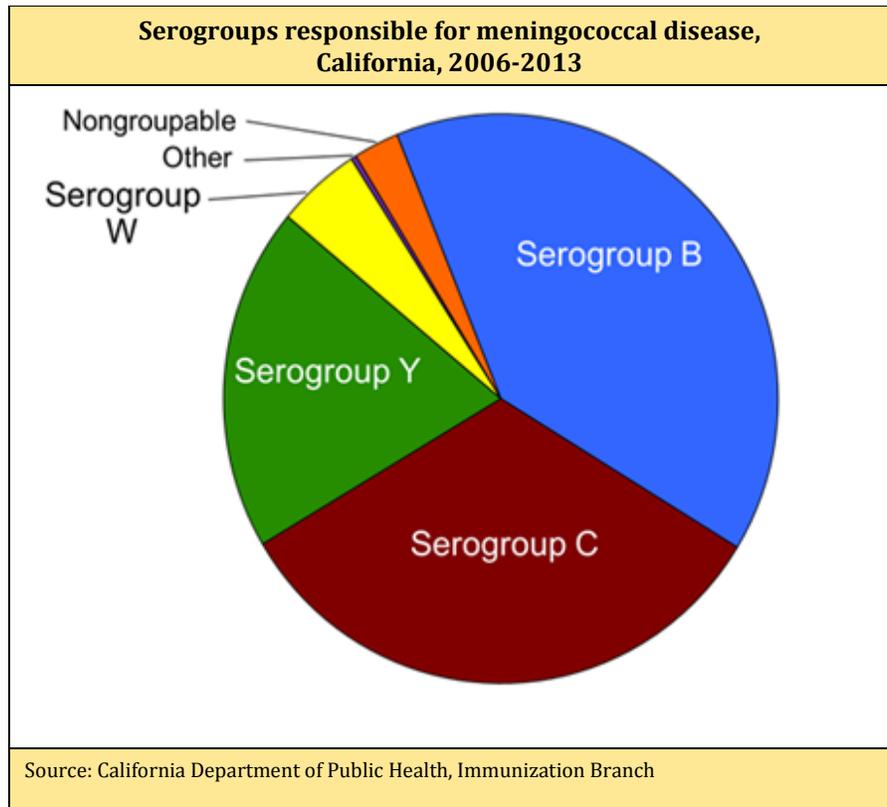
Rubella: Rubella vaccines were first licensed in 1969. Cases declined rapidly, although a moderate resurgence occurred in California in 1990. Domestic transmission of rubella was declared eliminated from the United States in 2004; in 2013, there were no rubella cases in California, compared to a high of 9,539 rubella cases in 1967. Pregnant women who are infected with rubella can have infants with congenital rubella syndrome (CRS), which is characterized by birth defects ranging from physical malformations to mental retardation. The last reported case of CRS in California was in 2008. The infant’s mother was infected with rubella during international travel while in her first-trimester of pregnancy.

Meningococcal disease:

In 2013, there were 113 meningococcal disease cases reported in California.

Although invasive meningococcal infections are relatively rare, the case fatality rate is 10%, and 11-19% of survivors suffer long-term consequences such as hearing loss, neurologic disability, digit or limb amputations, and skin scarring.

Meningococcal conjugate vaccine, which protects against disease due to serogroups A, C, Y, and W, is currently recommended for children beginning at age 11, as well as for certain other high-risk groups.



Serogroup B meningococcal disease, which is not prevented by this vaccine, is the most common serogroup causing meningococcal disease in California. Two serogroup B vaccines have been licensed in the United States since October 2014.

In 2013, an outbreak of meningococcal disease occurred at the University of California Santa Barbara (UCSB) campus. Four undergraduate students were diagnosed with serogroup B disease. An investigational new drug (IND) application was initiated to offer Bexsero®, one of the two meningococcal serogroup B vaccines that were licensed in the U.S. in 2015, to UCSB students. The IND was approved, and over 17,000 doses of Bexsero® were administered to at least 51% of undergraduates in a two-dose series.

Varicella (chickenpox): Formerly a nearly universal disease of childhood, varicella has been vaccine-preventable in the United States since 1995. In 2006, after occasional outbreaks had occurred in vaccinated populations, the CDC’s Advisory Committee on Immunization Practices recommended that children receive a second dose of vaccine at age 4 to 6 years to protect those who do not experience a sufficient immune response after a single dose.

This approach minimizes the number of people who remain vulnerable to varicella in adulthood, when the disease is more likely to lead to serious complications. Because only varicella hospitalizations and deaths are reportable in California, data on levels of disease over time are not available.

Challenges in the Control of Vaccine Preventable Diseases

Seasonal influenza: Influenza viruses cause widespread disease among persons of all ages. Rates of infection are highest among children, but the risks of complications, hospitalization, and death from seasonal influenza are higher among adults ages 65 and older, children under five, and persons of any age who have certain medical conditions such as chronic cardiac or respiratory disease. A CDC study published in 2004 concluded that, on average, more than 200,000 people in the United States are hospitalized each year for respiratory and heart conditions illnesses associated with seasonal influenza virus infections (<http://www.cdc.gov/flu/about/qa/hospital.htm>).

In 2010, the federal Advisory Committee on Immunization Practices adopted a universal recommendation for annual immunization against influenza for all persons six months of age or older.

CDC also estimates that from the 1976-1977 season to the 2006-2007 influenza season, influenza-associated deaths in the United States ranged from a low of about 3,000 to a high of about 49,000 people (http://www.cdc.gov/flu/about/disease/us_flu-related_deaths.htm). Because influenza is not a reportable illness, exact numbers are not available.

In California, fatal laboratory-confirmed influenza cases in persons <65 years of age are reportable. During the 2013–2014 influenza season, 342 laboratory-confirmed influenza deaths among persons <65 years of age were reported to CDPH, including seven among children <18 years of age.

Pertussis (whooping cough): Pertussis is a difficult disease to control because it is highly infectious and immunity wanes after either vaccination or natural infection. It has also been learned that immunity from acellular pertussis vaccines, which have been used in the United States since the 1990s, wanes more quickly than the immunity from the whole cell vaccines that preceded them.

Pertussis is a particular danger to young infants because they cannot be vaccinated against it until they are at least six weeks of age. In 2010, California experienced a pertussis epidemic with 10 reported infant deaths. Since fall 2011, California has required that all students entering seventh grade have receive a booster dose of pertussis vaccine (Tdap). CDPH's efforts around pertussis control are currently focused on preventing infant deaths by recommending that pregnant women receive Tdap vaccine between 27 and 36 weeks gestation during every pregnancy and that infants be immunized promptly.

In 2014, California experienced a pertussis epidemic, the second in this decade, that caused the deaths of three young infants in the State.

Over 11,000 pertussis cases were reported in California over the course of the year – more than in any year since 1947.

Vaccinated women create pertussis antibodies that are transferred to the fetus and can protect infants until they are old enough to be vaccinated themselves. In addition, CDPH assists in educating providers to promptly recognize and treat pertussis in young infants.

Measles: Measles was declared eliminated in the United States in 2000 and almost all reported cases in the U.S. are linked to foreign importation. During 2000-2013, there was an average of 14 measles cases per year in California. As a result of immunization, case numbers are very small compared to 1961, two years prior to the introduction of the measles vaccine, when there were more than 39,000 cases in California. As recently as 1989-91, a measles epidemic of over 17,000 reported cases claimed the lives of 70 Californians, 49 of whom were young children. This resurgence was due to low vaccine coverage due to lack of access to vaccine. This led to the creation of the federal Vaccines for Children (VFC) program, which ensures that all un- and under-insured children <19 years of age have access to recommended vaccines.

California typically identifies more measles cases than any other U.S. state, and measles case investigations are very labor-intensive. The 2008 San Diego outbreak was estimated to have cost public health authorities \$124,512 to contain, in addition to \$37,200 in costs to affected families.

Since December, 2014, there have been 134 confirmed measles cases reported in California residents. All but three of these cases were part of an outbreak associated with Disneyland in Orange County California.

This outbreak also resulted in measles cases in six other states, Canada and Mexico.

Among the 82 California outbreak-associated measles cases for whom there is vaccination documentation, 57 (70%) were unvaccinated.

New Vaccines and Recommendations:

Over the past decade, vaccines for four diseases – human papillomavirus, rotavirus, meningococcal and pneumococcal diseases – have been recommended for the pediatric population. Annual influenza vaccination is now recommended for all persons over six months of age, pertussis has been added to the traditional tetanus-diphtheria booster shot, and a second dose of varicella (chickenpox) vaccine was recommended. Accordingly, the discounted public sector cost of vaccinating each child has increased. Vaccines remain cost-saving, and the Affordable Care Act requires most health plans to cover vaccines. However some care providers serving privately insured children have declined to purchase the more-expensive vaccines, instead referring their patients to other, less accessible sources of care such as local public health departments, community clinics, pharmacies and other private providers.

Notes:

All costs reflect June 2014 CDC vaccine contract prices and assume the use of single rather than combination vaccines. There are two brands of human papillomavirus (HPV) vaccine. One protects against two cancer-causing strains of HPV and is recommended for females. The other protects against those strains plus two additional strains that cause genital warts, and is recommended for females and males. This graphic assumes the use of the quadrivalent vaccine. In 2015, the quadrivalent vaccine will be replaced with a 9-valent vaccine.

There are two brands of rotavirus vaccine, one given in a two-dose series and one requiring three doses. The total costs of the two series are comparable.

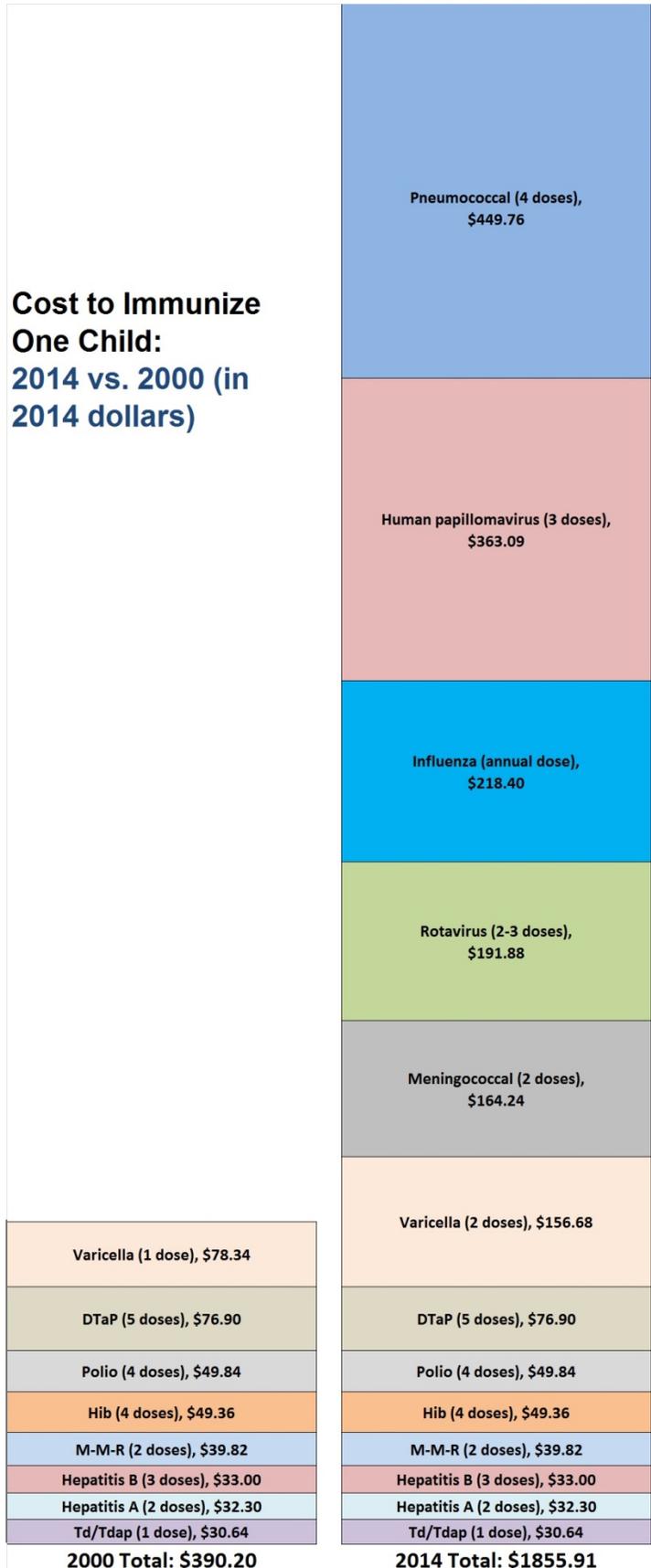
Influenza vaccine is recommended every influenza season for all persons over 6 months of age. Total cost represents cost of annual vaccination through childhood.

In 2000, hepatitis A vaccine was recommended only for children living in certain states, including California. By 2010, the recommendation had been extended nationwide. In 2000, only a tetanus-diphtheria (Td) booster dose was given to adolescents; by 2006 a pertussis-containing booster (Tdap) had become available and was recommended for all children 11-12 years of age.

MMR contains measles, mumps, and rubella vaccines.

DTaP contains diphtheria and tetanus toxoids and acellular pertussis vaccine.

**Cost to Immunize One Child:
2014 vs. 2000 (in 2014 dollars)**



I. THE IMMUNIZATION STATUS OF YOUNG CHILDREN

In *Healthy People 2010: National Health Promotion and Disease Prevention Objectives*, the federal government set a goal of adequately immunizing at least 90% of two-year-olds and 95% of school-age children. Several survey instruments measure California’s progress toward these benchmarks.

National Immunization Survey: This annual telephone survey conducted by CDC found that in 2013, the most recent year for which results are available, 78.8% ($\pm 6.7\%$) of California two-year-olds had completed the 4:3:1 series and 78.3% ($\pm 6.7\%$) had completed the 4:3:1:3:3 series, comparable to the rate found among two-year-olds nationally (76.9% and 74.1%, respectively).

National Immunization Surveys				
			California	United States
Completed 4:3:1 series ¹	24 mo.	2000	76.3% ($\pm 4.2\%$)	75.3% ($\pm 1.1\%$)
		2013	78.8% ($\pm 6.7\%$)	76.9% ($\pm 1.4\%$)
	19-35 mo.	2000	77.3% ($\pm 3.4\%$)	77.6% ($\pm 0.9\%$)
		2013	82.4% ($\pm 6.4\%$)	81.5% ($\pm 1.3\%$)
Completed 4:3:1:3:3 series ²	24 mo.	2000	71.8% ($\pm 4.4\%$)	70.7% ($\pm 1.1\%$)
		2013	78.3% ($\pm 6.7\%$)	74.1% ($\pm 1.4\%$)
	19-35 mo.	2000	72.3% ($\pm 3.6\%$)	72.8% ($\pm 0.9\%$)
		2013	81.9% ($\pm 6.4\%$)	78.7% ($\pm 1.3\%$)
Source: National Center for Immunization and Respiratory Diseases, Centers for Disease Control and Prevention				

Similarly, among children aged 19 to 35 months, California’s 4:3:1 and 4:3:1:3:3 coverage rates in 2013 were comparable to US rates, with 82.4% ($\pm 6.4\%$) of children being up to date for the 4:3:1 series and 81.9% ($\pm 6.4\%$) of children up to date for the 4:3:1:3:3 series.

¹ The 4:3:1 series refers to at least 4 doses of diphtheria and tetanus toxoids and pertussis vaccine; 3 doses of polio vaccine; and 1 dose of MMR vaccine.

² The 4:3:1:3:3 series is comprised of the 4:3:1 series plus at least 3 doses of Hib vaccine and 3 doses of hepatitis B vaccine. While neither series represents a complete list of the vaccines a child should receive, they are metrics that enable historical comparisons.

Herd Immunity and Exemptions from Vaccination Requirements

Non-immune persons are still protected against vaccine-preventable disease if enough of their contacts are immune and therefore unable to transmit diseases to them. This is the phenomenon of “herd immunity.” Herd immunity is important to control outbreaks of disease because even with a comprehensive immunization program, not every child will be immunized. In addition, infants are not fully vaccinated until 24 months of age; some have medical conditions that preclude vaccination or render vaccines ineffective and others remain unvaccinated because of their parents’ preferences. As long as a high proportion of the population has been vaccinated, herd immunity will protect those who are still vulnerable.

Elective exemptions to immunizations threaten herd immunity, making it more likely that children who truly cannot be immunized will encounter others who are contagious. Almost 10% of California kindergarteners had not received all required vaccines when they started school in 2013. Of those not up-to-date, 0.19% were medically ineligible for vaccination but over ten times as many (3.15%) held personal belief exemptions—a proportion that has quadrupled since 2000 (0.77%).

An exemption rate of 2% would not pose a serious threat to herd immunity, but exempt children are not evenly distributed among California schools. The number of kindergartens with 10% or more of exemptors has increased dramatically since 2000 so that in 2013, 8.4% of public school kindergartens (493 of 5,852) and 14.4% of private school kindergartens (264 of 1,832) had at least one out of ten students with incomplete immunization due to personal belief exemptions. Geographic clusters of exemptors are demonstrably associated with the locations of pertussis outbreaks, confirming that exemptors create community risks.*

To address the increasing number of personal beliefs exemptions being taken, the Legislature passed Assembly Bill 2109 which took effect January 1, 2014. Parents who wish to exempt their children from vaccines are now required to either be counseled first by a health care practitioner or are allowed to claim a ‘religious’ exemption.

*Omer SB, Enger KS, Moulton LH, Halsey NA, Stokley S, Salmon DA. Geographic clustering of nonmedical exemptions to school immunization requirements and associations with geographic clustering of pertussis. *Am J Epidemiology*. 2008;168:1389-1396.

California Fall Assessment Survey: Child care facilities and schools with kindergartens or 7th grades are required to report student immunization status each Fall. For the 2014-15 school year, 90.4% of kindergarteners, 89.4% of childcare participants, and 97.8% of 7th graders were fully immunized at school entry. The impact of AB 2109, the law that went into effect in 2014 and required parents seeking a personal belief exemption (PBE) for their child to seek health care practitioner counseling or take religious objection to such counseling, was moderate at best. The percentage of students with PBEs in child care facilities was reduced by about 0.3%, the percentage of PBEs in kindergartens being reduced by about 0.6%, and the percentage of PBEs in 7th grade being reduced the most by 1.2%. While the impact on PBEs was moderate, the trend of increasing PBEs each year for the past 10 or more years was reversed. Furthermore, despite these modest reductions in PBE numbers, the percentage of students in child care and kindergarten with all required vaccines rose only slightly, the reduction in PBEs being largely offset by increases in permanent medical exemptions (PMEs) (+0.27%, child care) or 'conditionals' entrants (+0.4%, kindergarten). However, for 7th grade, the ~1.2% reduction in PBEs was accompanied by a 1.2% increase in the percentage of 7th graders with the Tdap booster.

California Fall Assessment Surveys, 2013-14 compared to 2014-15									
Student Category	Childcare and Head Start			Kindergarten			7 th Grade		
	2013-14	2014-15	Δ	2013-14	2014-15	Δ	2013-14	2014-15	Δ
All required vaccines	89.3%	89.4%	+0.1%	90.2%	90.4%	+0.2%	96.6%	97.8%	+1.2%
'Conditional' entrant	7.5%	7.4%	-0.1%	6.5%	6.9%	+0.4%			
PME	0.29%	0.56%	+0.27%	0.19%	0.19%	NC	0.19%	0.14%	-0.05%
PBE	2.94%	2.67%	-0.27%	3.15%	2.54%	-0.59%	3.26%	2.09%	-1.15%
4+ doses DTaP	93.8%	94.1%	+0.3%	92.2%	92.4%	+0.2%			
3+ doses polio	95.7%	95.7%	+0.2%	92.6%	93.0%	+0.4%			
1+ dose MMR *	95.7%	96.1%	+0.4%						
2+ doses MMR *				92.3%	92.6%	+0.3%			
3+ doses hepatitis B	93.9%	94.3%	+0.4%	94.8%	94.9%	+0.1%			
1+ doses varicella **	95.1%	95.6%	+0.5%	95.3%	95.4%	+0.1%			
1 Tdap (booster)							96.6%	97.8%	+1.2%

* MMR vaccine is scheduled to be given at 12-15 months and at 4-6 years.
 ** Physician-documented disease can substitute for proof of immunization.
 Source: California Department of Public Health

II. Strengthening Immunization Efforts in California

Vaccines for Children (VFC) Program

The federal Vaccines for Children (VFC) program, administered by CDPH, makes funding available for the purchase of vaccines to be administered to uninsured* children as well as children eligible for Medi-Cal. Nationally, almost half of all vaccine doses given to children and adolescents are purchased through the VFC program. In 2014 approximately 4,000 public and private health care providers in California participated in the program by taking receipt of more than ten million doses of VFC-purchased vaccine valued at over \$500 million.

In order to participate in the VFC program, providers must agree to comply with certain requirements for storage and handling of VFC-purchased vaccine, vaccine administration procedures, and documentation. To ensure that providers meet these requirements, CDPH sends trained VFC consultants to medical practices around the state who provide assistance with VFC compliance and strategies to enhance immunization delivery. Representatives visit over 2,000 clinics each year. In customer satisfaction surveys, providers report that they are highly satisfied with this service and that it increases the number of children they are able to vaccinate.

National Immunization Survey results indicate that VFC recipients remain a population of special concern. Both in California and in the U.S. generally, fewer VFC recipients reach immunization benchmarks compared to children who are not VFC-eligible. As noted in the Table below for the most recent VFC comparison data from 2012, estimated 4:3:1 or 4:3:1:3:3 rates in California children served by providers participating in the VFC program are lower than rates in children served by providers not participating in the VFC program, although these differences are not statistically significant because of the large confidence intervals. Compared to children in higher income families, children eligible for VFC program often face additional barriers to immunization such as inadequate transportation or lack of child care for siblings.

2012 National Immunization Survey: 19- to 35-month-old Children			
		California	United States
Completed 4:3:1**series	Provider is VFC participant	78.3% (±8.7%)	81.8% (±1.4%)
	Provider is Not VFC Participant	86.5% (±8.3%)	82.3% (±2.5%)
Completed 4:3:1:3† series	Provider is VFC participant	73.8% (±8.9%)	77.1% (±1.5%)
	Provider is Not VFC Participant	86.5% (±8.3%)	79.5% (±3.2%)
Source: National Center for Immunization and Respiratory Diseases, Centers for Disease Control and Prevention			

* Children are entitled to VFC vaccine if they are eligible for Medi-Cal or the CHDP program, have no health insurance, or are American Indian or Alaska Natives. Children who have insurance that does not provide full coverage for immunization may receive VFC-purchased vaccine at Federally Qualified Health Centers or Rural Health Clinics.

** The 4:3:1 series is comprised of at least 4 doses of DTaP, 3 doses of polio vaccine, and 1 dose of MMR.

† The 4:3:1:3 series adds to the 4:3:1 series at least 3 doses of hepatitis B vaccine.

California's Immunization Workplan

California's immunization workplan is derived from the goals and objectives set at the national level by our funder CDC.

Immunization Budget Initiative

Because children in the Medi-Cal program are eligible to receive vaccines provided by the federal VFC program, the State avoids the need to purchase these vaccines. In 2013, this saved the General Fund over \$200 million. Beginning in 1995 and annually thereafter, the Legislature authorized the reinvestment of \$14 million of this savings into immunization projects under the umbrella of the Immunization Budget Initiative. During the 2009-10 budgeting process, CDPH was granted one-time American Recovery and Reinvestment Act (ARRA) funds, which were used to support the Immunization Budget Initiative. For FY 2010-11, the Governor proposed restoring State funding for the Initiative, but the Legislature deleted this restoration, leaving the Initiative un-funded. As a consequence, two programs were eliminated:

- (1) *Community Health Center Capacity*: About 600 nonprofit Community Health Centers (CHCs) served a large proportion of the State's Medi-Cal recipients, low-income individuals, and immigrants. In 1995, the Immunization Budget Initiative began providing \$3.5 million per year to expand select clinics' capacity to immunize these hard-to-reach populations by hiring more nursing and support staff, serving more patients during clinic hours, extending clinic hours, instituting the use of the California Immunization Registry (CAIR- see full description of CAIR below), and monitoring their performance. Over 50,000 children were immunized with Initiative funds each year until they were eliminated in 2010.
- (2) *Collaborative Intervention Projects*: On the premise that local providers know what works best in their own communities, in 1995 the Immunization Budget Initiative began awarding contracts for local Collaborative Intervention Projects to teams of local health departments, public and private agencies, and physicians. A 1997 CDPH review identified four particularly successful types of projects:
 - Practice assessments and practical tools for increasing immunization rates and improving medical assistants' adherence to best immunization practices in private providers' offices
 - Improving reminder and recall efforts for children who do not return for shots
 - Assessing immunization rates at WIC clinics
 - Conducting case management and targeted educational outreach to high-risk families

The Initiative funded approximately 25 projects in these four areas during each three-year grant cycle, with particular focus on populations at risk for underimmunization. Grantees were required to report quarterly on their activities.

California Immunization Registry (CAIR)

The immunization registry is a key component of the Immunization Workplan. While funding for the registry through the Immunization Budget Initiative was cut, CDPH has redirected funds and identified additional federal funds to support this activity.

The immunization registry is a confidential database of immunization records which protects public health and increases immunization rates by:

- Providing a comprehensive record that can adapt to changes in the medical home, health insurance, legal custody, or area of residency;
- Calculating promptly which shots children need, minimizing under- or over-immunization;
- Issuing reminders of upcoming visits; and
- Identifying individuals and populations with low immunization rates.

The Task Force on Community Preventive Services, an independent body of public health and prevention experts completed a comprehensive review of immunization registries in 2010. The Task Force recommended using immunization registries based on the strength of the evidence that they increase vaccination rates.

CAIR users include health care providers, public health departments, schools, child care facilities, family child care homes, WIC service providers, foster care agencies, welfare departments, juvenile justice facilities, and other programs that provide, track, or promote immunization. CAIR has been developed using a regional registry model. However, to provide full benefit to users and children, these regional registries will need to be merged into one statewide immunization registry.

California physicians' offices, clinics, families, and schools are estimated to have saved several million dollars per year in expenditures through the availability of CAIR, far exceeding the costs of the system.* These savings have resulted from reducing or avoiding:

- Vaccine-preventable diseases and their associated costs, including those to Medi-Cal and other public programs;
- Hundreds of thousands of duplicative shots that are given annually because complete records cannot be located;
- Manual record reviews by providers, schools, and child care centers; and
- Obtaining, reviewing, and transcribing immunization records for children entering educational institutions, such as when children displaced to California by Hurricane Katrina were able to quickly start school again because of the accessibility of registry records for the immunizations they needed to attend school.

*CDC. Development of Community- and State-Based Immunization Registries. CDC Response to a Report from the National Vaccine Advisory Committee. *MMWR*, Oct. 5, 2001, 50(RR-17).

<http://www.cdc.gov/mmwr/PDF/rr/rr5017.pdf>

Currently, CAIR has over 4,300 ‘read/write’ (provider) sites and almost 4,000 ‘read-only’ (mostly schools) participating. In addition to these traditional participant sites who login to CAIR to look up patient records or to add patients or vaccine doses manually, CAIR currently enrolls clinical sites that intend to submit vaccination information electronically through the CDPH Health Information Exchange Gateway, CDPH’s “one-stop shop” for public health data reporting.

As of April 7, 2015, CAIR has enrolled 4,919 sites registered at the CDPH Gateway/CAIR IZ Portal and 3,006 sites are currently submitting ‘production’ data to one of the CAIR registries. Currently, about 60% of data being submitted to CAIR each quarter is via electronic data exchange from provider Electronic Health Records (EHRs) and this percentage is increasing each quarter.

California Immunization Registry Participation as of 12/31/2014				
	0-5 years	6-18 years	19+ years	All ages
Est. CA population	2,979,852	6,607,845	29,317,917	38,905,614
Patients in CAIR	2,881,433	6,598,473	10,092,973	19,572,879
% of pop. in CAIR	96.7%	99.9%	34.4%	50.3%
CAIR patients w/ 2+ doses	1,897,984	4,856,627	4,503,889	11,258,500
% of pop. w/ 2+ doses	63.5%	73.5%	15.4%	28.9%
Total doses in CAIR	30,784,725	103,096,898	46,284,227	180,165,850
Source: California Department of Public Health				

Public Immunization Services

Access to Care: CDPH provides federal local assistance funds to pay for staff to operate local health department immunization clinics, which are distinct from the Community Health Centers described above. Services at these clinics are priced on a sliding scale, and are free to those without ability to pay. Without this access mechanism, many low-income individuals would have no means of obtaining immunization.

Technical Assistance to Public and Nonprofit Clinics: CDPH provides technical assistance to ensure that public clinics’ immunization services meet appropriate standards. This assistance takes the form of written guidelines, regular telephone consultation, and on-site visits to assess vaccine storage and handling, immunization knowledge and practices, service availability, and recordkeeping.

Evaluation of Clinic Immunization Rates: Tracking immunization rates is critical to improving them over time. CDPH requires most public and nonprofit clinics to assess the immunization rates of their patient panels every other year using the Clinic Assessment Software Application (CASA), a CDC-designed software package. In addition to calculating vaccine coverage rates, CASA alerts clinics to patterns of missed vaccination opportunities when providers fail to offer needed vaccines to children who come into their offices for other health needs.

Over the past decade, completion rates for the 4:3:1 series (at least 4 doses of DTaP vaccine, 3 doses of polio vaccine, and 1 dose of measles-containing vaccine) have increased by at least 30% in local health departments and community health clinics.

Partnerships with Private Providers

Public-Private Coalitions: The California Coalition for Childhood Immunizations (C3I) was founded in 1995. In 2008, C3I broadened its mission by merging with the California Adult Immunization Coalition to form the California Immunization Coalition (CIC). CIC's mission is to promote immunizations, not just among infants and children, but also across the lifespan, including adolescents, adults, and seniors. The Coalition's membership includes health care agencies, health care provider associations, and other health-related organizations that serve a variety of age groups and ethnicities. CIC is the only statewide collaboration of partnerships and stakeholders with the mission of raising immunization rates, developing sound immunization policy, planning actions, and implementing those plans locally.

Smaller-scale public-private coalitions exist throughout the State between local health departments and community organizations, often including volunteer groups such as the Kiwanis and Rotary Clubs. These coalitions undertake media and advertising campaigns, house-to-house efforts, and incentive programs sponsored by local merchants. CIC provides technical support and coordination between local coalitions. CDPH also lends support to regional immunization coalitions, such as the San Francisco Immunization Coalition.

Implementation of School and Childcare Immunization Laws

CDPH and local health departments help schools and childcare centers implement immunization laws by providing handbooks and other written guidelines and materials including explanatory letters to parents and standardized pupil immunization forms. Expert consultation is readily available to schools and childcare centers, and on-site visits are conducted to review reporting requirements and train school staff. The Fall Assessments of kindergartens and childcare centers measure how well the law is being implemented and provide positive reinforcement to schools and childcare centers that ensure their students are appropriately immunized.

Professional Education

CDPH provides regular updates to almost 40,000 recipients, training courses, Internet-based resources, webinars, an e-newsletter (*IZ Update*), and ongoing technical support to keep health and medical personnel abreast of new immunization schedules and practices. In addition, CDPH meets regularly with professional associations of health care providers and offers presentations and exhibits at their meetings and conferences.

Parental Education

Public Information Campaigns: CDPH's media campaigns are based on research indicating that a sense of parental responsibility and knowledge of the immunization schedule are key factors motivating parents to get their children immunized on time. CDPH uses professionally designed and tested, culturally-appropriate radio and television public service announcements, press releases, websites, and print materials in its regular media campaigns. During the past several years, educational efforts have been targeted to Latino communities, addressing HPV vaccination and pertussis.

Information and Reminder Materials: CDPH produces a large variety of information pamphlets, reminder postcards, posters, and online resources that are used to teach parents the immunization

schedule and remind them of the importance of timely immunization. CDPH also developed an immunization text message reminder system for pregnant and new mothers, using the national Text4Baby service. This service is offered in English and Spanish.

National Infant Immunization Week/Toddler Immunization Month: This major public outreach effort, which takes place every year during the last week in April and the month of May, involves the joint efforts of state, local, and federal health agencies. Public service advertising, special events and outreach campaigns, recognition of the contributions of immunization partners and press campaigns have all been successful in increasing awareness of the importance of immunizations.

Preteen Vaccine Week. This observance takes place every February and aims to highlight the importance of recommended immunizations for 11- and 12-year-olds. The Department hosts monthly calls with local health departments and coalitions to facilitate statewide collaboration. Many local health departments report planning immunization clinics and workshops in schools, as well as distributing health education materials at clinics and provider offices.

Partnership with Women, Infants, and Children (WIC) Supplemental Nutrition Program.

As the main point of access to health services for low-income preschool children, WIC is an important partner in the effort to improve immunization rates. In California, WIC serves more than 1.4 million participants, including 1.1 million children younger than five years old, and more than 60% of infants born in California.

- Since 2000, all WIC agencies have performed immunization screening for children under two at periodic WIC certification visits. Most of the 84 WIC agencies participate in CAIR.
- All California WIC agencies provide immunization education to participants and refer them to medical providers. Various agencies have adopted immunization promotion strategies such as co-locating WIC sites with immunization clinics and escorting participants to immunization clinics. Some require parents of under-immunized children to pick up their WIC vouchers monthly rather than at longer intervals in order to more closely monitor the children's progress toward becoming up-to-date on vaccines. Further investigation is needed to understand whether more frequent checks by WIC staff increase immunization rates and should be utilized more broadly.
- CDPH provides immunization education materials and technical assistance to WIC agencies.

Child Health and Disability Prevention (CHDP) Program.

Administered by local health departments (LHDs), this preventive health program provides periodic health assessments to Head Start and State preschool children as well as Medi-Cal beneficiaries from birth to age 21, with certain services available to a broader group. At every health assessment, beneficiaries receive immunization screening and any vaccines that are due.

LHDs design their own strategies for maximizing immunization coverage among their beneficiaries. Most CHDP offices collaborate and exchange information with corresponding local immunization programs. Commonly, CHDP staff receive technical assistance information from immunization staff to pass along to CHDP providers, and both programs share reports from their reviews of provider

practices. Some CHDP programs hold immunization training workshops for CHDP providers. In addition, the VFC Program regularly reports on VFC activities to the CHDP Executive Committee.

The Patient Protection and Affordable Care Act (ACA) and Immunizations

Provisions of the ACA may improve immunization rates, particularly for adults; however, many challenges still remain.

Opportunities

- No co-payments: Since 2010, immunizations routinely recommended by the federal Advisory Committee on Immunization Practices (ACIP) are required by the ACA to be covered by non-grandfathered health plans without cost-sharing.
- Expanded insurance coverage for adults:
 - An active state Health Care Exchange (Covered California)
 - Expanded Medi-Cal coverage to low-income adults. Historically, only groups such as pregnant women, low-income parents, and adults with disabilities were covered under Medicaid as adults.
 - Coverage for adult children up to age 26 years, who typically have had lower rates of insurance, under their parents' insurance.
- Increased reimbursement to Medi-Cal providers for primary care services, including vaccine administration, in 2013 and 2014.

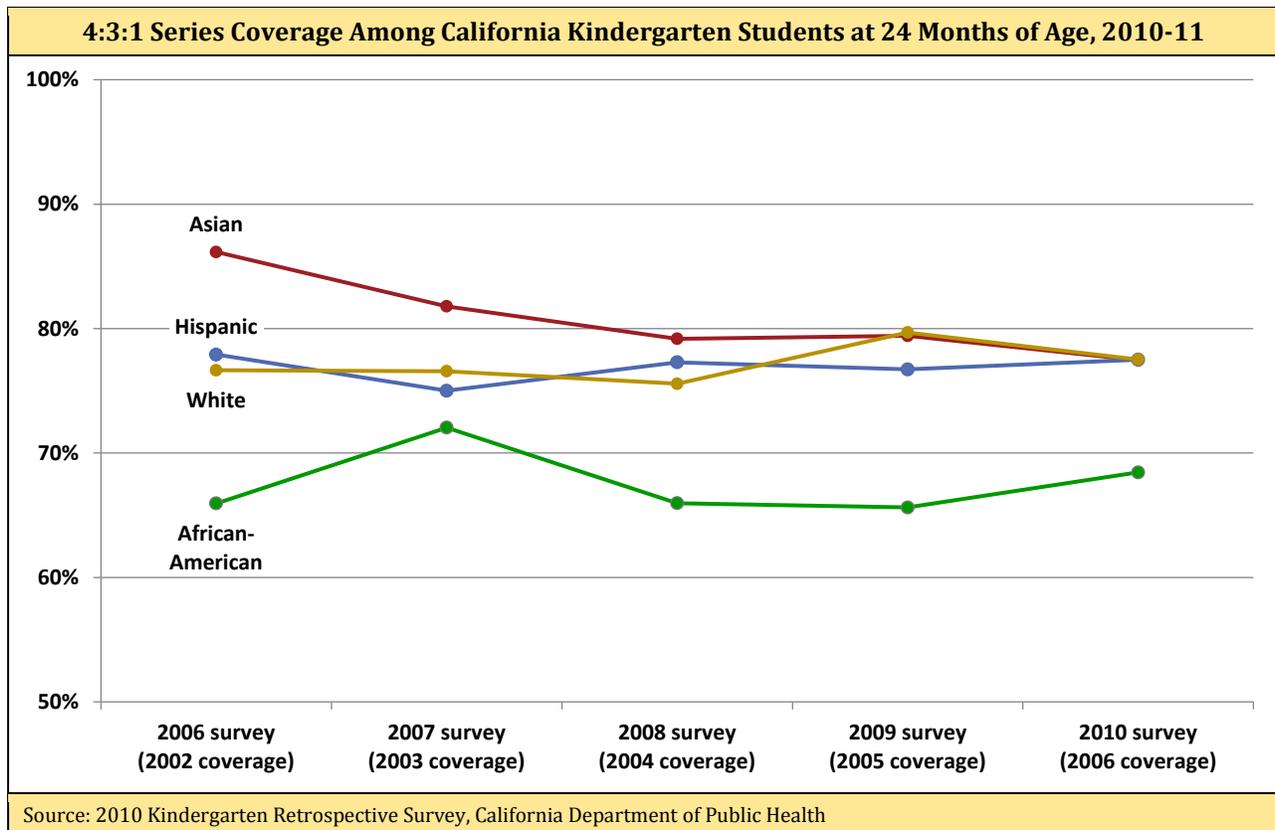
Challenges

- Grandfathered health plans are not required to follow the provisions of the ACA. State-regulated private plans sold prior to March 23, 2010, are considered grandfathered until significant changes are made to the plan. It is unclear how many health plans are grandfathered and the extent that vaccinations are not promoted or covered
- Medicare vaccine coverage has not changed under ACA; Medicare recipients may still need to pay out-of-pocket costs for immunizations. This leaves a large section of the population with potential barriers to immunization due to cost.
- Inadequate reimbursement may still be an issue for providers. Immunization costs include that of the vaccine, administration, storage, handling, and management of vaccine inventory. Some providers have stopped providing immunizations and instead refer patients to the local health department or other locations for immunization; other providers may not stock all immunizations, particularly the newer, more expensive vaccines
- ACA provisions do not apply to out-of-network providers, which may include pharmacists, school-based health centers, or LHD clinics. When providers do not stock immunizations, their patients are unlikely to be immunized at public health clinics due to recent restrictions on federally-funded vaccines for insured persons.
- Undocumented persons are not covered under the ACA. Community health centers may be a potential resource for some undocumented persons.
- Health Plan quality improvement measures, including National Committee for Quality Assurance (NCQA) HEDIS measures, need to be updated to reflect current ACIP recommendations, such as influenza vaccine and Tdap vaccine during pregnancy, and HPV vaccine for males. Adding and updating immunization metrics will help public and private plans improve their rates to protect public health.

III. Immunization of Minority Children and Children without Health Insurance

National Immunization Survey results: 19- to 35-month-old Children				
	4:3:1*		4:3:1:3:3:1†	
	California	US	California	US
Overall by age group (19-35 months) from 2012 survey				
All	86.2% ±4.0%	82.6% ±1.0%	80.4% ±4.7%	77.0% ±1.1%
By poverty level (at 19-35 months) from 2012 survey				
Above poverty level	86.9% ±5.2%	84.4% ±1.2%	82.1% ±5.9%	78.8% ±1.3%
Below poverty level	82.5% ±7.4%	79.5% ±2.0%	78.3% ±8.0%	74.4% ±2.1%
By race/ethnicity (at 19-35 months) from 2011 survey				
African-American	NA**	NA**	79.6% ±3.0%	74.6% ±3.3%
Asian	97.3% ±3.8%	95.0% ±5.1%	90.5% ±2.9%	83.2% ±4.1%
Hispanic	85.8% ±6.1%	80.8% ±6.8%	82.6% ±2.3%	77.1% ±2.5%
White	81.3% ±7.4%	74.8% ±9.0%	82.6% ±1.3%	76.9% ±1.4%
<p>*The 4:3:1 series is comprised of at least 4 doses of DTaP, 3 doses of polio vaccine, and 1 dose of MMR. **Insufficient sampling to provide point estimates. †The 4:3:1:3:3:1 series adds to the 4:3:1 series at least 3 doses of hepatitis B vaccine, 3 doses of Hib, and 1 dose of varicella vaccine.</p> <p style="text-align: center;">Source: National Center for Immunization and Respiratory Diseases, Centers for Disease Control and Prevention</p>				

Results from the 2011 National Immunization Survey (NIS), which is the latest national survey to present California coverage data by race/ethnicity and poverty level, showed no statistical significance in series completion rates for California children living in households above or below the federal poverty line, whereas a small, statistically significant disparity does occur in the United States as a whole. The 2011 NIS data also show that vaccination rates in White and Hispanic children for the 4:3:1 and 4:3:1:3:3:1 vaccine series in California are not different from national rates, but rates in Asian children in CA were significantly higher than national rates. Rates in Asian children were also significantly higher than rates in White or Hispanic children in California. This survey could not estimate rates for African-American children in California because of insufficient sampling in that group.



In the most recent 2010-11 Kindergarten Retrospective Survey (CKRS), the African-American coverage rate for the 4:3:1 vaccine series (66.4% ±8.6%) was lower than other racial/ethnic groups. The persistent disparity between the rates found among African-Americans versus other racial/ethnic groups highlights the need for targeted interventions to reach these children.

Similar to the 2011 National Immunization Survey, the 2010 CKRS did not find a lower completion rate in Hispanic children.

The California Department of Public Health undertakes the following activities to strengthen the immunization status of minority children and those without health insurance.

Minority Children: California’s diversity is reflected in virtually all the educational and promotional materials that CDPH produces. Most patient education materials are provided in Spanish as well as English, and many are translated into other languages including Chinese, Vietnamese, Laotian, Hmong, Russian, Arabic, Armenian, Cambodian, Tagalog, and Korean. CDPH also conducts specific culturally-appropriate outreach to at-risk communities:

- During the past several years, CDPH has partnered with various Latino community-based organizations, such as Vision y Compromiso to reach Latino parents and evaluate the utility of the Spanish-language immunization website (www.vacunasymisalud). Furthermore,

CDPH worked closely with the Health Initiative of the Americas to produce an influenza prevention curriculum that *promotoras* (Spanish-speaking community health leaders) could use in their communities. Whenever possible, the Department also partners with other Community Based Organizations including La Clínica de la Raza and Tiburcio Vasquez Health Center to develop educational materials aimed at Latinos.

Indigent Children: The following programs support the access of indigent children to immunization services in California:

- Vaccines for Children (VFC) provides vaccines to approximately 50% of California's children via over 4,000 VFC providers throughout California. Children eligible for VFC include uninsured children and those covered by Medi-Cal and CHDP.
- California Health and Safety Code §120350 requires local health departments to provide free immunizations to children who are not VFC-eligible but still face economic barriers to immunization (for example, families whose insurance plans are not subject to the requirements of the Affordable Care Act and do not cover vaccination). VFC-eligible children who lack means of transportation to VFC providers are also immunized by local health departments.

IV. Improving Outreach and Education Efforts

CDPH is committed to testing and improving the methods it uses to promote immunization, especially among target audiences in low-income communities. Information from the existing literature and new qualitative and quantitative research is used to assess outreach methods and materials before they are put into general use. Below are some examples:

- CDPH's interactive e-learning curriculum, EZ-IZ, trains medical assistants on immunization skills. In the beginning stages of designing this curriculum, the Department analyzed characteristics of the target audience; determined appropriate learning strategies and training delivery methods; identified and validated job skills and learning objectives; and identified critical content for the interactive lessons. With that information, CDPH developed instructional strategies for each skill area and metrics for each learning objective. Subject matter experts reviewed these plans and helped revise them. CDPH pilot-tested each lesson with the target audience, allowing for validation of the pre- and post-tests that are part of the curriculum. The EZ-IZ system stores information on each learner so that CDPH can analyze over time who is using the system and how well they are performing on the pre- and post-tests. Many of the lessons are now required for designated staff in provider offices receiving vaccines from the VFC Program in California.



- HPV Materials: In an effort to increase HPV immunization rates among adolescents, CDPH developed numerous HPV materials. In order to address the preteen (ages 11 and 12) Latino population in California, CDPH first developed an HPV Fotonovela in English and Spanish. This material was developed with input from the community and pilot tested.

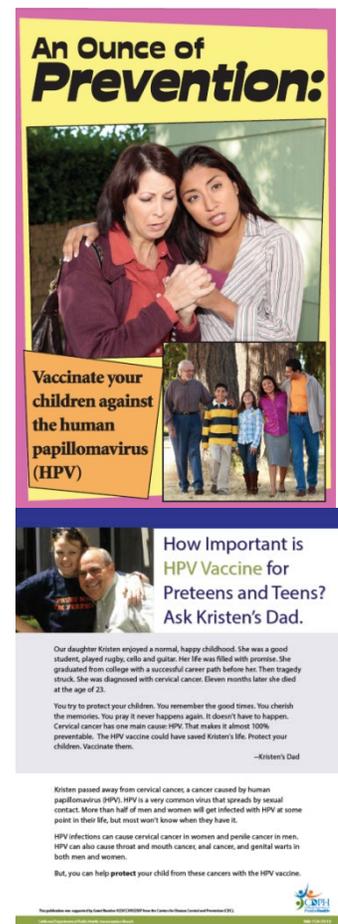
Since the distribution of the HPV Fotonovela, the Department has received feedback from two California Latino-oriented clinics that distributed the fotonovela to female patients in their waiting rooms. One clinic raised their HPV vaccine acceptance rates from 50% to 80% after they invited Latinas to read the fotonovela at the clinic's waiting room. Another clinic reported increasing 3-dose HPV vaccination completion rates from 60% to 80% after introducing the fotonovela in their exam rooms. This fotonovela has been distributed to Latino community-based organizations statewide.

- The Department continues to test materials with parents of preteens (ages 11 and 12) who had not immunized their children against HPV. The HPV flyer, “How Important is HPV Vaccine for Preteens and Teens” is very successful. Nearly 80% of parents stated they were likely to vaccinate their preteen in the next 12 months after reading the flyer.

In its ongoing effort to provide timely and accurate information to the public, healthcare providers, and other immunization stakeholders, CDPH focuses on the use of online and new media tools. Resources for the production of print materials are diminishing, and the general public is moving toward seeking information on the Internet. CDPH has adapted by developing websites, web banners, online training modules, text messaging programs, and webinars. The Department partnered with the California Immunization Coalition (CIC) to develop two new media campaigns, *Shot by Shot* and *iChoose*. Both campaigns make use of personal stories and statements from the general public to educate others about vaccinations and the diseases they prevent.



Shot by Shot: Stories of Vaccine-Preventable Diseases is a collection of stories from people who have been touched by vaccine-preventable diseases. *Shot by Shot's* user-generated story bank of real-life stories, told by survivors, family members, friends, and health care providers, brings first-hand experiences to new generations. Personal stories touch us, educate us, and remind us of the value of prevention. The project website, www.shotbysot.org, is the most visited CDPH website, with



The *iChoose* project is a social marketing campaign that aims to address concerns and attitudes held by people who question vaccines' importance and safety. The aim is to reduce the impact of negative publicity about vaccines. The campaign features true-life pictures and statements from immunization champions. Members of the public can upload their own photos and statements to the *iChoose* website. With photos from people all over the United States, the campaign validates health consumers' decision to immunize. Campaign materials are customizable for any age group, ethnicity or population and can include educational information for use in healthcare settings.

nearly seven million visits during the past 2 years. The ShotbyShot Facebook page has over 5,000 “likes.” With the amount of exposure the website and Facebook page receive, it becomes an important vehicle for sharing information with large amounts of people at the click of a button.

Evaluating the effectiveness of CDPH’s outreach efforts has become an area of special emphasis. To the extent feasible, all immunization outreach and education projects now incorporate plans for measuring their outcomes. Careful assessment of these projects’ results offers the opportunity to make refinements in future planning. This emphasis on program evaluation and performance measures is also being promoted at the local level.

V. RECOMMENDATIONS FOR A COMPREHENSIVE IMMUNIZATION STRATEGY AND ANALYSIS OF FUNDING REQUIREMENTS

By preventing illness and death, immunizations are cost-saving. Nationally, CDC estimates that vaccination of children born between 1995 and 2013 will save nearly \$1.4 trillion in total societal costs.

In 2000, the Institute of Medicine (IOM) published *Calling the Shots: Immunization Finance Policies and Practices*, a landmark report (excerpted at right) that urged states to devote more resources to activities that support efficient and comprehensive immunization of their populations. The IOM's caution about future expansion of the vaccine schedule was accurate: since 2000, the cost to fully immunize one child through age 18 has more than quadrupled.

Vaccines for Children (VFC) is a federal program that eliminates financial barriers to immunization by granting money to states for the purchase of vaccines for indigent children. The VFC program has helped create equity in vaccine access, and the program provides some additional funding for the maintenance of vaccine delivery infrastructure.

California's Immunization Workplan encompasses the individual and collaborative strategies of public and private partners aimed at achieving on-time vaccination for 90% of two-year-olds and 95% of kindergarteners and includes the activities previously described within this report. The Plan includes several major efforts by CDPH.

- 1) **Provision of Immunization Services:** The Department offers free or low-cost vaccinations to income-eligible people via local health departments' public clinics; supports these and other nonprofit clinics with technical assistance on matters of vaccine handling, recordkeeping, and similar subjects; and systematically evaluates clinic immunization rates to pinpoint patterns of missed vaccination opportunities that indicate how a clinic can improve its approach.
- 2) **Maintenance and Enhancement of the California Immunization Registry (CAIR):** The infrastructure of the immunization system must be capable of successfully implementing an increasingly complex vaccination schedule, maintaining high coverage of prior immunizations against diseases which have not been eradicated, and incorporating new vaccinations into the schedule.

"State immunization infrastructure programs require increased financial and administrative support to strengthen immunization capacity and reduce disparities in child and adult coverage rates. The committee recommends that states increase their immunization budgets by adding \$100 million over current spending levels, supplemented by an annual federal budget of \$200 million to support state infrastructure efforts."

"The annual federal and state budgets for the purchase of childhood vaccines for public health providers appear to be adequate but additions to the vaccine schedule are likely to increase the burden of effort within each state."

*Institute of Medicine
2000*

Approximately 500,000 children are born each year in California, each requiring over 20 doses of vaccine by age 18 months to be protected against over a dozen childhood diseases. These challenges frequently lead to missed opportunities to provide one or more recommended vaccines during medical appointments. Many children visit clinics sporadically and do not have a stable primary physician. When these children are first seen by a new health care provider, immunization records may be absent or incomplete, increasing the chance that children are either under-vaccinated or over-vaccinated.

Over 40,000 users utilize CAIR to access immunization records. Immunization registries are a vital tool both to ensure timely immunization and to prevent costly overimmunization of California's children. The registry's current infrastructure is regional but partly centralized with 7 of the 10 regional registries using the same software, hosted in the same location and managed by CDPH. However, the software is over 15 years old and is not currently compliant with state information technology rules. To provide the maximum benefit, the registry must become a statewide system that is compatible with future changes in information technology and that complies with federal requirements for meaningful use.

In 2013, the CAIR 2.0 Project was approved and funded through a 90%/10% Centers for Medicare & Medicaid Services (CMS) match. The intent of this CAIR 2.0 project is to

- Consolidate the 7 regional registries (48 of 58 counties -- ~ 87% of population) managed by CDPH staff into a single registry
- Implement new state-of-the-art registry software that is state IT-compliant and supports electronic health care incentive programs
- Connect via interoperability to 3 'independent' California registries to allow patient searches and data retrieval.

Completion of the CAIR 2.0 Project is slated for mid 2017.

- 3) *Public-Private Partnerships that Advance Immunization:* Through the California Immunization Committee, professional medical associations work with CDPH to provide physicians with ongoing education and technical assistance on vaccine and vaccine-preventable disease issues. CDPH also participates in the California Immunization Coalition, which promotes lifespan immunization through the cooperative efforts of state agencies, healthcare providers, and other stakeholders.
- 4) *Implementation of School and Childcare Immunization Requirements:* CDPH assists schools and child care centers in implementing California statutes mandating that children receive certain vaccines before enrollment. The Department provides compliance handbooks for these institutions and offers individual consultations. The annual 7th grade, Kindergarten and Childcare Fall Assessments quantify the results of these activities. CDPH has recently deployed an online child care/school lookup system to assist parents and others interested in determining the immunization rates of licensed child care facilities and K-12 schools.
- 5) *Educational Efforts:* CDPH creates healthcare provider educational materials, both in print and online, and offers periodic training courses for medical and nursing staff who administer vaccines. These efforts are crucial as the amount of misinformation about immunization is increasing and its effects are seen in the tripling of the philosophical belief

exemption rates evident throughout California.

CDPH vigorously engages in active outreach to parents, educating them about the risks of vaccine-preventable disease, the value and safety of vaccines, and the logistics of obtaining access to vaccines. The Department developed numerous resources to support the new law (AB 2109) affecting the documentation of personal belief exemptions (PBE).

The new law went into effect on January 1, 2014 and requires parents who want to exempt their child

from any required immunizations to submit documentation from a health care practitioner indicating that the practitioner has provided the parent with, and the parent has received, information about the benefits and risks of immunizations and the risk of vaccine-preventable disease. The resources are available at shotsforschool.org. In addition, printed copies of the PBE form were distributed to all local health departments and are available for order from CDPH. In February 2014, CDPH hosted a webinar on AB 2109 for schools and child care providers. Based on the questions received via email, phone, and on the webinar, the Department updated the frequently asked questions (FAQ) on the shotsforschool.org website and continues to do so as more questions arise.

*According to the CDC,
immunizations are among
the 10 great
public health achievements
of the past century.*

- 6) *Collaboration with Other State Programs to Promote Immunization:* CDPH also collaborates actively in the immunization enterprise. The Women, Infants, and Children (WIC) Supplemental Nutrition Program screens the immunization status of its participants, educates them about needed vaccines, and facilitates their access to vaccination services. City and county Child Health and Disability Prevention (CHDP) Program offices emphasize immunization among the preventive services they provide. The Department anticipates and welcomes the continued involvement of the WIC program, the Child Health and Disability Prevention program, and private healthcare providers and organizations as partners in carrying out the Plan. The programs described above are central to CDPH's mission of protecting the lives and health of Californians.

CDPH collaborates with the California Department of Education (CDE) to support implementation of school immunization requirements and promote other immunization initiatives such as seasonal flu vaccination among school-aged children and their families. CDE was a key partner in assisting to inform school administrators, staff, and parents about the 7th grade Tdap requirement (AB 354) and the new law regarding the process for obtaining personal belief exemptions (AB 2109).

CDPH also collaborates with DHCS to ensure access so that Medi-Cal members are fully vaccinated on time.

Recommendations and Funding Requirements

CDPH plans to continue programs and partnerships encompassed by the California immunization workplan, adjusting as appropriate to reflect demographic changes or variations in disease prevalence. Section 317 of the Public Health Service Act authorizes the federal purchase of vaccines and provides funding to support immunization program operations. Section 317-purchased vaccine has been directed towards meeting the needs of priority populations; typically underinsured children who are not eligible for VFC, and uninsured adults. Unfortunately, Section 317 funding to California decreased from \$32 million in 2010 to \$8 million in 2014.

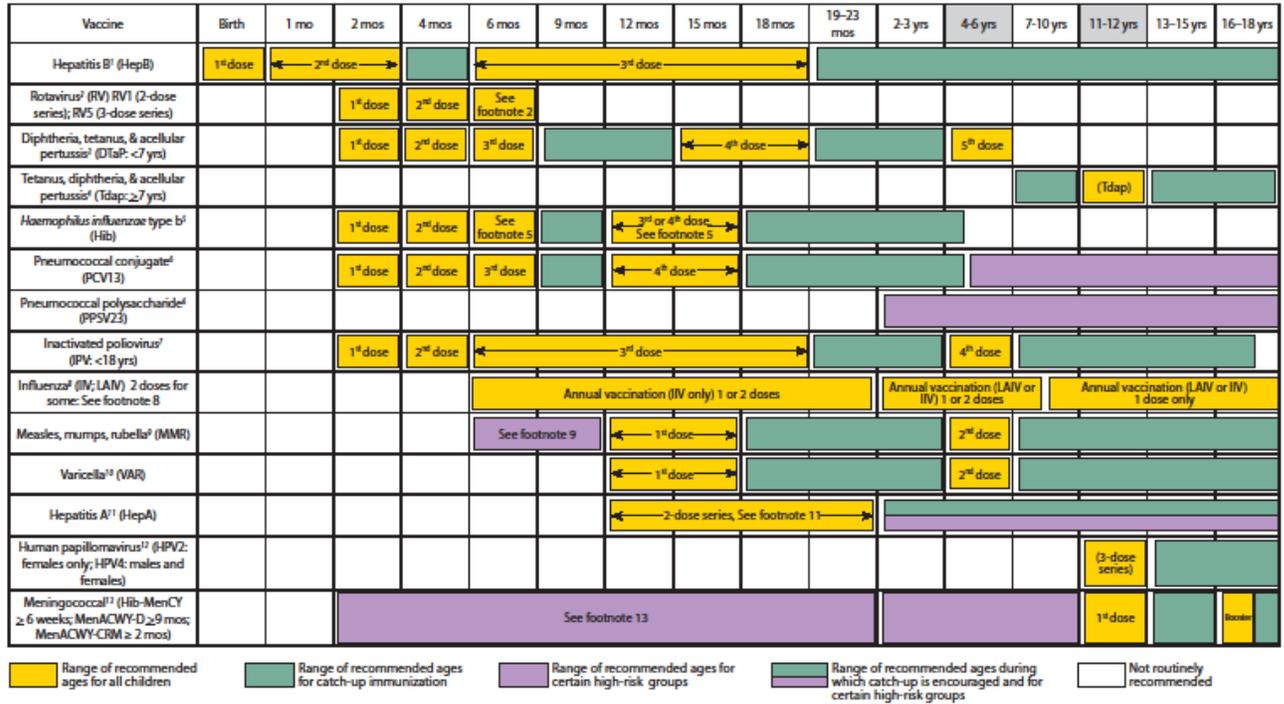
APPENDIX A: 2015 CHILDHOOD IMMUNIZATION SCHEDULE

For footnotes, see source of these schedules: <http://www.cdc.gov/vaccines/schedules/index.html>

Figure 1. Recommended immunization schedule for persons aged 0 through 18 years – United States, 2015.

(FOR THOSE WHO FALL BEHIND OR START LATE, SEE THE CATCH-UP SCHEDULE (FIGURE 2)).

These recommendations must be read with the footnotes that follow. For those who fall behind or start late, provide catch-up vaccination at the earliest opportunity as indicated by the green bars in Figure 1. To determine minimum intervals between doses, see the catch-up schedule (Figure 2). School entry and adolescent vaccine age groups are shaded.



This schedule includes recommendations in effect as of January 1, 2015. Any dose not administered at the recommended age should be administered at a subsequent visit, when indicated and feasible. The use of a combination vaccine generally is preferred over separate injections of its equivalent component vaccines. Vaccination providers should consult the relevant Advisory Committee on Immunization Practices (ACIP) statement for detailed recommendations, available online at <http://www.cdc.gov/vaccines/hcp/acip-recs/index.html>. Clinically significant adverse events that follow vaccination should be reported to the Vaccine Adverse Event Reporting System (VAERS) online (<http://www.vaers.hhs.gov>) or by telephone (800-822-7967). Suspected cases of vaccine-preventable diseases should be reported to the state or local health department. Additional information, including precautions and contraindications for vaccination, is available from CDC online (<http://www.cdc.gov/vaccines/recs/vac-admin/contraindications.htm>) or by telephone (800-CDC-INFO [800-232-4636]).

This schedule is approved by the Advisory Committee on Immunization Practices (<http://www.cdc.gov/vaccines/acip>), the American Academy of Pediatrics (<http://www.aap.org>), the American Academy of Family Physicians (<http://www.aafp.org>), and the American College of Obstetricians and Gynecologists (<http://www.acog.org>).

NOTE: The above recommendations must be read along with the footnotes of this schedule.

APPENDIX B: 2015 ADULT IMMUNIZATION SCHEDULE

For footnotes, see source of these schedules: <http://www.cdc.gov/vaccines/schedules/index.html>

Recommended Adult Immunization Schedule—United States - 2015

Note: These recommendations must be read with the footnotes that follow containing number of doses, intervals between doses, and other important information.

Figure 1. Recommended adult immunization schedule, by vaccine and age group¹

VACCINE	AGE GROUP	19-21 years	22-26 years	27-49 years	50-59 years	60-64 years	≥ 65 years
Influenza ²		1 dose annually					
Tetanus, diphtheria, pertussis (Td/Tdap) ²		Substitute 1-time dose of Tdap for Td booster; then boost with Td every 10 yrs					
Vaccine ²		2 doses					
Human papillomavirus (HPV) Female ²		3 doses					
Human papillomavirus (HPV) Male ²		3 doses					
Zoster ²		1 dose					
Measles, mumps, rubella (MMR) ²		1 or 2 doses					
Pneumococcal 13-valent conjugate (PCV13) ²		1-time dose					
Pneumococcal polysaccharide (PPSV23) ²		1 or 2 doses					
Meningococcal ²		1 or more doses					
Hepatitis A ²		2 doses					
Hepatitis B ²		3 doses					
Haemophilus influenzae type b (Hib) ²		1 or 3 doses					

²Covered by the Vaccine Injury Compensation Program

- For all persons in this category who meet the age requirements and who lack documentation of vaccination or have no evidence of previous infection; zoster vaccine recommended regardless of prior episode of zoster
- Recommended if some other risk factor is present (e.g., on the basis of medical, occupational, lifestyle, or other indication)
- No recommendation

Report all clinically significant postvaccination reactions to the Vaccine Adverse Event Reporting System (VAERS). Reporting forms and instructions on filing a VAERS report are available at www.cdc.gov/vaers or by telephone, 800-822-7967.

Information on how to file a Vaccine Injury Compensation Program claim is available at www.hrsa.gov/vaccinecompensation or by telephone, 800-338-2382. To file a claim for vaccine injury, contact the U.S. Court of Federal Claims, 717 Madison Place, N.W., Washington, D.C. 20005; telephone, 202-357-5400.

Additional information about the vaccines in this schedule, extent of available data, and contraindications for vaccination is also available at www.cdc.gov/vaccines or from the CDC-INFO Contact Center at 800-CDC-INFO (800-232-4636) in English and Spanish, 8:00 a.m. - 8:00 p.m. Eastern Time, Monday - Friday, excluding holidays.

Use of trade names and commercial sources is for identification only and does not imply endorsement by the U.S. Department of Health and Human Services.

The recommendations in this schedule were approved by the Centers for Disease Control and Prevention's (CDC) Advisory Committee on Immunization Practices (ACIP), the American Academy of Family Physicians (AAFP), the American College of Physicians (ACP), American College of Obstetricians and Gynecologists (ACOG) and American College of Nurse-Midwives (ACNM).

Figure 2. Vaccines that might be indicated for adults based on medical and other indications¹

VACCINE	INDICATION	Propagacy	Immuno-compromising conditions (including human immunodeficiency virus (HIV) ^{2,3,4,5,6,7})	HIV infection CD4+ T lymphocyte count ^{2,3,4,5,6,7}	Men who have sex with men (MSM) ^{2,3,4,5,6,7}	Kidney failure, end-stage renal disease, receipt of hemodialysis	Heart disease, chronic lung disease, chronic alcoholism	Aplenia (including elective splenectomy and persistent complement component deficiencies) ^{2,3,4,5,6,7}	Chronic liver disease	Diabetes	Healthcare personnel
Influenza ²				< 200 cells/µL	> 200 cells/µL	1 dose IIV or LAV annually					1 dose IIV or LAV annually
Tetanus, diphtheria, pertussis (Td/Tdap) ²		1 dose Tdap each pregnancy				Substitute 1-time dose of Tdap for Td booster; then boost with Td every 10 yrs					
Vaccine ²		Contraindicated				2 doses					
Human papillomavirus (HPV) Female ²						3 doses through age 26 yrs					
Human papillomavirus (HPV) Male ²						3 doses through age 21 yrs					
Zoster ²		Contraindicated				1 dose					
Measles, mumps, rubella (MMR) ²		Contraindicated				1 or 2 doses					
Pneumococcal 13-valent conjugate (PCV13) ²						1 dose					
Pneumococcal polysaccharide (PPSV23) ²						1 or 2 doses					
Meningococcal ²						1 or more doses					
Hepatitis A ²						2 doses					
Hepatitis B ²						3 doses					
Haemophilus influenzae type b (Hib) ²		post-BST recipients only				1 or 3 doses					

²Covered by the Vaccine Injury Compensation Program

- For all persons in this category who meet the age requirements and who lack documentation of vaccination or have no evidence of previous infection; zoster vaccine recommended regardless of prior episode of zoster
- Recommended if some other risk factor is present (e.g., on the basis of medical, occupational, lifestyle, or other indications)
- No recommendation

¹These schedules indicate the recommended age groups and medical indications for which administration of currently licensed vaccines is commonly recommended for adults ages 19 years and older, as of February 1, 2015. For all vaccines being recommended on the Adult Immunization Schedule a vaccine series does not need to be restarted, regardless of the time that has elapsed between doses. Licensed combination vaccines may be used whenever any components of the combination are indicated and when the vaccine's other components are not contraindicated. For detailed recommendations on all vaccines, including those used primarily for travelers or that are issued during the year, consult the manufacturers' package inserts and the complete statements from the Advisory Committee on Immunization Practices (www.cdc.gov/vaccines/acip-recs/index.html). Use of trade names and commercial sources is for identification only and does not imply endorsement by the U.S. Department of Health and Human Services.



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