CDPH California Department of Public Health | Immunization Branch

California Immunization Coalition

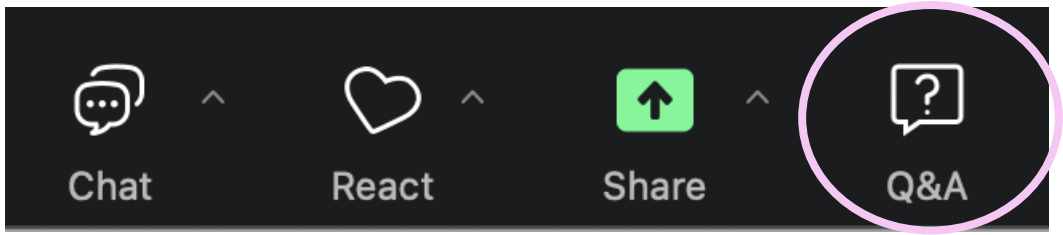
Critical Conversations: What's Old is New Again – Vaccine Preventable Diseases

Friday, June 20, 2025

12:00 pm – 1:00 pm (PT)

Q&A

During today's webinar, please click and open the Q&A icon to ask your questions so CDPH panelists and subject matter experts (SMEs) can respond.



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Housekeeping

Reminder to Attendees:

Today's session is being recorded. For this and previous Crucial Conversations slides and webinar recordings go to the IZ Provider Webinars page on EZIZ.

To be added to the CDPH email messaging listserv for providers, please email your request to blanca.corona@cdph.ca.gov.

If you have post-webinar-related questions, please email diane.evans@cdph.ca.gov.

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Agenda: Friday, June 20, 2025

No.	Item	Speaker	Time (PM)
1	Welcome	Leslie Amani, CDPH	12:00 – 12:05
2	Vaccine Preventable Diseases (VPDs): What's Old Is New Again	Dr. Jasjit Singh	12:05 – 12:45
3	Resources	Terisha Gamboa, CDPH	12:45 – 12:50
4	Discussion, Questions & Answers	Dr. Jasjit Singh and CDPH Subject Matter Experts (SMEs)	12:50 – 12:58
5	Wrap-Up	Leslie Amani, CDPH	12:58 – 1:00

Thank you for attending today's webinar!

Poll: CDPH Appreciates Your Feedback!

How confident are you in your ability to speak effectively with patients about measles, pertussis, and varicella vaccinations?

- ❑Very confident
- ❑Confident
- ❑Somewhat confident
- ❑Slightly confident
- ❑Not confident

What's Old is New Again – Vaccine Preventable Pediatric Infections

Jasjit Singh, MD, FAAP, FIDSA
Pediatric Infectious Diseases
CHOC Children's Hospital

Rady Children's Health

DISCLOSURE

I have no financial disclosures related to this presentation.

Measles

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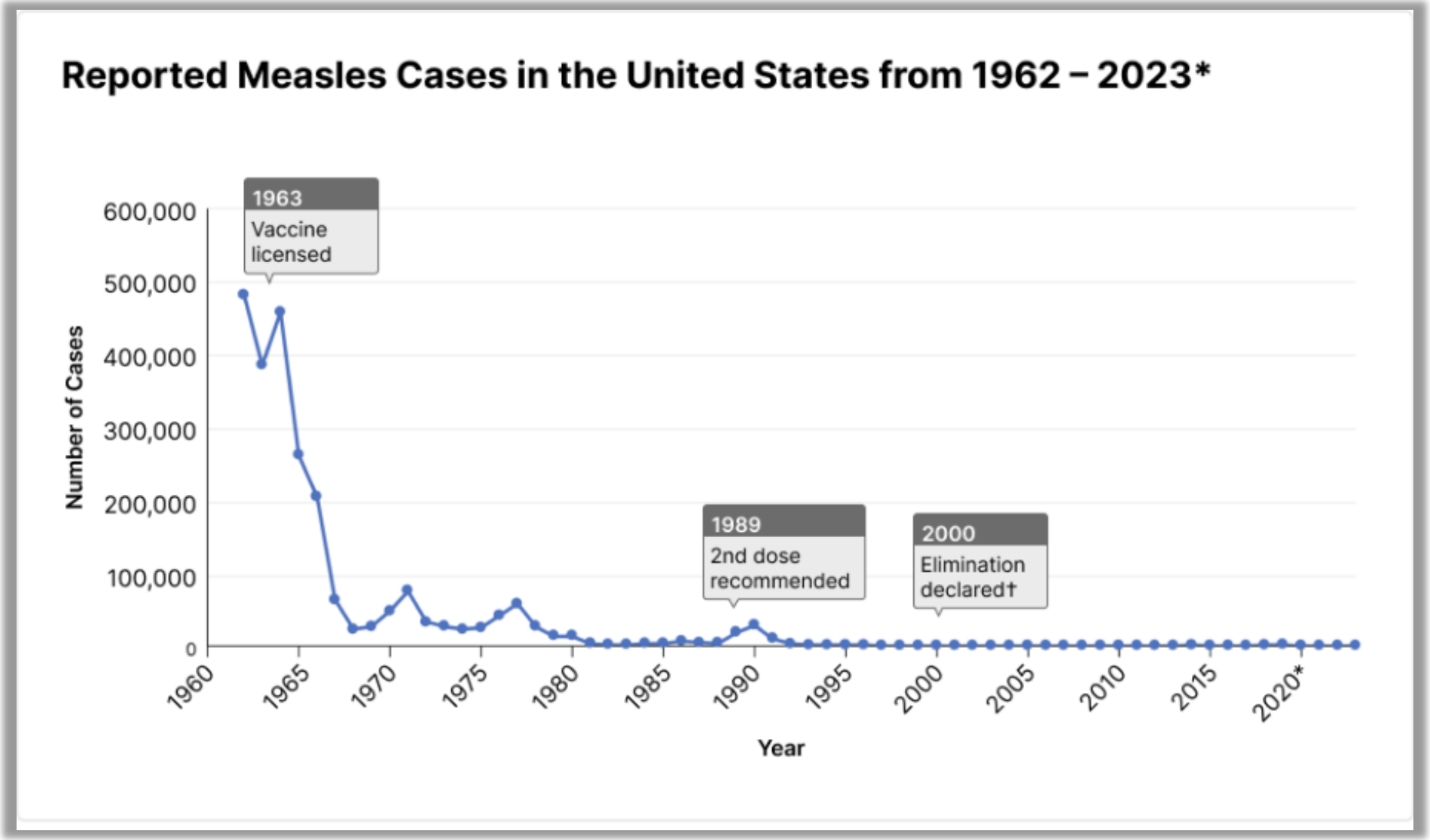
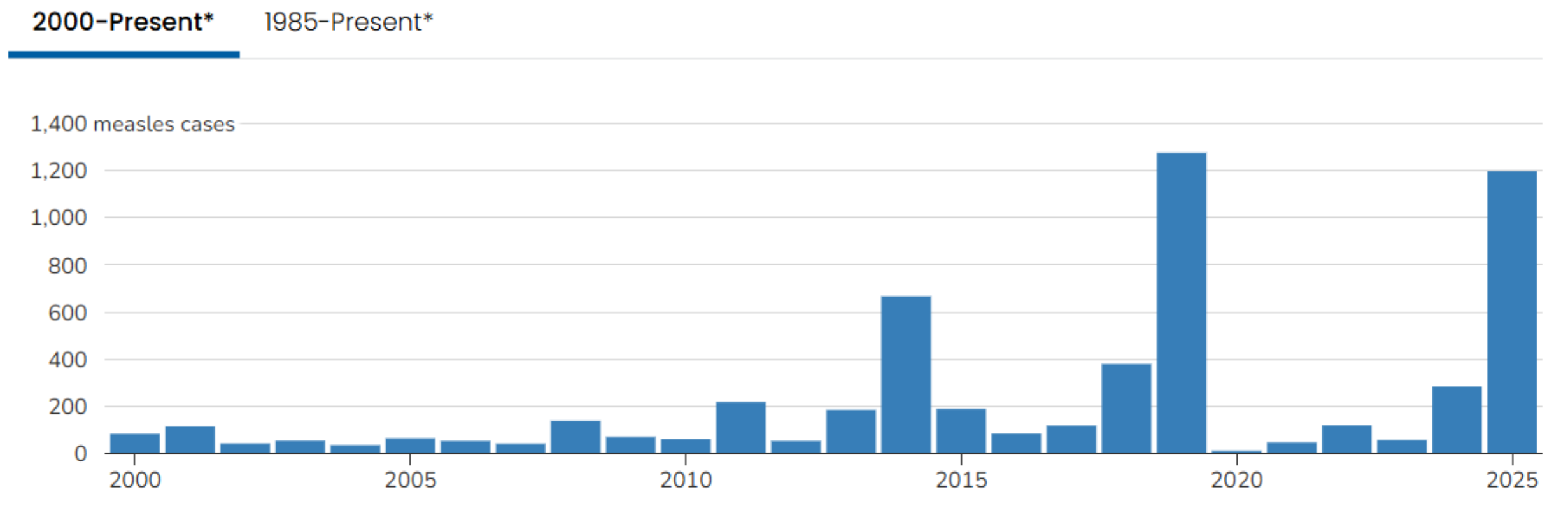
U.S. Reported Measles' Cases 1962 – 2023



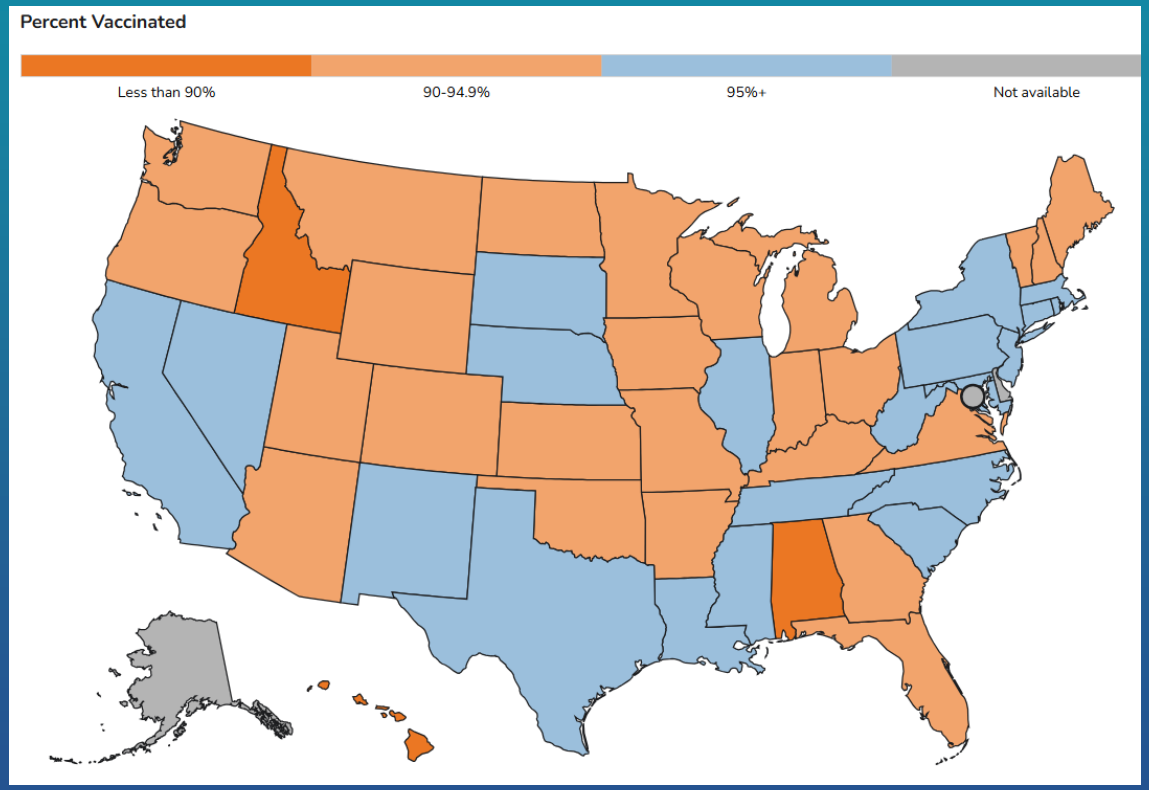
Yearly U.S. Measles Cases

(as of 6/12/25 (CDC))

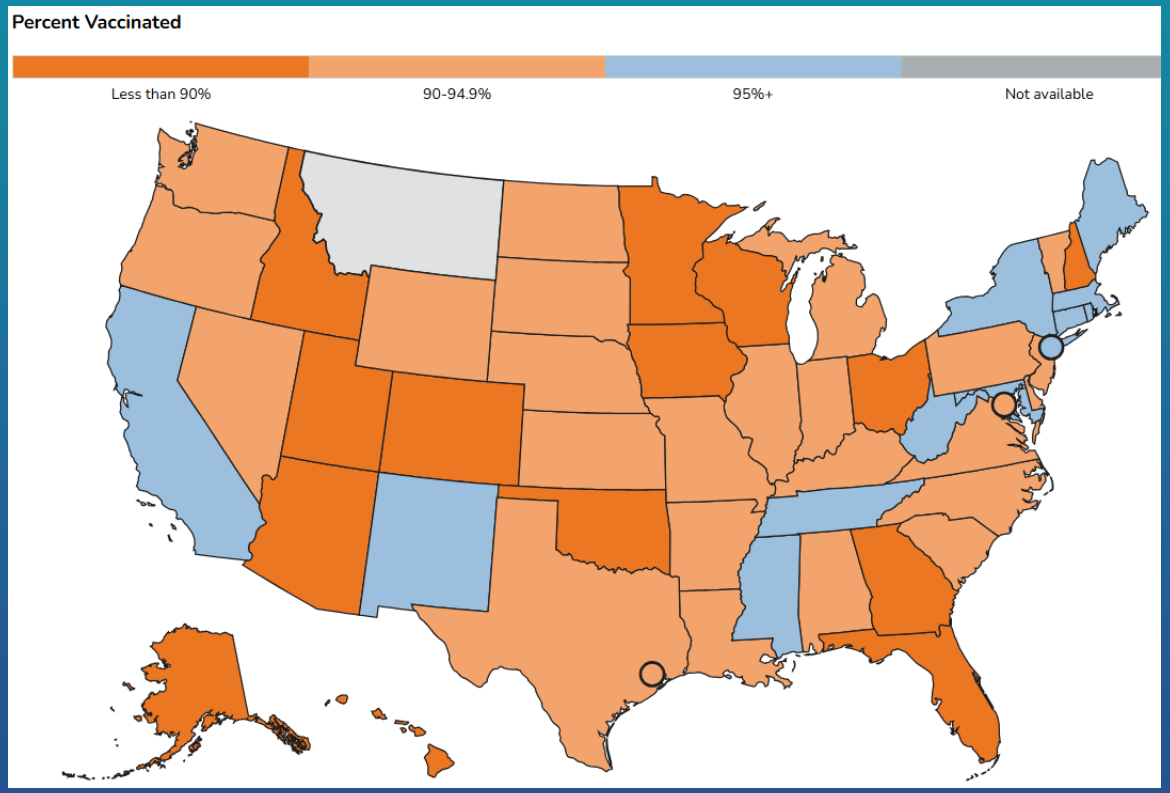


MMR Vaccine Coverage for Kindergarteners

2019 – 2020



2023 – 2024



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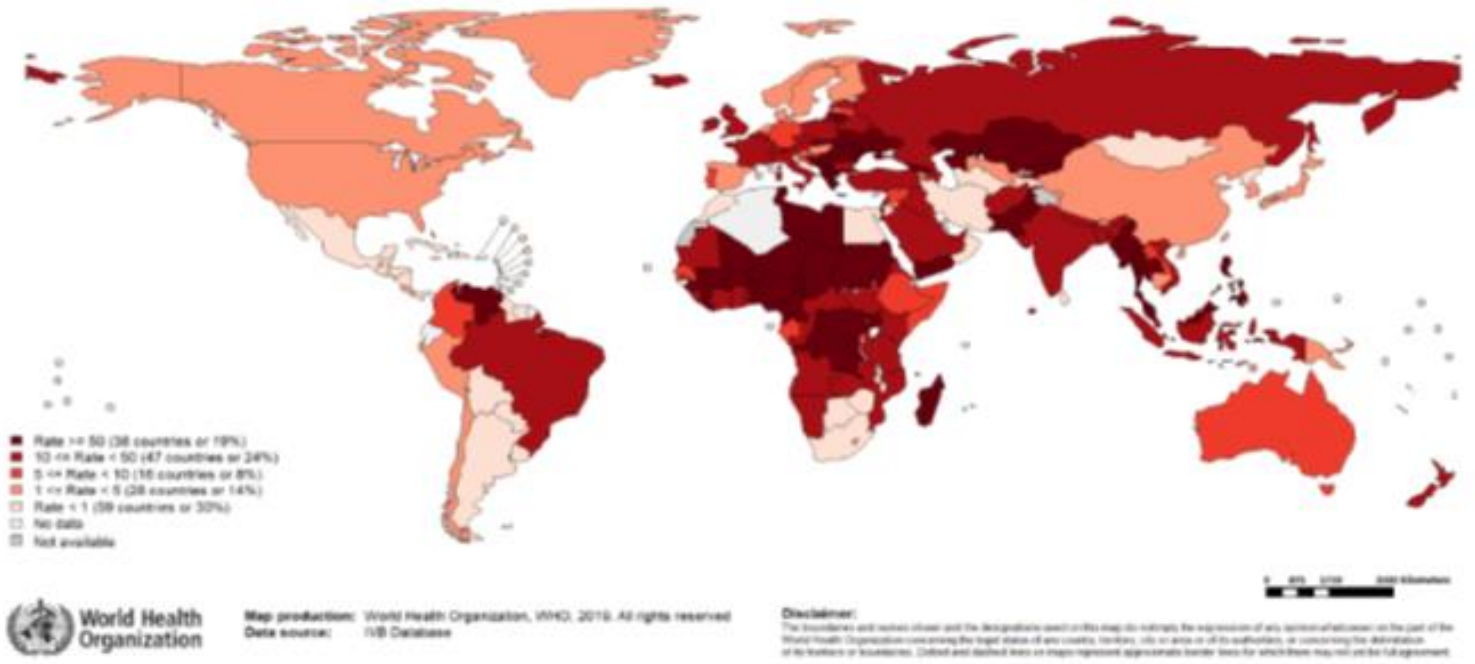
Measles Incidence Rate per Million (12M Period)

Top 10**		
Country	Cases	Rate
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

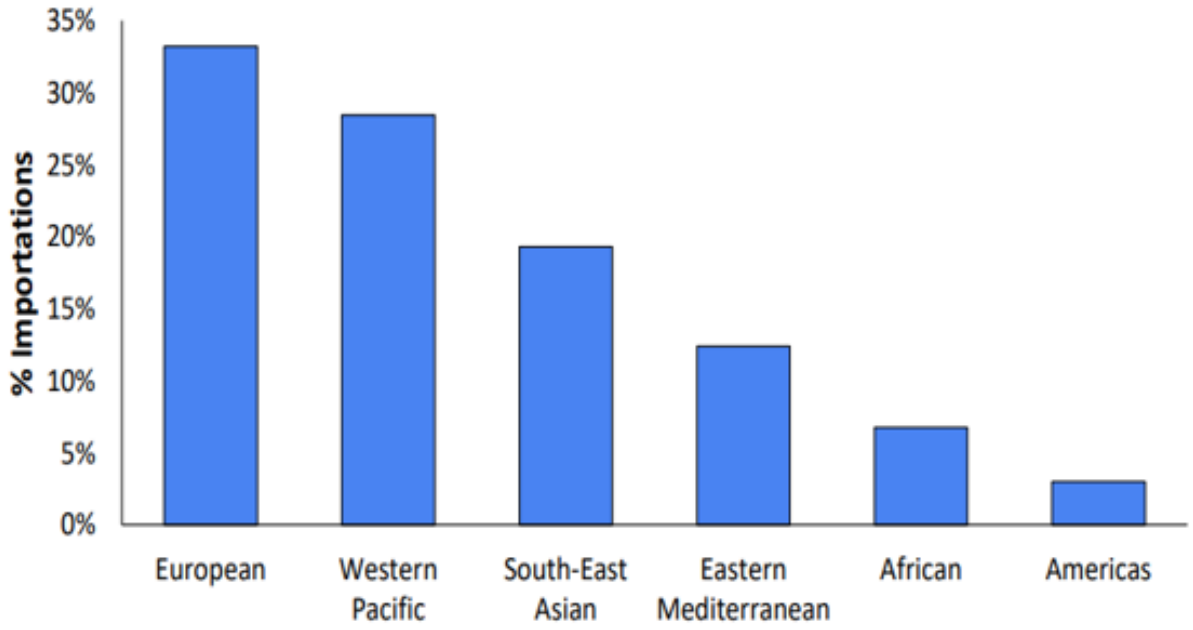
Other countries with high incidence rates***		
Country	Cases	Rate
Georgia	4678	1191.72
Liberia	2367	513.02
Israel	3755	458.38
Kyrgyzstan	2534	425.47
The Replublic of North Macedonia	885	425.23
Albania	1169	399.47



Based on data received 2019-05 and covering the period between 2018-04 and 2019-03 – Incidence: Number of cases/population * * 100,000. *World population prospects, 2017 revision - ** Countries with the highest number of cases for the period - *** Countries with the highest incident rates (excluding those already listed in the table above)

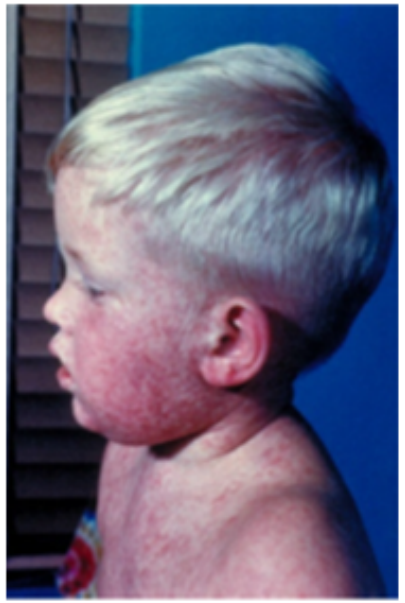
International Importations

- Among imported cases, 62% of patients reported travel to countries in the European and Western Pacific Regions during their exposure periods
- Top 5 source countries: India, the Philippines, China, Pakistan, and the UK



Measles

- Acute, febrile rash viral illness
- Transmitted by direct contact with infectious droplets or airborne spread
- Most contagious of the vaccine preventable diseases
  - R_0 = 12-16
  - Secondary attack rate in susceptible household contacts ~90%



Measles: Clinical Features

- Incubation period 10 – 14 days (range 7 – 21 days)
- Stepwise increase in fever to 103°F or higher
- Cough, coryza, conjunctivitis
- Koplik spots

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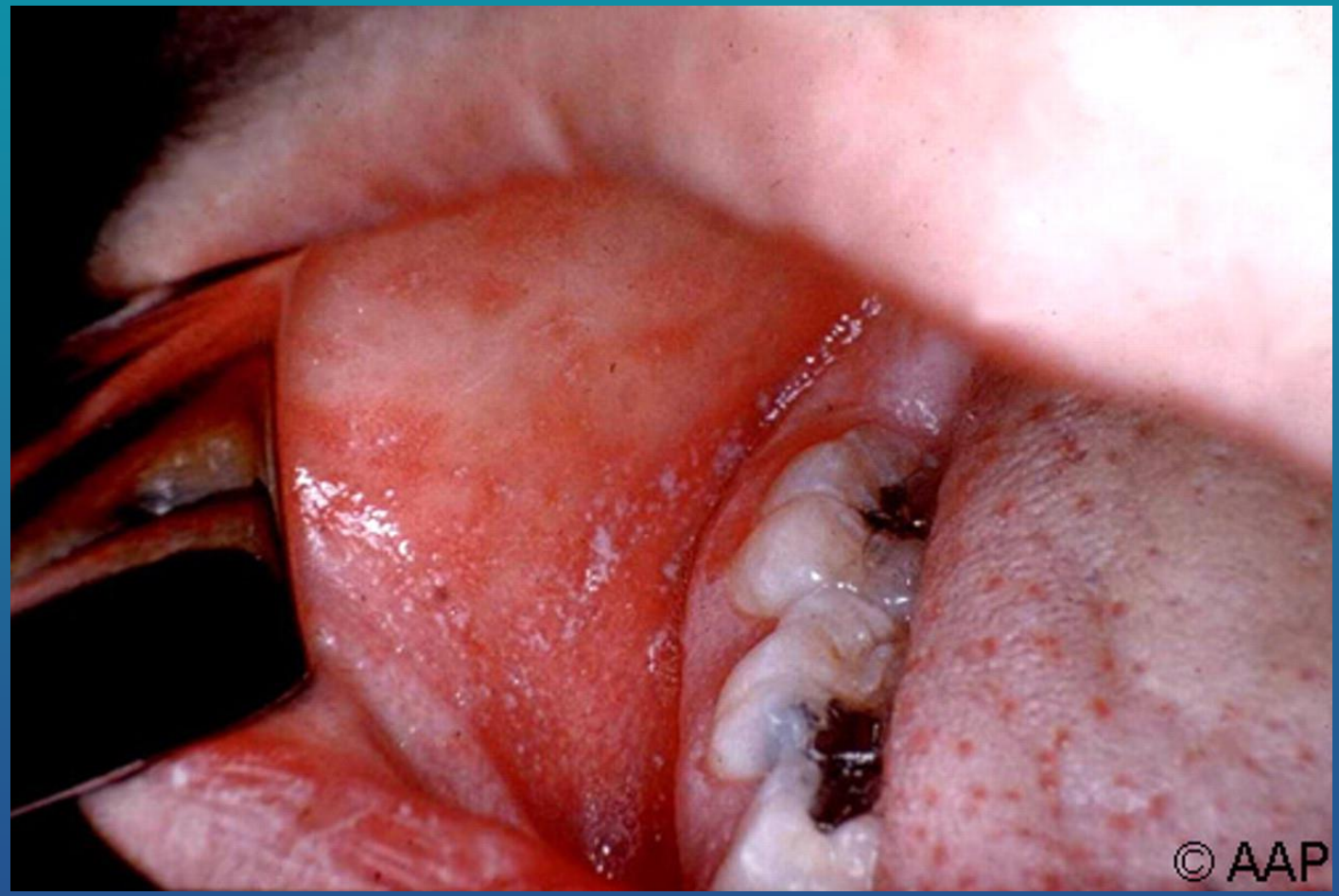
Measles Figure 6. Measles (Rubeola) with Koplik Spots



Committee on Infectious Diseases et al. Red Book Online 489-499

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RED BOOK® ONLINE
The Report of the Committee on Infectious Diseases

Measles: Clinical Features

Rash:

- 2 – 4 days after prodrome, 14 days after exposure
- Maculopapular, becomes confluent
- Begins on face and head
- Persists 5 – 6 days
- Fades in order of appearance
- Contagious 4 days before until 4 days after rash

Measles – Clinical Case Definition

- Fever (up to 105°F)

  AND

- Rash

  AND

- At least 1 of "The 3 C's"
  - Cough
  - Coryza (runny nose)
  - Conjunctivitis

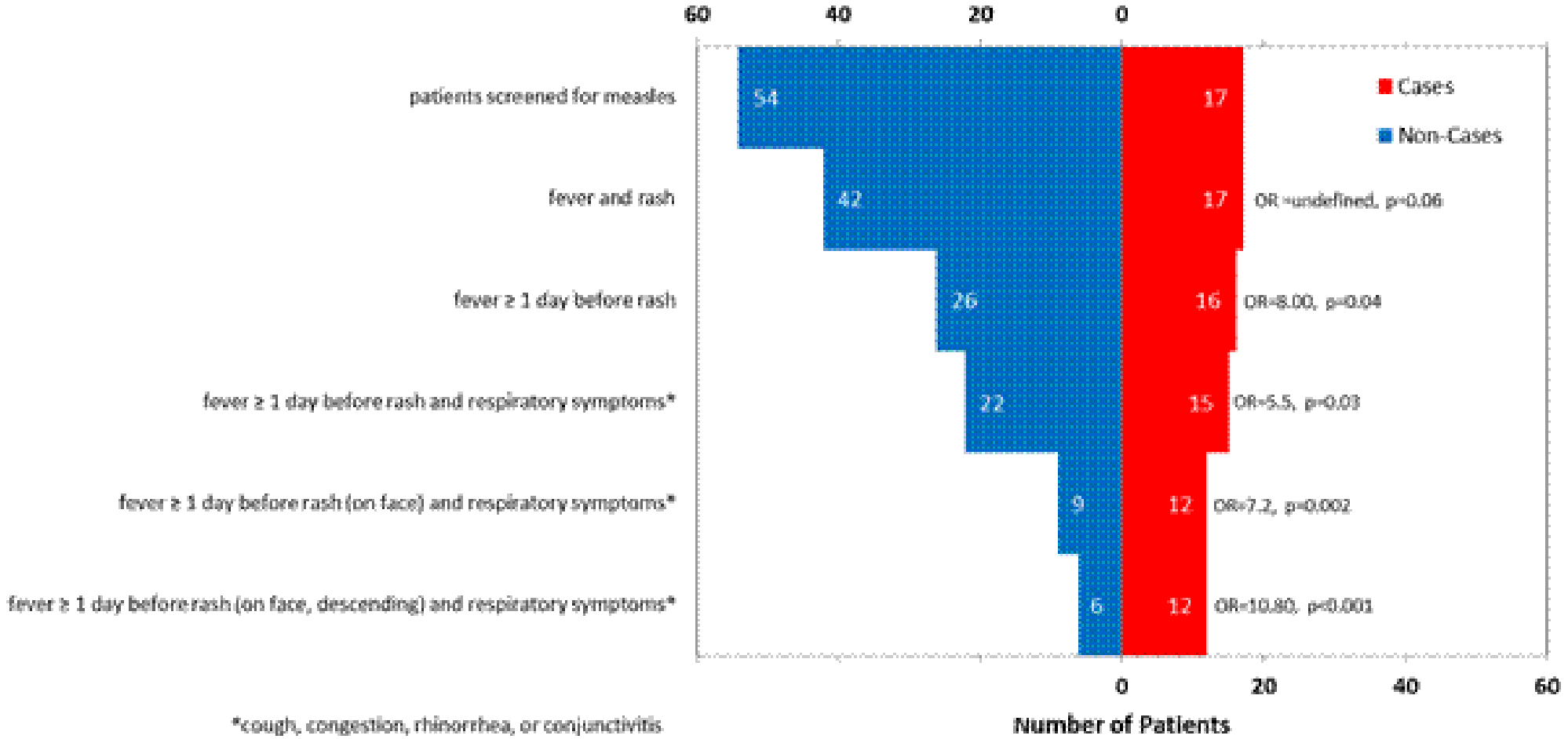
Measles rash

Measles conjunctivitis

https://healthjade.com/measles

Measles - Diagnosis

Figure 1. Patients Screened for Measles with Characteristic Symptoms



Other Common Causes of Maculopapular Febrile Rash

- **Parvovirus B-19 (Fifth Disease)**
  - "Slapped cheek" rash (photo) which can spread to trunk and extremities; more common in school-aged children than infants
- **Human Herpesvirus 6 (Roseola, Sixth Disease)**
  - Common cause of fever and rash in children; fever often resolves, and rash appears the next day starting on trunk and spreading outwards
- **Enteroviruses**
  - Rash can be maculopapular or urticarial
  - Often on hands/feet (Hand Foot Mouth, photo)
- **Antibiotic sensitivity reactions or allergies**

Slapped Cheek rash

HFM

Kawasaki Disease

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Measles Testing

Have a high index of suspicion for measles if your patient:

- Is unvaccinated
- Has traveled internationally, or has been exposed to someone who has traveled internationally, within 21 days
- Has visited a community where there is an outbreak
- Has been in contact or in a public location with a known measles case

Measles - Diagnosis

- Collect NP or throat swab and urine for identification of measles RNA by RT-PCR
- Serum for measles IgM – May be negative in the first 72 hours, or those immunized with 2 doses.
- All cases of suspected measles should be reported immediately to the Health Dept without waiting for the results of diagnostic tests.

CDC Measles Chapter of Vaccine-Preventable Disease Surveillance

Measles: Complications

- Otitis media
- Bronchopneumonia
- Laryngotracheobronchitis (croup)
- Diarrhea - all occur commonly in young children.
- Hospitalization – 1 in 4 cases in the US (12% in 2025)
- Acute encephalitis, which often results in permanent brain damage, occurs in approximately 1 of every 1,000 cases
- Case fatality in the US – 1 to 3 per 1000 cases, higher in children under 5 years, HIV+, other immune compromised (including malnutrition)

Suspect Measles Cases: (Identify, Isolate, Inform)

- Place masked patient in an Airborne Infection Isolation Room (AIIR).
- If AIIR not available, place the masked patient in a private room with the door closed.
- **Call your local Health Department or Infection Prevention Team!**

Control Measures: Post Exposure Prophylaxis (PEP)

PEP within the target window may provide measles protection or modify the clinical course of disease among susceptible people

MMR

- Should be given within 72 hours (3 days) of initial measles exposure
- Vaccination can be given after this window, but would only be expected to protect from future exposures and is not considered “adequate PEP”

Immunoglobulin

- Needs to be given within 6 days of initial exposure
- Can be given intramuscularly (IMIG) or intravenously (IVIG)
  - IVIG should be prioritized for adults at high risk of severe disease

Measles Vaccine

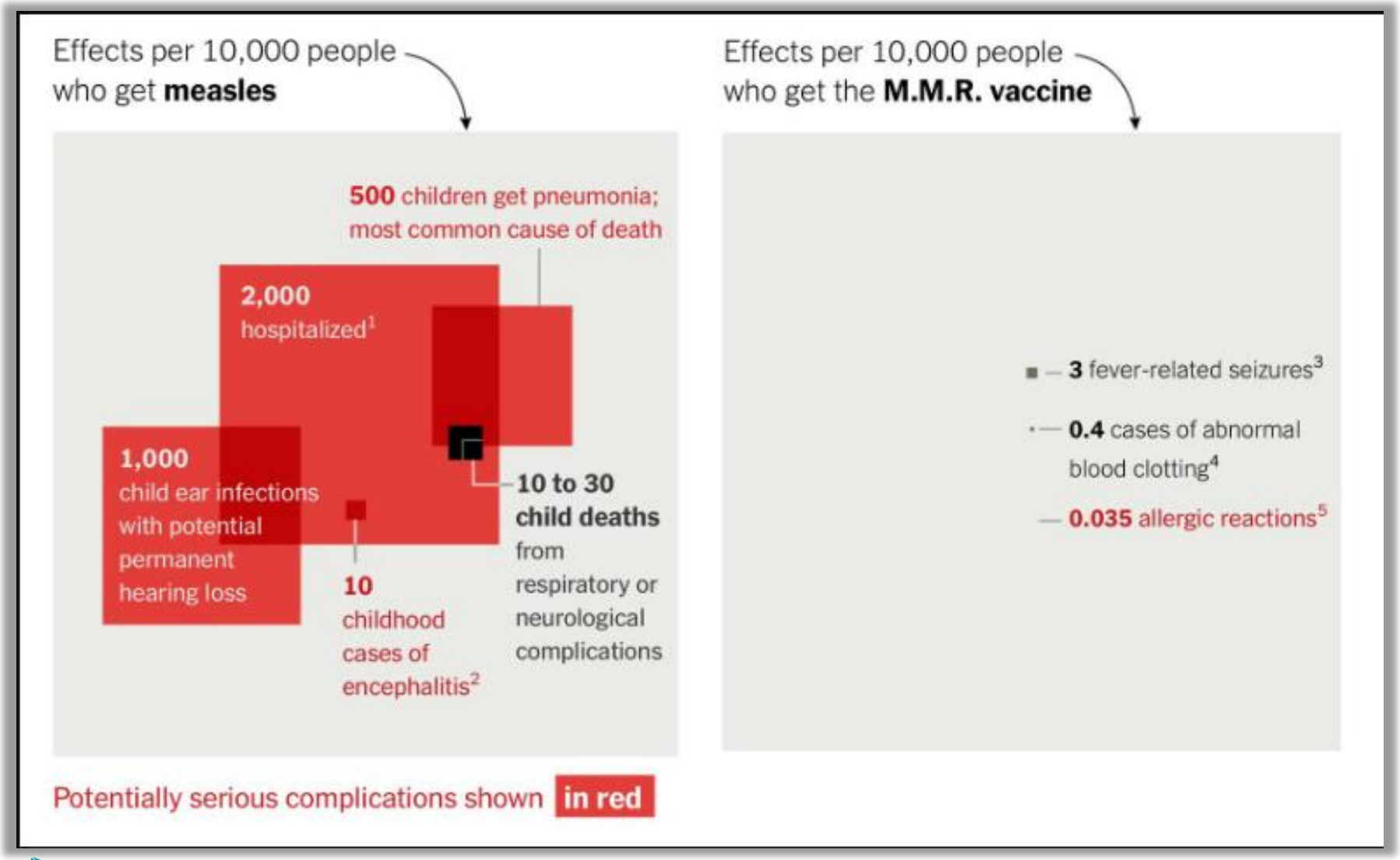
- **Vaccine Effectiveness:**
  - 1 dose ~92%
  - 2 doses ~97%
- **Excellent safety profile over 50 years**
- **Fever – 39.4 C or higher in 5-15% occurring 6-12 days after MMR. Lasts 1-2 days, sometimes longer.**
- **1 additional febrile seizure per 3000 vaccinees**
- **Transient rashes in 5%**
- **Transient thrombocytopenia in 1 in 30,000**
- **Vaccine virus cannot be transmitted**

U.S. 2-Dose Coverage of MMR for Kindergarteners (KG)

Years	Percentage
2019 – 2020	95.2%
2020 – 2021	93.9
2021 – 2022	94%
2022 – 2023	93.1%
2023 – 2024	92.7%

Risks from Natural Immunity vs. Vaccine

(Source: Katelyn Jetelina YLE newsletter 1/30/24)



MMR Recommendations for International Travelers

- CDC recommends that all U.S. residents older than age 6 months who will travel internationally receive MMR vaccine prior to departure if they are without evidence of immunity:
  - Infants 6–11 months of age: 1 dose of MMR vaccine
    - Followed by two more doses on the typical pediatric schedule
  - Children 12 months of age or older: 2 doses of MMR vaccine, separated by at least 28 days
  - Teenagers or adults without evidence of immunity: 2 doses of MMR vaccine separated by at least 28 days

https://emergency.cdc.gov/han/2023/han00493.asp

Another Good Reason to Vaccinate…

- In a paper in Science (5/8/15), Mina et al studied measles incidence and deaths from infectious disease both before and after the introduction of the measles vaccine in the U.K. in the 1960s.
- They noted deaths from a variety of non-measles infectious diseases closely tracked measles incidence. The more measles in a population, the more deaths from other illnesses in the 28-month period that followed.
- Hypothesize “immunologic amnesia” lasting ~2 years, not found following other illnesses.
- **Also published in Science (2019)** - study in 77 unvaccinated children demonstrating that 11% to 73% of about 400 pathogen-specific, anti-viral antibodies in the blood disappeared after the person developed measles.

Measles virus infection diminishes preexisting antibodies that offer protection from other pathogens. Mina MJ et al. **Science. 2019 Nov 1; 366(6465): 599–606.**

Pertussis (Whooping Cough)

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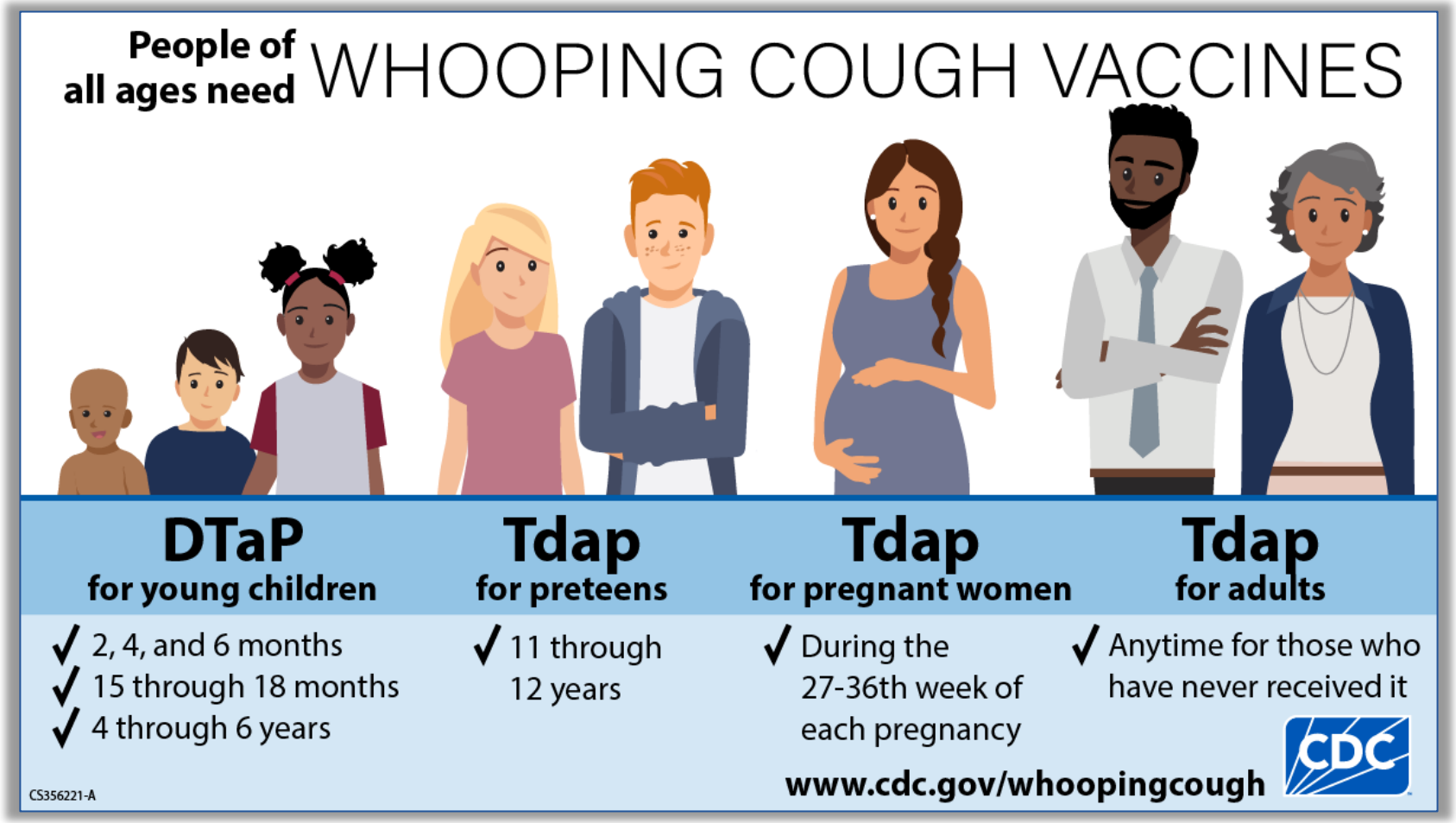
Pertussis (Whooping Cough)



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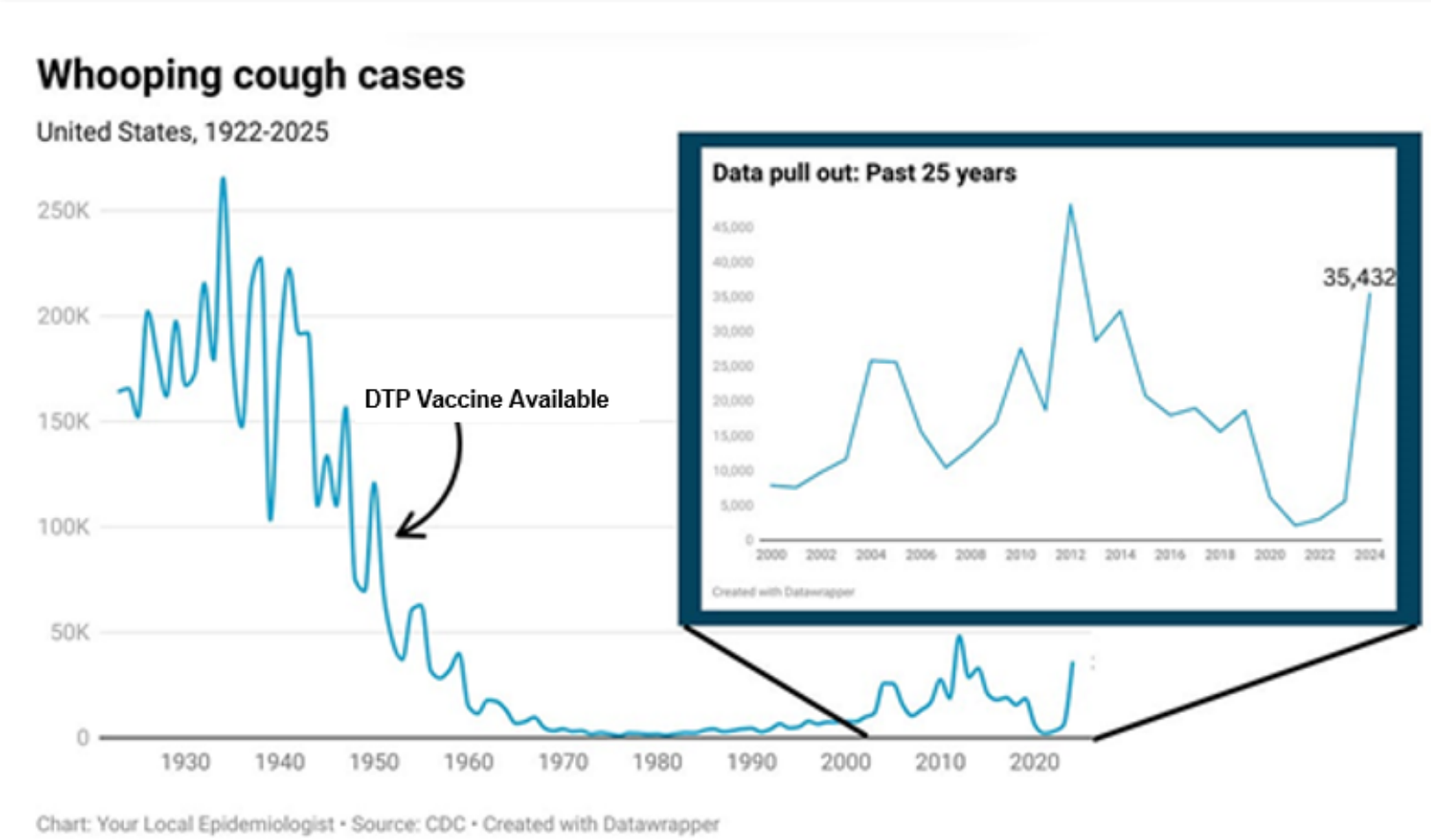
Pertussis Cases



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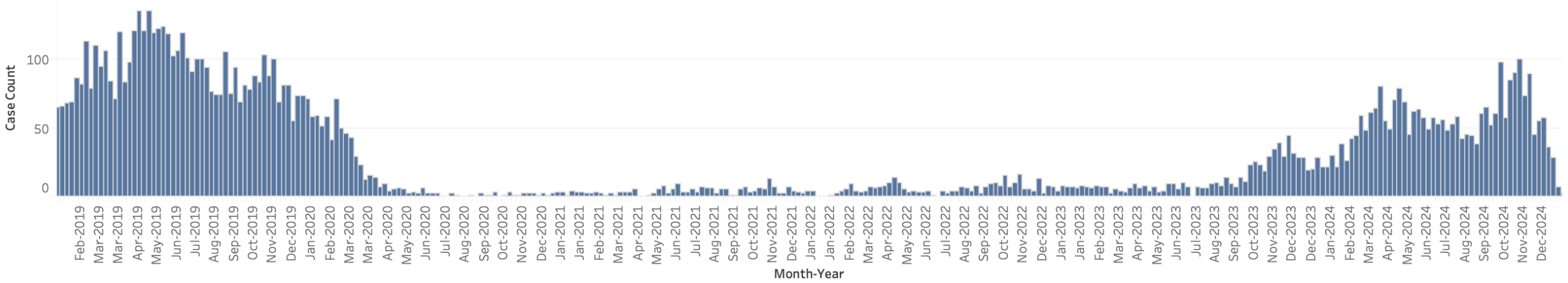
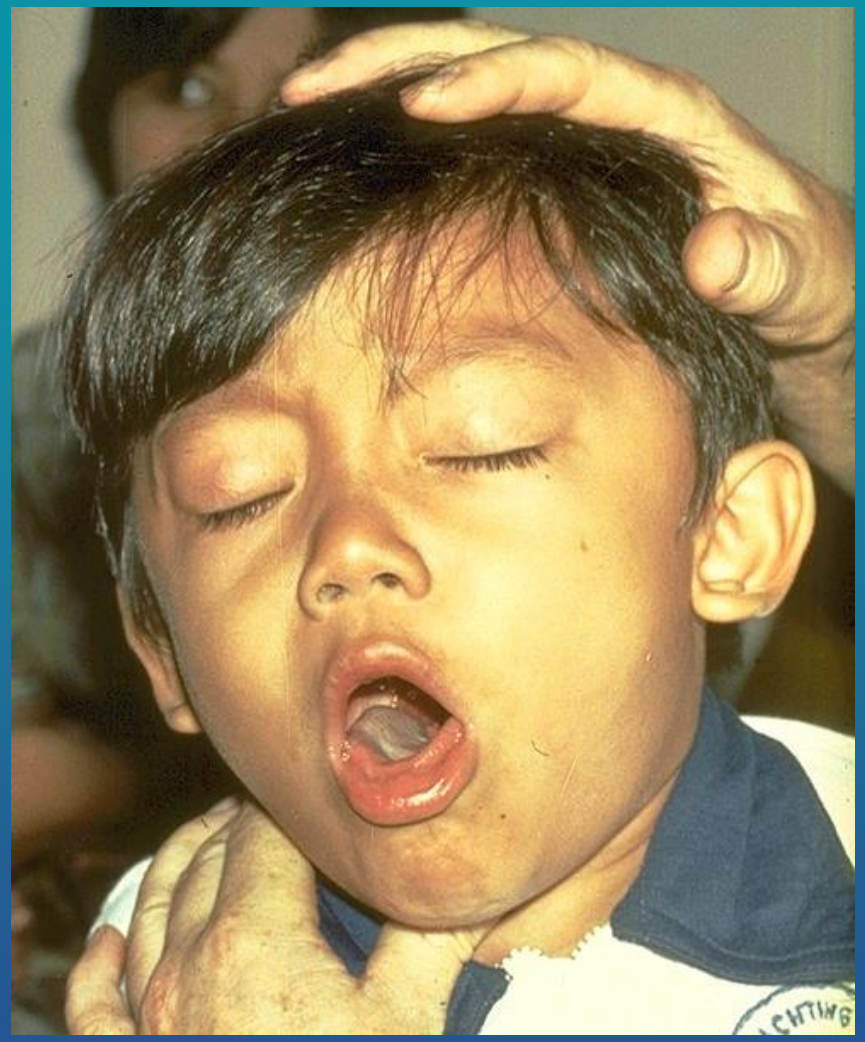
Pertussis Snapshot

Reported as of December 31, 2024

Figure 1. Year to date* pertussis case counts by week of onset -- California, 2019-2024



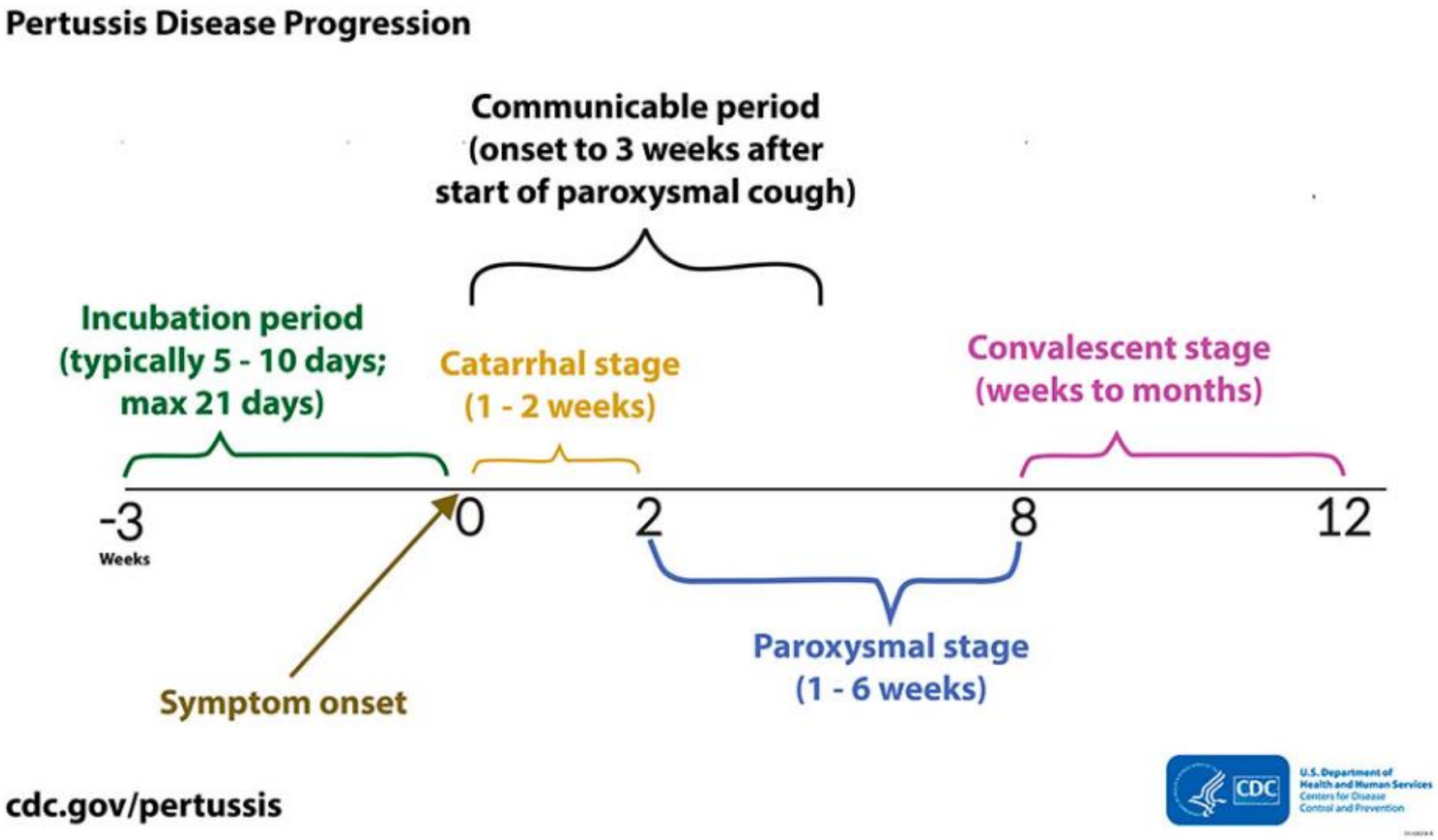
Pertussis Disease Manifestations



Child with paroxysmal cough of pertussis
Photograph courtesy of the WHO

- Incubation period: 7 – 10 days (range 4 – 21)
- Stages
  - Catarrhal: Runny nose, sneezing, low-grade fever, mild cough.
  - Paroxysmal: Severe spasms of cough, thick mucous, whoops, vomiting, exhaustion.
  - Convalescent: Gradual recovery with less frequent and less severe coughing.

Pertussis Disease Progression



Pertussis in the Infant

May present differently:

- Shorter catarrhal stage
- May not have noticeable cough or “whoop”
- Gagging, gasping or apnea
- Facial color changes (may turn blue, purple or red)
- Will frequently have leukocytosis with an increased absolute lymphocyte count

Complications of Pertussis in Infants

One-third of Infants with Pertussis will require hospitalization. Of those, complications include:

-Apnea - 68%

-Pneumonia - 22%

-Seizures - 2.2%

-Encephalopathy – 0.6% (hypoxic, possibly toxin mediated)

-Mortality – 1% (can be due to refractory pulmonary hypertension)

Source: CDC.gov/pertussis

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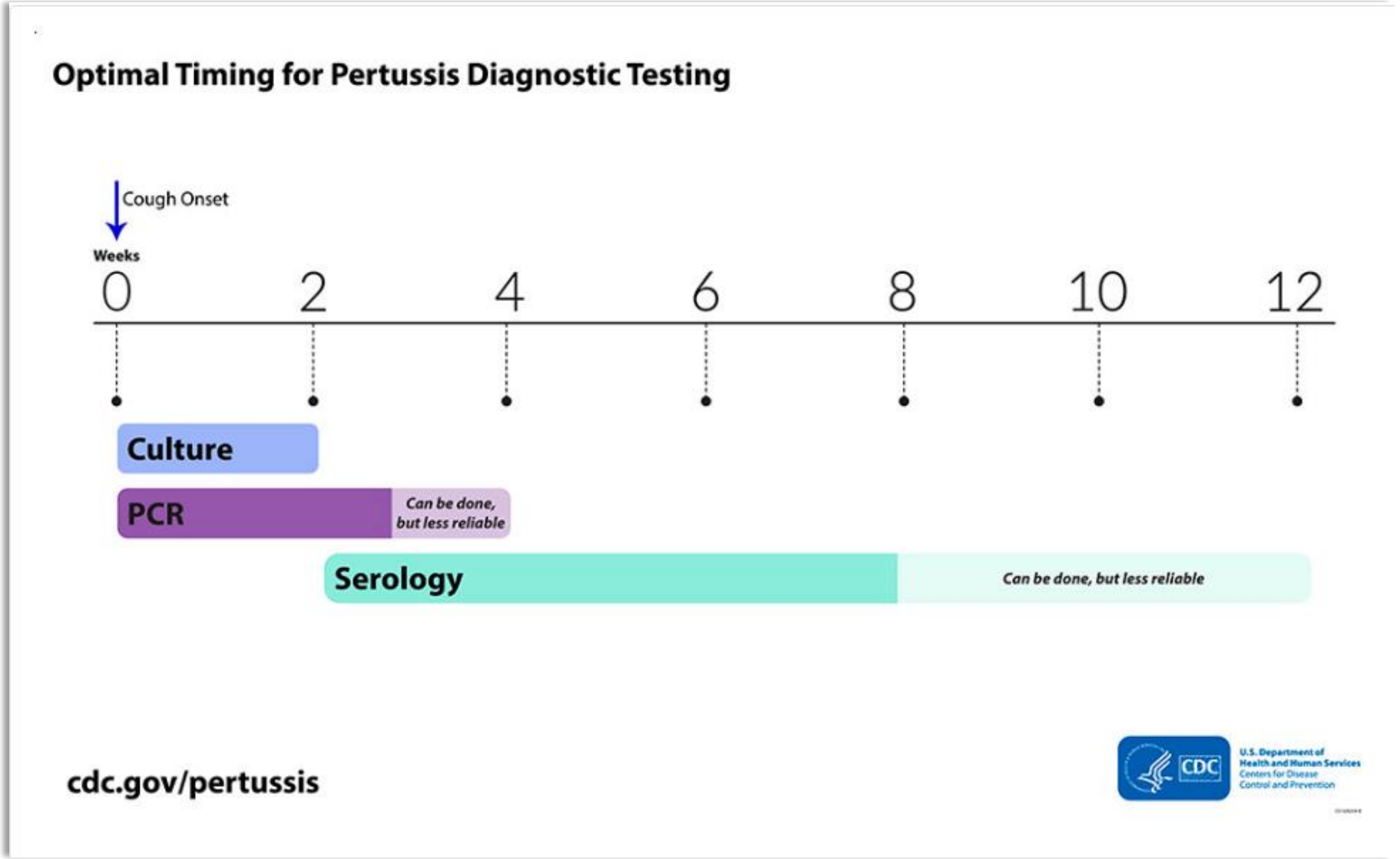
Optimal Timing for Pertussis Diagnostic Testing



Treat Early

A reasonable guideline is to treat:

- **Persons 1 year of age and older** within 3 weeks of cough onset
- **Infants younger than 1 year of age** and **pregnant women (especially if they are near term)** within 6 weeks of cough onset.

Postexposure Antibiotic Prophylaxis

All household contacts of a pertussis case, regardless of immunization status, within 21 days of exposure.

High risk people within 21 days of exposure:

- Infants and women in 3rd trimester of pregnancy
- Immunocompromised individuals
- Those with moderate – severe asthma
- Close contacts of high-risk individuals (infants and pregnant women)

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Tdap Recommendation

- Health care providers should administer Tdap during each pregnancy, preferably at 27 – 36 weeks gestation.
- Protects mom from developing illness and passing it to baby.
- Passes maternal antibodies to baby, protecting them for the first few months of life.
- Data from some studies shows Vaccine Efficacy (VE) as high as 93% (CID 2015, 60:333).
- Multiple studies have demonstrated safety.

Morbidity and Mortality Weekly Report (*MMWR*)

Influenza, Tdap, and COVID-19 Vaccination Coverage and Hesitancy Among Pregnant Women — United States, April 2023

Weekly / September 29, 2023 / 72(39);1065–1071

Summary

What is already known about this topic?

Influenza, tetanus toxoid, reduced diphtheria toxoid, and acellular pertussis (Tdap), and COVID-19 vaccines can reduce the risk for severe respiratory illness among pregnant women and their infants.

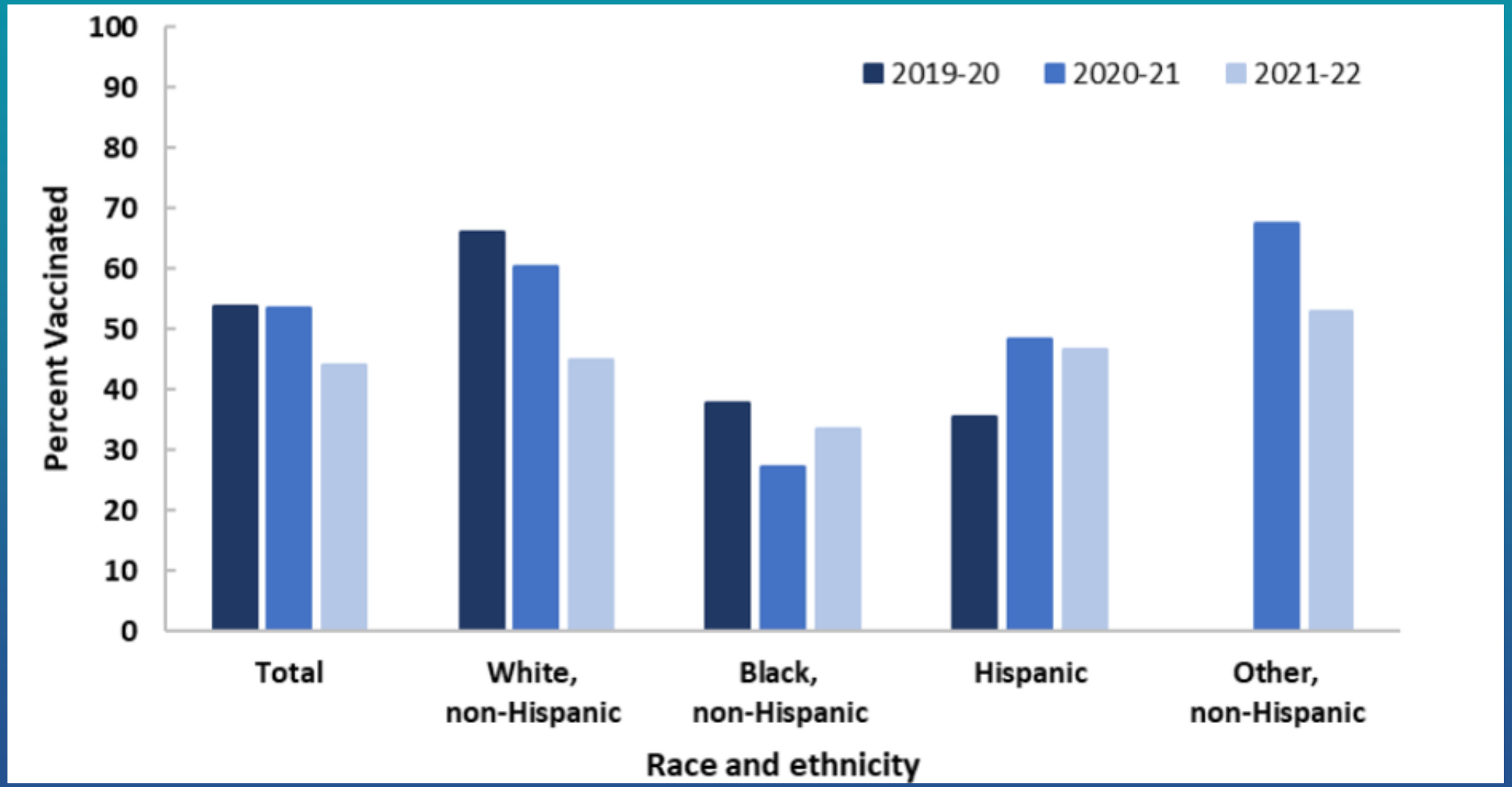
What is added by this report?

During the 2022–23 influenza season, 47.2% of women received influenza vaccination before or during pregnancy, 55.4% of women with a recent live birth received Tdap vaccination during pregnancy, and 27.3% of women received a COVID-19 bivalent booster vaccine before or during pregnancy. Pregnant women who received a provider recommendation for vaccination were less hesitant about influenza and Tdap vaccines.

What are the implications for public health practice?

Promotion of efforts to improve vaccination coverage among pregnant women, such as provider recommendation for vaccination and informative conversations with patients to address vaccine hesitancy, could reduce adverse maternal and infant illness and death from vaccine-preventable diseases.

Tdap Vaccine Coverage Among Pregnant Women (n=838), by Race and Ethnicity Internet Panel Survey, United States, April 2020 – April 2022



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Varicella (Chickenpox)

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Varicella (Chickenpox)

- Highly contagious virus
- Infection occurs after contact with the mucosa of the upper respiratory tract or the conjunctiva of a susceptible person.
- Person-to-person transmission occurs either from direct contact with VZV lesions from varicella or herpes zoster or from airborne spread
- Generalized, pruritic, erythematous vesicular rash typically consisting of 250 to 500 lesions in varying stages of development (papules, vesicles) and resolution (crusting), low-grade fever, and other systemic symptoms.

Varicella Vaccine: Efficacy

- Protection against any disease in vaccinees after household exposure ~70%, but >95% against severe disease.
- Varicella in vaccinees is much milder:
  - fewer skin lesions (16 – 32)
  - lower rate and height of fever
  - more rapid recovery
  - still potentially infectious

Varicella

Breakthrough Varicella (Chickenpox)

Do You Know What Breakthrough Varicella (Chickenpox) Looks Like?

What is breakthrough varicella?

Breakthrough varicella is an infection with wild-type varicella zoster virus that occurs in a varicella vaccinated person more than 42 days after vaccination.

Varicella in an Unvaccinated Person	Breakthrough Varicella
	
• 250–500 lesions • Mostly vesicular • Fever • Illness for 5–7 days	• <50 lesions • Few or no vesicles • No or low fever • Shorter duration of illness

How is breakthrough varicella confirmed?

The best method to confirm breakthrough varicella is laboratory PCR testing of skin lesion specimens—scabs, vesicular fluid, or scrapings of maculopapular lesions.
www.cdc.gov/chickenpox/lab-testing/

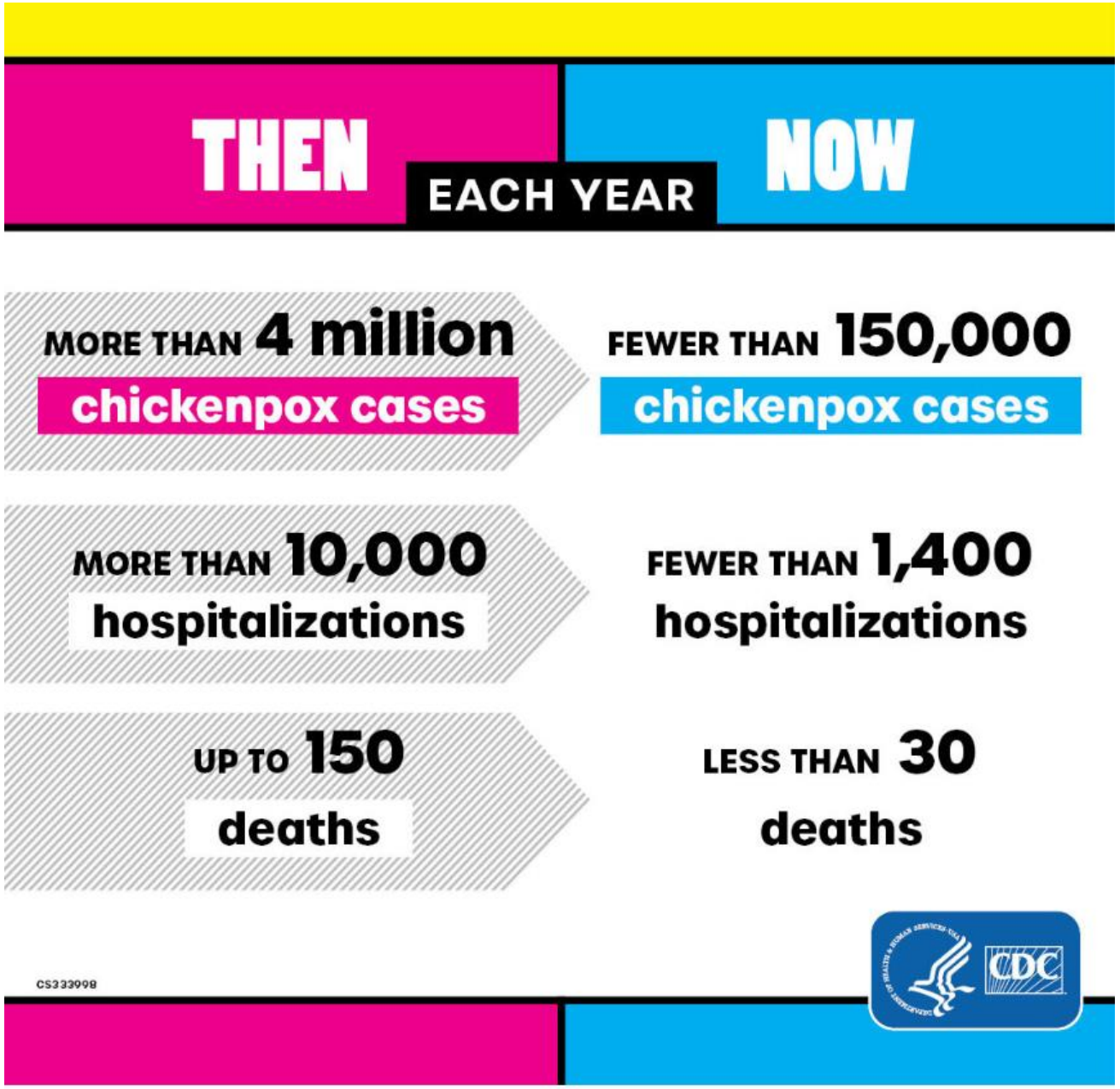
Centers for Disease Control and Prevention
National Center for Immunization and Respiratory Diseases

Why is breakthrough varicella hard to diagnose?

The rash caused by breakthrough varicella looks similar to other rashes, so it is often difficult to diagnose clinically.

Breakthrough Varicella	Insect Bites
	
Poison Ivy	**Ringworm**
	

Then and Now



Since the start of the U.S. varicella vaccination program in 1995, chickenpox cases have declined overall by more than 97%.

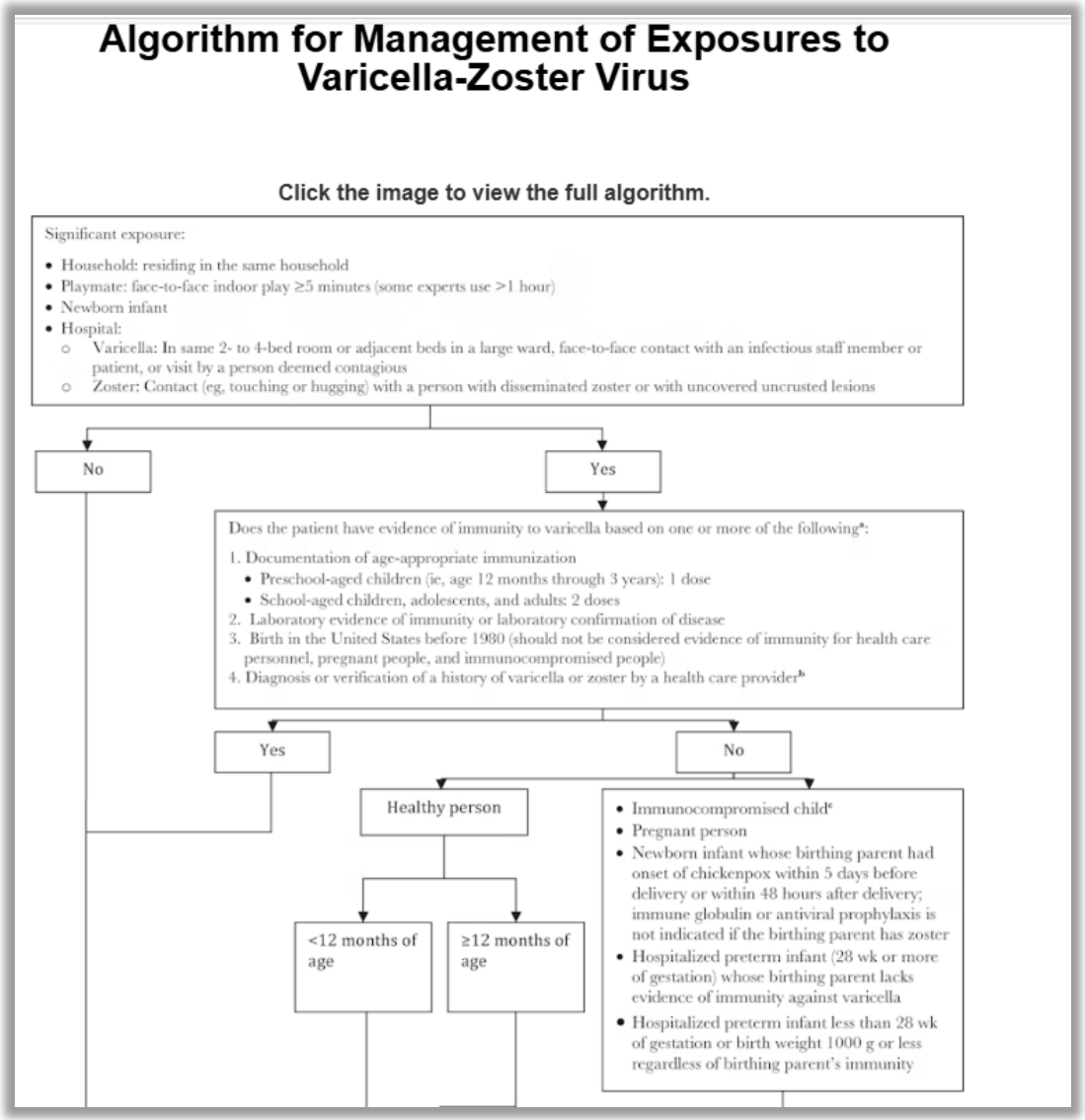
Complications of Varicella

- In children: Bacterial infections of the skin and soft tissues (including necrotizing fasciitis due to GABHS), sepsis; also, encephalitis, acute cerebellar ataxia, hepatitis, thrombocytopenia. Primary viral pneumonia is uncommon in immunocompetent children.
- In adults: Pneumonia is the most frequent complication. Zoster, post-herpetic neuralgia.

Exposure Management

Source: Red Book

- If healthy person, >12months, and within 5 days of exposure, give vaccine.
- Otherwise, if within 10 days of exposure, give VZV Ig, IVIG or Valtrex day 7 – 14.



Algorithm for Management of Exposures to Varicella-Zoster Virus

Click the image to view the full algorithm.

Significant exposure:
- Household: residing in the same household
- Playmate: face-to-face indoor play ≥5 minutes (some experts use >1 hour)
- Newborn infant
- Hospital:
  - Varicella: In same 2- to 4-bed room or adjacent beds in a large ward, face-to-face contact with an infectious staff member or patient, or visit by a person deemed contagious
  - Zoster: Contact (eg, touching or hugging) with a person with disseminated zoster or with uncovered uncrusted lesions

No

Yes

Does the patient have evidence of immunity to varicella based on one or more of the following[a]:
1. Documentation of age-appropriate immunization
   - Preschool-aged children (ie, age 12 months through 3 years): 1 dose
   - School-aged children, adolescents, and adults: 2 doses
2. Laboratory evidence of immunity or laboratory confirmation of disease
3. Birth in the United States before 1980 (should not be considered evidence of immunity for health care personnel, pregnant people, and immunocompromised people)
4. Diagnosis or verification of a history of varicella or zoster by a health care provider[b]

Yes

No

Healthy person

<12 months of age

≥12 months of age

- Immunocompromised child[c]
- Pregnant person
- Newborn infant whose birthing parent had onset of chickenpox within 5 days before delivery or within 48 hours after delivery; immune globulin or antiviral prophylaxis is not indicated if the birthing parent has zoster
- Hospitalized preterm infant (28 wk or more of gestation) whose birthing parent lacks evidence of immunity against varicella
- Hospitalized preterm infant less than 28 wk of gestation or birth weight 1000 g or less regardless of birthing parent's immunity

Factors Contributing to Parental Vaccine Concerns, Hesitancy, or Lack of Confidence:

- Lack of information about vaccines
- Lack of understanding of the severity of and communicability of vaccine-preventable diseases
- Misinformation from other sources
- Perceived risk of serious vaccine adverse effects
- Mistrust of the source of information regarding vaccines
- Concern regarding number of injections to be administered
- Delivery of information in a culturally insensitive manner or that is not tailored to individual concern
- Delivery of information in a hurried manner

Factors Contributing to Parental Vaccine Concerns, Hesitancy, or Lack of Confidence:

- Some people view the risk of immunization as disproportionately greater than the risk of disease, in part because of the relative infrequency of vaccine-preventable diseases in the United States because of the success of the immunization program.
- Others may dwell on sociopolitical issues, such as mandatory immunization, informed consent, and the primacy of individual rights over that of societal benefit.
- Health care professionals should determine, in general terms, what parents understand about vaccines their children will be receiving, the nature of their concerns, and what information should be provided to address their concerns.

Strategies with Parents

- Seek first to understand: Diagnose the Resistance.
- Respond to concerns.
- Show respect.
- Adjust to parents' learning style, while educating.
- Tell personal stories.

Douglas S. Diekema, MD, MPH
VICNetwork Webinar, February 29, 2012: **http://www.vicnetwork.org/category/events/archived-webinars/**

Resources for Health-Care Professionals

Children's Hospital of Philadelphia Vaccine Education Center

- VEC CHOP (**CHOP VEC Resources**)

Immunization Action Coalition

- IAC (**Immunize.org Webpage Resources**)

Centers for Disease Control and Prevention

- CDC (**CDC Vaccines & Immunizations Webpage**)

American Academy of Pediatrics

- AAP (**AAP Home Webpage**)

American Academy of Family Physicians

- AAFP (**AAFP Home Webpage**)

American College of Obstetricians and Gynecologists

- ACOG (**ACOG Home Webpage**)

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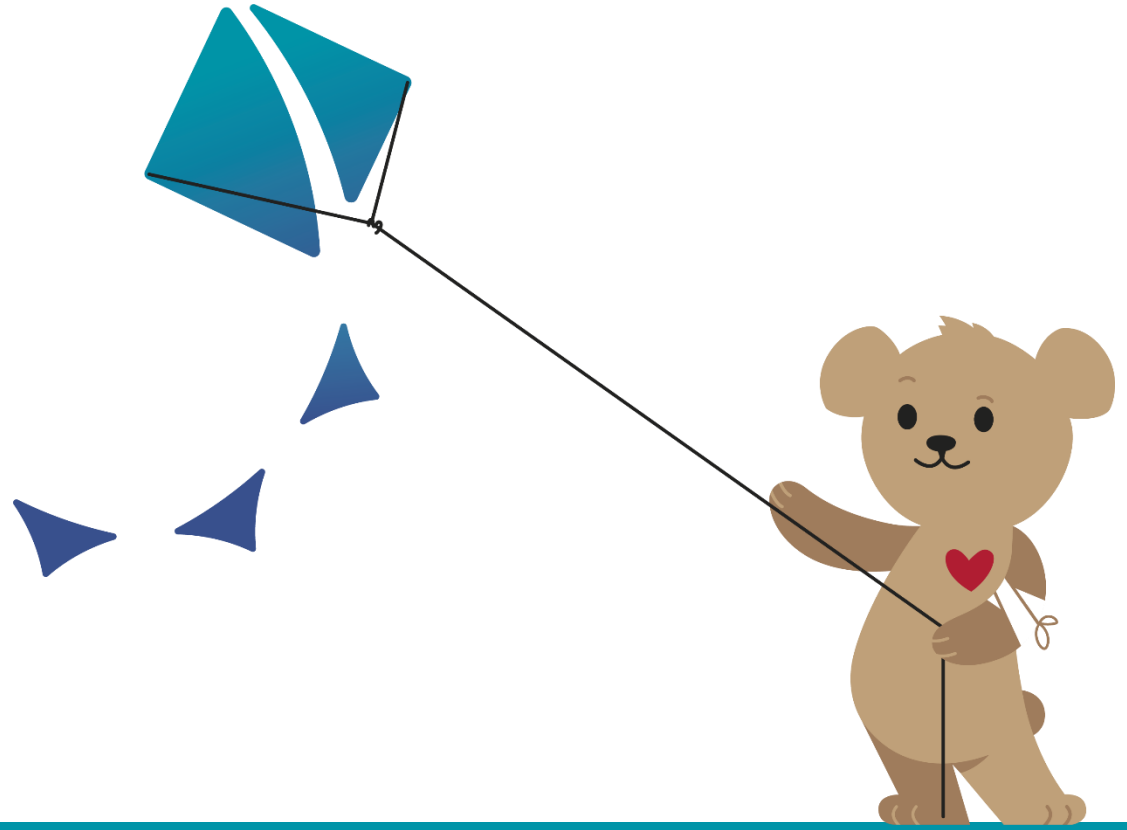
Thank you!

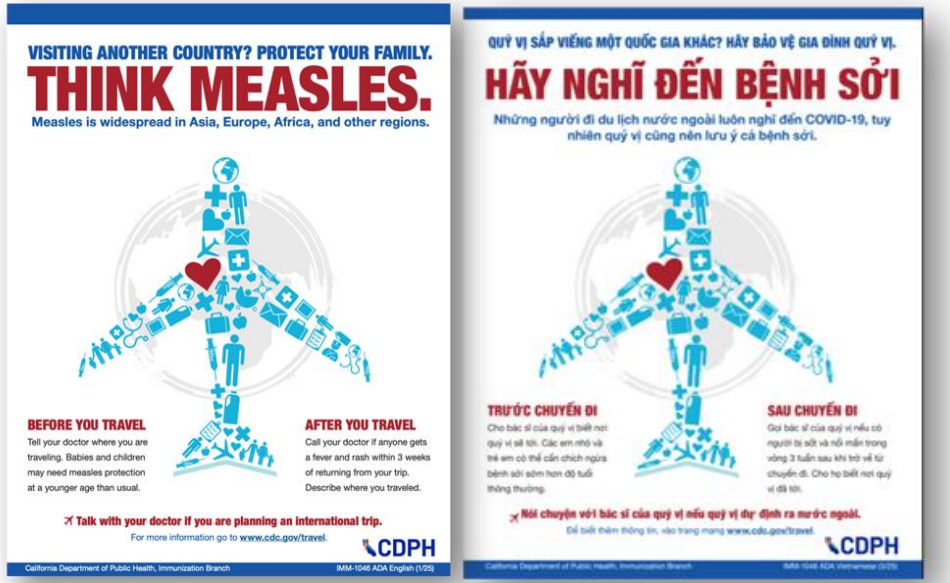


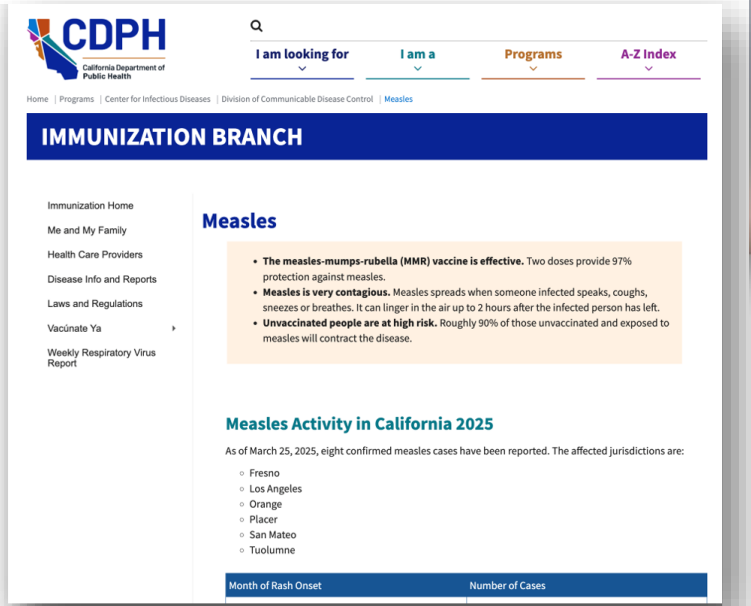
Resources & Poll

Terisha Gamboa, CDPH

CDPH Measles Resources

- Message from CDPH Director, Dr. Erica Pan
- Measles Disease Page
- Measles Communication Toolkit (Vietnamese, Tagalog, Hindi, and Thai translations - coming soon!)

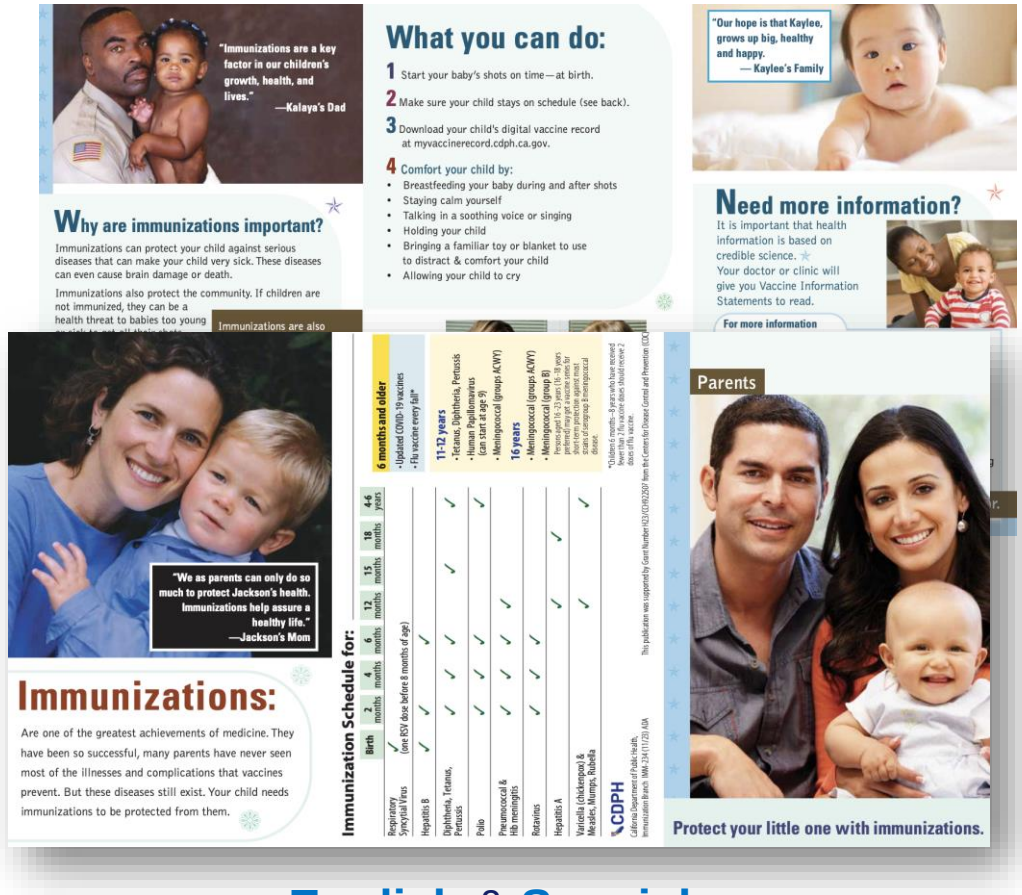




CDPH Prenatal Materials

[English](#) & [Spanish](#)

[English](#) & [Spanish](#)



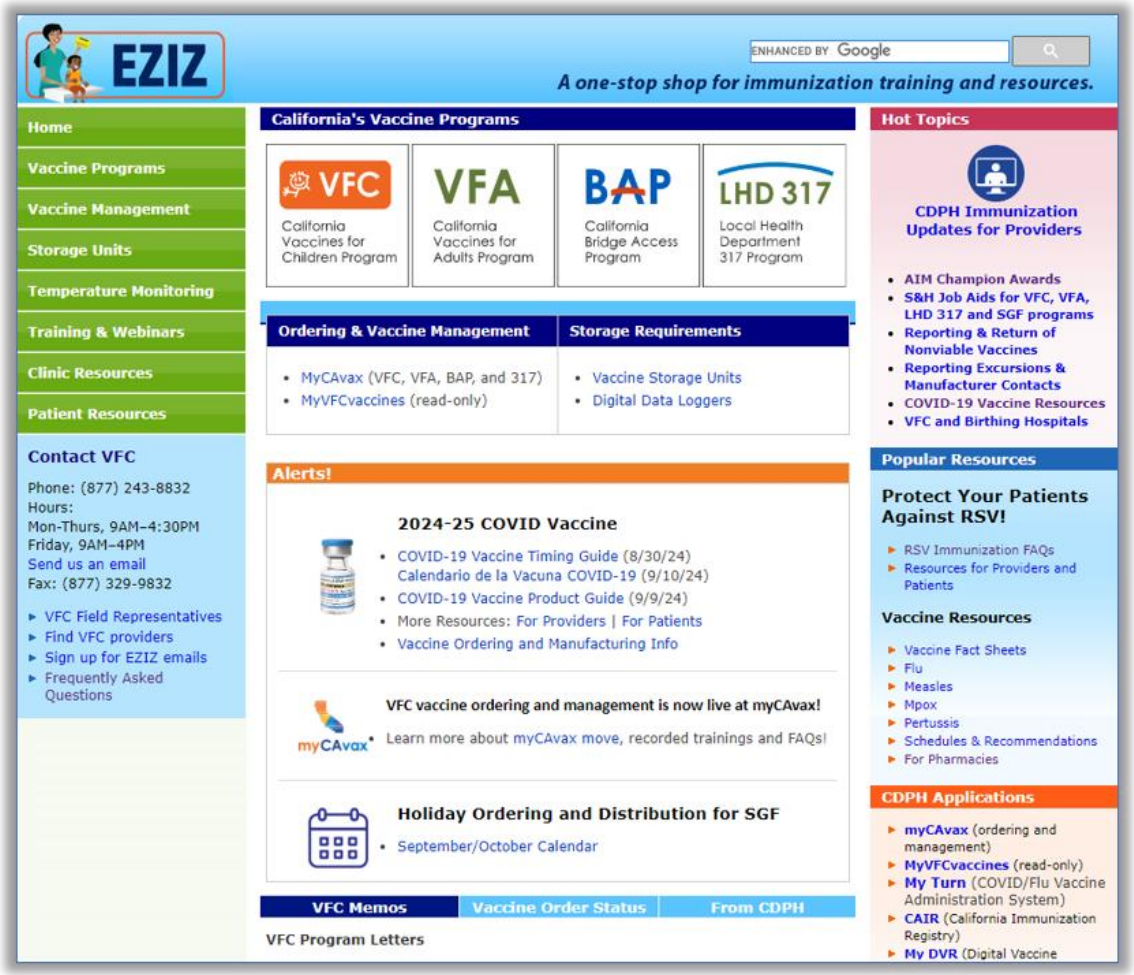
[English](#) & [Spanish](#)

Local health departments and clinical providers can order FREE copies of the above materials using this [form](#).

Providers can order this brochure from their [local health department](#).

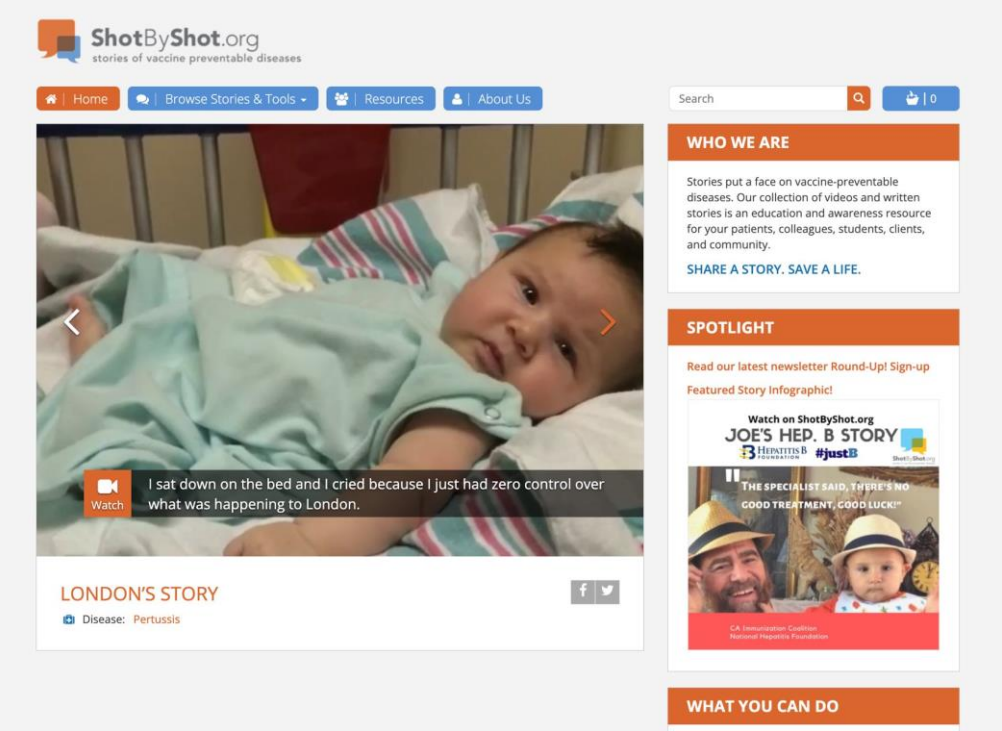
Additional CDPH Resources

- **Link to EZIZ Homepage**
  - Measles Resources Page
  - Pertussis Resources Page
  - Parent Education on Vaccine Safety
  - Immunization Studies & References
- CDPH Toolkit for Routine Immunizations



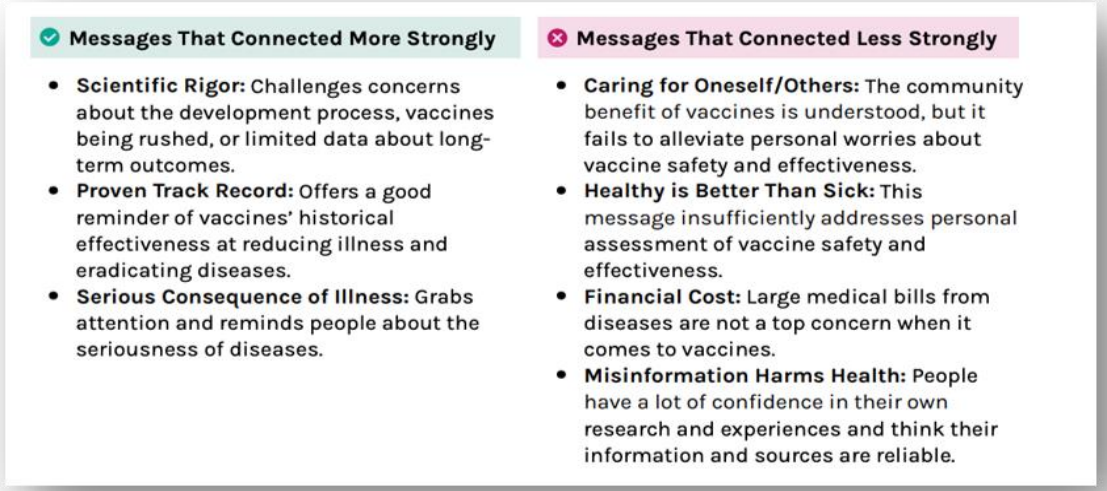
Additional Provider Resources

- ShotbyShot.org
- Immunizations | HealthyChildren.org
- Vaccine Confidence & Addressing Concerns | Immunize.org
- Vaccine hesitancy in the refugee, immigrant, and migrant population in the United States | PubMed



Public Health Communications Collaborative

- Guide for Communicating More Effectively About Vaccines
- Approaches to effective vaccine communication, webinars, and more here!

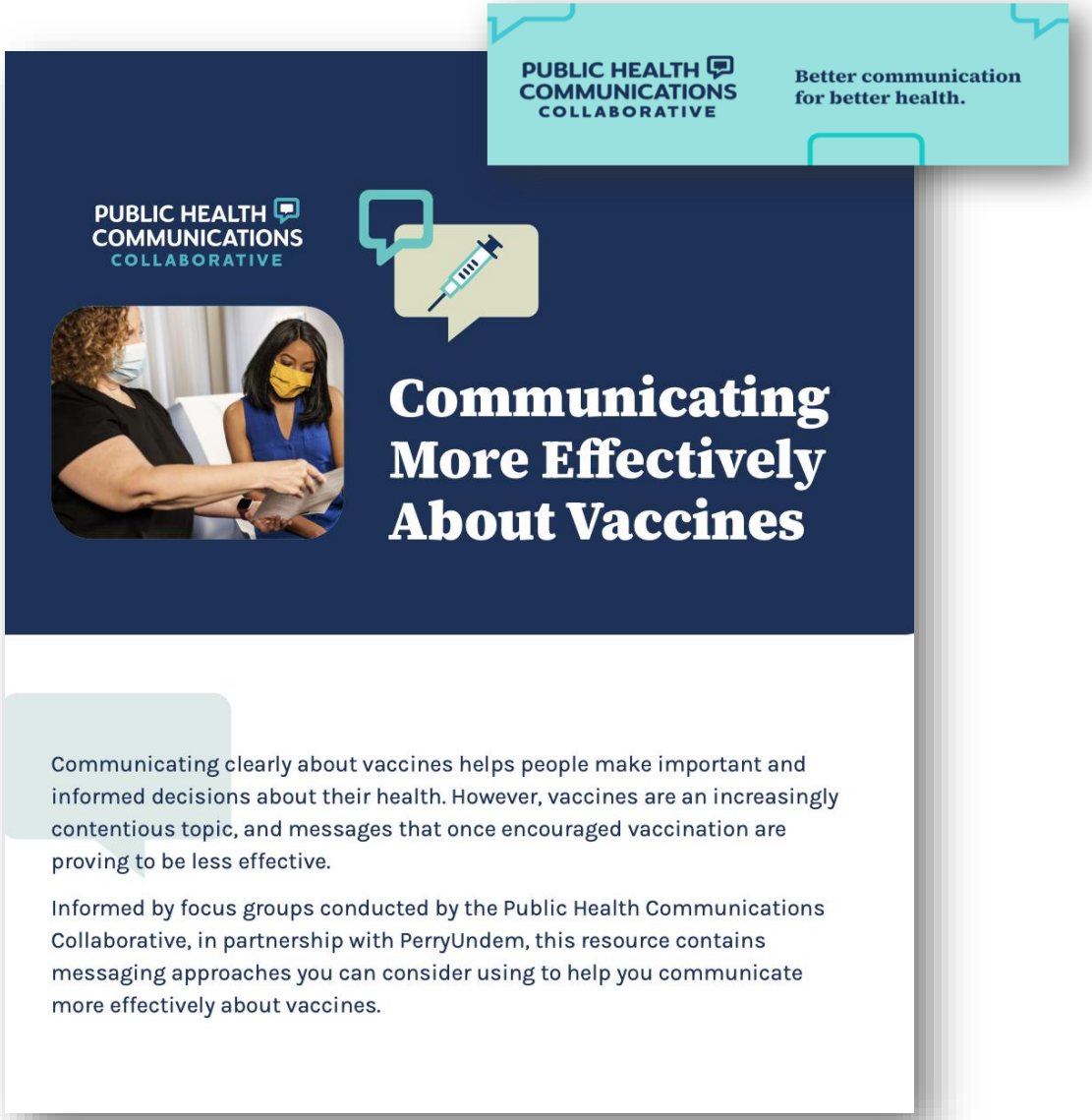


Messages That Connected More Strongly

- **Scientific Rigor:** Challenges concerns about the development process, vaccines being rushed, or limited data about long-term outcomes.
- **Proven Track Record:** Offers a good reminder of vaccines' historical effectiveness at reducing illness and eradicating diseases.
- **Serious Consequence of Illness:** Grabs attention and reminds people about the seriousness of diseases.

Messages That Connected Less Strongly

- **Caring for Oneself/Others:** The community benefit of vaccines is understood, but it fails to alleviate personal worries about vaccine safety and effectiveness.
- **Healthy is Better Than Sick:** This message insufficiently addresses personal assessment of vaccine safety and effectiveness.
- **Financial Cost:** Large medical bills from diseases are not a top concern when it comes to vaccines.
- **Misinformation Harms Health:** People have a lot of confidence in their own research and experiences and think their information and sources are reliable.



Additional Communication Resources

- Developing Public Health Messages Using Plain Language | Public Health Collaborative
- Vaccine Communication Resources (Print & Media) | CDC
- Vaccine Confidence Toolkit Webinar Series | Association of Immunization Managers (AIM)

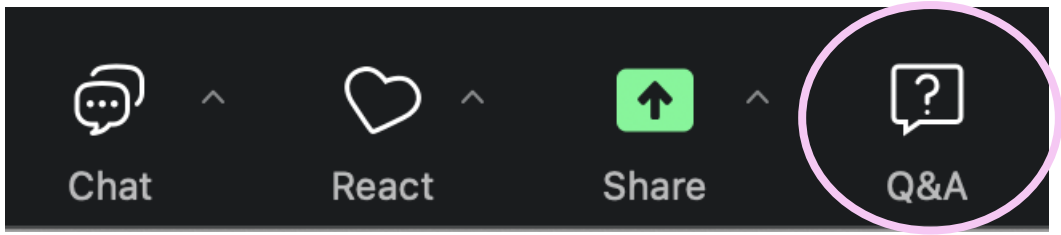
Poll: CDPH Appreciates Your Feedback!

After today's webinar, how confident are you in your ability to speak effectively with patients about measles, pertussis, and varicella vaccinations?

- ❑Very confident
- ❑Confident
- ❑Somewhat confident
- ❑Slightly confident
- ❑Not confident

Q&A

During today's webinar, please click and open the Q&A icon to ask your questions so CDPH panelists and subject matter experts (SMEs) can respond.



CDPH | Immunization Branch

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Upcoming Webinar Opportunities

CDPH Immunization Updates for Providers

Next session: Friday, June 27, 2025

9:00 am – 10:30 am (PT)

CDPH California Department of Public Health | Immunization Branch

Special Thanks to Today's Presenter:

Dr. Jasjit Singh

Webinar Planning & Support:

Terisha Gamboa, Diane Evans, Michael Fortunka, Blanca Corona,
CDPH Subject Matter Experts

And thank YOU for joining CDPH & CIC for this Critical Conversations webinar!

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