APIC GRAND CANYON

APIC Grand Canyon 088

FEBRUARY 2026 CHAPTER MEETING

Agenda

- 1:00-1:30 Chapter Updates
- 1:30-2:15 AZDHS- Measles Overview for Healthcare Professionals, Dr. Neil Ampel and Ms. Gwen Borlaug
- 2:15-2:45 MCPHD- Maricopa County Measles Outbreak, Karen Zabel, Epidemiology Nurse Manager
- 2:45-2:50 SSI Prevention Update
- 2:50-3:00 Closing

President's Update

Thank you!

- Leadership and Board
- Membership
- Healthcare partners

Welcome and Celebrations

- New members
- New certifications

2026 Strategic Plan

People

*Strengthening Membership

*Developing Leadership

*Building Connections

Purpose

*Advancing Prevention through Collaboration

*Aligning Strategy with Member Feedback

*Measurable Impact

Practice

*Elevating Evidence-Based Prevention Education

*Prevention and Outbreak Readiness

*Accessible Support

What's NEW!

APIC National:

*Strong Legislative impacts
*National Conference Registration–open
*New website design completed AI assist, and chat bot features
*Member value focus– including new toolkits and playbooks
*Community focus sharing groups

Grand Canyon Chapter:

*Newsletter
*Website
*Member Educational Support
*SSI office hours coming—March 2026!

Webmaster Update

- Meet Out Board
  - Updated to include members photos and bios.
- Meeting & Events
  - Includes AZ Activities
  - Upcoming webinars for CE credits
- SSI Prevention Tab
  - Dr. Edmistons presentations
- Resources Tab
  - Organized according to the eight Certification Board of Infection Control and Epidemiology (CBIC) Examination Content Areas
  - Presentations added under specific content from previous meetings.
- Job Opportunities
  - Contact Martin to add open positions.
  - Membership Opportunities will be updated 03/01/2026.

Nominations & Membership

Open Positions

- Member at Large
- Legislative Representative

Positions will be posted on website under **Resources** → **Membership Opportunities** with application and description.

Education Update

Results from Needs Assessment

- Top 5 most requested topics
  - HLD/Sterilization
  - SSI
  - Environmental Cleaning
  - NHSN Surveillance and Data Analytics
  - Regulatory Readiness

Measles: clinical aspects

Neil M. Ampel, M.D.
Consultant, Arizona Department of Health Services

Historical Context

- First described around **900 CE** by the Persian physician Abū Bakr Muhammad Zakariyyā Rāzī (Rhazes)
  - likely 2,000 - 3,000 years old

- Given the Latin name **morbilli** (“little disease”) to distinguish it from smallpox

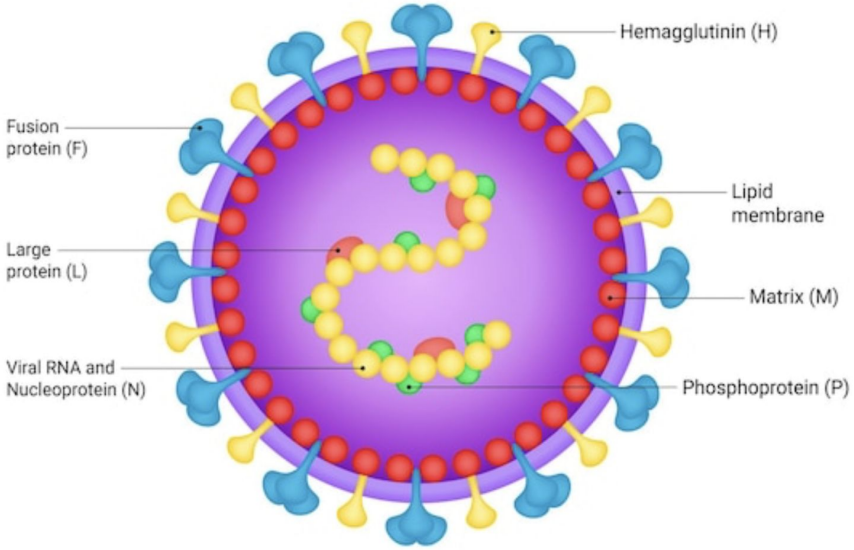
- **Rubeola** (“little red”) and **measles** (Dutch for “spot” or “pimple”) came later

- Once also called “**First Disease**” to distinguish it from other common childhood exanthems

Peltola H. Acta Paediatrica 2025; doi: https://doi.org/10.1111/apa.70370

The measles virus

- **Paramyxoviridae family, *Morbillivirus* genus**
  - helical, enveloped, single-stranded, negative-sense RNA virus with projecting hemagglutinin (H) and fusion (F) proteins
  - related to mumps, parainfluenza virus, RSV, metapneumovirus, Nipah virus



- **Humans are the only natural host**
  - A disease of civilization!
    - Likely derived from cattle rinderpest virus around 500 BCE
    - Spread in humans once urban areas >250,000 population occurred in Mesopotamia and Eurasia

The discovery of the measles virus

- Measles described as a distinct entity in Western medical literature in **1670** by Thomas **Sydenham**
- Found to be infectious in **1757**
  - Francis **Home** noted disease in 10 of 12 health children inoculated with blood from a patient to 12 healthy individuals
    - mimicking variolation
- **Parnum** described a measles outbreak on the Faroe Islands in **1846**
  - defined the incubation period, contagiousness, and life-long immunity after infection
  - O'Neill, Rake, Shaffer and Stokes in **1940** were able to cultivate the

Katz SL. Chapter 22, in "History of Vaccine Development," Plotkin, SA [ed]), 2011

The development of the measles vaccine

- During a measles outbreak outside of Boston in **1954**, Thomas Peebles and John **Enders** obtained blood and pharyngeal swab material from 13 year-old David Edmonston
  - *"Young man, you are standing on the threshold of science"*

- The virus was attenuated by >80 passages through several types of cell cultures
  - "**Edmonston B strain**"

- In **1963**, the first **live-attenuated measles vaccine** was licensed in the United States

- A **killed version** was licensed in the U.S. between 1963-1967
  - resulted in incomplete immunity, **atypical measles**
  - removed from the market in 1968

- The live virus was further attenuated in **1968** by **Hilleman**
  - **Edmonston-Enders (Moraten)** vaccine (**Mor**e **at**tenuated **En**ders)
  - Included in **MMR** in **1971**

Katz SL. Chapter 22, in "History of Vaccine Development," Plotkin, SA (ed), 2011

Results of measles vaccination

- Prior to 1963
  - 3-4 million annual cases measles in the U.S.
    - 48,000 were hospitalized
    - 1,000 developed encephalitis
    - 400-500 died

- **From 1968-1983** (15 years), measles vaccination
  - **prevented** 52 million cases, including

Safety and adverse events with MMR vaccination

- **5-15%** post-vaccination syndrome (5-12 days after)
  - Fever (5-10% at 39.4°C)
  - Mild morbilliform rash
  - Soreness, redness at vaccination site
  - Stiffness or pain in the joints

- **Less frequent**
  - Cervical lymphadenopthy
  - Febrile seizures ~8-14 days (1 in 3,000-4,000 children <7 years)

- **Rare**
  - Thrombocytopenia (~6 weeks)
  - Anaphylaxis (3.5 per 10 million doses)
  - Measles inclusion body encephalitis (3 reported cases, 1 confirmed)

CDC

- **No association**

Measles immunity and MMR vaccination recommendations in the United States

- **Children are protected by maternal antibody for 1-2 months**
  - Rapidly wanes by 6 months

- **Two doses of MMR provide 97% protection against measles**
  - protection begins within 2 weeks of first dose
    - appropriate to vaccinate under outbreak conditions

- **First dose between 12-15 months; second dose 4-6 years**
  - may give first dose earlier (6-11 months) in outbreak settings (doesn't count for full vaccination)

- **For adults born in or after 1957**
  - if received only 1 dose of MMR or
  - laboratory evidence of non-immunity

- **For higher-risk adults**
  - born ≥1957, no laboratory immunity
  - 2 doses MMR, 28 days apart
  - healthcare workers
  - international travelers
  - students in post-secondary institutions
  - household contacts of immunocompromised persons
  - outbreak settings

- **Measles immunity can be determined by antibody titer**
  - IgG levels ≥240 IU/mL

Measles immunity and MMR vaccination recommendations in the United States

- **One or two vaccinations can be considered in adults if evidence of waning immunity**
  - especially if born after 1957 and at risk

- **MMR is a live-attenuated vaccine. Do not give:**
  - **Pregnancy**
    - measles associated with miscarriage, stillborn and preterm birth
    - give postpartum and avoid pregnancy for 28 days
  - **Cellular Immunodeficiency**
    - Persons with HIV infection and CD4 <15%; active leukemia/lymphoma; persons receiving cancer chemotherapy; SCID

- Likely through both **aerosol** (<5 μm) and **droplet** (>5-10 μm) exposure

Measles transmission

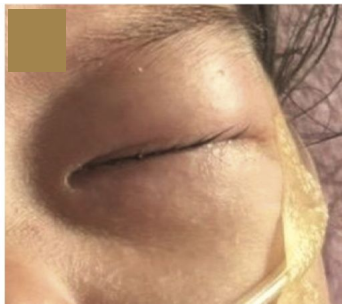
- Direct contact with respiratory secretions
  - surface contamination plays a very minor role

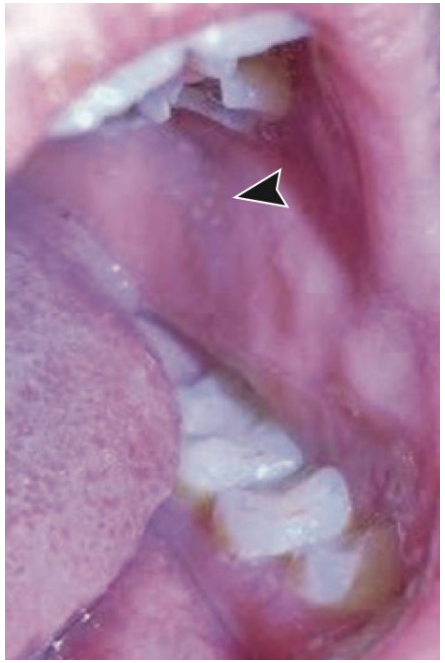
- **R_0** is **12-18**
  - 1 infected person will infect 12-18 non-immune individuals
  - Control requires ≥95% community immunity to prevent spread
  - Compared to
    - Chickenpox: 7-10; pertussis: 5-17; SARS-CoV-2: 3-8; influenza: 1-2

- Measles virus is **persistent** in the indoor environment
  - Virus **survives >2 hr** in airborne droplet nuclei
  - **Ventilation** important
    - airborne transmission predicted by room CO_2 concentration
(Iwamura & Tsutsumi, Cureus 2024; doi:10.7759/cureus.64882)

Measles: presentation

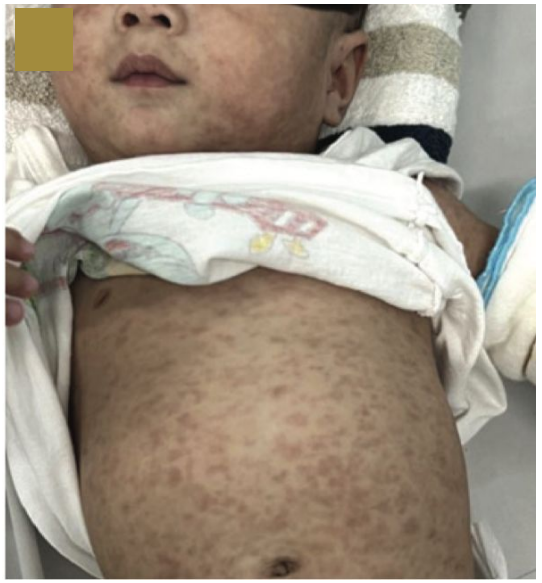
- **Fever**: 10-14 days after exposure





- **Three "C's"**
  - **Cough**
  - **Coryza**
  - **Conjunctivitis**

- **Koplic spots:**
  - 1-3 mm white spots on erythematous base on buccal mucosa opposite the molars
  - 1-2 days prior to rash, 1-2 days after
  - seen in 60-70% of cases and are <u>pathognomonic</u>



- **Rash**: 3-5 days after fever
  - Erythematous, maculopapular (<u>morbilliform</u>), not petechial
  - Face → Head → Trunk → Legs
  - Resolves in reverse order after 3-5 days
  - <u>Infectious</u>: 4 days before to 4 days after rash onset

- **Diarrhea**: common
  - at time of prodrome and may last up to 30 days

Ho & Mulholland, NEJM 2025; 393:2447

- **At least one** of the "**Three "C's**" is usually present

Measles: recognizing in the health care setting

  - **cough**: harsh, dry, non-productive "bark"
  - coryza: nasal discharge, sneezing, nasal congestion
  - conjunctivitis: bilateral redness, mild discharge, no corneal involvement
- **Koplic spots**: predate rash and resolve by 2 days after rash
- **Rash** begins 3-5 days after prodromal symptoms at height of fever
  - starts on **face** and **behind the ears**
  - **spreads outward** and **downward**
  - becomes hyperpigmented
  - starts to **fade** after 5-6 days
  - becomes confluent and desquamating

Daniels DK et al. Ped Emerg Care 2025; 42:79

- Most reliable symptoms:

Measles: differential diagnosis

TABLE 1. Differential Diagnosis of Measles Based on Rash Characteristics, Fever Pattern, and Clinical Features

Condition	Rash Type and Distribution	Fever Timing	Associated Symptoms	Distinguishing Features From Measles
Measles[9]	Morbilliform, starts on the face and spreads caudally and centrifugally	High fever (up to 105 °F/ 40.6 °C) that precedes rash	Prodromal symptoms of cough, coryza, conjunctivitis, Koplik spots	
Infectious mononucleosis[24]	Diffuse maculopapular	With illness onset	Pharyngitis, fatigue, lymphadenopathy	No cough/coryza, rash usually linked to antibiotic use
Roseola[25]	Maculopapular, starts on trunk and spreads to neck/extremities	High fever for 3-7 d, which precedes and resolves as rash appears	Fussiness, rhinorrhea, lymphadenopathy, diarrhea, inflammation of the tympanic membrane	Spread of rash differs, lower risk for complications, rash occurs after fever resolves
Rubella[26]	Fine, pink maculopapular, starts on the face and spreads to the trunk	Low-grade fever, with or just before rash	Mild upper respiratory infection (URI) symptoms, postauricular/suboccipital lymphadenopathy	Milder illness course, shorter duration, prominent regional lymphadenopathy
Kawasaki disease[27]	Polymorphous	Persistent fever ≥ 5 d	Nonexudative conjunctivitis with limbic sparing, mucosal membrane changes, extremity swelling, and lymphadenopathy	No cough/coryza; coronary artery involvement, nonexudative conjunctivitis
Drug eruption[28]	Diffuse morbilliform	Variable onset postexposure	Often none	Improves with drug withdrawal, often lacks systemic symptoms of measles
Meningococcemia[29]	Can begin as maculopapular and quickly progress to petechial/purpuric, starts on the trunk and lower extremities	With illness onset	Headache, myalgias, altered mental status, hypotension	Rapid deterioration, petechiae/purpura, systemic toxicity
Rocky Mountain Spotted Fever[30]	Maculopapular/petechial, starts on wrists/ ankles and spreads centrally	Fever precedes rash	Headache, myalgias, travel to an endemic region, history of tick bite	Rash starts on the extremities, tick exposure, risk of severe vasculitis
Mycoplasma pneumoniae[31]	Maculopapular, however, vesicles, bullae, petechiae, and urticaria are also described with variable distribution	With illness onset	URI symptoms, cough, and extrapulmonary findings	Mild upper and/or lower respiratory symptoms with nonspecific rash
Viral Hemorrhagic Fevers[32]	Petechial/purpuric, variable distribution	With illness onset	Bleeding diathesis, hypotension, travel to endemic region	Recent travel, coagulopathy, severe systemic illness
Toxic shock syndrome[33]	Diffuse erythrodermic	With illness onset	Hypotension, vomiting, diarrhea, multiorgan dysfunction	Sudden onset, distinct erythrodermic rash from onset, associated with tampon use or wound infection

Daniels DK et al. Ped Emerg Care 2025; 42:79

- **Occurs in those who received with the killed vaccine (1963-1967)**
  - high fever, headache 1-4 days after exposure
    - coryza, conjunctivitis
  - rash 3-4 days later: palms and soles → limbs, trunk
    - atypical: vesicular, petechial
  - severe pneumonitis: persistent cough, chest pain, chest x-ray infiltrates
  - ↑ liver aminotransaminases, thrombocytopenia
  - transmission to to others
  - rapid and high IgG titer

Measles: atypical and modified

- **Modified measles**
  - **Occurs in those with prior measles immunity (natural or acquired)**
    - longer incubation period (7-21 days)
    - milder disease but with similar symptoms and signs as natural measles
    - minimal IgM response

Martin DB et al. Ann Intern Med 1979; 90:877
Hickman CJ et al. J Infect Dis 2011; 204:S549

Measles and pregnancy

- **Measles is more severe during pregnancy**
  - increased risk of pneumonia

- **Measles is associated with increased adverse birth outcomes**
  - ↑ rates of miscarriage, pre-term birth, still-born
  - not teratogenic (unlike rubella)

- ***Congenital measles*** (rare)
  - measles occurring within the first 10 days of life when mother had measles infection during pregnancy

Joseph NT. Obstet Gynecol 2026; 147:44

  - ↑ risk death, hearing loss, subacute sclerosing panencephalitis (SSPE)

What to do if measles is suspected

- **Place the patient in respiratory isolation**
  - Have patient wear a **surgical mask**

  - Place patient in a **private room** with door closed
    - if possible, place in **airborne infection isolation room (AIIR)**
      - negative-pressure (-2.5 to 15 Pa)
      - ≥12 air-exchanges/hour with HEPA filtration on exhaust and no recirculation
      - sealed enclosure with anteroom, if possible

  - If AIIR not available
    - close door and place towels along bottom

  - continue isolation until 4 days after rash on-set

- **Health Care Personnel should wear N95 respirators**
  - preferably with documented measles immunity

- **Notify your local public health department!**

- Nasopharyngeal swab (preferred) or throat swab

Measles: diagnosis

- Urine
- (Heparinized blood)
- Increased yield with number of different samples
- Send samples for measles **RT-PCR** testing

- **Serology**
  - Obtain serum sample
  - Send for **measles IgM** and IgG
    - obtain second IgG specimen 10 days after first

Measles: diagnosis

Test		Detectable Window*		Advantages	
RT-PCR	**within 3 days**	**up to 10 days**	**Nasopharyngeal, throat, urine, blood, BAL**	**High sensitivity (94%) and specificity (99%)**	**Strict collection and transport requirements**
IgM serology	**from onset**	**up to 6-8 weeks**	**Serum, oral fluid**	**Longer testing window**	**False negatives if <3 days of rash onset and in immunocompromised patients**
IgG serology	**within 10 days**	**paired samples, 1st within 10 days and then 10 days later**	**Serum**	**Confirms recent vs past infection**	**Slow, not helpful in acute decision making**

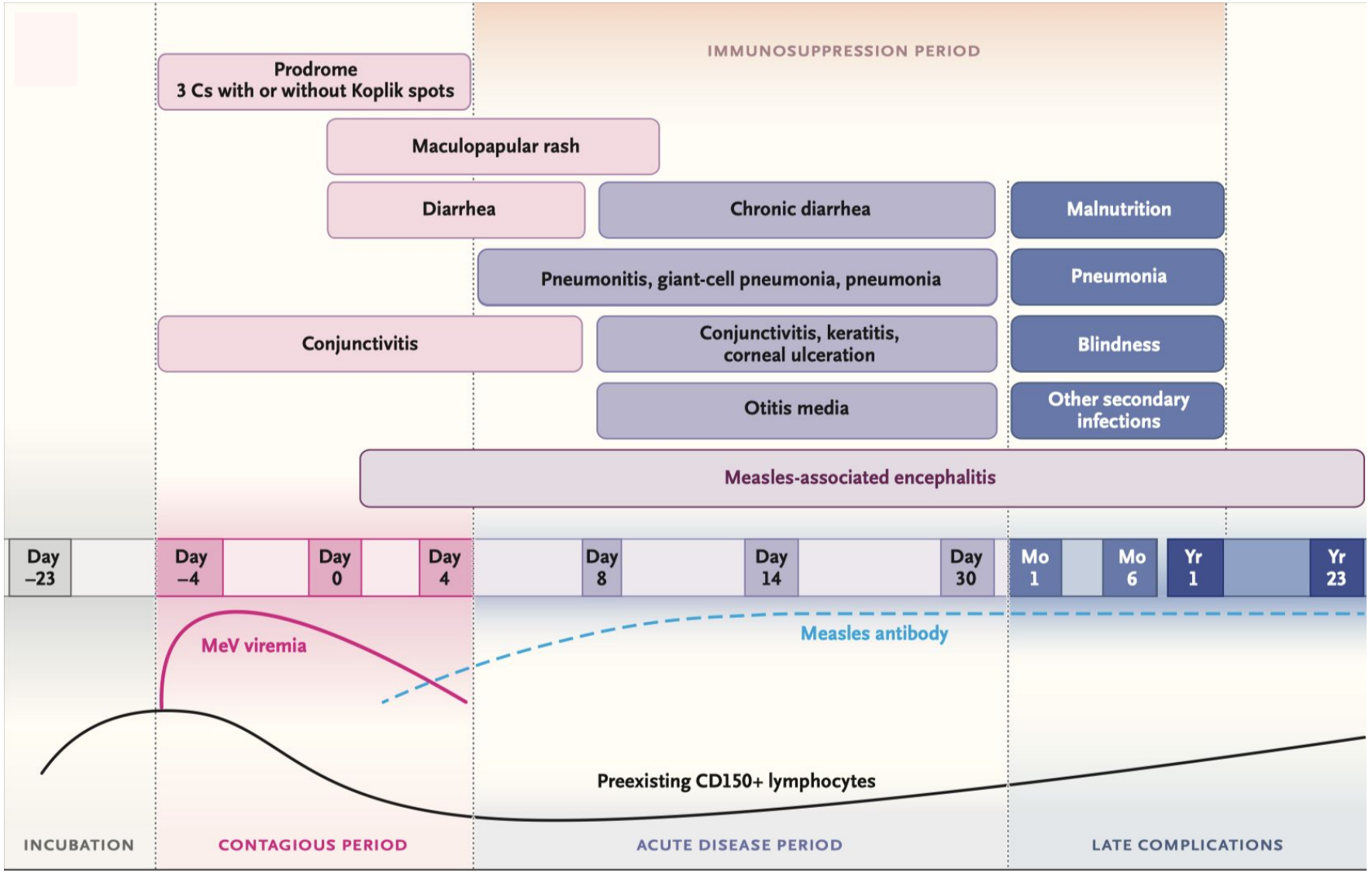
*based on onset of rash

Daniels DK et al. Ped Emerg Care 2025; 42:79

Testing for measles in Arizona

- **Immediately notify your local county health department**
- **Measles antibody testing (IgM and IgG)** can be obtained through several commercial laboratories
- **For PCR testing**
  - Collect a nasopharyngeal or throat swab
    - **polyester fiber–tipped** synthetic swab (e.g., Dacron, rayon, or nylon), with a plastic shaft
      - Do not use calcium alginate or cotton swabs or wooden shafts
    - place into 1-3 mL of **standard viral transport medium** (VTM)
    - **refrigerate** (2-8°C)
    - Health department will decide if appropriate to test and instruct on how to transport to Arizona State Public Health Laboratory (ASPHL)

Pathogenesis and complications



Ho & Mulholland, NEJM 2025; 393:2447

Measles: cell receptors and immune suppression

- **CD150**: wild type MeV
  - targets and depletes B-cells and memory T-cells
  - results in **temporary immune amnesia**
    - lasts 5-12 months
    - reduced innate and adaptive immunity
      - increased risk of infection
      - reduced response to immunization

- **CD46**: vaccine-related MeV
  - not associated with immune amnesia
  - vaccination associated with non-specific effects (NSE)
    - reducing morbidity and mortality of non-measles infections

Ho & Mulholland, NEJM 2025; 393:2447

- **Nectin-1**

Measles: complications

Table 1. Incidence of Severe Complications Associated with Measles.

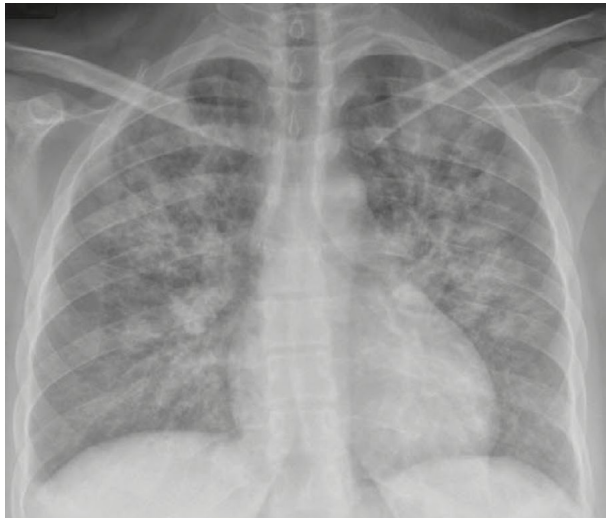
Complications	Incidence in Developed Countries	Comments
Pneumonia	1–6 per 100 measles cases[5]	Among the most common complications during the first month of measles; most common cause of measles hospitalization
Diarrhea	8–10 per 100 measles cases[5]	Common complication during the first month of measles
Keratitis or keratoconjunctivitis	3–10 per 100 measles cases [6-9]	Keratoconjunctivitis may appear in the prodromal stages of measles and persist for as long as 3 months[6]; keratitis with retinitis and optic neuritis also has been reported.[7-9]
Corneal ulceration	Rare	Documented in 1–4 per 100 measles cases in the 1980s in Africa and South Asia[10,11]; measles can cause corneal ulceration directly and facilitate a secondary infection (such as herpes simplex keratitis) that leads to corneal ulceration[10,11]
Blindness	Rare	Measles is a leading cause of childhood blindness in places where measles is endemic; results of surveys conducted in schools in Africa in the 1970s suggested that measles was the cause of 33 to 79% cases of blindness.[11]
Otitis media	7–9 per 100 measles cases[5]	One of the most common complications during the first month of measles; can lead to sensorineural deafness, which was observed in 5 to 10% of measles cases in the United States before the introduction of measles vaccination programs[5]
Death	1–3 per 1000 measles cases[5]	16 per 1000 measles cases in low-income countries[12]; 9 per 1000 measles cases in middle-income countries[12]; up to 180 per 1000 measles cases reported in the context of humanitarian relief efforts during major outbreaks[13]
Malnutrition	8–10 per 100 measles cases	
Acute postinfectious measles encephalitis	1 per 1000 measles cases[14]	Develops within the first week of measles, after the appearance of the first symptoms, and is associated with 20% mortality[14]
Measles-inclusion body encephalitis	1 per 1000 measles cases[14]	Develops within 7 days to 6 months after onset of measles and is associated with 100% mortality[14]
Subacute sclerosing panencephalitis	7–11 per 100,000 measles cases[5,14]	Develops within 7–10 years after measles and is associated with 100% mortality within 1–3 years after onset[14]; young children with measles (<2 years of age) are at increased risk

Ho & Mulholland, NEJM 2025; 393:2447

- **Complications occur in <u>30%</u> of unvaccinated measles patients**

Measles: general complications

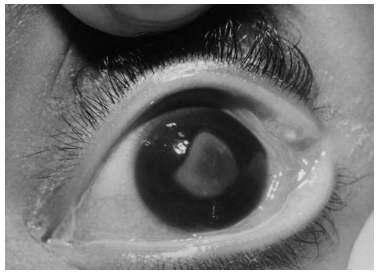
- **Pneumonia** (1-6%)
  - leading cause of hospitalization and mortality
  - may be directly due to measles virus
  - or to bacterial etiology
    Streptococcus pneumoniae, Staphylococcus aureus, Hemophilus influenzae



Kakoulis L et al. Internat J Clin Prac 2019;
DOI: 10.1111/ijcp.13430

- **Otitis media** (7-9%)
  - may result in **deafness**

- **Keratoconjunctivitis** (3-10%)
  - different from conjunctivitis of prodrome, which rapidly resolves
  - corneal inflammation → scarring → **blindness**
  - malnutrition, Vitamin A deficiency



Semba & Bloem Surv Ophthal 2004; 49:243

Measles: CNS complications

- 1:1000 cases
- headache, vomiting, stiff neck, meningeal irritation, drowsiness
- acute, rapid progression, seizures
- CSF: pleocytosis, PCR-positive for MeV
- MRI: patchy, gray-matter edema

- **Acute disseminated encephalomyelitis (ADEM)**
  - 1-14 days after rash onset
  - 1:1000 cases
  - headache, altered mental status, ataxia
  - subacute progression, steroid responsive
  - demyelinating, likely autoimmune
  - CSF: minimal pleocytosis, PCR-negative for MeV
  - MRI: large white matter lesions (T2 enhancement)

- **Subacute sclerosing panencephalitis (SSPE)**
  - due to viral persistence in the brain
  - 7-10 years after initial infection
  - usually in those <20 years of age

Lertamornkitti & Britton; Measles is Misery. Paediatric Respir Rev 2025; 56:24

Measles: management

- **Treatment is supportive**
  - there are no approved antivirals for measles virus
  - some experts use ribavirin or interferon-α

- **Role of Vitamin A**
  - measles infection results in low vitamin A levels
  - pre-existing vitamin A levels may predispose to more severe disease
  - vitamin A supplementation in resource limited settings has been associated with lower mortality but data are limited in U.S.
  - currently, supplementation is recommended in U.S. for children with measles
  - **no role for vitamin A to prevent measles**

Table 3. U.S. Recommendations for Vitamin A Supplementation in Patients with Measles.*

Age Group	Dose	Frequency
Children		
<6 mo	50,000 IU (15,000 μg RAE)	Daily for 2 days
6–11 mo	100,000 IU (30,000 μg RAE)	Daily for 2 days
>12 mo	200,000 IU (60,000 μg RAE)	Daily for 2 days
Previous vitamin A deficiency or eye complications caused by measles	Third dose	2–4 wk after the second dose
Adults†	No recommendation	No recommendation

Ho & Mulholland, NEJM 2025; 393:2447

Measles: what is exposure

- Sharing same room or airspace with a case
  - within 30 meters
- No minimum time of exposure
  - ≥30 minutes considered very high risk
- Lack of measles immunity
  - <2 doses of MMR, no laboratory confirmation of immunity, no prior measles history
- Public health may consider 21 days of quarantine

Measles: post-exposure prophylaxis

- give **within 6 days** of exposure
- **Infants** (**<6 months** to up to 12 months)
  - IM 0.5 ml/kg (maximum 15 mL)
  - give MMR 6 months later
- **pregnancy** without evidence of measles immunity and **severely immunocompromised** hosts
  - IV 400 mg/kg

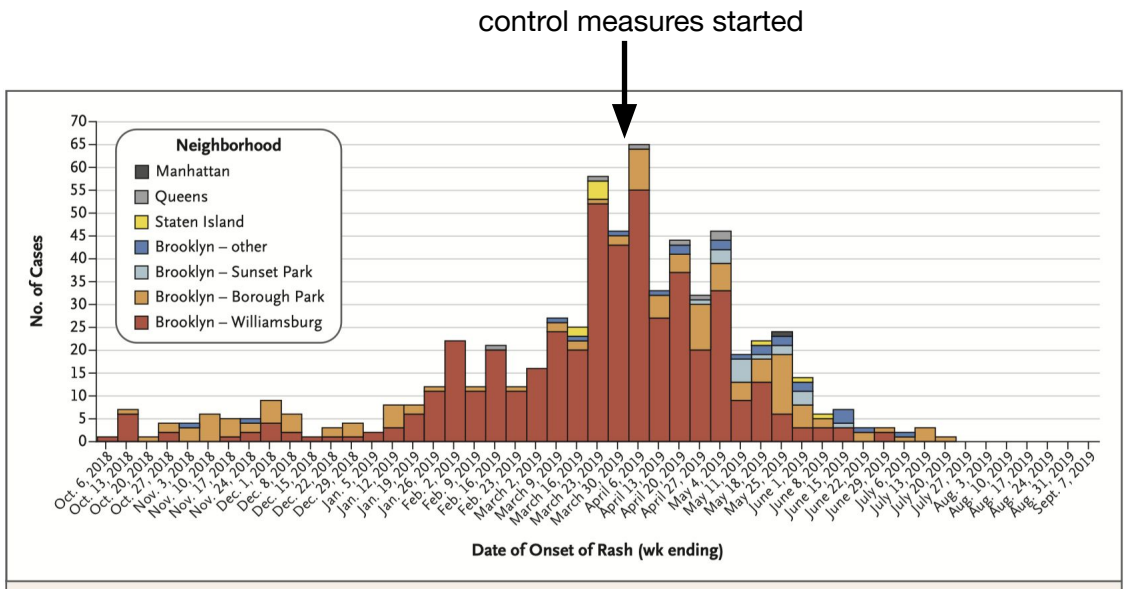
- **MMR** vaccination: give **within 72 hours**
  - **Children ≥12 months and adults**
    - no documented prior two-doses of MMR
    - no prior measles diagnosis
    - without evidence of immunity (IgG≥240 IU/mL)
    - adults born prior to 1957 may be exempted
  - **Infants 6-12 months**
    - Immune globulin should not be given with MMR
    - 2 subsequent doses of MMR are still required

Arciulolo RJ et al. Clin Infect Dis 2017; 65:1843
CCDR 2018; 44:9:226

Measles: prior outbreaks

- Several recent outbreaks associated with low vaccination rates reported in the mid-2000's

- **2018**: **among New York Orthodox Jewish population**
  - **Source**: an unvaccinated child who developed a rash 9 days after returning from Israel in September 2018
  - **649 confirmed cases**
    - 85.8% unvaccinated; median age: 3 years
    - 49 hospitalized, 20 admitted to ICU, no deaths; 94.6% unvaccinated
    - transmission occurred in home, schools, childcare, and community-wide
  - **Control achieved**
    - initiated on March 27, 2019
    - 20,000 contacts
      - post-exposure MMR vaccination
      - immune globulin
      - home quarantine
    - Total of 18,352 doses of MMR vaccine were administered to children 12-59 months

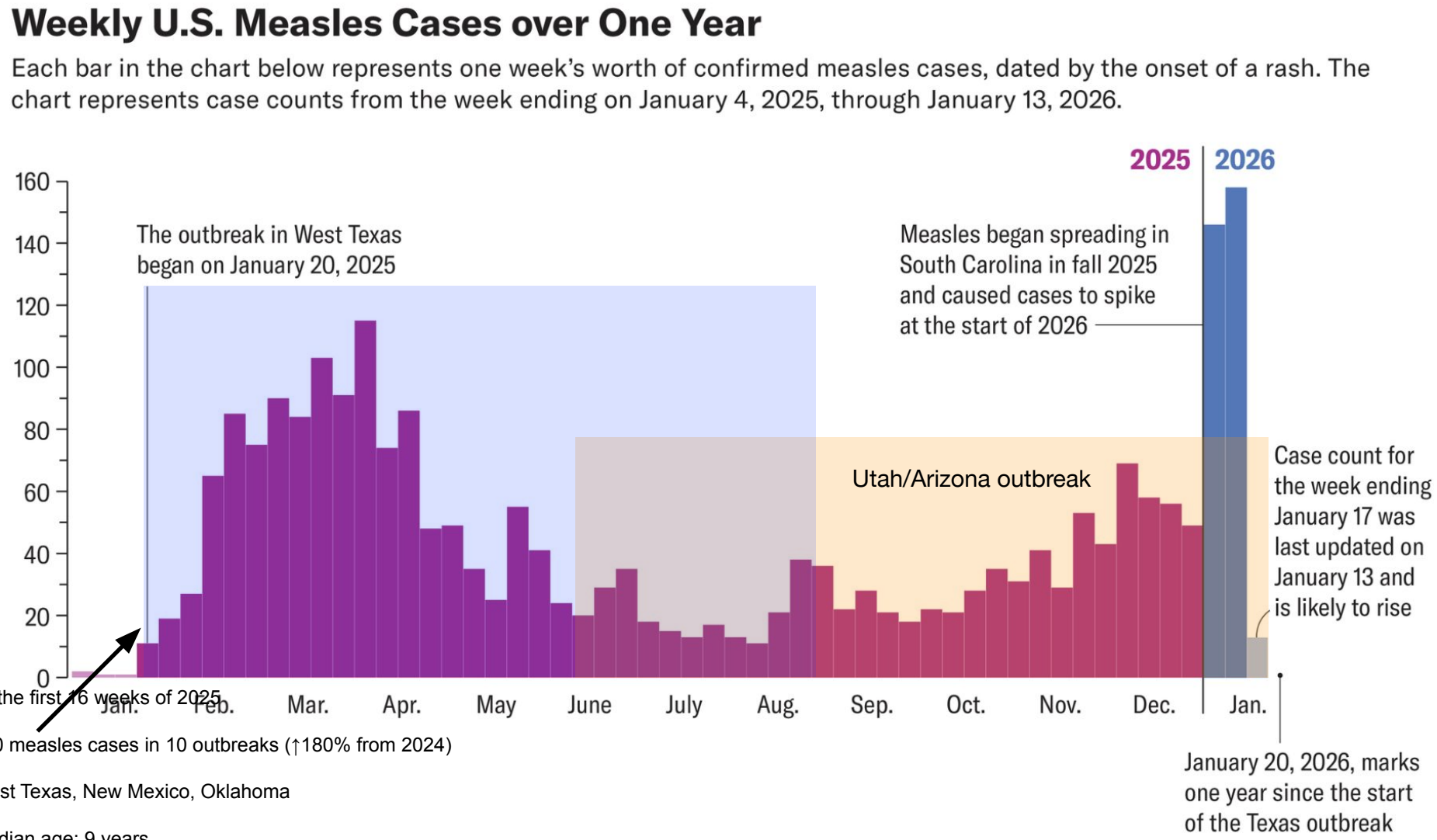


Zucker et al. NEJM 2020; 382:1009

Current on-going large U.S. measles outbreaks

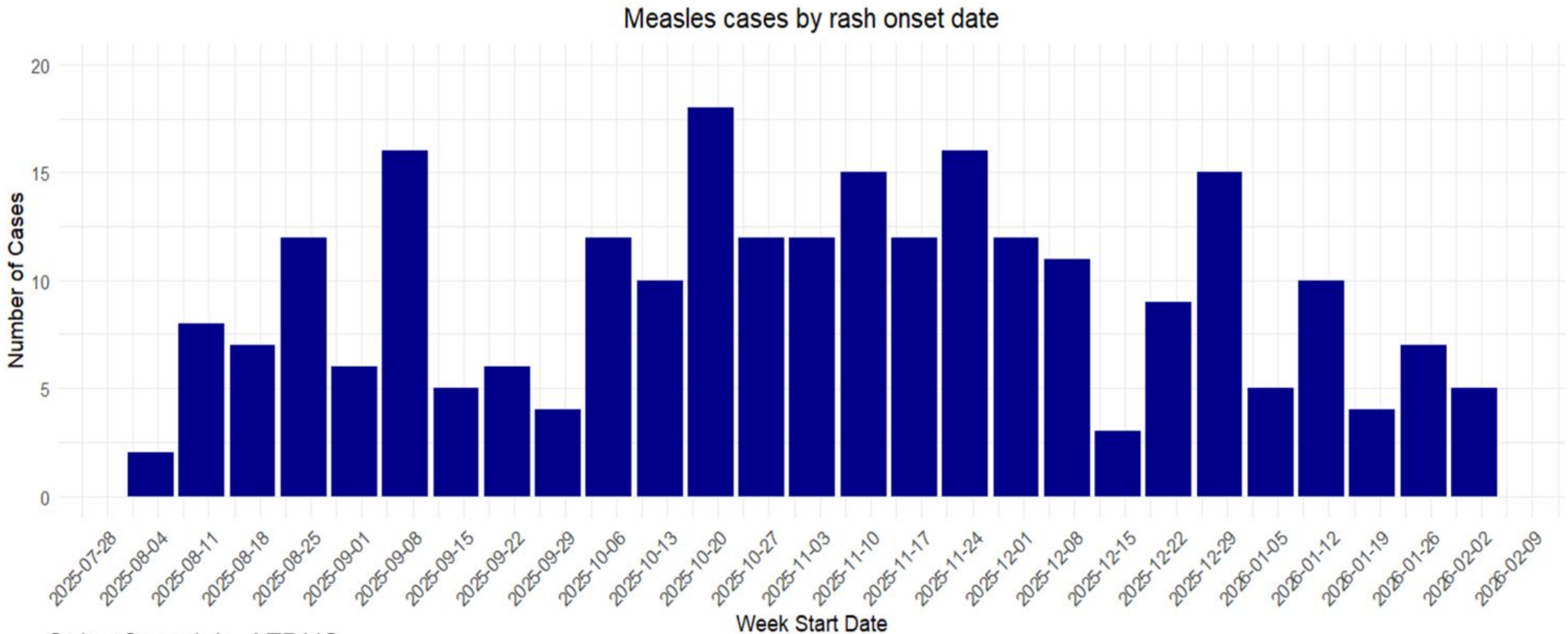
Location		Outbreak details
West Texas (Gaines County)	>762	Schools and churches in rural areas; 41 hospitalizations, 2 deaths (children)
New Mexico (Lee County)	>100	Indoor community gatherings; 1 death (adult)
Utah/Arizona border	>254	Schools and homes
South Carolina (Spartanburg County)	>920	Schools, churches, and hospitals

Current on-going measles outbreaks in the U.S.



- During the first 16 weeks of 2025
  - 800 measles cases in 10 outbreaks (↑180% from 2024)
  - West Texas, New Mexico, Oklahoma
  - median age: 9 years
  - 96% unvaccinated or unknown status
  - 85 hospitalized (only 1 documented to be vaccinated)

Measles Cases in Mohave County,

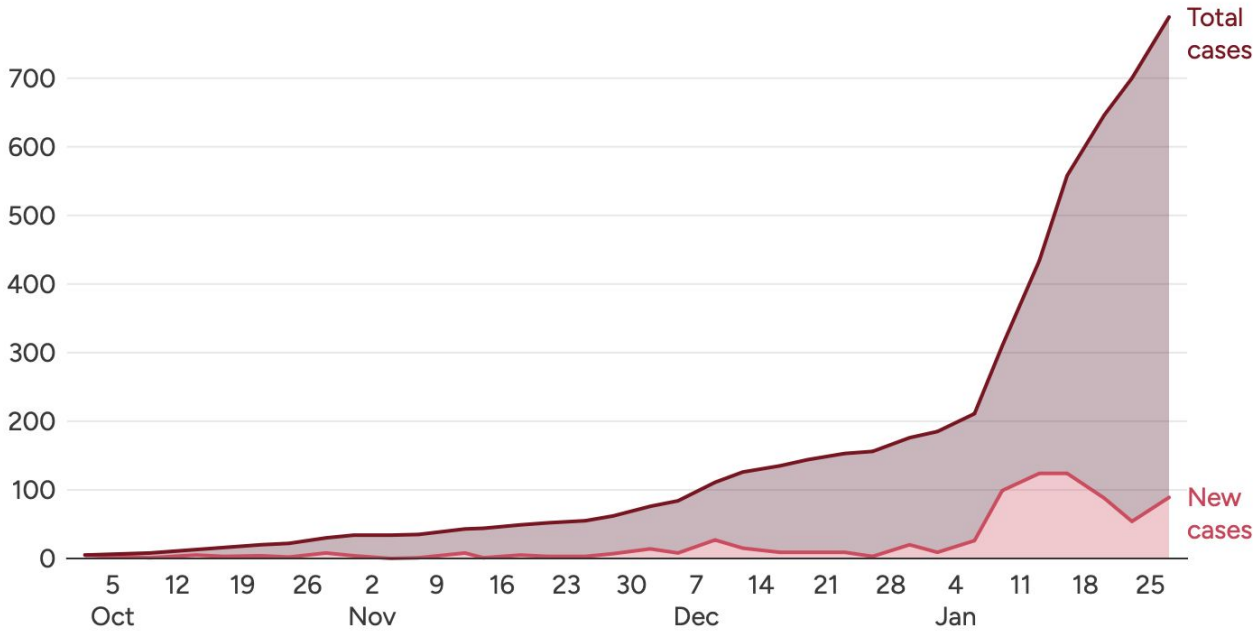


Saba Qasmieh, AZDHS

Current on-going measles outbreak in South Carolina

Began October 2, 2025 with identification of 5 cases without source in Spartanburg County, followed by 2 additional cases from two schools with MMR vaccination rates of 21% and 82%.

Chart shows new and cumulative measles outbreak cases reported by the South Carolina Department of Public Health through January 27, 2026.



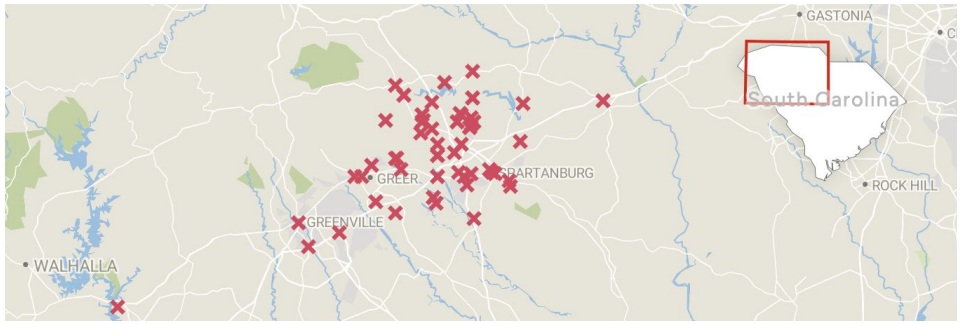


Chart: Thomas Wilburn • Source: South Carolina Department of Public Health twice-weekly outbreak data announcements

- Measles is highly contagious
  - It requires ≥95% community immunity to prevent spread

Conclusions

- Two doses of MMR is 97% effective in inducing individual immunity
  - MMR vaccination is highly effective in preventing measles outbreaks
- Measles can be suspected clinically
  - Fever, 3 C's, Koplic spots followed by rash
- Testing entails RT-PCR of throat, nasopharyngeal, urine, and/or blood and serology
- Patients suspected of measles should be placed in respiratory isolation
  - HCP should wear N95 masks and be measles immune
- 30% of healthy individuals have complications from measles infection
  - pneumonia, hearing loss, blindness, malnutrition, encephalitis
- There is no specific treatment for measles
  - Vitamin A supplementation may reduce complications but doesn't prevent measles infection

Measles: Infection Control in Healthcare Settings

Gwen Borlaug, MPH, eCIC, eFAPIC
Public Health Advisor, ADHS

ADHS Measles Resources

- ADHS Measles Surveillance Toolkit for Healthcare Settings
- *NEW* ADHS FAQs: Managing Measles Exposures in Healthcare Personnel
- *NEW* ADHS FAQs: Preventing and Controlling Measles in Healthcare Facilities
- CDC Measles Information for Healthcare Providers
- CDC Measles Website
- ADHS Measles Clinician Fact Sheet
- ADHS Measles Clinician FAQs
- ADHS Clinician Guide: Comparison between Measles, Influenza and Rubella
- Arizona Measles Outbreak Data

Measles in Arizona

Example of LHD notifications of exposures

Active public exposure sites

MCDPH publishes a cumulative list of public exposure sites so residents can view all locations where measles exposure may have occurred during the symptom watch period. The table below includes the newly identified location and all other active exposure sites. Listed exposure times include an additional two hours after the infected person left the location, when the measles virus can remain in the air.

People who were at the following locations at the listed dates and times may have been exposed to measles and should watch for symptoms.

Location	Date	Time	Watch for symptoms through this date
NEW: Phoenix Sky Harbor International Airport, all of Terminal 4	January 29, 2026	4:00 p.m.–8:30 p.m.	February 19, 2026

Measles Prevention in Clinical Settings

- **Proactive Vaccination Program**
  - HCP with no evidence of immunity.
  - Consider for residents of LTCF born after 1957 with no evidence of immunity, especially in areas where measles is being transmitted.

- **Infection Control**
  - Identify
  - Isolate
  - Inform

ADHS Measles Surveillance Toolkit for Healthcare Settings

The most effective way to prevent measles transmission is through routine vaccination with a measles-containing virus, typically administered as MMR (measles, mumps, and rubella). The Centers for Disease Control and Prevention's (CDC) recommended adult immunization schedule is both safe and effective at preventing disease and reducing outbreaks.

HCP Presumptive Evidence of Immunity

Evidence of Immunity	Healthcare Workers	General Public
Written documentation of one or more age appropriate MMR vaccinations (acceptable for low risk individuals)		✓
Written documentation of two MMR doses administered 28 days apart (required for high-risk individuals)	✓	✓
Laboratory evidence of disease	✓	✓
Laboratory evidence of immunity	✓	✓
Birth before 1957		✓

Definition of HCP

CDC definition:

All paid and unpaid persons working in healthcare settings who have the potential for exposure to patients and/or to infectious materials, including body substances, contaminated medical supplies and equipment, contaminated environmental surfaces, or contaminated air.

HCP include but are not limited to, emergency medical service personnel, nurses, nursing assistants, physicians, technicians, therapists, phlebotomists, pharmacists, students and trainees, contractual staff not employed by the healthcare facility, and persons not directly involved in patient care, but who could be exposed to infectious agents that can be transmitted in the healthcare setting (e.g., clerical, dietary, environmental services, laundry, security, engineering and facilities management, administrative, billing, and volunteer personnel).

Special Considerations for HCP

- HCP vaccinated between 1963 and 1967 with inactivated measles vaccine: Revaccinate with two doses of MMR, spaced at least 28 days apart.

- HCP who have two valid MMR doses: Do **not** perform serologic testing for immunity. If serologic testing is performed and results are negative or equivocal, do not give additional doses of MMR.

- During a measles outbreak, serologic testing should not delay vaccination, as rapid protection is critical for outbreak control.

HCP with No Evidence of Immunity

- Offer MMR vaccine at no cost to personnel without evidence of immunity.
- Staff with only one documented MMR dose should receive a second dose as soon as possible.
- Recently vaccinated personnel do not require work restrictions.

Measles Infection Control: Identify

Assume a patient has measles if they have measles symptoms and:

- Spent time in an area in the U.S. with a known measles outbreak.
- Recently were around someone else with measles.
- Traveled internationally in the last 21 days.
- Have not been vaccinated for measles or don’t know their vaccination status.

If your facility is located in an area where measles is known to be spreading, anyone with measles symptoms should be considered to have measles until you can rule it out.

CDC Project Firstline Measles Micro-Learn

STOP

Do you think you have symptoms of measles?

Measles symptoms include a FEVER and the following:

Cough

Runny Nose

Red Eyes

Rash

If so, please remain outside and call us at:

Thank you for helping us prevent the spread of measles!

Measles Infection Control: Isolate

When a patient with suspected measles visits a healthcare setting, the following actions are recommended:

- Advise the patient to call upon arrival and remain outside until escorted in.
- Provide a mask immediately.
- Escort the patient directly to an airborne infection isolation room (AIIR). If unavailable, place them in a private room with the door closed.
- Only HCP with documented measles immunity should enter the room.
- Instruct the patient on self-isolation, respiratory etiquette, and hand hygiene before discharge.

* For information on airborne precautions, airborne infection isolation rooms (AIIR), and environmental infection see airborne precautions. Airborne precautions should be maintained for 4 days after rash onset. Immunocompromised patients may remain infectious for longer and should remain in isolation for the duration of illness.

ADHS Measles Surveillance Toolkit for Healthcare Settings

Measles Infection Control: Isolate

Remember to follow standard precautions in addition to airborne precautions:

- Clean your hands before and after caring for the patient and after handling items or touching surfaces in the patient's room.
- Adhere to your facility's routine practices to clean and disinfect surfaces and handle linens.
- Use additional personal protective equipment (PPE) when exposure to blood/body fluids/non-intact skin is anticipated.

CDC Project Firstline Measles Micro-Learn

Measles Infection Control: Inform

- Notify your local public health department of suspected measles cases.

- Be prepared and able to collect appropriate specimens as directed by your local or state health department.

CDC Project Firstline Measles Micro-Learn

HCP Measles Exposures

HCP exposure in a healthcare setting is defined as spending any amount of time while unprotected (i.e., not wearing recommended respiratory protection) in a shared air space with an infectious measles patient at the same time (even if the patient is masked), **OR** in a shared air space vacated by an infectious measles patient for up to 2 hours.

Consult with your local public health department for exclusion guidance

Measles Post-Exposure Prophylaxis

- Given to exposed individuals with no presumptive evidence of immunity.
- Two types (do not give simultaneously):
  - The MMR vaccine should be administered within 72 hours of initial exposure to healthy individuals (pregnant women should receive immune globulin).
  - Immunoglobulin (IG) should be administered within 6 days of initial exposure for individuals at higher risk of severe illness or complications.
- Continue to monitor for symptoms through at least 1 incubation period.
- Exclude HCP without presumptive evidence of immunity, regardless if given PEP, starting on day 5 through day 21 following their last known exposure.

Measles Preparedness

CDC Measles Assessment Tool to evaluate:

- Ability to recognize measles cases
- Process for contact tracing and exposure management
- Methods for notifying key staff regarding measles cases in the facility.
- Training and education of staff
- Documentation of HCP measles vaccination/immunity
- Respiratory Protection Program
- Triage practices

CDC Measles Preparedness in Healthcare Settings

Measles Preparedness

CDC Responding to Measles Exposures

CDC Sample Script to Assess Patients and Visitors

CDC Measles Preparedness in Healthcare Settings

Measles Questions

Contact ADHS at

VPD@azdhs.gov

Presenter Evaluation

APIC GRAND CANYON

MARICOPA COUNTY
PUBLIC HEALTH

Maricopa County Measles Outbreak

Karen Zabel : Epidemiology Nurse Manager : 2.27.26

Measles outbreak in Maricopa County

Overview of Outbreak

- Outbreak includes the entire county; not specified to one area.
- Evidence of local transmission in Maricopa County.
- MCDPH has recommended an accelerated infant MMR vaccination schedule.
- Maricopa County healthcare providers should have a low threshold for measles clinical suspicion & should immediately report suspects to local public health.

MARICOPA COUNTY PUBLIC HEALTH

Maricopa County measles case counts

	Case Count (1/1/2026–present)
Confirmed cases	4

*Data as of 2/19/2026

Timeline of 2026 measles outbreak

1/15/26 MCDPH confirmed first case of 2026

- Associated with oversees international travel; no secondary spread.
- Enhanced measles survillance activites for MC.

1/23/26 MCDPH confirmed 2 additional cases

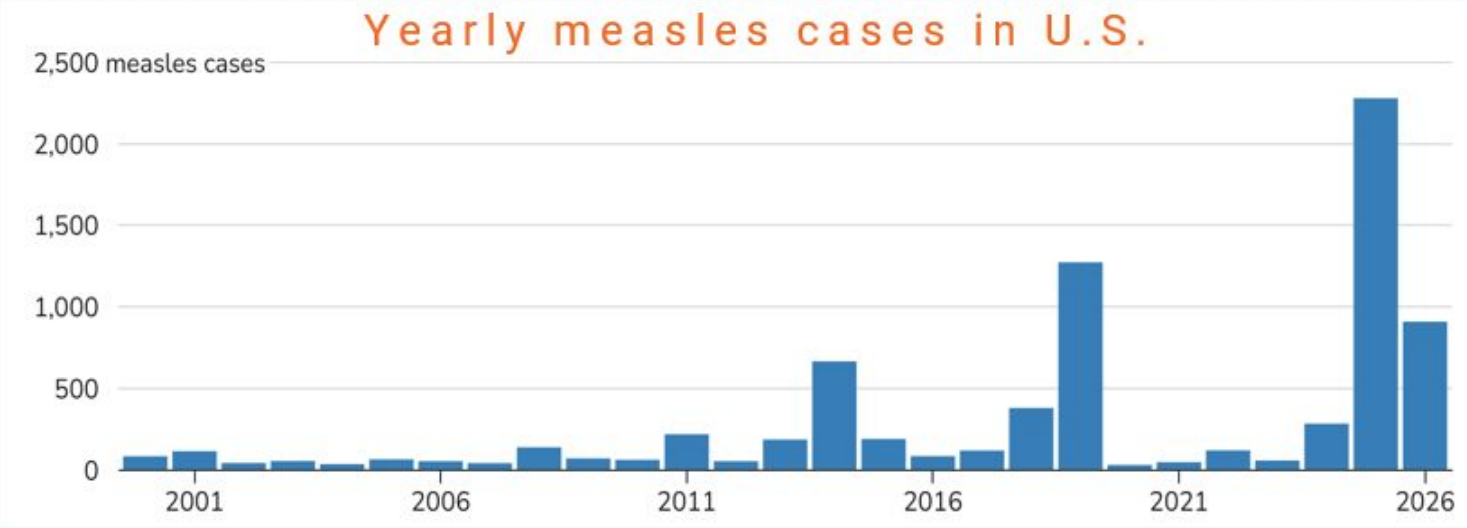
- One of the cases had no epi link demonstrating local transmission in MC.
- Declared a measels outbreak & activated our response.
- Initiated recommendations for 6–11month-old infants to get early MMR vaccination in addition to the 2 scheduled doses at 1 year and 4-6 years.

2/17/26 MCDPH confirmed an additional case

- Associated with a previously known MC case, demonstrating secondary spread.

Measles case counts surge nationally

This Maricopa County measles outbreak is occurring in the context of ongoing state and national measles outbreaks.



MARICOPA COUNTY PUBLIC HEALTH

Measles exposures in Maricopa County

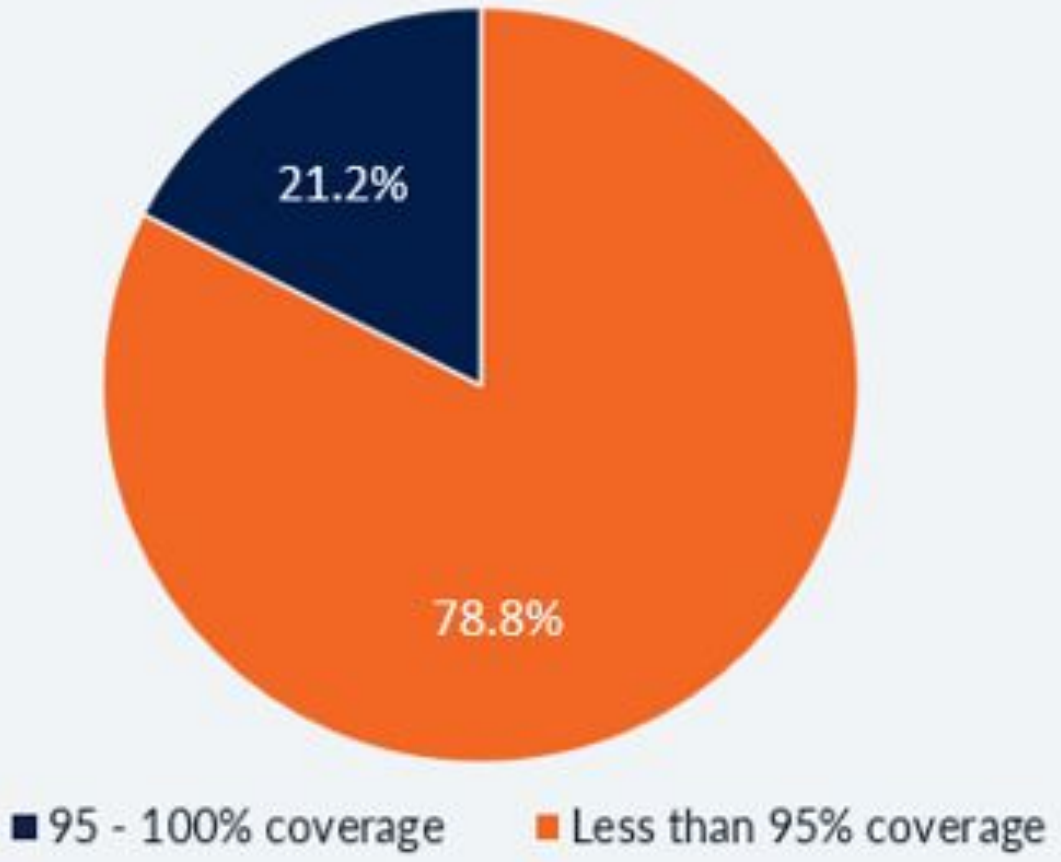
- In addition to exposures from MC cases, MCDPH receives periodic notices of exposures in MC from visitors.
- For each exposure, MCDPH works to identify & notify all measles contacts.
- When contacts cannot be identified or contacted directly, MCDPH issues public notifications.
- Public notifications are shared through the media & reflected in MCDPH's online list of public exposure sites.

MARICOPA COUNTY PUBLIC HEALTH

How protected are we in MC?

Maricopa County MMR coverage

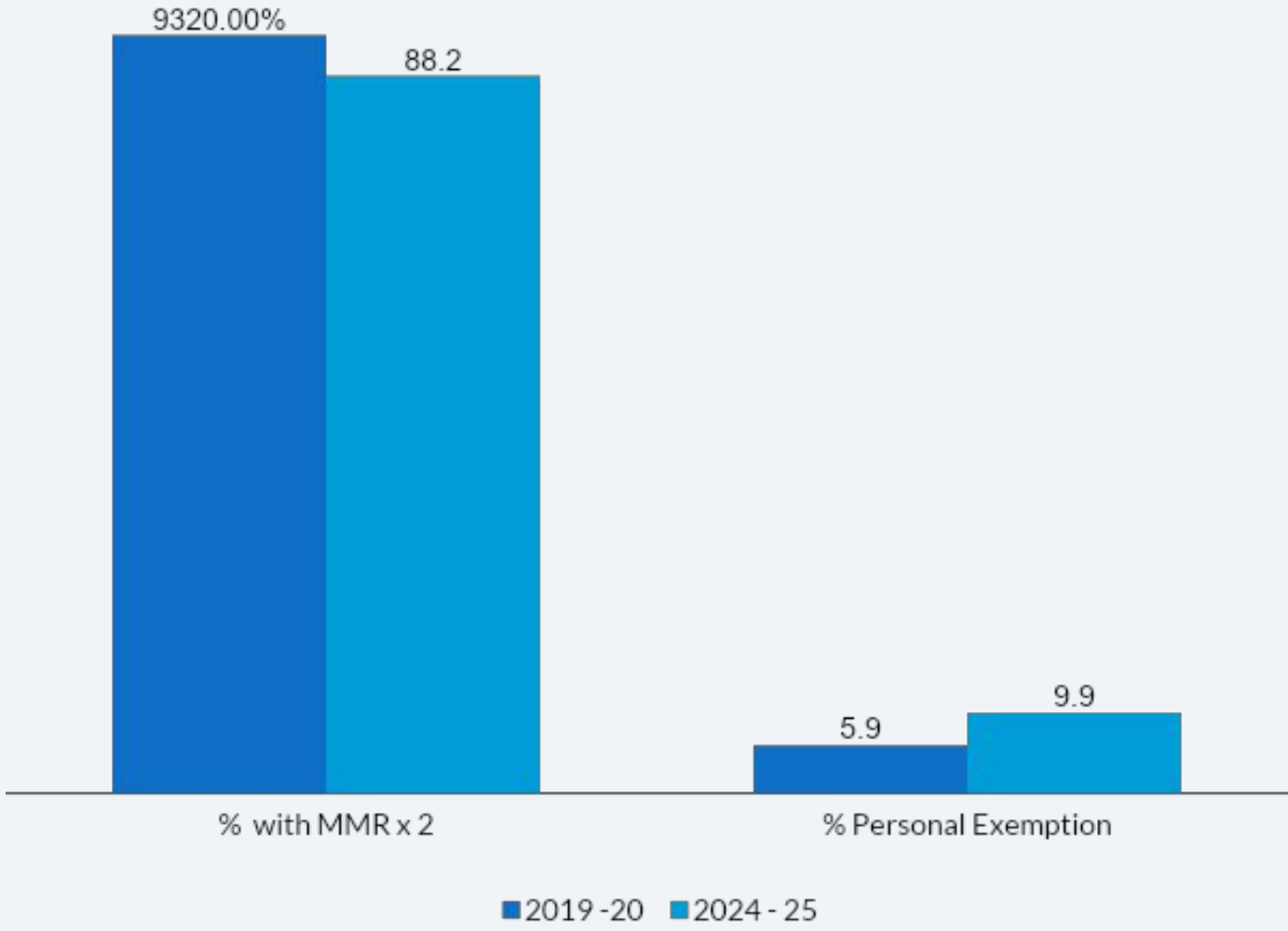
Maricopa County kindergarten schools with ≥95% MMR coverage in 2024-25



MARICOPA COUNTY PUBLIC HEALTH

Maricopa County MMR coverage

Maricopa County kindergartener MMR coverage & personal exemption trends



MARICOPA COUNTY PUBLIC HEALTH

Maricopa County

What can healthcare providers & healthcare facilities do?

Ensure appropriate infection prevention & control (IPC)protocols are in place

Align facility IPC with CDC Interim Infection Prevention and Control Recommendations for Measles in Healthcare Settings.

Immediately room suspects; Do not allow suspect measles patients to remain in the waiting area or other common areas.

Ensure airborne precautions are used & remain in place until cleared per public health investigation or per negative testing through public health.

MARICOPA COUNTY PUBLIC HEALTH

Assess immunity of healthcare staff

Review immunity to measles for all healthcare workers; included ancillary staff – anyone that shares airspace in the facility with a patient.

Healthcare workers should have documented evidence of immunity to measles.

Healthcare workers should receive 2 doses of MMR, at least 28 days apart, regardless of year of birth, unless they have documentation of previous immunity.

MARICOPA COUNTY PUBLIC HEALTH

Immediately report measles suspects to Public Health

Timely provider reporting is key to preventing transmission!

In Maricopa County, providers should report all measles suspects to MCDPH by calling 602-506-6767.

Once a report is received, MCDPH will reach out to guide next steps.

MARICOPA COUNTY PUBLIC HEALTH

Collect appropriate specimens for testing at Arizona State Public Health Laboratory (ASPHL)

Local public health will coordinate testing through ASPHL

Collect the **following two specimens** for polymerase chain reaction (PCR) testing through ASPHL:

- Urine collection
- Nasopharyngeal swab

Detection of measles RNA is most successful when specimens are collected from rash onset through 3 days post onset; may see detection as late as 10-14 days out.

MARICOPA COUNTY PUBLIC HEALTH

Stay up to date on public health alerts

MCDPH emails priority communications to healthcare professionals through the Maricopa County Health Alert Network (MCHAN).

Ongoing updates on this outbreak will continue to be shared per MCHAN and through our Healthcare Provider Measles website.

MC providers and public health partners are encouraged to sign up for MCHAN.

MARICOPA COUNTY PUBLIC HEALTH

Sign up now

maricopa.gov/MCHAN

Thank You

Presenter Evaluation

APIC GRAND CANYON

APIC Measles Resources

Measles Playbook:

- Click Here to Download the APIC Measles Playbook
- Developed by the APIC Emerging Infectious Diseases Task Force to help infection preventionists rapidly activate measles prevention efforts
- The playbook is a concise workflow document that is designed to be user-friendly and operational for busy infection preventionists

Rapid Run Down Videos:

- Click Here to Watch what IPs need to know about Measles
- Click Here to Watch What the General Public needs to know about Measles
- APIC's Rapid Rundown video provides concise, high-yield summaries tailored for busy infection preventionists in under 3 minutes

SSI Questions for Dr. Edmiston

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Closing