



Pediatric Immunization Update

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California Department of Public Health

Immunization Branch

Agenda

- ACIP 2019 Immunization Schedule updates and overview
- “Current events” in vaccine-preventable diseases
 - Measles
 - Flu
 - Pertussis
- Strategies to make our work more effective
- Helpful resources for parents and clinics

Can you identify these?

①



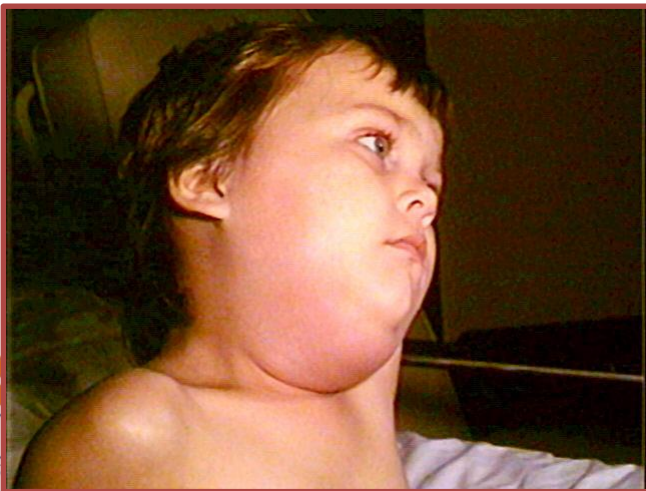
②



③



④



Pediatric Immunization Schedule, 2019

- Separation of Live, Attenuated Influenza Vaccine (LAIV) and Inactivated Influenza Vaccine (IIV) recommendations into 2 rows
- Changes to format of schedule
 - Indications-based table is clarified (precaution, delay, contraindication)
 - Footnotes are organized more clearly
 - Easier to read

Table 1—Vaccines by Age

Legend

Range of recommended ages for all children	Range of recommended ages for catch-up immunization	Range of recommended ages for certain high-risk groups	Range of recommended ages for non-high-risk groups that may receive vaccine, subject to individual clinical decision-making	No recommendation
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Birth to 15 Months

Vaccine	Birth	1 mo	2 mos	4 mos	6 mos	9 mos	12 mos	15 mos
Hepatitis B ⓘ (HepB)	1 st dose	2 nd dose			→ 3 rd dose →			
Rotavirus ⓘ (RV) RV1 (2-dose series); RV5 (3-dose series)			1 st dose	2 nd dose	See notes			
Diphtheria, tetanus, & acellular pertussis ⓘ (DTaP: <7 yrs)			1 st dose	2 nd dose	3 rd dose			→ 4 th dose →
Haemophilus influenzae type b ⓘ (Hib)			1 st dose	2 nd dose	See notes		→ 3 rd or 4 th dose, See notes →	
Pneumococcal conjugate ⓘ (PCV13)			1 st dose	2 nd dose	3 rd dose		→ 4 th dose →	
Inactivated poliovirus ⓘ (IPV: <18 yrs)			1 st dose	2 nd dose	→ 3 rd dose →			
Influenza (IIV) ⓘ					Annual vaccination 1 or 2 doses			
OR								
Influenza (LAIV) ⓘ								
Measles, mumps, rubella ⓘ (MMR)					See notes		→ 1 st dose →	
Varicella ⓘ (VAR)							→ 1 st dose →	
Hepatitis A ⓘ (HepA)					See notes		→ 2-dose series, See notes →	
Meningococcal ⓘ (MenACWY-D: ≥ 9 mos; MenACWY-CRM: ≥ 2 mos)			See notes					

18 Months to 18 Years

Vaccines	18 mos	19-23 mos	2-3 yrs	4-6 yrs	7-10 yrs	11-12 yrs	13-15 yrs	16 yrs	17-18 yrs
Hepatitis B ⓘ (HepB)	→ 3 rd dose →								
Rotavirus ⓘ (RV) RV1 (2-dose series); RV5 (3-dose series)									
Diphtheria, tetanus, & acellular pertussis ⓘ (DTaP: <7 yrs)	→ 4 th dose →			5 th dose					
Haemophilus influenzae type b ⓘ (Hib)									
Pneumococcal conjugate ⓘ (PCV13)									
Inactivated poliovirus ⓘ (IPV: <18 yrs)	→ 3 rd dose →			4 th dose					
Influenza (IIV) ⓘ	Annual vaccination 1 or 2 doses					Annual vaccination 1 dose only			
or Influenza (LAIV) ⓘ			Annual vaccination 1 or 2 doses		Annual vaccination 1 dose only				
Measles, mumps, rubella ⓘ (MMR)				2 nd dose					
Varicella ⓘ (VAR)				2 nd dose					
Hepatitis A ⓘ (HepA)	→ 2-dose series, See notes →								
Meningococcal ⓘ (MenACWY-D: ≥ 9 mos; MenACWY-CRM: ≥ 2 mos)	See notes					1 st dose		2 nd dose	
Tetanus, diphtheria, & acellular pertussis ⓘ (Tdap: ≥ 7 yrs)						Tdap			
Human papillomavirus ⓘ (HPV)							See notes		
Meningococcal B ⓘ (MenB)						See notes			
Pneumococcal polysaccharide ⓘ (PPSV23)			See notes						

Closer look at Table 1

Range of recommended ages for all children

Range of recommended ages for catch-up immunization

Range of recommended ages for certain high-risk groups

Range of recommended ages for non-high-risk groups that may receive vaccine, subject to individual clinical decision-making

No recommendation

Birth to 15 Months

Vaccine	Birth	1 mo	2 mos	4 mos	6 mos	9 mos	12 mos	15 mos
Measles, mumps, rubella ⓘ (MMR)					See notes		← 1 st dose →	
Varicella ⓘ (VAR)							← 1 st dose →	
Hepatitis A ⓘ (HepA)					See notes		← 2-dose series, See notes →	

Measles and Hepatitis A vaccination recommendations for infants 6-11 months who will be traveling internationally.

Table 2—Catch-up Schedule

Vaccine Catch-Up Guidance

CDC has developed catch-up guidance job aids to assist health care providers in interpreting Table 2 in the childhood and adolescent immunization schedule.

- [Pneumococcal Conjugate Vaccine \(PCV\) Catch-Up Guidance for Children 4 Months through 4 Years of Age](#). [3 pages]
- [Haemophilus influenzae type b-Containing Vaccines Catch-Up Guidance for Children 4 Months through 4 Years of Age](#)
 - [Hib vaccine products: ActHib, Pentacel, Hiberix or unknown](#). [3 pages]
 - [Hib vaccine products: PedvaxHIB vaccine only](#). [2 pages]
- [Diphtheria-, Tetanus-, and Pertussis-Containing Vaccines Catch-Up Guidance for Children 4 Months through 6 Years of Age](#). [2 pages]
- [Tetanus-, Diphtheria-, and Pertussis-Containing Vaccines Catch-Up Guidance for Children 7 through 18 Years of Age](#). [2 pages]

Children Age 4 Months through 6 Years

Vaccine	Minimum Age for Dose 1	Minimum Interval Between Doses			
		Dose 1 to Dose 2	Dose 2 to Dose 3	Dose 3 to Dose 4	Dose 4 to Dose 5
Hepatitis B ①	Birth	4 weeks	8 weeks and at least 16 weeks after first dose. Minimum age for the final dose is 24 weeks.		
Rotavirus ①	6 weeks Maximum age for first dose is 14 weeks, 6 days.	4 weeks	4 weeks Maximum age for final dose is 8 months, 0 days.		
Diphtheria, tetanus, and acellular pertussis ①	6 weeks	4 weeks	4 weeks	6 months	6 months
Haemophilus influenzae type b ①	6 weeks	<p>No further doses needed if first dose was administered at age 15 months or older.</p> <p>4 weeks if first dose was administered before the 1st birthday.</p> <p>8 weeks (as final dose) if first dose was administered at age 12 through 14 months.</p>	<p>No further doses needed if previous dose was administered at age 15 months or older.</p> <p>4 weeks if current age is younger than 12 months and first dose was administered at younger than age 7 months, and at least 1 previous dose was PRP-T (ActHib, Pentacel, Hiberix) or unknown.</p> <p>8 weeks and age 12 through 59 months (as final dose) if current age is younger than 12 months and first dose was administered at age 7 through 11 months; OR</p> <p>if current age is 12 through 59 months and first dose was administered before the 1st birthday, and second dose</p>	8 weeks (as final dose) This dose only necessary for children age 12 through 59 months who received 3 doses before the 1 st birthday.	

Table 3—Vaccines by Medical Condition

Legend

Vaccination according to the routine schedule recommended

Recommended for persons with an additional risk factor for which the vaccine would be indicated

Vaccination is recommended, and additional doses may be necessary based on medical condition. [See Notes.](#)

Contraindicated or use not recommended—vaccine should not be administered because of risk for serious adverse reaction

Precaution—vaccine might be indicated if benefit of protection outweighs risk of adverse reaction

Delay vaccination until after pregnancy if vaccine indicated

No recommendation

Vaccine	Indication									
	Pregnancy	Immunocompromised status (excluding HIV infection)	HIV infection CD4+ count ¹		Kidney failure, end-stage renal disease, on hemodialysis	Heart disease, chronic lung disease	CSF leaks/cochlear implants	Asplenia and persistent complement component deficiencies	Chronic liver disease	Diabetes
			<15% and total CD4 cell count of <200/mm3	≥15% and total CD4 cell count of ≥200/mm3						
Hepatitis B ⓘ										
Rotavirus ⓘ		SCID								
Diphtheria, tetanus, & acellular pertussis ⓘ (DTaP)										
Haemophilus influenzae type b ⓘ										
Pneumococcal conjugate ⓘ										
Inactivated poliovirus ⓘ										
Influenza ⓘ (IV)										
Oral Influenza ⓘ (LAIV)						Asthma, wheezing: 2-4yrs				
Measles, mumps, rubella ⓘ										
Varicella ⓘ										
Hepatitis A ⓘ										
Meningococcal ACWY ⓘ										
Tetanus, diphtheria, & acellular pertussis ⓘ (Tdap)										

Closer look at Table 3

Legend

Vaccination according to the routine schedule recommended

Recommended for persons with an additional risk factor for which the vaccine would be indicated

Vaccination is recommended, and additional doses may be necessary based on medical condition. [See Notes.](#)

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			<15% and total CD4 cell count of <200/mm3	≥ 15% and total CD4 cell count of ≥200/mm3						
Influenza ⓘ (IIV)										
<div>or</div> Influenza ⓘ (LAIV)						<div>Asthma, wheezing: 2-4yrs²</div>				

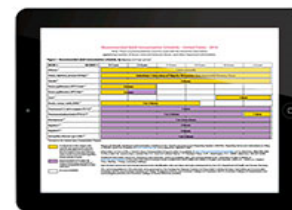
Check out the Apps!

CDC Vaccine Schedules App for Health Care Providers

Note: If you previously downloaded the app, check that you have version **6.0.1** with **2019** schedules and footnotes.

Healthcare providers who recommend or administer vaccines can immediately access all CDC recommended immunization schedules and footnotes using the CDC Vaccine Schedules app. Optimized for tablets and useful on smartphones, the app shows child, adolescent, and adult vaccines recommended by the Advisory Committee on Immunization Practices (ACIP).

The app visually mimics the printed schedules, which are reviewed and published annually. Users can identify correct vaccine, dosage, and timing with 2 or 3 clicks. Any changes in the schedules will be released through app updates. This app is one of an expanding collection of applications from CDC on a variety of topics, each optimized for your mobile device.



<https://www.cdc.gov/vaccines/schedules/hcp/schedule-app.html#download>

Shots Immunizations App by AAFP and STFM

2019 Immunization Schedules on Demand

Get easy-to-use, up-to-date vaccine information at the point of care with **Shots Immunizations by the American Academy of Family Physicians and Society of Teachers of Family Medicine.**

- View 2019 CDC schedules: Adult, Childhood/Adolescent, and Child Catch-up
- Input patient characteristics (age, conditions, special circumstances) and receive a list of recommended vaccines
- Access exclusive schedules for combination vaccines: ProQuad, Pediarix-Kinrix, and Pentacel-Quadracel
- Read detailed information on each vaccine, including dosing schedules, potential adverse reactions, contraindications, CPT codes, resident education, and more
- Available for iPhone, iPad, and Android devices

Shots Immunizations was developed by vaccine experts at AAFP and STFM

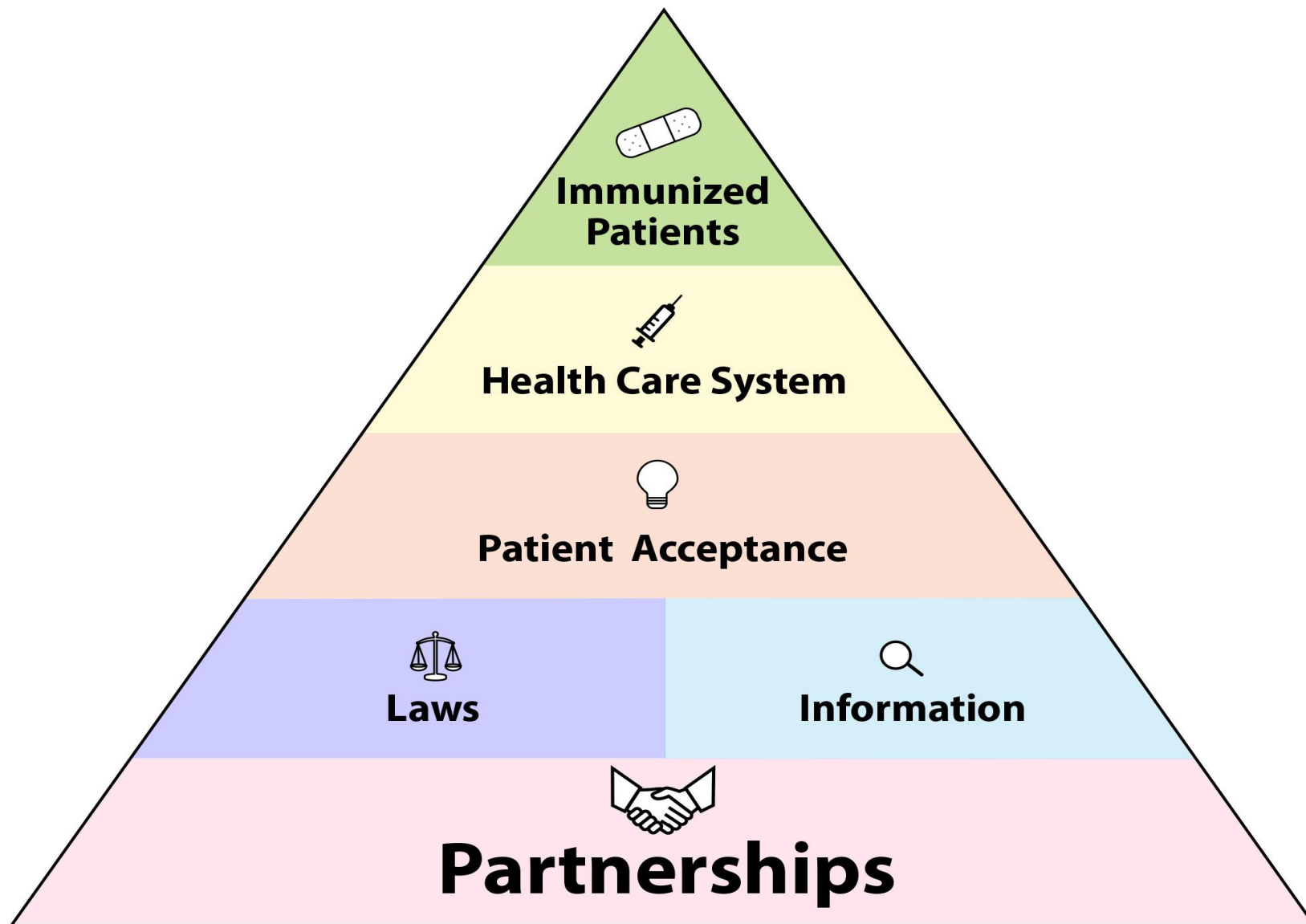


Shots Immunizations by AAFP and STFM is available in the AAFP mobile app.

Download the app now:

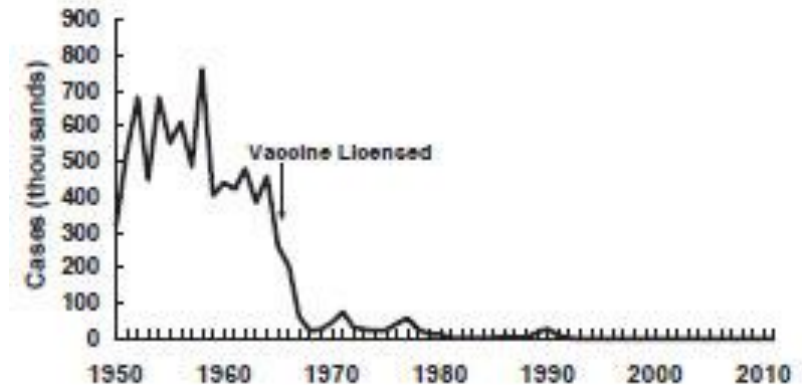


<https://www.aafp.org/patient-care/public-health/immunizations/shots-app.html>



How can we measure success?

- When we see outbreaks, it may mean there's a hole in the safety net.
- When prevention is successful, it is “hidden” or “invisible.”
- Immunization levels are a good indicator of how we are doing at preventing disease in our community.



IMMUNIZATION RECORD
Comprobante de Inmunización



Nome
nombre _____

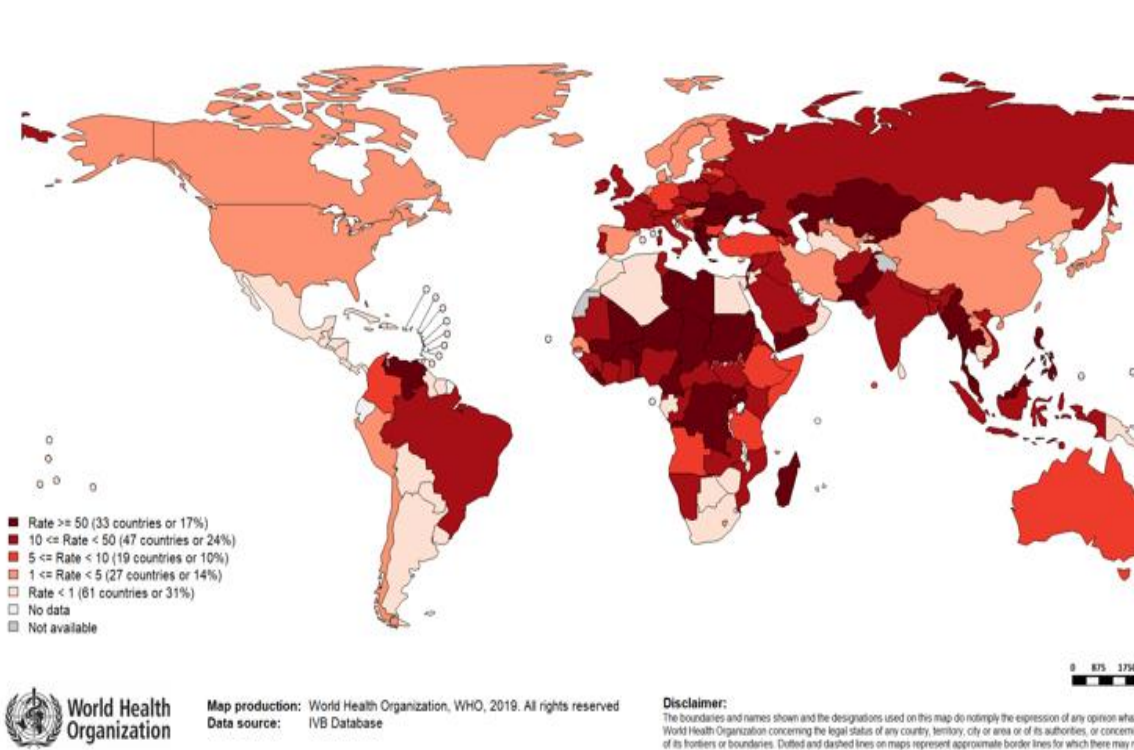
Birthdate
fecha de nacimiento _____

Allergies
alergias _____

Vaccine Reactions
reacciones a cualquier vacuna _____

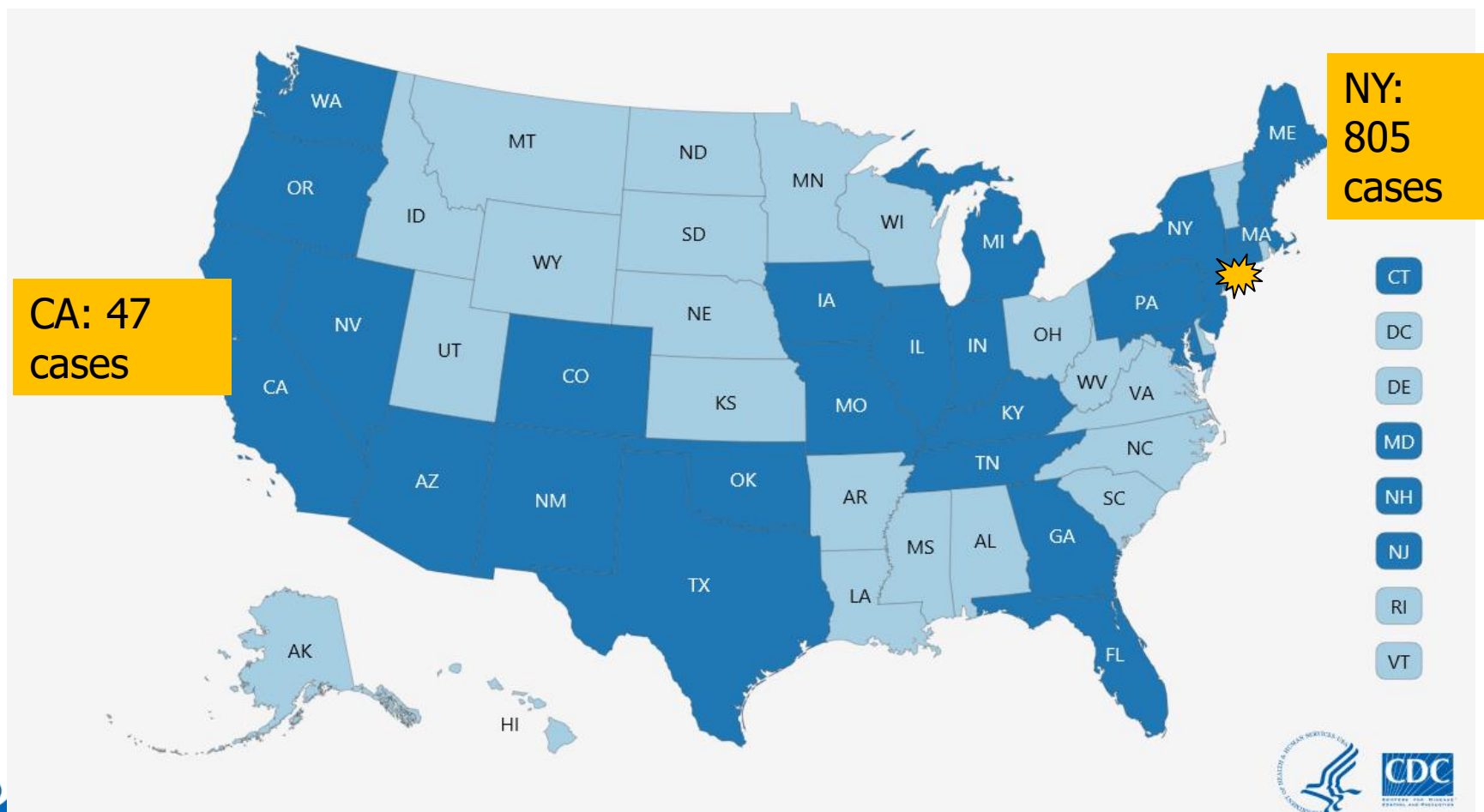
RETAIN THIS DOCUMENT — CONSERVE ESTE DOCUMENTO

Current Events—Measles



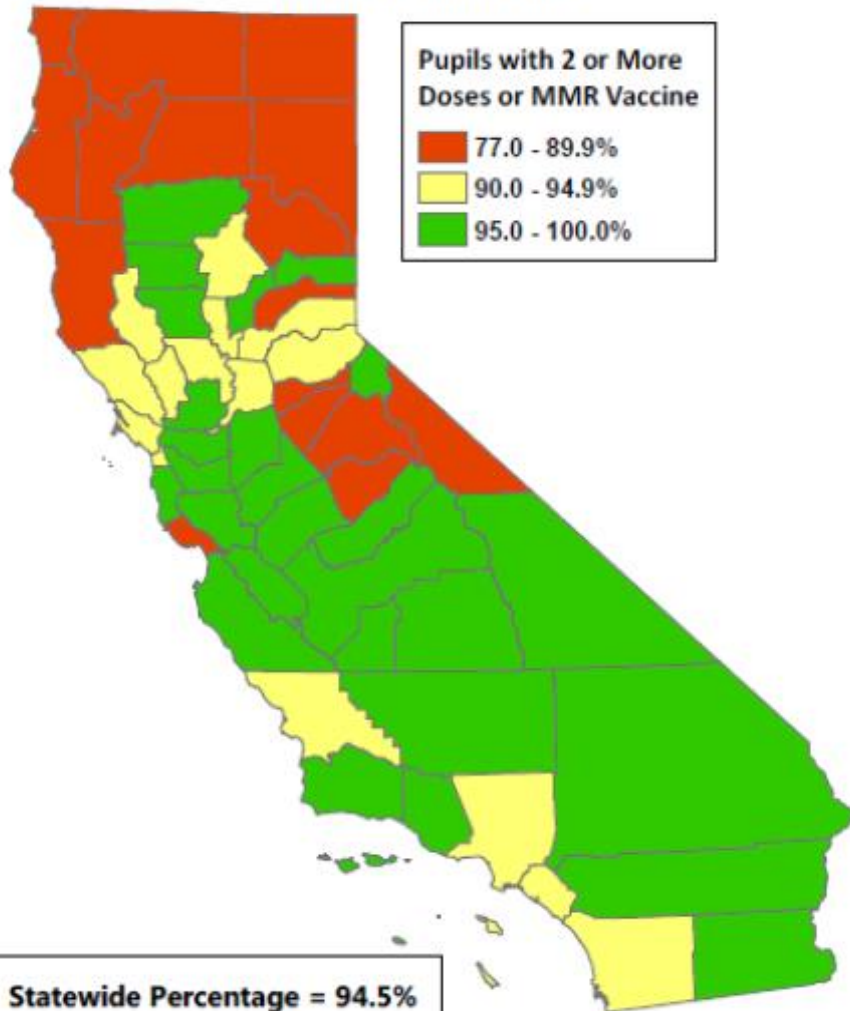
Top 10**		
Country	Cases	Rate (per million)
Madagascar	84804	3406.53
Ukraine	78659	1770.06
India	53170	40.15
Pakistan	22693	117.46
Philippines	16898	163.55
Yemen	13639	494.45
Nigeria	12745	68.53
Brazil	10316	49.68
Thailand	6914	100.4
Kazakhstan	5908	328.45

CDC: From January 1 to May 31, 2019, 981 individual cases of measles have been confirmed in 26 states. This is the greatest number of cases reported in the U.S. since 1992 and since measles was declared eliminated in 2000. <https://www.cdc.gov/measles/cases-outbreaks.html>

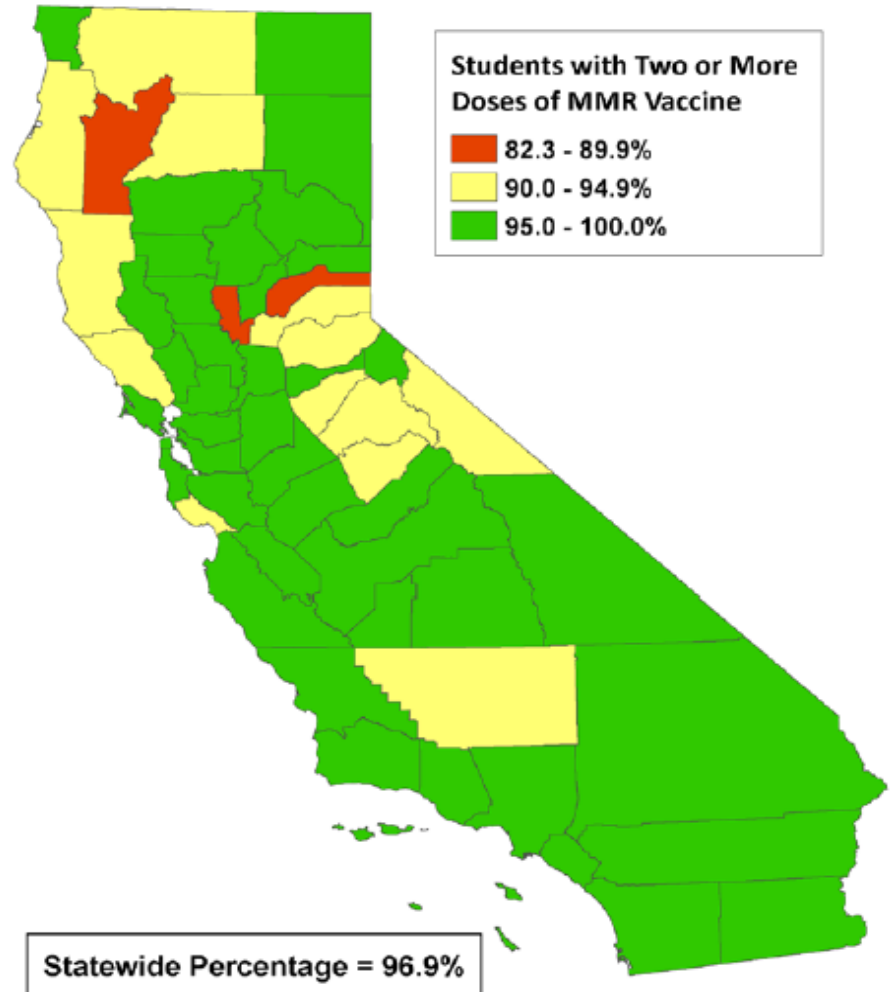


Kindergarten entrants with 2 or more MMR doses, 2015 vs. 2017

2015-2016 School Year



2017-2018 School Year



What Really Makes a Difference in Vaccination Rates?

Social media platforms play a role in spreading misinformation, but state legislatures have the power of law.



By Brendan Nyhan

March 6, 2019

Anti-vaccination protesters during the “March for Medical Freedom” outside the Legislative Building in Olympia, Wash., last month. Lindsey Wasson/Reuters

Community Immunity

A certain level of protection is necessary to protect those who can't be vaccinated.

IT TAKES A COMMUNITY

TO PROVIDE IMMUNITY

Getting vaccinated protects you and others you care about

such as infants, people with cancer, and anyone with a compromised immune system.



VACCINATE  FAMILY

WHY DOES MY CHOICE MATTER TO OTHERS?

It matters because of the concept of “herd immunity.” Here’s how it works:



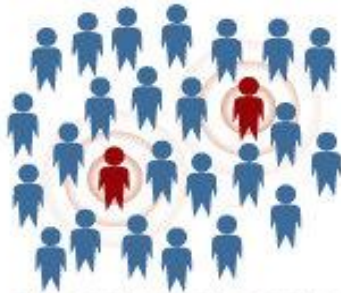
Not immunized
but still healthy



Immunized
and healthy



Not immunized,
sick and contagious



When no one is
immunized ...

... disease spreads through
the population.



When some of the
population is immunized ...

... disease spreads through
some of the population.



When most of the
population is immunized ...

... spread of the disease
is constrained.



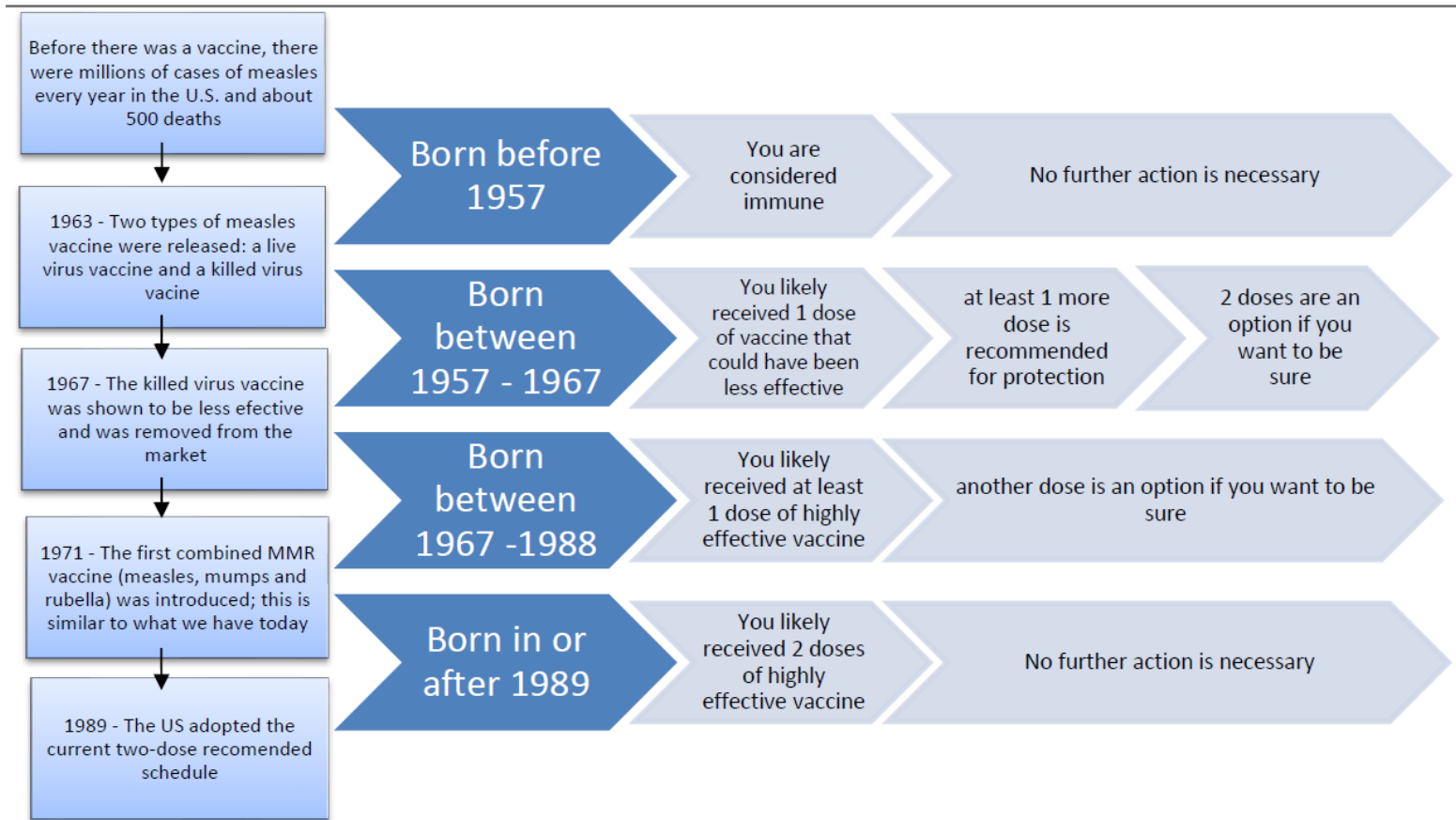
(MLive.com)



MMR Recommendations for Adults

- If no “evidence of immunity,” 1 dose MMR
- Evidence of immunity
 - Born before 1957
 - Documentation of prior MMR dose
 - Laboratory evidence of immunity (positive serology)
- Special situations
 - Healthcare workers, college students, and international travelers should have 2 documented doses if they don’t have laboratory evidence of immunity
- Children should receive 2 doses per routine schedule

Alameda County Adult Immunization Guidance



Measles: Key Points

- Without very high levels of immunity in the population (92-95%), measles can spread easily
- Routine measles immunization is very protective but not everyone can be immunized
- “Imported cases” will continue to occur and providers need to be vigilant
 - Isolate and test patients with measles symptoms and exposure risk
 - Immunize infants 6-11 months old before international travel

New Measles Testing Resource for California Providers

Should I Test For Measles?

A Guide for California Healthcare Providers

While suspecting measles in your patient, immediately mask and isolate the patient per airborne precautions.*

STEP 1 – HISTORY

In the 21 days prior to onset of illness, has patient had any of the following?

- Known exposure to a person with measles?
- International travel, contact with an international traveler, or been to an international airport in the US?
- Visited a venue popular with international visitors?
- Resided in or visited a US community with measles cases?

Current listings at bit.ly/2JqBbMW

If **NO** to all, measles very unlikely, testing not required.

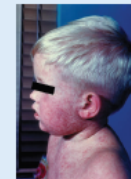


If **YES** to any, continue

STEP 2 – EXAM

Has the patient had a combination of...?

- **FEVER**
 - And one or more of: **COUGH, CONJUNCTIVITIS, or RUNNY NOSE**
 - And **RASH**[†]
 - Red-brown macules or papules - may become confluent patches
 - Begins on face and progresses downwards to the rest of the body
 - Typically appears within a few days after other symptoms begin
- If no rash within 4 days after onset of illness, you may consult your local health department.



If **YES**

STEP 3

CALL your local health department to report illness and discuss testing.

COLLECT specimens for PCR testing.

- Urine (10-50 ml in sterile container) AND

If **NO**

Measles unlikely, testing not required.

As needed, call your local health department for consultation.

NAG-TRAVEL KAMAKAILAN?



Kung may sakit ka
at may lagnat

+



Nag-travel sa ibang bansa
sa nakalipas na 3 linggo

Maaari Kang Magkatigdas.

**SABIHIN SA TAUHAN NG FRONT
DESK NGAYON!**

Ang tigdas ay lubhang nakakahawa at kumakalat sa maraming bahagi ng mundo.

California Department of Public Health, Sangay ng Pagbabakuna

IMM-1268 Tagalog (3/19)

<http://eziz.org/resources/measles/>

VISITING ANOTHER COUNTRY? PROTECT YOUR FAMILY.

THINK MEASLES.

Measles is widespread in places like Europe, Africa, Asia, India, and the Philippines.



BEFORE YOU TRAVEL

Tell your doctor where you are traveling. Babies and children may need measles protection at a younger age than usual.

AFTER YOU TRAVEL

Call your doctor if anyone gets a fever and rash within 3 weeks of returning from your trip. Describe where you traveled.

Talk with your doctor if you are planning an international trip.

For more information go to www.cdc.gov/travel.

California Department of Public Health, Immunization Branch

IMM-1046 (5/11)

Fever and Rash?.....Consider Measles

Measles is highly contagious. Please protect patients, visitors, and staff!



Keep an eye out for measles symptoms:

Suspect Measles in patients with fever, rash, and who have been in the last 3 weeks:

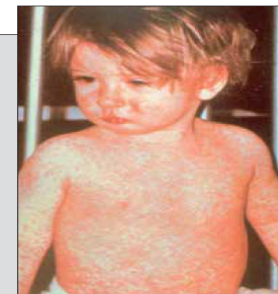
- In contact with a person with measles or febrile rash illness
- In locations or communities with cases of measles
- Outside of the U.S. or in contact with international visitors
- Visited sites popular with international visitors

Prodrome

- Mild to moderate fever
- Cough
- Coryza
- Conjunctivitis

Rash onset

- Fever spikes, often as high as 104° to 105° F
- Red, maculopapular rash that may become confluent—typically starts at hairline, then face, and spreads rapidly down body
- Koplik's spots (tiny blue/white spots on



What vaccine preventable disease (VPD) is responsible for the largest number of cases in California's children?



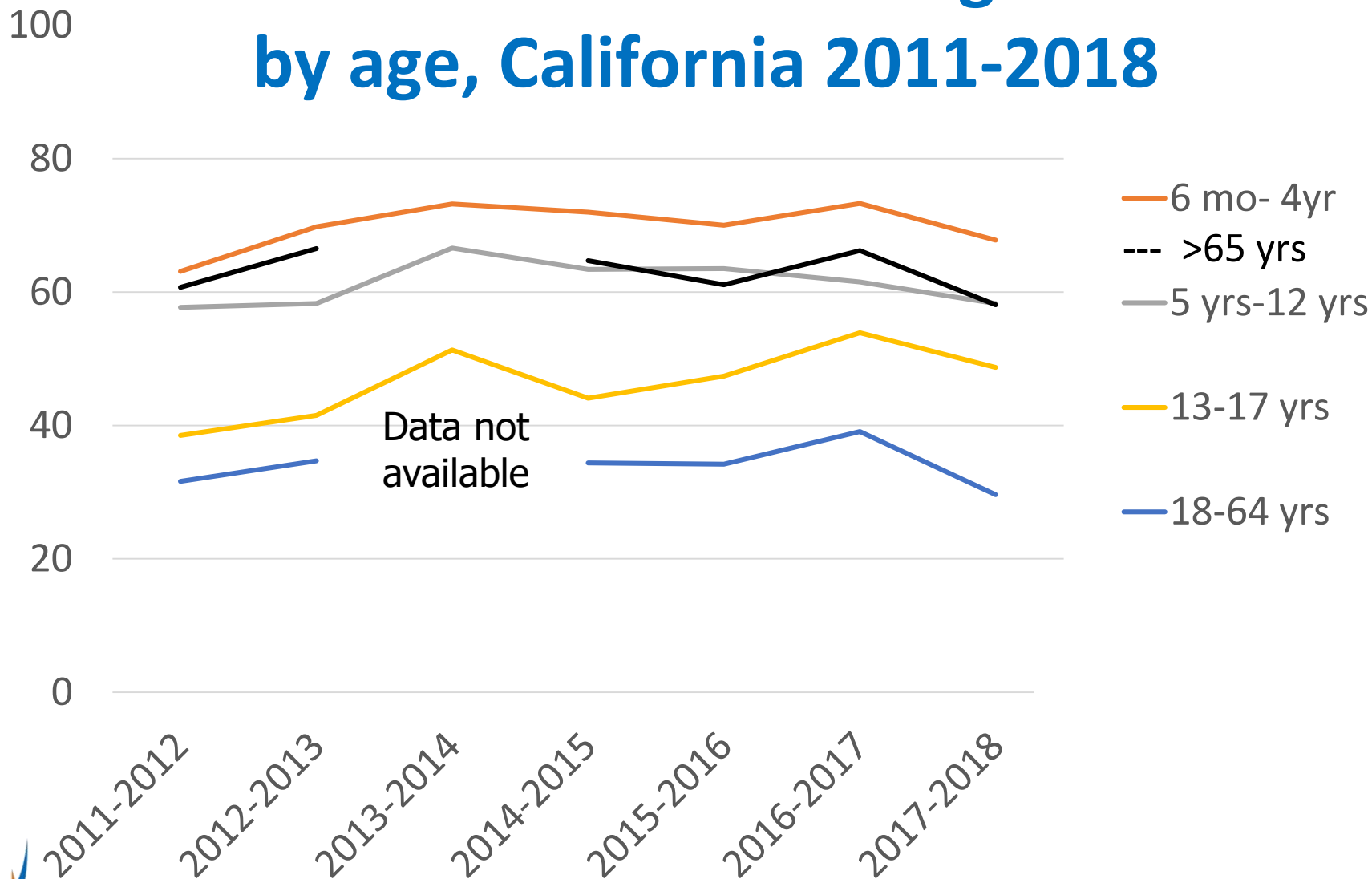
VPDs in persons <19 years of age, by number of cases/year, California

VPD	Cases/year	Deaths	<i>Year</i>
1.			
2.			
3.			
4.			
5.			
6. Measles	7	0	2017

VPDs in persons <19 years of age, by number of cases/year, California

VPD	Cases/year	Deaths	Year
1. Influenza	1,400,000	18	17-18 season
		8 (preliminary)	18-19 season
2.			
3.			
4.			
5.			
6. Measles	7	0	2017

Influenza vaccination coverage estimates by age, California 2011-2018



Measles vs. flu vaccination levels of infants/toddlers, provider verified, CA

- Flu vaccination of 6-23 month olds (2015-6)
 - **46%** up to date --2 doses (or 1)
- Measles vaccination of 19-35 month olds (2017)
 - **93%** --one dose MMR

Scarlet's Story

"The flu vaccination is not 100%. But I'd take 7%. I'd take 50%. I'd take 3%...The hardest part is knowing there are preventative measures I could have taken to possibly have saved her life."

-- mother of Scarlet, who died from influenza at age 5 yrs



Approximately 40% of the U.S. population chose to get a flu vaccine during the 2017-2018 flu season, and this prevented an estimated:

7million
flu illnesses,



about the population of
the entire Bay
Area

109,000
flu hospitalizations,



about the number of vehicles
crossing the Golden Gate Bridge
each day.

8,000
flu deaths,



twice the number of hospitals in
the United States.

**Imagine the impact if more Americans chose to get a flu vaccine.
Many more flu illnesses, flu hospitalizations and flu deaths could be prevented.**

Even though

- Flu vaccine is not perfect
 - Cuts in half the chances of children having to go to doctor with flu
 - Reduces risk of death in children by 65%
- With only 40% of US population immunized and ~40% vaccine effectiveness in 2017-8
 - Large burden of disease averted
- Flu seasons vary in severity; “predictably unpredictable”
 - Every season has pediatric deaths
 - 8 pediatric deaths this season so far in CA

Clinician-parent discussions about influenza vaccination of children and their association with vaccine acceptance (% immunized)

“Presumptive”	“Participatory”
94%	28%

“Pursued in the face of resistance”	“Did not pursue”
80%	13%

“Concurrent recommendation”	“Separate recommendation”
83%	33%

Hofstetter et al, 2017;

<https://www.ncbi.nlm.nih.gov/pubmed/28392141>

What is VPD causes the 2nd largest number of cases in CA's children?



VPDs in persons <19 years of age, ranked by number of cases/year, California

VPD	Cases/year	Deaths	Year
1. Influenza*	1,400,000	18	17-18 season
2. Pertussis [†] **	3,013	1	2018
< 4 mos. age	138	1	2018
< 4 mos. age	45	1	2019
3. Mumps [†]	28	0	2017
4. Meningococcal	21	1	2017
5. Acute hepatitis A	14	0	2017
6. Measles	7	0	2017

*estimate

**provisional

[†] includes confirmed and probable cases

Pertussis = Whooping Cough

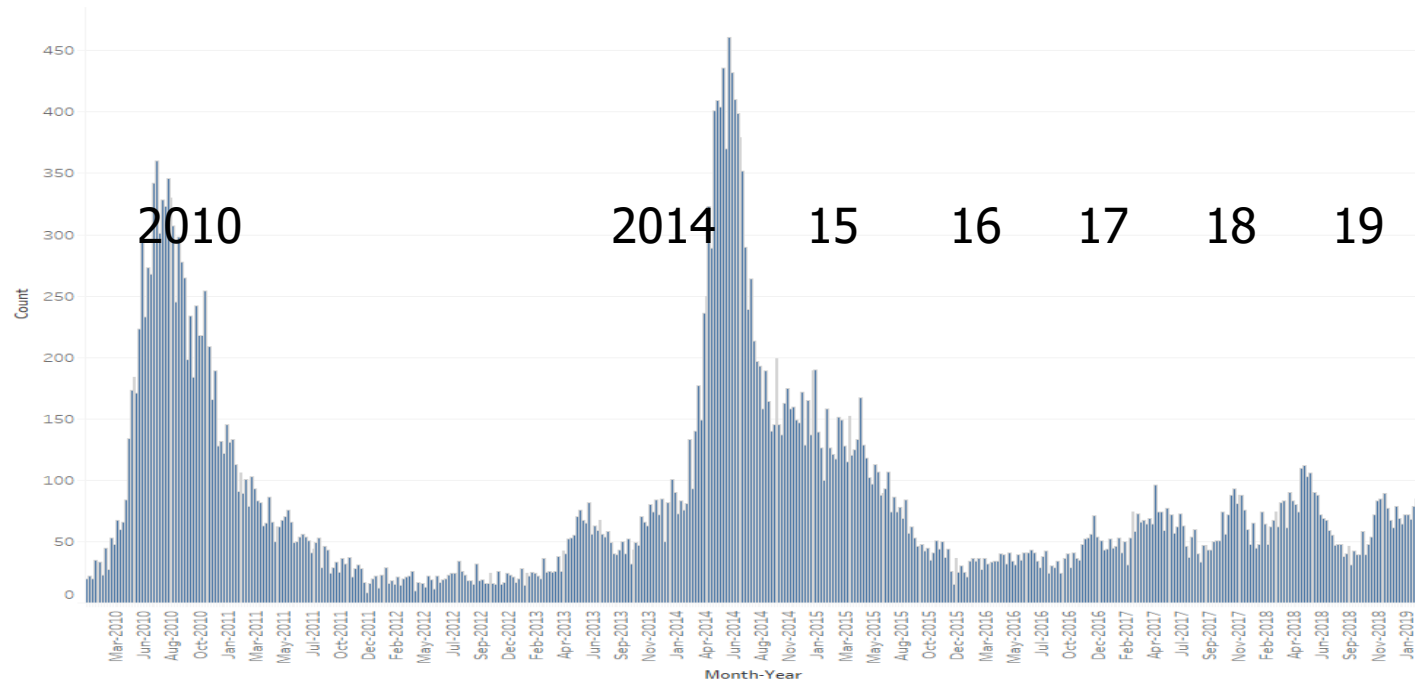
- “100 day cough”
- Very infectious
- Paroxysmal cough: gasping, gagging, vomiting
- Rarely causes serious illness in older kids/adults
- Pertussis in babies looks different:
 - Can be fatal
 - Cough may be mild
 - Baby may have apnea
 - Complications can include encephalitis, seizures, pneumonia



Pertussis in infants <4 months of age

- Most severe disease and almost all deaths occur in infants <4 months of age
 - 1-2 deaths per year in 3 of the last 4 non-epidemic years (2015-18)

Figure. Year to date* pertussis case counts by week of onset -- California, 2010-2019

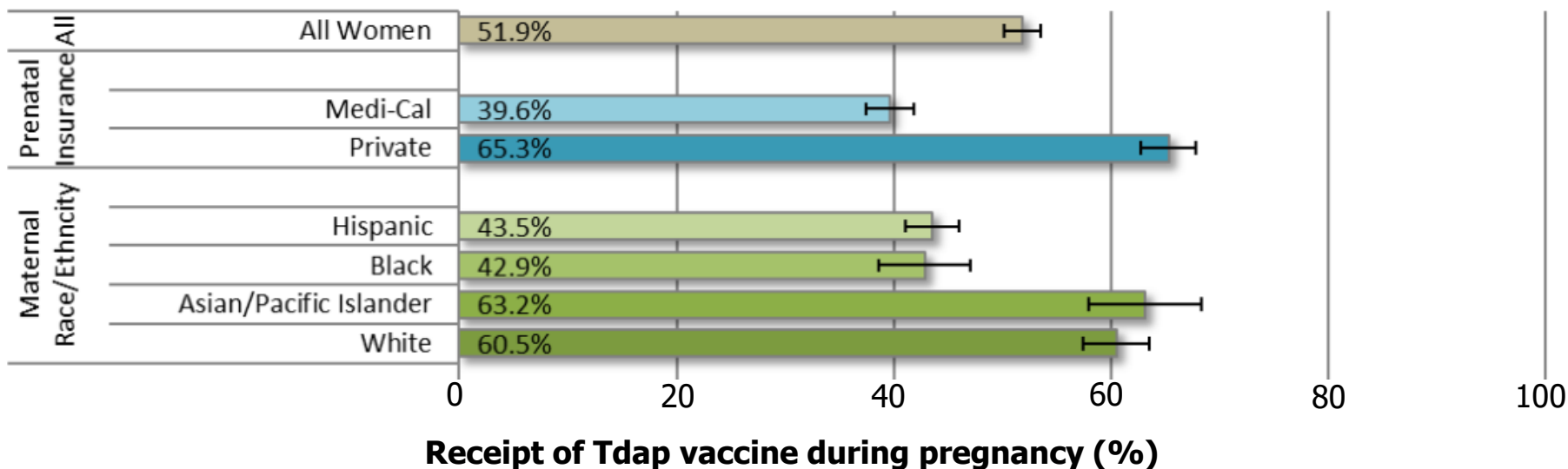


Tdap During Pregnancy Protects the Baby

- Women should receive Tdap between weeks 27-36 of EACH pregnancy
- Babies whose moms receive Tdap during pregnancy are 90% less likely to get pertussis and 95% less likely to die from pertussis.
- Vaccination during pregnancy is much more effective than postpartum vaccination.



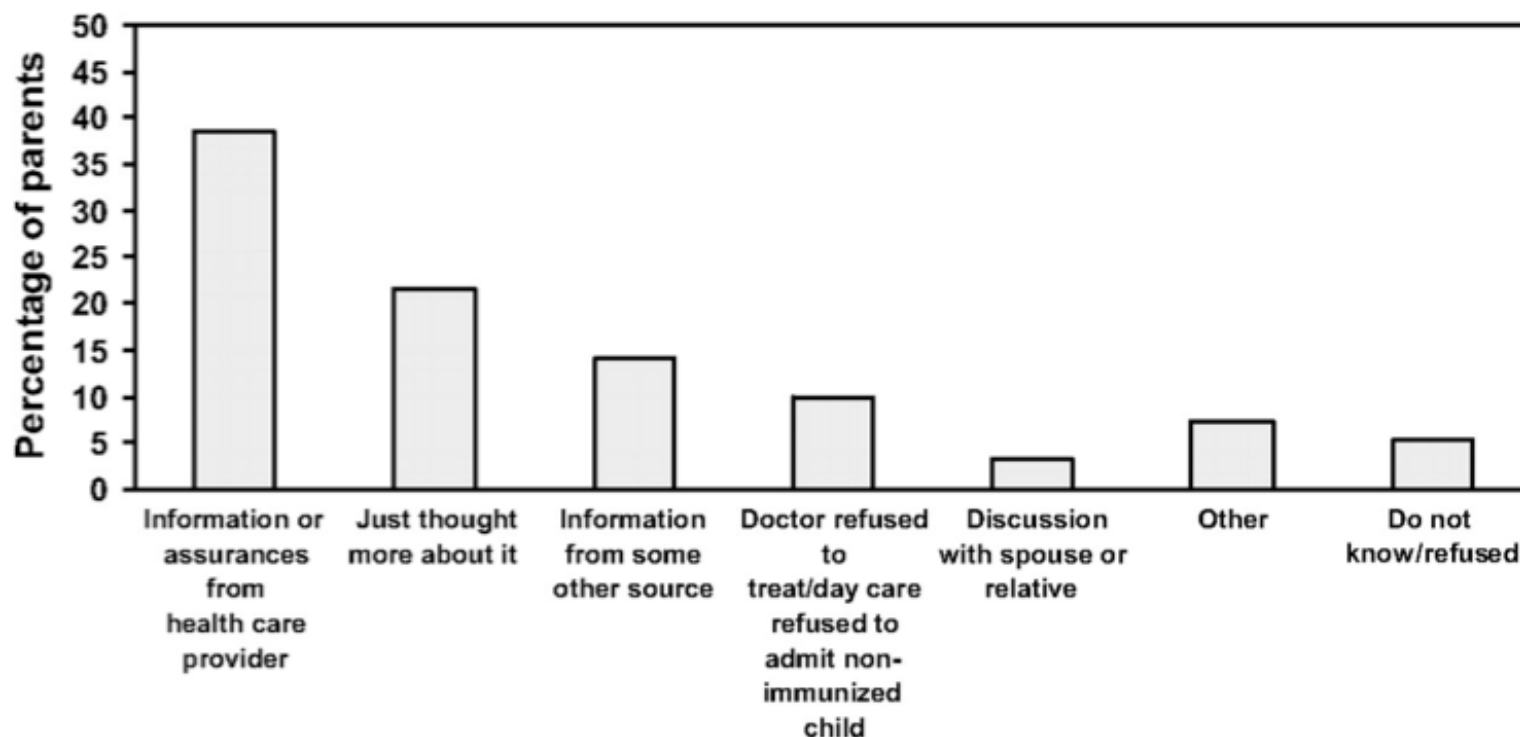
Prenatal Tdap Coverage Estimates in California: Maternal and Infant Health Assessment, 2016*



*The Maternal and Infant Health Assessment (MIHA) is an annual population-based survey of postpartum women. Percentages are weighted to represent all women with a live birth in 2016 in California.

<https://www.cdph.ca.gov/Programs/CID/DCDC/CDPH%20Document%20Library/Immunization/MIHA-FactSheet2016.pdf>

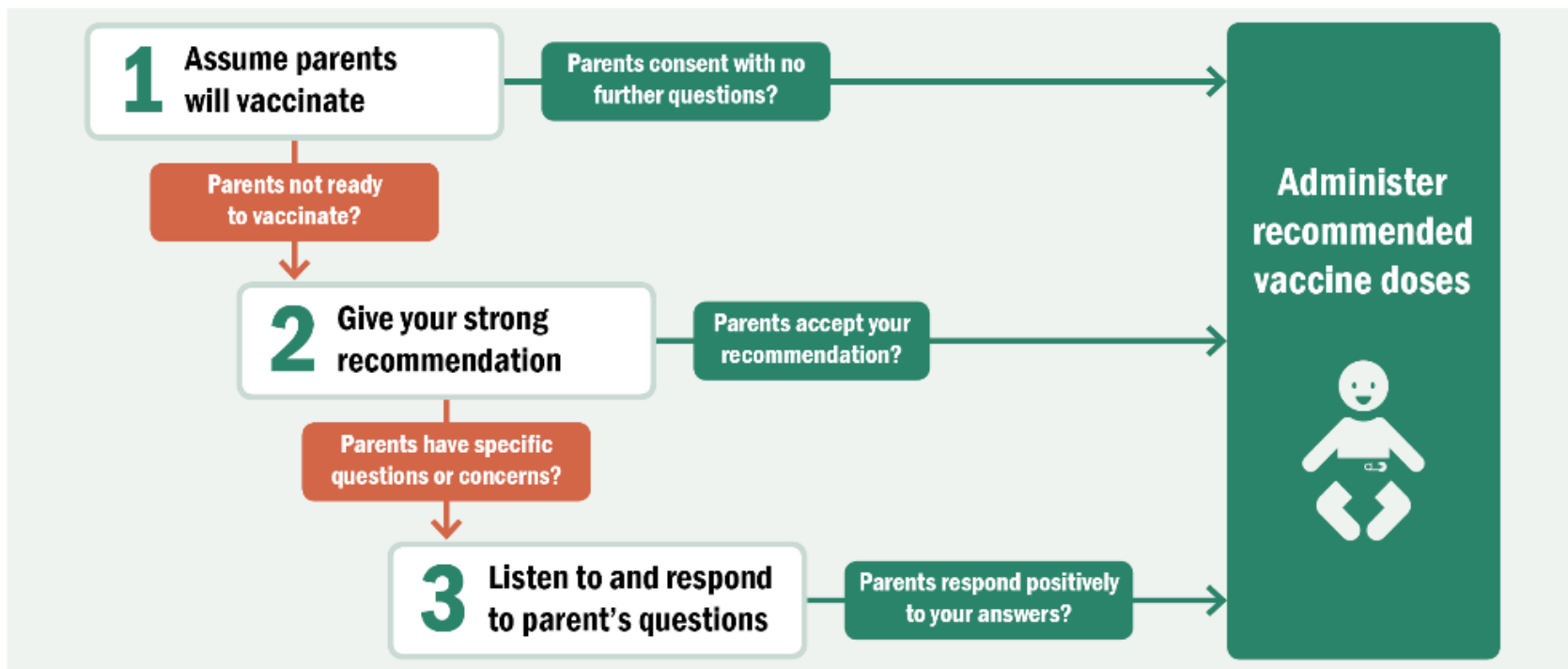
Main reasons parents who planned to delay or not to get a vaccine for their child changed their minds.



Gust D A et al. Pediatrics 2008;122:718-725

PEDIATRICS®

©2008 by American Academy of Pediatrics



"I strongly recommend your child get these vaccines today...."

"...These shots are very important to protect him from serious diseases."

"...I believe in vaccines so strongly that I vaccinated my own children on schedule."

"...This office has given thousands of doses of vaccines, and we have never seen a serious reaction."

<https://www.cdc.gov/vaccines/hcp/conversations/talking-with-parents.html>

<https://www.cdc.gov/vaccines/hcp/conversations/>

For You and Your Practice



Help strengthen communication between you and parents, and get information about:

- [Talking to parents about vaccines](#)
- [Understanding vaccines and vaccine safety](#)
- [Immunization schedules](#)
- [Creating a culture of immunization within your practice](#)

To Share With Parents



Download and print these materials to help parents understand vaccine benefits and risks.

- [If you choose not to vaccinate](#)
- [Vaccine-preventable disease fact sheets](#)
- [Childhood immunization schedule](#)
- [More resources](#)

Helpful Websites

[CDC.gov/vaccines](https://www.cdc.gov/vaccines)

- Immunization Schedules
- Training tools and resources

[EZIZ.org](https://www.eziz.org)

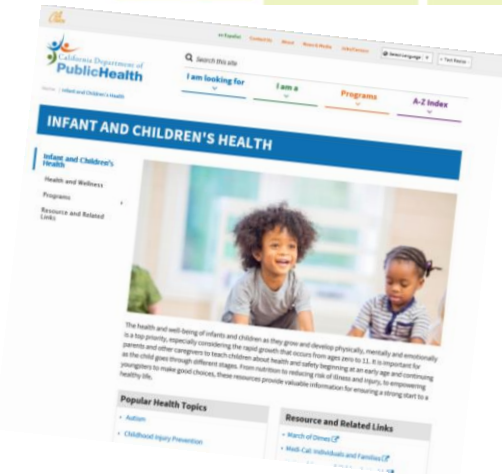
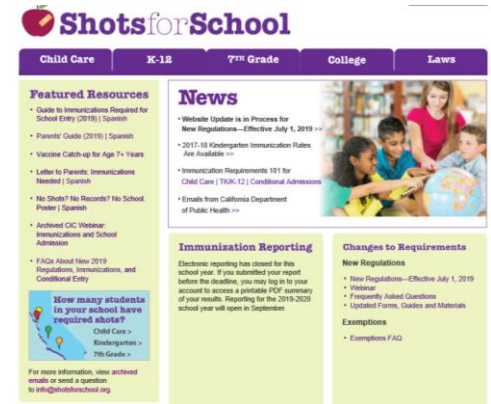
- Vaccines For Children (VFC) guidance
- Disease-specific resources
- Educational and promotional tools

[ShotsForSchool.org](https://www.shotsforschool.org)

- Childcare and school IZ info
- Downloadable tools and resources

[CDPH](https://www.cdph.ca)

- Info on statewide programs
- Newsworthy health topics





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