



# Measles Update for Clinicians: Where We Are Now & What to Expect

April 25, 2024





# Speakers

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# Objectives

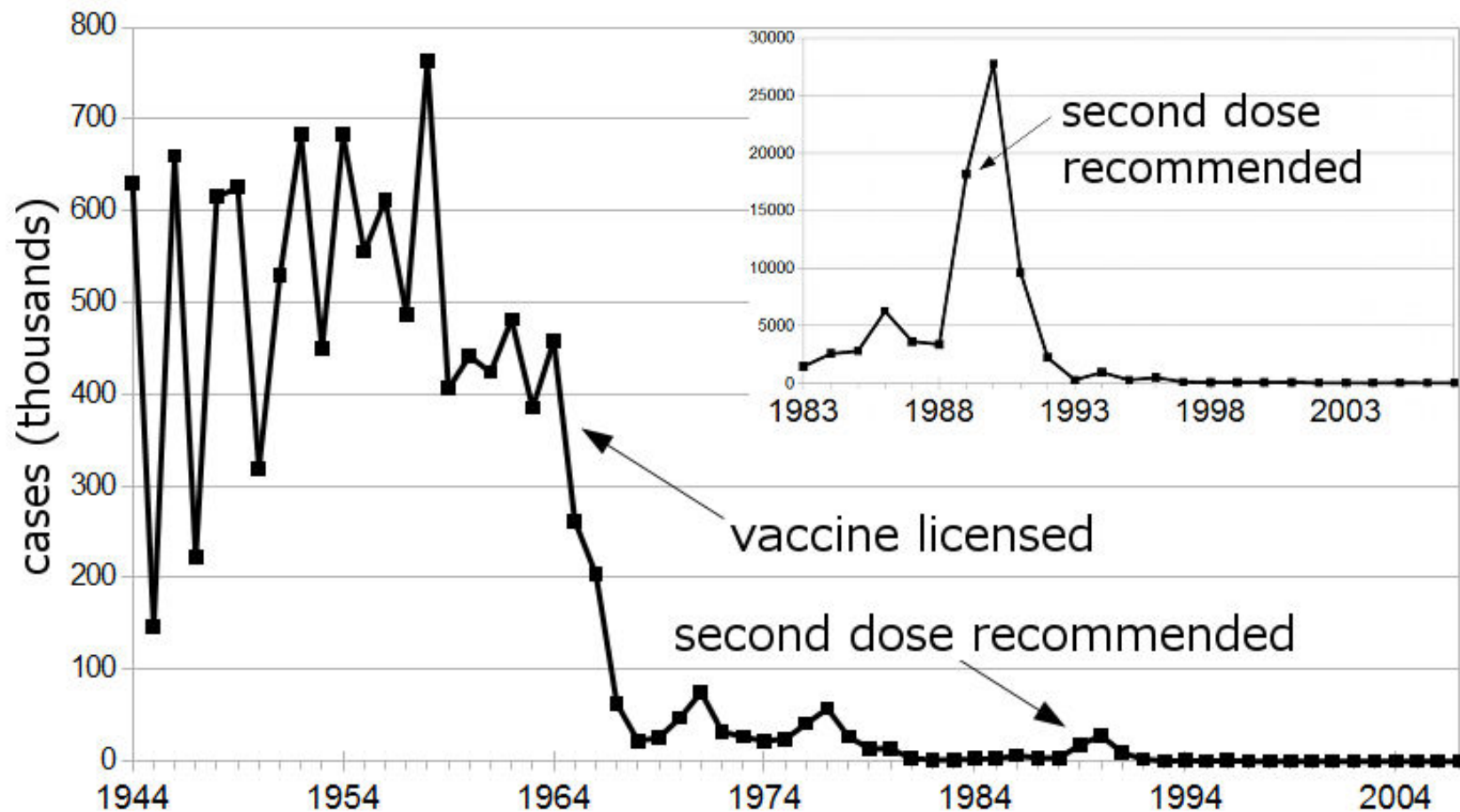
1. Understand recent epidemiology and transmission of measles in US and Illinois
  2. Review clinical presentation of measles
  3. Review prevention of measles through vaccination
  4. Update on current Chicago measles outbreak
  5. Review updated MMR guidance
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# **Measles Epidemiology and Transmission**

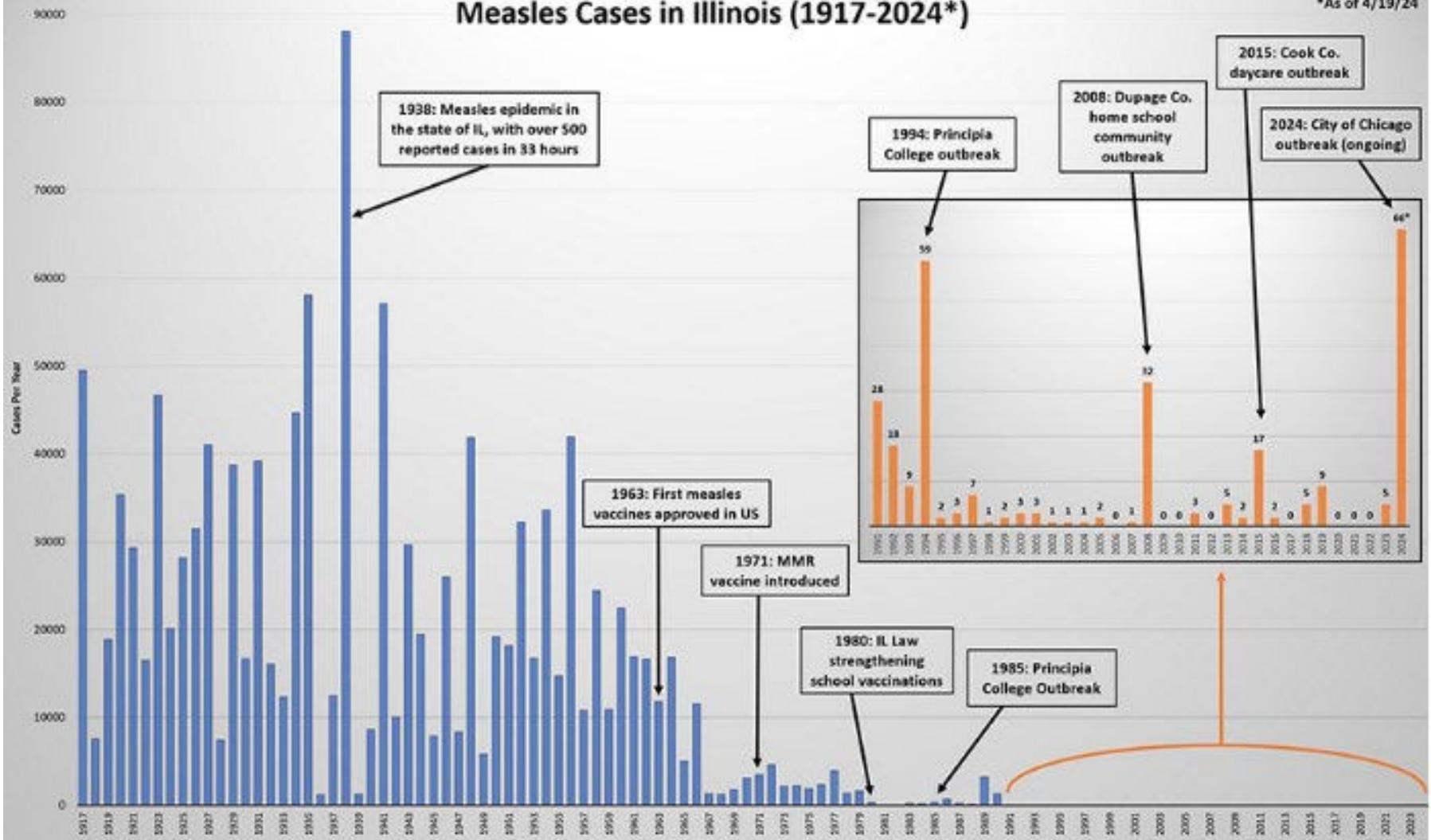


# Measles cases in the United States, 1944-2007

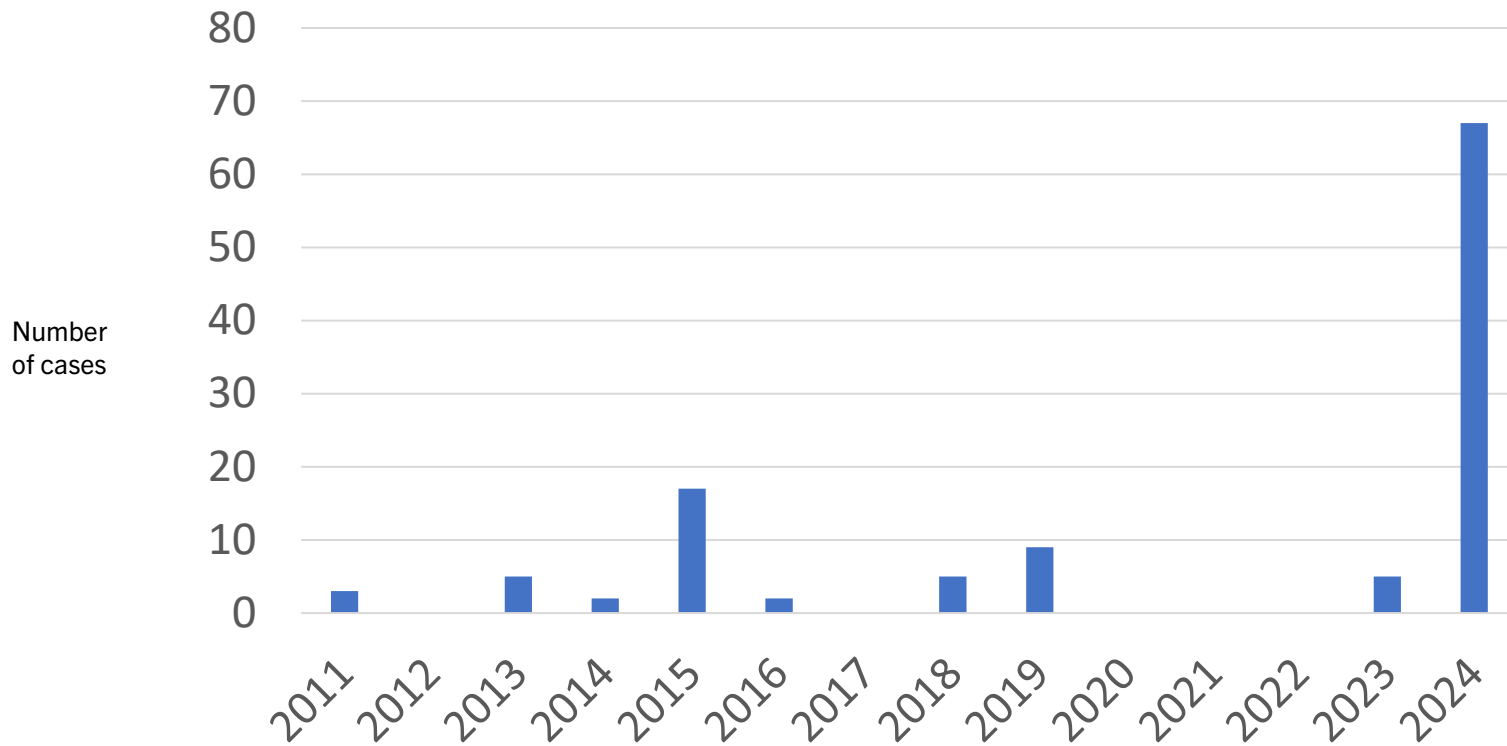


# Measles Cases in Illinois (1917-2024\*)

\*As of 4/19/24



# Measles cases—Illinois, 2011-2024



# Measles Cases - Illinois, 2024

JURISDICTION	NUMBER OF CASES
Chicago	61
DuPage	1
Suburban Cook	2
Lake	1
Will	2



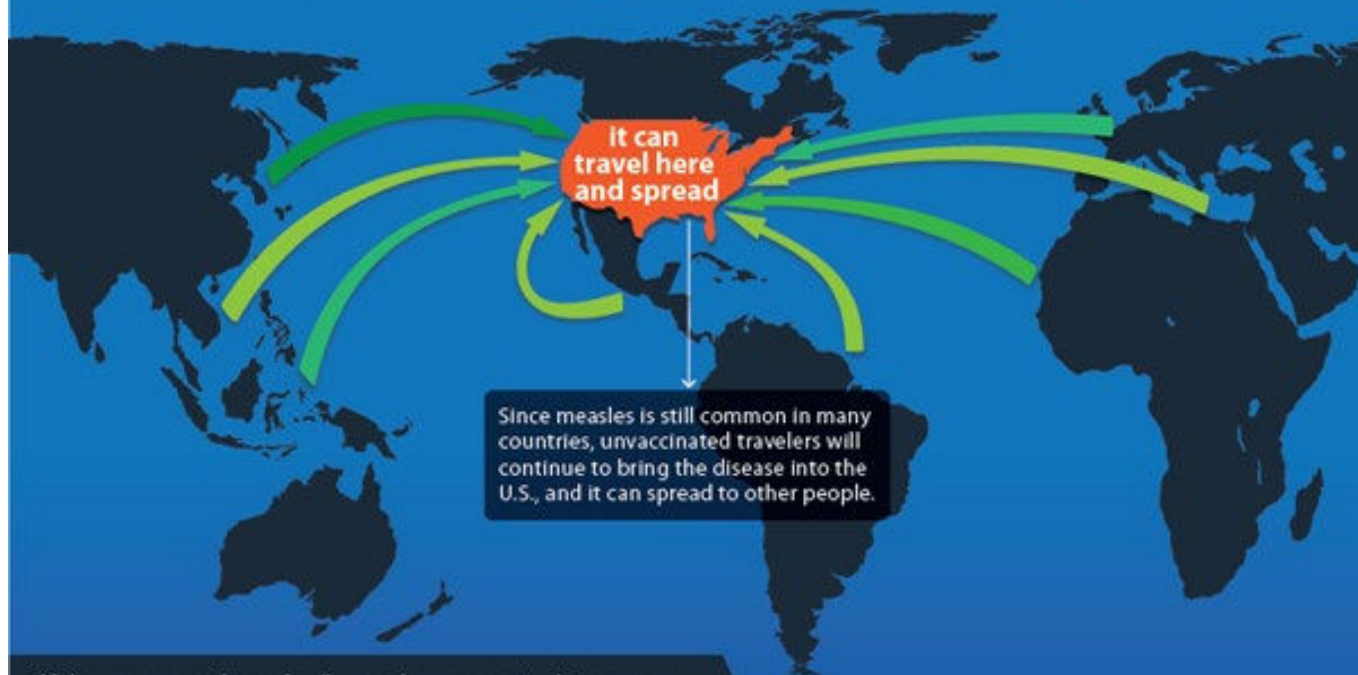
# Measles Facts

- In 2000, measles elimination was documented and verified in the United States.
- Measles is still common in many parts of the world including some countries in Europe, the Middle East Asia, the Pacific, and Africa.
- Travelers with measles continue to bring the disease into the U.S.
- The majority of people who get measles are unvaccinated.
- Measles can spread when it reaches a community in the U.S. where groups of people are unvaccinated.



# Get Vaccinated: Prevent and Stop Measles Outbreaks

When measles happens anywhere in the world...



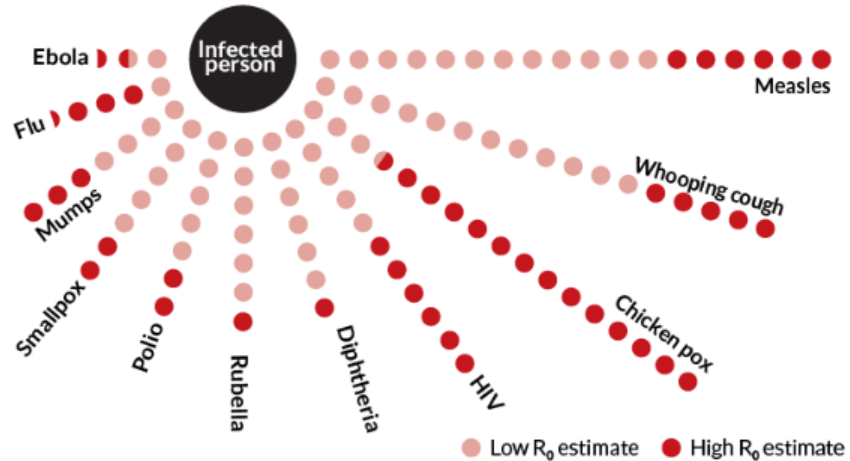
Make sure you and your family members are up-to-date on your measles-mumps-rubella (MMR) vaccine, including before traveling internationally. Ask your doctor if everyone has received all recommended doses of MMR for best protection against measles.

[www.cdc.gov/features/measles/](http://www.cdc.gov/features/measles/)



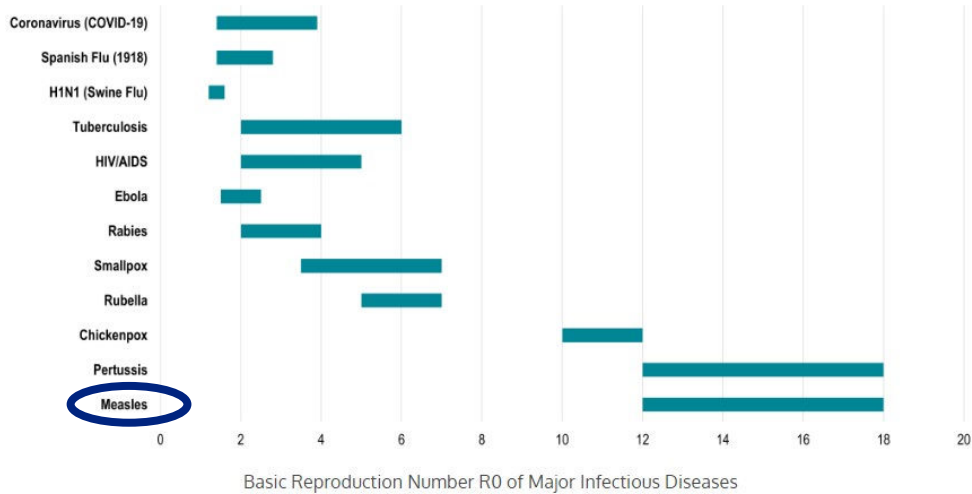
# Transmission

- Transmitted via airborne route by droplet spread or direct contact with nasal or throat secretions of an infected person.
  - Coughing, sneezing
  - Contaminated surfaces
  - Airborne droplets can be present up to 2 hours after case has left the room
  - Highly contagious; approximately 9 out of 10 non-immune persons with close contact to a measles patient will develop measles.



CREDIT: T. TIBBITS; SOURCES: P. FINE/EPIDEMIOLOGICAL REVIEWS, 1993; S. HAY ET AL./PHILOSOPHICAL TRANSACTIONS OF THE ROYAL SOCIETY B, 2013; G. CHOWELL AND H. NISHIURA/BMC MEDICINE, 2014

# Basic Reproduction Number (R0) of Major Infectious Diseases



Source: CDC and WHO.

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Up to **9** in **10** people who lack immunity to measles and are close to an infected person will become infected



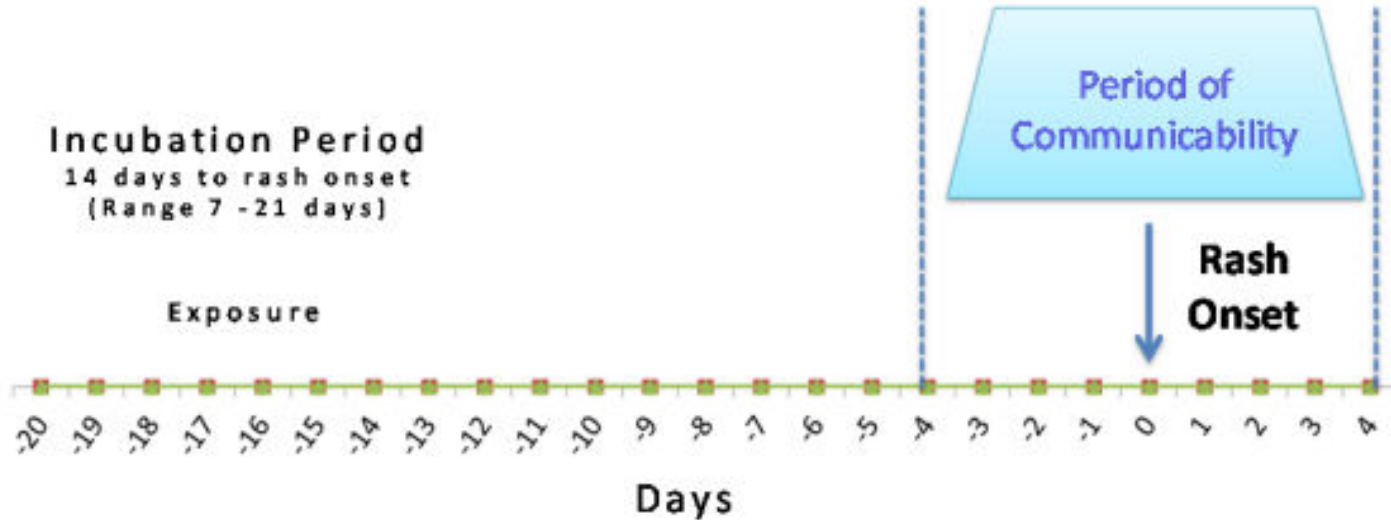
## **Period of Communicability**

Typically, about 4 days before rash onset to 4 days after rash appearance.

- (Rash onset is day 0)

Immunocompromised patients are considered infectious for the duration of their illness.

# Measles Disease Progression





# **Clinical Presentation of Measles**





# Measles

## Symptoms:

- prodrome of fever (often exceeds 102°F),
- Cough, coryza, or conjunctivitis (3 C's),
- may have Koplik spots,
- maculopapular rash (usually begins at hairline and moves downward)



# Measles – Clinical Case Definition

- Fever (up to 105°F)

AND

- Rash

AND

- At least one of the “3 C’s”

- Cough
- Coryza (runny nose)
- Conjunctivitis



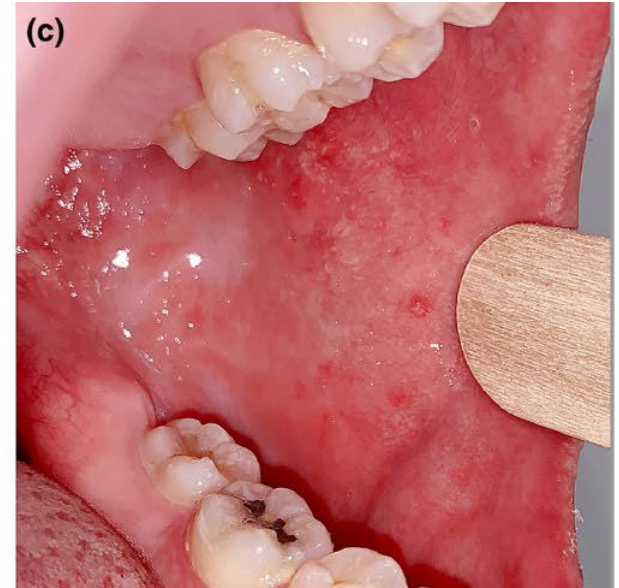
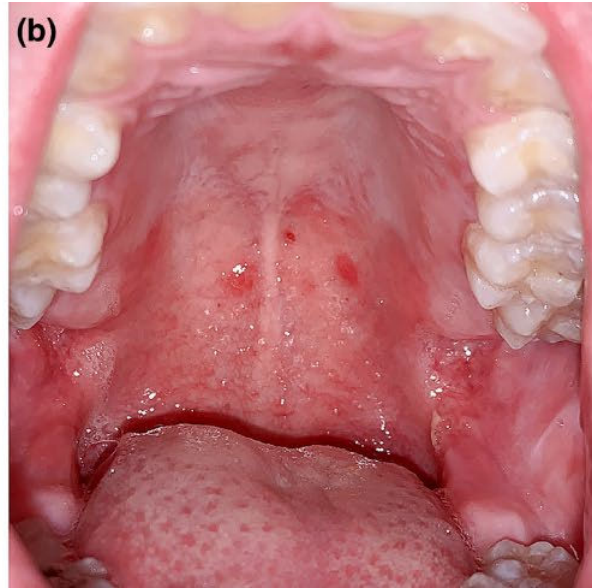
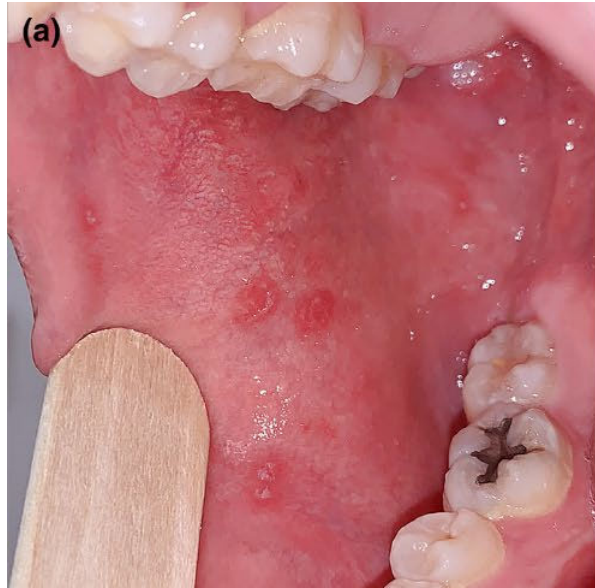
Measles rash



Measles conjunctivitis

<https://healthjade.com/measles>

# Koplik spots in buccal mucosa, but can be on palate too!



# Measles Rash

May be just a little itchy!

- Typical presentation:
  - Starts on face, at hairline, or behind ears
  - Spreads downwards to neck, trunk, extremities
  - Maculopapular
    - › Small raised or flat red bumps
    - › Spots may join together as the rash spreads
  - Not usually itchy
  - Koplik spots may be present on buccal mucosa



Koplik Spots

<https://www.nhs.uk/conditions/measles>

# Measles Rash



CDC, COCA Call, Aug. 2023



# Measles rash on more pigmented skin



# Measles rash on more pigmented skin



Rash may  
slough

# Many measles mimics

- Coxsackie virus-not always just hand/foot/mouth
- Roseola
- MMR vaccine reaction- 7-12 days after MMR



Scarlet fever

<https://www.nhs.uk/conditions/scarlet-fever/>



Fifth disease

<https://health.clevelandclinic.org/when-your-childs-chapped-cheeks-may-actually-be-fifth-disease-slap-cheek/>



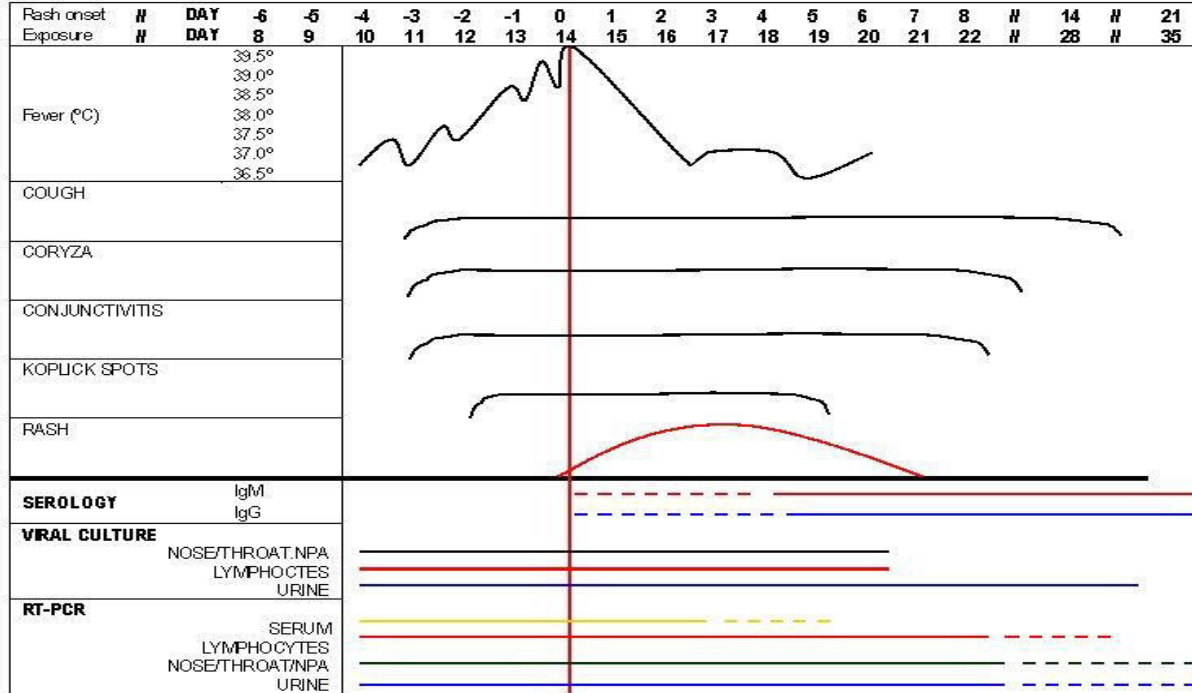


RASH ONSET



CLINICAL SYMPTOMS

LABORATORY INVESTIGATIONS





# Modified measles in someone who had been immunized



Fever may not be as high

May not have all 3 Cs

Rash may not descend as much as usual





# Vaccine Reactions

- Fever and or Rash that occurs days 5-12 post vaccination with MMR
- Patients can have symptoms comparable to wild type measles-though milder
- PCR on the patient's throat swab will likely be positive for measles
- Additional testing (genotyping/MeVA) is needed to discriminate between vaccine strain and wild type strain
- Not infectious



# Complications of Measles Infection



## Common complications

Ear infections (7-9%)

Diarrhea (8%)



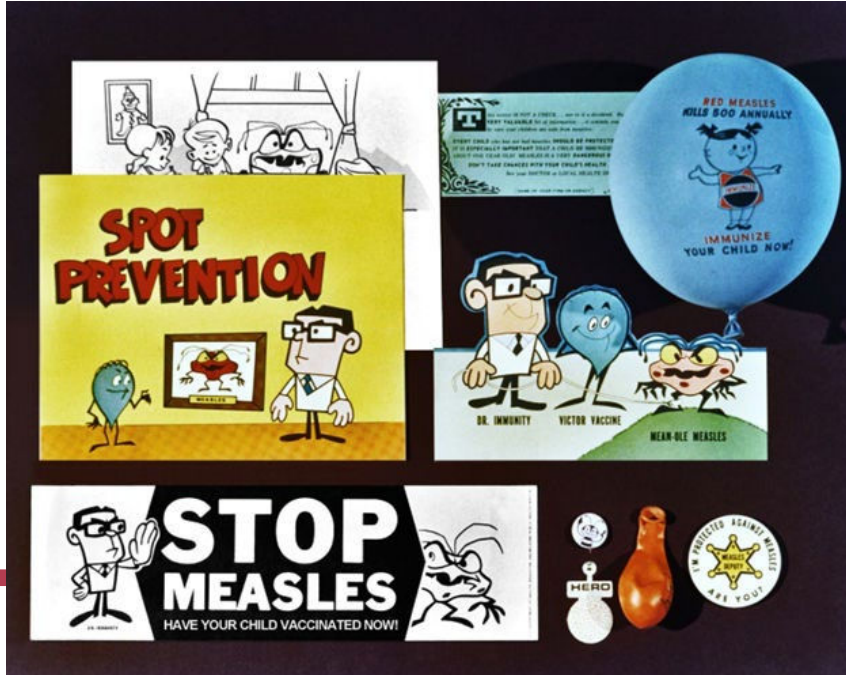
## Severe complications

Hospitalization (25%)

Pneumonia (1-6%)

Encephalitis (1 per 1000)

Death (1-3 per 1000)





# **Prevention through Vaccination**





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**“There’s a very easy fix and that’s getting vaccinated. It starts and ends with vaccination.”**

Dr. David Zhang  
Pediatric Infectious Disease  
Comer Children’s Hospital



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# Measles Vaccine

Schedule:

- 2 doses at 12 months and older, doses separated by 28 days
  - 1st dose recommended between 12-15 months of age
  - 2nd dose recommended at 4-6 years of age
- International travel: give MMR at 6-11 months
- Available vaccines
  - MMR: measles with mumps, and rubella
  - MMRV: measles with mumps, rubella and varicella





# Contraindications

People with a contraindication for MMR vaccine should not receive MMR vaccine, including anyone who:

- Had a severe allergic reaction after a previous dose or to a vaccine component
- Has a known severe immunodeficiency
- Is pregnant
- Has a history of anaphylactic reactions to neomycin





# Preparing your clinic



Ensure clinic staff up to date on immunization/proof of immunity



Last appointment



Call before you come in



Signage



Goal to limit exposure



drive by testing





# **City of Chicago Measles Update**

Alexander Sloboda, MD, MPH  
Medical Director CDPH



# CDPH Measles Dashboard

Data last updated 4/23/2024

Data are updated daily at 1 p.m. All data are provisional and subject to change.

## Chicago Measles Outbreak 2024

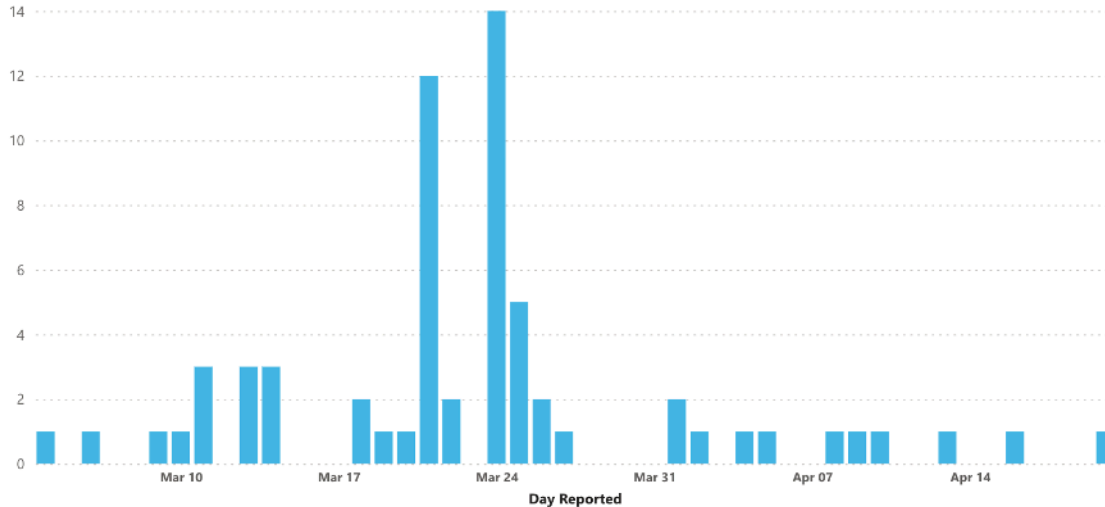
Cases This Year

64

Cases This Week: 04/21 - 04/27

0

### Cases by Date Reported



### Cases by Age Group

Age Group	Count	%
0 - 4 years	33	52%
5 - 17 years	9	14%
18 - 49 years	19	30%
50+ years	3	5%

# CDPH Measles Dashboard

Data last updated 4/23/2024. Counts include vaccinations administered through 4/21/2024 to account for reporting lags. Data are updated Tuesdays and Thursdays at 1 p.m. All data are provisional and subject to change.

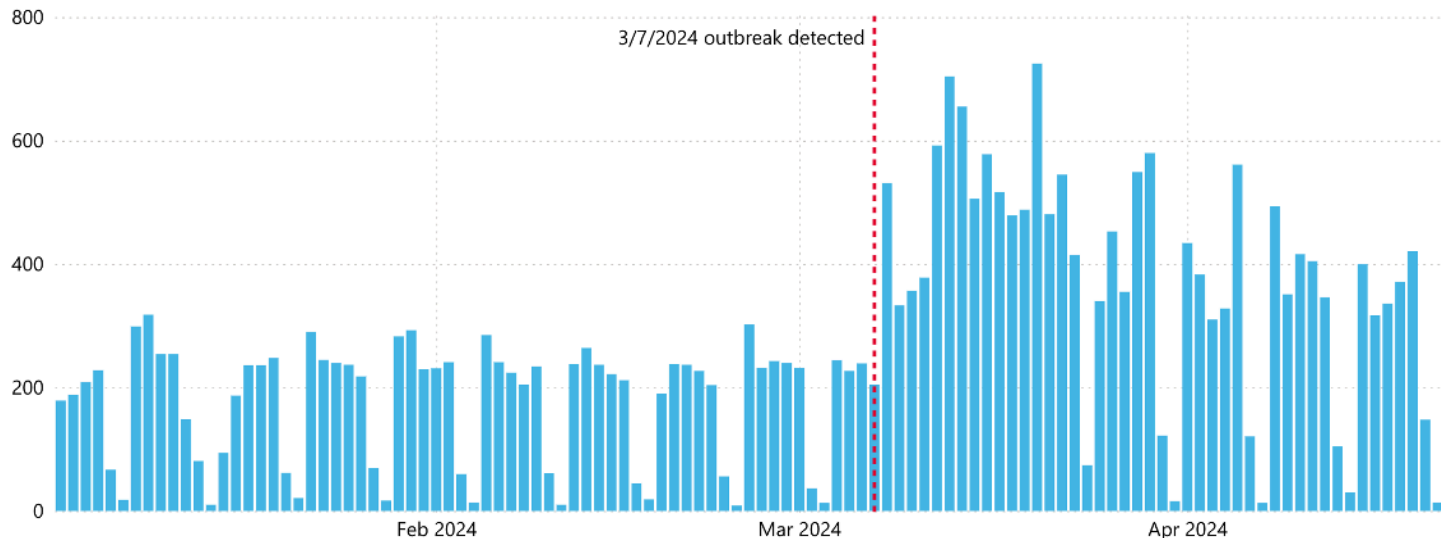
## Measles-Containing Vaccines Administered to Chicago Residents

[Click here to view vaccines administered in 2023 compared to 2024](#)

Doses Administered since 3/7/2024  
**17,282**

Doses Administered Last Week (4/14/2024 - 4/20/2024)  
**2,023**

### Vaccinations Administered by Day



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### 7-Day Rolling Averages of Doses Administered

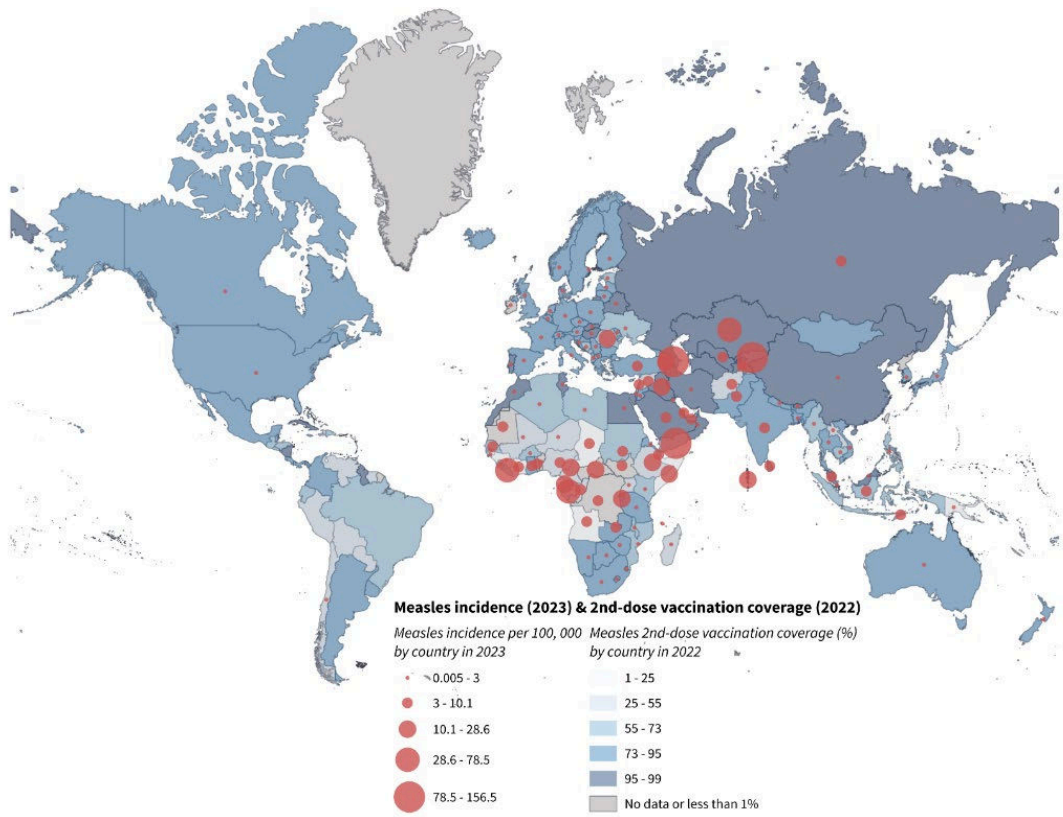
Year ● 2023 ● 2024



# Measles Outbreak Response

- From March 8 to April 23, CDPH and health care partners have administered **8,173 MMR doses** for New Arrivals throughout **22+ shelters** and landing zone.
  - Achieved over **95% 1st dose coverage** at Pilsen shelter March 8-10.
  - Achieved over **80% 2nd dose coverage** at Pilsen shelter April 8-10.
- CDPH and partners have performed over **100 vaccine events** for new arrivals throughout shelter system since March 8.
- Now vaccinating or verifying every new arrival with MMR at the landing zone prior to shelter placement.
- From March 7 to April 17, 2024: **9,123 MMR containing doses** have been administered in the community outside of new arrivals response.
  - Compared to 7,897 doses in 2023 during same period.

# BlueDot Global Measles Report 4/15





# Community Preparation

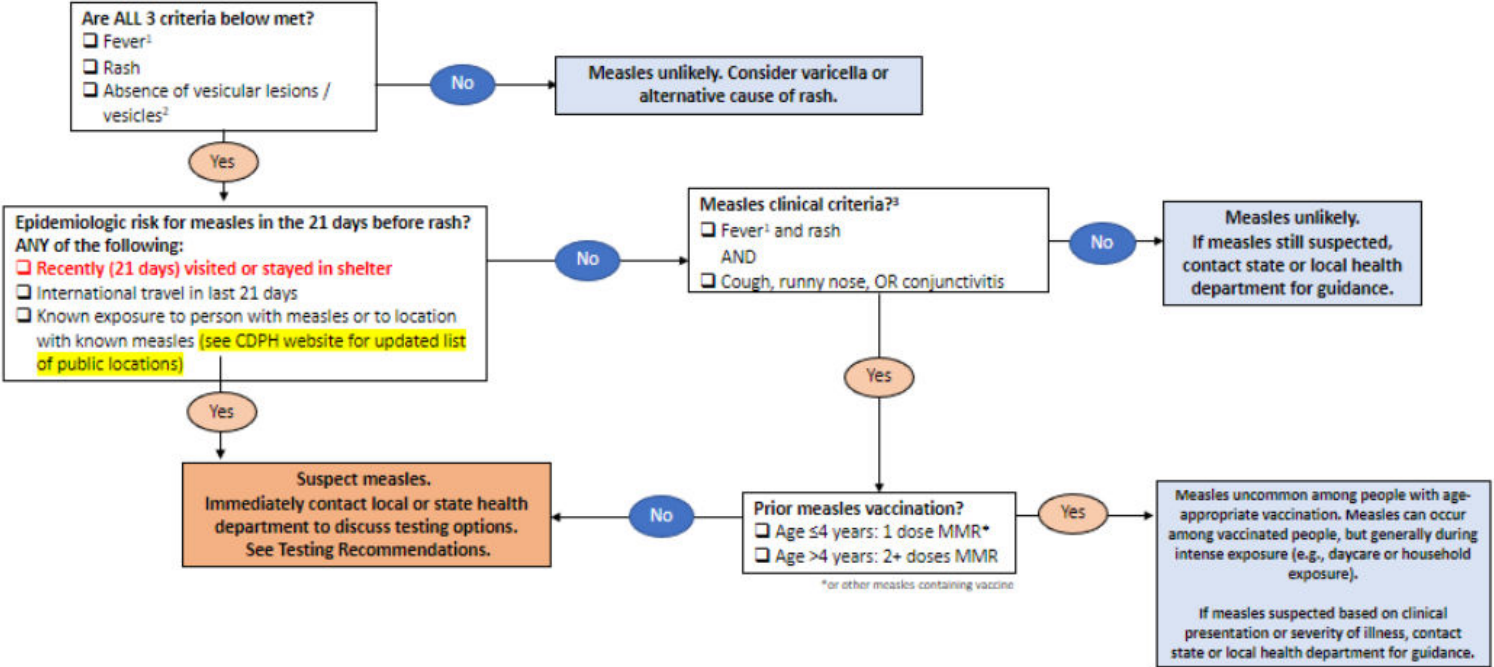
- Starting to see **community cases** geographically throughout Chicago and Chicagoland with no identifiable epidemiological link to New Arrivals or shelters.
  - **7 community cases** in Chicago with no direct link identified.
- We want to get all Chicagoans vaccinated and as protected as possible against measles prior to summer months.
- CDPH is currently partnering with city, state, and federal partners to advocate for additional adult MMR and Varicella doses for **uninsured adults**.
- Working with communities, schools, and childcare facilities on getting **children up to date and protected**.
- Chicago will receive a lot of **domestic and international visitors** this summer.
  - Lollapalooza, NASCAR, Democratic National Convention.
  - Expecting surge of New Arrivals in the coming months.

# MMR and Routine Vaccines

- This is the **pivotal teaching moment** from providers.
- Routine childhood vaccine (including MMR) protects against roughly **20 different life-threatening diseases** and prevents disease outbreaks.
  - Protect children when they are young and most vulnerable.
- Measles was declared eliminated in the USA in 2000 because of strong childhood vaccination program in the USA.
- Looking at cohort of children born in 2017, childhood vaccinations have:
  - Prevented over 17 million cases of diseases
  - Prevented over 31,000 deaths
- Selling point: If patient is exposed to measles, but they are vaccinated, they don't have to quarantine!

# Measles Screening Guide

**START HERE**



# CDPH Updated MMR Guidance

## 4.19.24 HAN

All children should receive 2 doses of MMR, with 1st dose given at 12 months of age.

- In the context of community measles transmission, providers should consider administering an **“accelerated” 2nd MMR dose to Chicago children >12 months of age**, especially if attending schools or daycares.
- A 2nd MMR dose can be administered as soon as **28 days after a 1st dose**.
- An “accelerated” 2nd dose given before 4 years of age is **valid and effective** according to ACIP. Children who receive two appropriately timed MMR doses before 4 years of age should not need any additional doses in their lifetime.
- This “accelerated” 2nd dose of MMR meets [Illinois’ vaccination requirements for school enrollment](#).

# CDPH Updated MMR Guidance

## Adults

- Measles containing vaccines have been recommended as routine childhood immunization in the USA since the late 1960.
- Adults born in the US who received any childhood vaccines, and adults who went to primary and secondary school in the US in the 1970s or later, are very likely to have immunity to measles even if they do not have written proof of vaccination.
- Prioritize vaccination with at least 1 dose of MMR for their adult patients who are known or suspected to be unvaccinated, or who were born outside the U.S. and are unsure of their vaccination status.
- Providers should ask their patients if they are known or suspected to be unvaccinated.
- If a patient has appropriate documentation of MMR vaccination, providers do not need to check titers. Documented age-appropriate vaccination supersedes the results of subsequent serologic testing per CDC.

# CDPH Updated MMR Guidance

## Adults

- In the event of a known exposure to measles, adults will be required to demonstrate evidence of immunity - at least one of the following:
  - Written documentation of adequate vaccination:
    - one or more doses of a measles-containing vaccine administered on or after the first birthday for adults not at high risk.
    - Two doses of measles-containing vaccine for adults at high risk. These include:
      - Students at post-high school educational institutions
      - Healthcare personnel
      - International travelers
  - Laboratory evidence of immunity
  - Laboratory confirmation of prior measles infection
  - Birth before 1957

# Reminders: International Travel

- The Centers for Disease Control and Prevention (CDC) recommends the following practices for international travel:
  - **Infants aged 6-11 months** who are traveling should receive an early dose before departure. They should then follow recommended schedule and get another dose at 12–15 months and a final dose at 4–6 years.
    - This initial dose between 6–11 months is considered a “**zero**” dose and does not count in the normal 2-dose series.
  - **Children over 12 months old** should get a first dose immediately and get a second dose at least 28 days after first dose.
  - **Teens and adults** with no evidence of immunity should get a first dose immediately and get a second dose at least 28 days after first dose.

# Reminders: Health Care Personnel

- Health care personnel MMR recommendations per ACIP:
  - Health care personnel born before 1957 with no evidence of immunity to measles, mumps, or rubella should consider 2-dose series at least 4 weeks apart for protection against measles or mumps or 1 dose for protection against rubella.
  - Health care personnel born in 1957 or later with no evidence of immunity to measles, mumps, or rubella should receive a 2-dose series at least 4 weeks apart for protection against measles or mumps or at least 1 dose for protection against rubella.



# Live Attenuated Vaccine Reminders

- When possible, providers should give first doses of MMR and Varicella during the same encounter.
  - If these live attenuated vaccines are not given on the same day, then the patient must wait 28 days before receiving the other live-attenuated vaccine.
- If a second live attenuated vaccine is administered within 28 days of the first, then the second vaccine administered is considered invalid, and must be repeated 28 days later.

# Reporting – IDPH

- Reportable in Illinois: Class 1a, as soon as possible, but within 3 hours.
- First call your LHD, but if unable to reach, call IDPH! 217-782-2016; After hours: 217-782-7860
- [Section 690.520 Measles](#)
- Suspect measles cases require an IMMEDIATE, URGENT (within 3 hours by phone) LHD to IDPH and IDPH to CDC
- **Provider should call LHD immediately upon clinical suspicion (don't wait for lab results):**
  - If they suspect measles and/or
  - If measles testing is being ordered (IgM) or requested (PCR)

**Enter case as soon as possible into INEDSS but the initial investigation of the case is the most critical piece early on.**



# Resources



# Posters and Palm Cards Available in English and Spanish

# Protect You and Your Family from the Measles

For those who were exposed.



## Protect You & Your Family from the Measles

Everyone can get a **second dose** of the measles, mumps, rubella (MMR) vaccine **28 days after** their first documented dose.



### Why Do We Need 2 Doses?

- **Two doses** of the MMR vaccine helps to give your body the best protection possible from measles.
- Children must have two documented doses of MMR vaccine **to go back to childcare centers.**
- All children in grades K-12 must have two documented doses of MMR vaccine **to be in school in Illinois.**

### Is it Safe to Have 2 Doses?

**Yes!** It's safe and effective for children 12 months and older to receive a second dose 28 days after the first.

And receiving a second dose of the MMR vaccine does not mean you have to restart quarantine!



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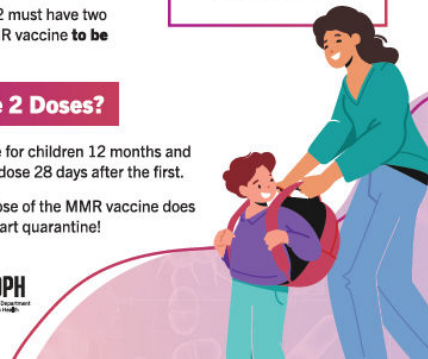
### Be Mindful!

Children have to wait **21 days after their second documented dose** to go back to childcare centers.

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# Communicating with Patients About Isolation

Draft handout

## Staying Isolated While Awaiting Test Results from Measles

### What Does Isolation Mean?

- ▶ **While waiting for your measles test results, it's important to stay isolated, this means staying home from work, school and other activities—and away from others outside of your household.** This helps protect your friends, family, and community from potential exposure to the virus. Measles spread very easily through the air when an infected person coughs or sneezes, it can also live on surfaces.

### Symptoms Monitoring:

- ▶ **Please monitor your symptoms closely.** Typical symptoms of measles include a high fever, cough, runny nose, red eyes, and a rash that spreads across the body, usually starting at the hairline. If your symptoms worsen or you experience difficulty breathing, please contact a healthcare provider right away.

### Preventive Measures While in Isolation:

- ▶ **While in isolation,** please cover your mouth and nose with a tissue when you cough or sneeze, and dispose of the tissue properly. Wash your hands frequently with soap and water for at least 20 seconds, especially after coughing or sneezing.

### Duration of Isolation:

- ▶ **You should remain isolated until you receive instructions from your doctor or the health department.** If the test is positive, you will need to continue isolating until you are no longer infectious. This is usually about 4 days after the rash has appeared. If your test results are negative, you will no longer need to isolate.

### Importance of Immunization

Measles Can Be Prevented Through Vaccination

If you're not already vaccinated, please discuss getting the measles, mumps, and rubella (MMR) vaccine with your healthcare provider. Staying isolated can be challenging, but it's a crucial step in preventing the spread of this highly contagious disease. Thank you for working hard to keep our communities safe from the measles!



# Links & Handouts

- Illinois Chapter, American Academy of Pediatrics (ICAAP) [Emerging Issues Webpage](#)
- ICAAP handouts: What You Should Know About Measles During an Outbreak - [English](#) and [Spanish](#)
- CDPH handout: [FAQs in English/Spanish](#)
- CDC: [Educational Resources for Parents and Childcare Providers](#)
- Top 4 Things Parents Need to Know about Measles: [English](#), [Spanish](#)
- Measles and the Vaccine (Shot) to Prevent It: [English](#), [Spanish](#)
- HealthyChildren.org: [How to Protect Your Children During a Measles Outbreak](#) and [Protecting Your Baby From a Measles Outbreak FAQ](#)