

Respiratory Illness Update

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Annual School Health Conference

July 29, 2022



Disclosures

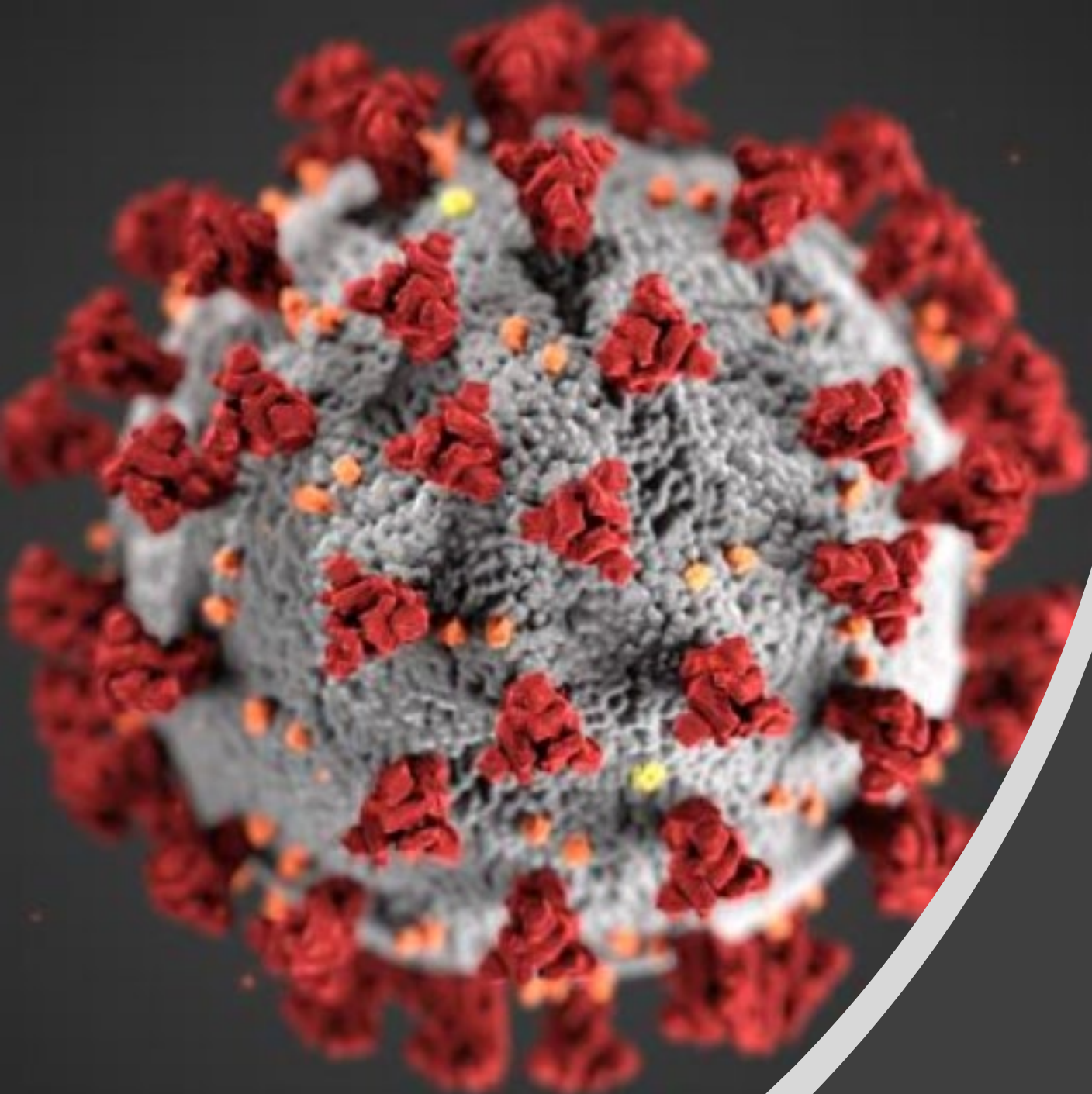
- JGN- AHRQ, NIH, Merck, Pfizer
- JES- NIH
- Everything is only up to date as of the time that we put the slides together!

Objectives (original plan)

- Review current information related to COVID-19 infection and treatment
- Review influenza symptoms and vaccination recommendations
- Review RSV epidemiology and prevention strategies

Objectives (last minute change)

- Review current information related to COVID-19 infection and treatment
- Review influenza symptoms and vaccination recommendations
- ~~• Review RSV epidemiology and prevention strategies~~
- Review monkeypox!



COVID-19

Watch for Symptoms

People with COVID-19 have had a wide range of symptoms reported – ranging from mild symptoms to severe illness. Symptoms may appear 2-14 days after exposure to the virus. Anyone can have mild to severe symptoms. People with these symptoms may have COVID-19:

- Fever or chills
- Cough
- Shortness of breath or difficulty breathing
- Fatigue
- Muscle or body aches
- Headache
- New loss of taste or smell
- Sore throat
- Congestion or runny nose
- Nausea or vomiting
- Diarrhea

COVID-19 Community Levels and Associated Prevention Strategies

COVID-19 Community Levels – Use the Highest Level that Applies to Your Community				
New COVID-19 Cases Per 100,000 people in the past 7 days	Indicators	Low	Medium	High
Fewer than 200	New COVID-19 admissions per 100,000 population (7-day total)	<10.0	10.0-19.9	≥20.0
	Percent of staffed inpatient beds occupied by COVID-19 patients (7-day average)	<10.0%	10.0-14.9%	≥15.0%
200 or more	New COVID-19 admissions per 100,000 population (7-day total)	NA	<10.0	≥10.0
	Percent of staffed inpatient beds occupied by COVID-19 patients (7-day average)	NA	<10.0%	≥10.0%

The COVID-19 community level is determined by the higher of the new admissions and inpatient beds metrics, based on the current level of new cases per 100,000 population in the past 7 days

Missouri

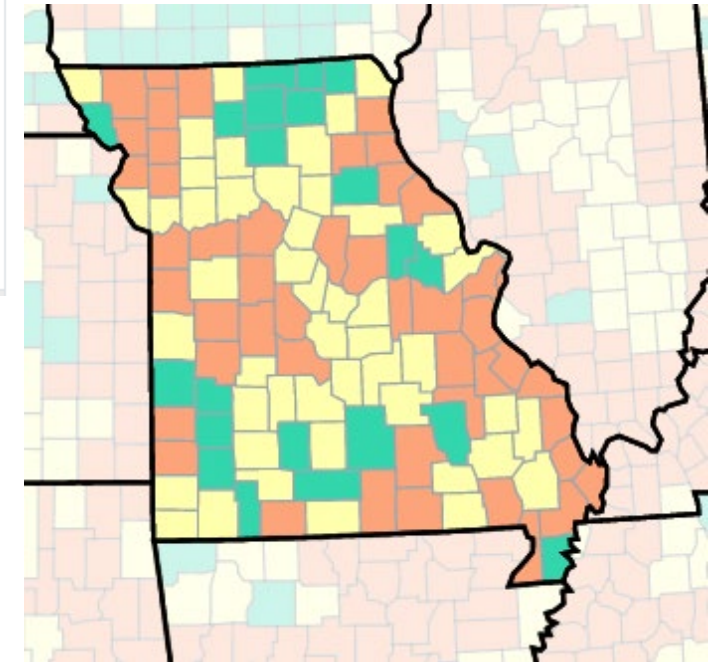
State Health Department [↗](#)

7-day Metrics

Cases	14,201
% Positivity	25 + %
Deaths	62
% of Population ≥ 5 Years of Age Fully Vaccinated	60.5%
New Hospital Admissions (7-Day Moving Avg)	133.57

What Prevention Steps Should You Take Based on Your COVID-19 Community Level?

Low	Medium	High
<ul style="list-style-type: none">Stay <u>up to date</u> with COVID-19 vaccines<u>Get tested</u> if you have symptoms	<ul style="list-style-type: none">If you are <u>at high risk for severe illness</u>, talk to your healthcare provider about whether you need to wear a mask and take other precautionsStay <u>up to date</u> with COVID-19 vaccines<u>Get tested</u> if you have symptoms	<ul style="list-style-type: none">Wear a <u>mask</u> indoors in publicStay <u>up to date</u> with COVID-19 vaccines<u>Get tested</u> if you have symptomsAdditional precautions may be needed for people <u>at high risk for severe illness</u>




NEWS

Face masks required in Jackson County buildings amid high community level

by: [Juan Cisneros](#)
Posted: Jun 28, 2022 / 10:03 AM CDT
Updated: Jun 29, 2022 / 03:17 PM CDT

School mask mandates return as latest coronavirus variants surge

 By [Donna St. George](#)
July 27, 2022 at 11:50 a.m. EDT

<https://www.cdc.gov/coronavirus/2019-ncov/your-health/covid-by-county.html>

https://covid.cdc.gov/covid-data-tracker/#county-view?list_select_state=Missouri&data-type=CommunityLevels&null=CommunityLevels

[School mask mandates return, as latest covid variants surge - The Washington Post](#)

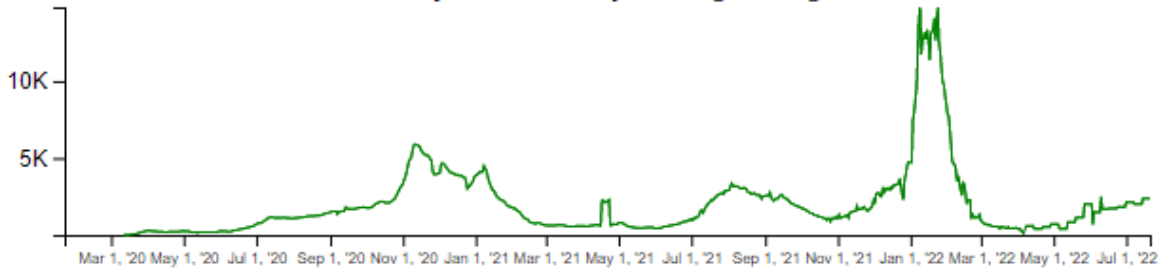
How do we interpret our current data?

Tue, Jan 21st 2020 - Thu, Jul 21st 2022

Use slider to update time series chart



Daily Cases - 7-Day Moving Average



Daily Deaths - 7-Day Moving Average

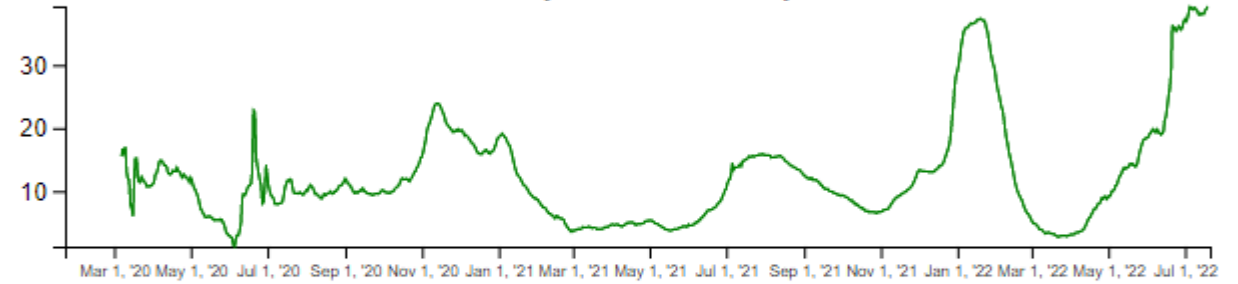


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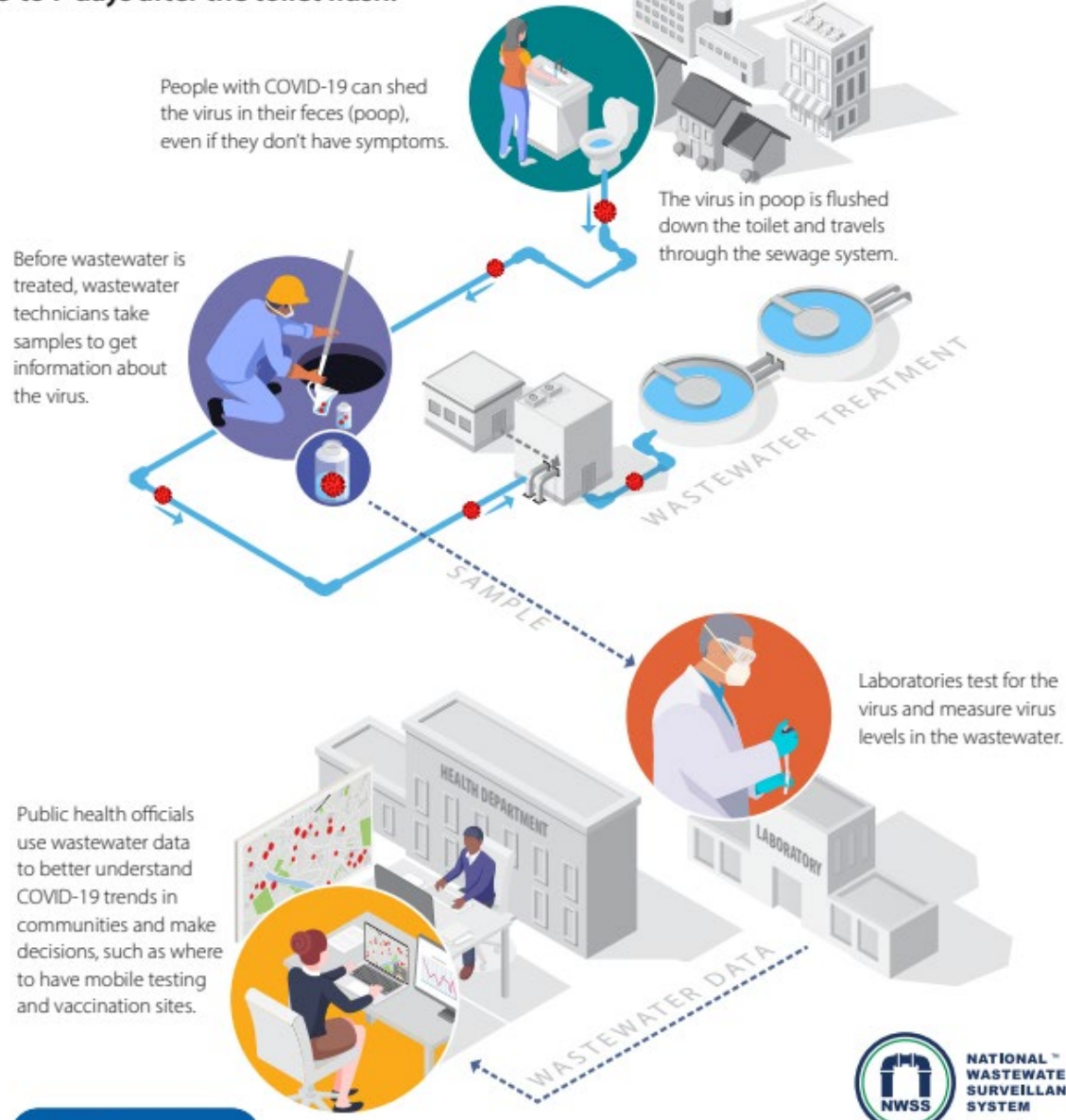
7-day Percent Positivity



Daily Tests Performed - 7-Day Moving Average



Wastewater surveillance can help communities detect and prepare for increasing cases of COVID-19. Data are available quickly, 5 to 7 days after the toilet flush.



Wastewater surveillance



Vaccination status of Missourians

People Vaccinated	At Least One Dose	Fully Vaccinated	Boosters
Total	4,119,132	3,491,007	1,541,915
% of Total Population	67.1%	56.9%	44.2%
Population ≥ 5 Years of Age	4,109,530	3,490,923	
% of Population ≥ 5 Years of Age	71.2%	60.5%	
Population ≥ 12 Years of Age	3,967,378	3,379,610	1,532,412
% of Population ≥ 12 Years of Age	75.8%	64.5%	45.3%
Population ≥ 18 Years of Age	3,720,238	3,169,257	1,483,793
% of Population ≥ 18 Years of Age	78%	66.5%	46.8%
Population ≥ 65 Years of Age	1,030,907	912,445	615,706
% of Population ≥ 65 Years of Age	95%	85.9%	67.5%

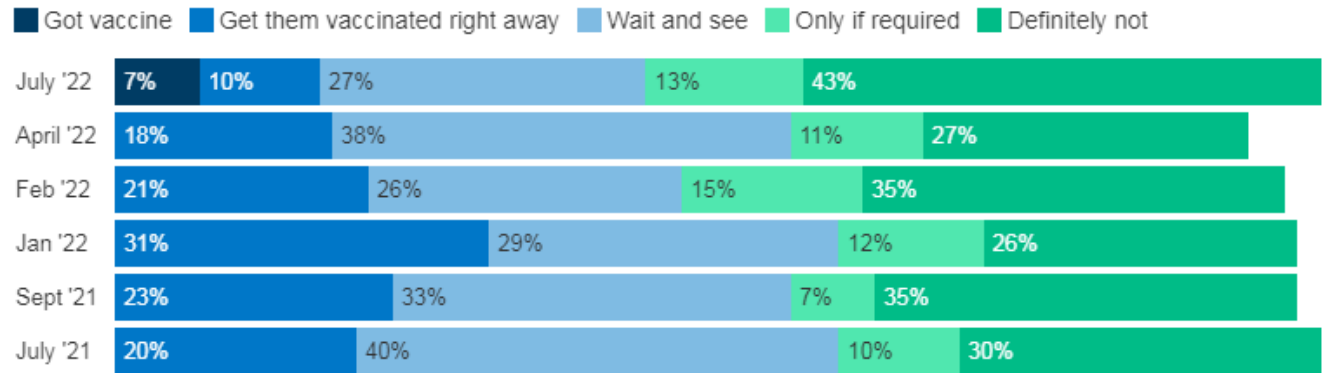
Few Parents Intend to Have Very Young Children Vaccinated Against Covid

In a new survey, 43 percent of parents of children ages 6 months through 4 years said they would refuse the shots for their kids. An additional 27 percent were uncertain.

Figure 1

More Than Four In Ten Parents Of Children Under 5 Eligible For The Vaccine Say They Will "Definitely Not" Vaccinate Their Child For COVID-19

Thinking about your child between the ages of 6 months and 4 years, have they received at least one dose of a COVID-19 vaccine, or not? If not, do you think you will get them vaccinated...?



NOTE: Asked of parents or guardians of children between the ages of 6 months and 4 years. July 2021-April 2022 question was asked of parents or guardians of children under the age of five with question wording: "Once there is a COVID-19 vaccine authorized and available for your child's age group, do you think you will..." See topline for full question wording.

SOURCE: KFF COVID-19 Vaccine Monitor • PNG

KFF COVID-19
Vaccine Monitor

<https://www.nytimes.com/2022/07/26/health/covid-vaccines-kids-youngest.html>

<https://www.kff.org/coronavirus-covid-19/poll-finding/kff-covid-19-vaccine-monitor-july-2022/>

Operational Guidance for K-12 Schools and Early Care and Education Programs to Support Safe In-Person Learning

Updated May 27, 2022

[Languages](#) ▼

[Print](#)

CDC Operational K-12 School Guidance

- K-12 schools should put in place a core set of infectious disease prevention strategies as part of their normal operations
- The addition and layering of COVID-19-specific prevention strategies should be tied to COVID-19 Community Levels

General actions to prevent spread of infections



Vaccination



Hand Hygiene and
Respiratory Etiquette



Cleaning and Disinfection



Stay Home When Sick



Ventilation

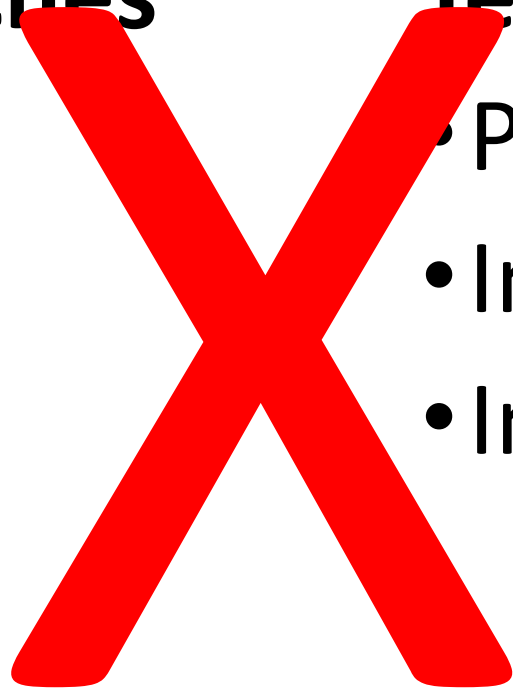
COVID-19 Testing Approaches 2021-22

Testing Approaches

- Screening
- Exposure
- Symptomatic
- Test to Stay
- Test to Play

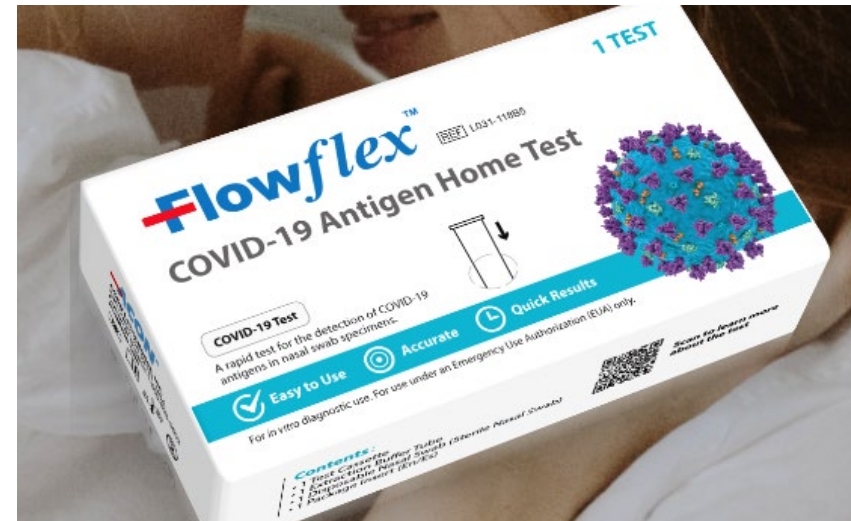
Testing Types

- Pooled PCR
- Individual PCR
- Individual Antigen



Considerations for 2022-2023 for K-12 Testing

- Antigen testing
- Symptomatic
- Testing at home and school



ACON Laboratories, Inc: Flowflex COVID-19 Antigen Home Test
12-month to 16-month self-life extension granted by the FDA on April 20, 2022

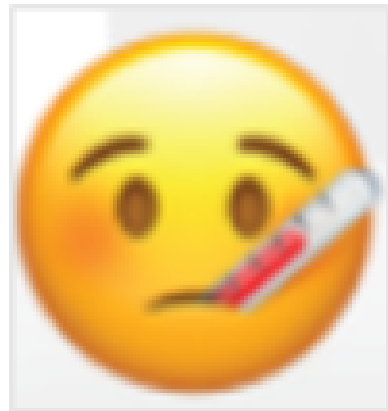
Test with this printed expiration date	Now have this extended expiration date
October 2022	February 2023
November 2022	March 2023
December 2022	April 2023
January 2023	May 2023
February 2023	June 2023
March 2023	July 2023

Considerations for 2022-2023 for K-12 Testing

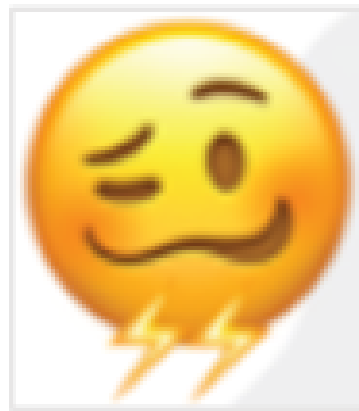
- Home results for negative tests
- Reporting positive tests
- CLIA Waiver

Student Symptom Decision Tree

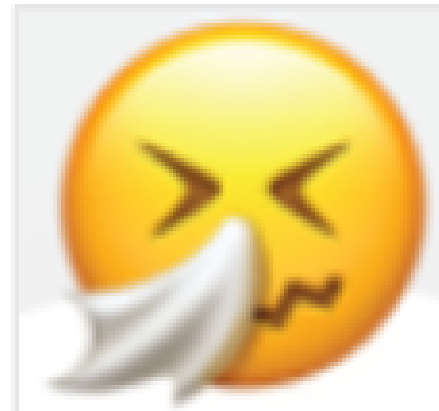
Screen all students for potential COVID-19 symptoms



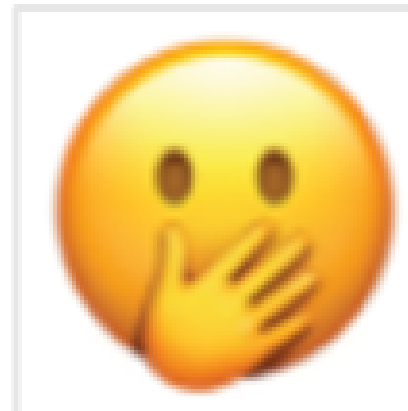
Fever ≥ 100.4 F



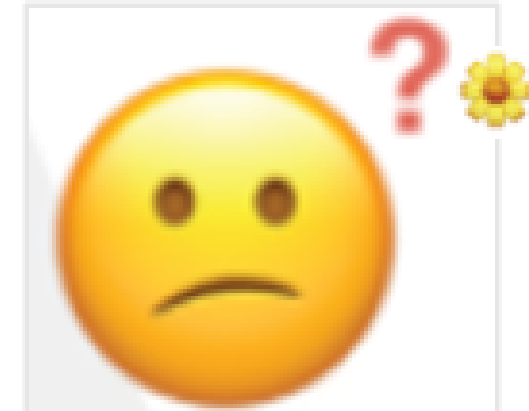
Sore Throat



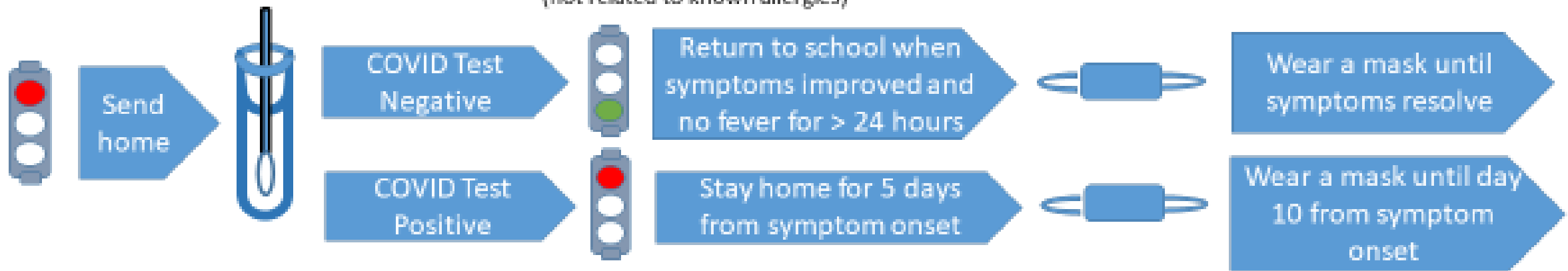
Runny Nose/Congestion
(not related to known allergies)



Cough



Loss of Taste or Smell



Zero: No testing is necessary for those with a positive test in the last 90 days.

One: Test with any **ONE** or more symptom(s) not explained by a known medical problem.

Two: Consider repeat testing with **TWO** or more tests for individuals with progressive symptoms or known high-risk (household) contact.

Free: Using the **FREE** tests available from the US government or other purchased test at home is acceptable.

Terminology review

Quarantine



If you were exposed

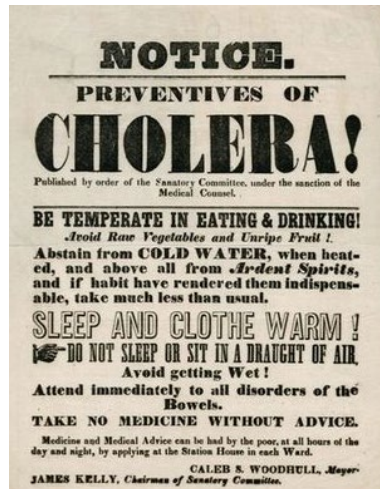
Quarantine and stay away from others when you have been in close contact with someone who has COVID-19.

Isolate



If you are sick or test positive

Isolate when you are sick or when you have COVID-19, even if you don't have symptoms.



<https://drloihjournal.blogspot.com/2017/01/the-cholera-epidemic-of-1833-in-illinois.html>

<https://www.nationalgeographic.com/history/article/plague-doctors-beaked-masks-coronavirus>

**IF YOU
Tested
positive for
COVID-19 or
have
symptoms,
regardless of
vaccination
status**

Stay home for at least 5 days

Stay home for 5 days and [isolate](#) from others in your home.

Wear a [well-fitting mask](#) if you must be around others in your home.

[Do not travel.](#)

Ending isolation if you had symptoms

[End isolation after 5 full days](#) if you are fever-free for 24 hours (without the use of fever-reducing medication) and your symptoms are improving.

Ending isolation if you did NOT have symptoms

[End isolation after at least 5 full days](#) after your positive test.

If you got very sick from COVID-19 or have a weakened immune system

You should isolate for at least 10 days. Consult your doctor before ending isolation.

Take precautions until day 10

Wear a well-fitting mask

Wear a [well-fitting mask](#) for 10 full days any time you are around others inside your home or in public. Do not go to places where you are unable to wear a mask.

Do not travel

[Do not travel](#) until a full 10 days after your symptoms started or the date your positive test was taken if you had no symptoms.

Avoid being around people who are [more likely to get very sick](#) from COVID-19.

Vaccines

COVID-19 primary series vaccination for children and teens

Child's Age	Pfizer-BioNTech	Moderna	J&J/Janssen
6 months – 4 years old	3-dose primary series	2-dose primary series	Not authorized
5 – 17 years old	2-dose primary series	2-dose primary series	Not authorized

Who Can Get a Booster

Recommended 1 Booster

- Everyone ages 5 years and older should get 1 booster after completing their [COVID-19 vaccine primary series, if eligible](#).

Learn when you should get your 1st booster below.

Recommended 2 Boosters

- Adults ages 50 years and older
- Some people ages 12 years and older who are [moderately or severely immunocompromised](#)

Learn when you should get your 2nd booster below.

COVID-19 Treatments

Risk Factors for Severe Disease in Children

- Most children who develop severe disease have underlying medical problems, but risk factors in children are poorly defined
- Eligibility criteria for most treatments use adult risk factors and extrapolation to children is problematic
- Risk factors identified in children:
 - **Medical complexity (e.g. neurologic impairment, developmental delay, genetic syndromes including trisomy 21)**
 - **Obesity, especially in teenagers**
 - Asthma and chronic lung disease
 - Congenital heart disease
 - Diabetes mellitus
 - Sickle cell disease
 - Immunosuppression

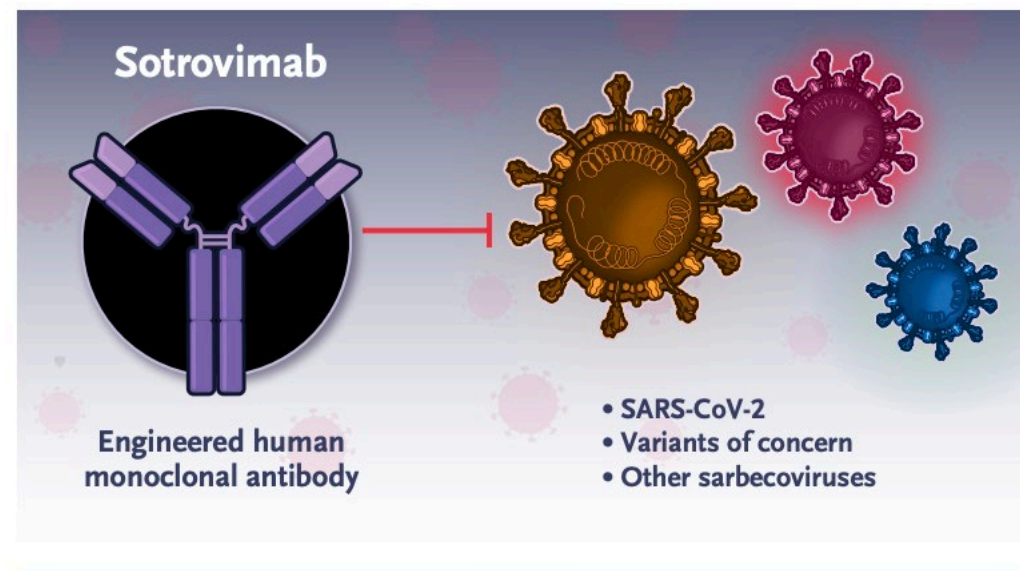
Unvaccinated status is the greatest risk factor for hospitalization in both children and adults

Monoclonal Antibodies

Neutralizing IgG1 monoclonal antibodies (mAbs) directed against the spike protein of SARS-CoV-2

Bebtelovimab is the current effective monoclonal antibody

Approved for 12 and older and 40kg with a high-risk condition

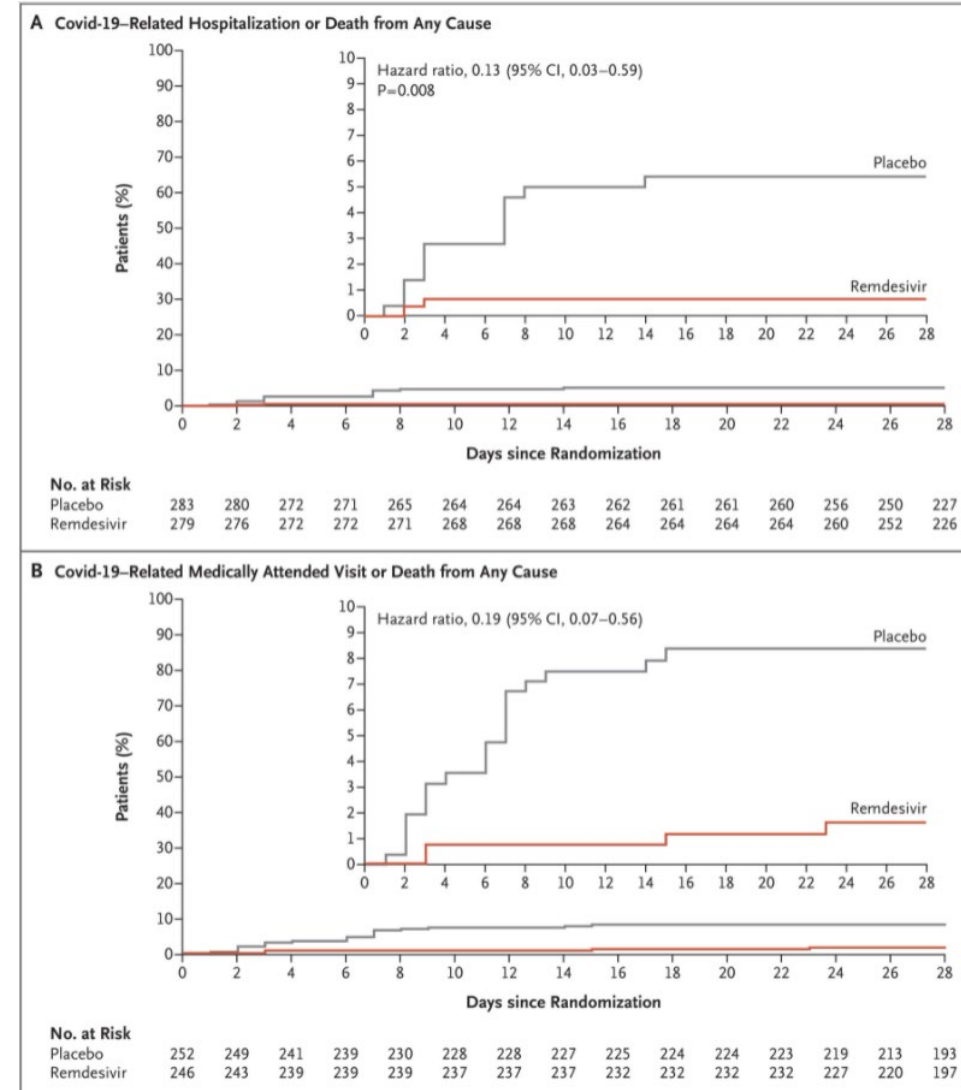


Primary Outcome: Hospitalization for >24 Hours or Death		
Outcome	Sotrovimab N=291	Placebo N=292
Hospitalization for any cause through day 29	3	21
Death from any cause through day 29	0	1

Remdesivir: Outpatients

PINETREE trial

- 562 **non-hospitalized unvaccinated adults** at high risk of severe disease with mild-moderate COVID-19
- Randomized within **7 days of symptom onset** to 3 consecutive days of remdesivir vs. placebo
- 87% relative reduction in risk of hospitalization or death at day 28
- Increased interest in use in outpatients for those not eligible or mAb not available
- May consider in high risk patients hospitalized for other reasons and found to have COVID-19



Oral Agent

Nirmatrelvir/ritonavir (Paxlovid)

- Inhibitor of SARS-CoV-2 main protease (Mpro), preventing viral replication
- 89% risk reduction of hospitalization or death (within 3d of symptoms)
- Authorized for ≥ 12 yrs and ≥ 40 kg **within 5 days of symptom onset**
- Ritonavir is a potent CYP3A4 inhibitor—**carefully check drug interactions**
- 300mg (2 tablets) of Nirmatrelvir plus 100mg ritonavir twice a day for 5 days
- Rebound infection occurred in 2% in both treatment and placebo
- Currently some think might be higher in Paxlovid group

If you want to learn more about COVID-19...

Better COVID-19 Care for Patients, Students, and Communities



COVID-19 & Kids ECHO will provide up-to-date information and support for health care, school and public health professionals across Missouri. A team of pediatric infectious disease physicians and other experts will share information about the latest developments, answer questions, and discuss management of de-identified patient and student cases presented by participants. The [Missouri Chapter of the American Academy of Pediatrics](#), University of Missouri [Sinclair School of Nursing](#) and MU's [Missouri Telehealth Network](#) are partnering to support primary care physicians and other providers, school leaders and nurses,



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Communication & Education**

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Influenza



FIGURE 1. Influenza-positive test results reported by clinical laboratories to CDC, by *MMWR* week and influenza season — United States, October–June, 2017–18 to 2021–22

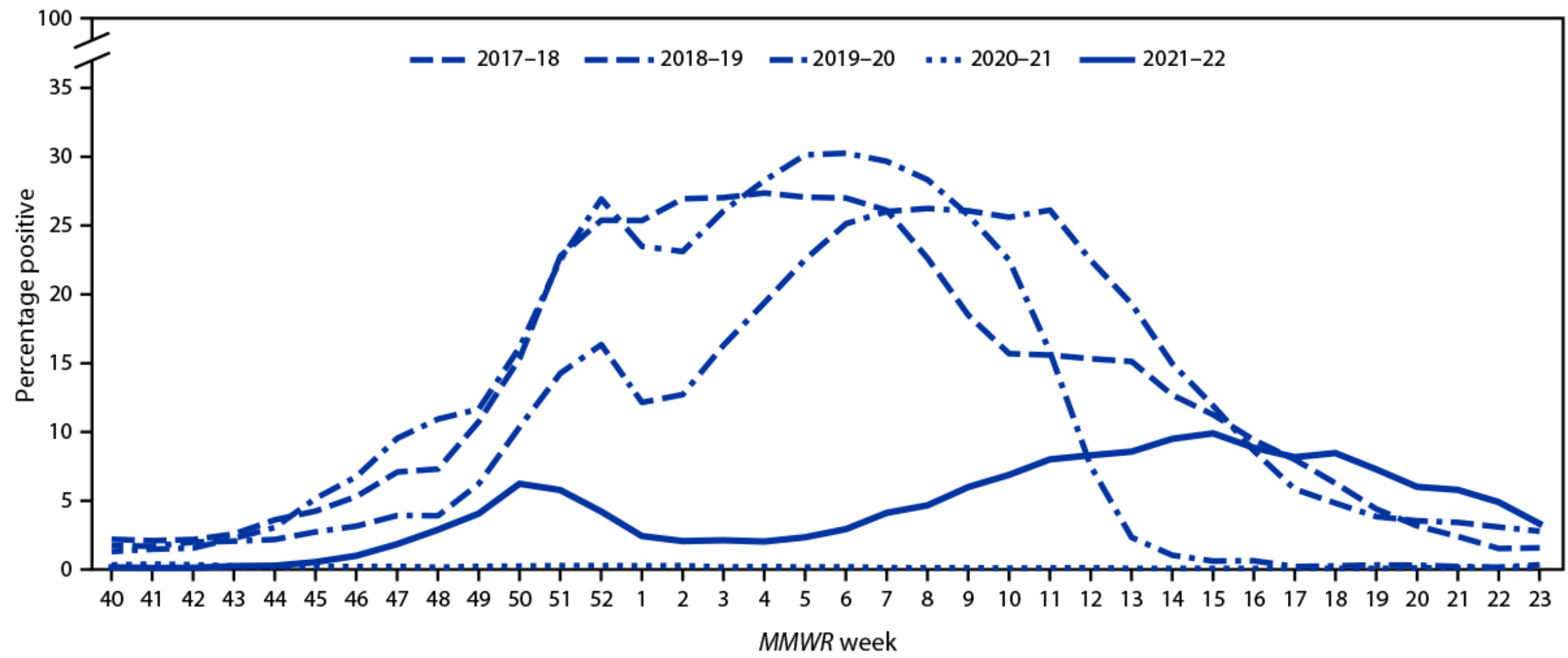
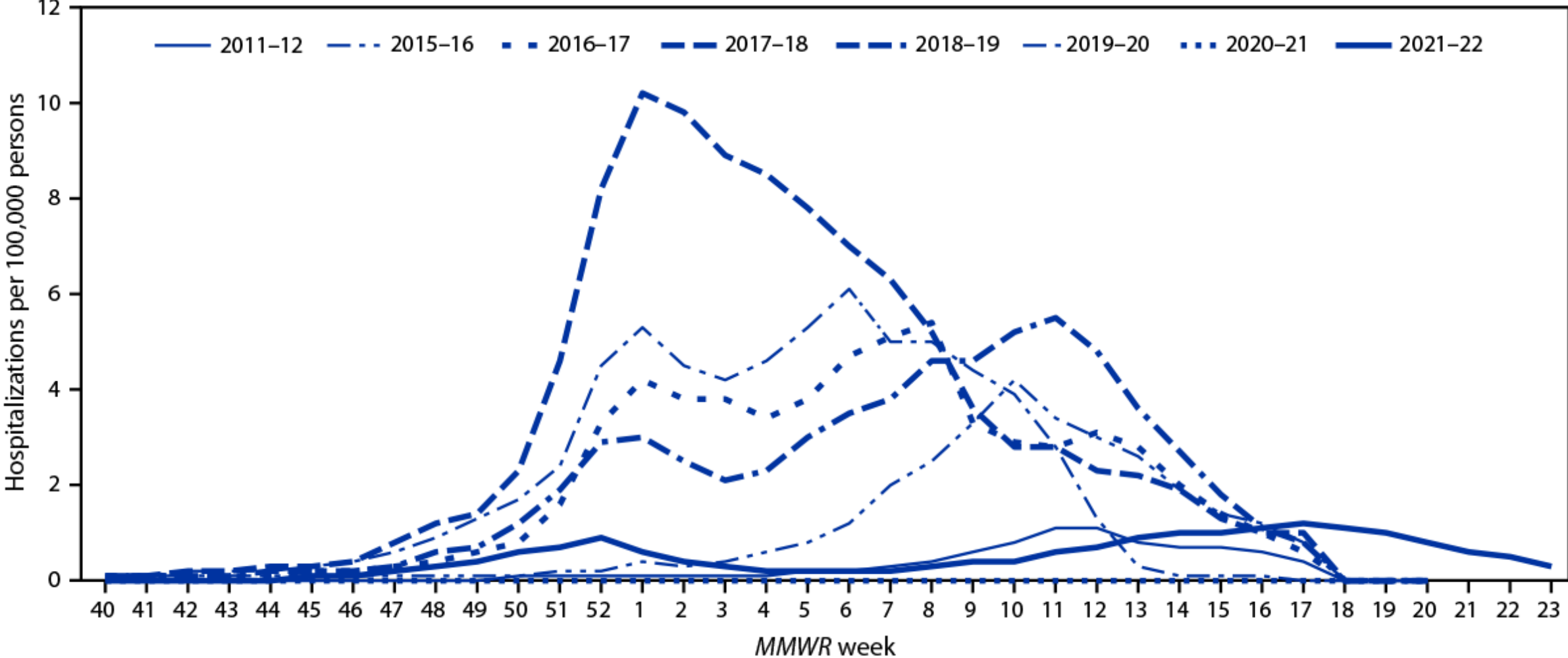
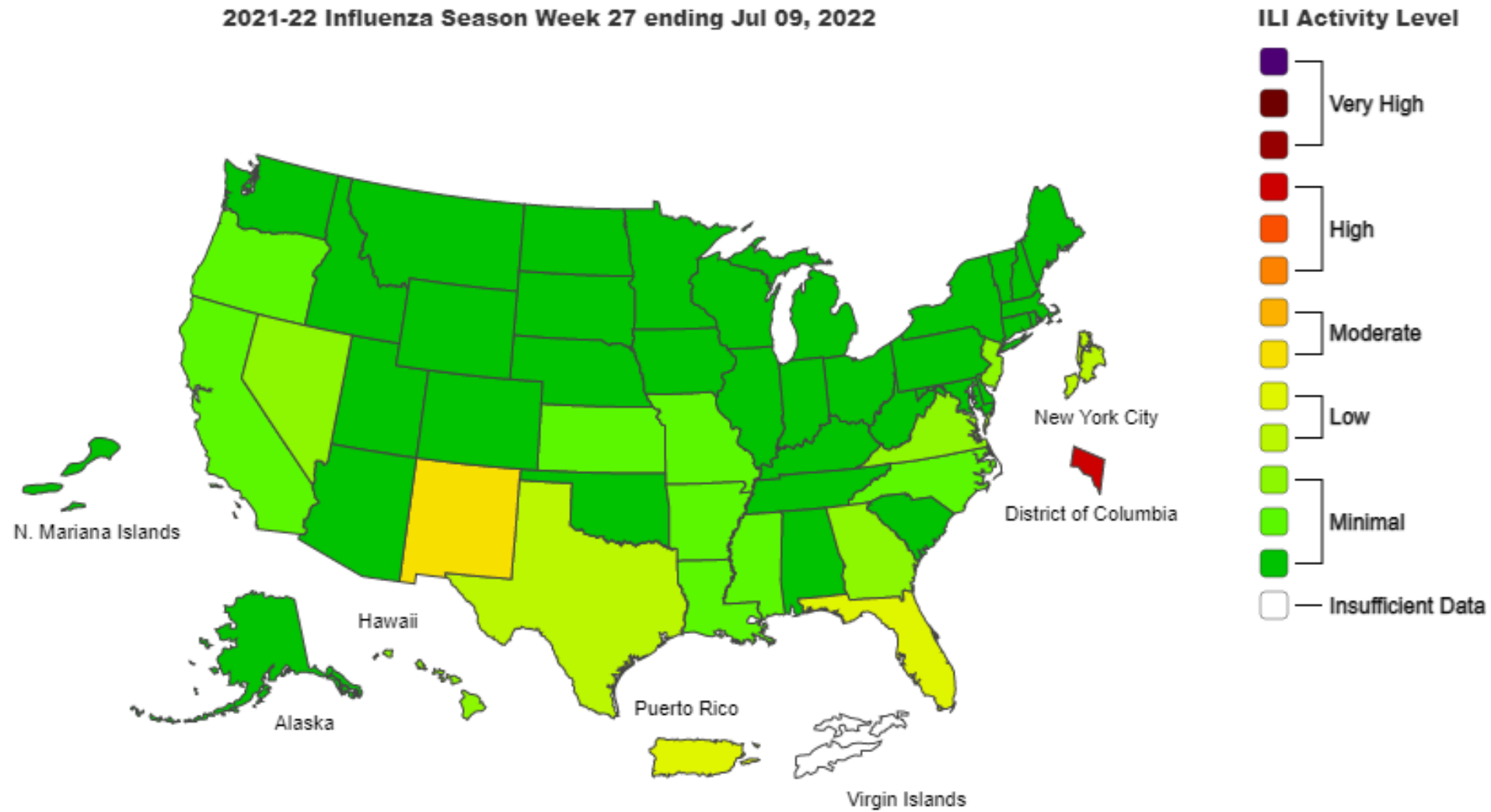


FIGURE 2. Weekly rate* of hospitalizations among patients of all ages with laboratory-confirmed influenza — United States, October–June, 2011–12 and 2015–16 to 2021–22

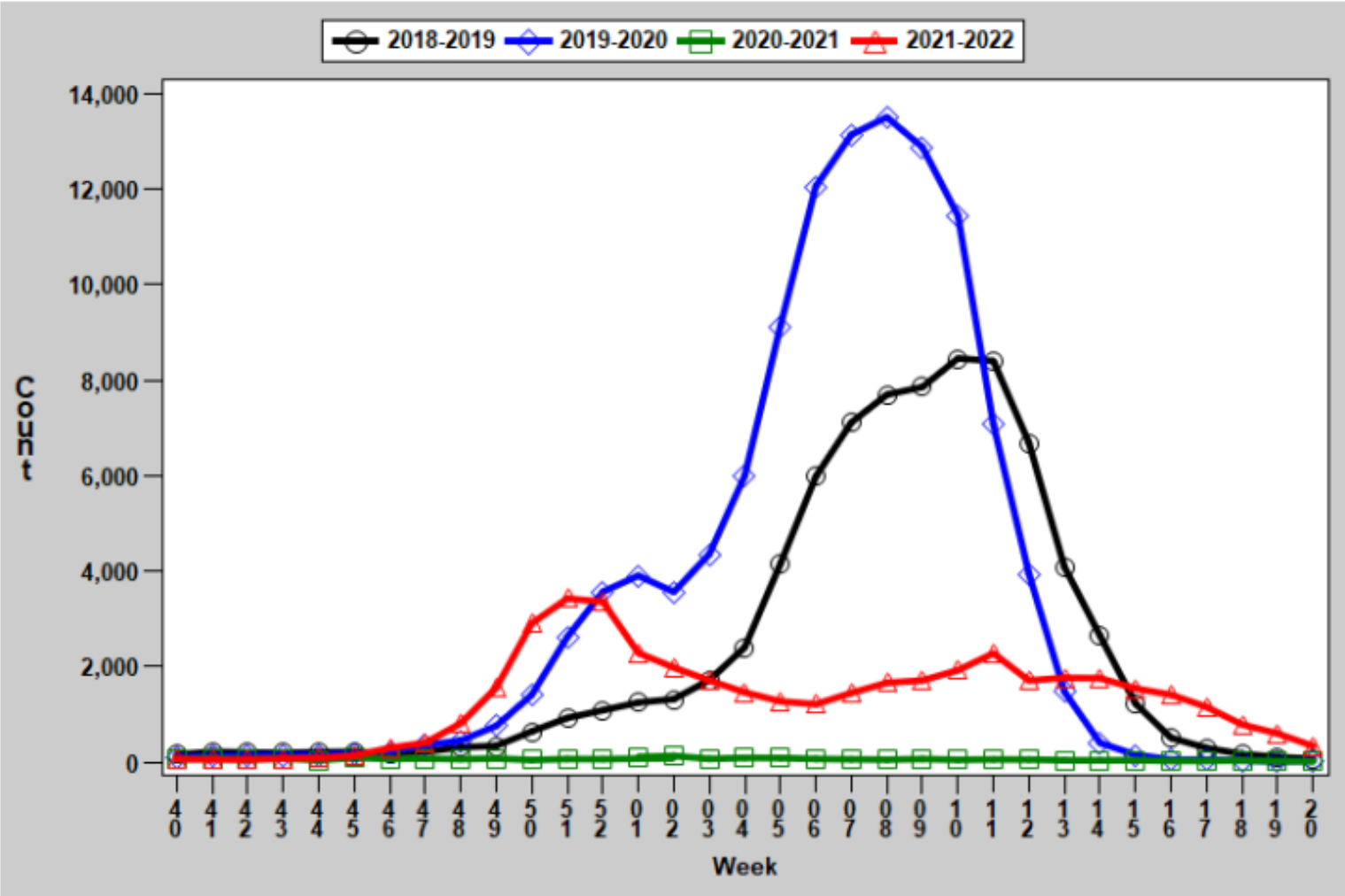


2021-22 Influenza Season Week 27 ending Jul 09, 2022

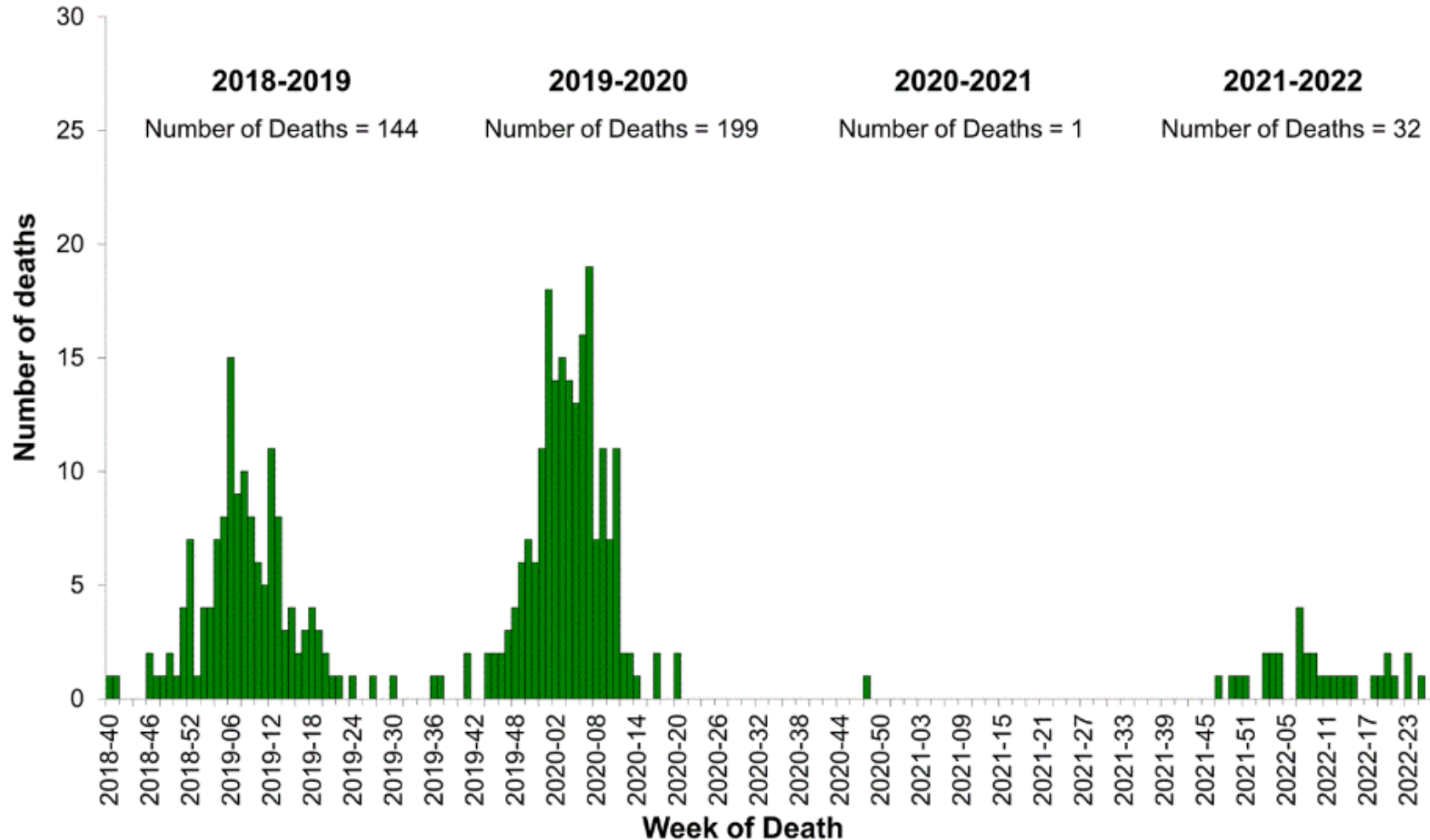


Missouri

Figure 4. Number of Laboratory-positive[†] Influenza Cases by CDC Week, Missouri, 2018-2022*



Influenza-Associated Pediatric Deaths by Week of Death, 2018-2019 season to 2021-2022 season



Signs and symptoms of influenza

Fever/ chills

Cough

Sore throat

Runny or stuffy nose

Muscle or body aches

Headaches

Fatigue

Vomiting/ diarrhea

How to distinguish influenza from COVID-19?



Why do you care?

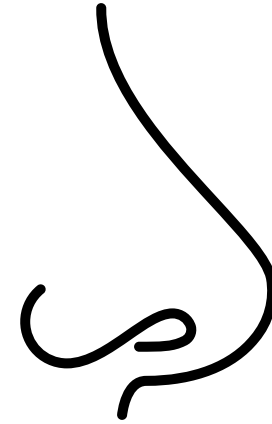


Who is at high risk for influenza?

- Children <5 years old
 - Particularly children <2 years old
- Adults \geq 65 years
- Asthma
- Neurologic and neurodevelopment conditions
- Blood disorders
- Chronic lung disease
- Endocrine disorders
- Heart disease
- Kidney diseases
- Liver disorders
- Metabolic disorders
- BMI \geq 40
- On long term aspirin medication and \leq 19 years
- Weakened immune system
- History of a stroke

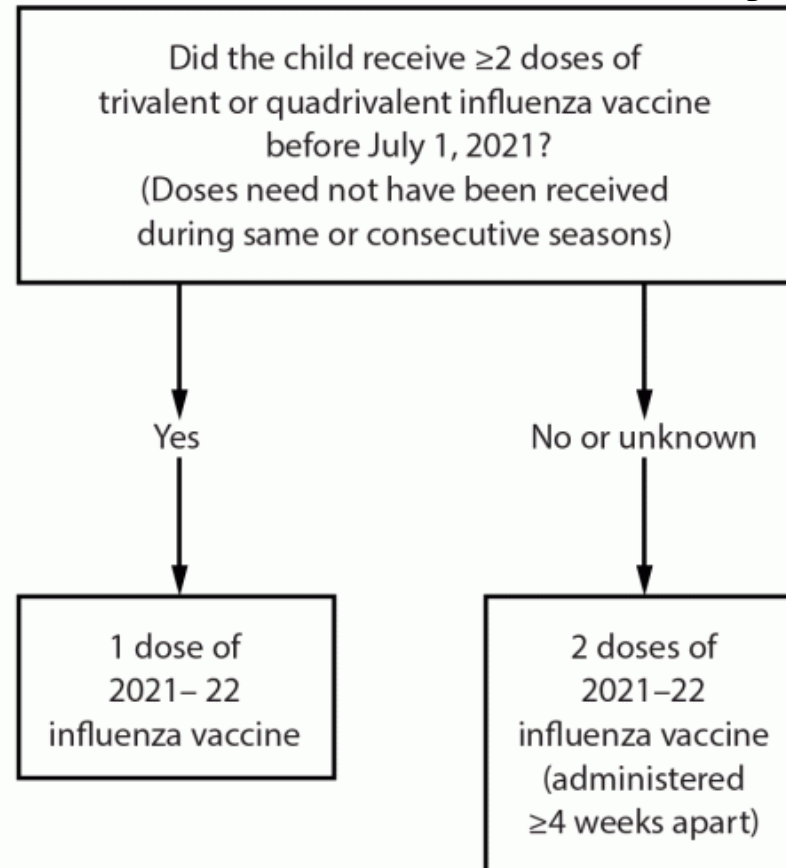
Influenza vaccine

- Recommended for all persons ≥ 6 months who do not have contraindications
- Live attenuated influenza vaccine
 - ≥ 2 years
 - Not recommended for certain groups
- Inactivated influenza vaccine



Which children need more than 1 dose?

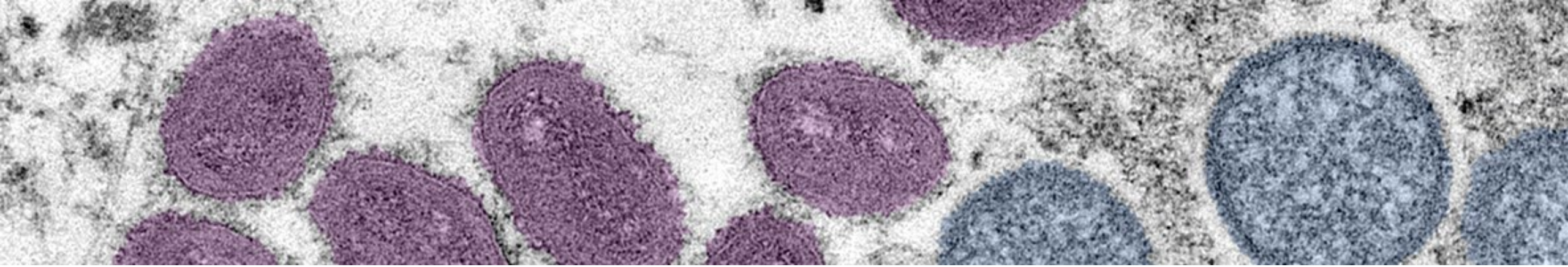
Children 6 months to 8 years



Influenza vaccine FAQs

- Can influenza vaccine be given with other vaccines?
 - YES, including COVID-19
- Can influenza vaccine be given while someone has COVID-19?
 - Defer flu vaccine if in COVID-19 isolation or quarantine
- Can I get influenza vaccine if I am allergic to eggs?
 - Yes!
 - Hives only- any influenza vaccine
 - More serious reaction- any influenza vaccine BUT administer in a healthcare setting where allergy conditions can be managed

Respiratory Syncytial Virus



Monkeypox

Bonus slides!

Monkeypox

- Same family as smallpox
- Milder and current data shows rarely fatal
 - Concerns for severe disease in children less than 8 years of age
- Not chickenpox

W.H.O. Declares Monkeypox Spread a Global Health Emergency

There have been more than 16,000 cases in 75 countries,

Monkeypox symptoms

- Fever/ chills
- Headache
- Muscles aches/ backache
- Swollen lymph nodes
- Exhaustion
- Rash
- May or may not have a prodromal symptoms prior to onset of rash

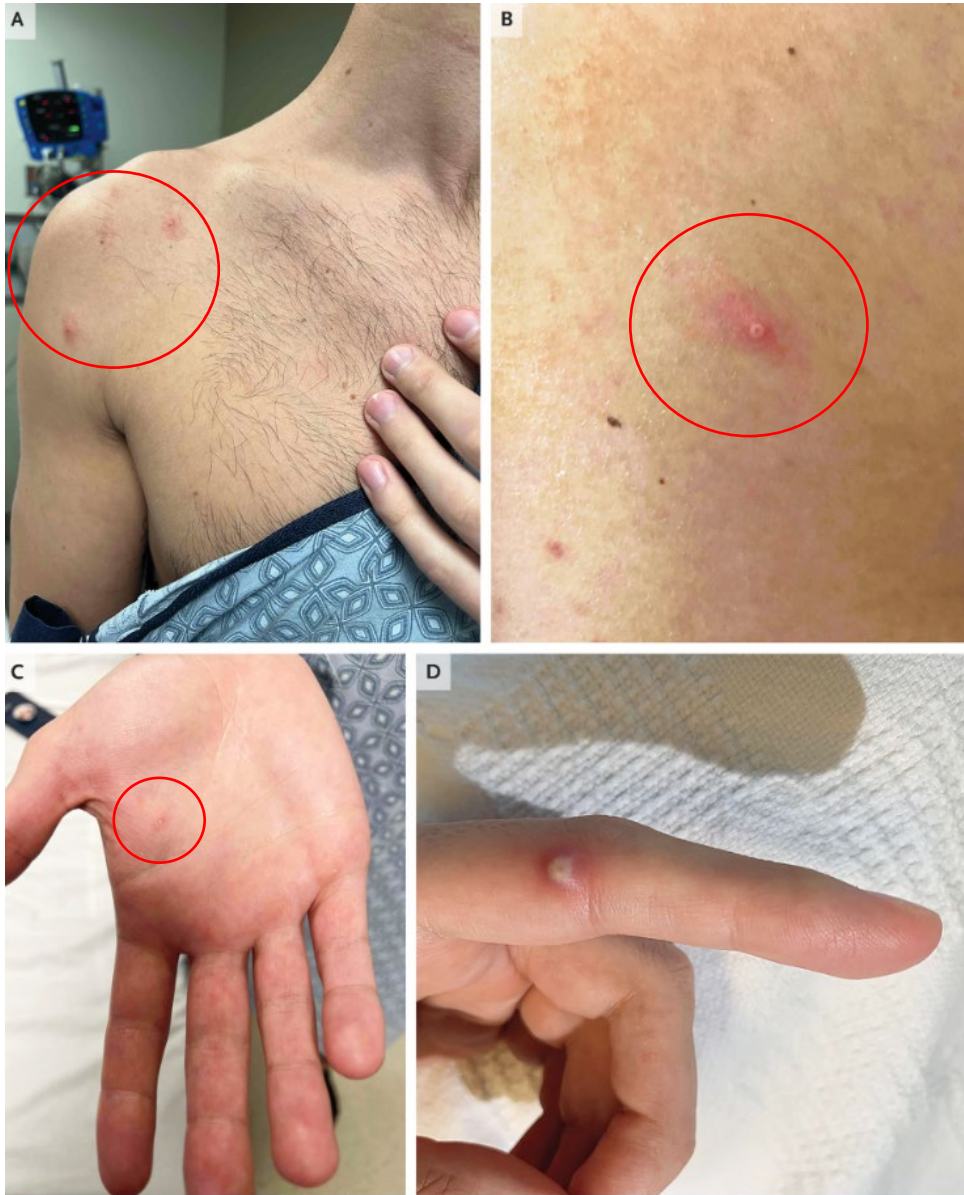
Rash

- Location
 - Face
 - Inside mouth
 - Body parts- extremities, torso, genitals
- Rash goes through stages before healing
 - Macules, papules, vesicles, pustules, scabs
 - Pustules are deep seated and often are umbilicated
- Rash can be present in different stages when present
- Lasts 2-4 weeks

Monkeypox Epidemiology: Signs and Symptoms (Atypical)

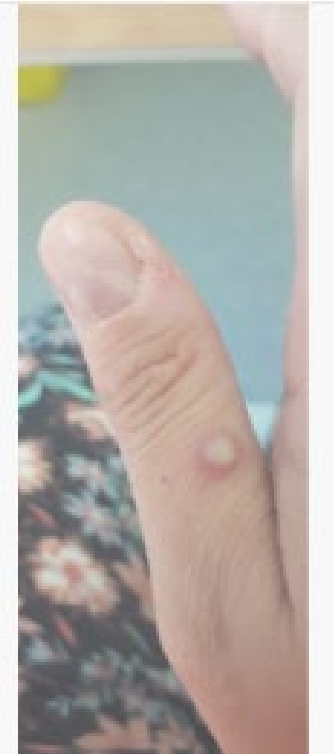
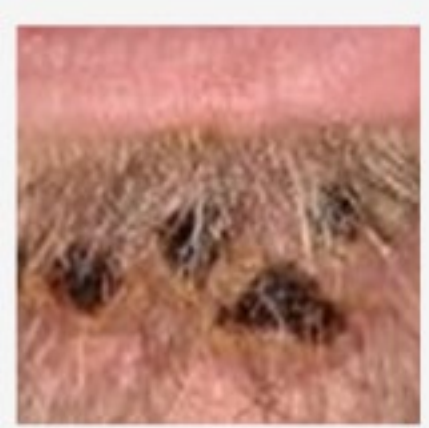
- **First symptoms** can be lesions developing in the genital and/or perianal region and **may not be diffuse**.
- **First symptoms can be rectal (proctitis) pain** or vaginal pain reported in individuals with unknown lesions in the genital/perianal region.
- Most recent reported cases, **prodromal symptoms, if experienced at all, have not always occurred before the rash**.
- Some lesions on the same anatomical body site **at different stages of progression**
 - Possible coinfection vs. atypical presentation
 - Non-genital/perianal lesions still have characteristic rash and progression
- Lesions appearing much smaller than usual, **can be reduced in number**.
 - Still presenting as firm, deep seated, sometime umbilicated and painful

Rash Presentations – 2022 Monkeypox Outbreak



From Basgoz N, Brown CM, Smole SC, et al. Case 24-2022: A 31-Year-Old Man with Perianal and Penile Ulcers, Rectal Pain, and Rash. Epub ahead of print. *Copyright* © Jun 15 2022. Massachusetts Medical Society. Reprinted with permission from Massachusetts Medical Society

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from patients,
CDC 2022

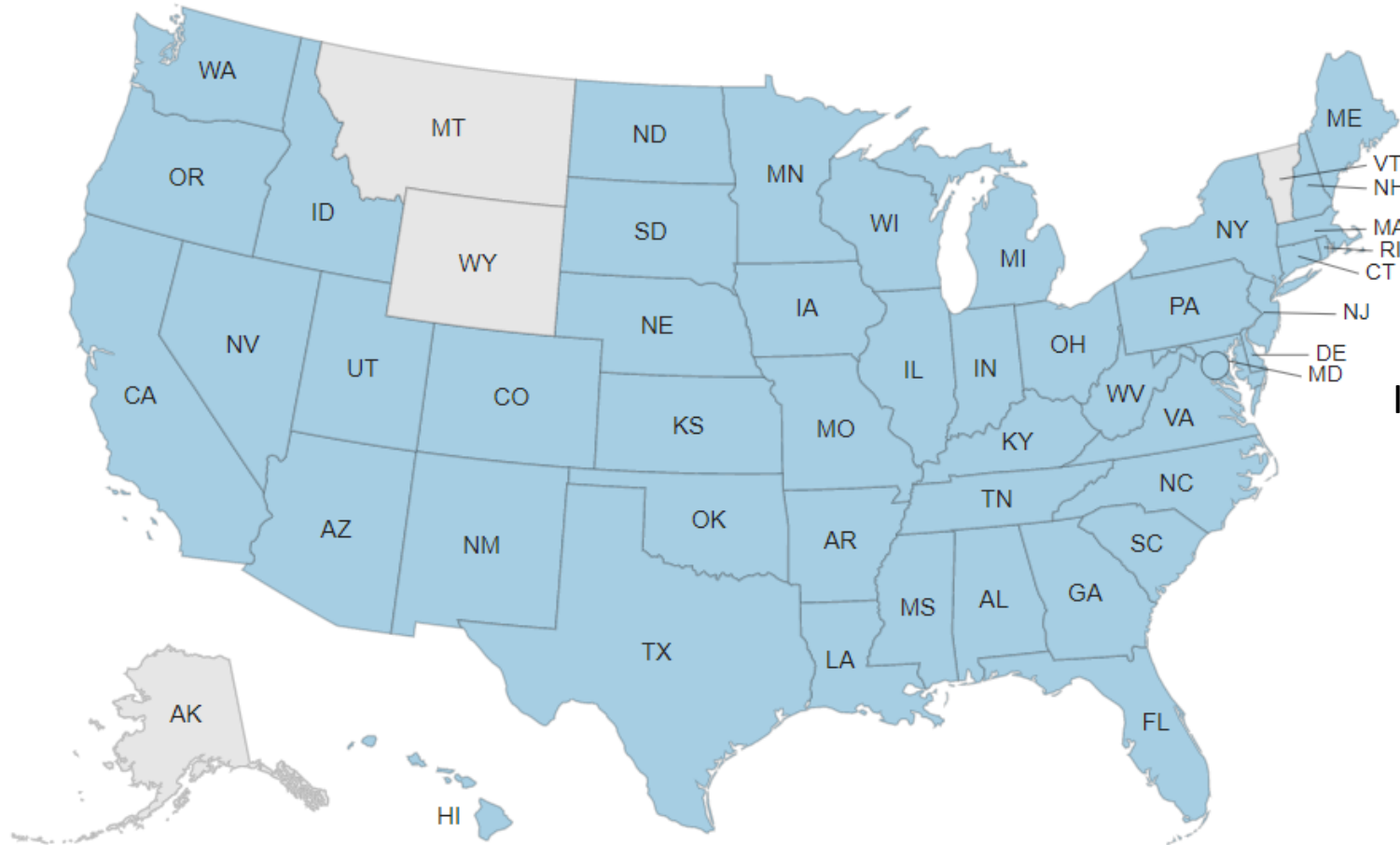


Transmission

- Direct contact with rash, scabs, or body fluids
- Respiratory secretions during prolonged, face to face contact
- Touching items that previously touched the rash/ fluids
- Through the placenta
- Less commonly
 - Scratched/ bitten by animal
 - Preparing/ eating meat from an infected animal

Total confirmed monkeypox/orthopoxvirus cases: **4,639**

*One Florida case is listed here but included in the United Kingdom case counts because the individual was tested while in the UK.



Kansas: 1 cases

In US, 2 cases reported in children
Missouri: 6 cases

Territories PR



Case series

NYC Monkeypox Total Case Summary

	Cumulative
Total	639 (100.0%)
Age	
19 years old and younger	0 (0.0%)
20 to 29 years old	112 (17.5%)
30 to 39 years old	324 (50.7%)
40 to 49 years old	143 (22.4%)
50 years old and older	60 (9.4%)
Unknown ²	0 (0.0%)
Gender¹	
Men	624 (97.7%)
Women	1 (0.2%)
TGNCNB	9 (1.4%)
Unknown ²	5 (0.8%)
Sexual Orientation³	
LGBQ+	335 (52.4%)
Straight	9 (1.4%)
Unknown ²	295 (46.2%)

[Monkeypox - NYC Health](#)



Joint ECDC-WHO Regional Office for Europe Monkeypox Surveillance Bulletin

42% cases have HIV co-infection



ORIGINAL ARTICLE

Monkeypox Virus Infection in Humans across 16 Countries — April–June 2022

J.P. Thornhill, S. Barkati, S. Walmsley, J. Rockstroh, A. Antinori, L.B. Harrison, R. Palich, A. Nori, I. Reeves, M.S. Habibi, V. Apea, C. Boesecke, L. Vandekerckhove, M. Yakubovsky, E. Sendagorta, J.L. Blanco, E. Florence, D. Moschese, F.M. Maltez, A. Goorhuis, V. Pourcher, P. Migaud, S. Noe, C. Pintado, F. Maggi, A.-B.E. Hansen, C. Hoffmann, J.I. Lezama, C. Mussini, A.M. Cattelan, K. Makofane, D. Tan, S. Nozza, J. Nemeth, M.B. Klein, and C.M. Orkin, for the SHARE-net Clinical Group*

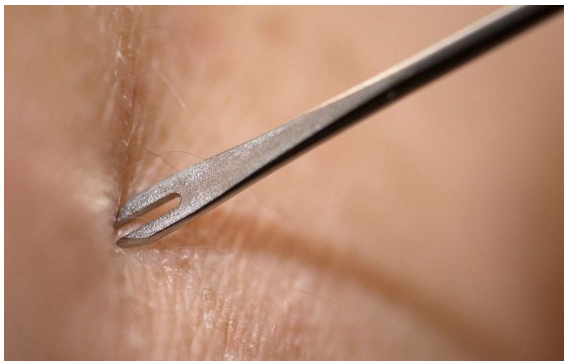
Table 1. Demographic and Clinical Characteristics of the Persons with Monkeypox.*

Characteristic	All Persons (N = 528)
Median age (range) — yr	38 (18–68)
Sex or gender — no. (%)	
Male	527 (>99)
Female	0
Trans or nonbinary	1 (<1)
Sexual orientation — no. (%)†	
Heterosexual	9 (2)
Homosexual	509 (96)
Bisexual	10 (2)
Race or ethnic group — no. (%)†	
White	398 (75)
Black	25 (5)
Mixed race	19 (4)
Latinx	66 (12)
Other or unknown	20 (4)
Known to have undergone STI screening — no. (%)	377 (71)
Microbiologically confirmed concomitant STI present — no./total no. screened (%)	109/377 (29)
Gonorrhea	32/377 (8)
Chlamydia	20/377 (5)
Syphilis	33/377 (9)
Herpes simplex virus infection	3/377 (1)
Lymphogranuloma venereum	2/377 (1)
Chlamydia and gonorrhea	5/377 (1)
Other or not stated	14/377 (4)
HIV test taken — no./total no. with previously unknown or negative HIV status (%)	122/310 (39)
New HIV infection diagnosis — no./total no. (%)	3/122 (2)

9% of patients had received smallpox vaccine

Vaccination

- Two vaccines available
- Targeting high-risk individuals
 - Occupational exposure (PrEP)
 - After exposure to infected persons (PEP)



STRATEGIC NATIONAL STOCKPILE USE ONLY

Smallpox (Vaccinia) Vaccine, Live, ACAM2000®

Store at 2-8°C (36-46°F). Use within 30 days of reconstitution.

Fill volume: 0.3 mL/100 doses.
Approximate Dose: 2.5µ L
Potency: 1-5x10⁸ PFU/mL

Manufactured by:
Emergent Product Development Gaithersburg Inc.
Gaithersburg, MD 20879 USA, Lic. 2089
COMPONENT # LBL040020-01

'Rx Only'. For percutaneous inoculation with Bifurcated Needle only. Do not administer by injection. Contains trace amounts of antibiotics.

Lot No:
Mfg. Date:
Recon Date:

71865-330-01

- JYNNEOS
 - Live virus
 - 2 injections, 4 weeks apart
 - ≥18 years
- ACAM2000
 - Live vaccinia virus
 - 1 percutaneous dose with bifurcated needle
 - Licensed for smallpox, eIND for monkeypox
 - ≥12 months

MONKEYPOX



Tecovirimat

- Tecovirimat (TPOXX or ST-246) is an antiviral medication developed for smallpox and is available from the Strategic National Stockpile
- Oral capsule and IV formulations approved by FDA for the treatment of human smallpox disease in adults and pediatric patients under Animal Rule
 - Efficacy based on studies of non-human primates infected with monkeypox and rabbits infected with rabbitpox
 - Safety evaluation in 359 healthy adults (18-79 years)
- Tecovirimat use for unapproved indications (i.e., uses not covered by the FDA-approved labeling) requires an alternative regulatory mechanism (e.g., Expanded Access Investigational New Drug (EA-IND) or Emergency Use Authorization)

https://www.accessdata.fda.gov/drugsatfda_docs/label/2018/208627s000lbl.pdf

Questions?