



The ABCs of VPDs:

Common Vaccine Preventable Diseases in Schools

April 16th, 2025

Financial Disclosures

- Brooke Collins and Xandy Peterson Pompa, faculty for this CE activity, have no relevant financial relationship(s) with ineligible companies to disclose.
- None of the planners for this activity have relevant financial relationships to disclose with ineligible companies.
- The Arizona Alliance for Community Health Centers is accredited by the Arizona Medical Association to provide medical education for physicians.
- The Arizona Alliance for Community Health Centers designated the 2025 Arizona Immunization Conference educational activity for a maximum of 11 hours AMA PRA Category 1 Credits Physicians should only claim credit commensurate with the extent of their participation in the activity.
- The Arizona Pharmacy Association is accredited by the Accreditation Council for Pharmacy Education (ACPE) as a provider of continuing pharmacy education.

Learning Objectives:

- 1) Learn the current vaccine-preventable disease (VPD) trends in schools.
- 2) Learn the process of Public Health VPD outbreak investigations.
- 3) Identify where to find and access the latest VPD information, data, and outbreaks.

Measles

Not just a little rash



Measles Clinical Features

Symptoms of measles include a prodrome of:

- Fever (may spike up to 105°F),
- Cough,
- Coryza,
- Conjunctivitis, and
- Koplik spots – tiny white spots with bluish/white centers found inside the mouth.

After 2–4 days, the prodrome is followed by the characteristic maculopapular rash that starts at the hairline and progresses down the body.

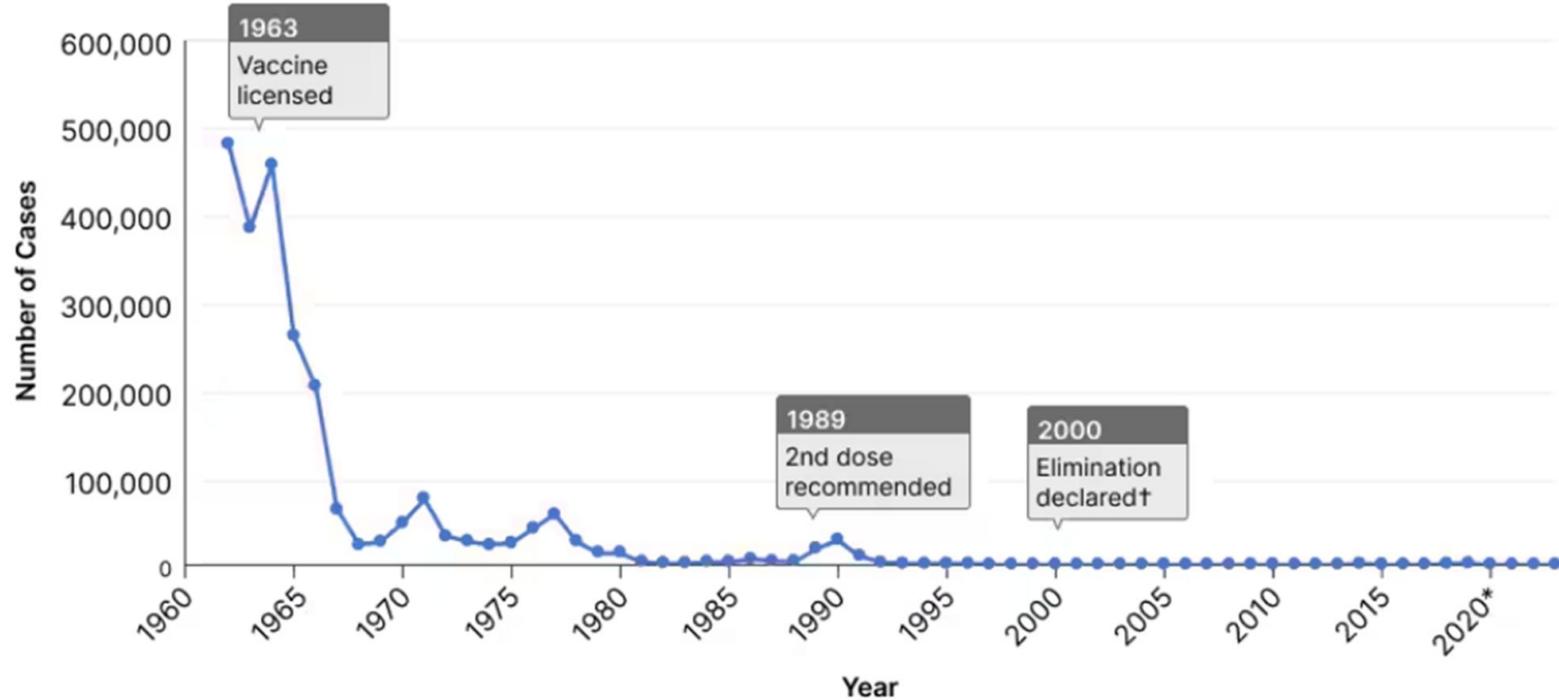


Measles Transmission

- Highly contagious
- Spread from person-to-person through coughing and sneezing
- Can remain in the air of a room for up to two hours even if the infected person is no longer there



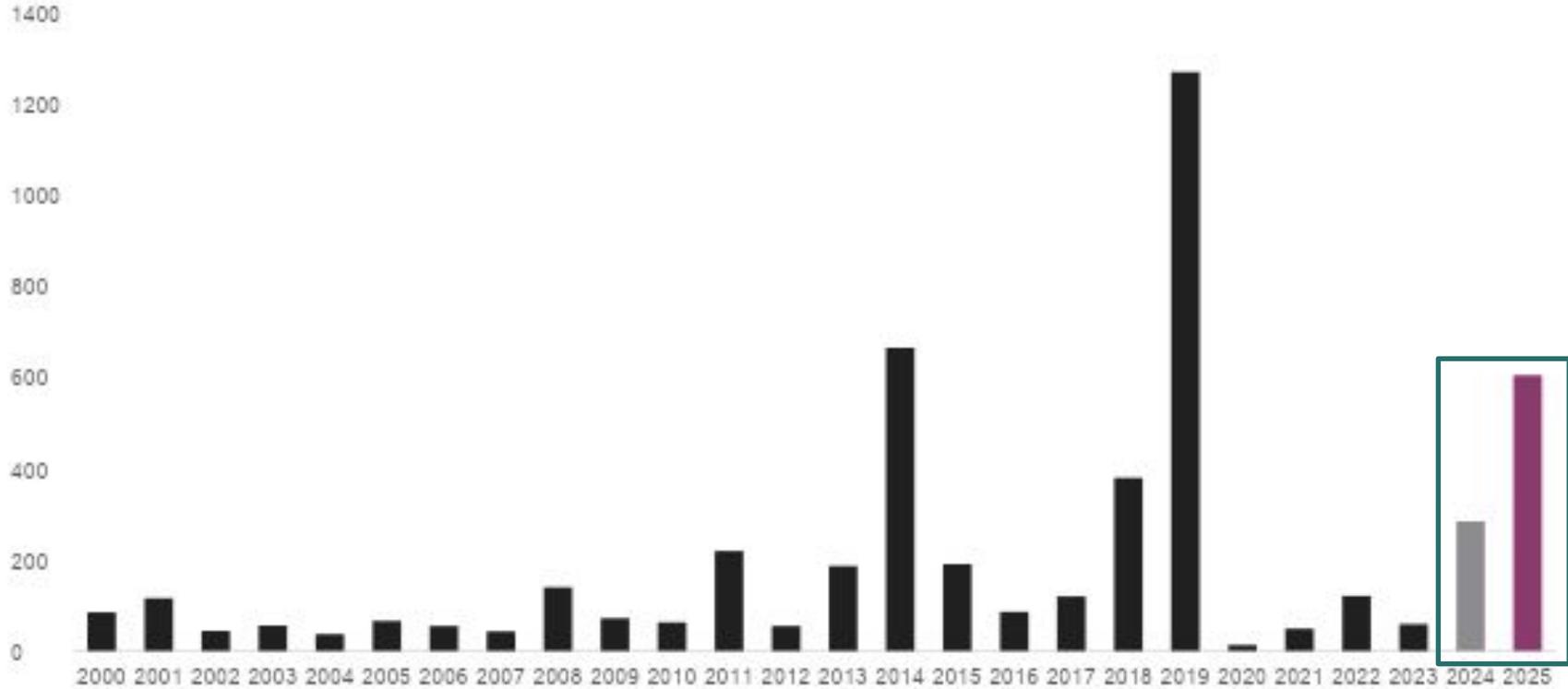
Reported Measles Cases in the United States from 1962 – 2023*



Source: <https://www.cdc.gov/measles/data-research/index.html>



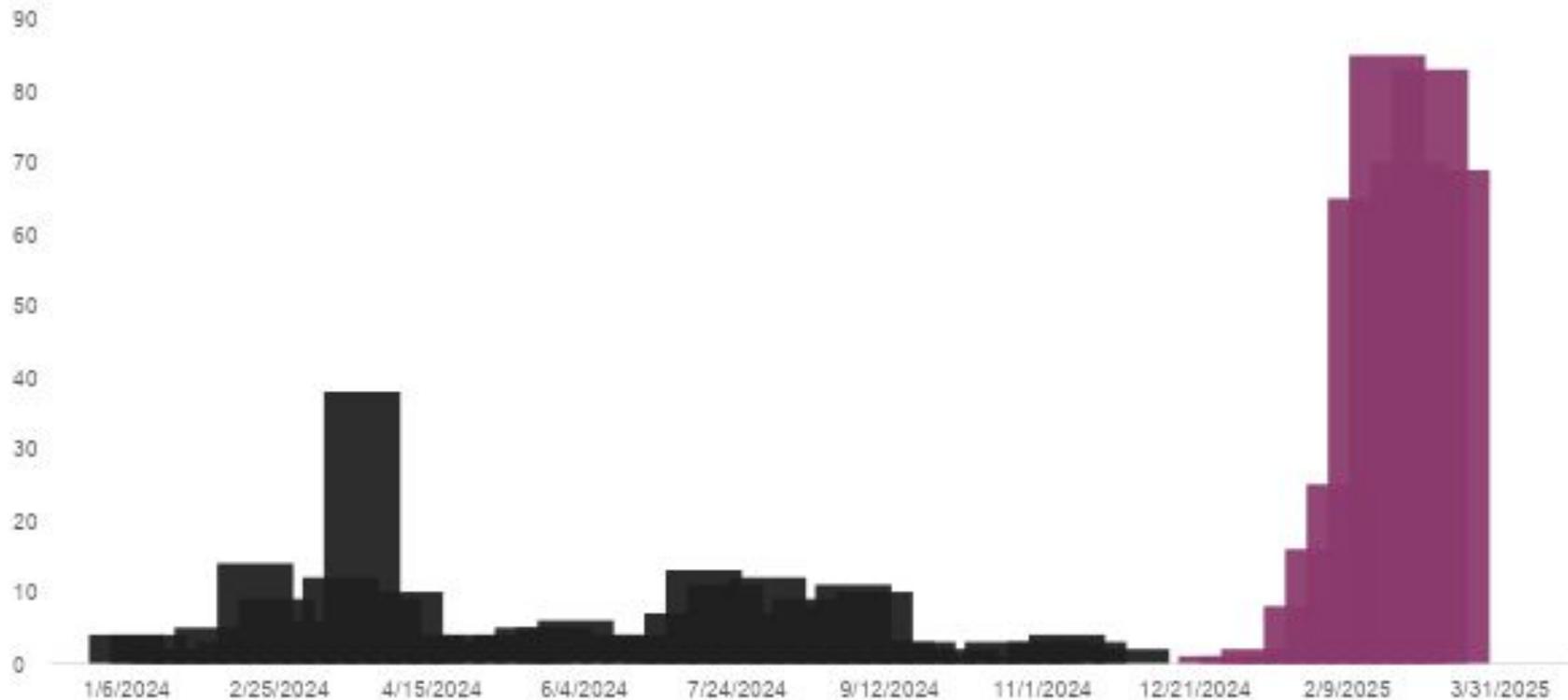
2025 measles cases have already surpassed 2024.



Source: <https://www.cdc.gov/measles/data-research/index.html>



2025 measles cases have already surpassed 2024.



Source: <https://www.cdc.gov/measles/data-research/index.html>



Community Immunity

The goal:

95%

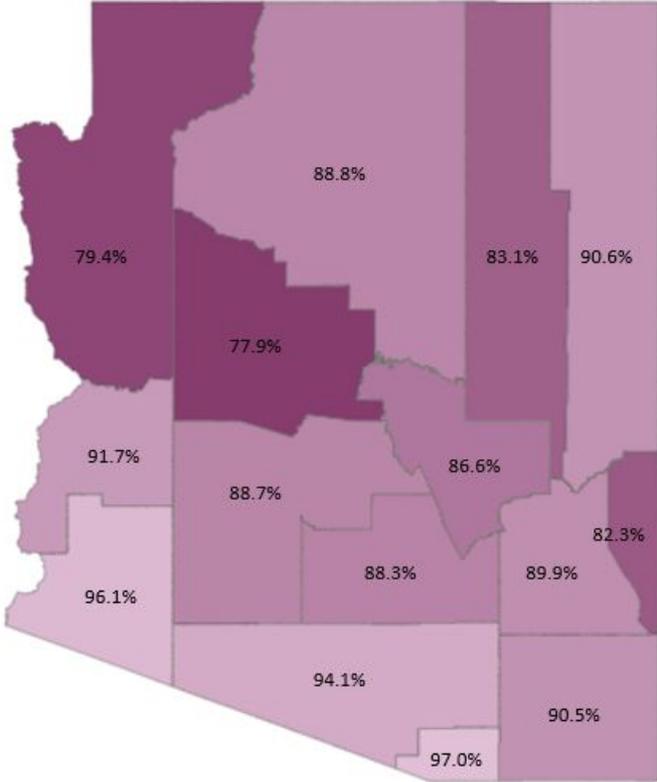
of people in a community
vaccinated

The reality:

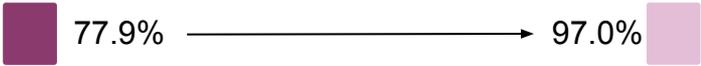
89.3%

of Kindergartners in AZ fully
immunized with MMR





2023-2024 Kindergarten MMR Coverage by County



Measles Testing

- PCR testing of urine and nasopharyngeal sample
 - **Preferred method of testing**
 - As early in disease presentation as possible, but may be possible to detect 7-10 days after onset
- Serology Testing
 - IgM and IgG can assist with diagnosing but can be complicated to interpret
 - Still recommended to collect to send commercially



Measles in schools: what to expect when you have a case

- 1. Report**
- 2. Isolate**
- 3. Contact Trace & Quarantine**
- 4. Monitor**

Report

Schools should report suspected or confirmed cases of measles to their local public health department **within 24 hours.**

County	Day Time Hours	After Hours
Apache	928-337-4364	928-245-7639
Cochise	520-432-9400	800-423-7271
Coconino	928-679-7272	928-255-8715
Gila	928-402-8811 (Globe) 928-474-1210 (Payson)	928-701-1610
Graham	928-428-1962	928-965-8921
Greenlee	928-865-2601	928-701-7000
La Paz	928-669-1100	928-669-2281
Maricopa	602-506-6767	602-747-7111 (Banner Poison Control)
Mohave	928-753-0714	928-718-4927
Navajo	928-524-4750 (Holbrook) 928-524-6050 (Show Low)	928-241-0593
Pima	520-724-7797	520-743-7987
Pinal	520-866-7281	520-566-6239
Santa Cruz	520-375-7900	877-202-0586 520-375-7774
Yavapai	928-771-3134	928-442-5262
Yuma	928-317-4550	928-317-4624

Isolate

- Students and staff with confirmed measles should be excluded from school and school activities until 4 days after the rash onset.
- Suspected cases should be excluded until evaluated and cleared by a healthcare provider.



Contact Trace

- **Identify** exposed individuals who do not have documentation of two doses of MMR vaccine.
 - Create a linelist

Contact Trace

- Identify exposed individuals who do not have documentation of two doses of MMR vaccine.
 - Written documentation of vaccination
 - Laboratory evidence of immunity
 - Laboratory confirmation of measles
 - Birth before 1957

Contact Trace

- Identify exposed individuals who do not have documentation of two doses of MMR vaccine.
- Notify contacts of exposure
- Exclude students and staff without 2 documented doses of MMR.
 - If one dose of MMR is given within 72 hours after their **initial** exposure, they may return to school.
 - Individuals who receive measles immunoglobulin as prophylaxis need to quarantine for 28 days.

Contact Trace

- Identify exposed individuals who do not have documentation of two doses of MMR vaccine.
- Notify contacts of exposure
- Exclude students and staff without 2 documented doses of MMR.
- Exposed individuals need to monitor for symptoms for 21 days from last exposure.

Monitor

- All exposed students and staff need to monitor for symptoms.
 - Provide education regarding what symptoms to look out for.



Monitor

- All exposed students and staff need to monitor for symptoms.
- Regularly communicate with your local health department.
 - 2 incubation periods (42 days)



Monitor

- All exposed students and staff need to monitor for symptoms.
- Regularly communicate with your local health department.
- Encourage vaccination!!



Measles Resources

- ADHS Measles Surveillance Toolkit for Healthcare Settings

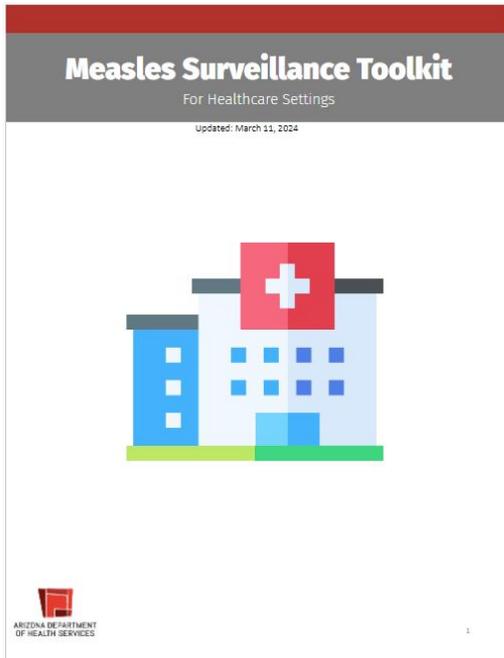


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Measles Resources

- ADHS Measles Surveillance Toolkit for Healthcare Settings



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 Exposure Notification Letter for Healthcare Worker Example

XXX XX, 20XX

To whom it may concern:

On XXX, we became aware that you, and anyone accompanying you, may have been exposed to measles at the (Location/Facility), (Address), from (identified possible exposure period).

Measles is a vaccine-preventable disease that is spread through coughing, sneezing, and contact with mucus or saliva from the nose, mouth, or throat of an infected individual. Measles virus can also survive in the air for several hours and may be transmitted to others even after the infected person has left the room.

Measles is a highly contagious viral illness that usually begins with symptoms such as fever (101 degrees F or higher), red, watery eyes, cough and runny nose. This is followed by a maculopapular rash that is red, raised, and blotchy that starts on the head at the hairline and moves down the body. The rash may last for 5–6 days and may turn brownish. Symptoms typically appear 8–12 days after exposure to measles but may take up to 21 days. A person with measles is considered to be contagious 4 days before rash onset until 4 days after.

If you develop symptoms of measles as described above, please self-isolate and avoid contact with other people. Please contact your healthcare provider by phone and let them know you have been exposed to measles and have symptoms. They will let you know when to visit their office so as not to expose others in the waiting area. If you develop symptoms and do not have a healthcare provider, you may need to be seen at your local hospital emergency room/urgent care center. **IF YOU HAVE SYMPTOMS, PLEASE CALL BEFORE GOING TO ANY HEALTHCARE PROVIDER TO LET THEM KNOW YOU MAY HAVE MEASLES.**

As a healthcare worker, documentation for presumptive evidence of immunity (listed below) will need to be established before you can return to work.

- Laboratory evidence of immunity; OR
- Documentation of 2 doses of live MMR vaccine; OR
- Laboratory confirmation of disease

If you or your healthcare provider think that you may have measles, please notify (county health department or point of contact) immediately so that the appropriate follow-up can be initiated. Please phone: (XXX) XXX-XXX Mon–Fri 8am–5pm, or (XXX) XXX-XXX after hours, holidays and weekends and ask to speak with XXXX.

Sincerely,



Measles Resources

- [ADHS Measles Surveillance Toolkit for Healthcare Settings](#)
- [Photos of Measles](#)
- [Johns Hopkins Measles Outbreak Response](#)





United States Measles Cases in 2025

Center for Outbreak Response Innovation (CORI) Measles Scenario-based Risk Assessment can be found [here](#).

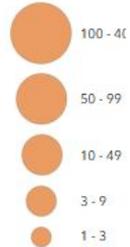
Legend

Public Exposures



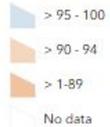
Measles Cases

2025 Case Count

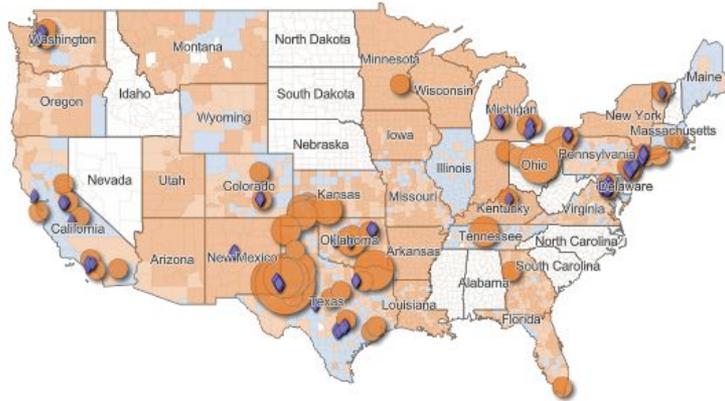


Immunization Coverage

MMR Coverage Percentage



US Measles Map



Sources: Esri; U.S. Department of Commerce, Census Bureau; U.S. Department of Commerce (DOC), National ... Powered by Esri

Table of US Measles Cases

State	Case Count
Texas	511
New Mexico	56
Kansas	25
Ohio	25
Oklahoma	10
California	9
Pennsylvania	6
New York	4
Tennessee	4
Georgia	3
Maryland	3
Michigan	3
New Jersey	3
Washington	3
Alaska	2
Colorado	2
Total*	675

Last update: 19 seconds ago

*Includes probable cases.

2

Confirmed Deaths from Measles

1

Death Under Investigation



Varicella

No need for chickenpox parties with vaccines



Varicella Clinical Features

Symptoms of varicella include a prodrome of:

- Fever
- Tiredness
- Loss of appetite
- Headache

Followed by the rash – itchy, fluid-filled blisters which eventually become scabs.

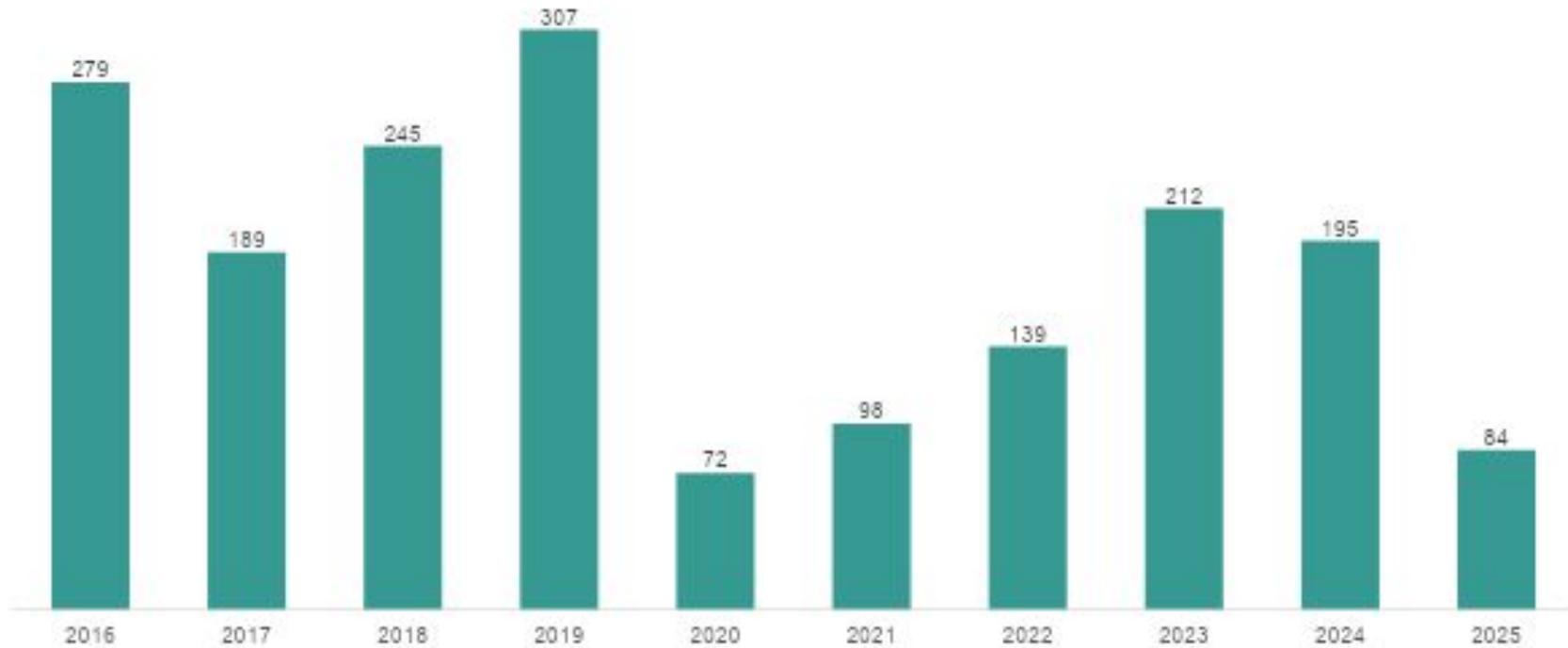


Varicella Transmission

- Highly contagious
- Spread from person-to-person through coughing and sneezing or through direct contact with blisters of an infected person.
- Contagious 1 to 2 days before the rash begins, until all the lesions have crusted over.
- It takes around 2 weeks (10 to 21 days) after exposure for someone to develop chickenpox.



Arizona varicella trends over the last decade.

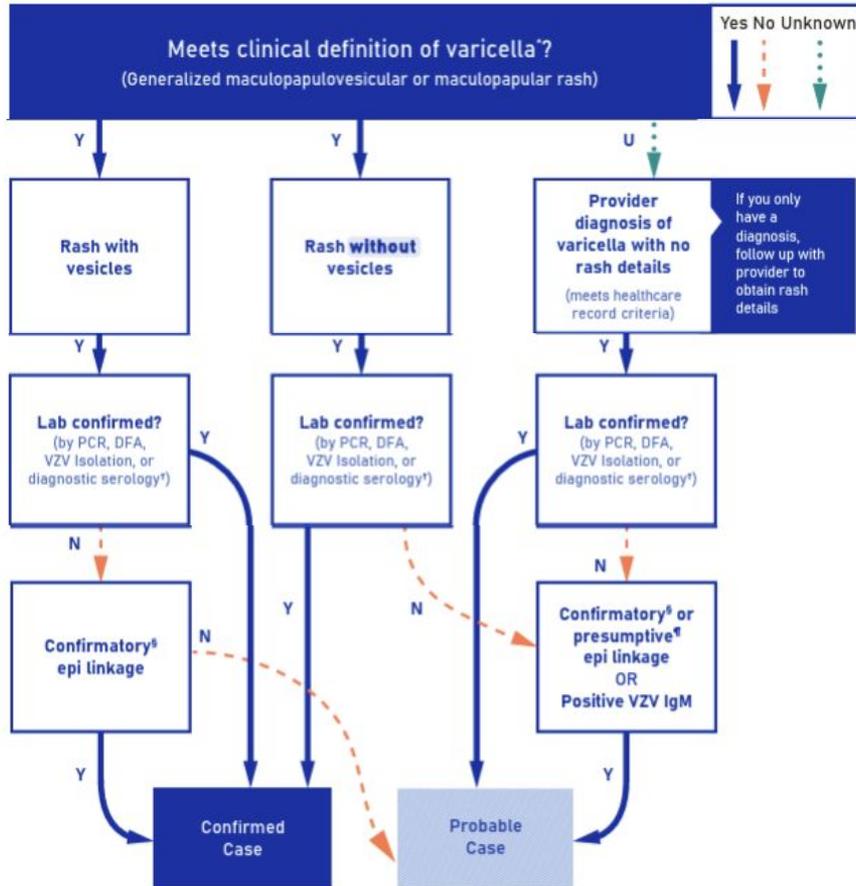


Varicella Lab Testing

- Lab testing is **not** required to confirm or report a varicella case.
- PCR, DFA, VZV isolation or diagnostic serology can help confirm the diagnosis.
- Without confirmatory testing, rash information (including presence of vesicles) and/or epi linkage are required to classify a case as confirmed or probable.



How to Classify Confirmed & Probable Varicella Cases During Investigations



Varicella in schools: what to expect when you have a case

- 1. Report**
- 2. Isolate**
- 3. Contact Trace & Quarantine**
- 4. Monitor**

Contact Trace

- Identify exposed individuals who do not have documentation of two doses of MMR vaccine.
- Notify contacts of exposure
 - Parent notification letter
 - Measles FAQs for parents and students

Report

Schools should report suspected or confirmed cases of measles to their local public health department 5 working days.

County	Day Time Hours	After Hours
Apache	928-337-4364	928-245-7639
Cochise	520-432-9400	800-423-7271
Coconino	928-679-7272	928-255-8715
Gila	928-402-8811 (Globe) 928-474-1210 (Payson)	928-701-1610
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Yavapai	928-771-3134	928-442-5262
Yuma	928-317-4550	928-317-4624

Isolate

- Exclude students or staff with chickenpox from school until all blisters have crusted.



Isolate

- Exclude students or staff with chickenpox from school until all blisters have crusted.
- Chickenpox in vaccinated individuals is usually mild but is still infectious.
 - Blisters may not crust. Cases should be excluded until all lesions have faded or no new lesions have occurred in a 24-hour period.



Isolate

- Exclude students or staff with chickenpox from school until all blisters have crusted.
- Chickenpox in vaccinated individuals is usually mild but is still infectious.
- Suspected cases should be excluded until evaluated and cleared by a healthcare provider.



Contact Trace & Quarantine

- Notify parents of exposed students.
 - Parent notification letter
 - Chickenpox FAQs for parents and students



Contact Trace & Quarantine

- Notify parents of exposed students.
- Exclude students and staff without evidence of immunity from days 8 to 21 after exposure.



Monitor

- Monitor the situation and be on the lookout for additional cases
- Consider maintaining a linelist of cases and contacts
- Recognize the symptoms of chickenpox and encourage symptomatic individuals to be evaluated by their healthcare provider
- Encourage vaccination!!



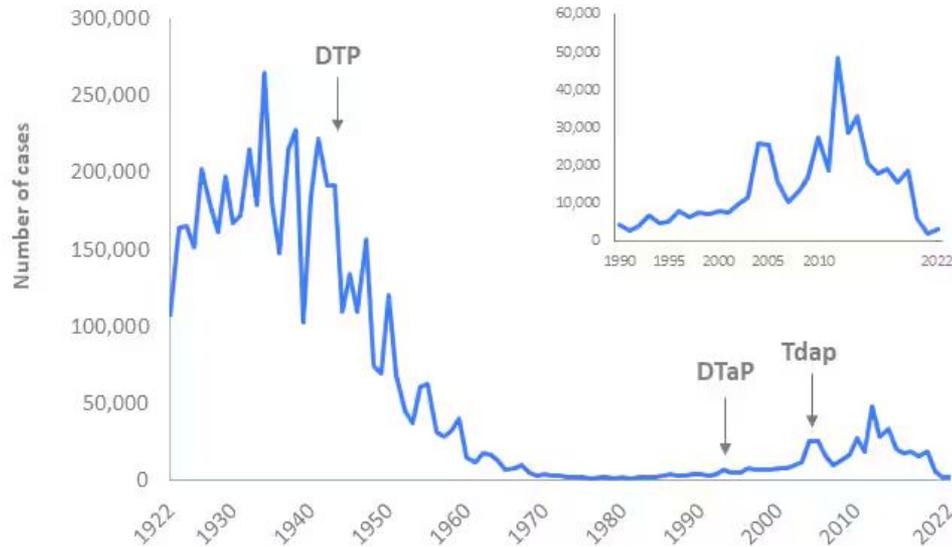
Pertussis

Big whoop or a big whoop



National Trends

Reported NNDSS pertussis cases: 1922-2022

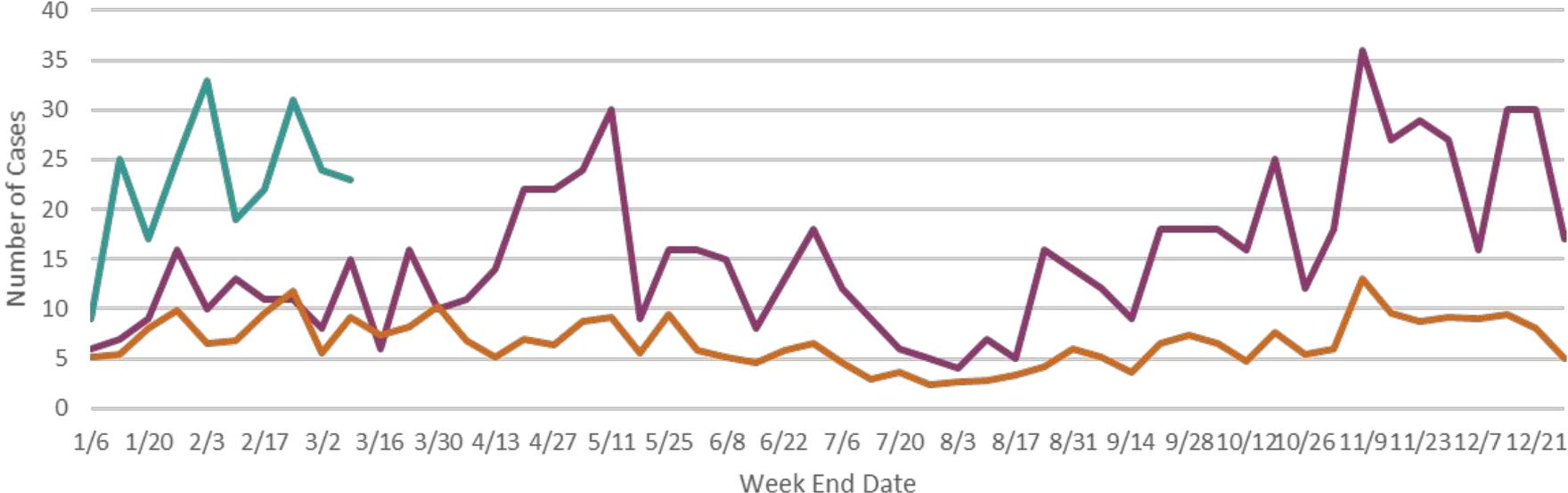


SOURCE: CDC, National Notifiable Diseases Surveillance System

Pertussis in Arizona

Pertussis Cases by Week

2025 2024 5 Year Average (2020–2024)



Pertussis Vaccination Trends

Immunization Coverage and Exemptions Trends

Data Updated: Nov 2023

Hover over the icon to learn more about the different statuses.



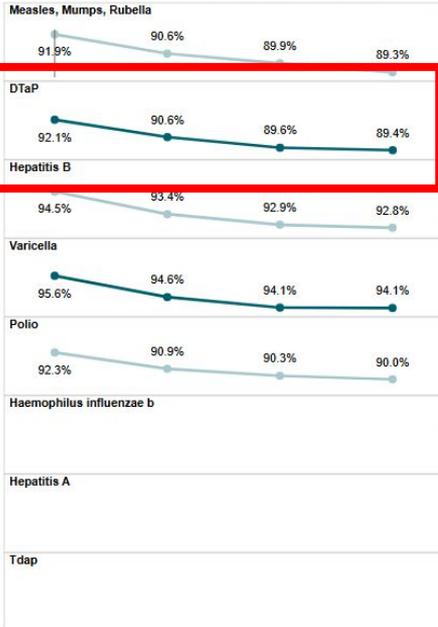
Select a County

All

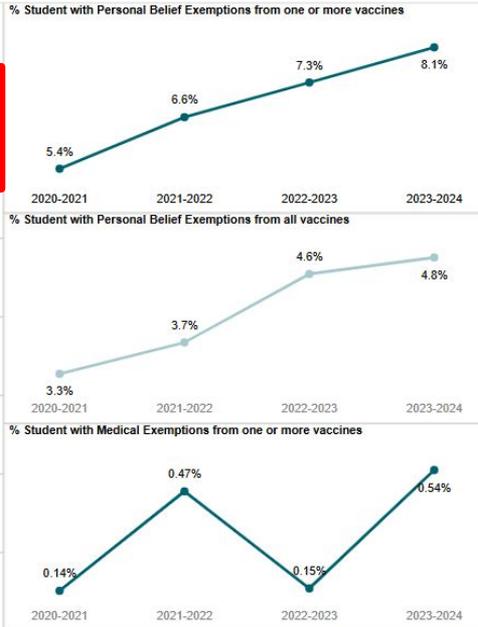
Select a Grade

Kindergarten

% Kindergarten Students Fully Immunized by Vaccine and by Year in Arizona from 2020-2021 to 2023-2024



% of Kindergarten Students with an Exemption in Arizona



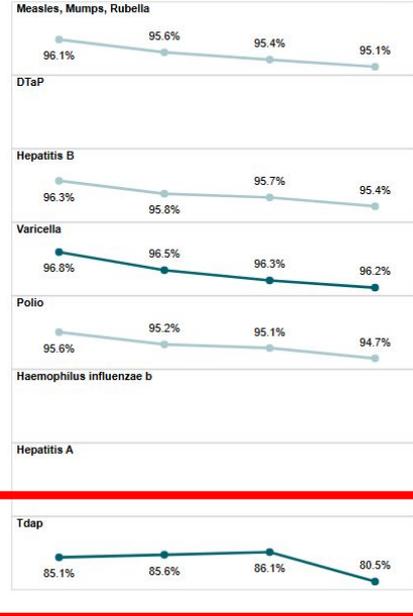
Select a County

All

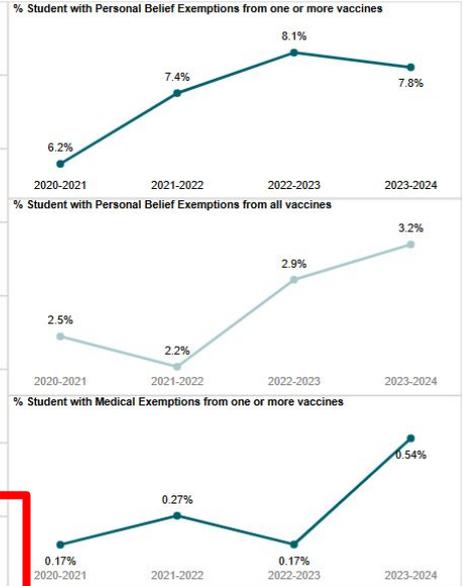
Select a Grade

6th Grade

% 6th Grade Students Fully Immunized by Vaccine and by Year in Arizona from 2020-2021 to 2023-2024



% of 6th Grade Students with an Exemption in Arizona



Pertussis Stages and Symptoms

**Catarrhal stage
(first stage):
Cold-like
symptoms**

Generally lasts for
1-2 weeks



**Paroxysmal stage
(middle stage):
More severe cough
and may
experience
paroxysms of
numerous, rapid
coughs**

Generally lasts 1-6 weeks



**Convalescence
stage (final
stage): Gradual
recovery**

Generally lasts several
weeks to months



Epidemiology

- Transmission
 - Occurs through contact with respiratory droplets from the mouth, nose, or throat
- Incubation
 - Generally 7 through 10 days from exposure but can range from 4 through 21 days
- Infectious Period
 - Most contagious during the catarrhal stage (early stage) through the third week after onset of paroxysms

Pertussis Testing

PCR Testing or Culture

- Gold standard- needed for a case to be classified as confirmed
- Specimen should be collected at 0 to 3 weeks following cough onset

Serology Testing

- Useful for diagnosing pertussis during the later phase of disease when both culture and PCR are likely to be negative
- Ideally collected 2 to 8 weeks following cough onset
- In absence or recent immunizations, elevated IgG antibody present 2-8 weeks after onset of cough is suggestive of recent pertussis infection

**Vaccination is the best
way to prevent Pertussis**

People of all ages need **WHOOPING COUGH VACCINES**



DTaP
for young children

- ✓ 2, 4, and 6 months
- ✓ 15 through 18 months
- ✓ 4 through 6 years

Tdap
for preteens

- ✓ 11 through 12 years

Tdap
for pregnant women

- ✓ During the 27-36th week of each pregnancy

Tdap
for adults

- ✓ Anytime for those who have never received it

www.cdc.gov/whoopingcough



CS356221-A

Pertussis in Schools: What to expect when you have a case

- 1. Report**
- 2. Isolate**
- 3. Contact Trace**
- 4. Monitor**

Report

Schools should report suspected or confirmed cases of Pertussis to their local public health department within one business day

County	Day Time Hours	After Hours
Apache	928-337-4364	928-245-7639
Cochise	520-432-9400	800-423-7271
Coconino	928-679-7272	928-255-8715
Gila	928-402-8811 (Globe) 928-474-1210 (Payson)	928-701-1610
Graham	928-428-1962	928-965-8921
Greenlee	928-865-2601	928-701-7000
La Paz	928-669-1100	928-669-2281
Maricopa	602-506-6767	602-747-7111 (Banner Poison Control)
Mohave	928-753-0714	928-718-4927
Navajo	928-524-4750 (Holbrook) 928-524-6050 (Show Low)	928-241-0593
Pima	520-724-7797	520-743-7987
Pinal	520-866-7281	520-566-6239
Santa Cruz	520-375-7900	877-202-0586 520-375-7774
Yavapai	928-771-3134	928-442-5262
Yuma	928-317-4550	928-317-4624

Isolate

- Students and staff with confirmed pertussis should be excluded from school and school activities
 - 21 days after cough onset if no treatment
 - 5 days after initiation of antibiotics
- Suspected cases should be excluded until evaluated and cleared by a healthcare provider



Contact Trace and Quarantine

- Work with public health to identify close contacts
 - Classrooms
 - Social circles
 - Extracurriculars
- Notify contacts of exposure
- Close contacts should monitor for symptoms for 21 days from last exposure
- Quarantine of contacts is generally not necessary, chemoprophylaxis is usually only recommended for household and high risk contacts

Monitor

- Monitor the situation and be on the lookout for additional cases
- Consider maintaining linelist of cases and contacts
- Recognize the symptoms of pertussis and encourage symptomatic individuals to be evaluated by their healthcare provider
- Encourage vaccination



Mumps

Let's get a jump on Mumps

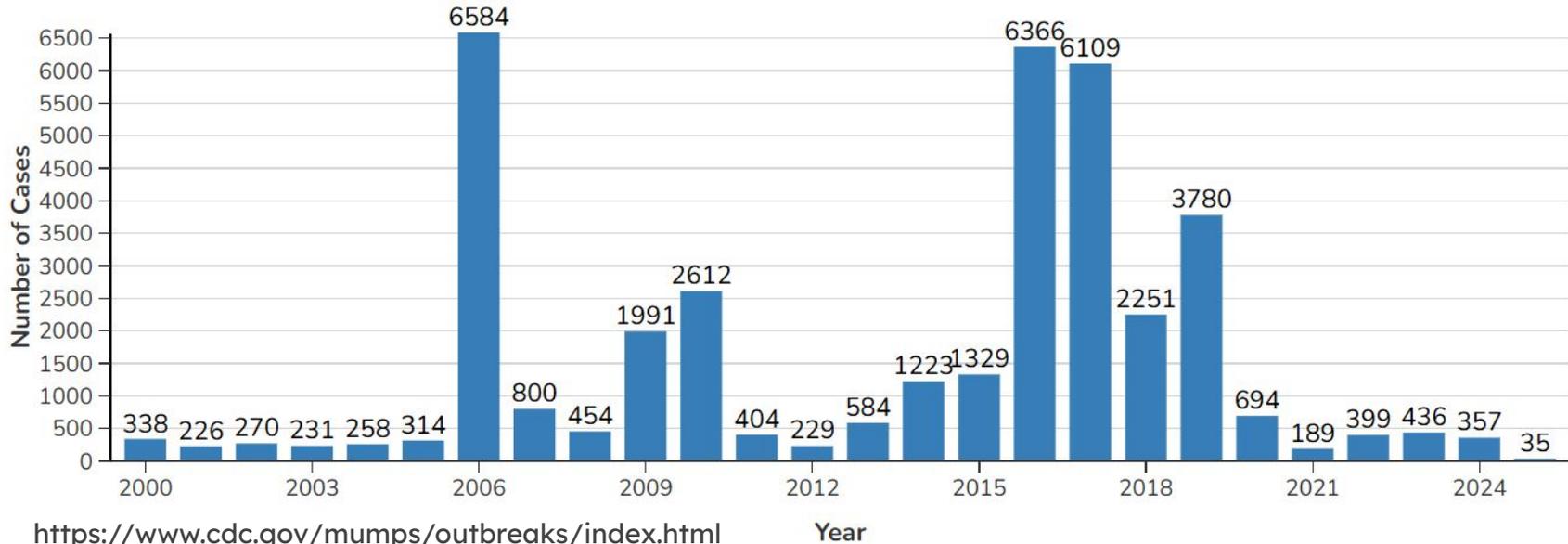


Symptoms

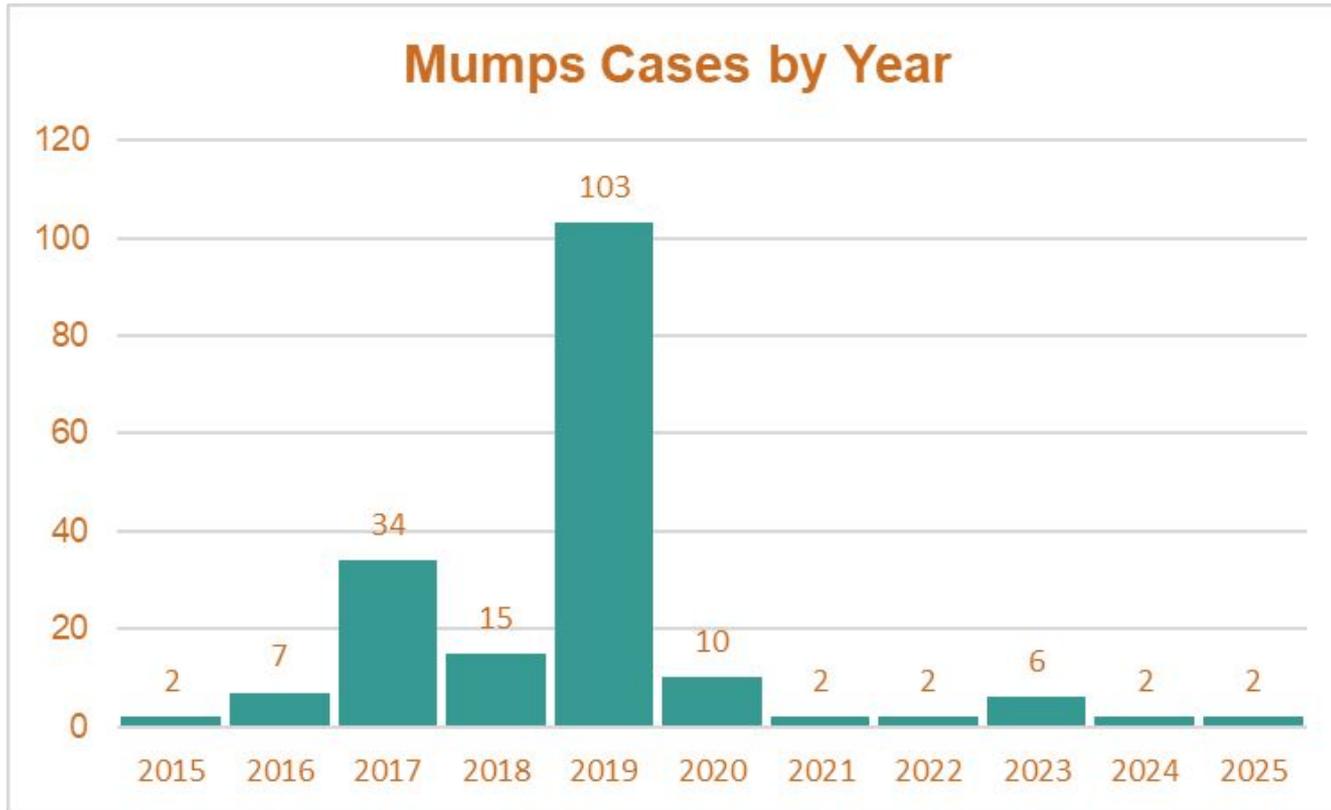
- Parotitis (swollen salivary glands) on one or both sides of the face
- Fever
- Headache
- Muscle Aches
- Fatigue
- Complications may include
 - Orchitis or oophoritis
 - Mastitis
 - Pancreatitis
 - Hearing loss
 - Meningitis
 - Encephalitis

National Trends

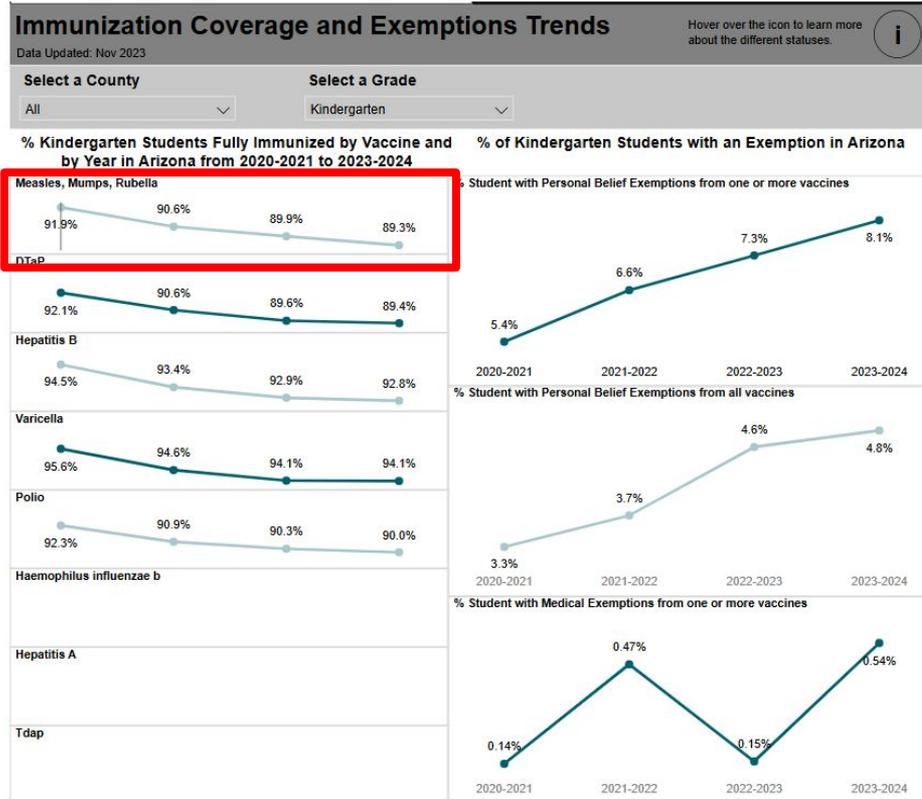
Reported U.S. mumps cases by year
(2000–2025)



Arizona Mumps Trends



Mumps Vaccination Trends



Epidemiology

- Transmission
 - Spread through direct contact with saliva or respiratory droplets
- Incubation
 - Usually 16-18 days but may occur from 12-25 days after exposure
- Infectious Period
 - 2 days before through 5 days after onset of parotitis





Mumps Testing

- PCR testing of urine and buccal sample
 - **Preferred method of testing**
- Serology Testing
 - IgG and IgM can assist with diagnosing Mumps
 - Can't differentiate between an exposure to vaccine and an exposure to wild-type mumps virus.
 - Certain viruses can interfere and cause false positives

**The best way to prevent
mumps is...**

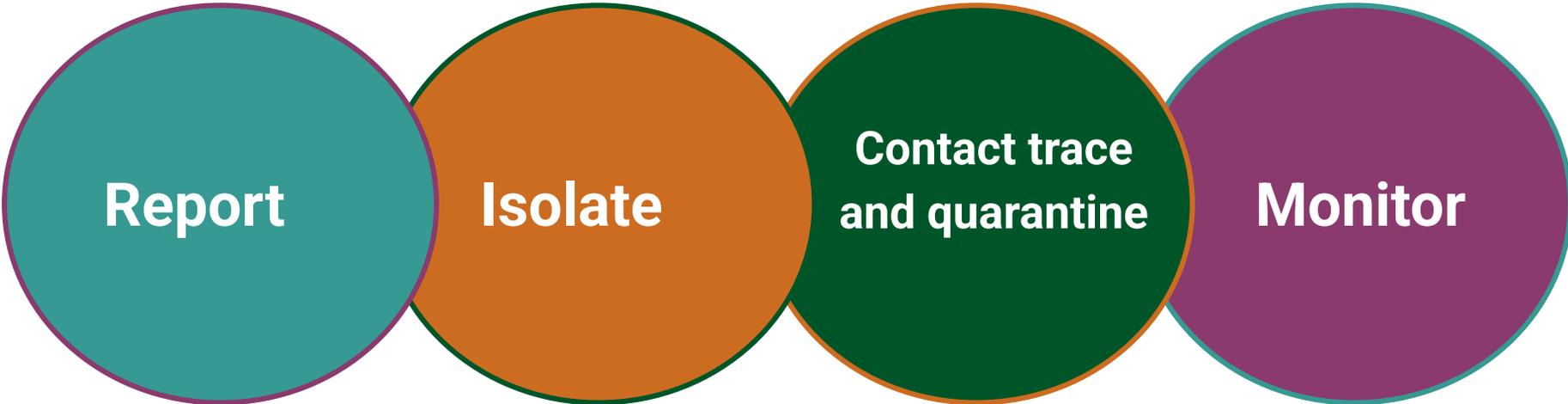
Vaccination!

Mumps Vaccine

The second “M” in MMR

- MMR (Measles, Mumps, Rubella) Vaccine
 - First dose at 12 through 15 months of age, and
 - Second dose at 4 through 6 years of age.
- MMRV (Measles, Mumps, Rubella, Varicella) vaccine is also available
 - Only licensed for use in children who are 12 months through 12 years of age

Mumps in Schools: Action steps to take



Report

Isolate

**Contact trace
and quarantine**

Monitor

Report

Schools should report suspected or confirmed cases of Mumps to their local public health department within one business day

County	Day Time Hours	After Hours
Apache	928-337-4364	928-245-7639
Cochise	520-432-9400	800-423-7271
Coconino	928-679-7272	928-255-8715
Gila	928-402-8811 (Globe) 928-474-1210 (Payson)	928-701-1610
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Pima	520-724-7797	520-743-7987
Pinal	520-866-7281	520-566-6239
Santa Cruz	520-375-7900	877-202-0586 520-375-7774
Yavapai	928-771-3134	928-442-5262
Yuma	928-317-4550	928-317-4624

Isolate

- Students and staff with Mumps should be excluded from school and school activities for 5 days from onset of parotitis
- Suspected cases should be excluded until evaluated and cleared by a healthcare provider



Contact Trace and Quarantine

- Identify close contacts
 - Classroom
 - Social Circle
 - Extracurricular
- Notify contacts of exposure
- Determine immunization status of close contacts
- Determine quarantine for unvaccinated close contacts
 - Quarantine: 25 days from last exposure
 - Early return to school may be considered for unvaccinated close contacts who receive the MMR vaccine in response to the exposure
- All close contacts should monitor for symptoms for 25 days from last exposure



Monitor

Monitor the situation and be on the lookout for additional cases

- Monitor the situation and be on the lookout for additional cases
- Consider maintaining linelist of cases and contacts
- Maintain record of immunization status for students and staff
- Recognize the symptoms of mumps and encourage symptomatic individuals to be evaluated by their healthcare provider
- Encourage vaccination

Data and Resources Available



Disease Data, Statistics & Reports - Data & Statistics Current

Epidemiology & Disease Control

ADHS Home / Public Health Preparedness / Epidemiology & Disease Control - Disease Data, Statistics & Reports - Data & Statistics Tables

Home

Border Infectious Disease Surveillance (BIDS) >

Immunization Program >

Environmental Health >

Infectious Disease Services >

Disease Integration & Services >

Council on Infectious Disease Preparedness and Response

Infectious Diseases A-Z

Communicable Disease Reporting

Disease Data, Statistics & Reports

Home

Data & Statistics Current

Data & Statistics Past Years

Reports

Publications

Disease Investigation Resources >

Legal Requirements

Arizona Infectious Disease Training and Exercise >

Promoting Interoperability >

Additional Resources

Disease Data, Statistics & Reports - Data & Statistics Current

Select a County: All

2025 Year-to-Date Case Counts

Confirmed and probable case classifications are included.

Counts by category for county: All
Click on a bar to show the relevant diseases in the table

Category	Count
Cocci (Valley Fever)	3,475
Invasive or healthcare-associated	1,440
Enteric	538
Vaccine-preventable	358
Hepatitis (A or B)	198
Other	57
Vector/Zoonotic	13

Counts for county: All
Disease category: All

Disease	Count
Amebiasis	1
Brucellosis	1
Campylobacteriosis	159
Candida auris, clinical	46
Candida auris, screening	59
Carbapenem-Resistant Acinetobacter baumannii (CP or Pan-R)	42
Carbapenem-Resistant Enterobacterales	331
Carbapenem-Resistant Pseudomonas aeruginosa (CP or Pan-R)	8
Coccidioidomycosis	3,475
Creutzfeldt-Jakob Disease	1
Cryptosporidiosis	21
Cyclospora Infection	1
Dengue	6
E. coli, Shiga Toxin-Producing	47
Flu-Associated Pediatric Death	4
Giardiasis	20
H. influenzae, Invasive	47
Hantavirus Infection	2
Hepatitis A	4
Hepatitis B, Acute	8
Hepatitis B, Chronic	188
Hepatitis D	1
Legionellosis	52
Listeriosis	1
Lyme Disease	2
Meningococcal Invasive Disease	8
MRSA, Invasive	275
Mumps	2
Pertussis	230
Rocky Mtn. Spotted Fever	1
Salmonellosis	173

Date last updated: 3/11/2025

- Current year case counts for VPDs and other morbidities
- Weekly and monthly case counts
- Cases by county
- Historical case counts
- <https://www.azdhs.gov/preparedness/epidemiology-disease-control/index.php#data-stats>



ARIZONA

Thank you



Claim your Continuing Education Credit

Event Evaluation - April 16, 2025 -
Session 4 Breakouts - VPDs in
Schools



NOTE: This session was formerly called “VPDs in Schools”



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