Selected Vaccine-Preventable Diseases and Related Diseases

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WEST VIRGINIA Department of Health & Human Resources
BUREAU FOR PUBLIC HEALTH

DISCLOSURES

- No financial interest or other relationship with the company who makes/provides this product/service.
- Hepatitis B and COVID-19 infections and vaccine are not included on this talk.
- Disease conditions that are not vaccine preventable but may be related to a vaccine-preventable disease will be discussed.

OBJECTIVES

By the end of this session, participants will be able to:

1. Understand immunology.
2. Identify the different types of vaccines.
3. Describe the epidemiology of selected vaccine-preventable diseases and other diseases of interest.
4. Discuss the control to vaccine-preventable diseases and diseases of interest.

BASIC IMMUNOLOGY

- Antigen versus Antibody

- Immune Response
  - ❖ Innate immunity
  - ❖ Adaptive immunity → immunologic memory
    - Cell-mediated immunity – T cells
    - Antibody-mediated immunity – B cells

- Immunizing Agents
  - ❖ Active immunization - vaccines
  - ❖ Passive immunization – immunoglobulin

VACCINES

- Live-attenuated vaccines – MMR, Rotavirus, Varicella, Smallpox
- Inactivated vaccines – Hep A, IPV, Flu, Rabies
- mRNA vaccines – COVID-19
- Subunit, recombinant, conjugate vaccines – HiB, Hep B, HPV, part of DTaP, Pneumococcal vaccine, Meningococcal vaccine, Shingles
- Toxoid vaccines – Diphtheria, Tetanus

MUMPS

Etiology: Paramyxovirus

Reservoir: human

Transmission: Respiratory droplet

Incubation Period: 12-25 days

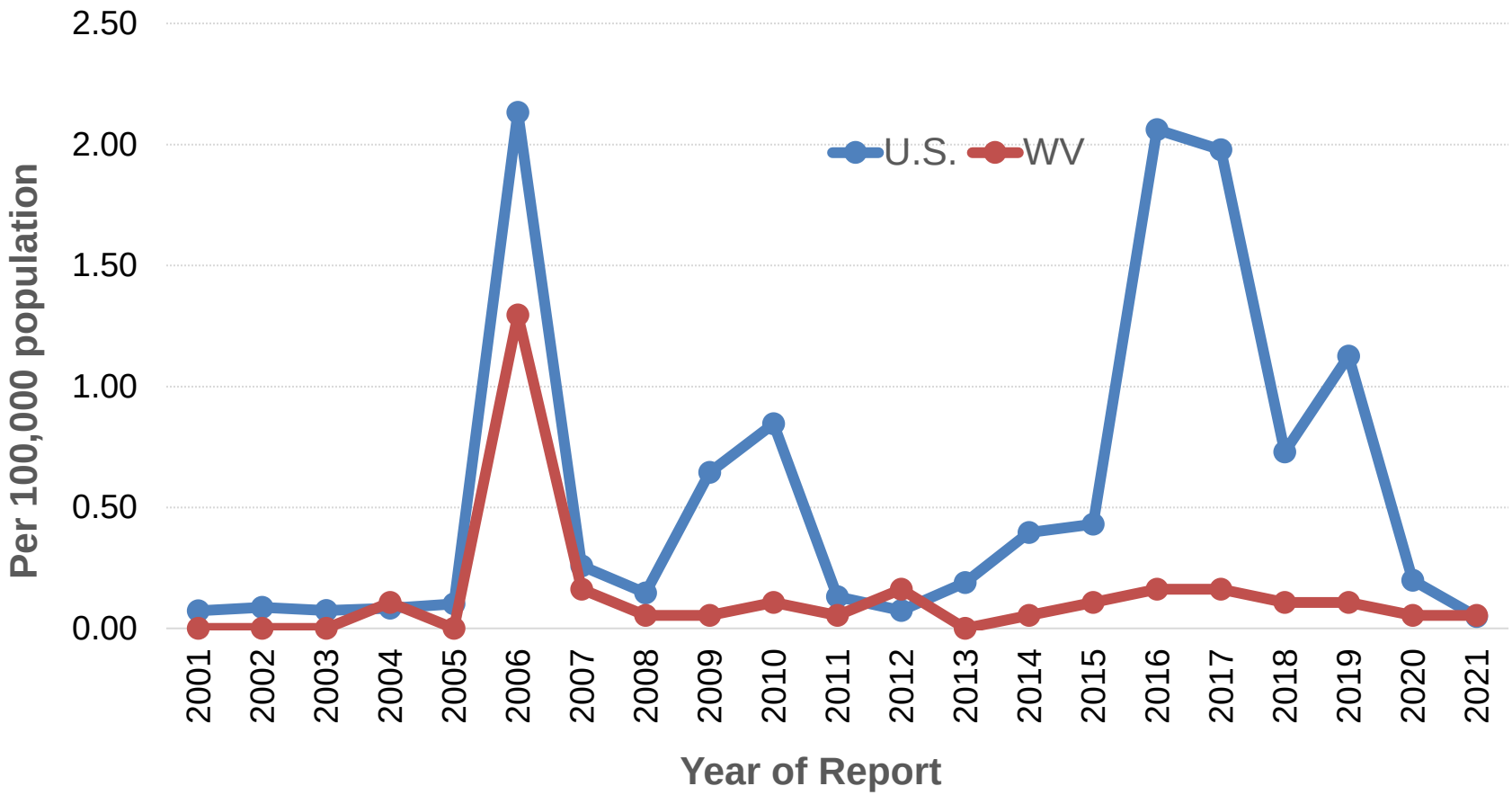
Communicability: 2 days before to 5 days after parotitis onset

Clinical Presentation:

- non-specific, parotitis
- Infection can occur in fully vaccinated person but not as severe

https://www.immune.org.nz/diseases/mumps

Mumps Incidence



Control of Mumps

Vaccination

- 2-dose MMR – mumps live, attenuated virus
  - VE 1 dose: 78%
  - VE 2 doses: 88%
- Outbreak setting (ACIP, Oct. 2017): 3rd dose mumps (MMR) vaccine

Report within 24 hours of diagnosis to local health department

- Testing: viral culture, RT-PCR (buccal, urine, CSF)

Isolation + standard and droplet precautions:

- From diagnosis to 5 days after parotitis

Close contacts:

1. Assess Immunity status - birth before 1957, serologic evidence, lab confirmation of disease, vaccination record
2. If part of outbreak – 3rd dose of MMR
3. Monitor for symptoms x 25 days

MEASLES

Etiology: Paramyxovirus, RNA virus

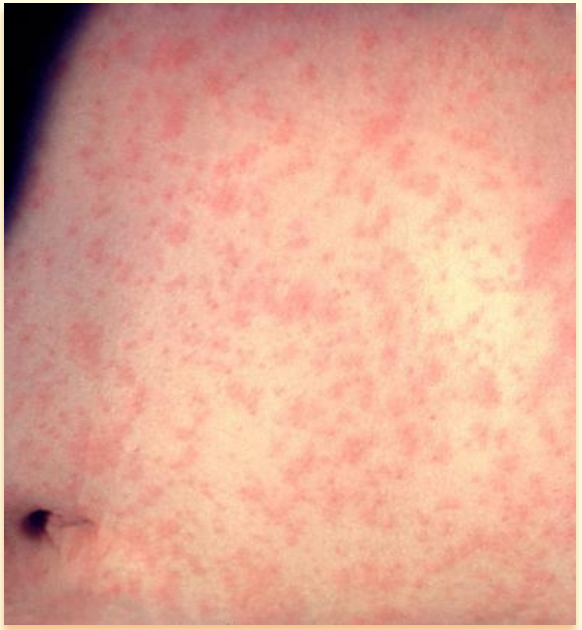
Reservoir: human

Transmission:

- Respiratory route - airborne

Communicability:

- 4 days before to 4 days after rash onset



Measles rash

Clinical Presentation:

<u>Prodrome</u> (3 C's)

- Cough
- Coryza
- Conjunctivitis

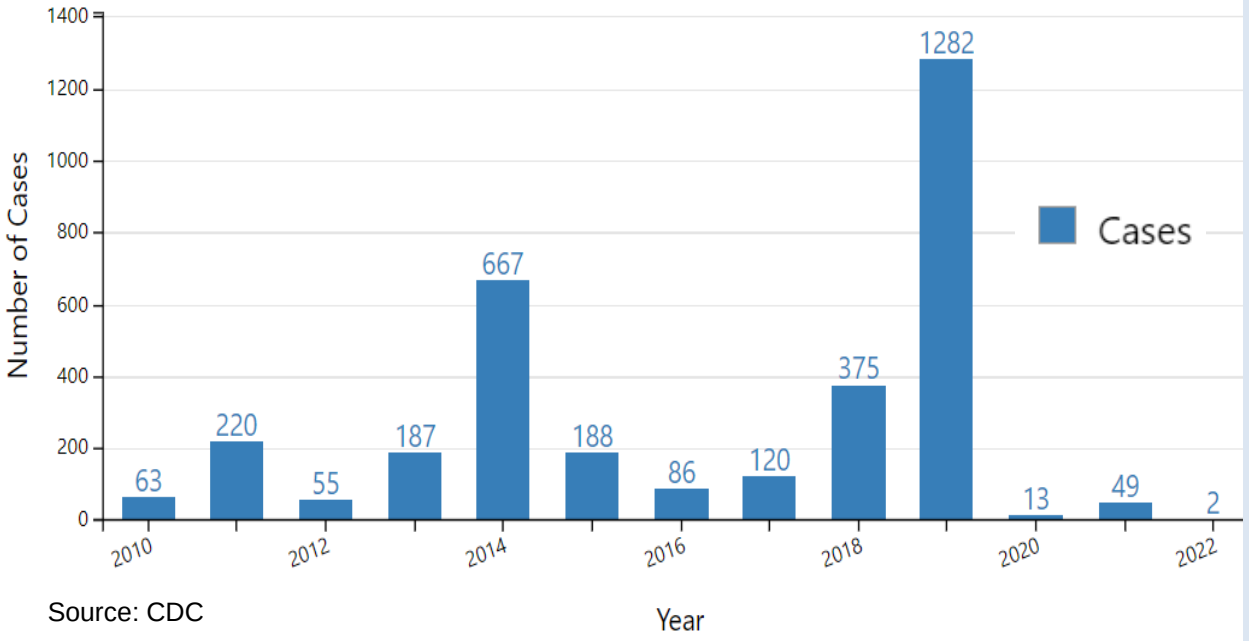
<u>Rash</u>

- Maculopapular → confluence → peel, fades
- Starts at hairline → trunk → hands, feet

Measles Cases

Measles Cases Reported by Year, United States, 2010-2022

(as of April 1, 2022)



Source: CDC

Measles outbreaks (CDC):

In a given year, more measles cases can occur for any of the following reasons:

- an **increase in the number of travelers who get measles abroad** and bring it into the U.S., and/or
- further spread of measles in U.S. **communities with pockets of unvaccinated people**.

West Virginia: 1 case in 2009

MEASLES OUTBREAK

WEST VIRGINIA Department of Health & Human Resources BUREAU FOR PUBLIC HEALTH

Morbidity and Mortality Weekly Report

National Update on Measles Cases and Outbreaks — United States, January 1–October 1, 2019

TABLE. Number and vaccination status of measles cases, by age group — United States, January 1–October 1, 2019

Age group	Measles cases no. (%)	Vaccination status no. (%)*		
		Unvaccinated	Vaccinated	Unknown
0–5 mos	43 (3)	43 (100)	0 (0)	0 (0)
6–11 mos	116 (9)	110 (95)	5 (4)	1 (1)
12–15 mos	118 (9)	106 (90)	12 (10)	0 (0)
16 mos–4 yrs	274 (22)	238 (87)	33 (12)	3 (1)
5–17 yrs	339 (27)	295 (87)	26 (8)	18 (5)
18–29 yrs	144 (12)	49 (34)	41 (28)	54 (38)
30–49 yrs	160 (13)	25 (16)	22 (14)	113 (71)
≥50 yrs	55 (4)	6 (11)	3 (5)	46 (84)
Overall	**1,249**	**872 (70)**	**142 (11)**	**235 (19)**

* Received ≥1 dose of measles, mumps, and rubella vaccine.

Control of Measles

- **MMR** or **MMRV** – contain live, attenuated measles virus, VE: 99%

MMR Vaccine Schedule	1st Dose	2nd Dose
NOT TRAVELING		
Children	12-15 months old	4-6 years old
Teens, Adults with no evidence of immunity (at least **one** of the following: written documentation of adequate vaccination, laboratory evidence of immunity, laboratory confirmation of measles, or birth in the United States before 1957)	ASAP	n/a
INTERNATIONAL TRAVEL		
Under 12 months old	• 6-11 months old (early dose) • Follow recommended schedule; another dose at 12-15 mos. old	• 4-6 years
12 months and older, Teens and Adults with no evidence of immunity	Immediately	28 days after 1st dose

- **Report immediately** to local health department (LHD)
- **Isolate** measles case-patient up to 4 days after rash onset
- **Airborne precaution**
- **Quarantine** susceptible measles contacts for 21 days from last exposure

MENINGOCOCCAL DISEASE

Etiology:

Neisseria meningitidis serogroup A, B, C, W, X, Y

Transmission:

- Respiratory droplets, direct contact with secretions

Communicability:

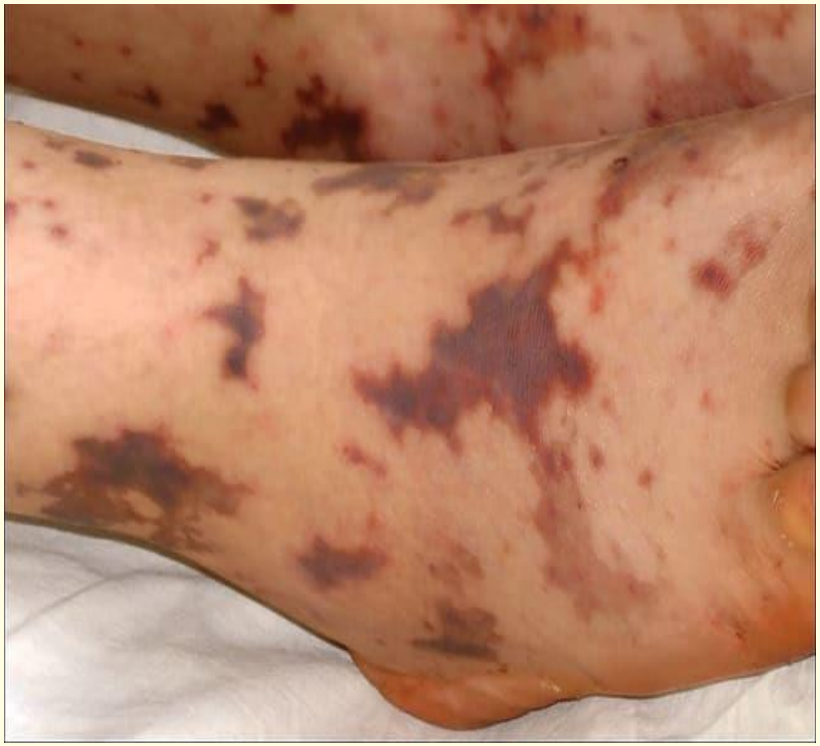
- Up to 24 hours after initiation of appropriate antibiotic

Clinical Presentation:

- Most common: fever, headache, neck stiffness
- Other symptoms: nausea, vomiting, photophobia, confusion

Complications

- Loss of limb(s)
- Deafness
- Nervous system problems, brain damage

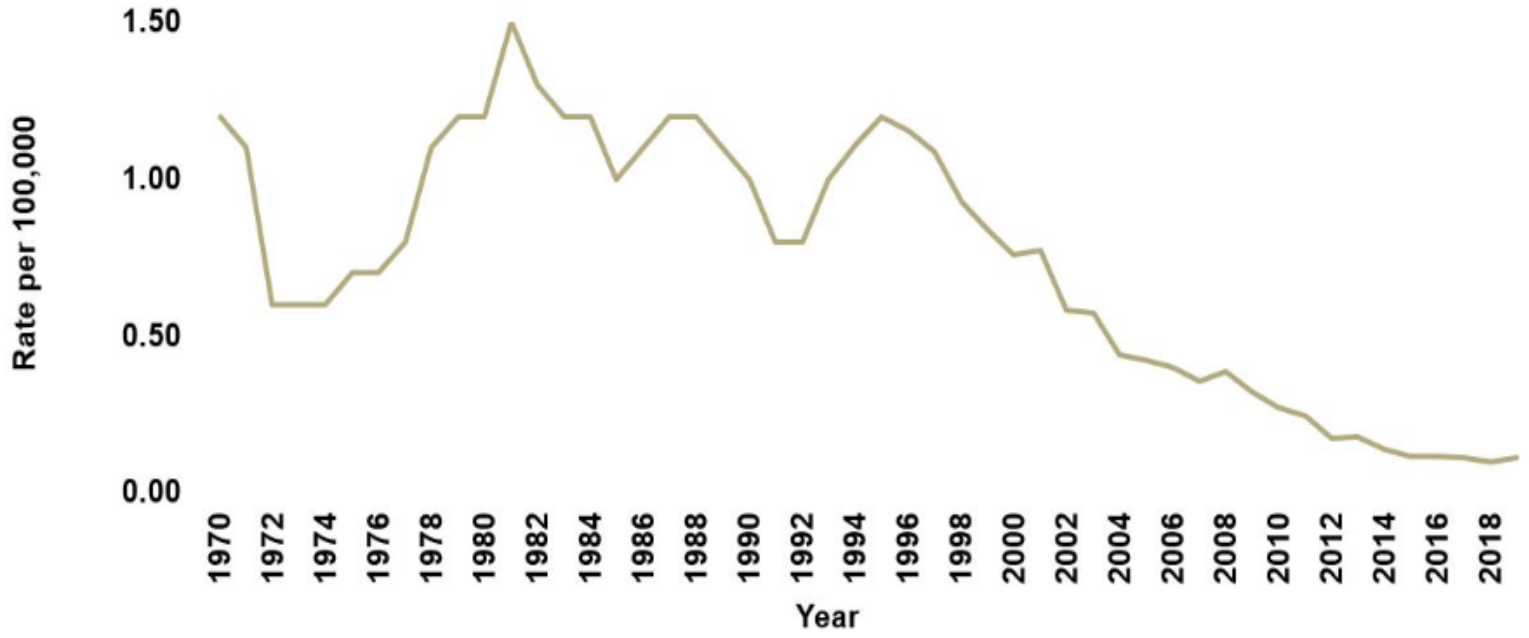


Meningococcemia – ankle and feet

Source: www.webmd.com/skin-problems-and-treatments/picture-of-meningococcemia

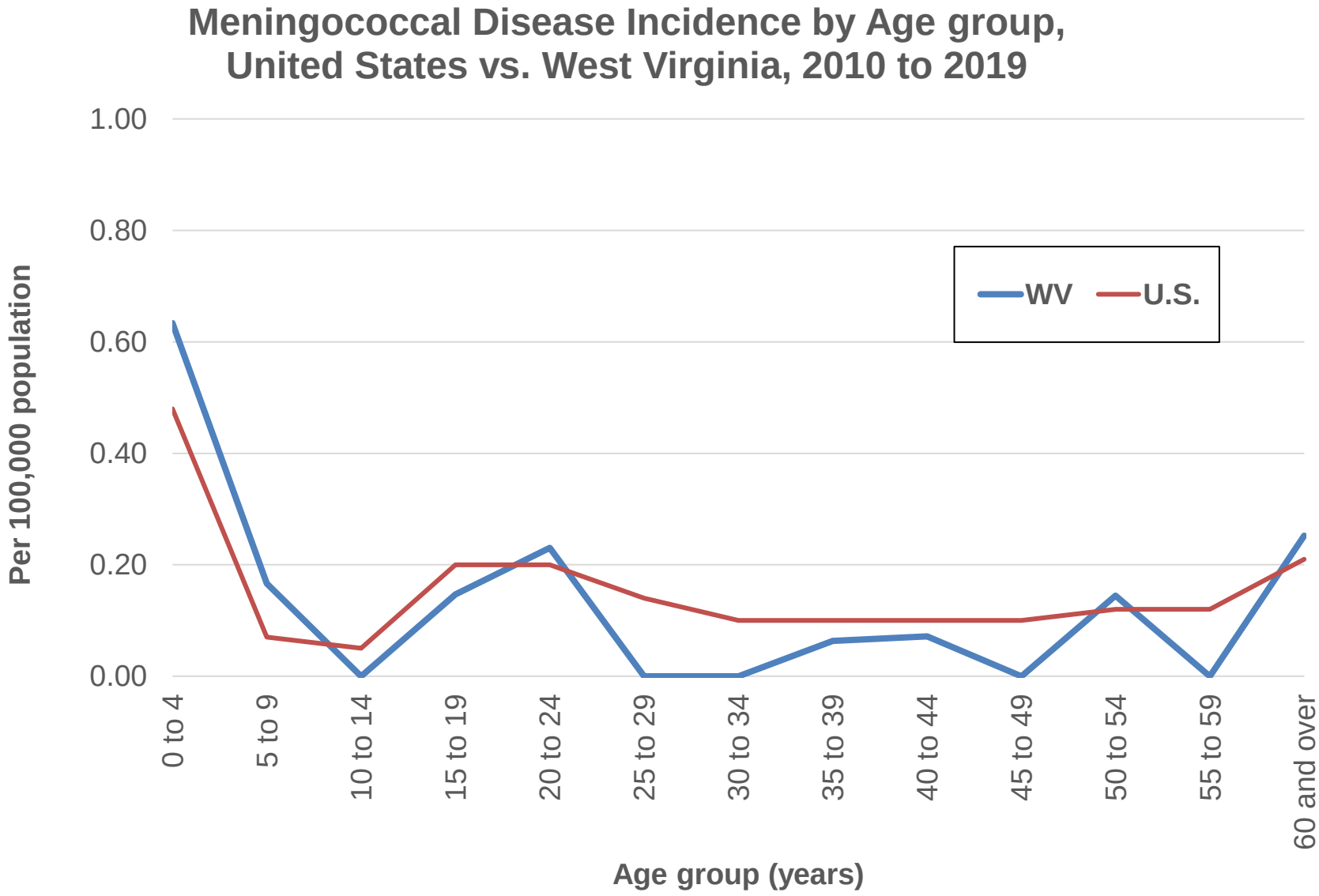
Meningococcal Disease Incidence

Meningococcal disease incidence, United States, 1970–2019



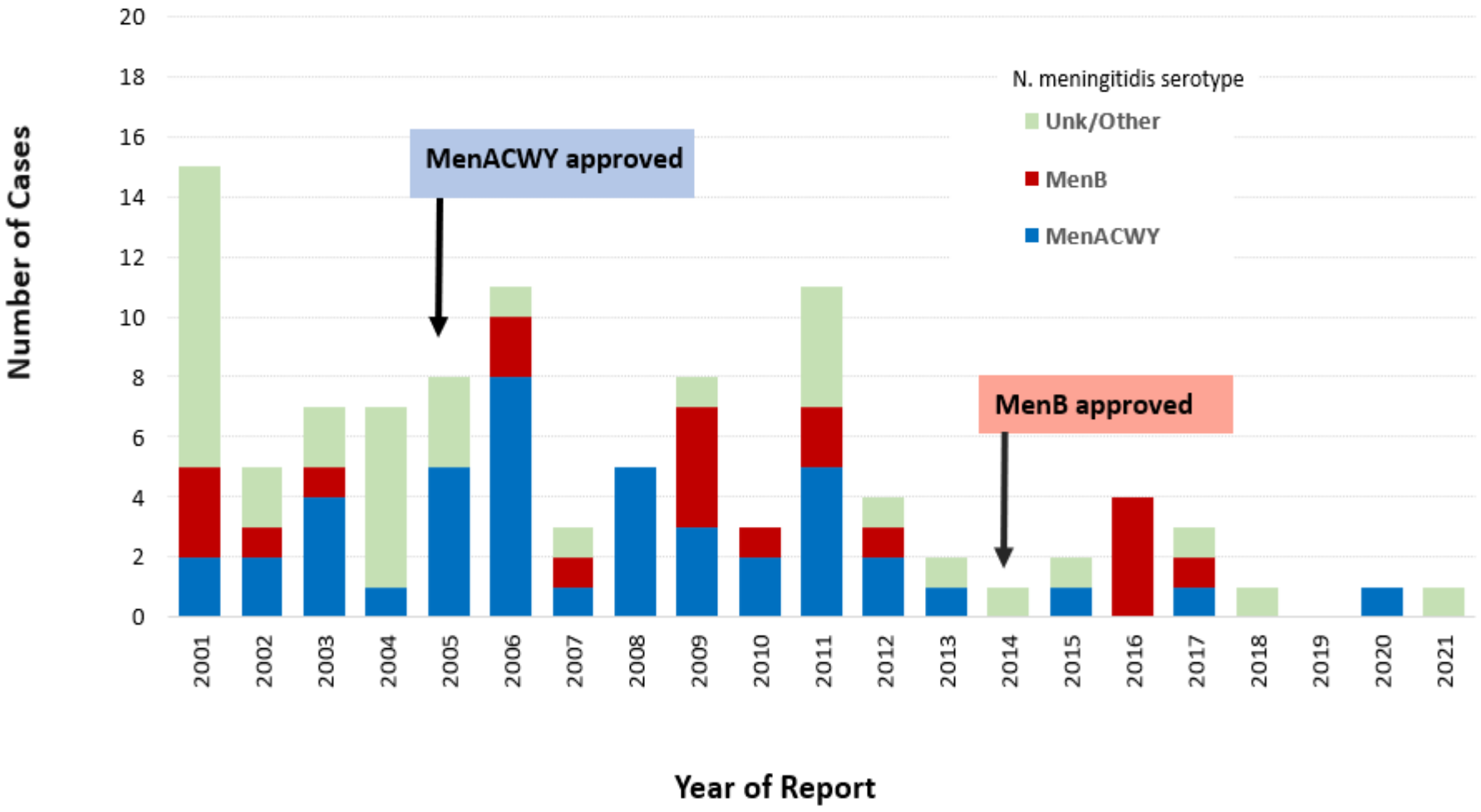
SOURCE: CDC; National Notifiable Diseases Surveillance System

Meningococcal Disease Incidence by Age group



Meningococcal Disease by Serotype

Invasive Meningococcal Disease, West Virginia, 2001-2021



Meningococcal Outbreak – Florida, 2022

April 2022

- Number of cases surpassed 5-year average
- Large outbreak:
  - Gay, bisexual men (MSM)
  - Living with HIV
- Small outbreak:
  - college students
- Vaccines:
  - MenACWY vaccine
  - MenB vaccine
    - college students
    - age 16-23 years

Florida Department of Health Advises on Meningococcal Disease and Vaccines in Florida

April 07, 2022

Contact:
Communications Office
NewsMedia@flhealth.gov
(850) 245-4111

Tallahassee, Fla. — The Florida Department of Health (FDOH) is responding to an outbreak of meningococcal disease in Florida. **However, it can be prevented and treated. Getting vaccinated is the best way to protect against meningococcal disease.**

Control of Meningococcal Disease

- Report within **24 hours of diagnosis** to local health department
- Antimicrobial susceptibility testing
- Antibiotic treatment
- Prophylaxis for close contacts
  - Persons in same household
  - Roommates
  - Anyone with direct contact with a patient's oral secretions (saliva or spit), such as a kissing partner
- Meningococcal vaccine – MenACWY, MenB

ACIP Meningococcal Vaccine Recommendation (2020)

1. **MenACWY** – conjugate vaccines (Menactra, Menveo, MenQuadfi)
   - All preteens at 11 to 12 years old, booster at 16 years
   - NEW: Persons aged ≥2 months at increased risk for meningococcal disease*
   - NEW: Booster doses for previously vaccinated persons who become or remain at increased risk.
   - MenACWY vaccines are interchangeable

2. **MenB** – recombinant vaccine (Trumenba, Bexsero)
   - NEW: Persons ≥10 years old at increased risk for meningococcal disease*
   - Preferred age is 16 through 18 years old
   - Booster doses for previously vaccinated persons who become or remain at increased risk.
   - Must get the same brand for all doses

*<u>Meningococcal vaccine for special population</u>

- Certain medical conditions – functional/anatomic asplenia, complement deficiency
- Travel plans to areas where the disease is common
- Jobs working with the bacteria
- Increased risk due to a meningococcal disease outbreak – MSM, community settings

Source: Mbaeyi SA, Bozio CH, Duffy J, et al. Meningococcal Vaccination: Recommendations of the Advisory Committee on Immunization Practices, United States, 2020. MMWR Recomm Rep 2020;69(No. RR-9):1–41.

PNEUMOCOCCAL DISEASE

Etiology: *Streptococcus pneumoniae*

Transmission:

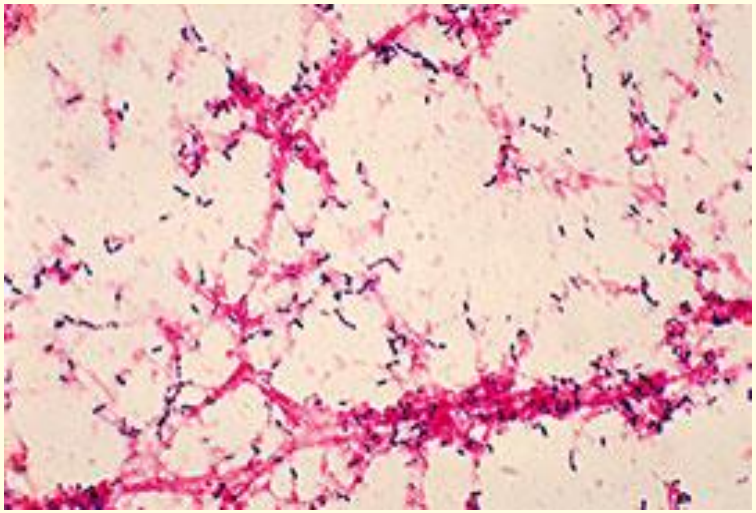
- Respiratory droplets
- Autoinoculation

Clinical Presentation:

- Non-invasive – ear and sinus infection
- Invasive – pneumonia, sepsis, meningitis (Invasive Pneumococcal Disease, IPD)

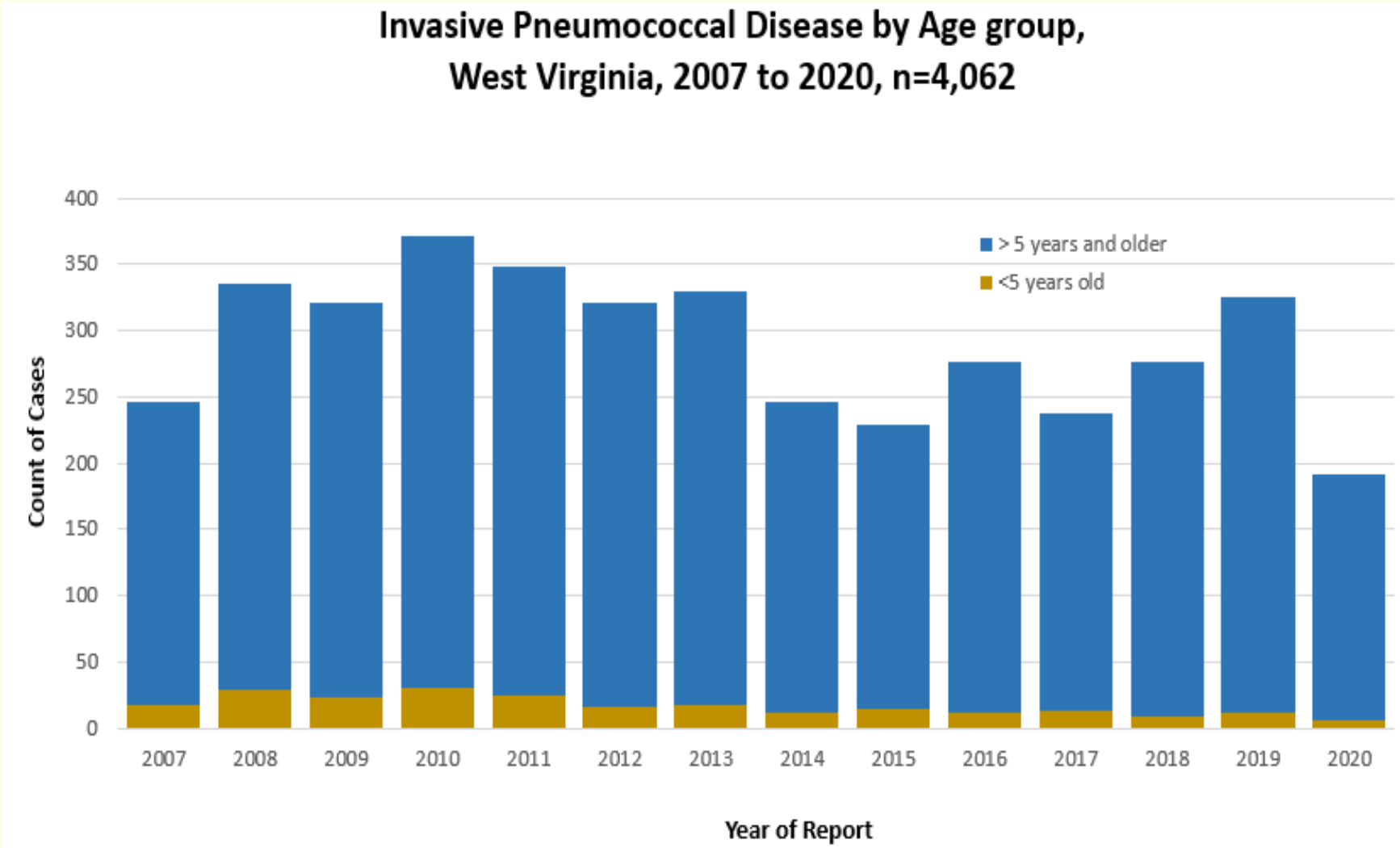
Drug resistance:

Pneumococcal bacteria are resistant to one or more antibiotics in 3 out of every 10 cases.

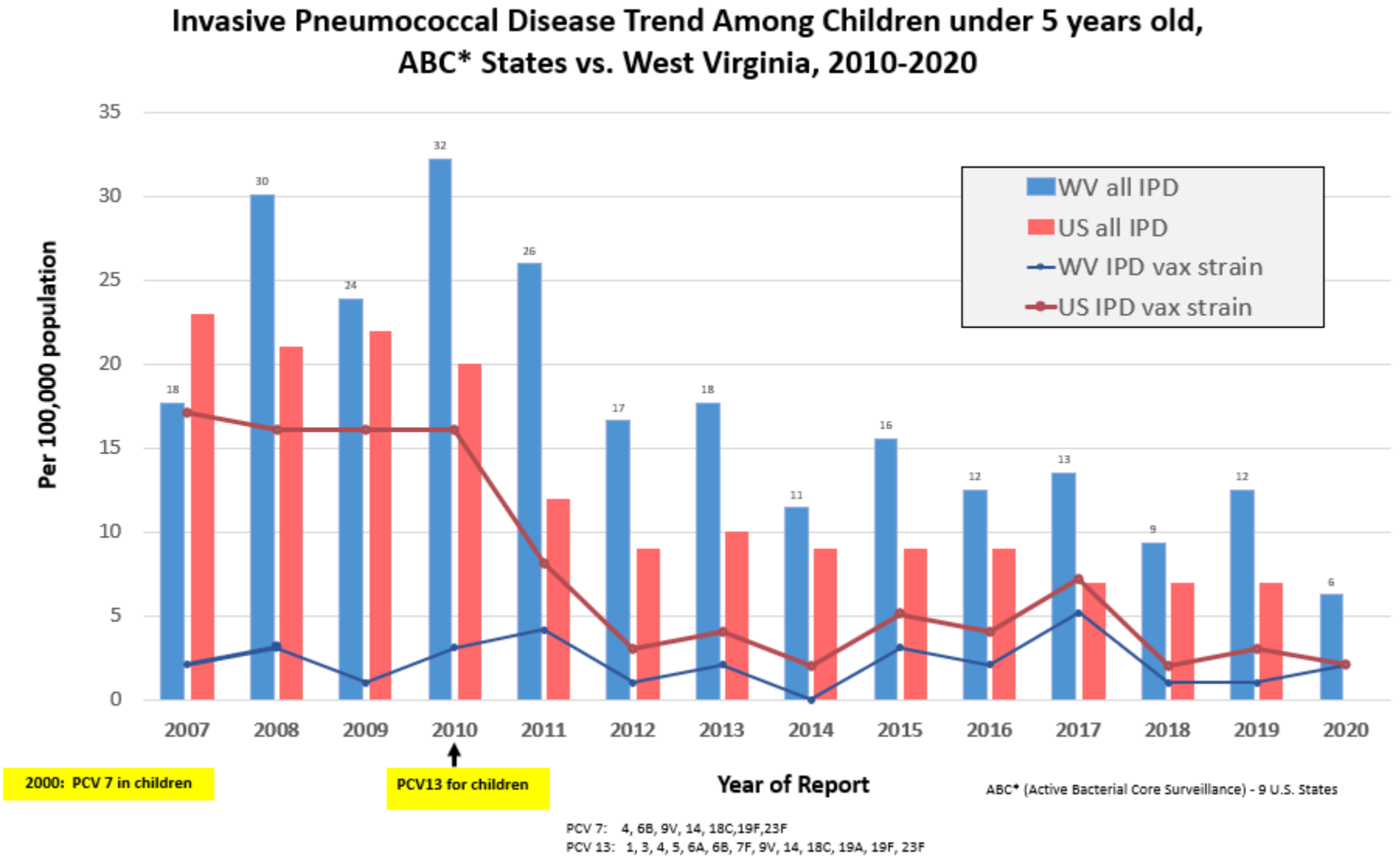


Streptococcus pneumoniae

Invasive Pneumococcal Disease (IPD) by Age group



IPD Under 5 years old



Control of IPD

- Report within **1 week of diagnosis** to local health department
- Antibiotic treatment for cases
- Prophylaxis – not recommended for close contacts
- Pneumococcal vaccines:
  PCV13* for all children < 2 years of age:
  - 4 doses - 2 months, 4 months, 6 months, and 12 through 15 months
  - Those who miss their shots or start the series later should still get the vaccine.

  ACIP, 2021: PCV15 or PCV20 for all adults ≥ 65 years who have never received any pneumococcal conjugate vaccine or whose previous vaccination history is unknown**:
  - If use PCV15, follow with a dose of PPSV23 one year later. Minimum interval is 8 weeks and can be considered in immunocompromised adults.
  - If use PCV20, dose of PPSV23 is NOT indicated.

*PCV 13: 1, 3, 4, 5, 6A, 6B, 7F, 9V, 14, 19A, 19F, 18C, and 23F

**Kobayashi M, Farrar JL, Gierke R, et al. Use of 15-Valent Pneumococcal Conjugate Vaccine and 20-Valent Pneumococcal Conjugate Vaccine Among U.S. Adults: Updated Recommendations of the Advisory Committee on Immunization Practices — United States, 2022. MMWR Morb Mortal Wkly Rep 2022;71:109–117.

INFLUENZA

Etiology: Influenza A and B virus

Transmission: Respiratory droplets

Communicability:

- From 3-4 days before illness begins and up to 5-7 days after illness onset

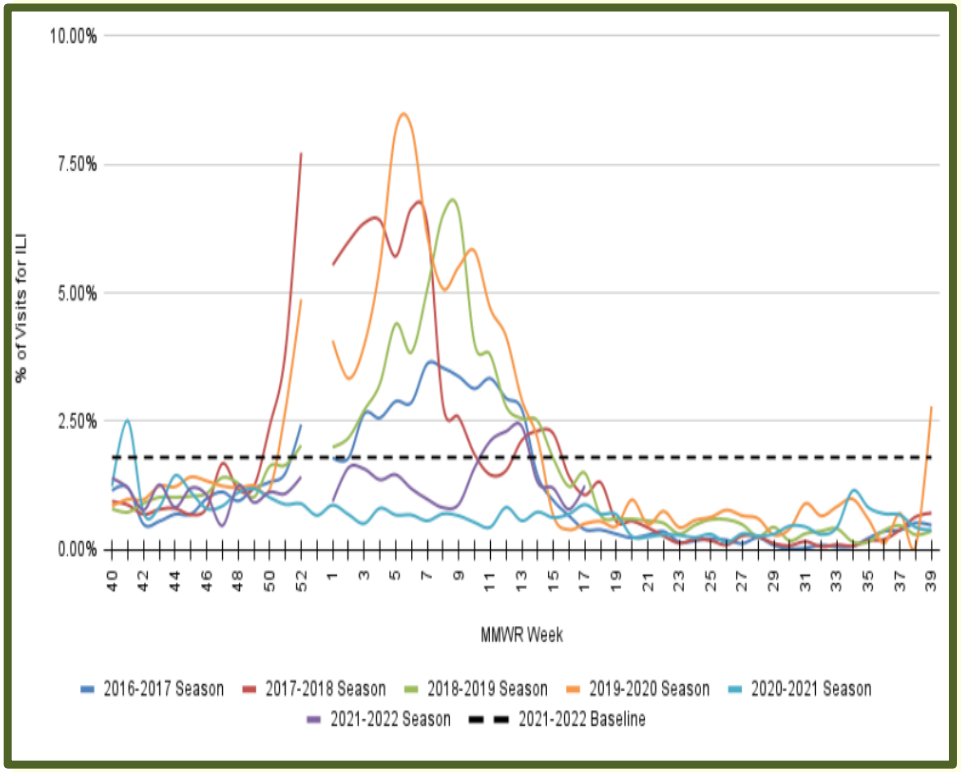
Clinical Presentation:

- Fever
- Cough
- Sore throat
- Runny nose
- Muscle aches
- Headaches
- Fatigue

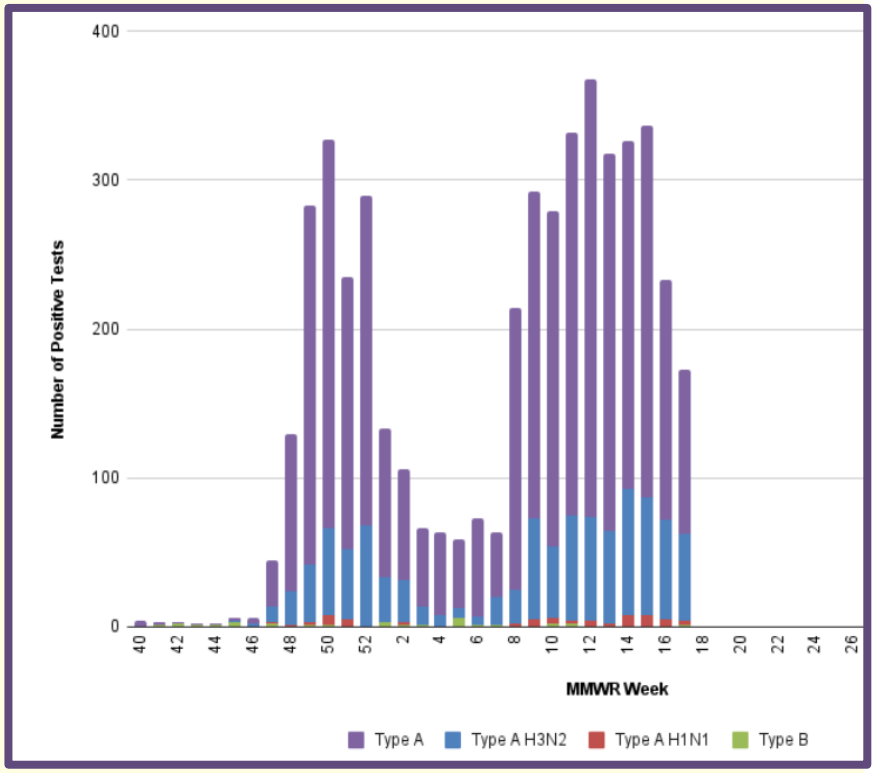
It is difficult to distinguish flu from other viral or bacterial respiratory illnesses based on symptoms alone. There are tests available to diagnose flu.

Influenza Surveillance, WV, 2016-2022

Percent of Patient Visits for Influenza-like Illness (ILI) as reported by WV Sentinel Providers, 2016-2022*



Positive Influenza Tests Reported by Hospital and Reference Laboratories, 2021-2022*



*as of May 9, 2022, source: https://oeps.wv.gov/flu/pages/flu_data.aspx

Control of Influenza

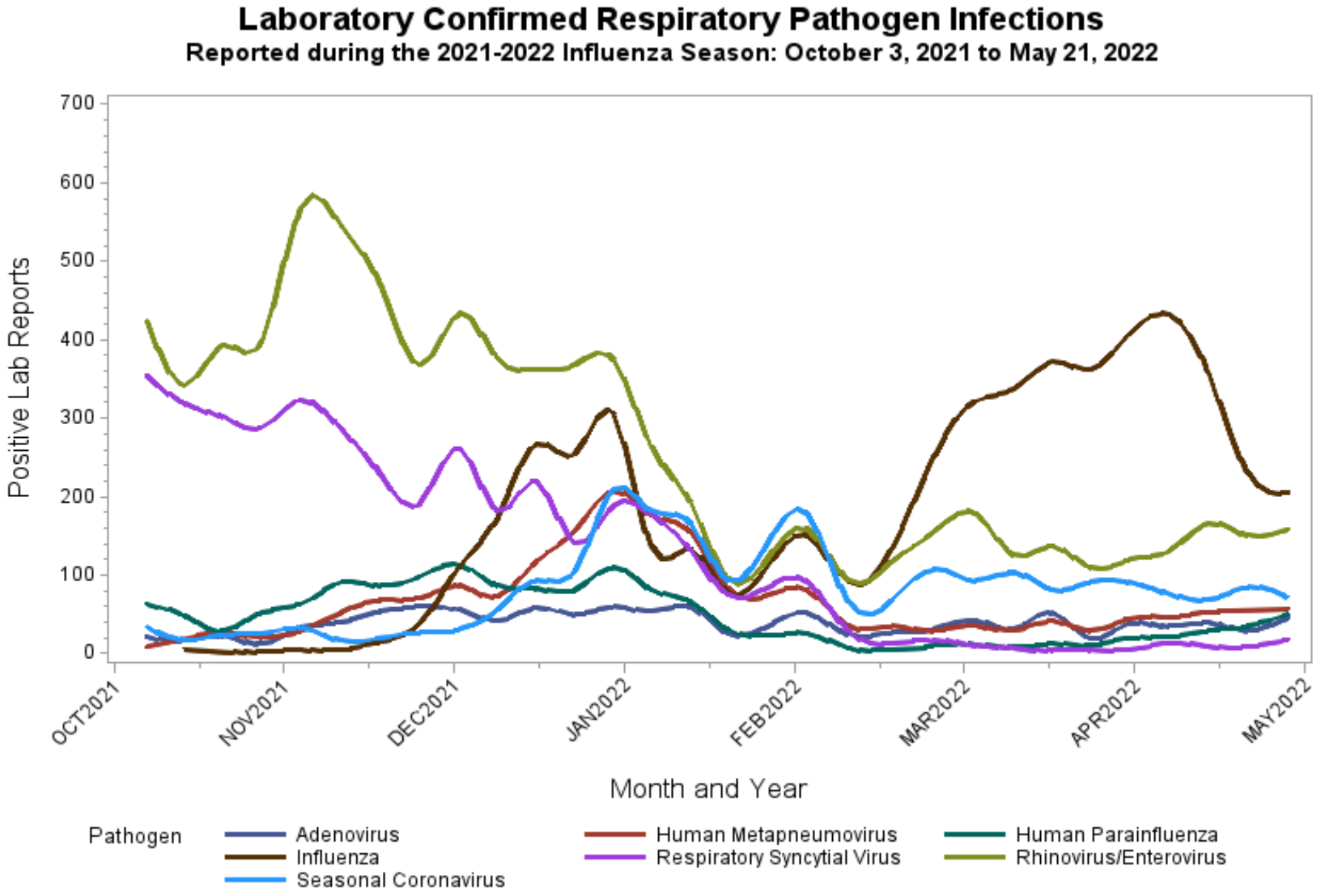
Influenza outbreak – report **immediately** to LHD

Influenza vaccine 2021-2022

- Virus lineage: Influenza A(H1N1)pdm09, Influenza A(H3N2), Influenza B/Victoria, Influenza B/Yamagata
- CDC (MMWR, Feb. 2022):
  - "…seasonal influenza vaccination did not reduce the risk for outpatient respiratory illness caused by influenza A(H3N2) viruses that have predominated so far this season"
  - "…influenza vaccination for as long as influenza viruses are circulating. Vaccination can prevent serious influenza-related complications caused by viruses that might circulate later in the season, including 2009 pandemic A(H1N1) and influenza B viruses."

Antiviral medications – for at-risk persons

Co-circulating Viruses in WV



Seasonal Coronavirus includes strains OC43, 229E, HKU1 and NL63. These commonly circulating viruses cause mild illness and differ from COVID-19.
Trends are displayed annually by influenza season which begins in early October during MMWR Week 40 and ends the following year during MMWR Week 39.

RESPIRATORY SYNCYTIAL VIRUS (RSV)

Etiology: RSV virus

Transmission:

- Respiratory droplet
- Direct contact

Communicability: 3-8 days

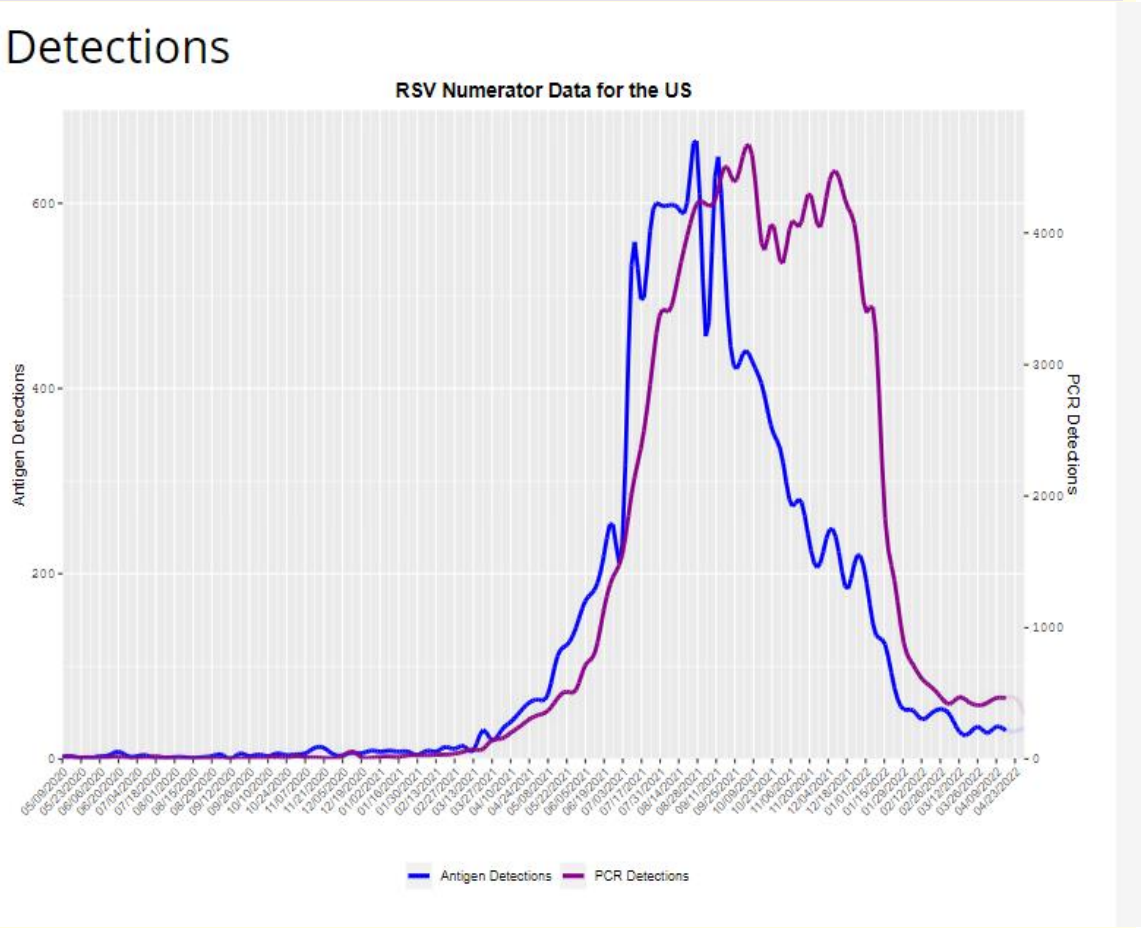
Clinical Presentation:

- Mild, cold-like symptoms
- Bronchiolitis, pneumonia

Disease Control:

- No vaccine
- Respiratory precautions
- cleaning
- Palivizumab

RSV Weekly Positive Tests, U.S., May 2020-April 2022

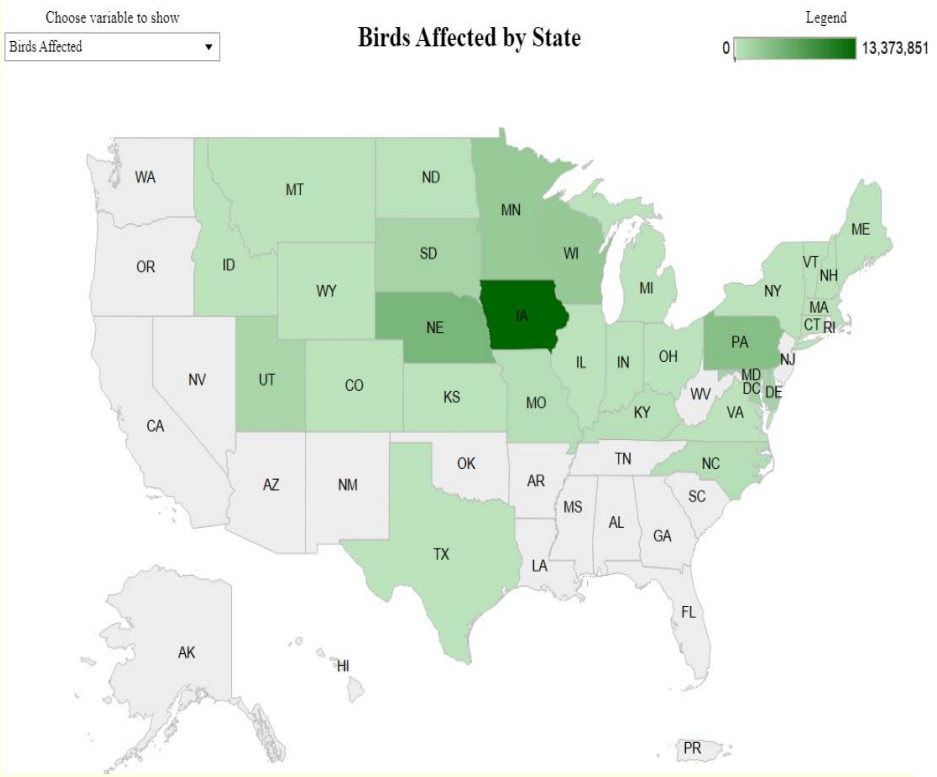


https://www.cdc.gov/surveillance/nrevss/rsv/natl-trend.html

HIGHLY-PATHOGENIC AVIAN INFLUENZA

- Highly-Pathogenic Avian (H5) Influenza (HPAI)
- Jan. - April 2022, APHIS: >899 detections of wild birds infected with HPAI in 33 states
- Feb. 2022, APHIS: commercial turkey flock outbreak
- By April 2022, APHIS: 247 HPAI outbreaks among commercial poultry/backyard bird flocks in 29 states
- Virus infect the respiratory and gastrointestinal tracts of birds → shed virus in saliva, mucous, and feces

States with birds affected by HPAI, January to April 2022



HPAI in Humans

- April 20, 2022, CDC: 1 person (with PPE) involved in poultry depopulation with mild respiratory illness with Influenza A (H5), close contacts not infected

U.S. Case of Human Avian Influenza A(H5) Virus Reported

Person Had Contact with Infected Poultry; Public Health Risk Assessment Remains Low

Media Statement

For Immediate Release: Thursday, April 28, 2022, 11:00 p.m. ET
Contact: Media Relations
(404) 639-3286

- 2003 to March 2022, WHO: 864 human infections and 456 deaths
- Transmission to human: virus gets into a person's eyes, nose, or mouth or is inhaled after close or prolonged unprotected contact with infected birds or contaminated environments.
- No evidence of human-to-human transmission in U.S.
- Clinical presentation: mild infection, pneumonia

Control of HPAI

Recommendations for Health Care Providers:

- Consider HPAI A(H5N1) infection in persons with signs or symptoms of respiratory illness and exposure
- Contact health department
- Collect respiratory specimens (using PPE)
- Empiric antiviral treatment, no vaccine
- Advise patient to isolate at home
- Monitor exposed individuals for 10 days
- Recommend PPE – flock workers, healthcare provider

WV Response:

- HAN
- WV BPH partnership with USDA and WV Dept. of Agriculture
- Case investigation

HEPATITIS A INFECTION

Etiology: HAV virus

Reservoir: human, no carriers

Transmission:

- Fecal-oral

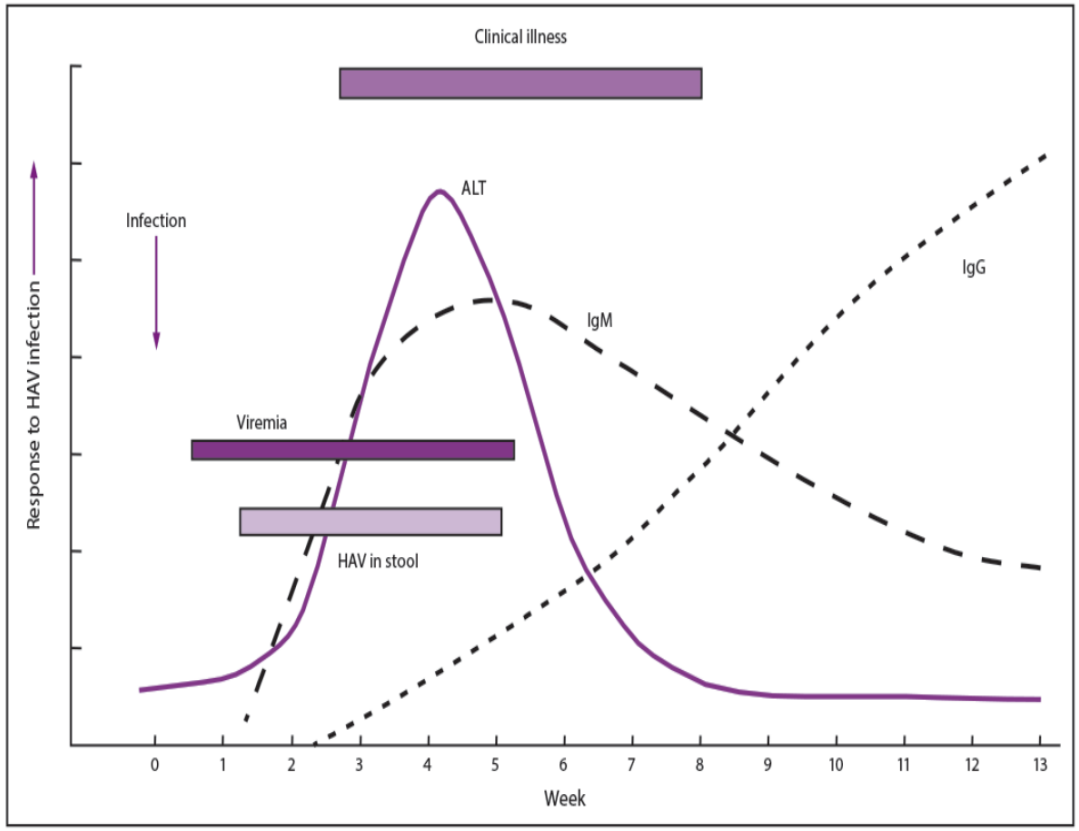
Communicability:

- Infectious from 2 weeks before to 1 week after symptoms onset

Presentation:

- Abrupt onset of fever, malaise, anorexia, nausea, dark urine, jaundice
- Detectable IgM anti-HAV

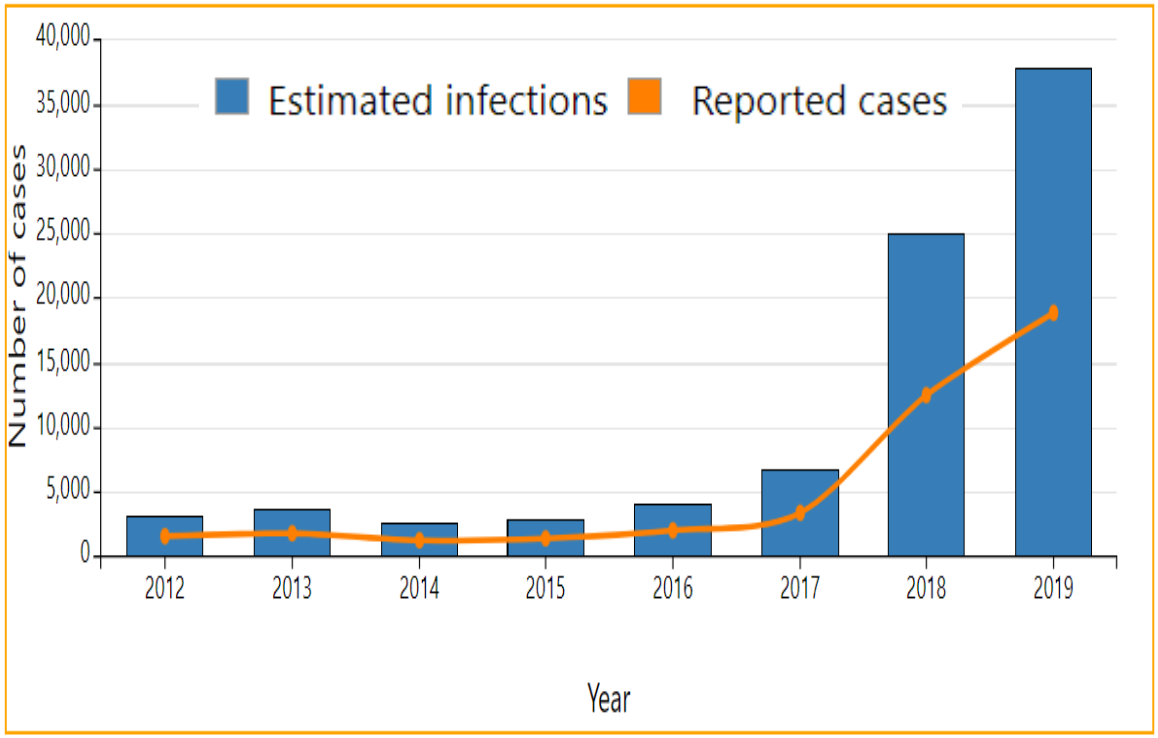
Immunologic and clinical events associated with hepatitis A virus infection and recovery



Source: CDC. Diagnosis and management of foodborne illnesses. MMWR Recomm Rep 2004;53(No. RR-4).

Hepatitis A Cases

Number of reported hepatitis A virus infection cases and estimated infections, United States, 2012–2019



Source: https://www.cdc.gov/hepatitis/statistics

West Virginia Hepatitis A Cases:

- Annual average: 9 cases
- March 2018, WV declared an OB of HAV after cases were epidemiologically and genetically linked to the HAV virus genotype 1B
- By 2020, more than 2,500 cases of HAV were identified in WV

Hepatitis A Outbreak, WV, 2018-2020

West Virginia Hepatitis A Outbreak Cases* as of August 24, 2020**	
Number of Cases	2732
Demographics	
Age Range	1-87
Median Age	37
Male	1589 (58.2%)
Hospitalizations	1377 (50.4%)
Deaths	23
Risk Factors	
Co-infection with Hepatitis C (Information available for 2163 cases)	1223 (56.5%)
Co-infection with Hepatitis B (Information available for 2163 cases)	222 (10.3%)
Reports Illicit Drug Use (Information available for 2341 cases)	1599 (68.3%)
Homeless	254 (9.3%)

**: Table does not include all reported hepatitis A cases in the outbreak region; only those cases that are identified as outbreak-related. Data are provisional and subject to change.*

Control of Hepatitis A

Reportable within 24 hours of diagnosis

HAV vaccination (ACIP, 2020):

- All children aged 12–23 months,
- **NEW**: All children and adolescents 2–18 years who have not previously received HepA vaccine
- For high-risk individuals
- Adults not at risk but want protection: 2 doses

Food service workers:

- Excluded from work for at least 2 weeks after symptom onset
- Food workers with jaundice: NOT return to work for at least 1 week after onset of jaundice

Recommendations for preexposure protection and postexposure prophylaxis, by age group and risk category — ACIP, 2020

Indication and Age Group	Risk Category and Health Status	Hep A vaccine	IG
PRE-EXPOSURE PROTECTION (e.g. travel)			
<6 months	Healthy	No	0.1-0.2 ml/kg
6-11 months	Healthy	1 dose	None
12 months-40 years	Healthy	2 dose	None
>40 years	Healthy	3 dose	0.1-0.2 ml/kg
>6 months	Immunocompromised or chronic liver disease	No	0.1-0.2 ml/kg
>6 months	Persons electing not to receive vaccine or vaccine is contraindicated	No	0.1-0.2 ml/kg
POST-EXPOSURE PROPHYLAXIS			
<12 months	Healthy	No	0.1 ml/kg
12 months-40 years	Healthy	1 dose	none
>40 years	Healthy	2 dose	0.1 ml/kg
≥12 months	Immunocompromised or chronic liver disease	3 dose	0.1 ml/kg
≥12 months	Vaccine contraindicated	No	0.1 ml/kg

Source: Nelson NP, Weng MK, Hofmeister MG, et al. Prevention of Hepatitis A Virus Infection in the United States: Recommendations of the Advisory Committee on Immunization Practices, 2020. MMWR Recomm Rep 2020;69(No. RR-5):1–38

Acute Hepatitis of Unknown Etiology (UE)

Clinical Presentation:

- Previously healthy children 1-10 years old
- Abdominal pain, diarrhea, vomiting
- Increase LFTs: ALT, AST >500 IU/L

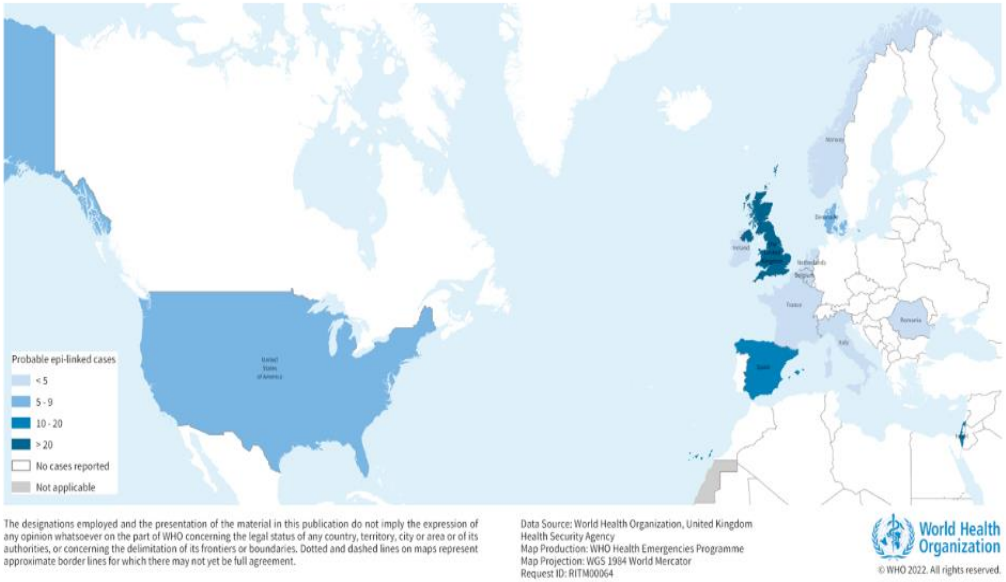
Complications:

- Liver failure → transplant
- Death

Agents:

- HAV, HBV, HCV – not detected
- Adenovirus 41 detected
- SARS-CoV2 detected

Figure 1. Distribution of cases of acute severe hepatitis of unknown origin by country, as of 23 April 2022.



Testing for Acute Hepatitis of UE

Specimen Types Involved in This Investigation

CDC recommends including adenovirus testing in children with acute hepatitis of unknown etiology.

Because the potential relationship between adenovirus and acute hepatitis is still under a national epidemiologic investigation, consider collection and submission of the following specimen types (if available) for adenovirus detection.

- Blood specimen collected in purple top EDTA tube (whole blood, plasma) or serum; whole blood is preferred to plasma
- Respiratory specimen (nasopharyngeal swab in VTM/UTM, sputum, or bronchioalveolar lavage [BAL])
- Stool specimen (or rectal swab in VTM/UTM); whenever possible, a stool specimen is preferred to a rectal swab
- If a liver biopsy has already been performed as clinically indicated, or from native liver explant or autopsy:
  - Formalin-fixed, paraffin embedded (FFPE) liver tissue
  - Fresh liver tissue, frozen on dry ice or liquid nitrogen immediately or as soon as possible, and stored at ≤ -70°C

Nucleic acid amplification testing (NAAT, e.g., PCR) is preferred for adenovirus detection (currently not available for FFPE liver biopsy or native liver explant). Testing whole blood by PCR may be more sensitive than testing plasma by PCR and is preferred.

Source: https://www.cdc.gov/ncird/investigation/hepatitis-unknown-cause/laboratories-testing-typing.html

Acute Hepatitis of UE – What to do:

Health Care Providers

- Notify LHD → investigate
- Evaluate for other causes of hepatitis, standard diagnostic work-up for hepatitis
- Adenovirus testing

Parents and Guardians

- Be aware of symptoms of hepatitis
  - fever, fatigue
  - loss of appetite
  - nausea, vomiting
  - abdominal pain
  - dark urine
  - light-colored stools
  - joint pain
  - jaundice
- Consult health care provider
- Keep children current on all vaccines
- Everyday actions to prevent disease: handwashing, avoid sick people, respiratory etiquette

RABIES

Etiology: RNA virus

Reservoir: mammals

Transmission:

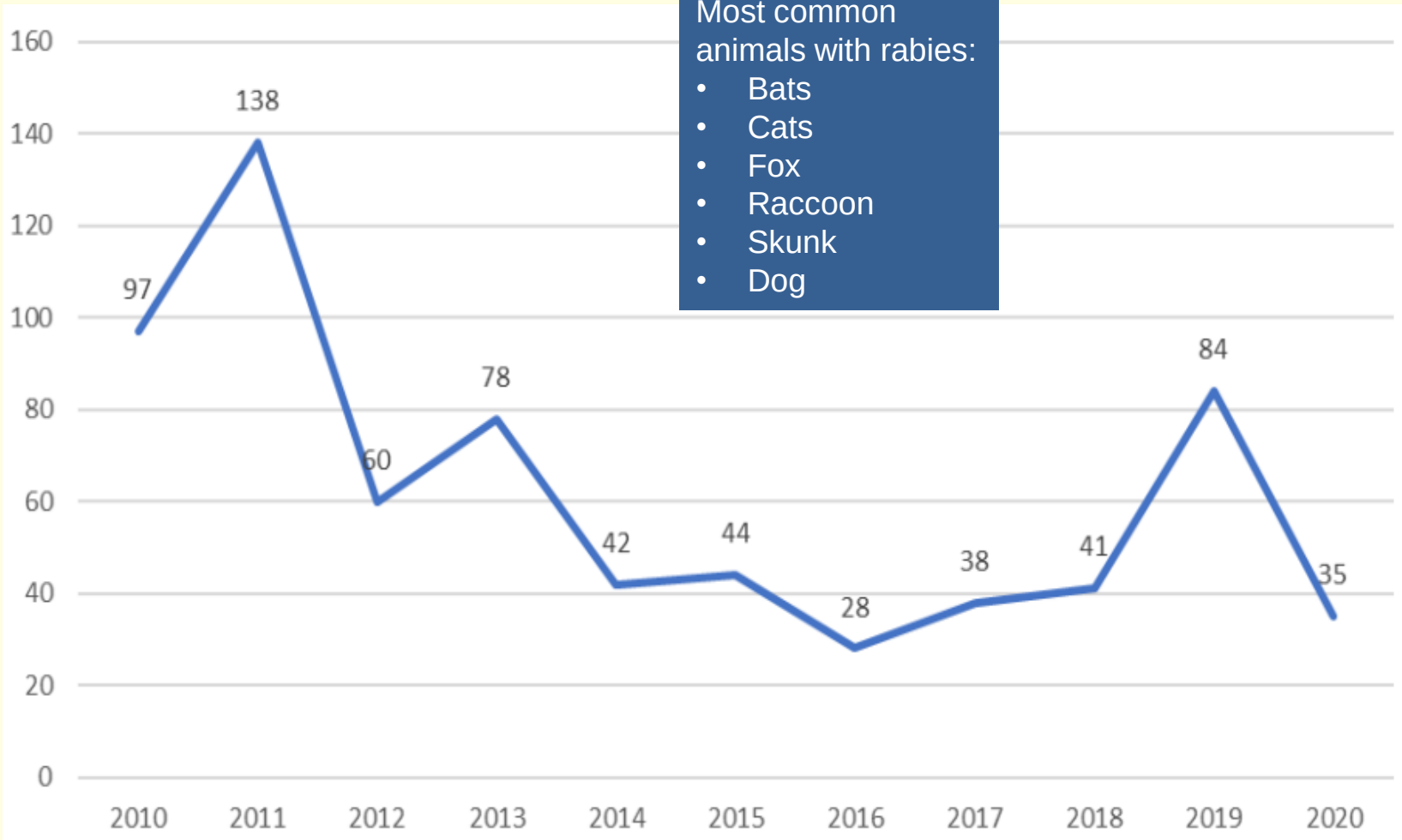
- Most common: direct contact with saliva or brain/nervous tissue of infected animal
- Rare: inhalation, organ transplant

Incubation Period: weeks to months

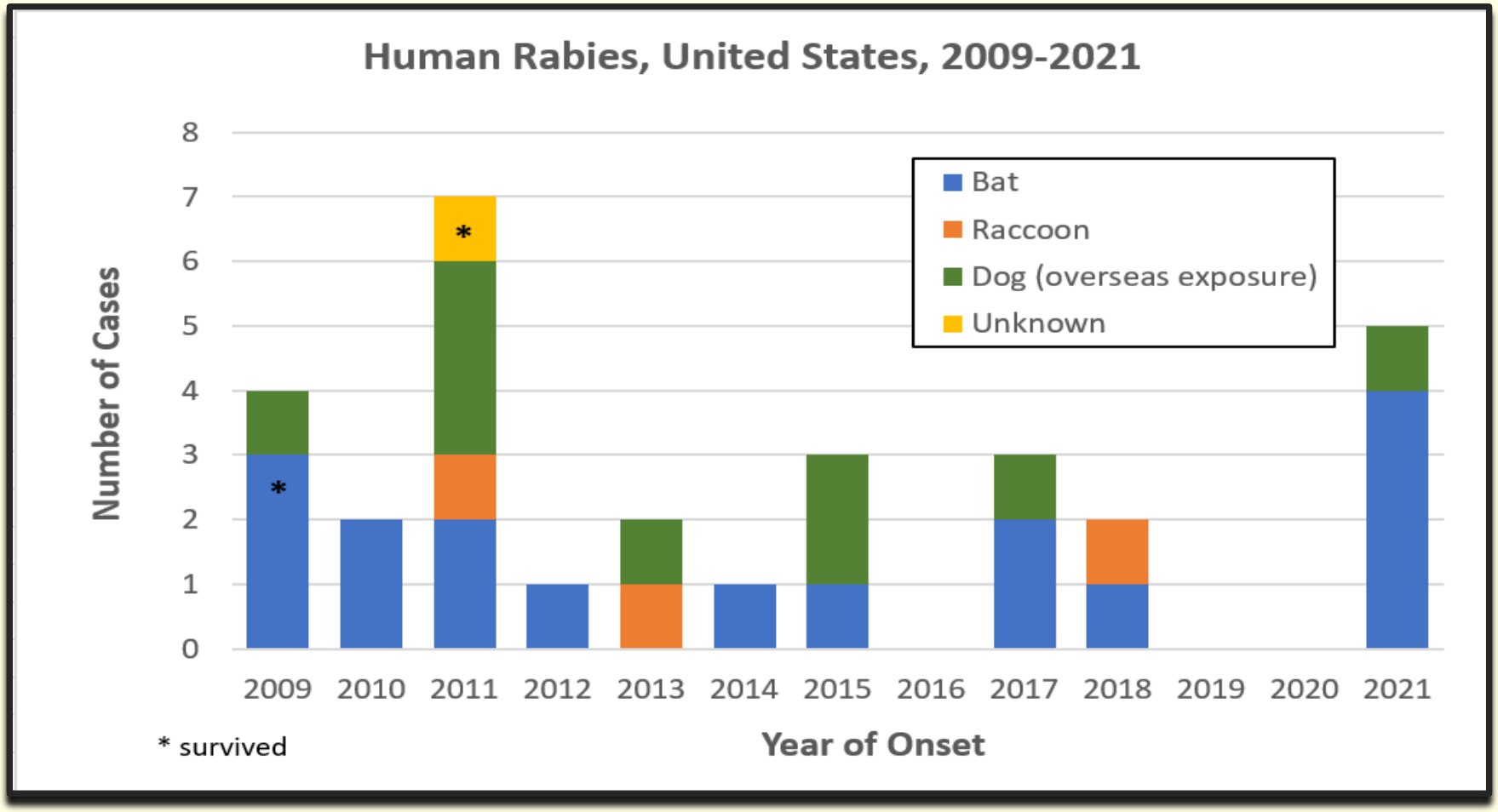
Clinical Presentation: flu-like symptoms → cerebral dysfunction

Animal Rabies

Animal Rabies, WV, 2010-2020, n= 685



Human Rabies



Human Rabies Cases, U.S., 2022

CDC Reports Increase in Human Rabies Cases Linked to Bats in the U.S.

Three U.S. rabies deaths in just five weeks

Press Release

Embargoed Until: Thursday, January 6, 2022, 1:00 p.m. ET
Contact: Media Relations
(404) 639-3286

The Centers for Disease Control and Prevention (CDC) is raising awareness of the risks of rabies from bats in the U.S. after three people, including one child, died from rabies between late September and early November 2021. The three cases, described in the January 6, 2022, Morbidity and Mortality Weekly Report, bring the total number of cases in 2021 to five, compared to no reported rabies cases in people during 2019 and 2020.

Rabies Control and Prevention

Rabies prevention for people:

1. Stay away from wildlife.
2. Prevent rabies in pets.
3. **Post-exposure Prophylaxis (PEP)**
    - Clean the wound, tetanus shot
    - HRIG
    - Rabies vaccine – day 0, 3, 7, 14
4. **Pre-exposure Prophylaxis (PrEP)** for high-risk persons, ACIP 2022

Rabies prevention for pets:

1. Protect pets from rabies
2. Vaccinate pets

Updates to the ACIP recommendations to prevent human rabies, 2022

- A 2-dose PrEP schedule has replaced the 3-dose PrEP schedule to protect for up to 3 years. Options for maintaining protection beyond 3 years are also described.
- Risk categories have been redefined into 5 risk groups.
- The minimum acceptable laboratory value (antibody titer) used to determine whether rabies vaccine booster doses are needed was revised and standardized.
- Many people for whom serial titers were recommended every 2 years now require only a one-time titer (and booster if below a certain level) OR a one-time booster.
- Clinical guidance for administering PrEP to people with weakened immune systems has been outlined and includes recommendations to confirm that the vaccine was effective.

Source: Reao AK, Briggs D, Moore SM, et al. Use of a Modified Preexposure Prophylaxis Vaccination Schedule to Prevent Human Rabies: Recommendations of the Advisory Committee on Immunization Practices — United States, 2022. MMWR Morb Mortal Wkly Rep 2022;71:619–627.

Monkeypox Outbreak

- 1970: Monkeypox in DRC
- Since then, reported in African countries
- May 2022: Monkeypox reported in Europe and North America among persons who self-identify as gay, bisexual, or MSM

Disease Outbreak News

21 May 2022 | Multi-country monkeypox outbreak in non-endemic countries

Disease Outbreak News

18 May 2022 | Monkeypox - United Kingdom of Great Britain and Northern Ireland

Disease Outbreak News

16 May 2022 | Monkeypox - United Kingdom of Great Britain and Northern Ireland

Monkeypox Virus Infection in the United States and Other Non-endemic Countries—2022

HAN HEALTH ALERT NETWORK

This is an official CDC HEALTH ADVISORY

Distributed via the CDC Health Alert Network
May 20, 2022, 11:30 AM ET
CDCHAN-00466

MONKEYPOX

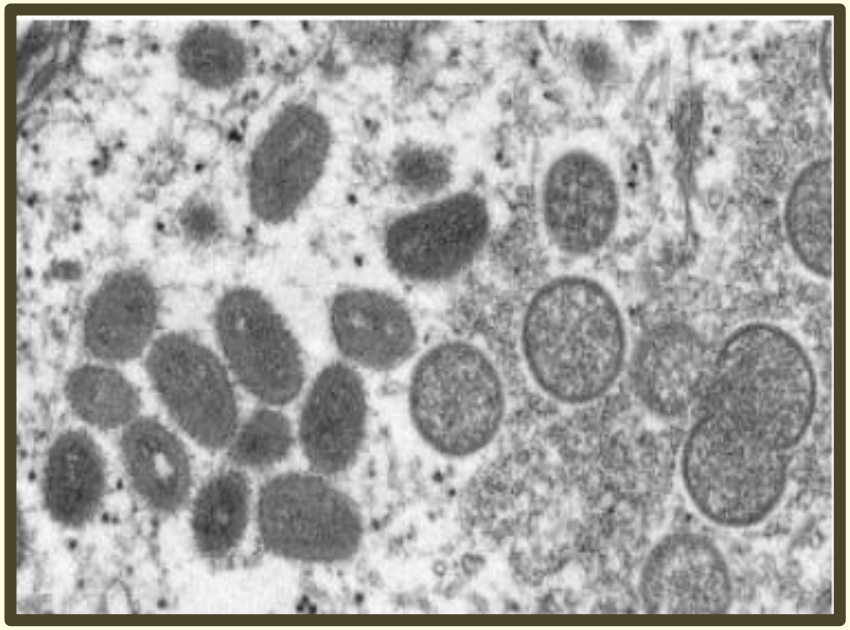
Etiology: Monkeypox virus

Reservoir: unknown

Transmission:

- Through broken skin, respiratory tract, mucous membranes
- Direct contact with body fluids or lesion
- Respiratory droplets
- Indirect – contaminated items

Incubation Period: 5-21 days



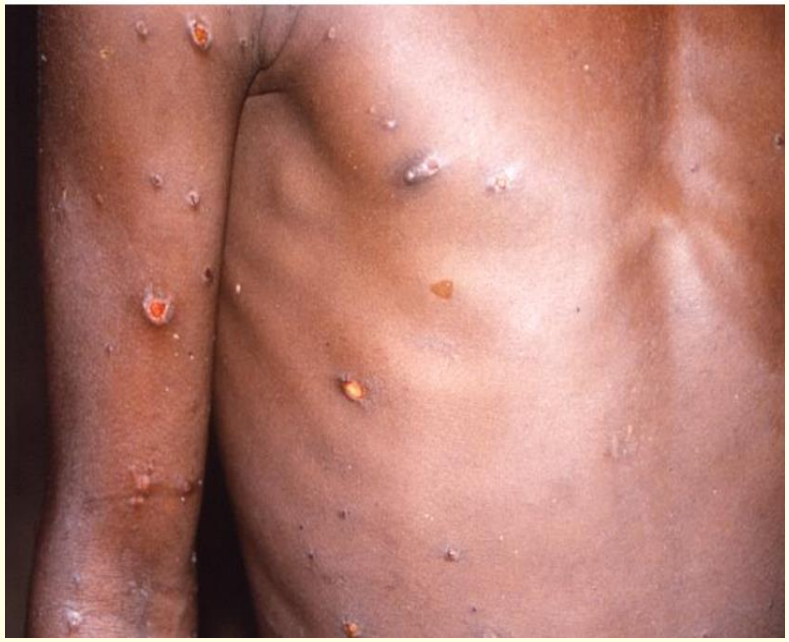
Monkeypox virus

Source: CDC

MONKEYPOX

Clinical Presentation:

- Prodrome – malaise, fever, headache, sore throat, cough, LYMPHADENOPATHY
- Rash
  - Lesions in mouth and body
  - Face → arms, legs → palms, soles
  - Macule → papule → vesicle → pustule → scab → fall off
  - Firm, well-circumscribed, central umbilication



Monkeypox patient during 1997 outbreak investigation in the Democratic Republic of the Congo (DRC), formerly Zaire.

Source: https://phil.cdc.gov/Details.aspx?pid=12779

Communicability:

- From onset of enanthem through scab stage.

Monkeypox Control and Prevention

1. Rash suspicious for monkeypox, report **immediately** to LHD.
2. Suspect monkeypox when evaluating people with the characteristic rash, especially:
    a. Men who report sexual contact with other men who present with lesions in the genital/perianal area,
    b. People reporting a significant travel history in the month before illness onset, or
    c. People reporting contact with people who have a similar rash or have received a diagnosis of suspected or confirmed monkeypox.
3. Infection prevention and control practices.
    a. Immediately notify the Infection Preventionist.
    b. Isolate infected patient.
    c. Airborne precautions.
    d. Use PPE when caring for patients: gown, respirator, face shield, gloves.
    e. Good hand hygiene after contact with infected humans: wash hands with soap and water or use an alcohol-based hand sanitizer.
    f. Avoid contact with any materials, *e.g.,* beddings, clothing
4. Obtain multiple specimens from more >1 lesion, from different locations on the body and/or from lesions with differing appearances.
5. Vaccine and immune globulin

CONCLUSION

- Surveillance is key to understanding disease epidemiology and control (of disease).
- If suspect VPD, notify public health.
- Benefits of vaccination outweigh risk of disease.

Contact Information

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