LOUISIANA DEPARTMENT OF HEALTH

Vaccine-Preventable Diseases Update

Louisiana Department of Health | Infectious Disease Epidemiology Section

May 2024

Disclosure Statement

The speaker does not have a financial or non-financial relationship with a commercial interest that would create a conflict of interest with this presentation.

Objectives

Participants will be able to;

- Define Vaccine-Preventable Diseases (VPDs) and disease transmission
- Utilize appropriate diagnostic testing for VPDS
- Identify current VPD trends

What are Vaccine-Preventable Diseases?

Chickenpox (Varicella)

Dengue

Diphtheria

Flu (Influenza)

Hepatitis A

Hepatitis B

Hib (*Haemophilus influenzae* type b)

HPV (Human Papillomavirus)

Measles

Meningococcal

Mumps

Pneumococcal

Polio (Poliomyelitis)

Rotavirus

RSV (Respiratory Syncytial Virus)

Rubella (German Measles)

Shingles (Herpes Zoster)

Tetanus (Lockjaw)

Whooping Cough (Pertussis)

Infants, children, adolescents, teens and adults need different vaccinations, depending on their age, location, job, lifestyle, travel schedule, health conditions or previous vaccination

Non-Routine Vaccines

- Adenovirus
- Anthrax
- Cholera
- Japanese Encephalitis (JE)
- Rabies
- Smallpox
- Tuberculosis
- Typhoid Fever
- Yellow Fever

People in certain research jobs and travel situations may be exposed to dangerous or deadly diseases that are no longer common in the U.S

Table 1 Recommended Child and Adolescent Immunization Schedule for ages 18 years or younger United States, 2019

These recommendations must be read with the Notes that follow. For those who fall behind or start late, provide catch-up vaccination at the earliest opportunity as indicated by the green bars in Table 1. To determine minimum intervals between doses, see the catch-up schedule (Table 2). School entry and adolescent vaccine age groups are shaded in gray.

Vaccine	Birth	1 mo	2 mos	4 mos	6 mos	9 mos	12 mos	15 mos	18 mos	19-23 mos	2-3 yrs	4-6 yrs	7-10 yrs	11-12 yrs	13-15 yrs	16 yrs	17-18 yrs
Hepatitis B (HepB)	1st dose	2nd dose			3rd dose												
Rotavirus (RV) RV1 (2-dose series); RV5 (3-dose series)			1st dose	2nd dose	See Notes												
Diphtheria, tetanus, & acellular pertussis (DTaP: <7 yrs)			1st dose	2nd dose	3rd dose			4th dose				5th dose					
Haemophilus influenzae type b (Hib)			1st dose	2nd dose	See Notes		3rd or 4th dose, See Notes										
Pneumococcal conjugate (PCV13)			1st dose	2nd dose	3rd dose		4th dose										
Inactivated poliovirus (IPV: <18 yrs)			1st dose	2nd dose	3rd dose							4th dose					
Influenza (IIV)					Annual vaccination 1 or 2 doses								Annual vaccination 1 dose only				
or													or				
Influenza (LAIV)											Annual vaccination 1 or 2 doses		Annual vaccination 1 dose only				
Measles, mumps, rubella (MMR)					See Notes		1st dose					2nd dose					
Varicella (VAR)							1st dose					2nd dose					
Hepatitis A (HepA)					See Notes		2-dose series, See Notes										
Meningococcal (MenACWY-D ≥9 mos; MenACWY-CRM ≥2 mos)			See Notes											1st dose		2nd dose	
Tetanus, diphtheria, & acellular pertussis (Tdap: ≥7 yrs)														Tdap			
Human papillomavirus (HPV)														See Notes			
Meningococcal B														See Notes			
Pneumococcal polysaccharide (PPSV23)											See Notes						

Range of recommended ages for all children

Range of recommended ages for catch-up immunization

Range of recommended ages for certain high-risk groups

Range of recommended ages for non-high-risk groups that may receive vaccine, subject to individual clinical decision-making

No recommendation

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Measles

Measles (Rubeola)

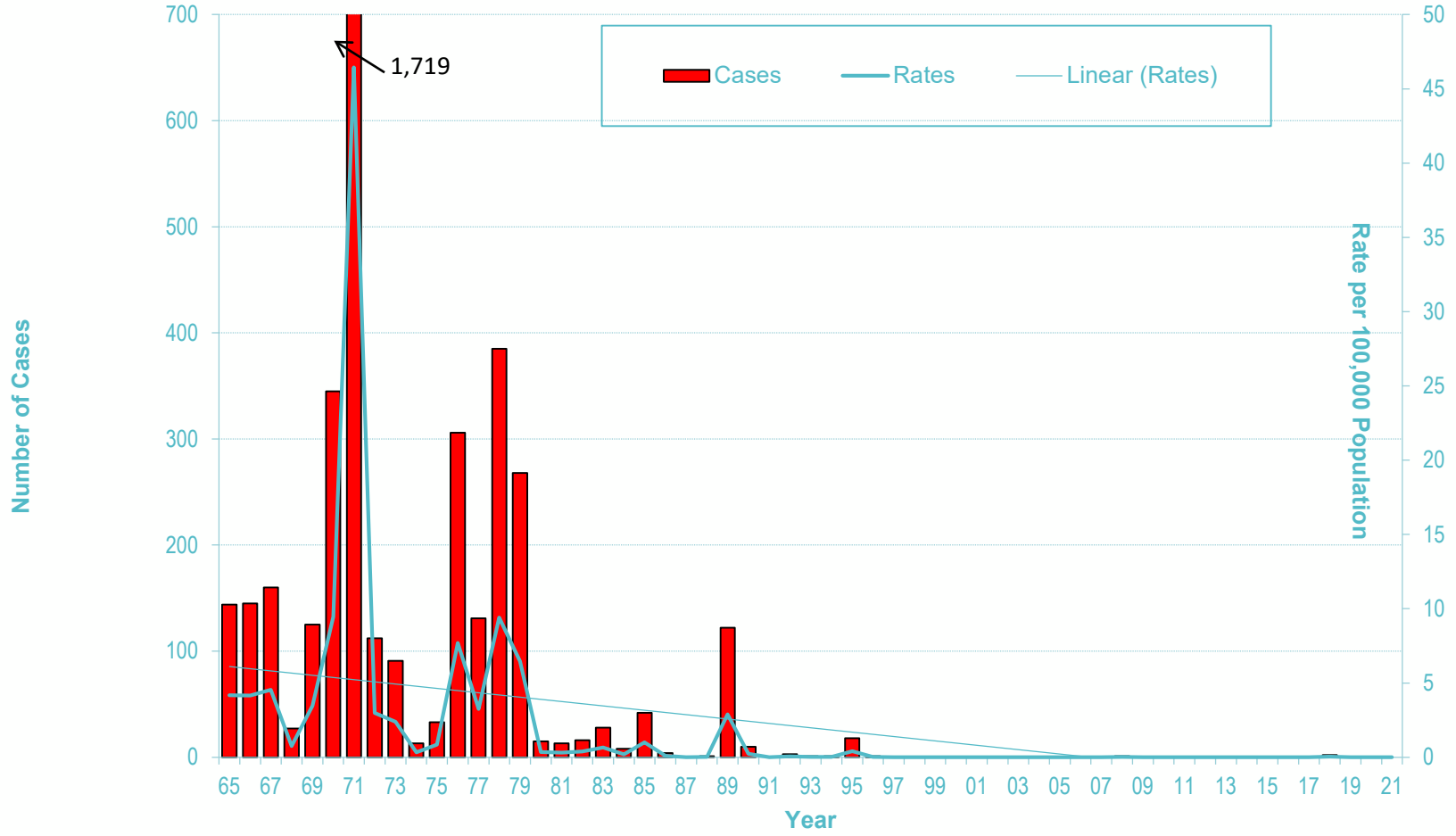
- **Transmission occurs from respiratory droplets, by direct contact with infectious droplets or by airborne spread from respiratory secretions.**
- **Symptoms:**
  - high fever (may spike to more than 104°)
  - cough
  - runny nose (coryza)
  - red, watery eyes (conjunctivitis)
  - Koplik spots
  - Followed by a maculopapular rash
- **Complications:**
  - Hospitalization
  - Pneumonia
  - Encephalitis
  - Death
  - Complications during pregnancy
- **Period of infectiousness: 4 days before through 4 days after rash onset**

Image source: CDC PHIL

Measles Vaccination

- MMR or MMRV (only for children 12 months- 12 years old)
- 2 doses
  - 1st dose: 12-15 months of age
  - 2nd dose: 4-6 years of age
  - 97% effective at preventing measles
- Who should get vaccinated?
  - All children
  - Adults without evidence of immunity
  - International travelers (children 6-11 months old should receive 1 dose)
  - Healthcare personnel should have evidence of immunity

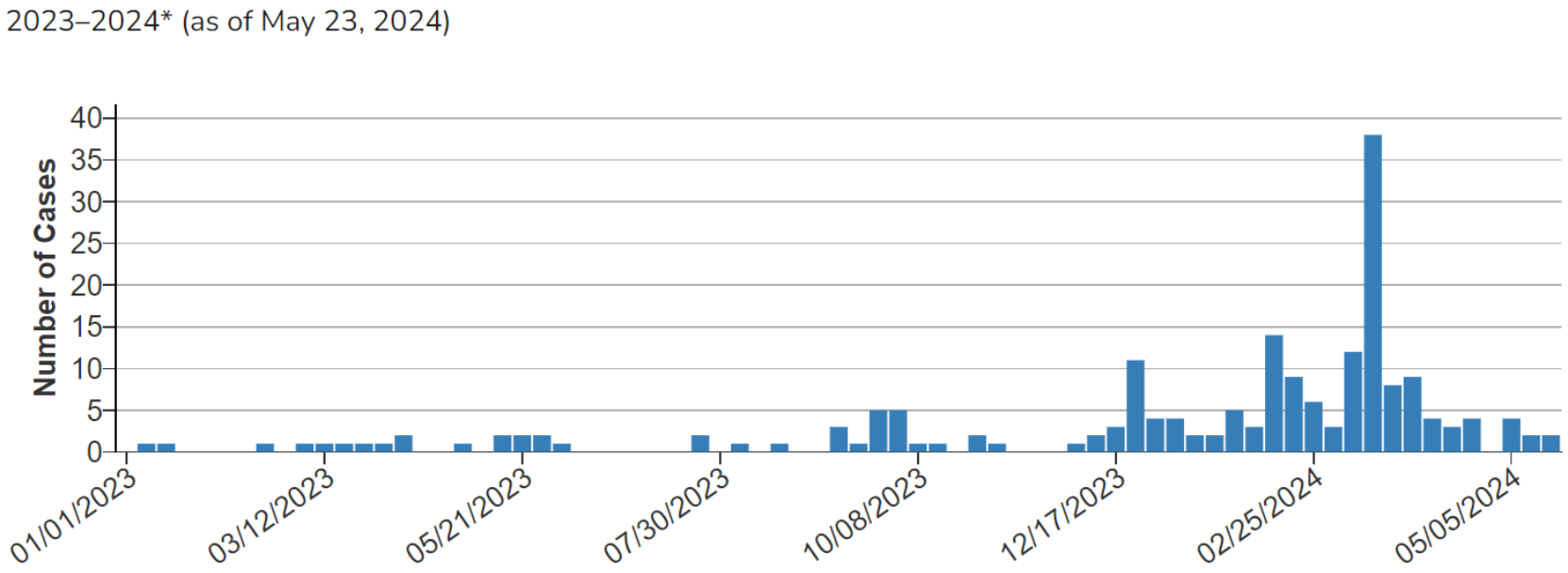
Measles cases and incidence rates - Louisiana, 1965-2021



- Last endemic case of measles in Louisiana was in 1996
- 5 cases since that time, all travel associated and unvaccinated
- 2 recently reported cases both unvaccinated and exposed out-of-state

https://ldh.la.gov/page/annual-infectious-disease-surveillance-reports

Measles cases by week, 2023- 2024 (as of May 23, 2024), United States



- Measles declared eliminated in the US in 2000
- 142 cases reported year to date in the US
- Cases *reported* globally:
  - *2022: 171,000*
  - *2023: >300,000*

https://www.cdc.gov/measles/cases-outbreaks.html

Measles Cases in 2024 as of May 23, 2024

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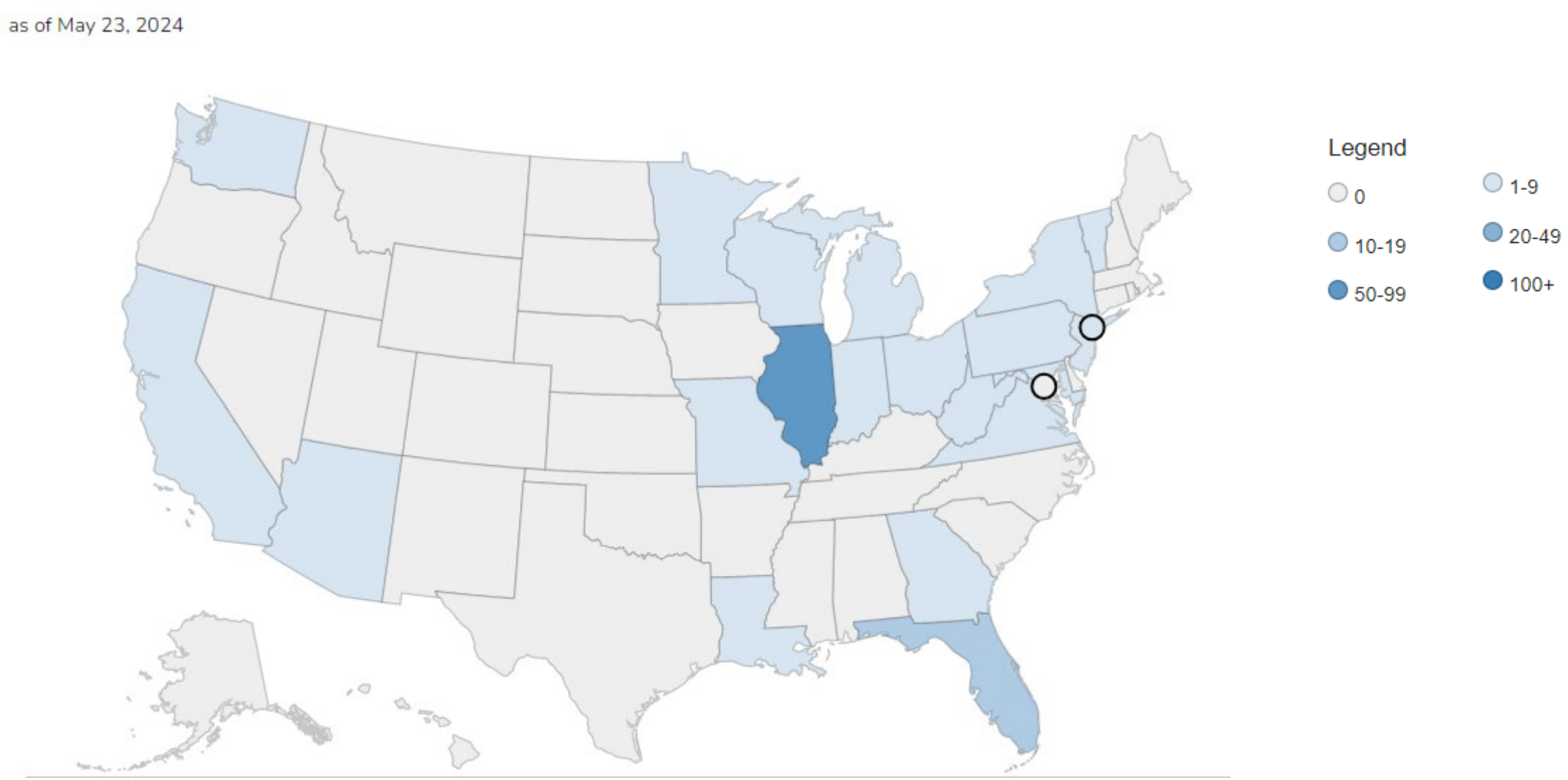

https://www.cdc.gov/measles/cases-outbreaks.html

Yearly Measles Cases as of May 23, 2024

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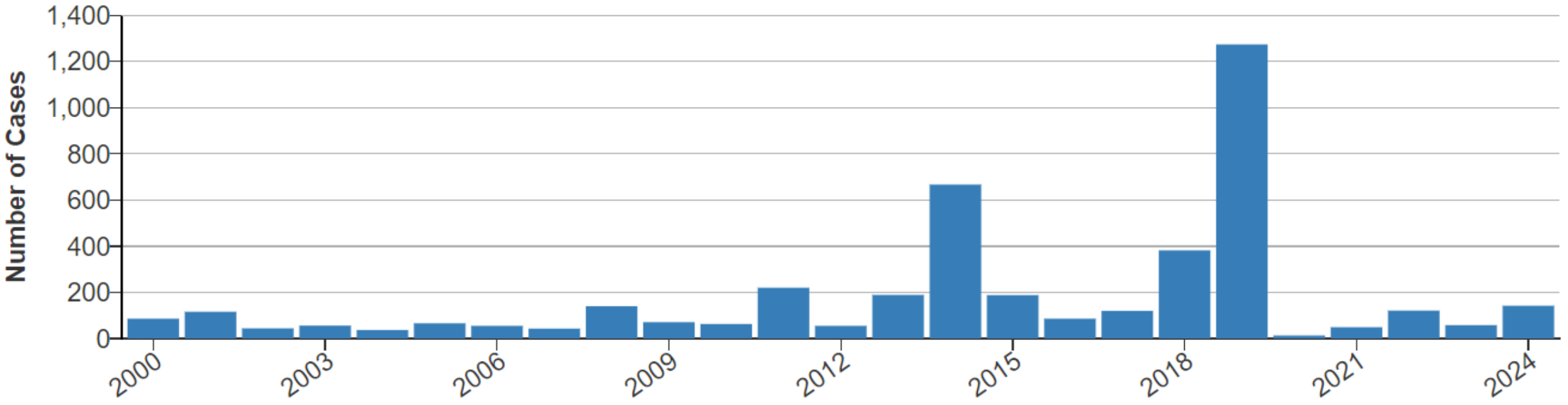
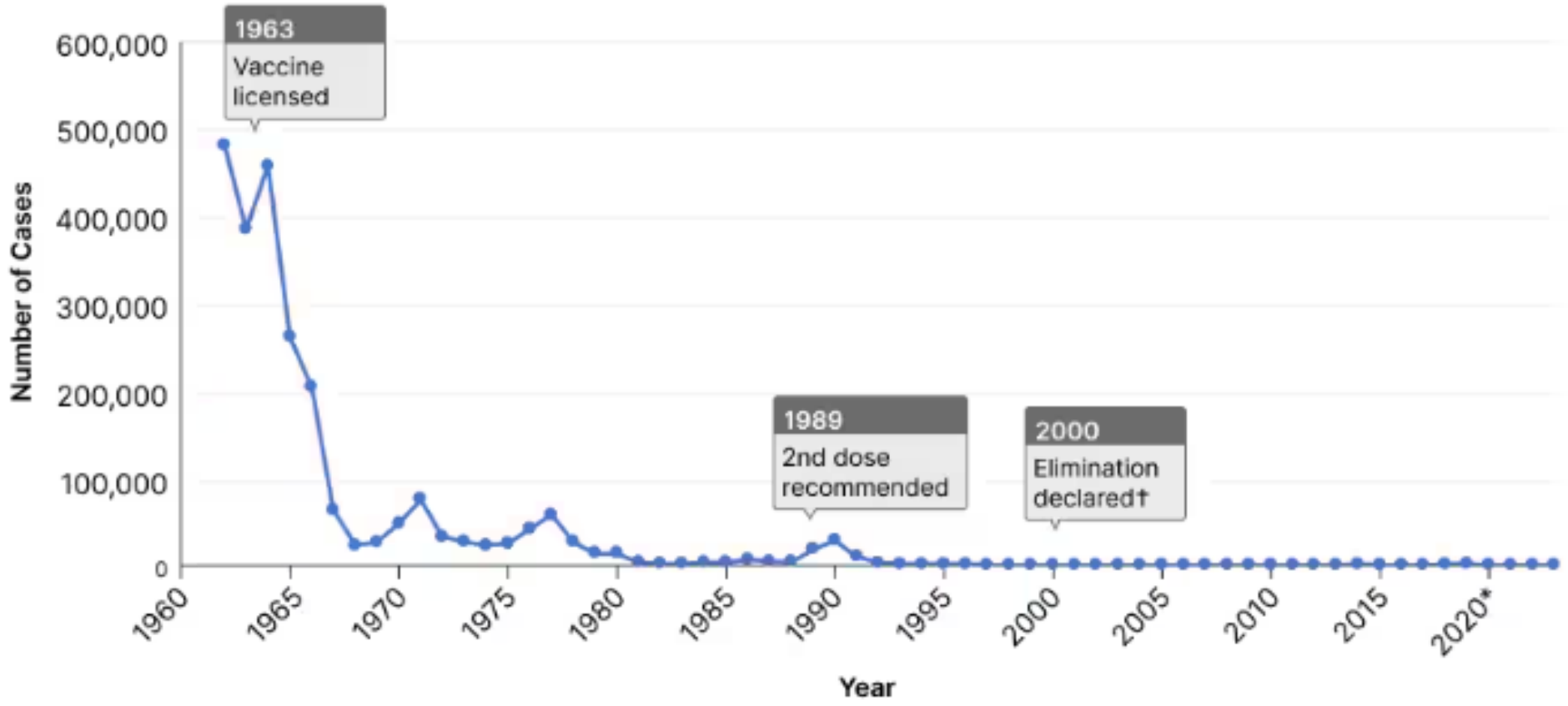


https://www.cdc.gov/measles/cases-outbreaks.html

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



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

U.S. Cases in 2024

Total cases

142

Age

Under 5 years: **63 (44%)**

5-19 years: **33 (23%)**

20+ years: **46 (32%)**

Vaccination Status

Unvaccinated or Unknown: **82%**

One MMR dose: **13%**

Two MMR doses: **5%**

https://www.cdc.gov/measles/cases-outbreaks.html

U.S. Hospitalizations in 2024

55%

55% of cases hospitalized (78 of 142) for isolation or for management of measles complications.

Percent of Age Group Hospitalized

Under 5 years: **63% (40 of 63)**

5-19 years: **42% (14 of 33)**

20+ years: **52% (24 of 46)**

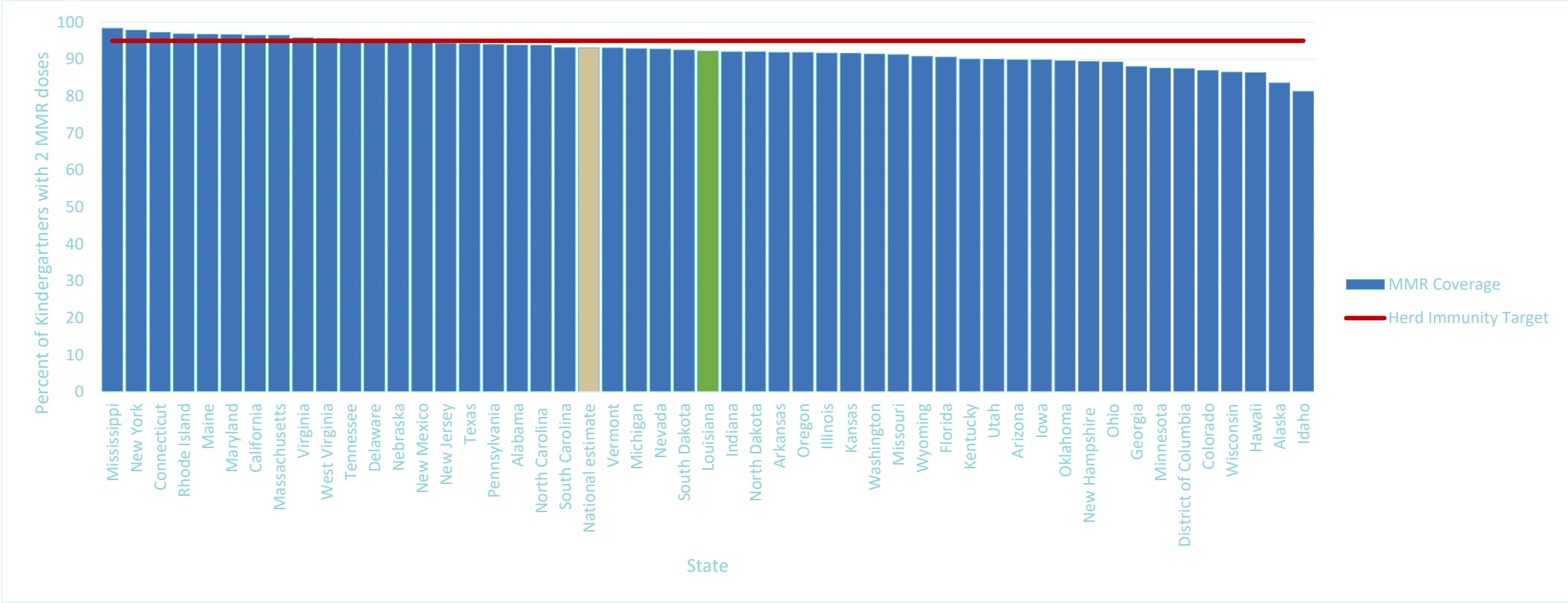
https://www.cdc.gov/measles/cases-outbreaks.html

What is herd immunity

- Herd immunity occurs when a large portion of a community (the herd) becomes immune to a disease
- The spread of disease from person to person becomes unlikely when herd immunity is achieved
- As a result, the whole community becomes protected — not just those who are immune.
- What percentage of a community needs to be immune in order to achieve herd immunity? It varies from disease to disease. The more contagious a disease is, the greater the proportion of the population that needs to be immune to the disease to stop its spread.

https://www.mayoclinic.org/diseases-conditions/coronavirus/in-depth/herd-immunity-and-coronavirus/art-20486808

The importance of herd immunity



Louisiana:

- 2019-2020: 95.6%
- 2022-2023: 92.2%, U.S.
- 2019-2020: 95.2%
- 2022-2023: 93.1%

https://www.cdc.gov/vaccines/imz-managers/coverage/schoolvaxview/data-reports/index.html

MMR Vaccine Coverage for Kindergarteners by School Year (2009–2023)

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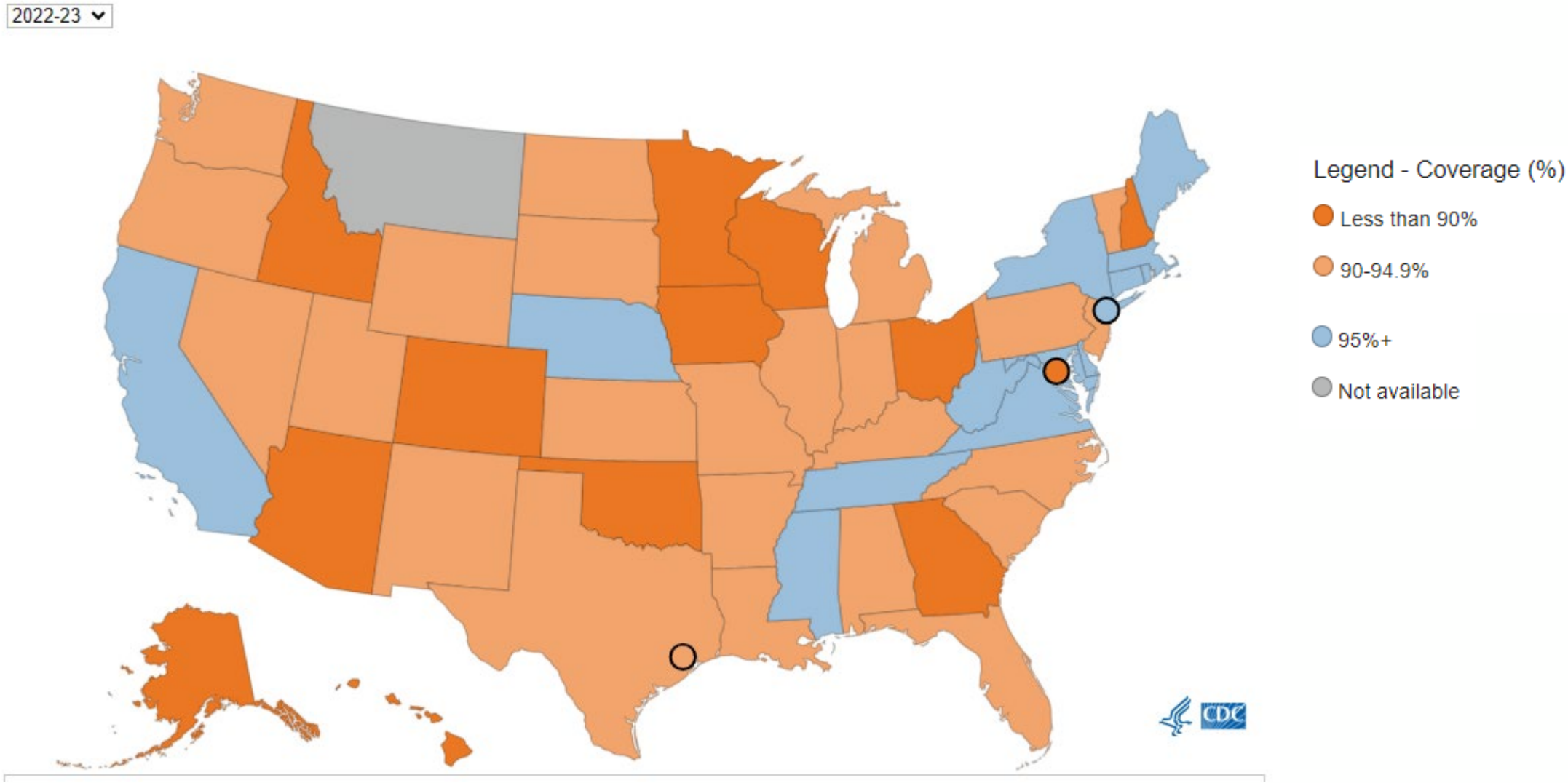

https://www.cdc.gov/measles/data-research/index.html

Public Health Response to a Confirmed Measles Case

- Case Confirmation
- Contact tracing to identify exposed individuals
  - Collect documentation of immunity
    - Born before 1957 (not applicable for healthcare providers)
    - Serologic evidence of measles immunity
    - Laboratory confirmation of disease
    - Documentation of adequate vaccination for measles
  - Post-exposure prophylaxis
    - Vaccine for those who are eligible up to 72 hours after exposure
    - Immune Globulin up to 6 days after exposure
  - Monitoring of all exposed contacts
    - Active or passive monitoring depending of risk
  - Potential exclusion for susceptible contacts
- Communication
  - Healthcare providers (HAN)
  - General public/communities at risk (Press Release)
- Collaboration

Infection Control Recommendations for suspect cases

- If facility knows the patient is coming
  - Have patient use a side / infrequently used door to limit patient contact
  - Do not allow suspect measles cases to remain in the waiting area or other common areas
  - Ensure only staff with documented evidence of immunity care for the patient
  - Close examination room for 2 hours (if not negative pressure)
- If patient is being admitted
  - Ensure it is in a negative pressure room
  - Patient should be wearing a mask for the duration of their visit including entering and exiting the building
  - All healthcare personnel entering the room should use a N95 respirator
- If patient is being discharged
  - Ensure they know to self-isolate at home until they get the test results or are no longer infectious.
  - If they must go out in public they must wear a mask.

What to do if you suspect a case

- Call the Infectious Disease Epidemiology Section on-call phone
  - 1-800-256-2748

- Testing available at the State Public Health Laboratory

Global Measles

Over 61 million doses of measles-containing vaccine were postponed or missed due to COVID-19 related delays in supplementary immunization activities.

Top 10 Countries with Measles Outbreaks*

Rank	Country	Number of Cases
1	Azerbaijan	28,787
2	Kazakhstan	28,660
3	Iraq	25,429
4	India**	15,183
5	Kyrgyzstan	11,723
6	Russian Federation	11,537
7	Pakistan	8,648
8	Yemen	8,558
9	Burkina Faso	4,810
10	Nigeria	4,701

Provisional data based on monthly data reported to WHO (Geneva) as of early May 2024. Data covers October 2023 – March 2024.

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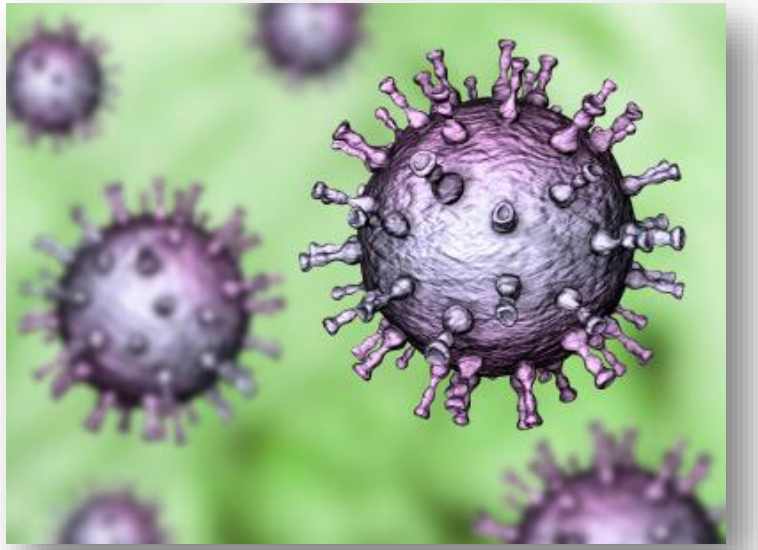
Varicella

24

Varicella (chickenpox)

- Caused by the varicella-zoster virus
- Symptoms
  - Itchy, blister-like rash that turns into fluid-filled blisters and eventually scabs
  - Rash first appears on chest, back and face and then spreads over the entire body
- Highly contagious
- Children usually miss 5-6 days of school/childcare due to chickenpox



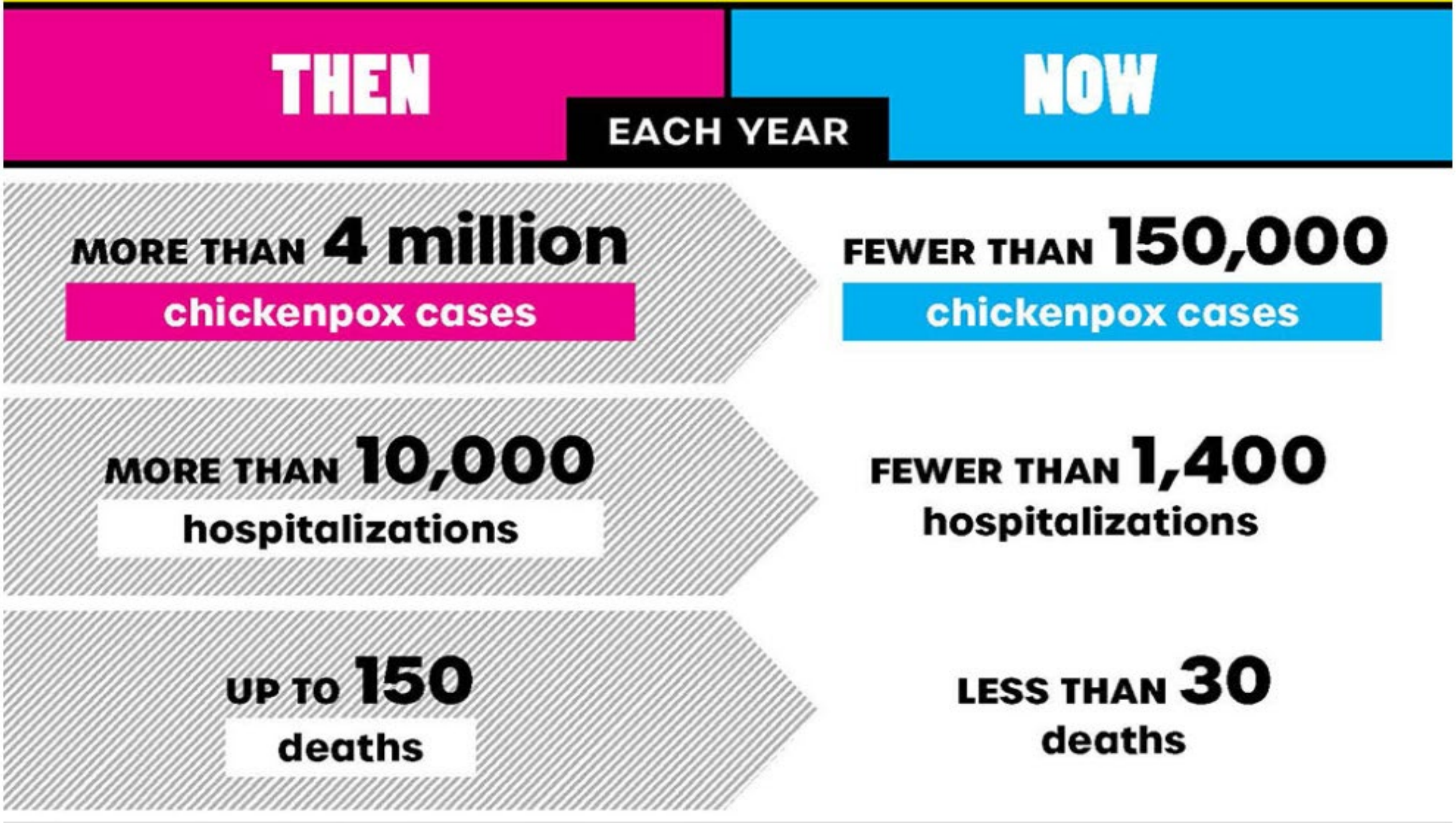
Varicella Vaccination

- 2 Doses
  - 1st dose: 12-15 months of age
  - 2nd dose: 4-6 years old
  - Introduced in 1995
- More than 90% effective at preventing the disease
- Chickenpox is usually mild but can be serious in the following groups:
  - Under 12 months old
  - Pregnant people
  - Adolescents
  - People with weakened immune systems

Evidence of Immunity- Varicella

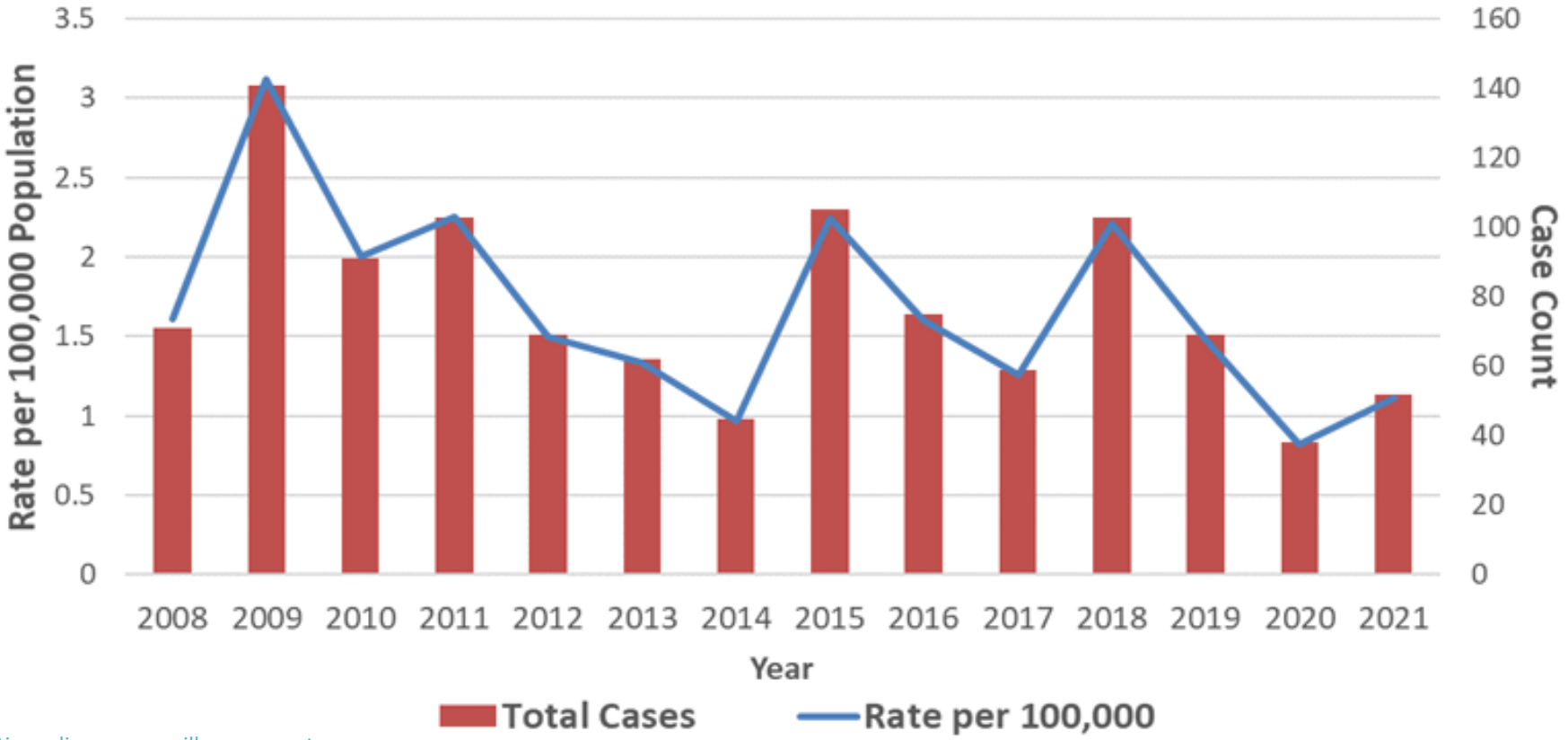
- Documentation of age-appropriate varicella vaccination
  - Preschool-age children (i.e., age 12 months through 3 years): one dose
  - School-age children, adolescents, and adults: two doses
- Laboratory evidence of immunity or laboratory confirmation of disease*
- Birth in the United States before 1980 (should not be considered evidence of immunity for healthcare personnel, pregnant women, and immunocompromised people)
- Diagnosis or verification of a history of varicella or herpes zoster by a healthcare provider


During the first 25 years,* the U.S. chickenpox vaccination program has PREVENTED an estimated:
91 million CASES
238,000 HOSPITALIZATIONS
2,000 DEATHS
*The U.S. chickenpox vaccination program started in 1995.


THEN
NOW
EACH YEAR
MORE THAN 4 million
chickenpox cases
FEWER THAN 150,000
chickenpox cases
MORE THAN 10,000
hospitalizations
FEWER THAN 1,400
hospitalizations
UP TO 150
deaths
LESS THAN 30
deaths

Louisiana Varicella Data

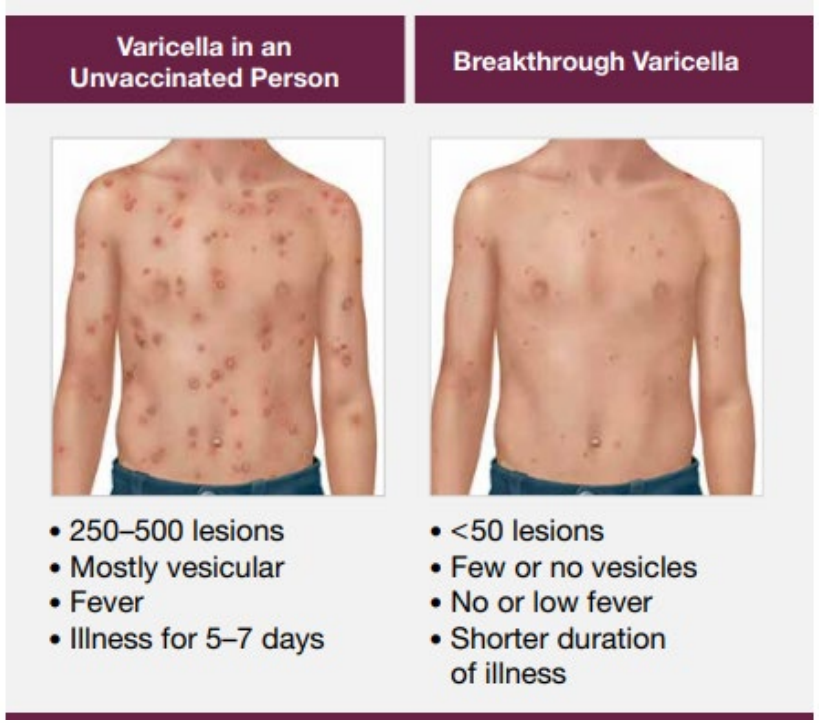
Figure 1: Varicella Cases and Incidence Rates - Louisiana, 2008-2021



https://ldh.la.gov/page/annual-infectious-disease-surveillance-reports

Testing

- IDEpi is able to test for certain scenarios
- PCR testing is recommended
  - CDC has guidance on collection for different lesion types



https://www.cdc.gov/chickenpox/downloads/Breakthrough-Varicella-fact-sheet-508.pdf

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Mumps

Mumps

- Caused by the mumps virus
- Symptoms – puffy cheeks/ swollen jaw, fever, headache
- Complications
  - Meningitis, deafness, encephalitis, orchitis, oophoritis
- Transmission
  - Coughing, sneezing or talking
  - Participating in close-contact activities
  - Touching objects/ sharing items

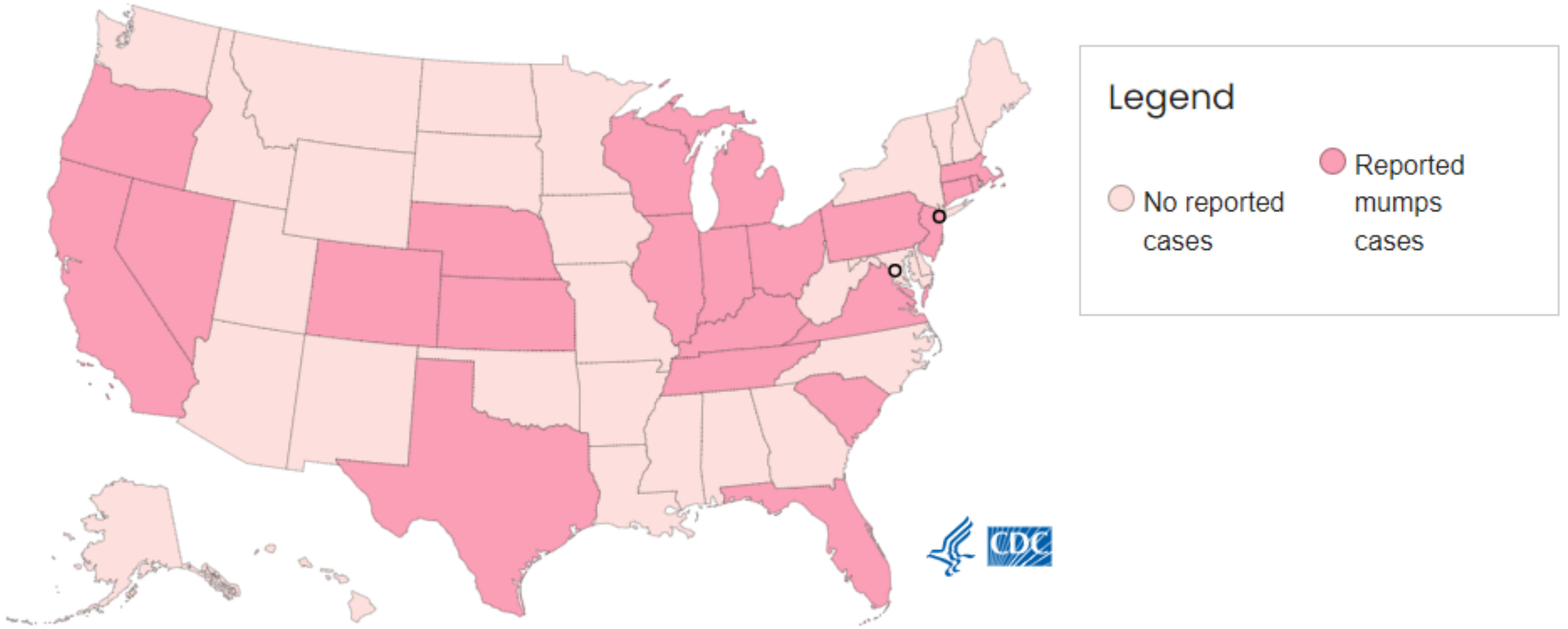
An infected person can likely spread mumps from two days before their salivary glands begin to swell to up to five days after the swelling begins.

Mumps Vaccination

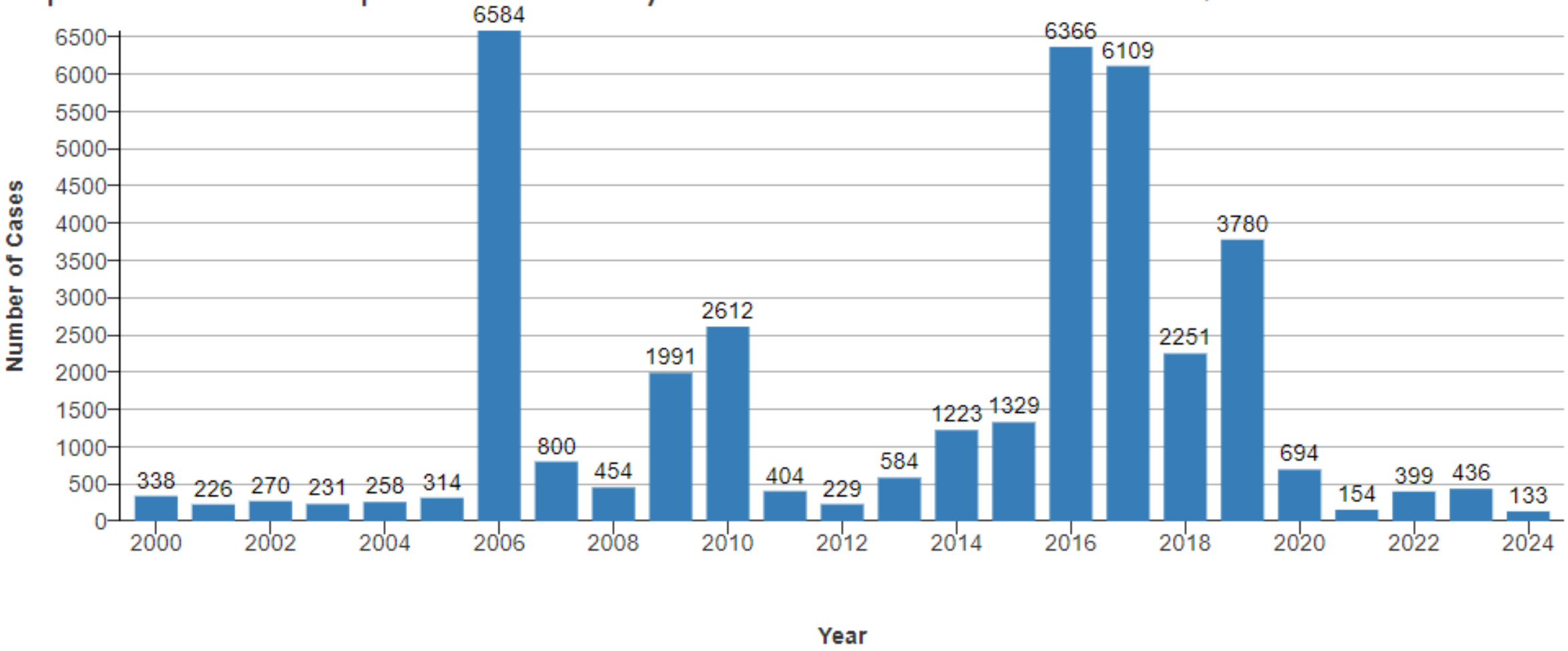
- MMR or MMRV (only for children 12 months- 12 years old)
- 2 doses
  - 1st dose: 12-15 months of age
  - 2nd dose: 4-6 years of age
  - 88% effective against mumps

Reported US Mumps Cases by Jurisdiction and Year*

Reported Mumps Cases, 2024



Reported Mumps Cases by Year — United States, 2000-2024



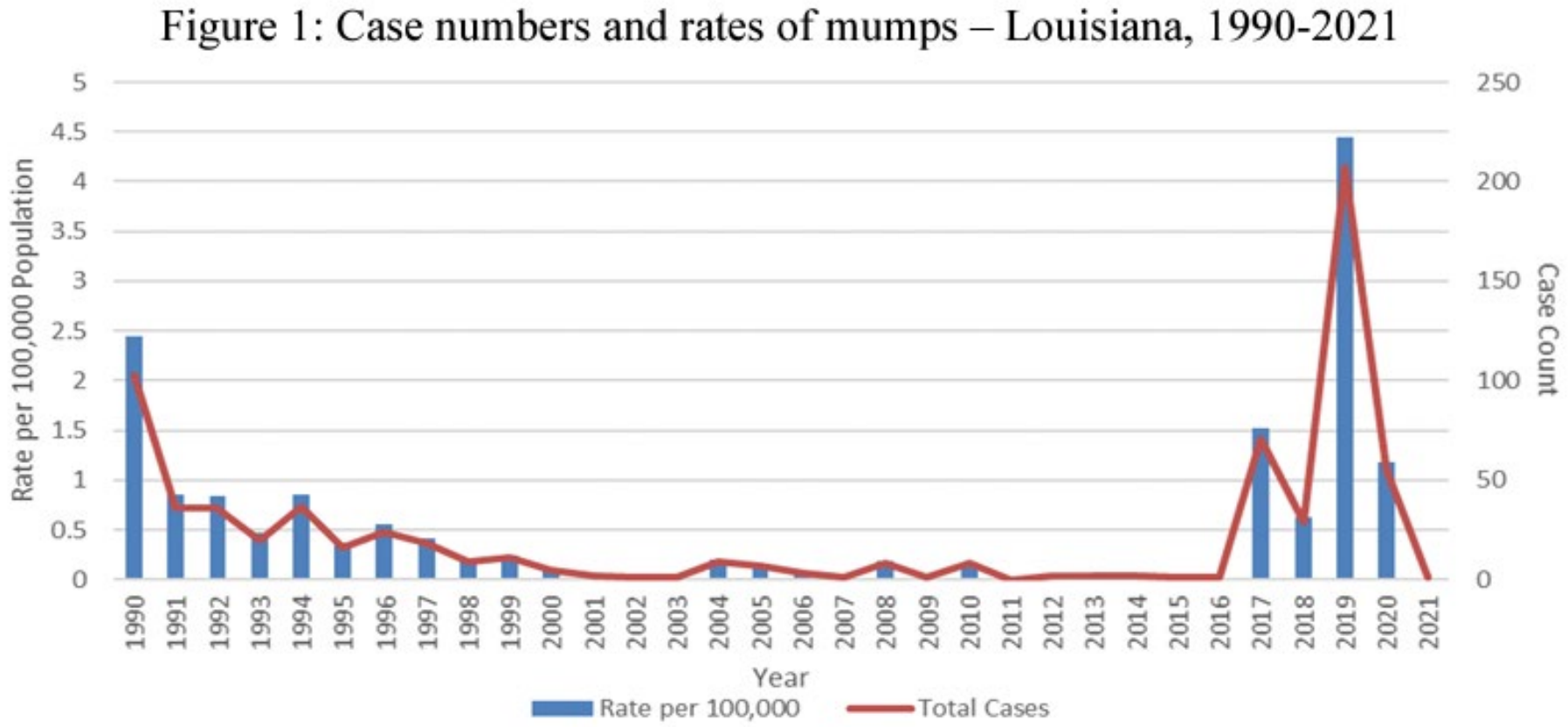
Mumps Outbreaks

- 2015-2019 saw large increases in cases
- From Jan 2016 – July 2017 health departments reported 150 outbreaks (9,200 cases)
  - Related to universities, athletics, church groups, large parties, workplaces
- The largest outbreak occurred in a close-knit Arkansas community
  - Resulted in nearly 3,000 cases
- Sept 2018 – Aug 2019, health departments reported nearly 900 cases in adult migrants detained in 57 detention facilities

Mumps Outbreaks

- In 2020, mumps cases decreased compared with the previous six years, possibly due to social distancing and other COVID-19 prevention measures.
- However, mumps continued to circulate across the U.S. despite these measures. From April 1, 2020 to December 31, 2020, 32 health departments reported 142 mumps cases.

Louisiana Mumps Data



https://ldh.la.gov/page/annual-infectious-disease-surveillance-reports

Testing

- PCR tests are usually the gold-standard diagnostic test
- State Public Health Lab for certain scenarios
- Reference labs

References

- https://www.cdc.gov/measles/index.html
- https://www.cdc.gov/mumps/index.html
- https://www.cdc.gov/chickenpox/index.html

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THANK YOU

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