WVU Medicine
Golisano Children's

Measles: I’m Back!
Pertussis: I Never Left!

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Pediatric Infectious Diseases

I have nothing to discloses

No conflicts other than being passionate about vaccines

Objectives

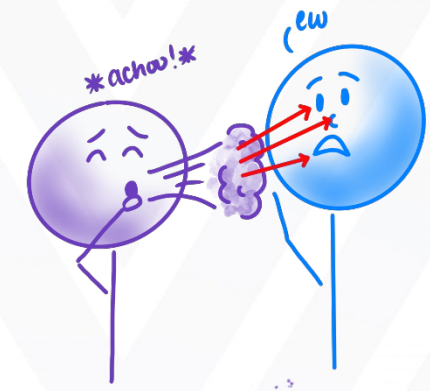
- Distinguish unique signs/symptoms of measles infection compared to other fever/rash illnesses
- Recognize early and late complications of measles
- Distinguish unique signs/symptoms of pertussis infection compared to other cough illnesses
- Prepare for vaccine-hesitant questions from patients/parents

Measles

- *Morbillivirus* in the *Paramyxovirus* family:
  - RNA virus with one serotype
- Transmission
  - direct spread of infectious droplets, may be airborne
- Incubation period:
  - 8-12 days (usual interval exposure to rash is 14 days)
- **HIGHLY** Contagious 1-2 days before onset symptoms (3-4 days before onset rash)

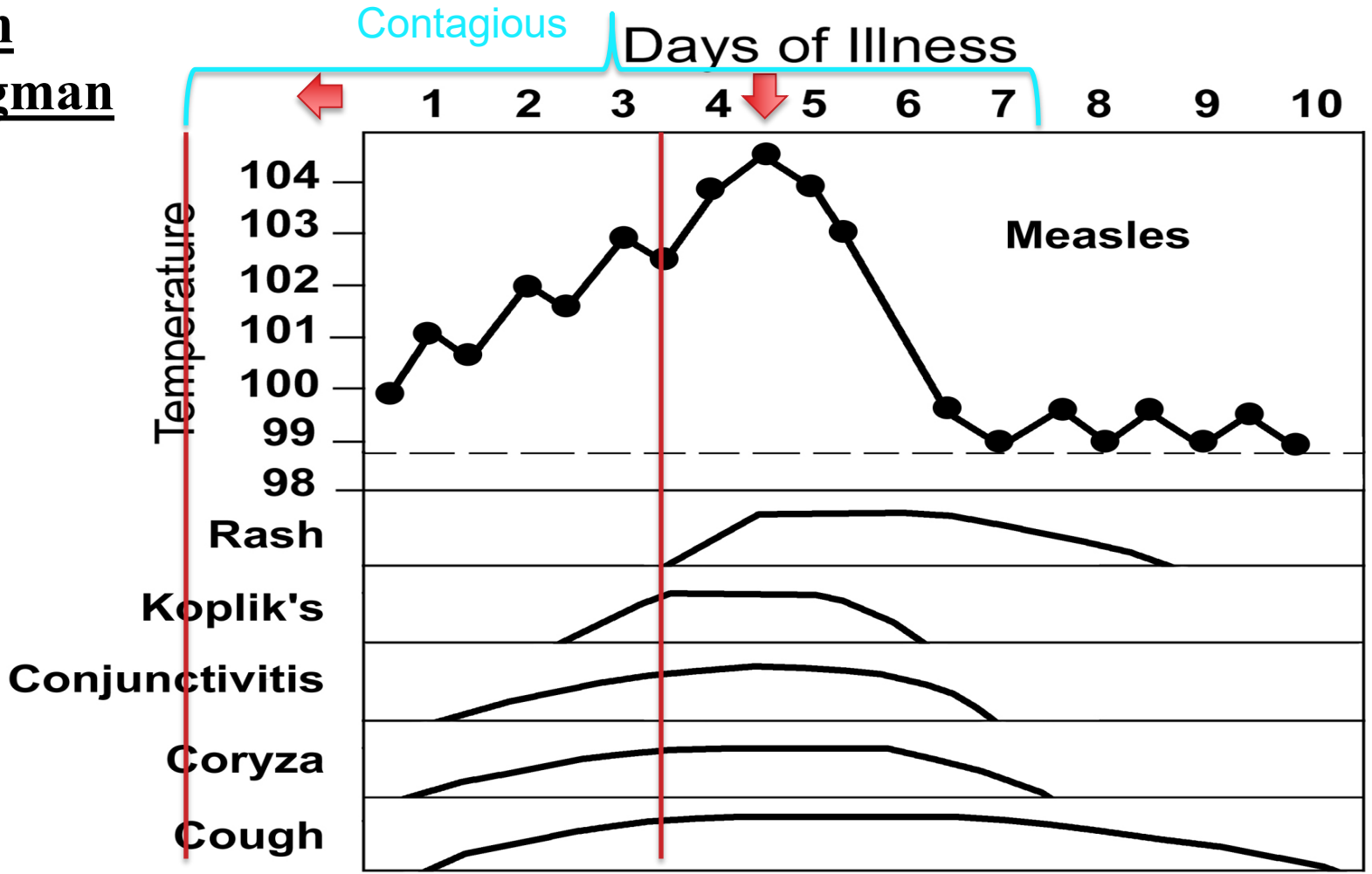
Transmission

- Person to person via large respiratory droplets (coughing or sneezing)
- Aerosolized droplet nuclei (airborne) in closed areas for up to 2 hours
- Transmission occurs from 4 days prior to onset of rash until 4 days after rash eruption



Images courtesy of the University of Arizona Vax Fax on Measles

From Krugman



Case #1

- 11 mos old admitted with fever and rash, conjunctivitis
- Is it

What do you want to know?

These help me determine possibility

- MMR Vaccination?
  - An 11 month old usually has had no MMR vaccine
  - Can give at age 6 months if concern or travel to area
- Travel
  - Never left Kaiser WV
  - Traveled to W Texas/ Europe etc. 2 weeks ago
- Exposure
  - No cases in WV (that we know of)

Timing of events

- Fever and ra[illegible]ed 4 days ago

NOPE

Timing of events

- Fever, cough, congestion 3 days ago

NOPE

- Fever resolved and now today has rash

Timing of events

- F
- F

Day 5-6

- rash is confluent on trunk


Library of JW Bass

Case #2

- 16 yo teen with
  - 3 days of runny nose, conjunctivitis, fever, & cough
- Bluish-white dots
  - appeared on buccal mucosa appeared after 1 day of fever

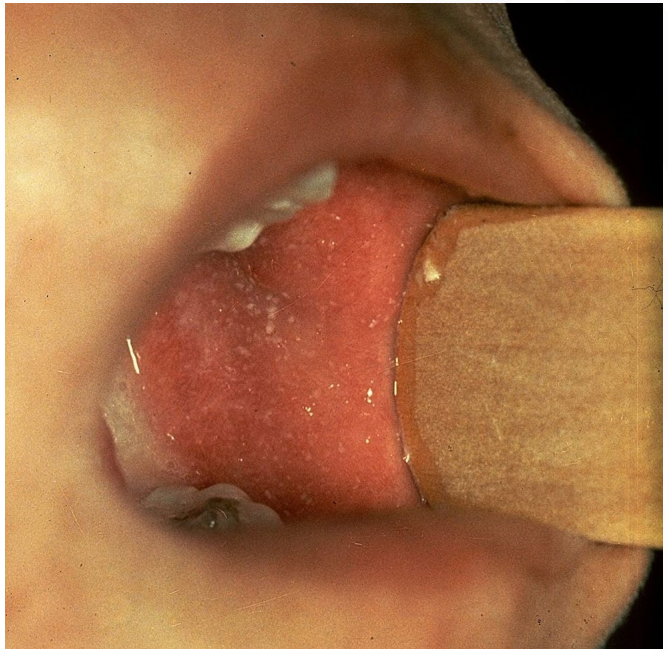
- Koplik Spots
  - Pre molar
  - Present from 1 day before rash to 2 days into rash

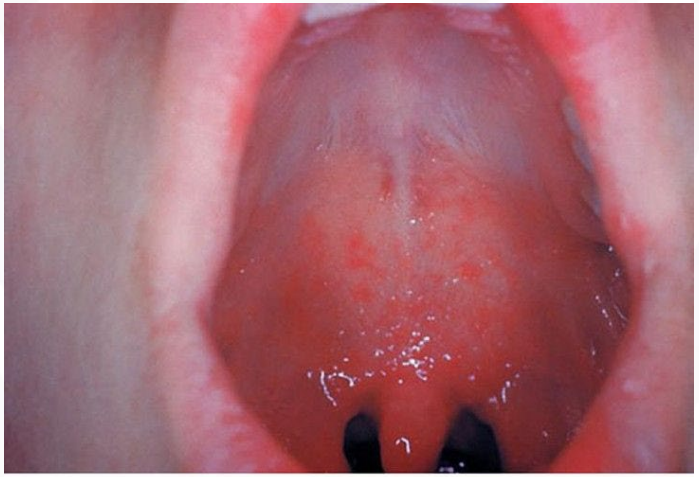
Red Book: 2021–2024 Report of the Committee on Infectious Diseases, 2021

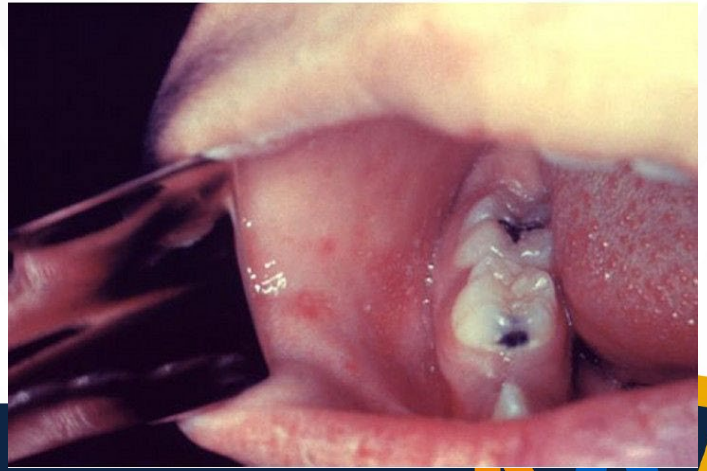
Figure Legend:

Koplik spots of measles in a 7-year-old. Courtesy of Larry Frenkel, MD

Koplik







Images courtesy of the Public Health Image Library of the Centers for Disease Control and Prevention.

Case #2

- Morbilliform rash:
  - started (on day 4 of illness) face & thorax…spread to extremities, present now 2 days
- Last 24°,
  - cough worsening with barking sound, very hoarse voice, copious nasal congestion

Physical exam: Case #2

- Ill appearing male
  - does not want lights on in room, curled up on bed, freq. very brassy cough (no stridor)
- Vitals:
  - 39.9^{o}, Pulse oxymeter 98% in RA
- HEENT:
  - bulging R TM, nose with copious clear D/C, eyes with red conjunctiva, (+) photophobia

Measles

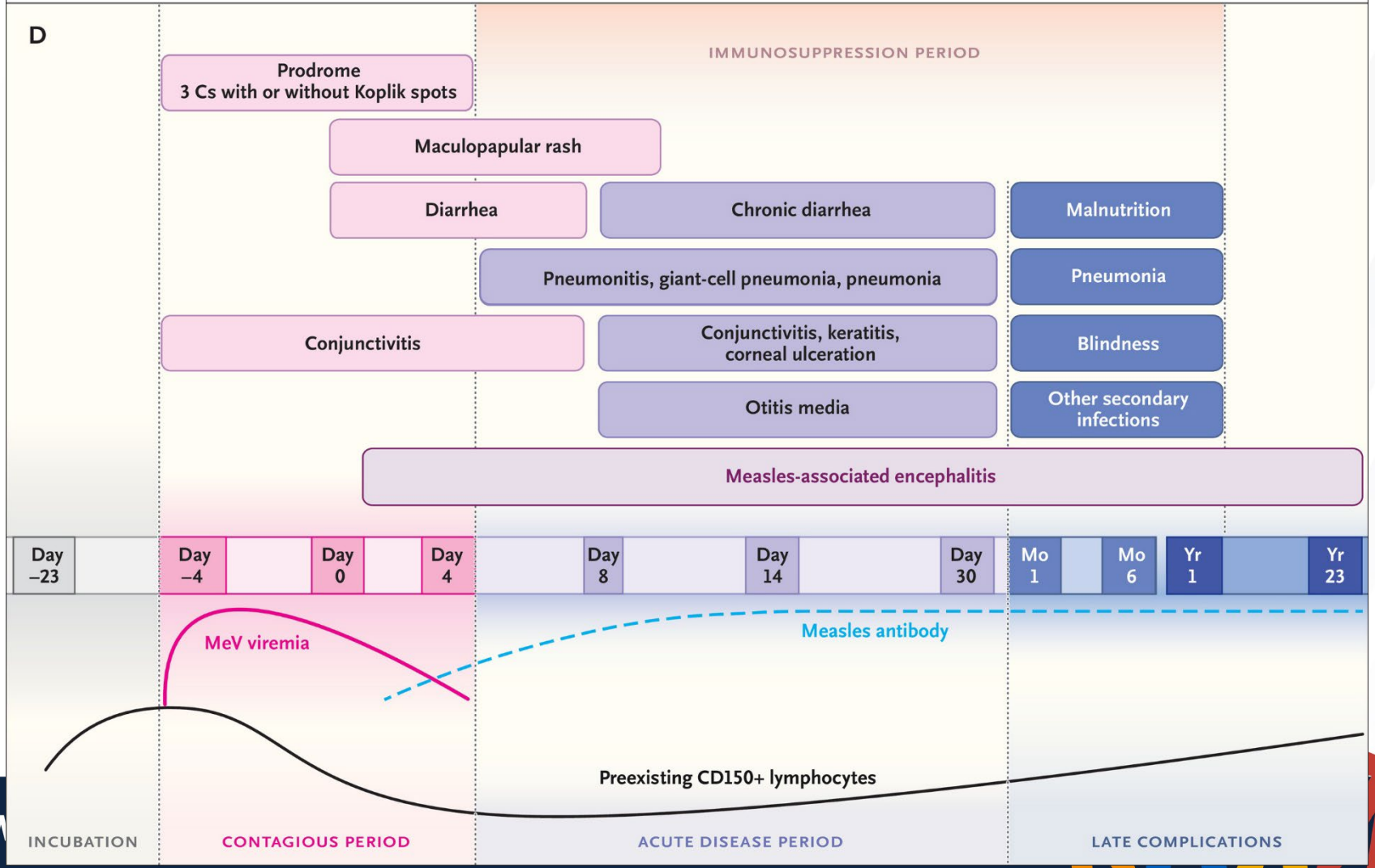

A

Images courtesy of the Public Health Image Library of the Centers for Disease Control and Prevention.

Later have desquemation

Measles

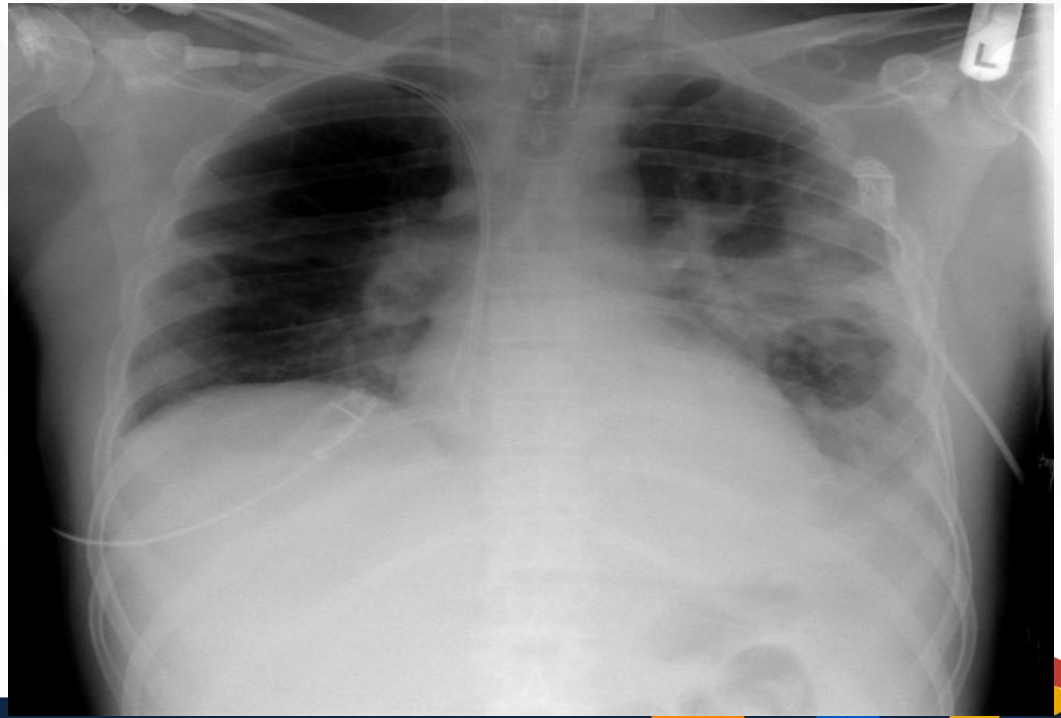
- *3 C's*:
  - cough, coryzia, conjunctivitis
- Also frequent:
  - photophobia, fever, rash, otitis media, hoarse voice with freq cough


D
IMMUNOSUPPRESSION PERIOD
Prodrome
3 Cs with or without Koplik spots
Maculopapular rash
Diarrhea
Chronic diarrhea
Malnutrition
Pneumonitis, giant-cell pneumonia, pneumonia
Pneumonia
Conjunctivitis
Conjunctivitis, keratitis, corneal ulceration
Blindness
Otitis media
Other secondary infections
Measles-associated encephalitis
Day −23
Day −4
Day 0
Day 4
Day 8
Day 14
Day 30
Mo 1
Mo 6
Yr 1
Yr 23
MeV viremia
Measles antibody
Preexisting CD150+ lymphocytes
INCUBATION
CONTAGIOUS PERIOD
ACUTE DISEASE PERIOD
LATE COMPLICATIONS

Who is at risk?

- Vulnerable populations are more likely to suffer complications:
  - Children under 5 years of age
  - Adults older than 20 years
  - Pregnant people
  - Immunocompromised people
- Globally:
  - Malnutrition (including vitamin A deficiency)
  - Low per capita incomes
  - Weak health infrastructure

Measles: 7 days ago on left, now with respiratory failure (right)



Measles in Developing World

- Cases of measles in young children can lead to immunosuppression
- Malnutrition commonly follows measles…diarrhea, failure-to-thrive
- Common bacteria secondary infection: ***Staph aureus*** pneumonia

Diagnosis

Per the Red Book, “Measles virus infection can be confirmed by:

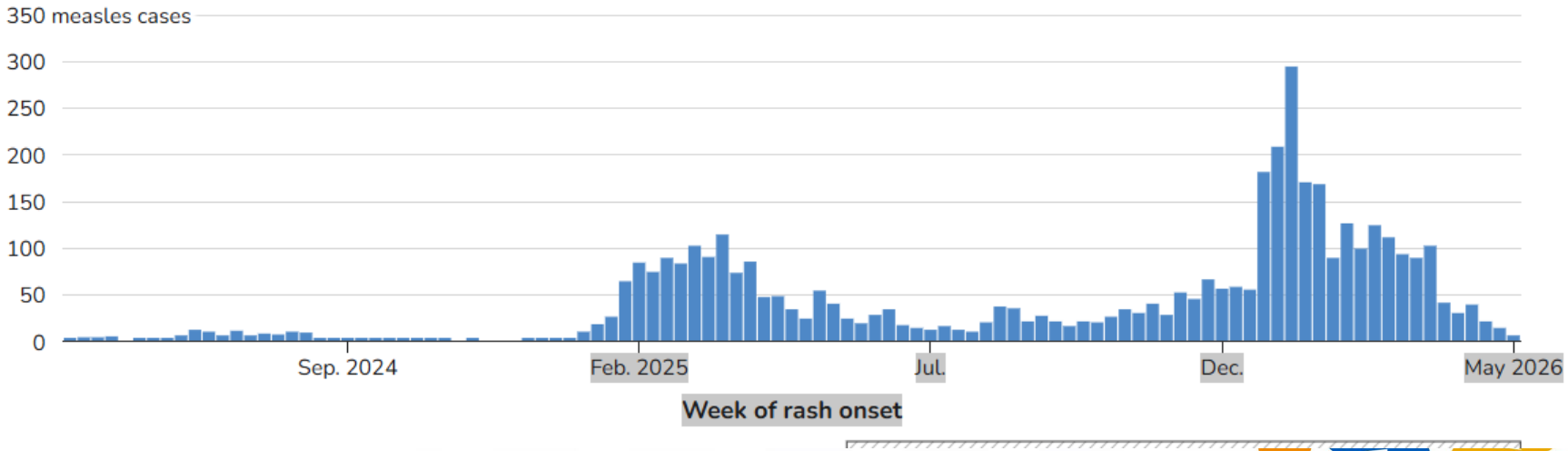
- Detection of measles viral RNA by reverse transcriptase-polymerase chain reaction (RT-PCR)
- Detection of measles virus-specific immunoglobulin IgM
- A fourfold increase in measles IgG antibody concentration in paired acute and convalescent serum specimens (collected at least 10 days apart)
- Isolation of measles virus in cell culture”

Diagnosis

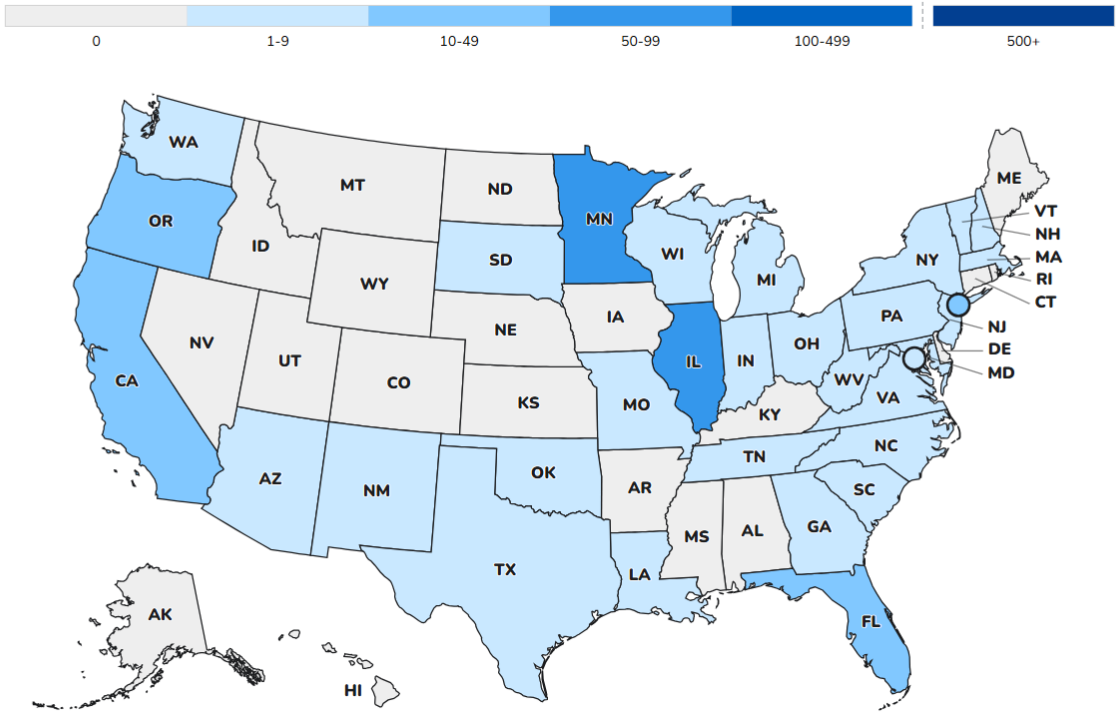
- In all patients with suspected measles, a throat swab (RT-PCR) and serum specimen (IgM) is recommended
- It is also ideal to obtain a urine sample (RT-PCR) to increase the likelihood of establishing a diagnosis
- Viral genotyping can help track transmission

Weekly measles cases by rash onset date

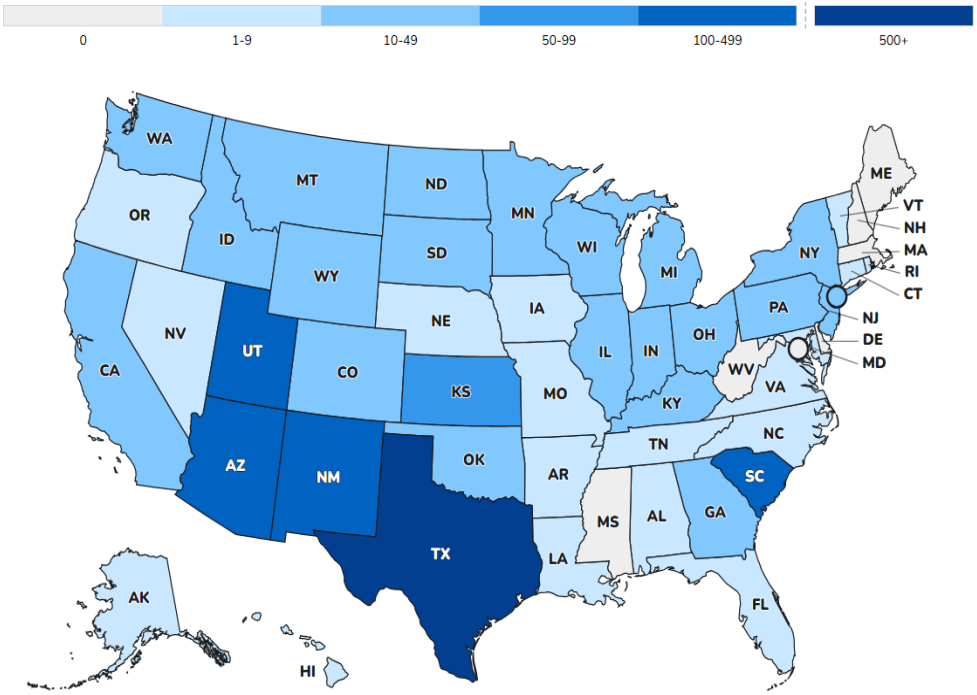
2022–2026* (as of May 7, 2026)

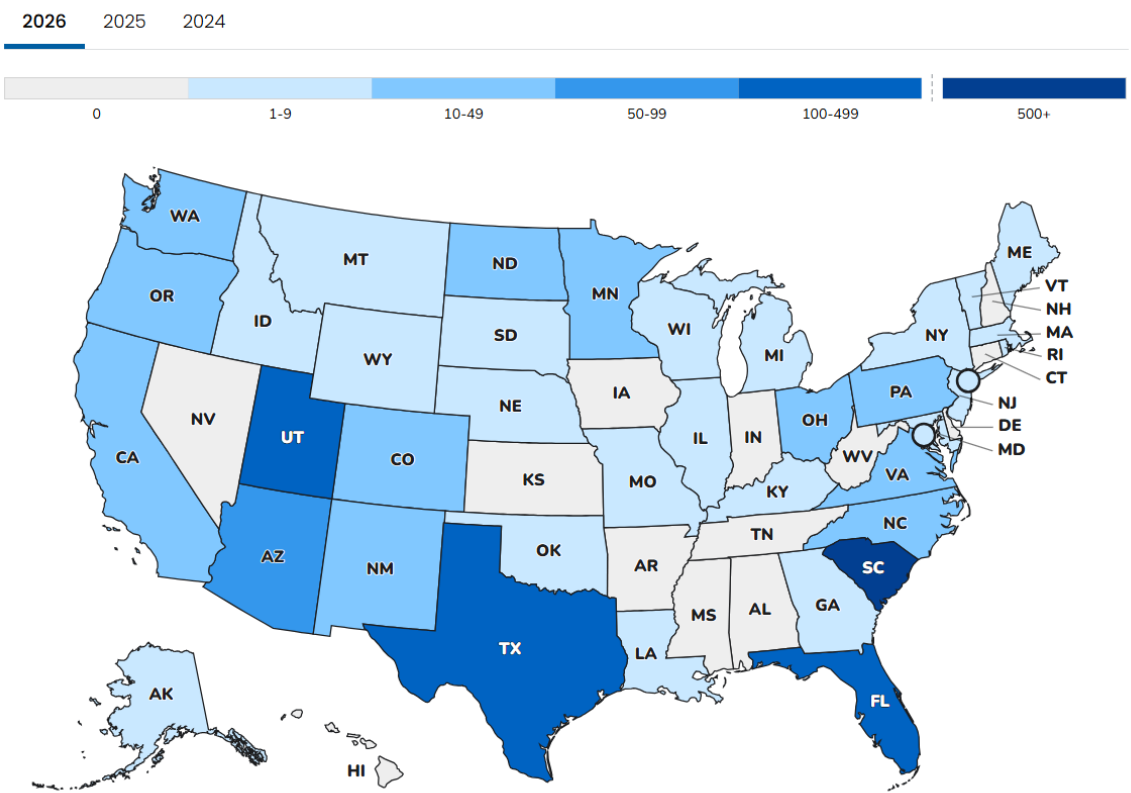


2026 2025 **2024**



2026 **2025** 2024




2026
2025
2024
0
1-9
10-49
50-99
100-499
500+
WA
OR
CA
ID
NV
MT
WY
UT
AZ
CO
NM
ND
SD
NE
KS
OK
TX
MN
IA
MO
AR
LA
WI
IL
MS
MI
IN
KY
TN
AL
OH
WV
GA
FL
SC
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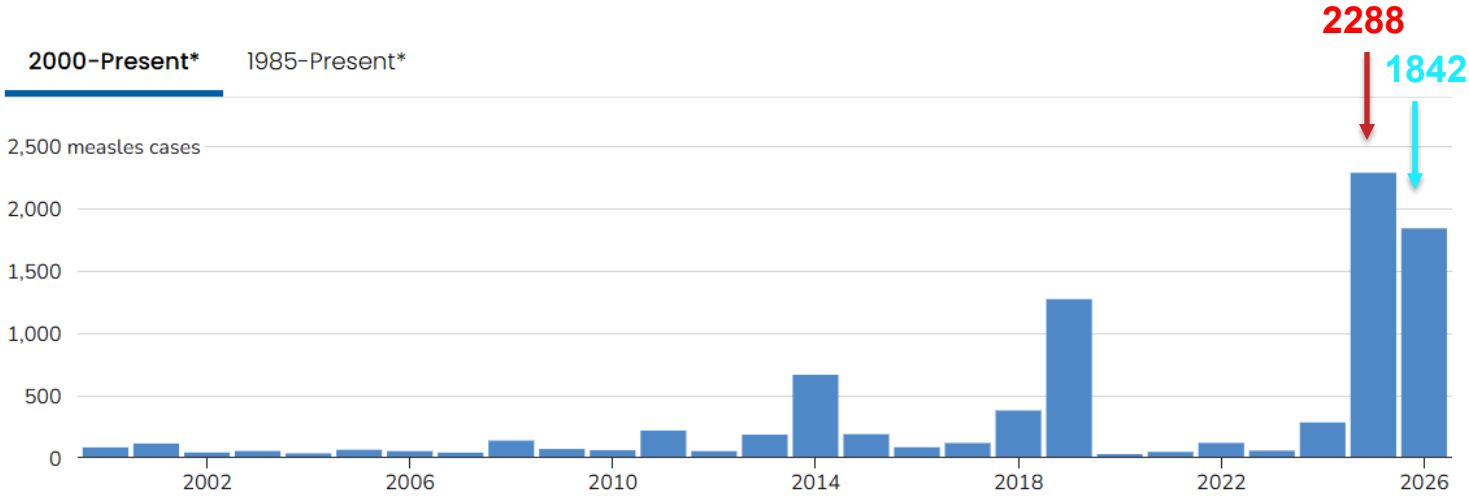
Yearly measles cases

as of May 7, 2026



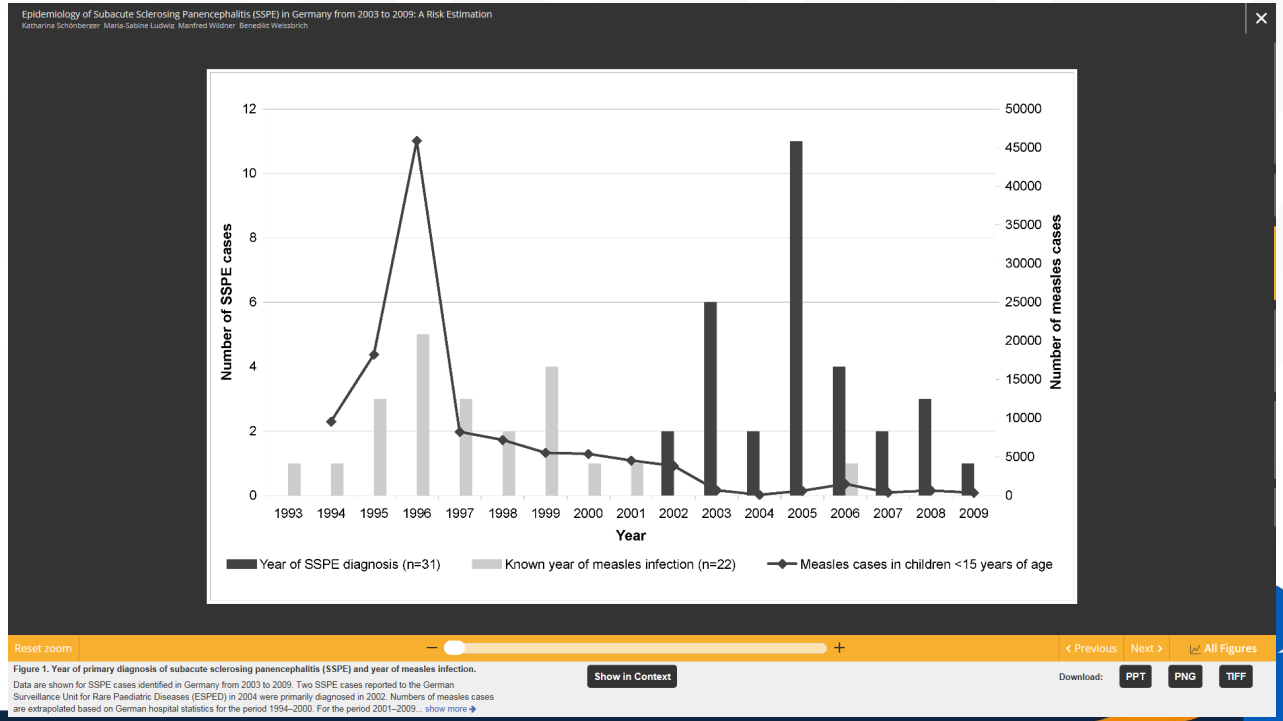
Late complication of measles

- Subacute sclerosing panencephalitis (SSPE), a rare and fatal complication of measles
- 4–11 SSPE cases per 100,000 measles cases, approximately 10 times higher than earlier estimates (Bellini 2005 J Infect Dis)
  - Evidence recently may be as high as 1 per 2500

Subacute Sclerosing Panencephalitis (SSPE)

- Progressive neurologic disorder affecting the central nervous system which follows measles infection earlier in life
- Initial symptoms occur around 6-8 years following measles infection
  - Mild cognitive decline
  - Changes in behavior
  - Alteration of motor function
  - Seizures
  - Blindness
- Leads to progressive deterioration and death

Subacute Sclerosing Panencephalitis (SSPE)



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Schönberger K, Ludwig M-S, Wildner M, Weissbrich B (2013) Epidemiology of Subacute Sclerosing Panencephalitis (SSPE) in Germany from 2003 to 2009: A Risk Estimation. PLoS ONE 8(7): e68909.

Public Health Notification

- Measles is a category I communicable disease
- Suspected and confirmed cases are immediately reportable to the local health department
- Visit CSTE for reporting contact information: https://www.cste.org/page/EpiOnCall

Jurisdiction ↑	After Hours/Epi-on-Call Phone Number	Infectious Disease Outbreak-Related Quest...
West Virginia	(304) 558-5358 Ext. 2	(304) 558-5358 Ext. 2

Treatment

- Largely supportive
- The WHO recommends Vitamin A daily for 2 days in all children with severe acute measles requiring hospitalization
  - 200,000 IU for children 12 months and older
  - 100,000 IU for infants 6-11months of age
  - 50,000 IU for infants <6 months of age
  - A third dose should be given 2-6 weeks later to children with clinical signs/symptoms of vitamin A deficiency

Measles – not benign

- 1 (or higher) of 1,000 measles cases will develop acute encephalitis: often permanent brain damage.
- 1-2 of 1,000 children will die from respiratory and neurologic complications

Post Exposure Prophylaxis

Is vaccination or intravenous infusion of immunoglobulins (passive immunization) effective at preventing measles in exposed individuals without evidence of immunity?

- Immunoglobulins were effective at preventing measles if given within 7 days of exposure compared to no treatment
- Immunoglobulins were effective at preventing death due to measles compared to no treatment
- Vaccination was more effective than immunoglobulin

Post-Exposure Prophylaxis

Age & Health Status	Vaccination History (Assumes 2 doses of MMR)	
	Yes*	No
Pregnant		
Documented evidence of measles immunity	No action needed	No action needed
No documented evidence of measles immunity	No action needed*	Administer IGIV[§] within 6 days of exposure and administer MMR vaccine post-partum
Immunocompromised		
Immunocompromised	Administer IGIV[§] within 6 days of exposure	Administer IGIV[§] within 6 days of exposure

Post-Exposure Prophylaxis

Age & Health Status	Vaccination History (Assumes 2 doses of MMR)	
	Yes*	No
Age		
<6 months	—	Administer IGIM‡ within 6 days of exposure
6-11 months	—	MMR† vaccine if ≤ 72 hours since exposure; IGIM‡ if > 3 days but ≤ 6 days since exposure
≥ 12 months	No action needed*	MMR vaccine if ≤ 72 hours since exposure; IGIM‡ if > 3 days but ≤ 6 days since exposure
Born before 1957‖	Assume immunity‖ No action needed	Assume immunity‖ No action needed

Post-Exposure Prophylaxis

Age & Health Status	Vaccination History (Assumes 2 doses of MMR)	
	Yes*	No
Healthcare worker (regardless of age and year of birth)		
Documented evidence of measles immunity	No Action needed	No action needed
No documented evidence of measles immunity	—	MMR vaccine if ≤ 72 hours since exposure; IG[‡§] if > 3 days but ≤ 6 days since exposure.

Vaccination

Measles Vaccination of Travelers

- Adequate vaccination for persons traveling outside the United States
  - 1 dose MMR for children age 6 through 11 months
  - 2 doses of age appropriate MMR or MMRV for children age 12 months and older and adults

Measles cases without the vaccine

Before the vaccine*

- 3 to 4 million cases
  - 48,000 hospitalizations
  - 1-3,000 chronically disability
  - 4000+ annual deaths

Today if no vaccine**

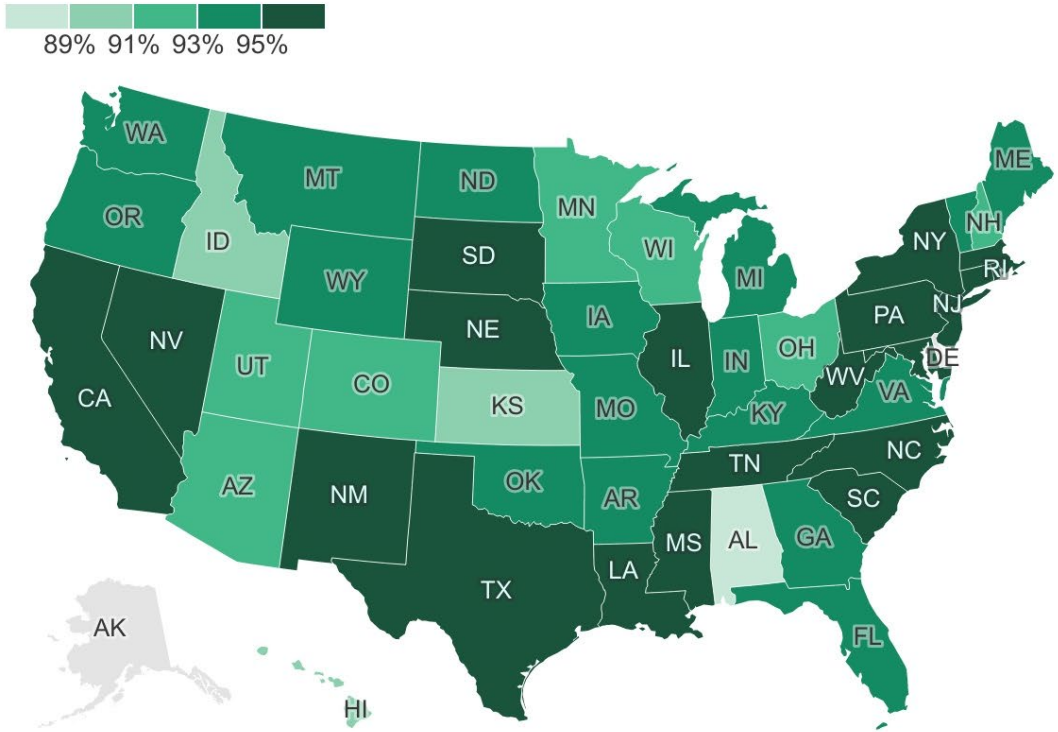
- 7 to 8 million cases
  - 87,000 hospitalizations
  - 2-5,000 chronically disabled
  - ?4000 annual deaths
  - SSPE: 3200

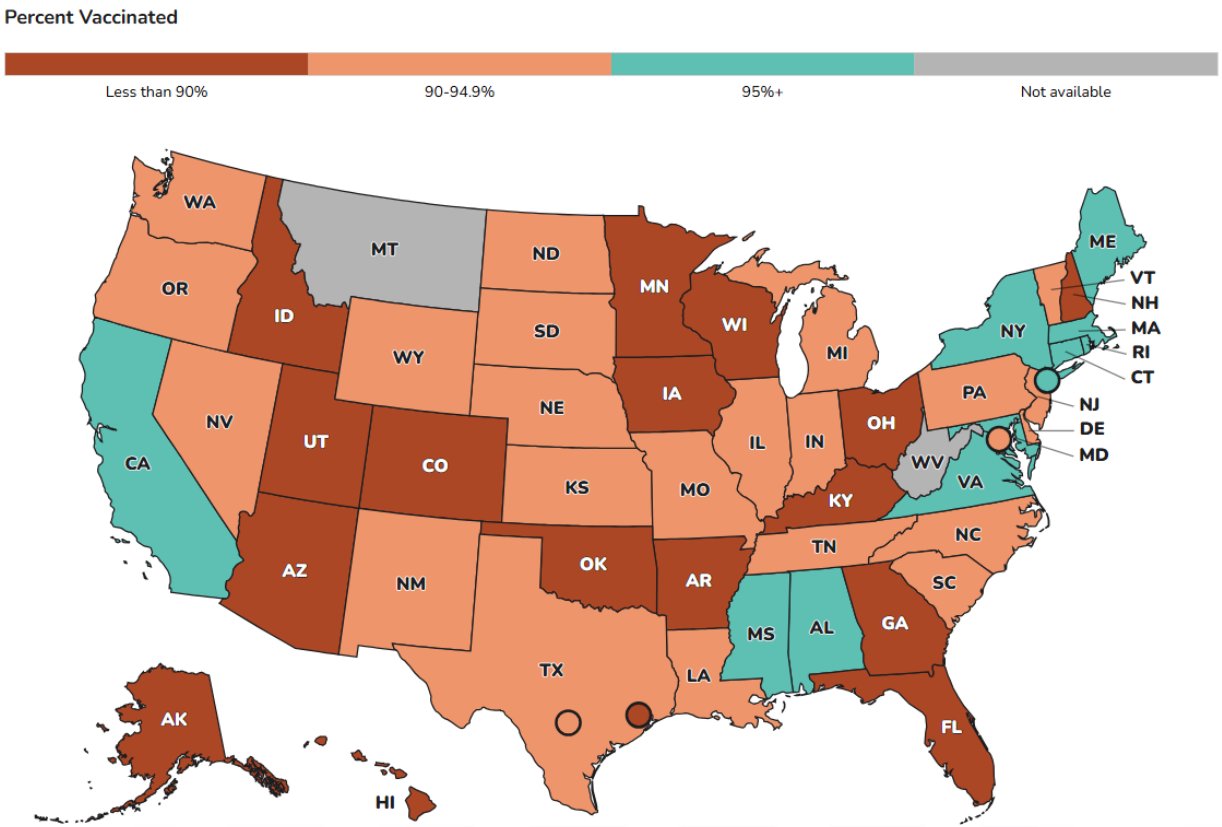
- * US population: 180 million in 1963
- ** US population: 345 million in 2025

Share of Kindergartener's Fully Vaccinated Against MMR for the 2021-2022 School Year by State

MMR coverage was **93%** nationally, which falls below the Healthy People 2030 Target of **95%**.

https://www.kff.org/covid-19/headed-back-to-school-in-2023-a-look-at-childrens-routine-vaccination-trends/

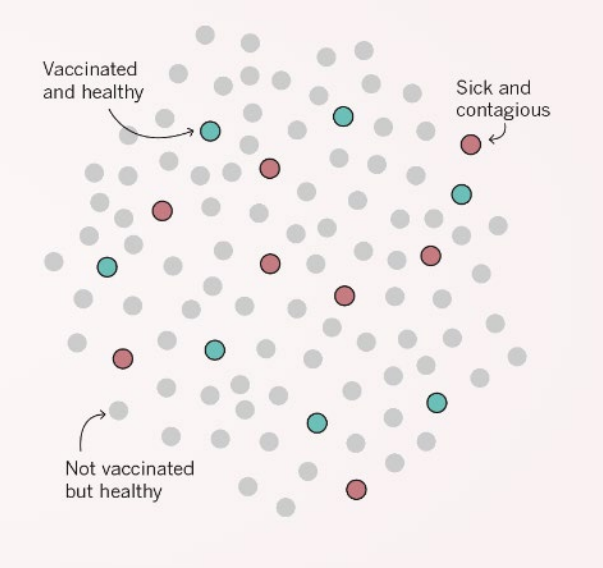


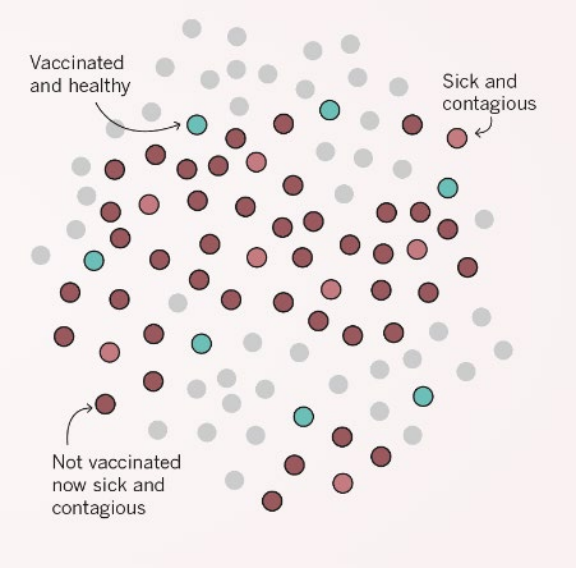

Percent Vaccinated
Less than 90%
90-94.9%
95%+
Not available
WA
OR
CA
ID
NV
MT
WY
UT
AZ
CO
NM
ND
SD
NE
KS
OK
TX
MN
IA
MO
AR
LA
WI
IL
MS
MI
IN
KY
TN
AL
OH
WV
GA
FL
SC
NC
VA
PA
NY
ME
VT
NH
MA
RI
CT
NJ
DE
MD
AK
HI

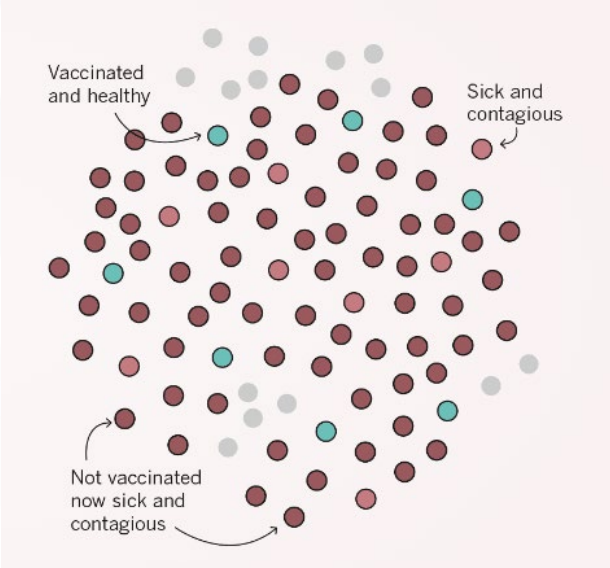
How well does the vaccine work?

- 1st dose of MMR
  - 95% measles
  - 80% mumps
- Need 2nd dose to vaccinate those non-responders
- Will always have non-responders
  - Rely on herd immunity/protection
  - Highly vaccinated population prevents outbreak

Herd Immunity







Images from LA Times

Herd Immunity

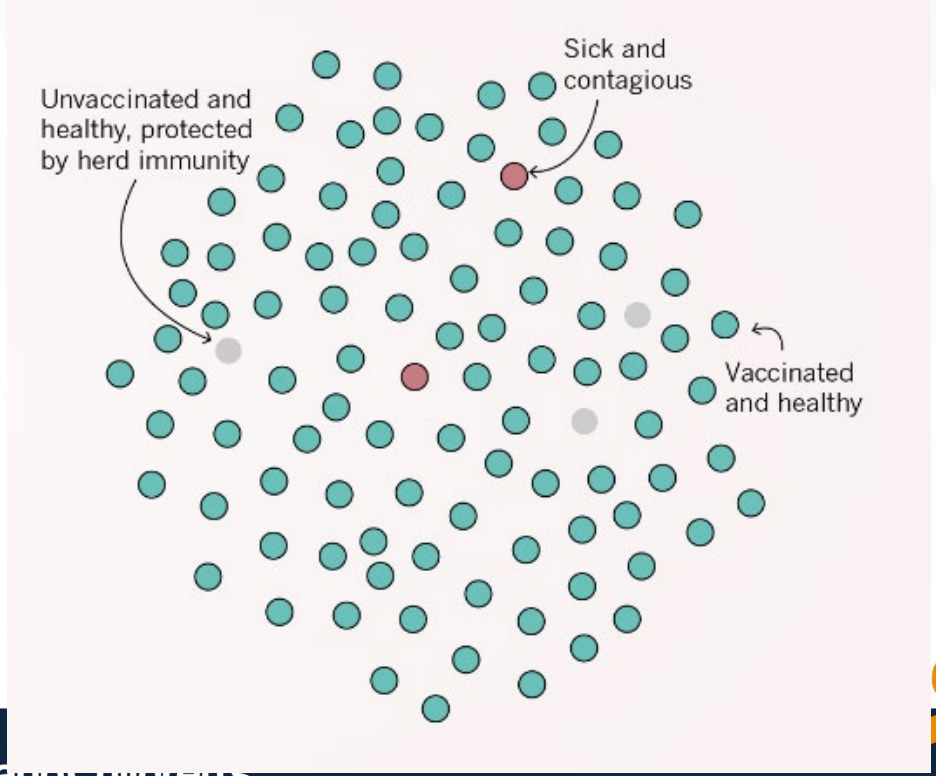


Image from LA Times

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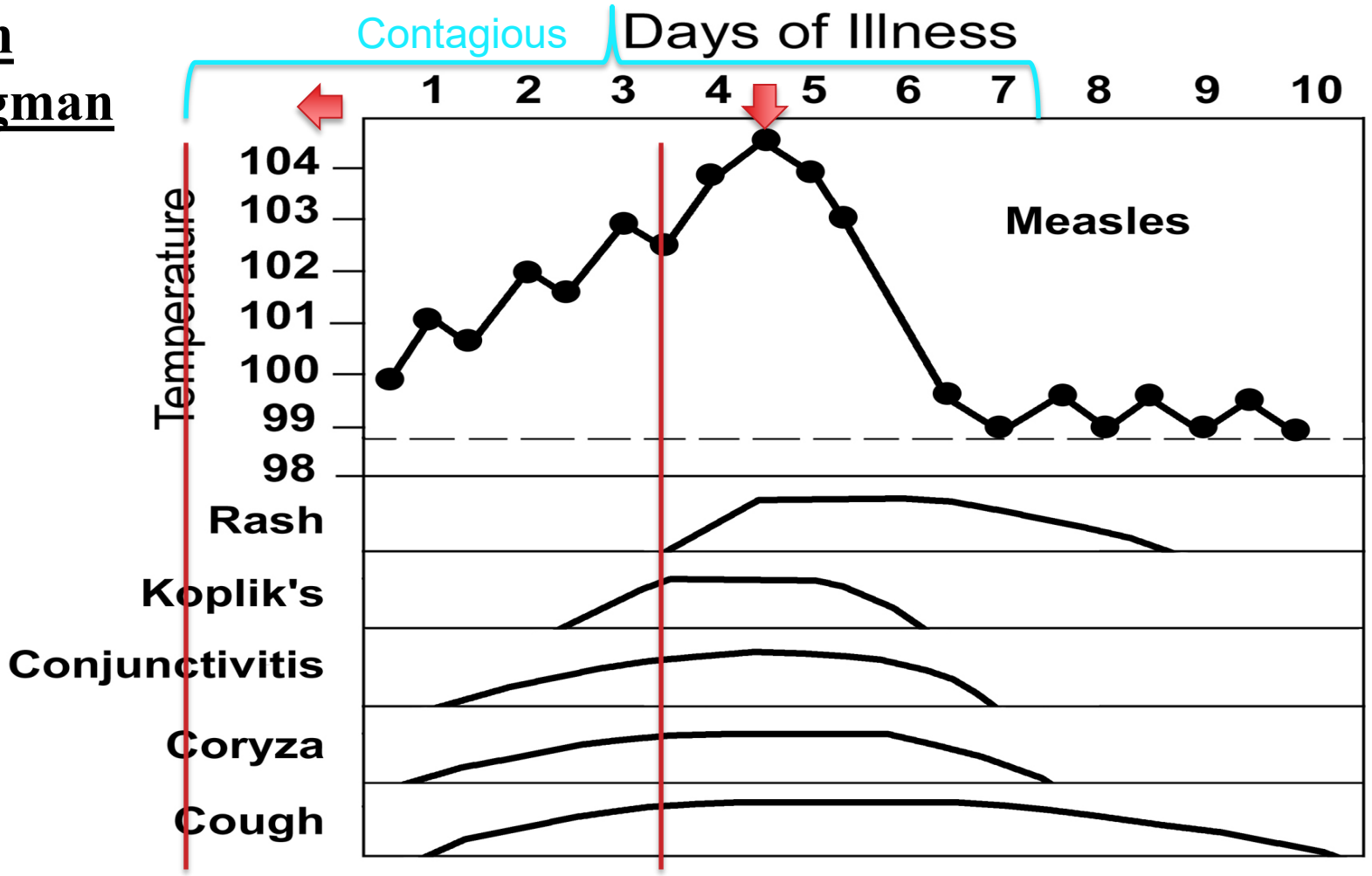


YOU MAY HAVE BEEN EXPOSED TO MEASLES IF YOU VISITED:

ALERT

O'HARE AIRPORT

Terminal 5 on
Thursday, September 11
between 7:30 a.m. and 11 a.m.

Cook County Public Health
A division of Cook County Health

BUILDING HEALTHIER COMMUNITIES

cookcountypublichealth.org

WVUMedicine

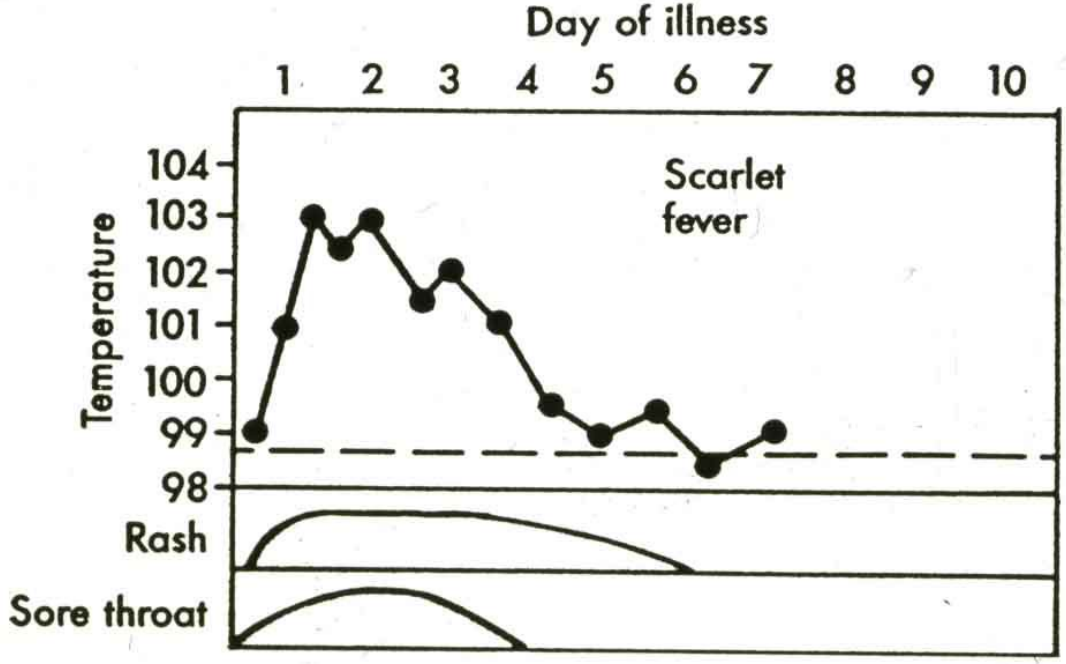
Vaccine Hesitancy

- No association between MMR and autism
- Andrew Wakefield, adult GI, fabricated data to show association between *leaky gut* and autism
- Multiple prospective studies refute any link between MMR (or any vaccine) and autism

“Other adults have moral objections because some vaccines are connected to human cell cultures developed from two aborted fetus in the 1960s, even though new abortions are never performed for current vaccines (AAP, May 14, 2025). I share moral repugnance at any connection to the taking of an ongoing child's life. But we do not live in a perfect world.
Weeds and wheat grow together. Trying to pull up all the weeds, will also pull up a lot of wheat (Matthew 13: 24-30). We can accept a remote link to a moral evil, which we did not cause and do not endorse, because a far greater good can be obtained despite it. ”

Mark Brennan, Bishop of Wheeling-Charleston
August 27, 2025

Scarlet Fever


Day of illness
1 2 3 4 5 6 7 8 9 10
Temperature
104
103
102
101
100
99
98
Scarlet fever
Rash
Sore throat

Rash is

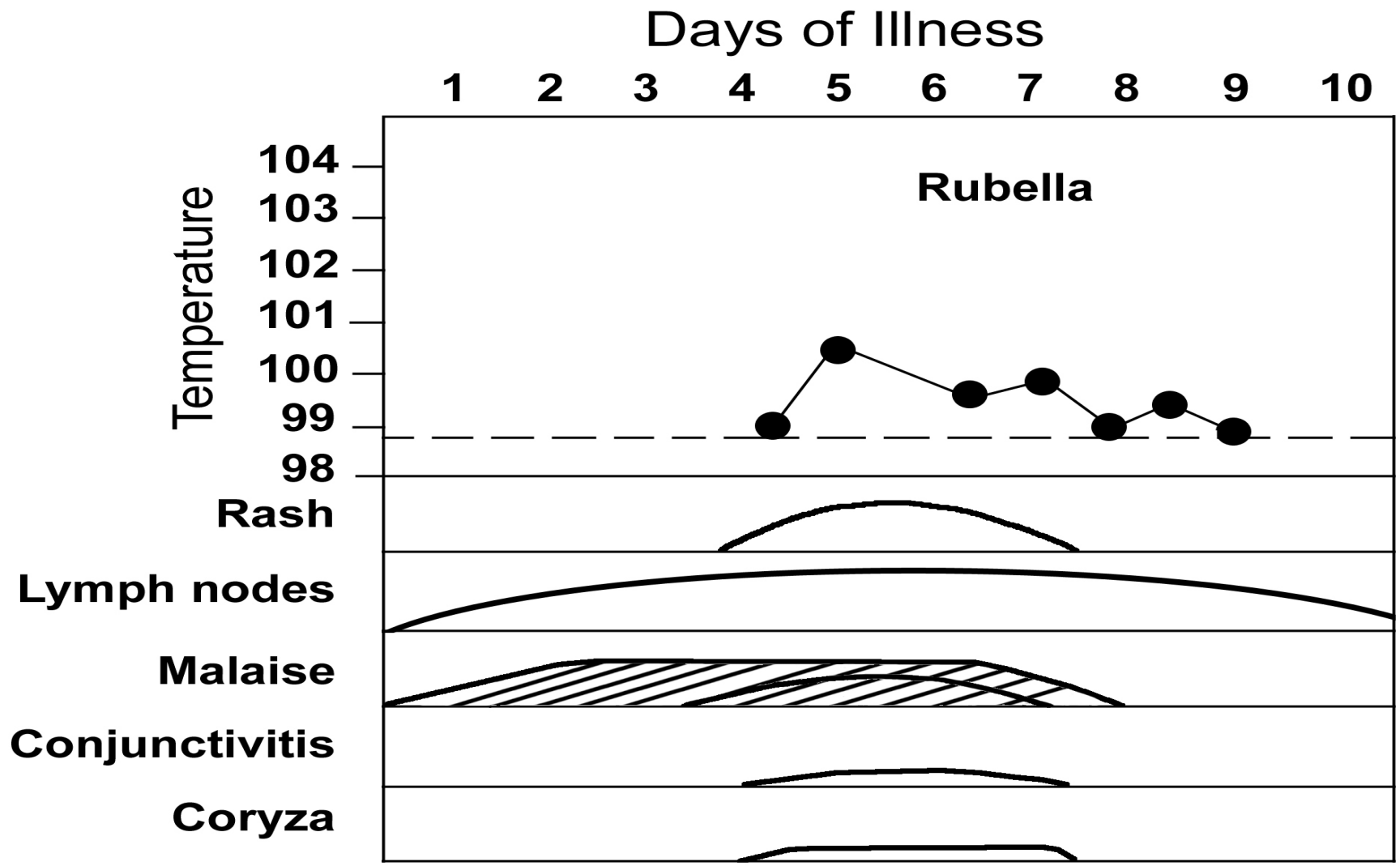
- Generalized
- Erythematous
- Blanching
- Finely papular
  - Sandpaper

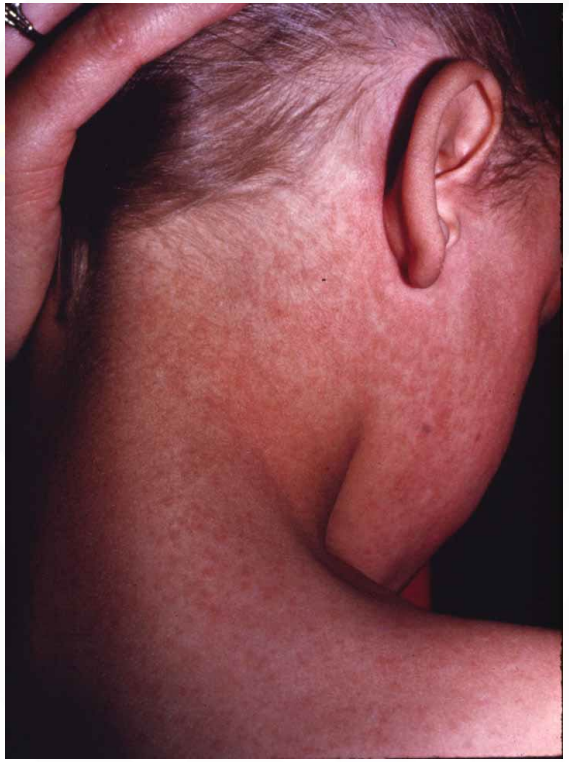
https://healthjade.net/scarlet-fever/

- Pastia's lines

https://healthjourney.net/scarlet-fever/

Rubella


Days of Illness
1
2
3
4
5
6
7
8
9
10
Temperature
104
103
102
101
100
99
98
Rubella
Rash
Lymph nodes
Malaise
Conjunctivitis
Coryza



- Posterior cervical adenopathy
- Rash is splotchy on first day, will become pinpoint as it moves down the body

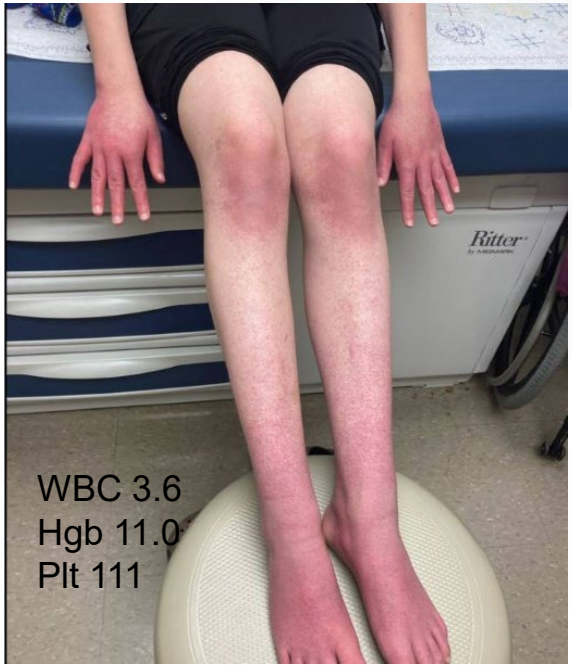
Congenital rubella syndrome

- Congenital rubella syndrome:
  - 20% of infants born to mothers infected during the first half of pregnancy
- Most common congenital defects:
  - cataracts
  - heart disease
  - sensorineural deafness
  - profound intellectual disability

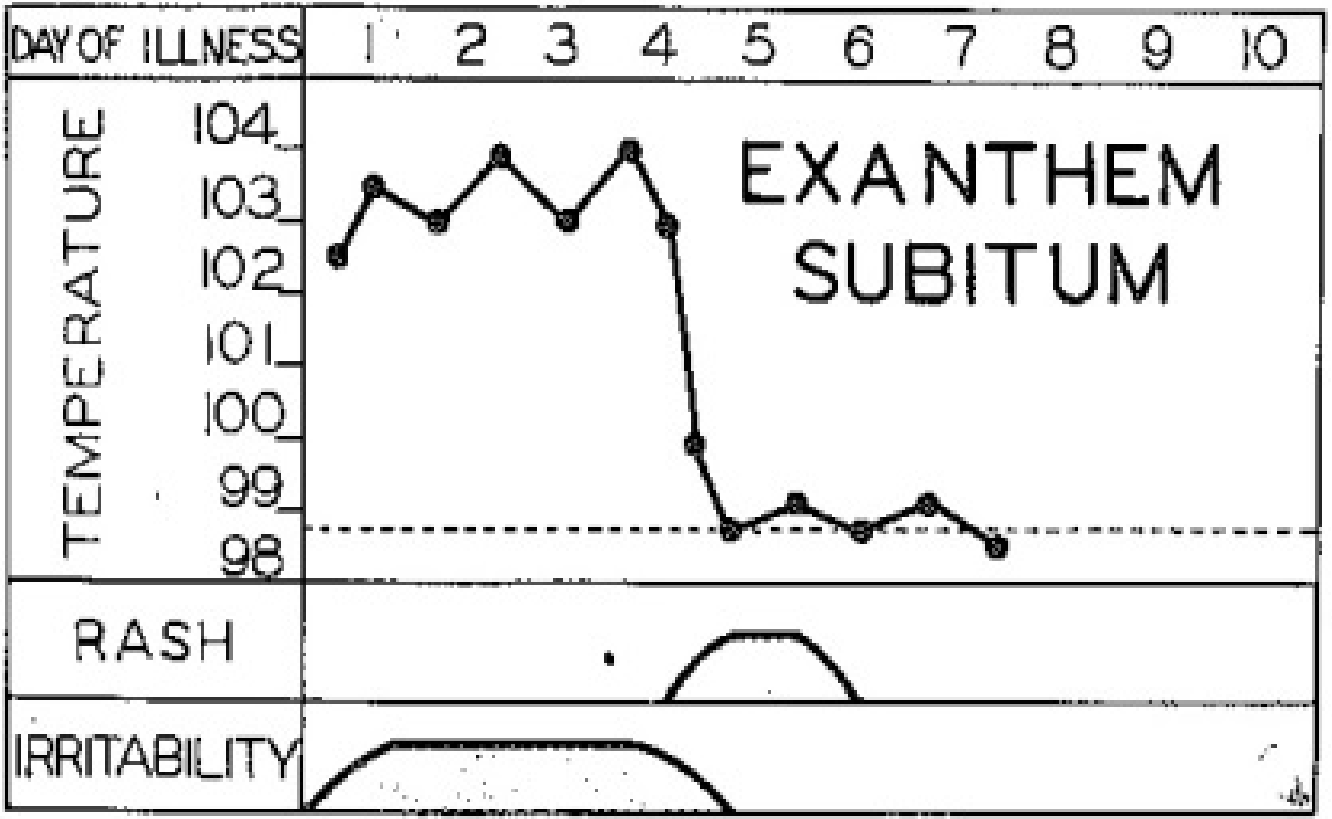
Erythema infectiosum

Fifth Disease

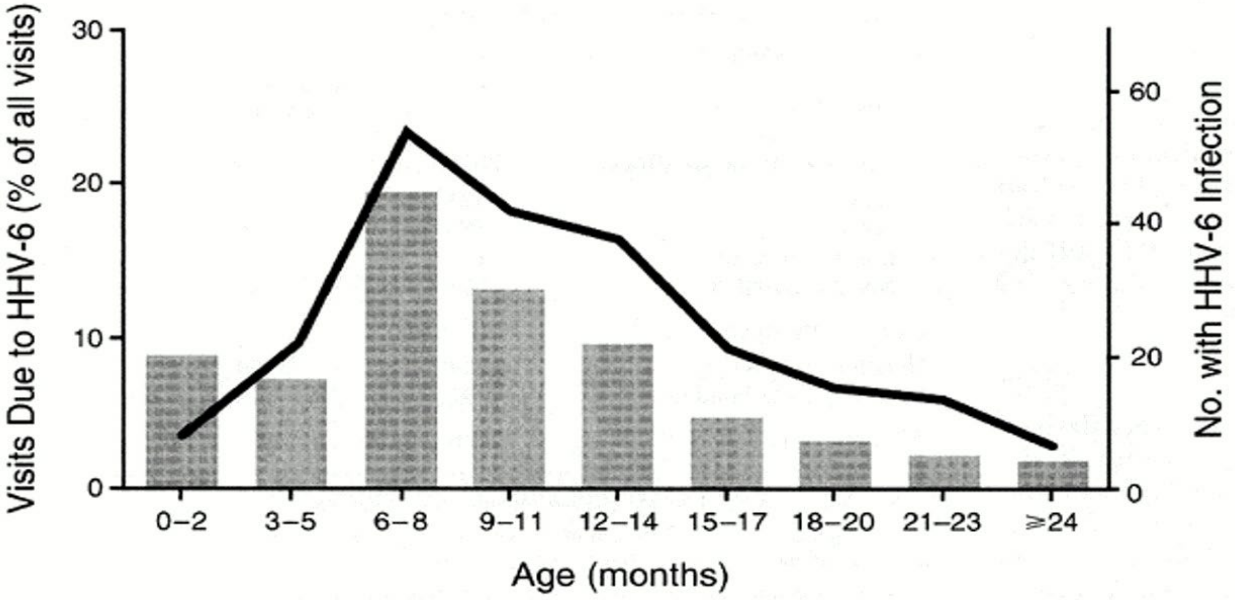
Baby with the typical "slapped-cheek" rash, which is characteristic of fifth disease.


WBC 3.6
Hgb 11.0
Plt 111

Roseola


DAY OF ILLNESS
1
2
3
4
5
6
7
8
9
10
TEMPERATURE
104
103
102
101
100
99
98
EXANTHEM SUBITUM
RASH
IRRITABILITY

Age of Roseola Infection (HHV-6)



Hall, C. B. et al. N Engl J Med 1994;331:432-438

Bordetella pertussis

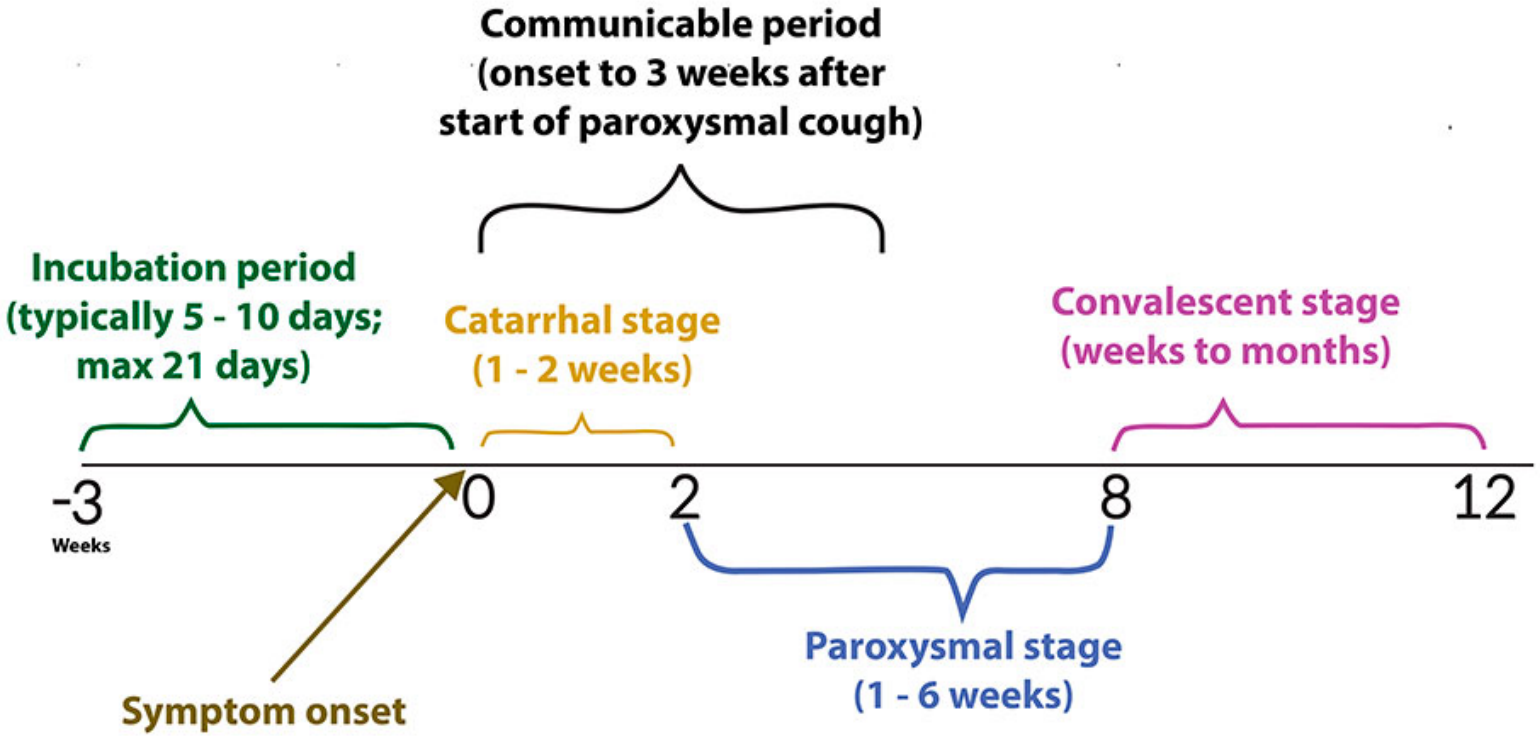
AKA *Whooping Cough*

Pertussis Disease Manifestations

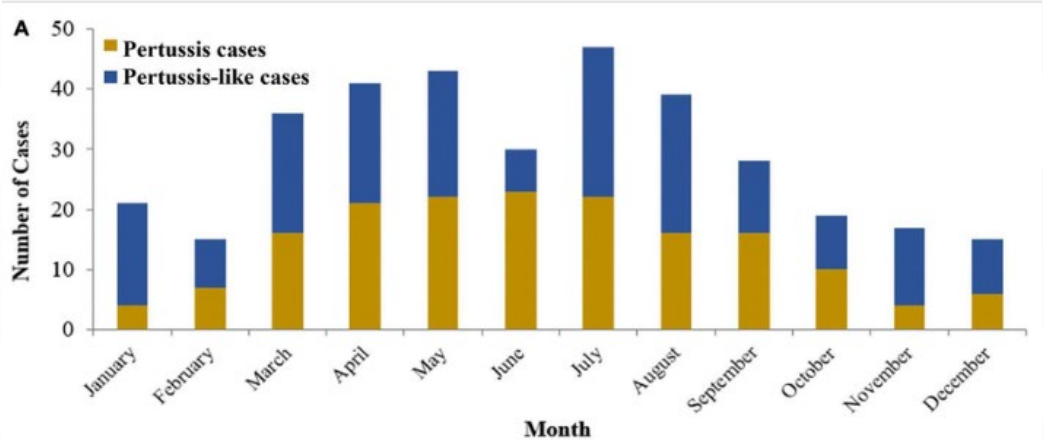
- Incubation period -- 7 - 10 days (range 4 - 21)
- Stages:
  - **Catarrhal**: runny nose, sneezing, low-grade fever, mild cough
  - **Paroxysmal**: severe spasms of cough, thick mucus, whoops, vomiting, exhaustion
  - **Convalescent**: gradual recovery with less frequent & less severe coughing

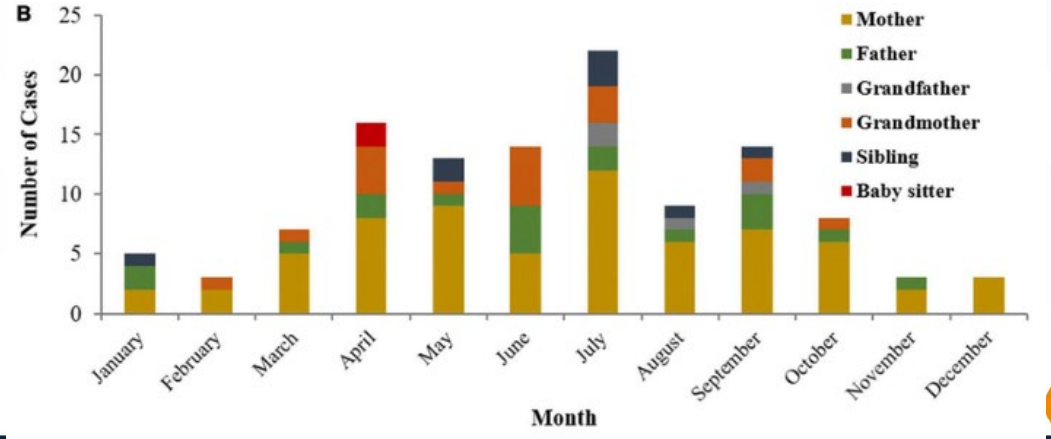
Photograph courtesy of the WHO

Pertussis Disease Progression



cdc.gov/pertussis



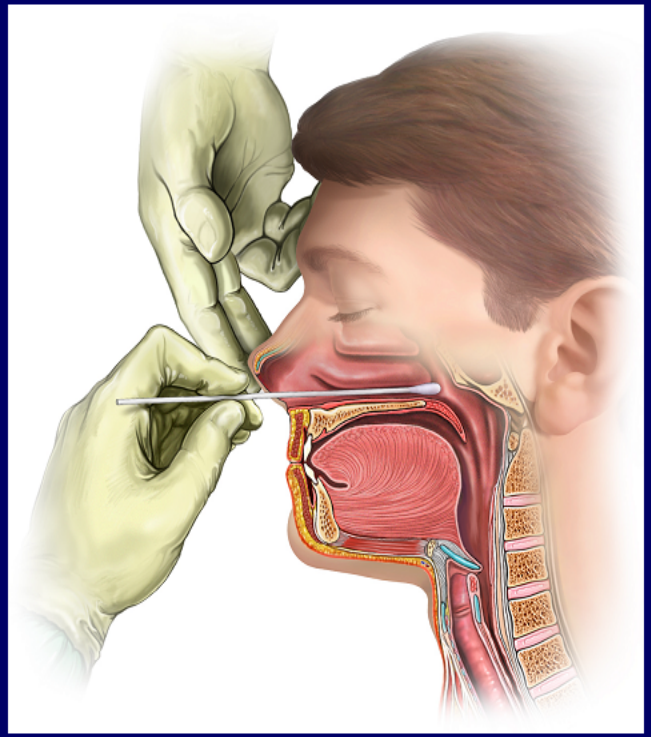


The distribution of pertussis cases (A) and positive household close-contacts (B) between 2018 and 2020.

https://www.researchgate.net/figure/MICs-of-9-antimicrobial-agents-against-130-B-pertussis-strains-isolated-from-index-cases_tbl2_362770852

Diagnostic Tests for Pertussis

- NP culture on special media (Regan-Lowe, Bordet-Gengou)
- PCR
- Serologic tests
- Increased WBC with an absolute lymphocytosis
- DFA—variable sensitivity/specificity



PEDIATRICS

Pediatrics 2005;115;1422-1427

The Epidemiology of Pertussis

James D. Cherry, MD, MSc

ABSTRACT. In the prevaccine era pertussis epidemics followed a cyclic pattern, with peaks every 2 to 5 years. With the marked reduction of pertussis by vaccination, the same cyclic pattern still occurs. Studies relating to reported pertussis and *Bordetella pertussis* infection have been reviewed and analyzed. The increase in reported pertussis over the last 2 decades is mainly due to a greater awareness of pertussis and perhaps to the use of several less efficacious vaccines.

Studies of prolonged cough illnesses in adolescents and adults reveal that 13% to 20% are a result of *B pertussis* infection. Serologic studies suggest that the rate of *B pertussis* infection in adolescents and adults is ~2.0% per year. The rate of cough illnesses (pertussis) caused by *B pertussis* infection in adolescents and adults is between 370 and 1500 per 100 000 population. These data suggest that there are between ~800 000 and 3.3 million cases per year in the United States.

The coming availability of adolescent- and adult-formulated diphtheria and tetanus toxoids and acellular pertussis vaccines for adolescents and adults and their widespread use should reduce the reservoir of *B pertussis* disease. It is suggested that a universal program of adolescent and adult boosters would decrease the circulation of *B pertussis* in these age groups and possibly could lead to the elimination of the organism from the population. *Pediatrics* 2005;115:1422–1427; *pertussis, Bordetella pertussis, adult pertussis, adolescent pertussis, pertussis, epidemiology.*

…there are between ~800,000 and 3.3 million cases per year in the United States.

Prolonged Cough Illness in Adolescents and Adults Due to *Bordetella pertussis*

Source	Locale	Year(s)	% of cough illness
Nennig et al	San Francisco	1994-95	12
Strebel et al	Minn-St Paul	1995-96	13
Jackson et al	Seattle	1983-87	15
Jansen et al	San Diego	1993-94	17
Birbeback et al	Denmark	1995-97	17
Wright et al	Nashville	1992-94	21
Robertson et al	New S Wales	1985-86	26
Mink et al	Los Angeles	1986-89	26
Rosenthal et al	Chicago	1993-94	26
Wirsing v Köenig et al	Germany	1992-94	31
Schmitt-Grohé et al	Germany	1992-94	32
Vicent et al	Korea	1997-98	50
Gilberg et al	Paris	1999	52

Healthcare Professionals Involved in Transmission of Pertussis

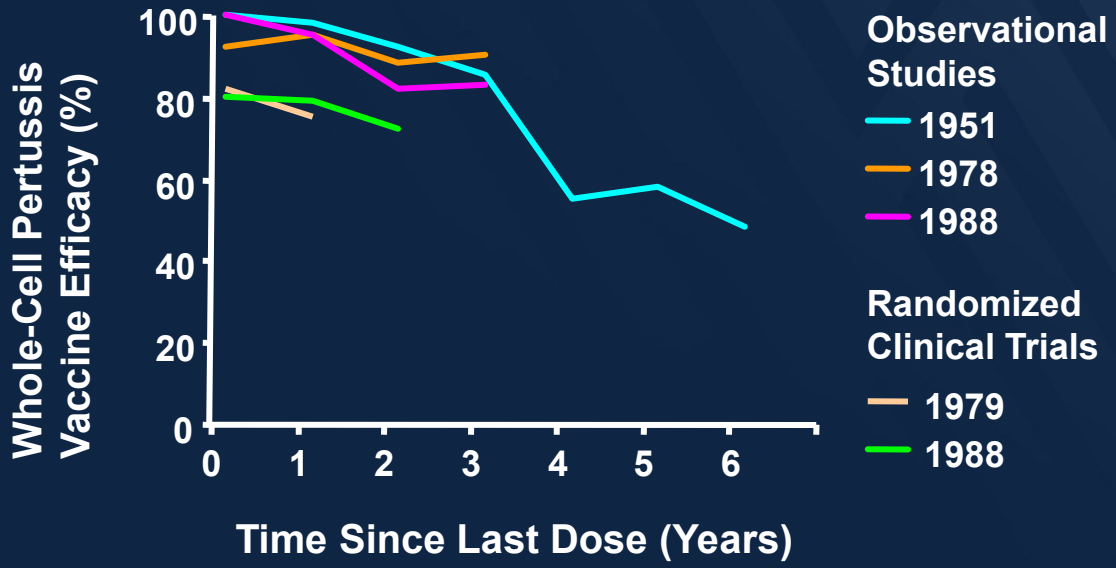
• Physicians	1912	Schwenkenbecher
• Nurses	1972	Kurt et al
• Physicians	1992	Etkind et al
• Nurses	1995	Christie et al
• Nurses	1997	Matlow et al
• Nurses and Physicians	2005	CDC

Schwenkenbecher, 1912;
Kurt et al. *JAMA.* 1972;221(3):264-7;
Etkind et al. *Am J Dis Child.* 1992;146:173-6;
Christie et al. *Infect Control Hosp Epidemiol.* 1995;16:556-63;
Matlow et al. *Infect Control Hosp Epidemiol.* 1997;18:715-16;
CDC. *MMWR.* 2004;54(03):67-71

Change from DwPT to DaPT

- Whole-cell vaccine was associated with:
  - a high rate of common side effects, including high fever, local pain, and swelling
- Public concern grew over rare events:
  - febrile seizures and acute encephalopathy
  - later studies did not find a definitive causal link between the vaccine and permanent brain damage, the resulting "vaccine scare" led to a significant drop in vaccination coverage in many countries

Waning of Vaccine-Induced Immunity



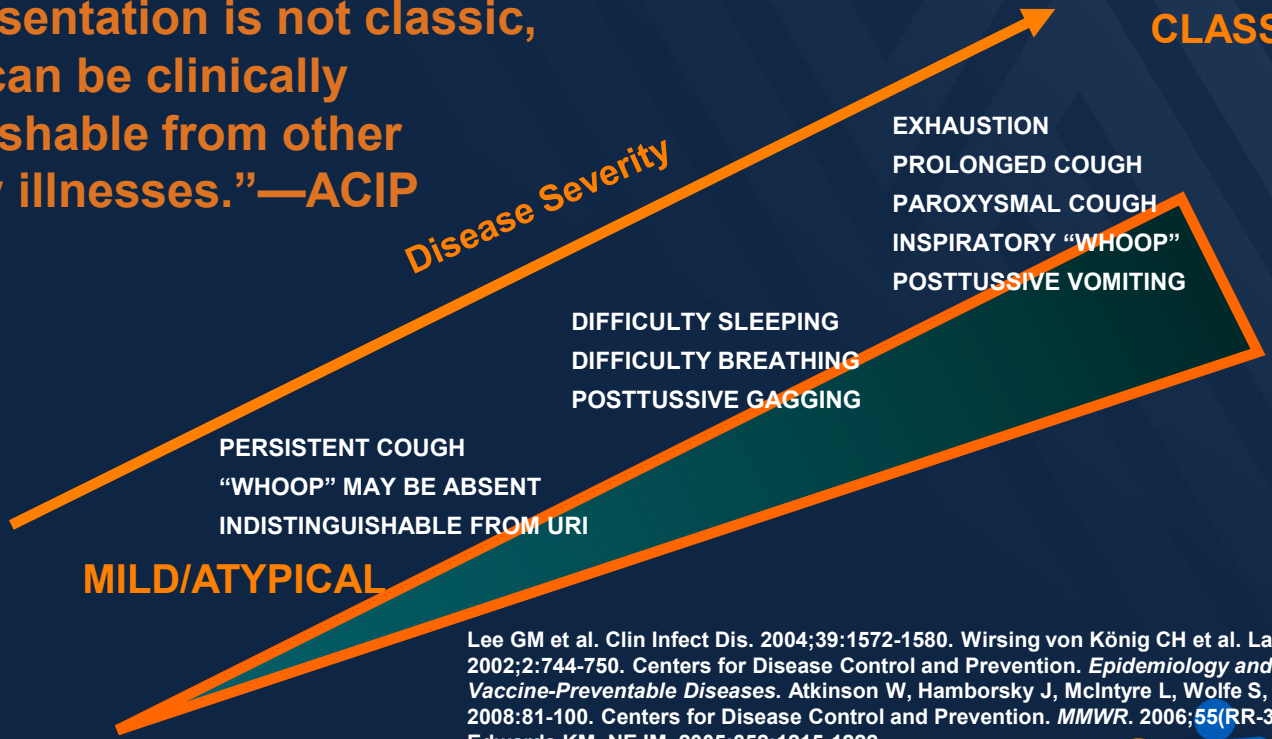
Strebel P. *Infect Med.* 1996;13:S33-S41.

DaPT/Tdap Vaccine

- Safe
  - 92% (95% CI, 32%-99%) effective at preventing pertussis infection
- Case-control study of adolescents conducted during an epidemic:
  - Tdap vaccine efficacy was 73% (95% CI, 60%-82%) within 1 year of vaccination
  - Declined to 34% (95% CI, −0.03% to 58%) after 2 to 4 years

Pertussis Diagnosis Can Be Overlooked

"When presentation is not classic, pertussis can be clinically indistinguishable from other respiratory illnesses."—ACIP



Lee GM et al. Clin Infect Dis. 2004;39:1572-1580. Wirsing von König CH et al. Lancet Infect Dis. 2002;2:744-750. Centers for Disease Control and Prevention. *Epidemiology and Prevention of Vaccine-Preventable Diseases*. Atkinson W, Hamborsky J, McIntyre L, Wolfe S, eds. 10th ed. 2008:81-100. Centers for Disease Control and Prevention. *MMWR*. 2006;55(RR-3):1-43. Hewlett EL, Edwards KM. NEJM. 2005;352:1215-1222.

Common Clinical Manifestations of Adolescent-Adult Pertussis

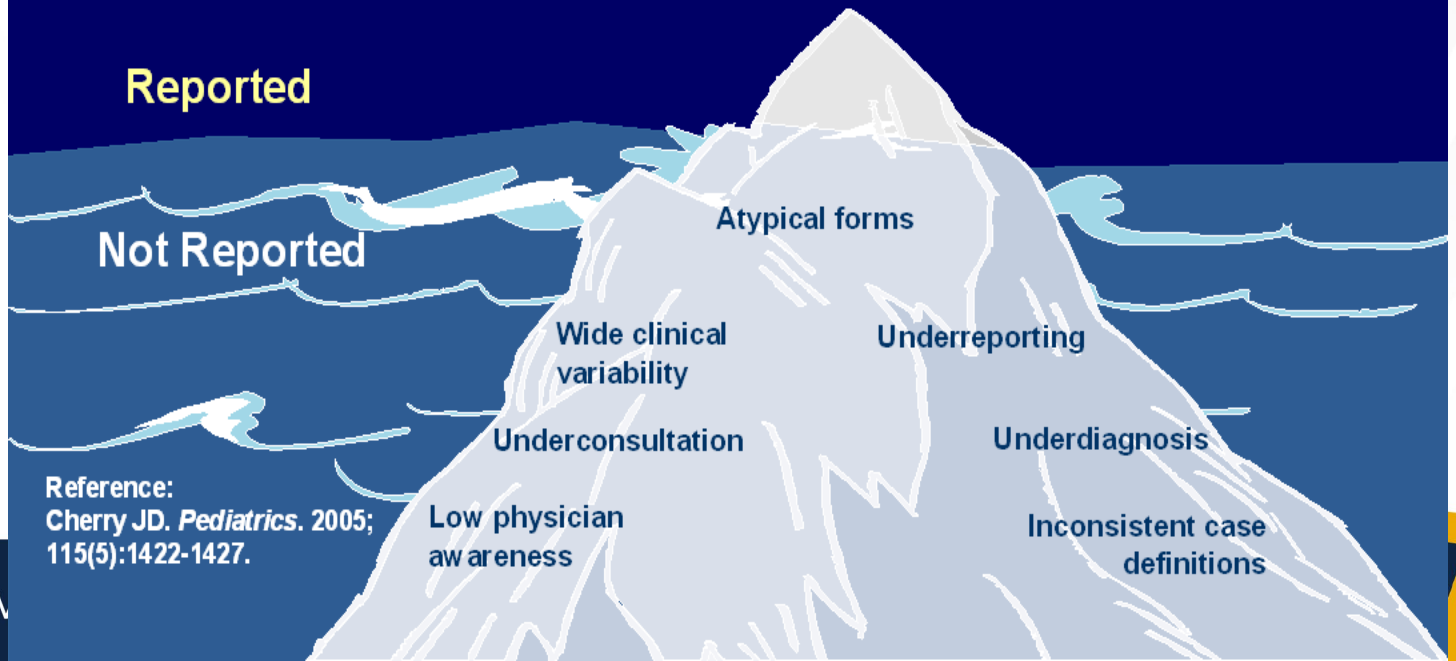
- Cough 97% ≥ 3 weeks, 52% ≥ 9 weeks
- Paroxysms ≥ 3 weeks in 73%
- Whoop in 69%
- Post-tussive emesis in 65%
- Teens missed average 5 days of school;
  Adults missed average 7 days of work
- Average 14 days of disrupted sleep

https://www.youtube.com/shorts/31tnXPlhA7w

De Serres et al. *J Infect Dis*. 2000;182:174–9.
Rutledge RK, Keen EC.NEJM Jul 13, 2012.
Cornia, PB, Lipsky BA. JAMA 2026; 335; (12):1084-85

Reported Pertussis Cases Are the Tip of the Iceberg

- Nationwide, a small percentage of pertussis cases are actually reported
- Underreporting may be greatest among adolescents and adults



Reference:
Cherry JD. *Pediatrics*. 2005; 115(5):1422-1427.

WVUMedicine
GolisanoChildren's

Always be thinking about pertussis…..

WVUMedicine
GolisanoChildren's

Having the Right Tools…

TOP 10 List

1 MMR vaccines are safe.

Since 1971, estimated > 100 million infants receive MMR annually.
No serious safety concern has been identified.

U.S. Vaccine Safety System

System	Collaborators	Description
Vaccine Adverse Event Reporting System (VAERS)	CDC and FDA	Frontline spontaneous reporting system to detect potential vaccine safety issues
Vaccine Safety Datalink (VSD)	CDC and 9 Integrated Health Care Systems	Large linked database system used for active surveillance and research ~9.4 million members (~3% of US pop.)
Clinical Immunization Safety Assessment (CISA) Project	CDC and 7 Academic Centers	Expert collaboration that conducts individual clinical vaccine safety assessments and clinical research
Post-Licensure Rapid Immunization Safety Monitoring Program (PRISM)	FDA and 6 partner organizations	Large distributed database system used for active surveillance and research ~170 million individuals

Decades of Vaccine Safety Data

- Reactions after vaccination may include
  - Injection site reactions: pain, redness, and/or swelling in the arm where the shot was given
  - Systemic: fever, headaches
- Brief fainting spells (syncope) and related symptoms (such as jerking movements) can happen:
  - soon after any injection
- Patients should be seated (or lay down) during vaccination and remain in that position for 15 minutes

Gee, et al. Hum Vaccin Immunother. 2016.

2 Vaccines do not cause serious side effects.

Vaccine have been tested in numerous clinical trials and **proved to be safe; they continue to be monitored for safety**. No deaths have be causally linked to vaccination. No link of MMR to autism. No link of thiomersol to autism.


Death
SEX
Too early
Not my child
Parents don't want their
child Vaccinated
Autism
BUST MYTHS WITH
FACTS
Awkward Conversation

3 The vaccines cause NO fertility issues.

There are no data to suggest that getting any vaccine will have a negative effect on future fertility.

4 Vaccines contain NO harmful ingredients.

Vaccines contain ingredients that have proven to be safe. The vaccine that contain aluminum adjuvant in quantities less that breast milk, infant formula, antacids and even fruits and vegetables*.

* MMR is a live-attenuated vaccine, contains no aluminum adjuvant.

5 The Tdap booster is necessary, regardless of previous infection (or vaccination).

Protection after vaccination wanes within 3-7 + years, after 15 years from natural pertussis disease.

6 Vaccines are for males and females, babies, kids, & adults.

All ages need protection. Tdap important to prevent pertussis in older adults, and to protect infants not yet old enough to be vaccinated “cocoon”.

7

Two vaccines are effective in preventing cancer. One prevents congenital infection. Prenatal (2^{nd}/3^{rd} trimester) vaccination is recommended to prevent neonatal infection

HPV vaccine and Hep B prevent cancer
MMR-V prevents congenital infection
Prenatal: Tdap, Influenza/Covid, RSV

8

Many people do not know diseases that now are prevented by vaccination.

Most Americans born after the mass polio vaccination efforts (late 1950s onward) have no personal memory of the disease's severity, often viewing it as "ancient history." This lack of direct understanding is cited by health experts as a factor in modern vaccine hesitancy..

Can Americans relate to either image of effects of Polio sequelae?

I ask these ~~3~~ 5 questions?

- Do you know someone who has had an abnormal PAP smear?
- **Do you recommend** ?
- **PAP smears?**
- head & neck cancer?


HPV-16

HPV-16

9 Effectively recommending the vaccines takes less than a minute.

Recommending all vaccines the **same day** and the **same way** as is effective and takes minimal time.

Not be wishy/washing

Listen to concerns, answer truthfully

2 Sentences

….. needs three vaccines today to protect against whooping cough, HPV cancers & meningitis.

He/She will get those at the end of the visit…..

10

After primary infection and recovery from Measles, children can still die.

Immunodeficiency can last > 1 year after measles.

Subacute sclerosing panencephalitis (SSPE): fatal, progressive brain disorder; develops 7–10 years after a person has fully recovered from measles. 1/1000-1/2500

Questions?