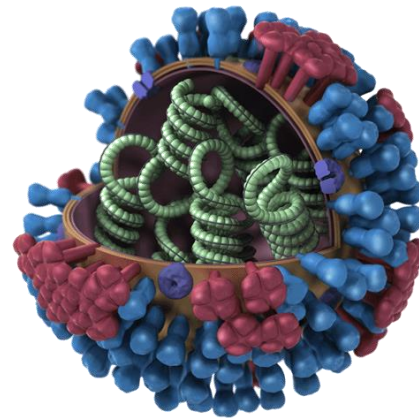




# Respiratory Virus Update - 2024



Allen Bateman and Erika Hanson  
Wisconsin State Laboratory of Hygiene  
October 2, 2024



# Program Objectives

**At the end of the session, participants will be able to**

- Explain the current H5N1 avian influenza outbreak in the U.S.
- Describe influenza, SARS-CoV-2, and other respiratory virus transmission during the 2023-2024 season
- Summarize the 2024-2025 influenza and SARS-CoV-2 vaccines and what is anticipated for the upcoming season
- Discuss the strategies for laboratory-based surveillance for influenza, SARS-CoV-2, and other respiratory viruses in Wisconsin



# Avian Influenza - 2022

*The Atlantic*

SCIENCE

## Wild Birds in North America Are Dying Like Never Before

Scientists are concerned for North American wildlife as the worst avian flu outbreak since 2015 rages on.

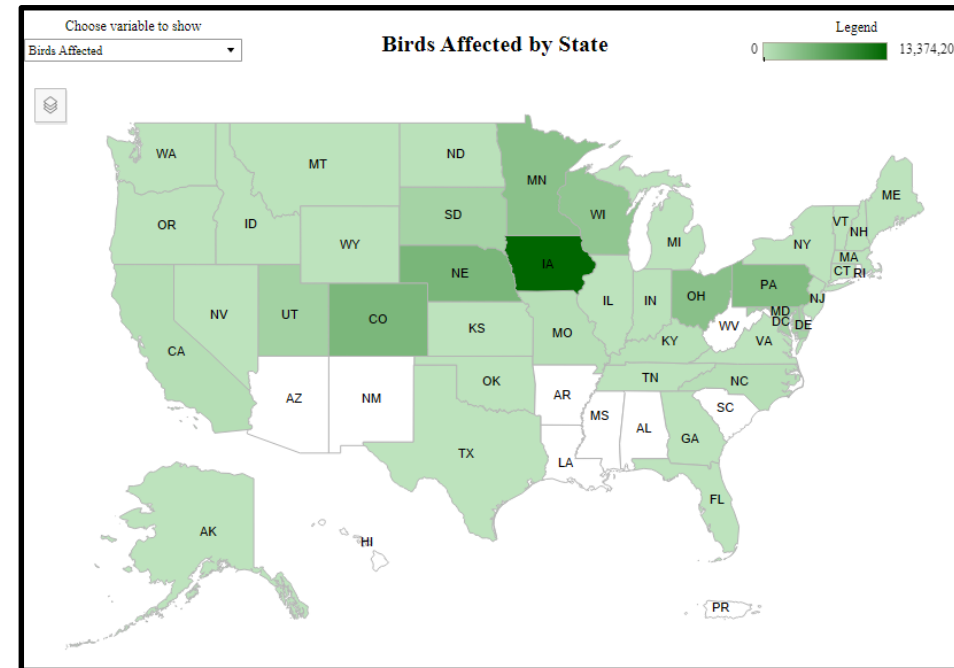
By Sarah Trent



# Avian Influenza - 2022

- New H5N1 strain of avian influenza affecting entire world
- Began in the U.S. in December 2021
- Previous avian influenza in 2014/15
  - Caused ~\$3 billion in losses to U.S. farmers
  - 50 million chickens and turkeys culled
- This year's outbreak:
  - 47 million poultry affected (so far)
  - Orders of magnitude larger in wild bird populations

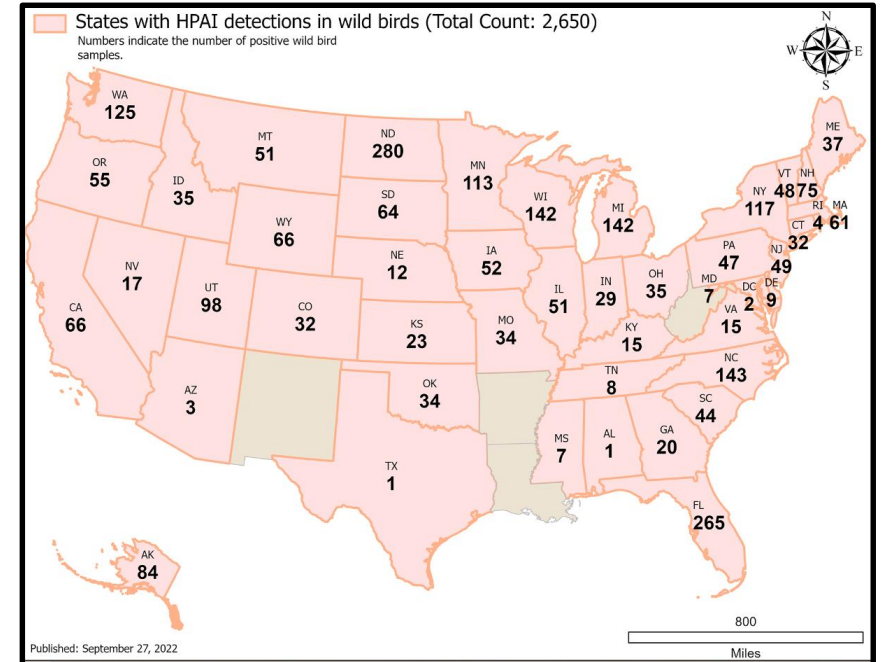
## Commercial and Backyard Flocks



# Avian Influenza - 2022



- 2014–15 outbreak: 18 wild-bird species across 16 states
- 2022 outbreak: 108 wild-bird species across nearly every state
- Mammal cases and deaths also confirmed:
  - foxes, skunks, opossums, raccoons, bobcats, minks, harbor seals, black bear, and one bottlenose dolphin
- This strain is different from previous ones!
- Currently low risk of mutating to become widely infectious and transmissible in humans, but we need to identify possible human infections to stop transmission

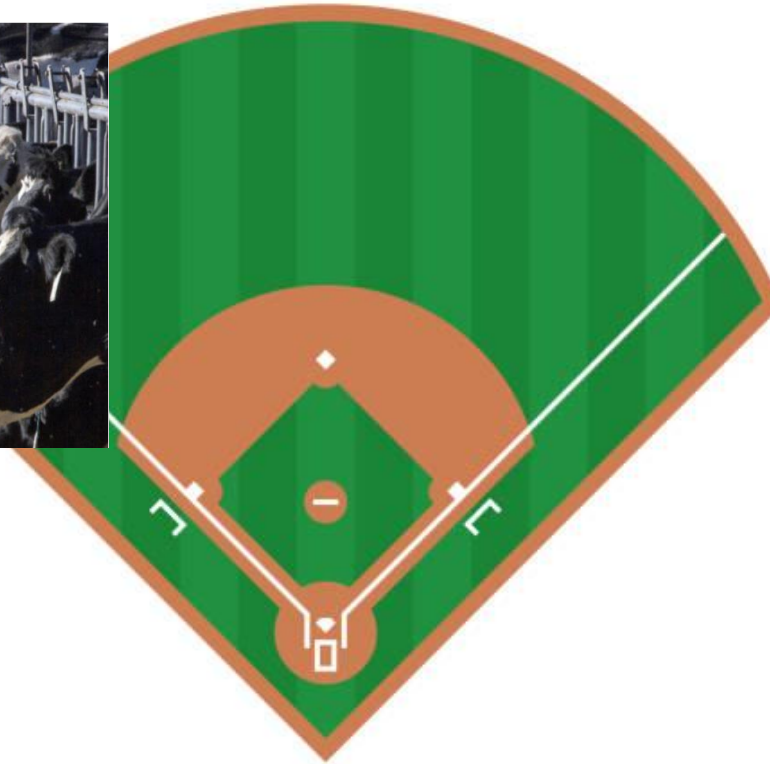




# H5N1 Avian Influenza - 2023

- Still affected wild birds and mammals worldwide
- Relatively quiet in Wisconsin

# H5N1 Avian Influenza - 2024



- March 24, USDA reports H5N1 in dairy herds
- April 1, first human case identified (farm worker)
- Conjunctivitis initially only symptom in humans
  - Then some cases also with respiratory symptoms

<https://www.statnews.com/2024/04/01/bird-flu-h5n1-spread-to-humans-dairy-cattle/>





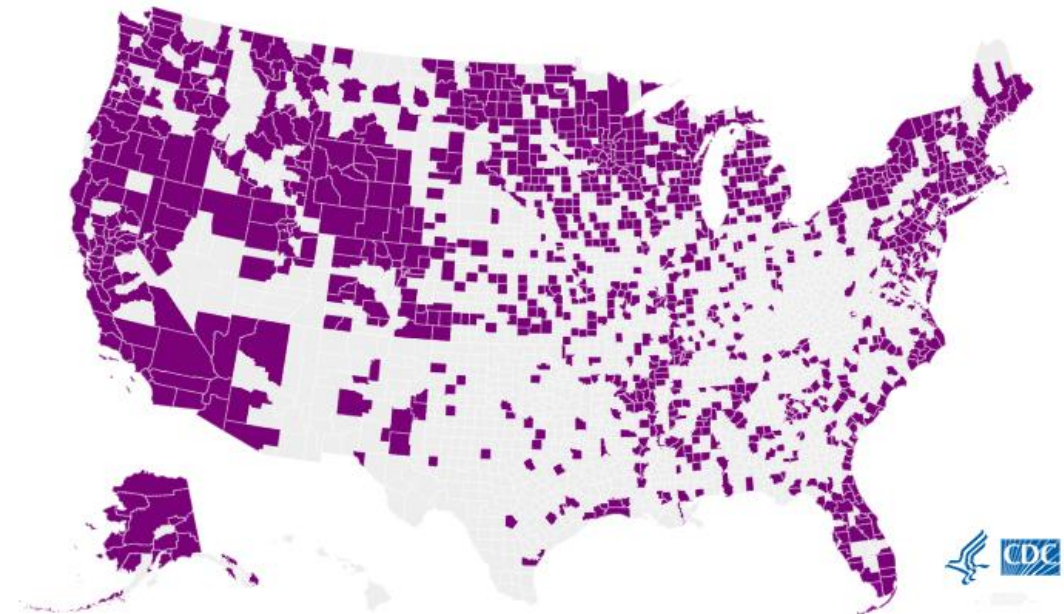
# H5N1 Avian Influenza - 2024

- Wild birds still being affected

Birds Detected
<b>10,286</b>
Counties Affected
<b>1,179</b>

## Counties Affected

**Instructions:** Counties in which bird flu has been detected in wild birds are marked in purple. On the map, select a state that has an outbreak to zoom in. More information is available about bird flu detections in wild birds by hovering over with the mouse (desktop) or tapping (mobile) the affected county. [Download Data](#) EXCEL 







# Counties Affected

**Instructions:** Counties that have reported bird flu outbreaks are marked in purple. On the map, select a state that has an outbreak to zoom in. More information is available about the outbreak by hovering over with the mouse (desktop) or tapping (mobile) the affected county.

- Poultry flocks:

[Download Data](#)

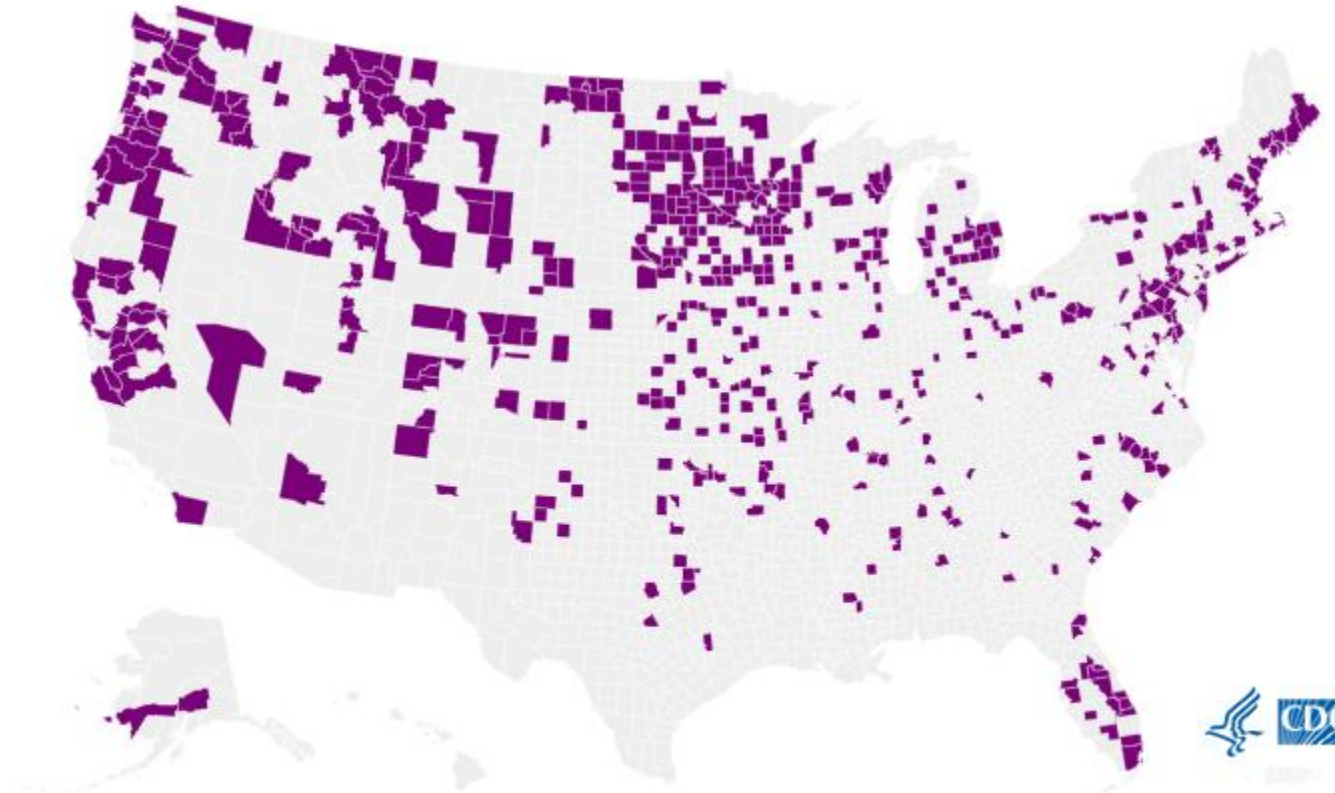
**Birds Affected**

**100,781**

Highly pathogenic  
hobbyist flocks be  
sequencing and F

**States Affected**

**48**



**l or  
etic**

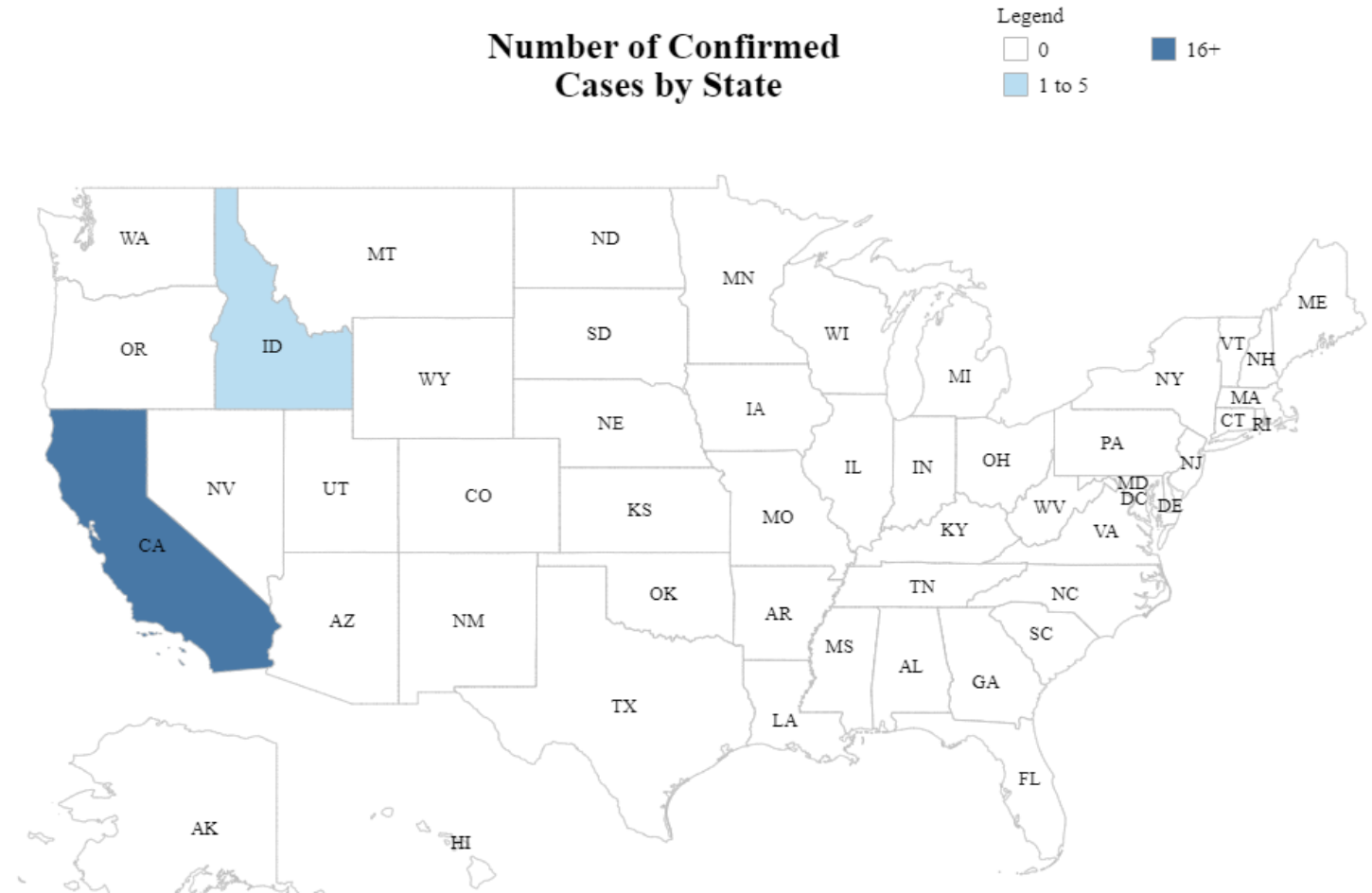
# H5N1 Avian Influenza - 2024



Confirmed Cases Last 30 Days  
**43**

States Affected Last 30 Days  
**2**

- Cattle now also affected
- April-June, lots of spread to many states
- Calmed down somewhat now, but some states/herds still affected





# H5N1 Avian Influenza - 2024

- 15 human infections in U.S. in 2024
- All viruses from the same 2.3.4.4b clade of H5N1 causing the worldwide outbreak since 2021
- From exposure to dairy cows (4), exposure to poultry (10), or no immediately known animal exposure (1)

Total people monitored	Total people tested	Human cases
<b>4,900+</b> after exposure to infected animals	<b>230+</b> after exposure to infected animals	<b>14</b> total reported human cases in the United States



# Missouri reports human bird flu case with no link to animals



Published on September 6, 2024  
By BNO News

- September 2024, found through statewide surveillance
  - Unsubtypeable at clinical lab, sent to PHL and identified as H5N1
- Intense investigation: no known animal contact
- Patient hospitalized, not for respiratory issues; recovered and discharged
- Some contacts also had respiratory symptoms
  - H5N1? Enterovirus? SARS-CoV-2?
  - Serology will shed light

## HEALTH

# Four more health care workers reported illnesses after caring for bird flu case in Missouri

It is not clear if any of these people were actually infected with H5N1



# WSLH response to H5N1 avian influenza in cattle

- Continue subtyping specimens as part of normal influenza surveillance
  - Thanks for sending all influenza positives to us!
- Testing specimens from people with respiratory symptoms and known exposure to H5N1
  - Poultry farms the past 2-3 years; no dairy farms yet
- Collaborating with WVDL and DHS to perform surveillance for H5N1 in cats sent in for rabies testing
- Developed and implemented H5 subtyping for wastewater testing
- Explored H5N1 testing on a high-throughput platform (Panther Fusion)
- Receiving influenza positive specimens from LabCorp to subtype
  - Enhance surveillance, to determine if H5 is circulating unnoticed
  - Haven't identified any yet

US NEWS

## Missouri reports human bird flu case with no link to animals



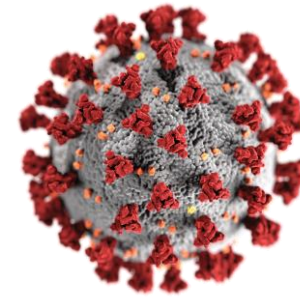
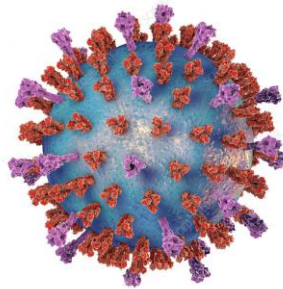
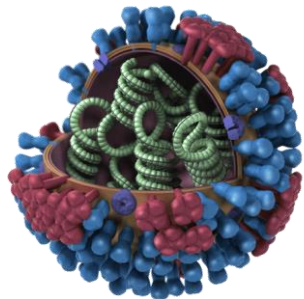
Published on September 6, 2024  
By BNO News

# Respiratory Pathogens

## Why conduct surveillance



- **Respiratory pathogens overall**
  - Situational awareness of what is circulating, to inform clinical decision-making and public health response
- **Influenza, RSV, SARS-CoV-2**
  - Genomic surveillance (at WSLH)
    - Track virus lineages/variants of concern/novel and reassortant viruses (H5N1)
    - Inform vaccine strain inclusion for all three viruses
  - Phenotypic characterization (at CDC)
    - Monitor resistance to antivirals and monoclonal antibody treatments

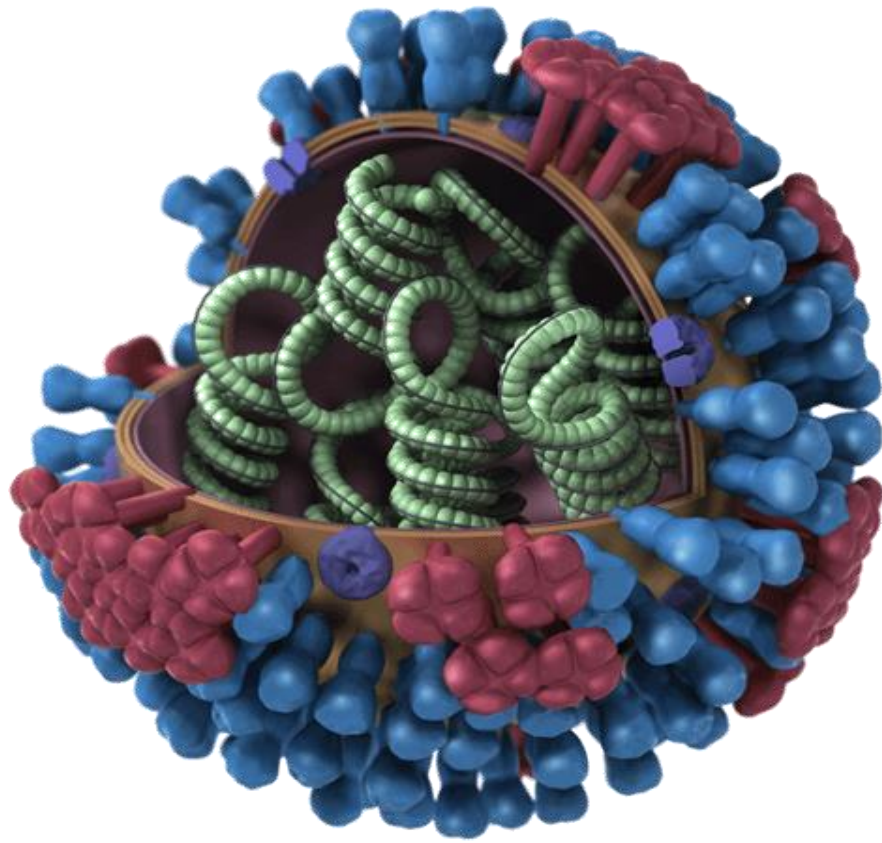






# Influenza virus:

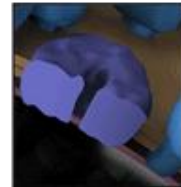
Changeability is its hallmark



Hemagglutinin



Neuraminidase



M2 Ion Channel



RNP

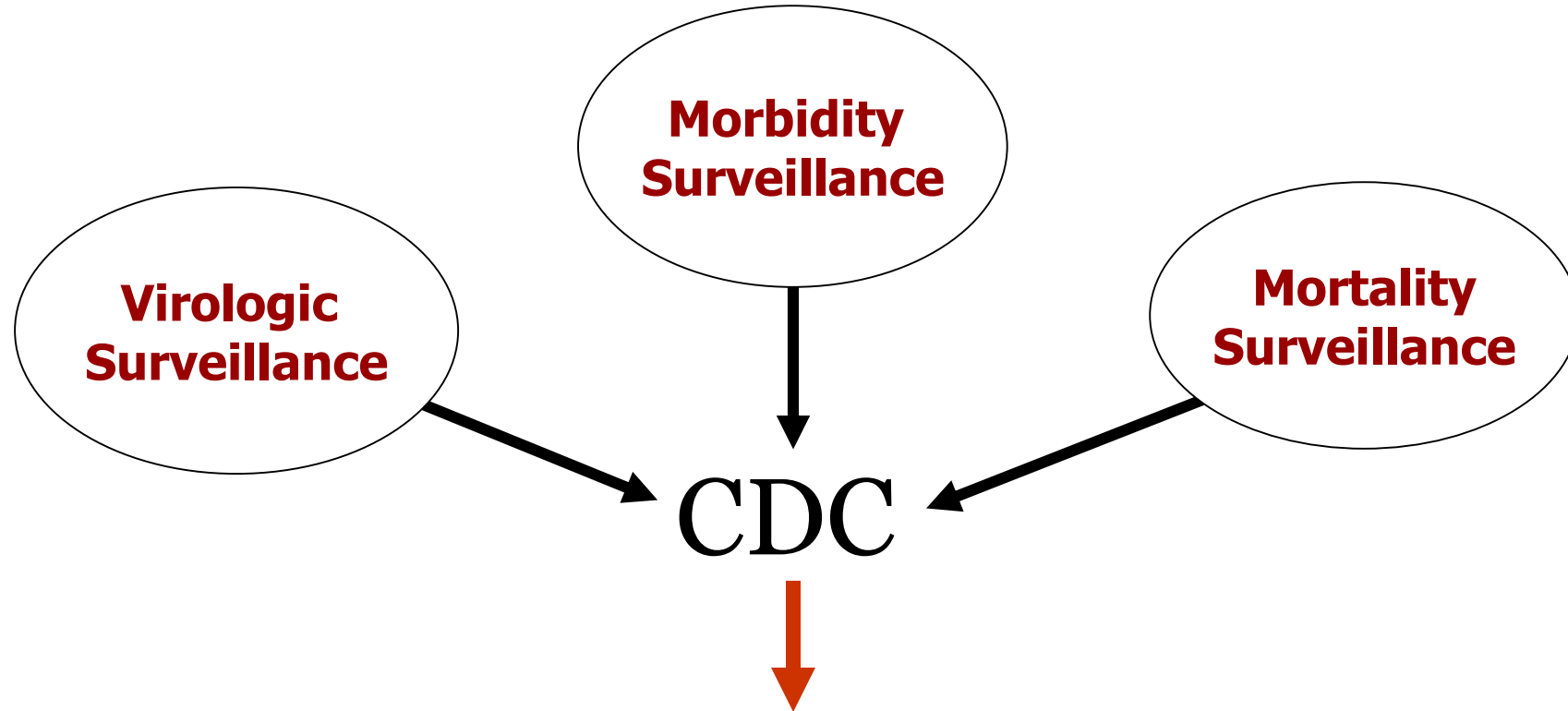
- Influenza types A, B, C and D
  - A and B are major human pathogens
- Negative-sense segmented RNA genome
  - 8 separate RNA segments
- Two major surface proteins of A and B viruses: **Hemagglutinin (HA)** and **Neuraminidase (NA)**
  - Role in pathogenesis
  - Defines subtypes
- Annual epidemics
  - Antigenic drift – small changes in HA and NA
- Periodic pandemic
  - Antigenic shift – HA that is new to the human population



# U.S. Influenza Surveillance



Track annual epidemics and identify possible pandemic viruses



# The Looooooooong 2023-24 Influenza Season



## Wisconsin Laboratory Surveillance Reporting

Institution ID

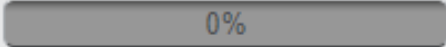
Please enter your institution's ID to access the report form. Please email [wcln@slh.wisc.edu](mailto:wcln@slh.wisc.edu) if you need assistance. "Institution ID" is a series of letters followed by numbers. Please note that we are now able to update default information again. Please alert us to updates by marking the information has been changed box. Thank you.

LaboratoryID

2022/2023 Updates to reporting:

- PCR and Rapid Molecular testing has been merged
- Reporting options have been updated to reflect current testing.

Next

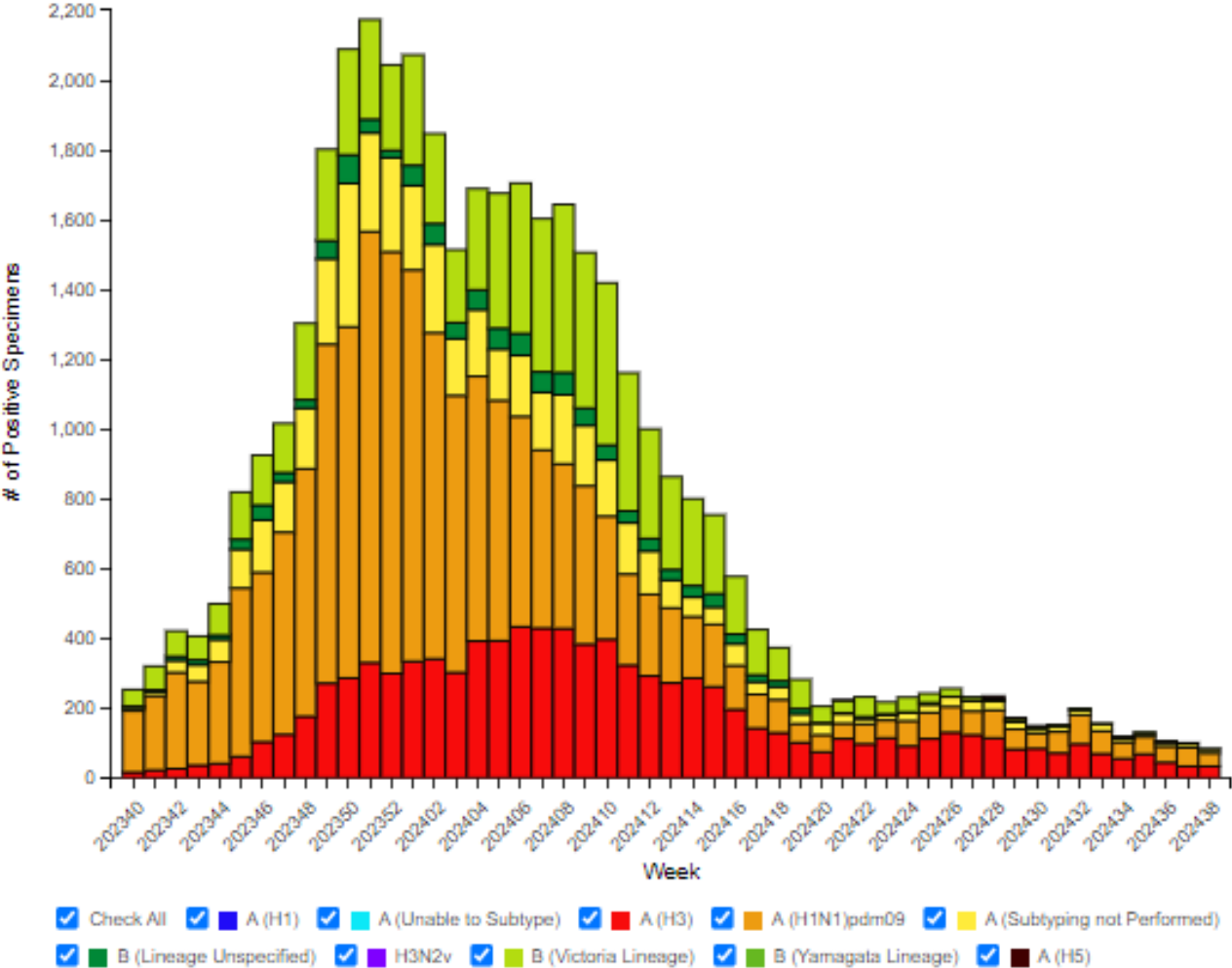


# The Loooooooong 2023-24 Influenza Season



Season: 2023-24 Surveillance Area: National

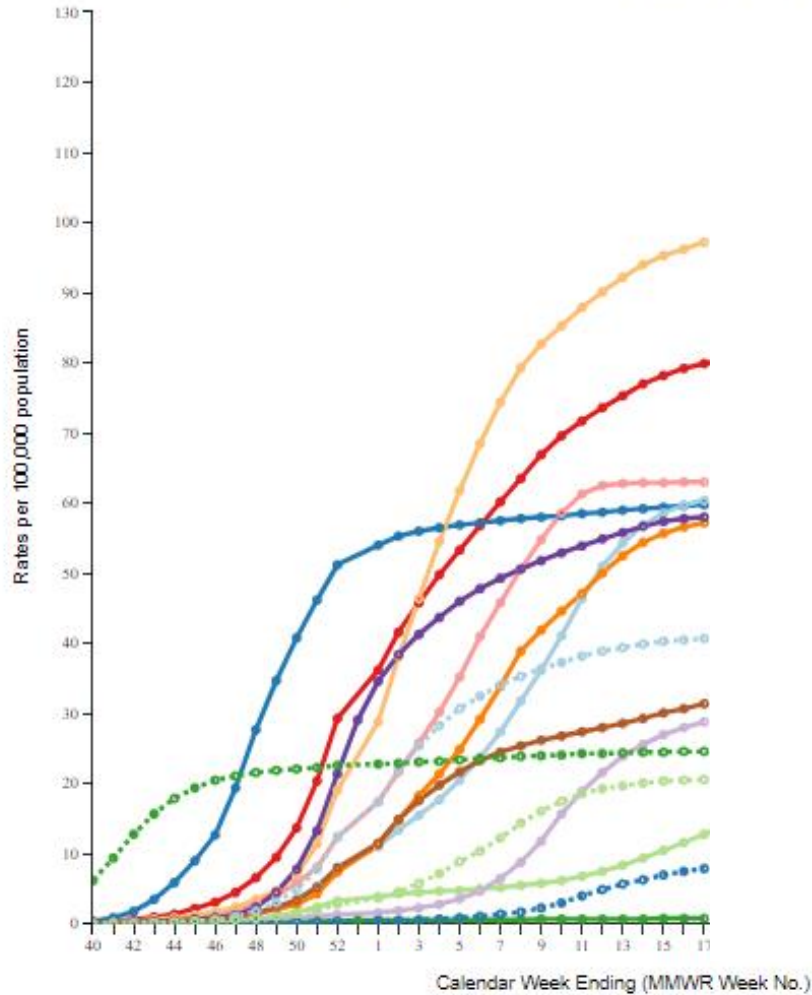
Influenza Positive Tests Reported to CDC by Public Health Laboratories, National Summary, 2023-24 Season, week ending Sep 21, 2024



# The Looooooong 2023-24 Influenza Season

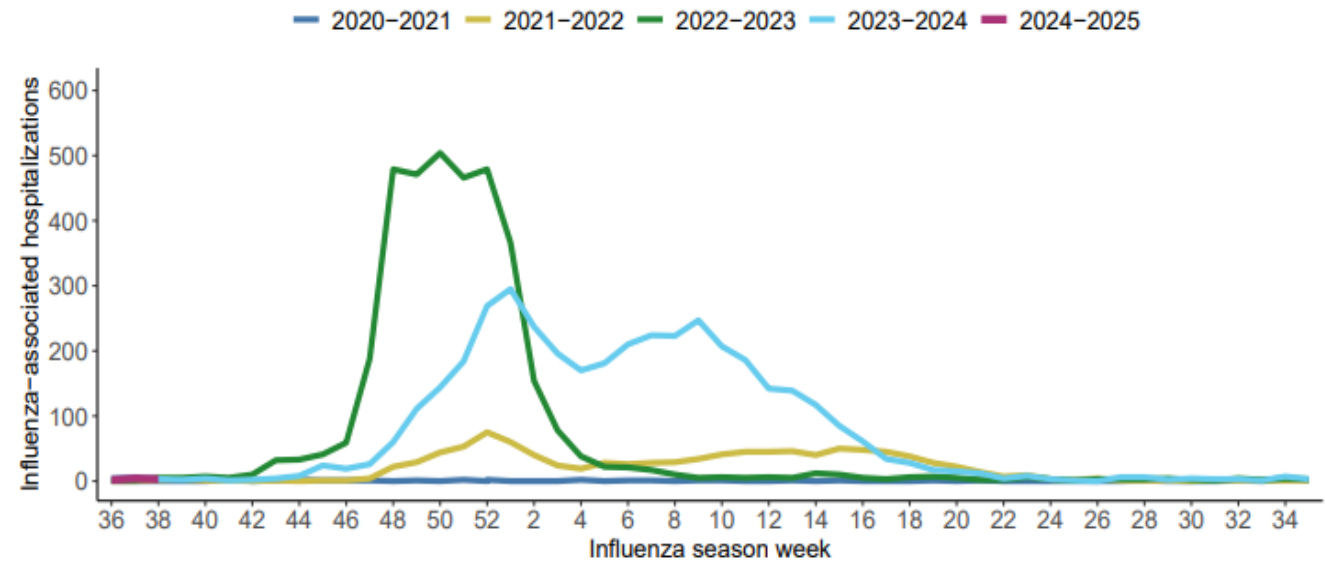


Laboratory-Confirmed Influenza Hospitalizations  
 Preliminary cumulative rates as of Sep 21, 2024  
 FluSurv-NET :: Entire Network :: Overall Age Group :: Cumulative Rate



- All Seasons
- 2023-24
- 2022-23
- 2021-22
- 2020-21
- 2019-20
- 2018-19
- 2017-18
- 2016-17
- 2015-16
- 2014-15
- 2013-14
- 2012-13
- 2011-12
- 2010-11
- 2009-10

Weekly influenza-associated hospitalizations by influenza season, WEDSS



# Influenza Vaccines



- Flu vaccines used to be trivalent: H1, H3, B component (either B/Victoria or B/Yamagata)
- 2013, switched to quadrivalent: H1, H3, B/Vic, B/Yam
- B/Yamagata hasn't been seen worldwide since March 2020
- In addition to normal worldwide flu surveillance:
  - “in a last-ditch attempt to find the missing pathogen, a worldwide network of monitoring centers tested over 15,000 influenza B virus samples collected from February to August of 2023. Not a single one of them was Yamagata.”
- 2024-25, back to trivalent
  - H1, H3, B/Victoria

STAT Reporting from the frontiers  
of health and medicine

HEALTH

**FDA expert panel endorses idea of  
removing a component from flu vaccine**

- Note: destroy B/Yamagata samples if you still have them

[https://www.statnews.com/2023/10/05/fda-expert-panel-endorses-idea-of-removing-a-component-from-flu-vaccine/?utm\\_medium=email&utm\\_source=rasa\\_io&utm\\_campaign=newsletter](https://www.statnews.com/2023/10/05/fda-expert-panel-endorses-idea-of-removing-a-component-from-flu-vaccine/?utm_medium=email&utm_source=rasa_io&utm_campaign=newsletter)



# Influenza Vaccine Recommendations

U.S. Centers for Disease Control and Prevention

**MMWR**

Morbidity and Mortality Weekly Report

Recommendations and Reports / Vol. 73 / No. 5

August 29, 2024

**Prevention and Control of Seasonal Influenza  
with Vaccines: Recommendations of the  
Advisory Committee on Immunization Practices —  
United States, 2024–25 Influenza Season**

- Routine annual influenza vaccination is recommended for all persons aged  $\geq 6$  months who do not have contraindications
- All types are trivalent:
  - Trivalent inactivated influenza vaccines (IIV3s)
  - Trivalent recombinant influenza vaccines (RIV3)
  - Trivalent live attenuated influenza vaccines (LAIV3)
- People over 65 years old recommended to have a high-dose or adjuvanted trivalent vaccine (higher protection)



# Available next year: spray your own nose!



## FDA Approves Nasal Spray Influenza Vaccine for Self- or Caregiver-Administration

*First Influenza Vaccine That Does Not Need to be Administered by a Health Care Provider*



**For Immediate Release:** September 20, 2024

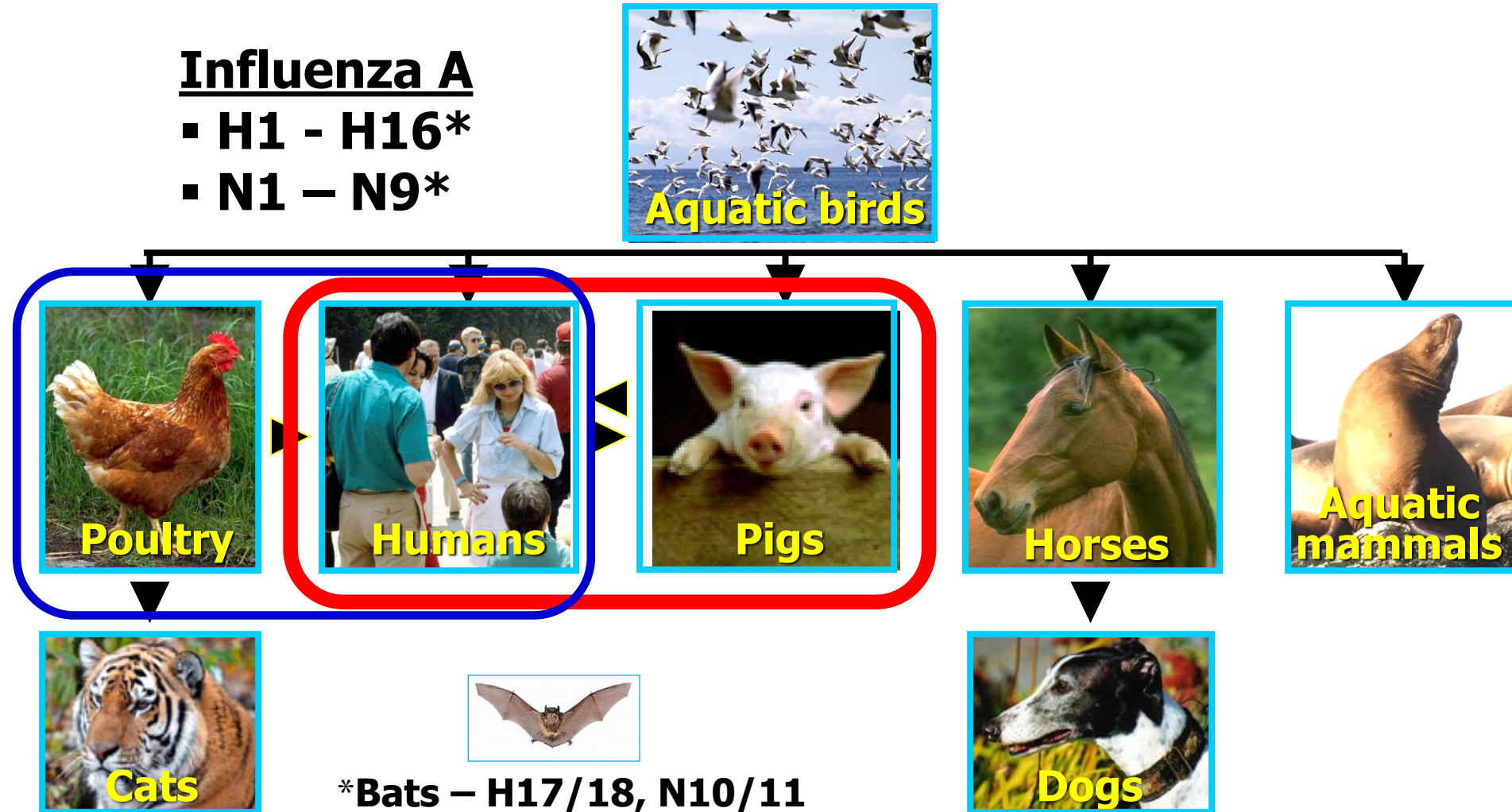
- Sold direct-to-consumers in conjunction with online pharmacy service
- Still available through physicians and pharmacies







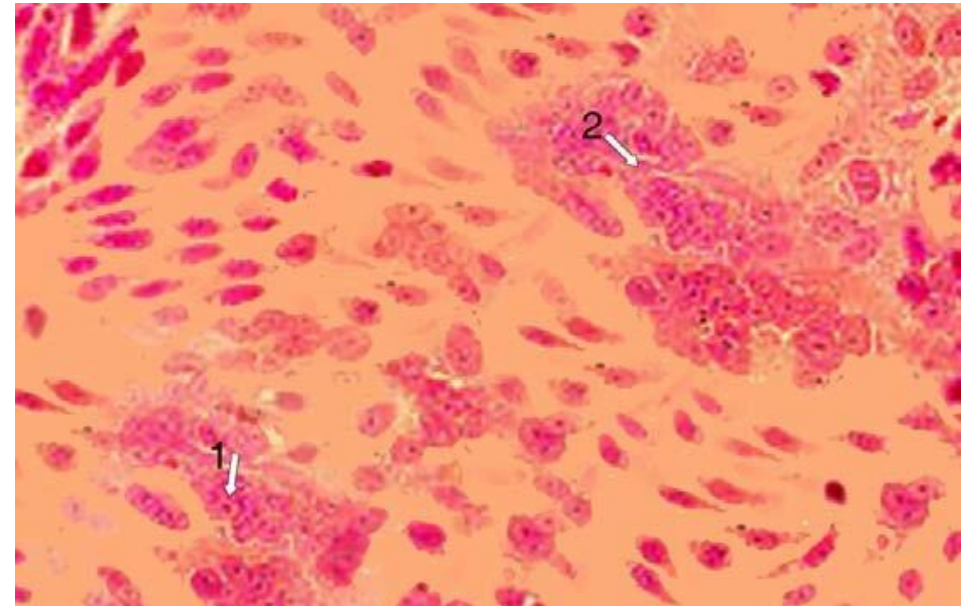
# Pandemic Influenza Generation: Viruses at the Human-Animal Interface





# RSV

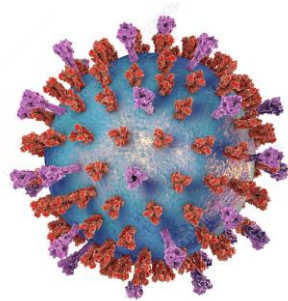
- Respiratory syncytial virus
- Disease burden:
  - More than two-thirds of babies are infected by age 1
  - Virtually all children are infected by age 2
  - RSV is the leading cause of infant hospitalization in the U.S.
    - 60-80,000 hospitalizations per year
  - Second leading cause of death in children under 1 globally (malaria is 1<sup>st</sup>)



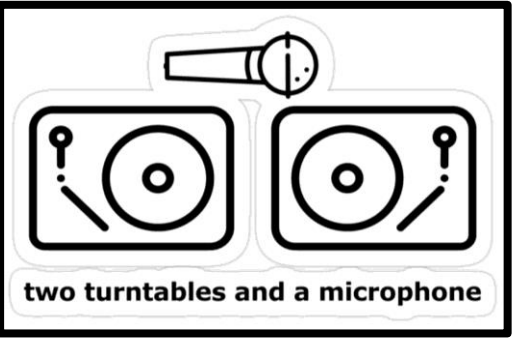


# RSV Surveillance in WI

- Data: number tested and number positive, per week
- Specimens: no specific request for RSV positive samples
  - We receive some RSV positives through sentinel and UHS surveillance
- We now perform WGS for genomic surveillance of RSV also!



# RSV Developments in 2023: Two vaccines and a MoAb



## Vaccine #1

- GSK's Arexvy
- Approved for adults ages 60 and older

## Vaccine #2

- Pfizer's Abrysvo
- Approved for adults over 60
- Approved to protect newborns against RSV by vaccinating pregnant people in the latter part of pregnancy (24-36 weeks of gestation)

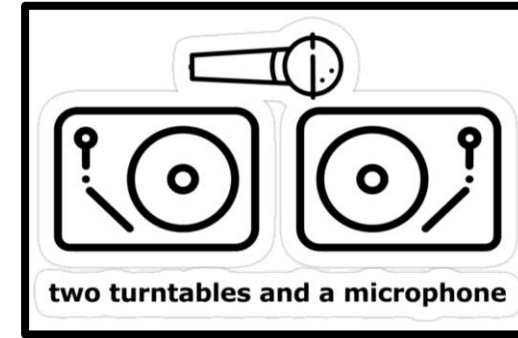
<https://www.statnews.com/2023/05/03/fda-approves-rsv-vaccine-gsk/>

<https://www.precisionvaccinations.com/vaccines/arexvy-rsv-vaccine>

[https://www.statnews.com/2023/08/21/pfizer-rsv-vaccine-abrysvo-newborns-fda-approval/?utm\\_medium=email&utm\\_source=rasa\\_io&utm\\_campaign=newsletter](https://www.statnews.com/2023/08/21/pfizer-rsv-vaccine-abrysvo-newborns-fda-approval/?utm_medium=email&utm_source=rasa_io&utm_campaign=newsletter)

[https://www.statnews.com/2023/07/17/fda-approves-rsv-monoclonal-antibody-for-infants-young-children-at-high-risk/?utm\\_medium=email&utm\\_source=rasa\\_io&utm\\_campaign=newsletter](https://www.statnews.com/2023/07/17/fda-approves-rsv-monoclonal-antibody-for-infants-young-children-at-high-risk/?utm_medium=email&utm_source=rasa_io&utm_campaign=newsletter)

# RSV Developments in 2023: Two vaccines and a MoAb



Monoclonal antibody: Ab against the virus, rather than vaccine that induces recipients' immune systems to make their own

- Sanofi's Nirsevimab
- Two CDC recommendations:
  - Single dose of Nirsevimab to all infants aged less than 8 months and children aged 8 through 19 months at increased risk

<https://www.statnews.com/2023/05/03/fda-approves-rsv-vaccine-gsk/>

<https://www.precisionvaccinations.com/vaccines/arexvy-rsv-vaccine>

[https://www.statnews.com/2023/08/21/pfizer-rsv-vaccine-abrysvo-newborns-fda-approval/?utm\\_medium=email&utm\\_source=rasa\\_io&utm\\_campaign=newsletter](https://www.statnews.com/2023/08/21/pfizer-rsv-vaccine-abrysvo-newborns-fda-approval/?utm_medium=email&utm_source=rasa_io&utm_campaign=newsletter)

[https://www.statnews.com/2023/07/17/fda-approves-rsv-monoclonal-antibody-for-infants-young-children-at-high-risk/?utm\\_medium=email&utm\\_source=rasa\\_io&utm\\_campaign=newsletter](https://www.statnews.com/2023/07/17/fda-approves-rsv-monoclonal-antibody-for-infants-young-children-at-high-risk/?utm_medium=email&utm_source=rasa_io&utm_campaign=newsletter)



## Use of Respiratory Syncytial Virus Vaccines in Older Adults: Recommendations of the Advisory Committee on Immunization Practices — United States, 2023

- CDC recommended that adults aged  $\geq 60$  years may receive an RSV vaccine



# Letters

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## RESEARCH LETTER

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### **RSV Vaccine Effectiveness Against Hospitalization Among US Adults 60 Years and Older**

- First year to conduct real-world effectiveness studies
- Even though vaccinated people were older and more immunocompromised:
  - RSV vaccines had 75% effectiveness in protecting against RSV hospitalizations!





## Use of Respiratory Syncytial Virus Vaccines in Adults Aged $\geq 60$ Years: Updated Recommendations of the Advisory Committee on Immunization Practices — United States, 2024

- CDC now recommends that a single dose of any FDA-approved RSV vaccine (Arexvy [GSK]; Abrysvo [Pfizer]; or mResvia [Moderna]):
  - For all adults aged  $\geq 75$  years
  - For adults aged 60–74 years who are at increased risk for severe RSV disease

### **mRESVIA's FDA approval paves the way for mRNA vaccines across multiple indications**

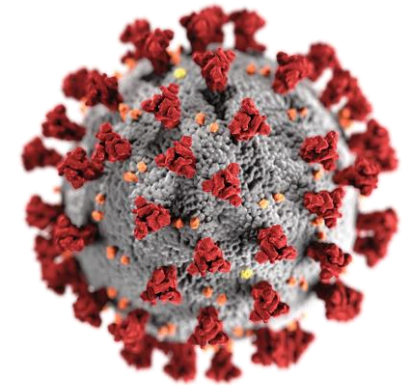
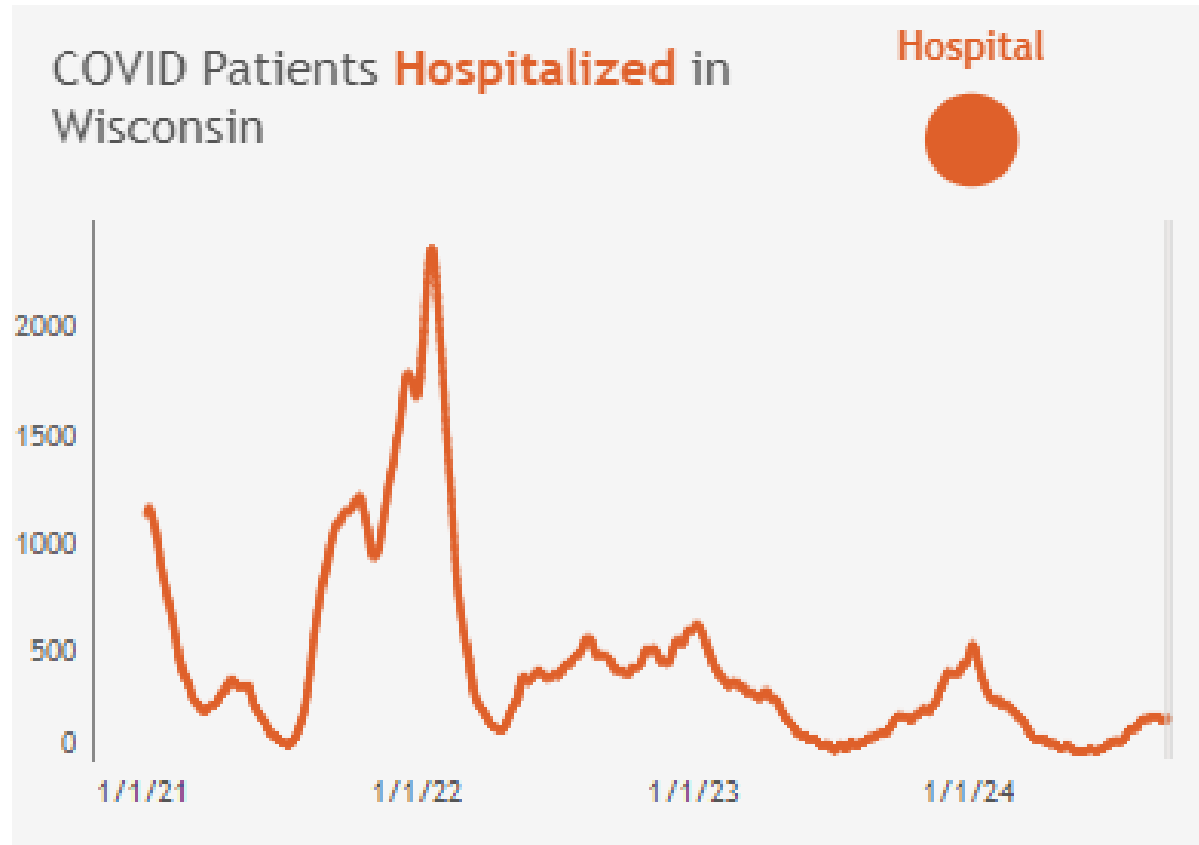
The approval is a significant development in the field and will encourage the use of mRNA technology across other disciplines.

 GlobalData | GlobalData Healthcare | June 6, 2024

<https://www.clinicaltrialsarena.com/analyst-comment/mresvias-fda-approval-mrna-vaccines/?cf-view>



# SARS-CoV-2 Surveillance



<https://www.dhs.wisconsin.gov/covid-19/hosp-data.htm>



# SARS-CoV-2 Surveillance

## COVID-19 Wastewater Surveillance in Wisconsin

Dashboard Updated: 9/27/2024

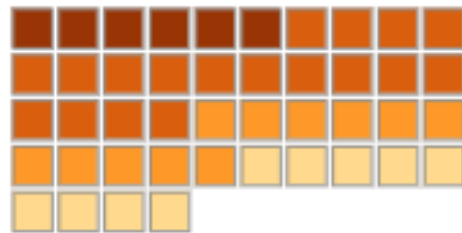
Total population served: 2,944,691

Statewide presence of SARS-CoV-2 in wastewater

Statewide average SARS-CoV-2 levels in wastewater over time

Slide to pick start date

4/4/2021



SARS-CoV-2 concentration categories

- Very high
- High
- Moderate
- Low
- Very low



Sites with a significant increase (+):  
1

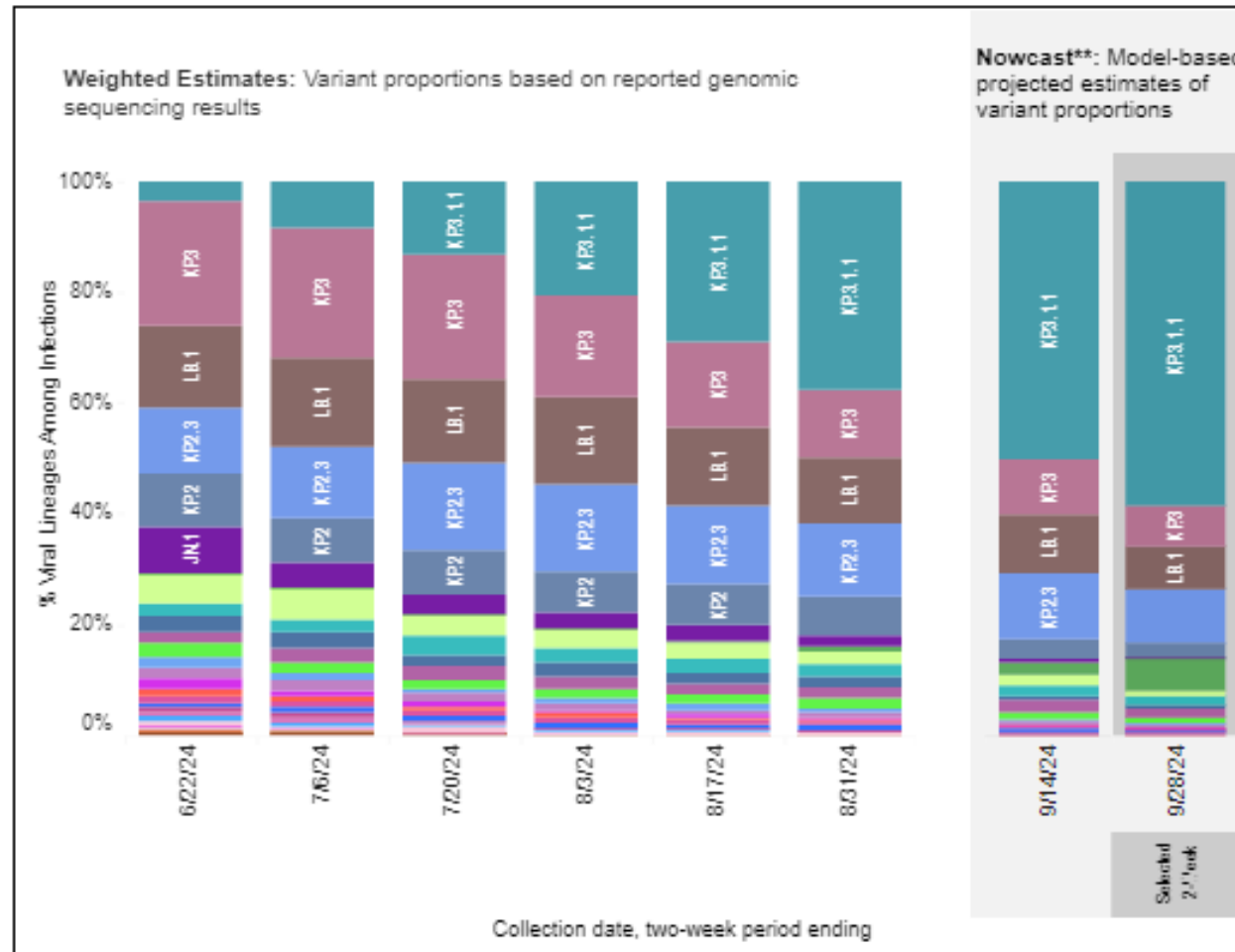


# SARS-CoV-2 Genomic Surveillance



## Weighted and Nowcast Estimates in United States for 2-Week Periods in 6/9/2024 – 9/28/2024

Hover over (or tap in mobile) any lineage of interest to see the amount of uncertainty in that lineage's estimate.



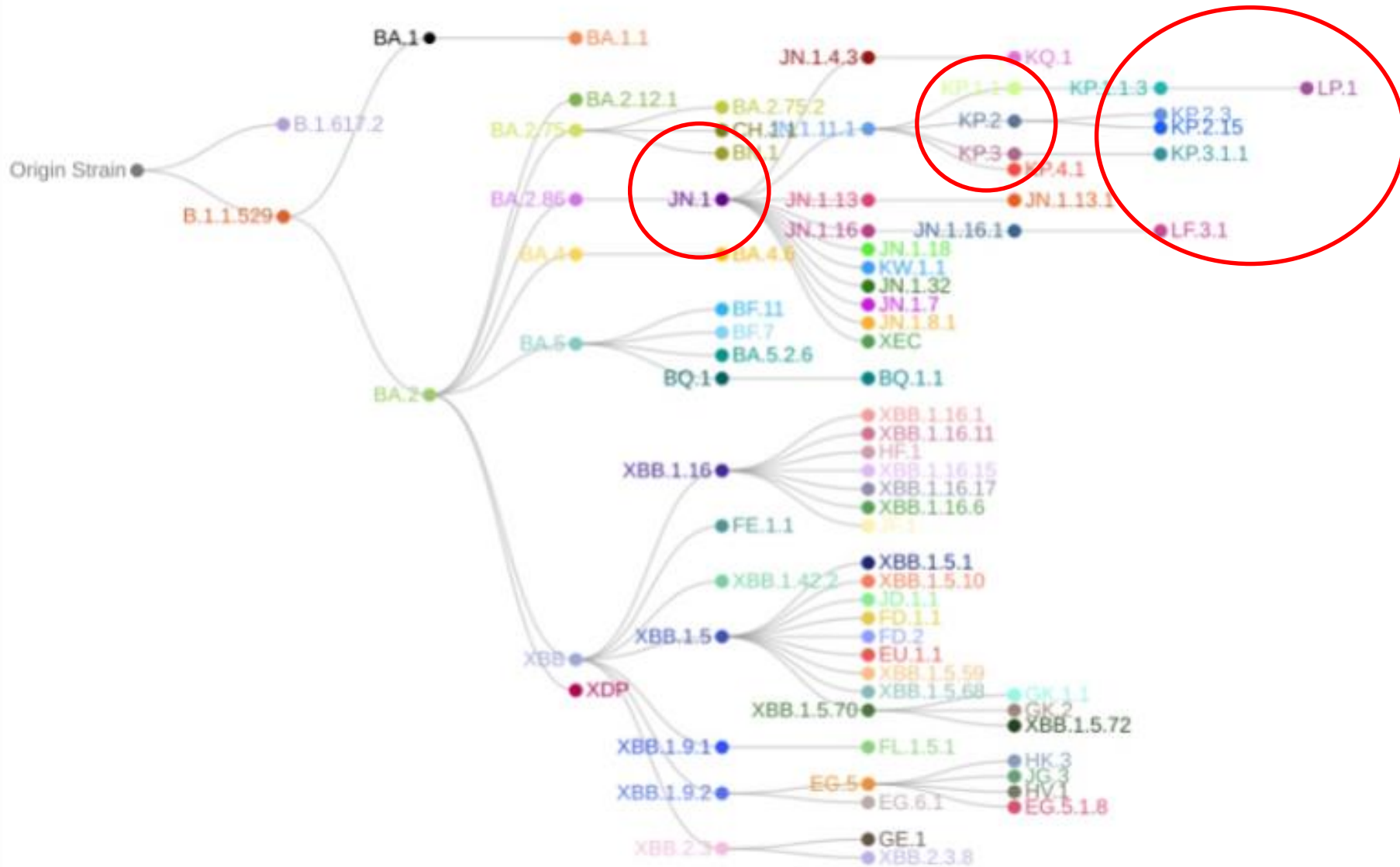
Thank you for sending up to 5 SARS-CoV-2 positives per week for sequencing!





# SARS-CoV-2 Vaccine update

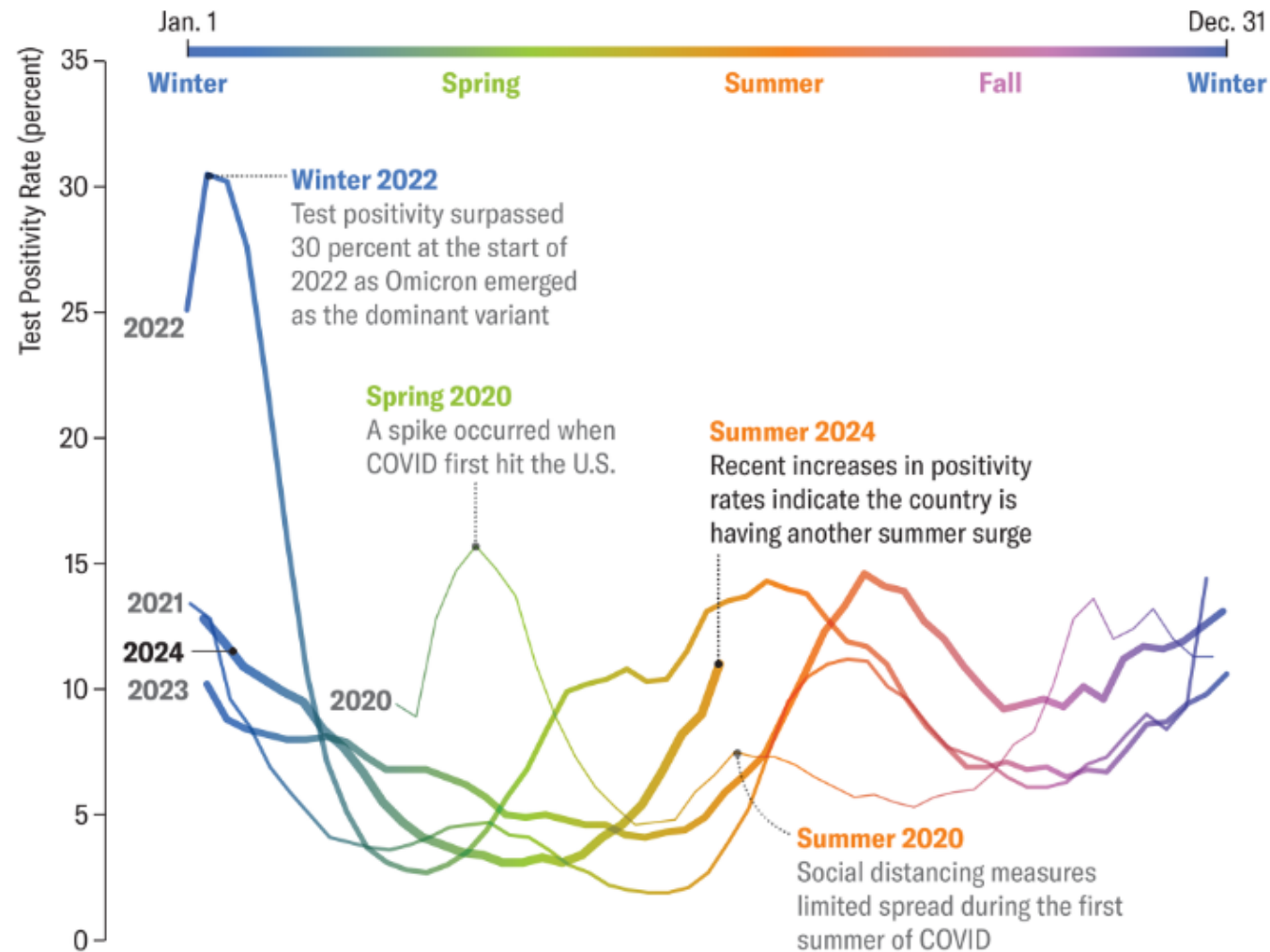
- Three updated vaccines are available: from Moderna, Pfizer, and Novavax
- The Pfizer and Moderna vaccines are both formulated to target KP.2
  - This strain is very similar to the variants that are now spreading widely
- The Novavax vaccine is formulated to target JN.1
  - This is an earlier strain of the virus that is also close to the dominant strains





## COVID Test Positivity Data Reveal Seasonal Patterns

The chart shows the percentage of PCR tests that came back positive for SARS-CoV-2 each week across the U.S. since testing began in early 2020. The last data point for 2024 reflects the test positivity rate as of July 6.



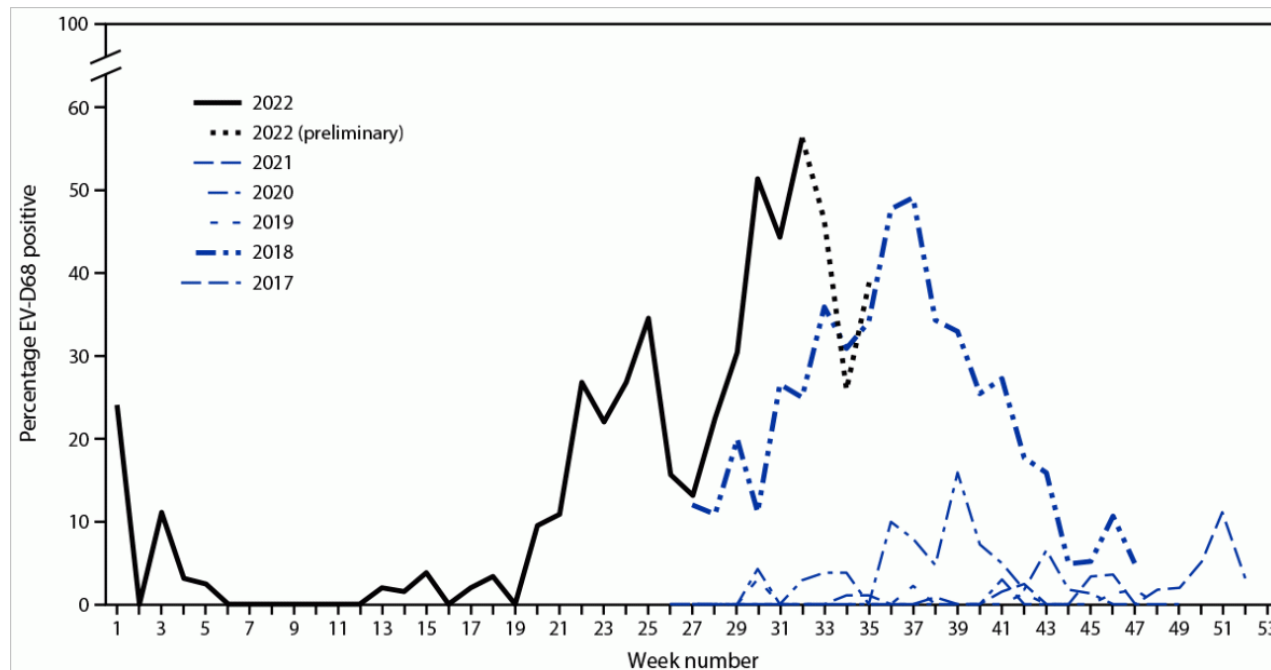
Amanda Montañez; Source: [Centers for Disease Control and Prevention](https://www.cdc.gov/)



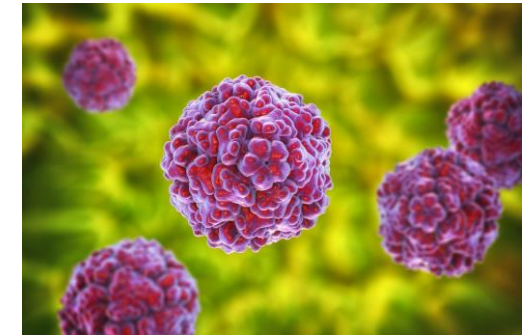
# Enterovirus surveillance



- 2022, huge peak of EV-D68
- 5,633 children with ARI seeking emergency care in late summer
  - EV-D68 detected in 17.4% of all children
- Large concern for surge of acute flaccid myelitis (AFM)



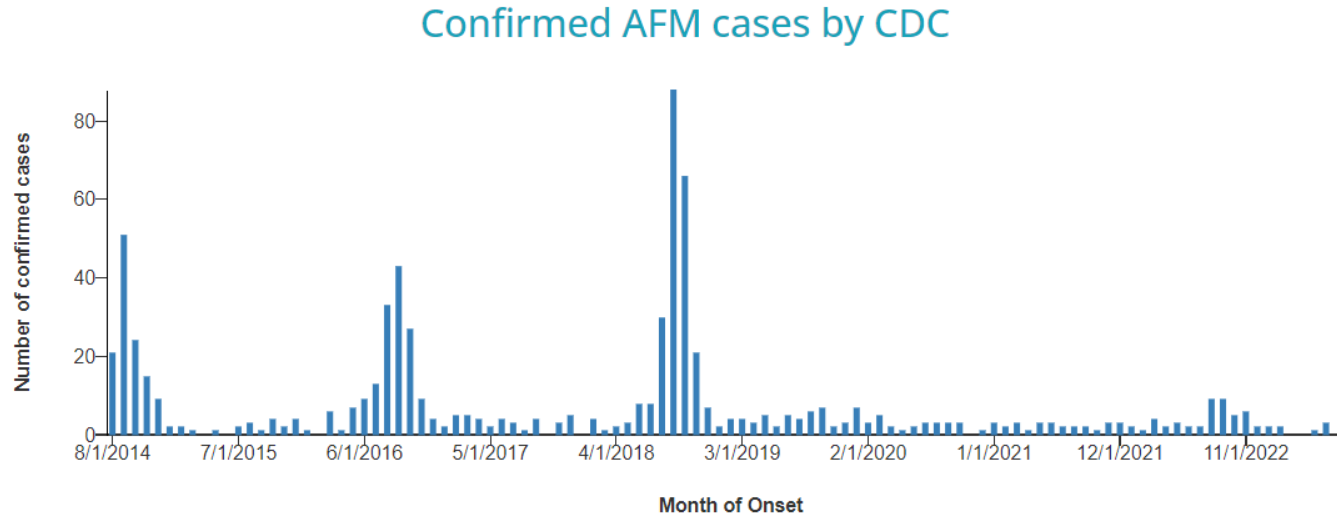
Abbreviation: EV-D68 = enterovirus D68.



# Acute Flaccid Myelitis (AFM)



- Thankfully, no large AFM peak in 2022



<https://www.cdc.gov/acute-flaccid-myelitis/cases-in-us.html>

- CDC: “we need to learn more about enteroviruses!”
- New national enterovirus surveillance
- More to come from Erika



**Enterovirus Surveillance Testing at the VPD Reference Centers**



# Not a virus, but worth mentioning!



## Whooping cough spikes, especially among unvaccinated teens

Pertussis outbreaks are at the highest level in a decade and doctors say many cases are going undetected – allowing people to spread the bacterial infection unknowingly for weeks.



WISCONSIN DEPARTMENT  
of HEALTH SERVICES

### DHS Health Alert Network

#### Wisconsin DHS Health Alert #61: Pertussis Cases in Wisconsin

*Bureau of Communicable Diseases*

*September 25, 2024*

#### Key points

- Pertussis is increasing nationwide.
- In Wisconsin, 49 counties have had at least one reported case of pertussis in 2024.
- As of September 20, 2024, Wisconsin has 662 confirmed cases statewide.
- Of the cases of pertussis reported in Wisconsin in 2024, 41% of the cases have been individuals aged 11–18 years, 31 cases have been infants, and six have been hospitalized.
- No deaths have been reported.

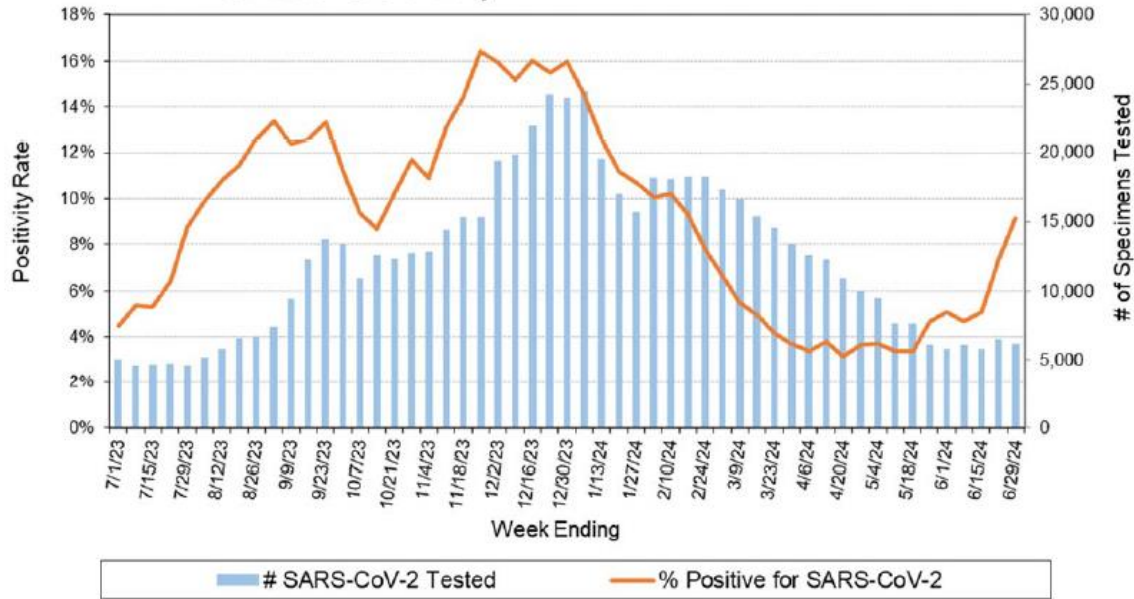


# Wisconsin Respiratory Surveillance 2023-2024

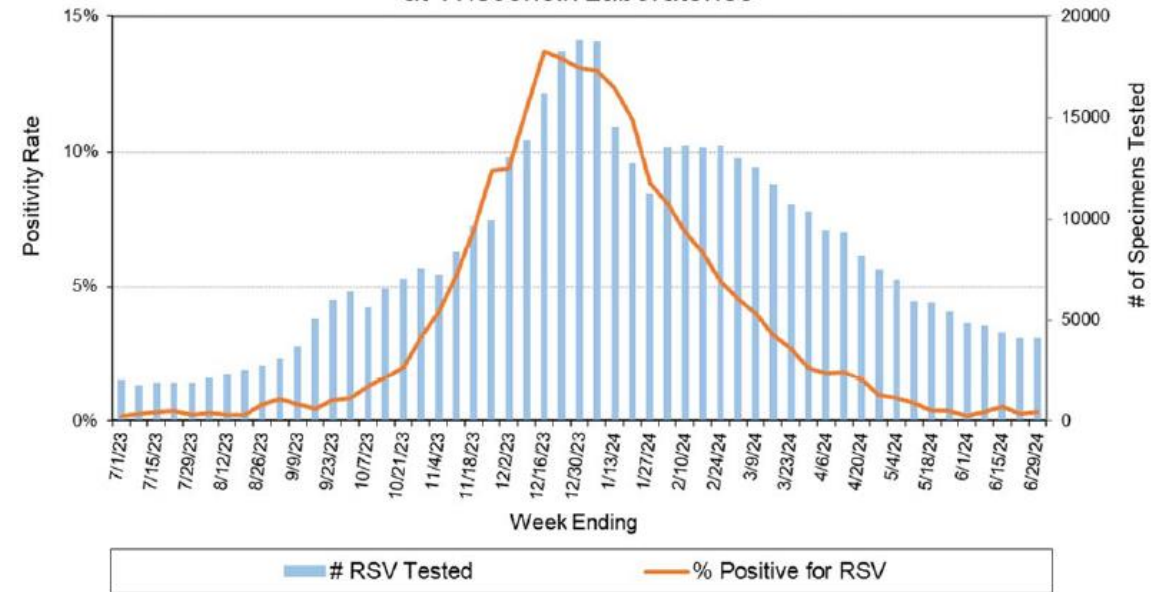


# 2023-24 SARS-CoV-2 and RSV

Positivity Rate and Number of Specimens Tested for **SARS-CoV-2** by PCR at Wisconsin Laboratories

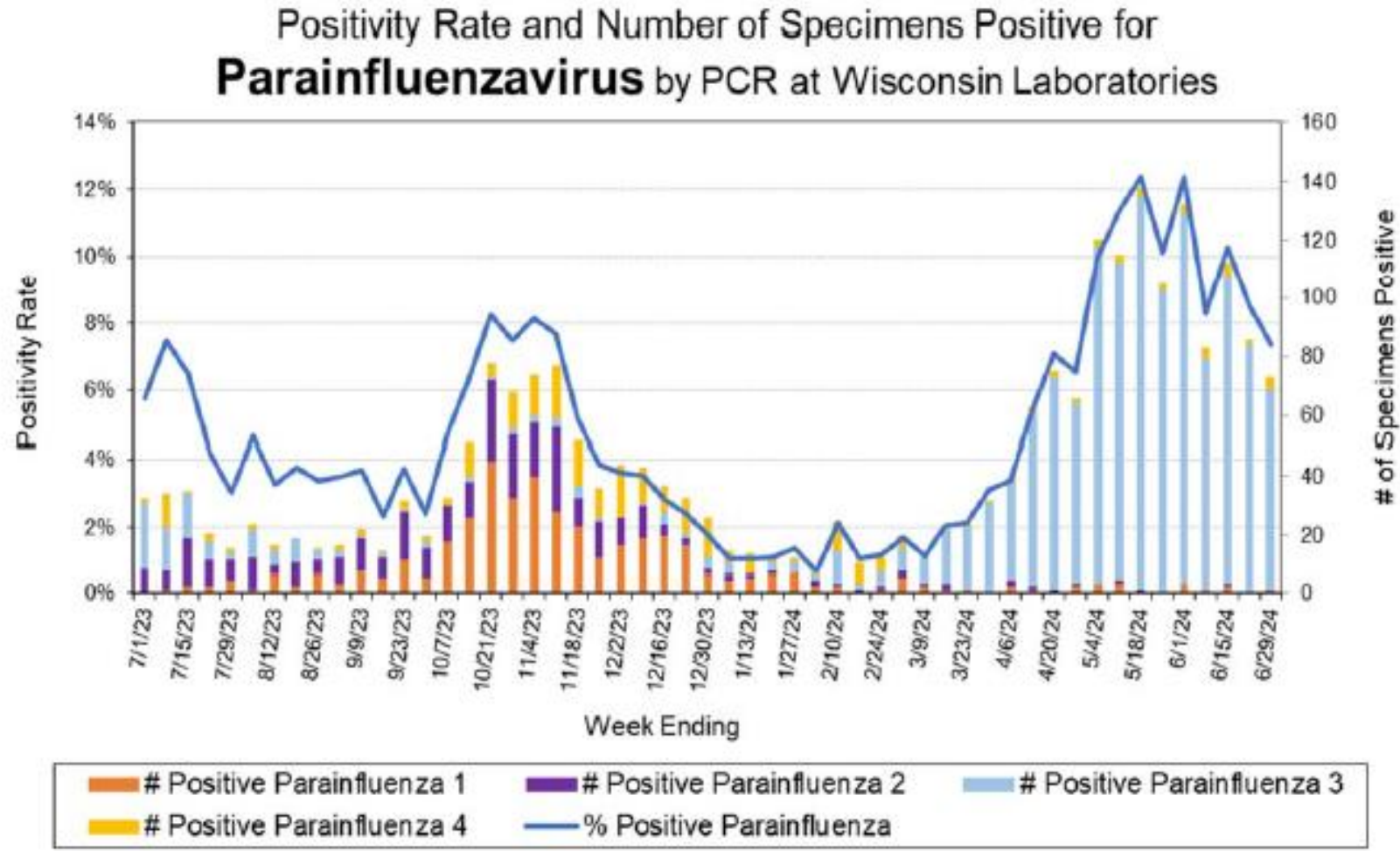


Positivity Rate and Number of Specimens Tested for **RSV** by PCR at Wisconsin Laboratories





# 2023-24 Parainfluenza viruses

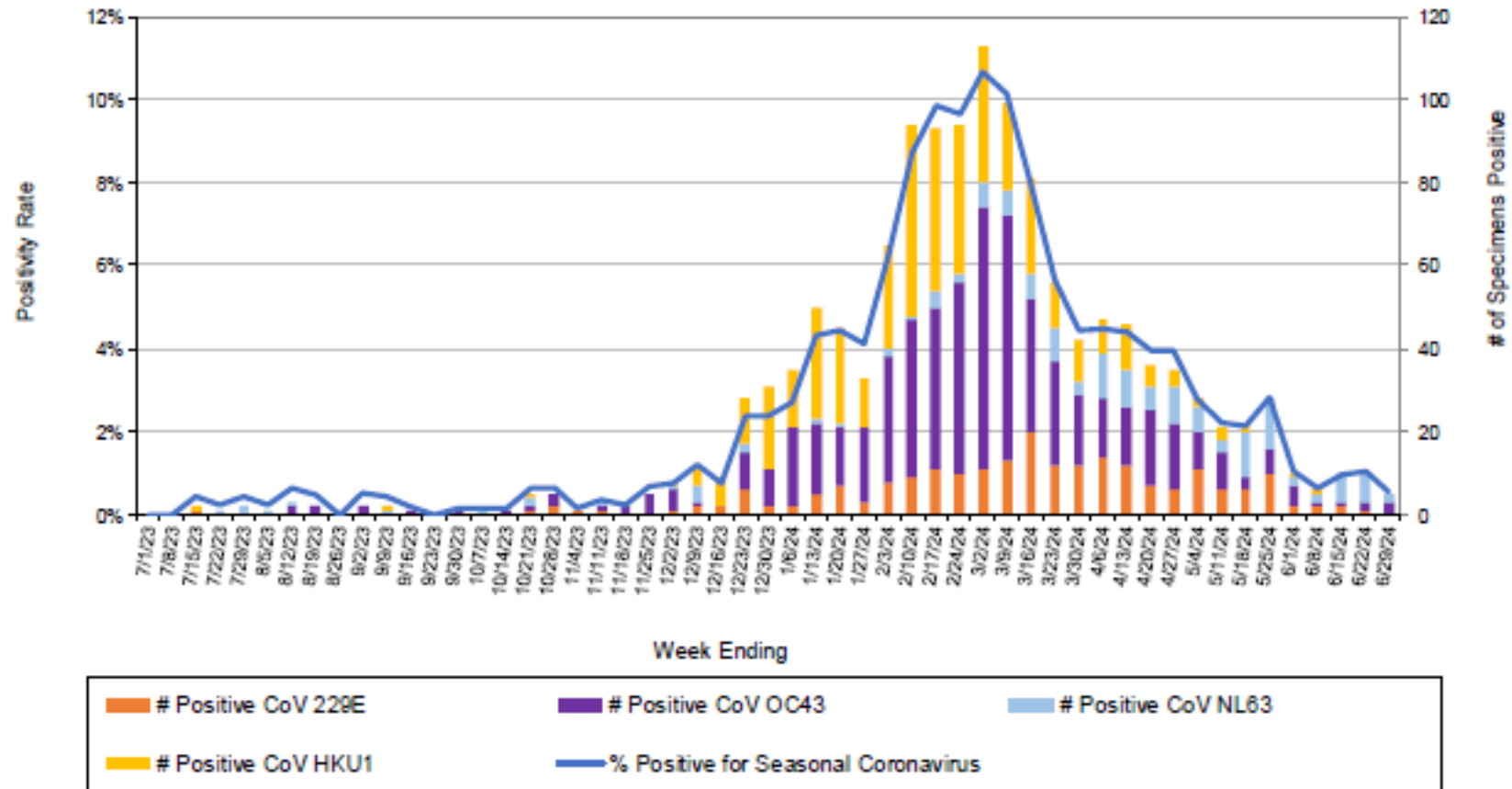






# 2023-24 Seasonal Coronaviruses

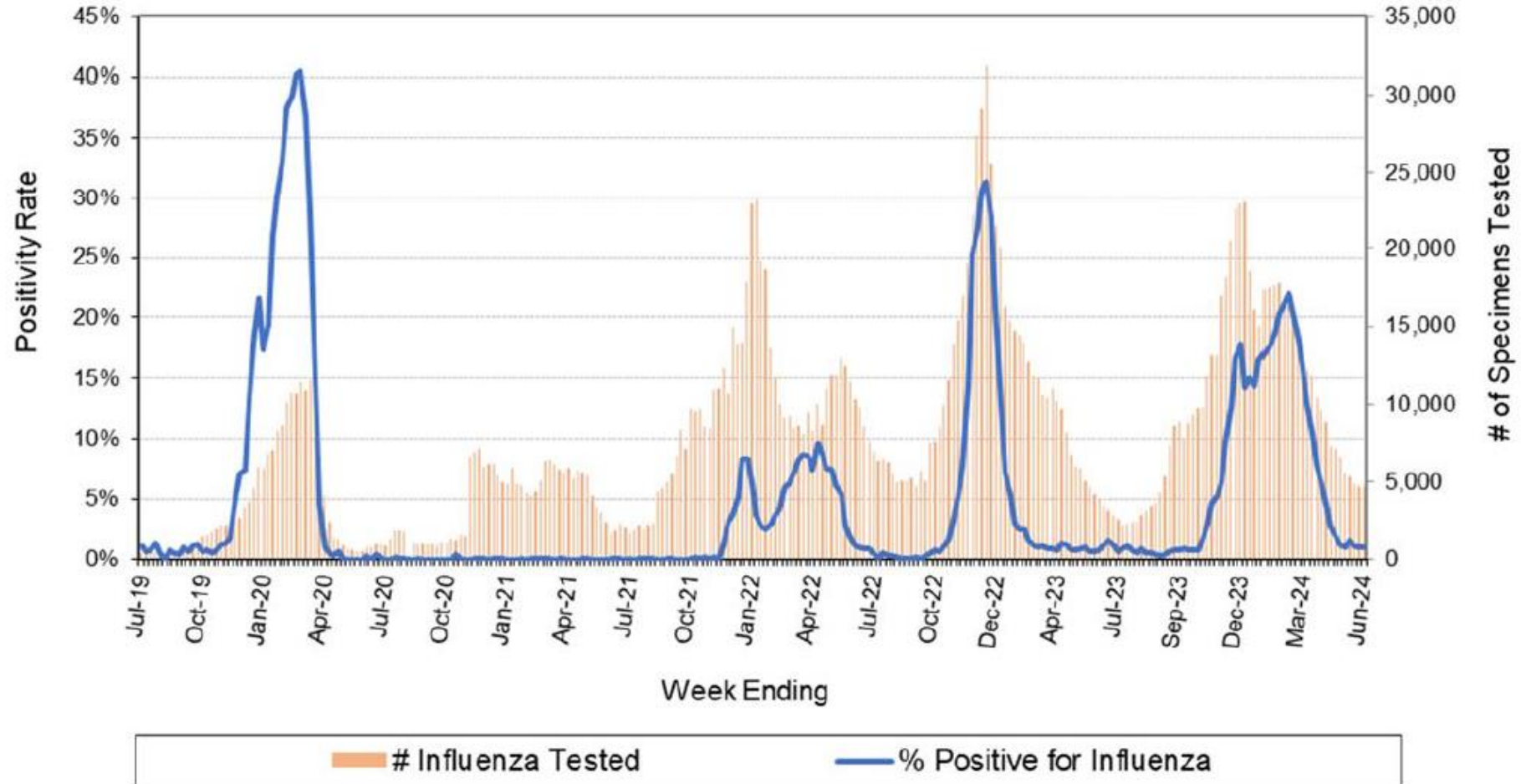
Positivity Rate and Number of Specimens Positive for **Seasonal Coronaviruses** by PCR at Wisconsin Laboratories





# The past 5 years

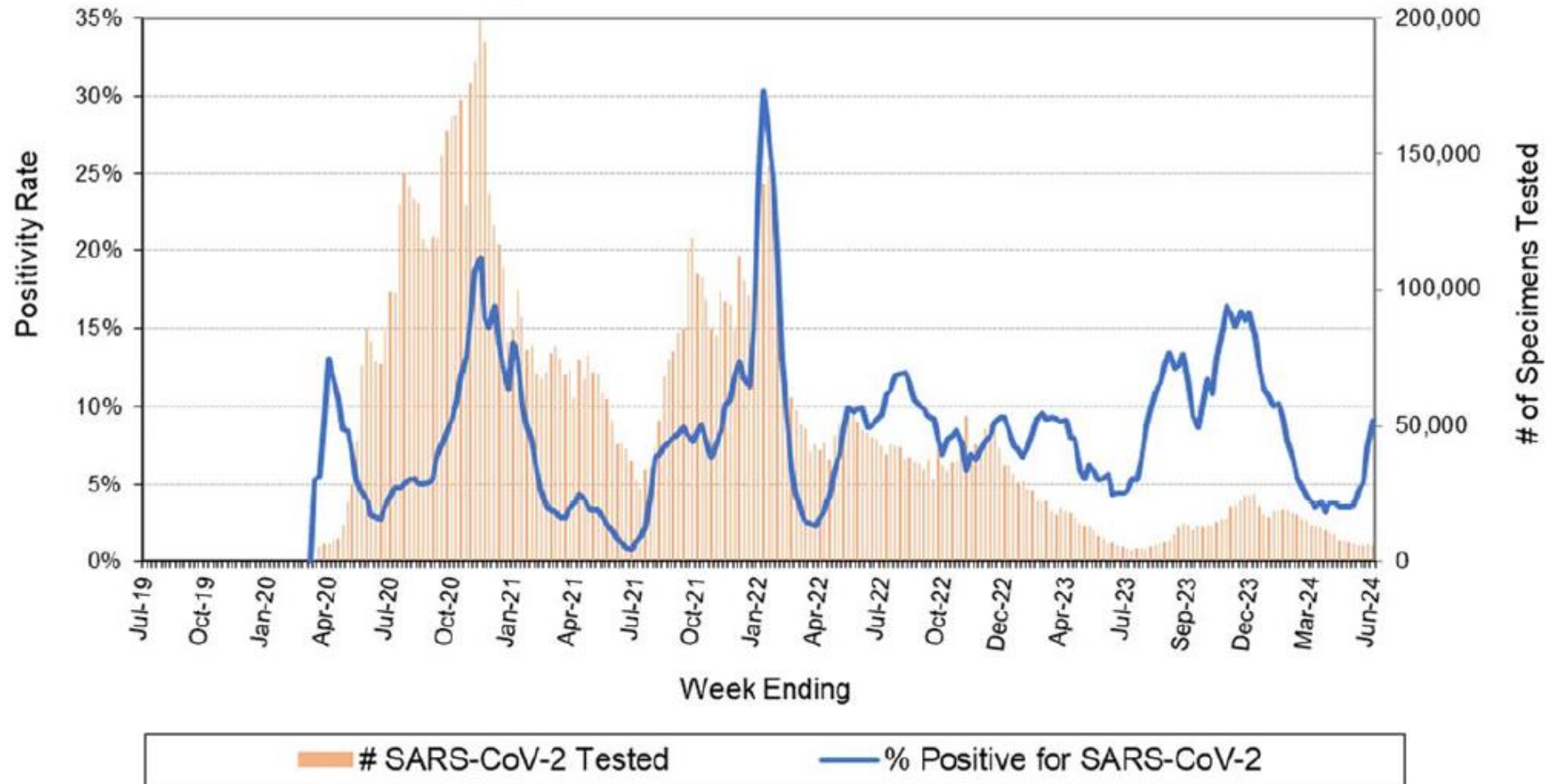
Positivity Rate and Number of Specimens Tested for **Influenza** by PCR at Wisconsin Laboratories from 2019-24





# The past 5 years

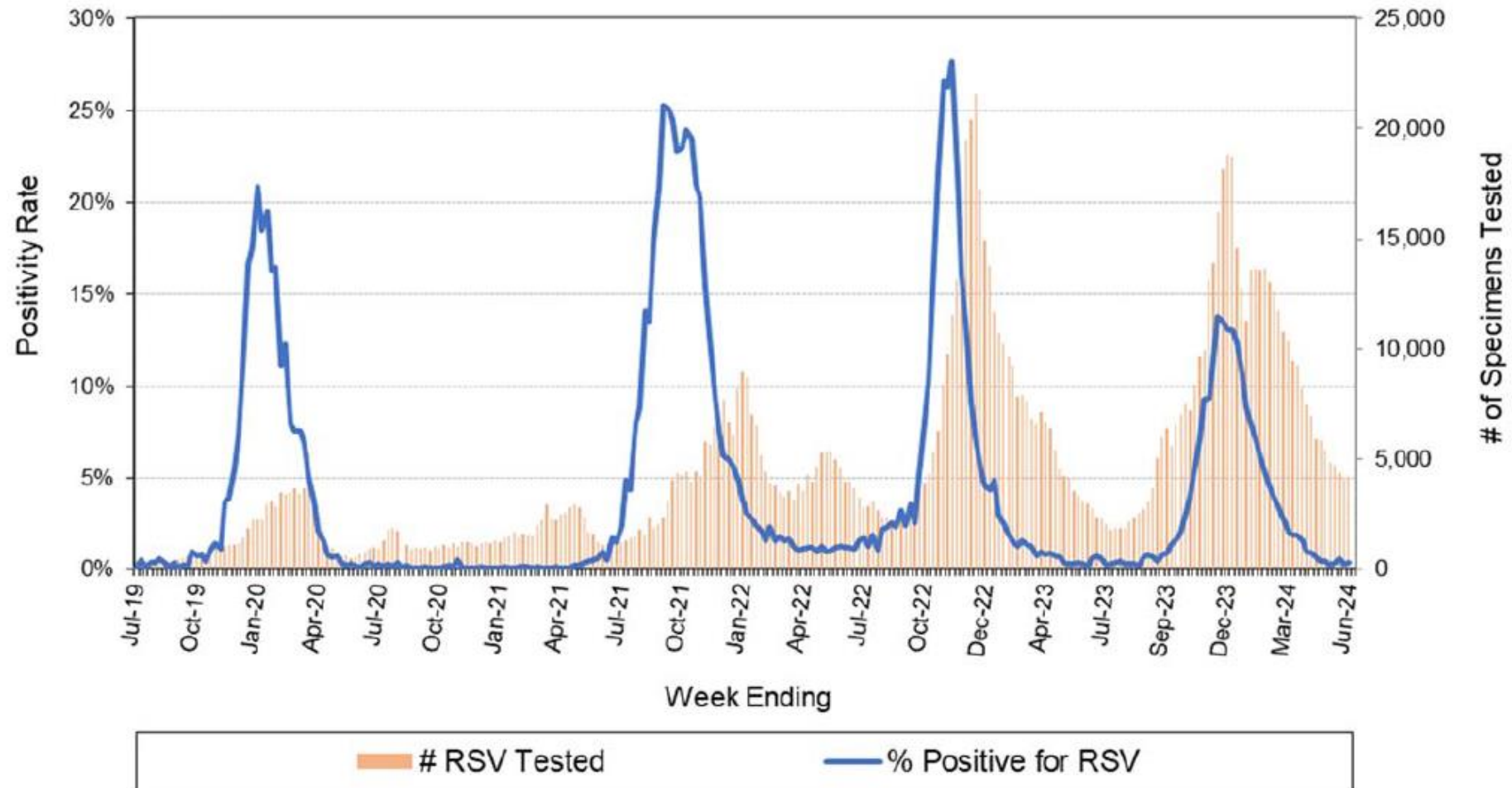
Positivity Rate and Number of Specimens Tested for **SARS-CoV-2** by PCR at Wisconsin Laboratories from 2019-24





# The past 5 years

Positivity Rate and Number of Specimens Tested for **RSV** by PCR at Wisconsin Laboratories from 2019-24

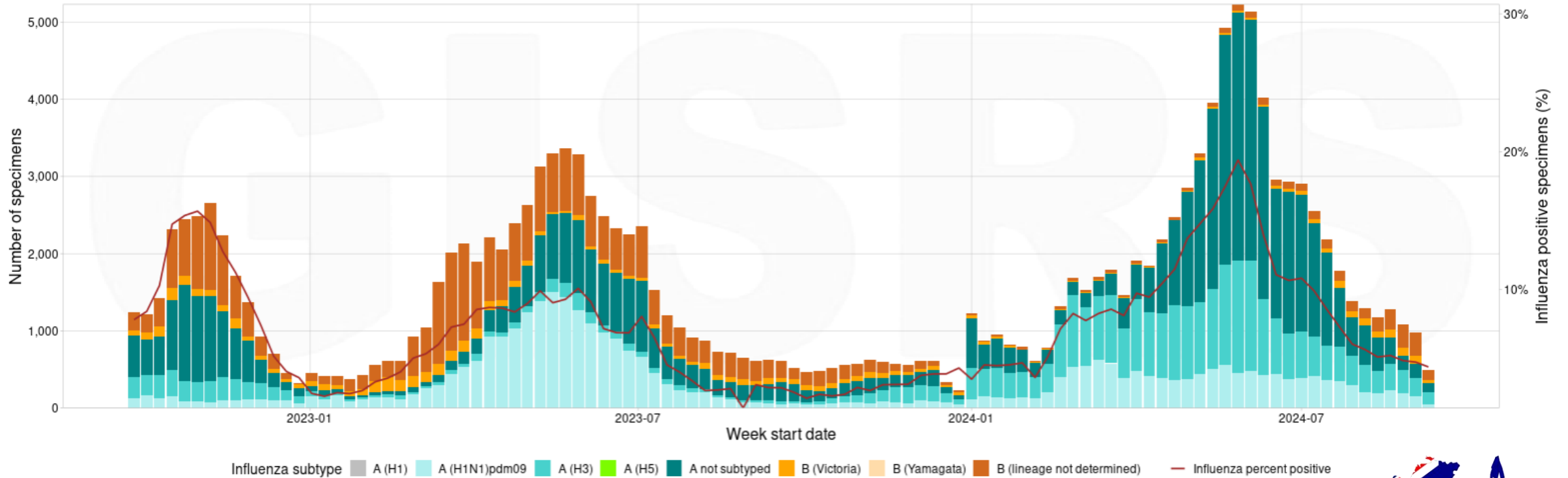




# WHO Global Influenza Surveillance and Response System (GISRS)

## Southern hemisphere, 2022-24

Virus detections by subtype reported to FluNet, 26 September 2022 to 09 September 2024



<https://apps.who.int/flumart/Default?ReportNo=5&Hemisphere=Southern>



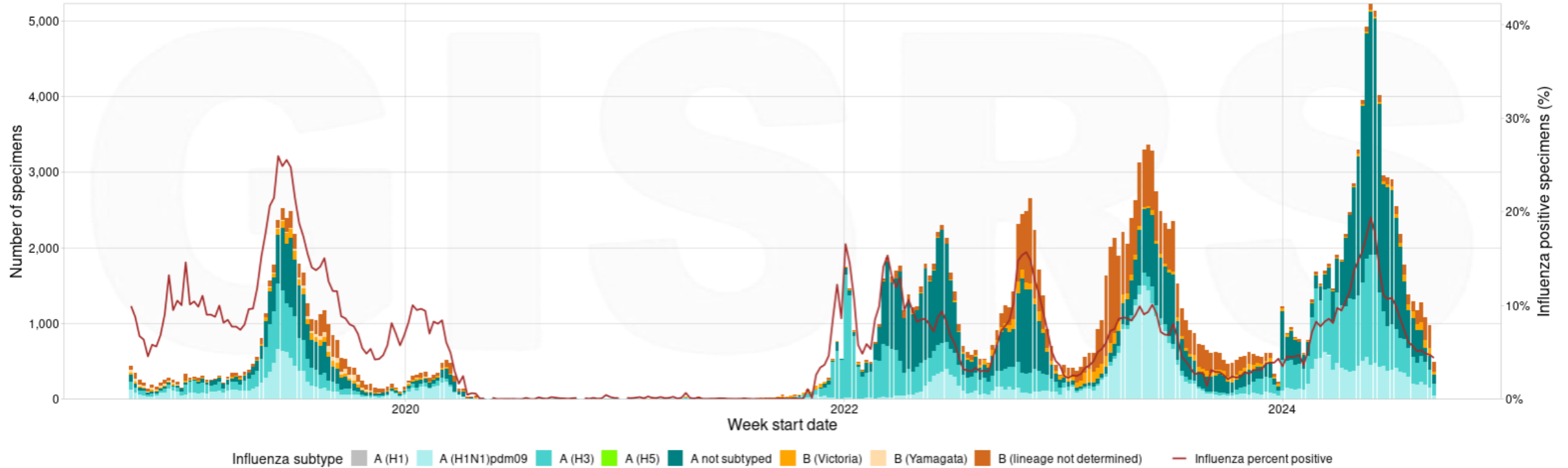




# WHO Global Influenza Surveillance and Response System (GISRS)

## Southern hemisphere, 2018-24

Virus detections by subtype reported to FluNet, 26 September 2018 to 09 September 2024



<https://apps.who.int/flumart/Default?ReportNo=5&Hemisphere=Southern>



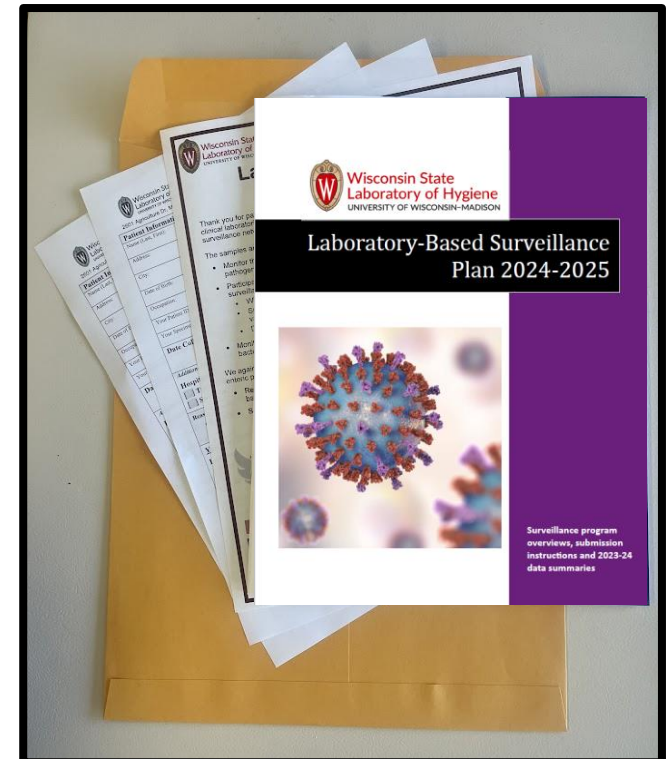
# Wisconsin Respiratory Surveillance Plan 2024-2025





# Welcome to the 2024-25 Respiratory Season!

- WSLH mails out a Surveillance packet to all clinical labs in WI performing testing
  - Updated “Laboratory-Based Surveillance plan” booklet
  - Customized surveillance requisition forms
  - Introductory letter
- Email [wcln@slh.wisc.edu](mailto:wcln@slh.wisc.edu) for more information!





# Respiratory Surveillance in Wisconsin

- Overall picture: A unified approach to respiratory surveillance
  - Plans are outlined in the “Laboratory-Based Surveillance Plan 2024-25” booklet
  - .PDF version available online at: [www.slh.wisc.edu/wcln-surveillance/](http://www.slh.wisc.edu/wcln-surveillance/)

## Two Branches of Surveillance:

- Reporting of clinical testing data
- Submission of surveillance specimens

### Updates for the 2024-25 Season

Table 1. Updates to Data and Specimen Submission Requests for the 2024-25 Season		
Pathogen	Surveillance Type	What is Requested
<b>Updated Requests</b>		
<i>Clostridioides difficile</i>	Data	Number tested and number positive (pg 4)
<i>Legionella species</i>	Specimens— Respiratory Pathogens	<ul style="list-style-type: none"> <li>Sputum or BAL from Urine Antigen positive patients (NOT URINE)</li> <li>Isolates (pg 12)</li> </ul>
<i>Cronobacter spp.</i>	Specimens - Invasive Pathogens	Isolates from infants <12mo (pg 22)
<i>Enterovirus</i>	Specimens - Invasive Pathogens	All enterovirus positive CSF specimens (pg 22)
<i>Streptococcus pneumoniae</i>	Specimens- Invasive Pathogens	Change in isolate submission requirements and testing. (pg 21)
<i>Blastomyces</i>	Specimens- Invasive Pathogens	Species Identification. (pg 22)
<b>No Longer Requested</b>		
<i>Aeromonas species</i>	Specimens - Enteric Pathogens	Isolates or stools
<i>Plesiomonas shigelloides</i>	Specimens - Enteric Pathogens	Isolates or stools



# Reporting of Clinical Testing Data

- Report data **weekly all year!**
  - All Clinical labs
  - Report # tested and # positive for **PCR/molecular and/or rapid antigen testing** performed **on site**
  - Complete list of pathogens found in the Laboratory-based surveillance plan 2024-25

Table 2. Laboratory Testing Data Requests		
Antigen Detection		
Influenza A/B	SARS-CoV-2	RSV
Rotavirus	Rapid Strep (Group A <i>Streptococcus</i> )	
Respiratory Pathogens - PCR/Molecular Detection		
Influenza A/B	SARS-CoV-2	RSV
Seasonal Coronaviruses	Human Metapneumovirus	Human Parainfluenza virus
Rhinovirus/Enterovirus	Adenovirus	<i>B. pertussis</i> and <i>parapertussis</i>
Group A <i>Streptococcus</i>		




# Reporting of Clinical Testing Data

- Step-by-Step instructions can be found in the Laboratory Surveillance Report 2024-25
  - Go to the WSLH website: <http://www.slh.wisc.edu/wcln-surveillance/surveillance/>
  - Click on “Click here to report Wisconsin Test Data” in the center of the page.



- Institution ID for reporting testing data can be found on your customized requisition form
- Contact [WCLN@slh.wisc.edu](mailto:WCLN@slh.wisc.edu) with questions



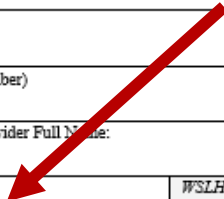
**Wisconsin State  
Laboratory of Hygiene**  
UNIVERSITY OF WISCONSIN-MADISON

2801 Agriculture Dr, Madison, WI 53718

**CDD Customer Service**  
Phone: 800-862-1013  
Kits and Supplies: 800-862-1088  
**Purple Mountain Solutions (Courier):**  
Phone: 800-990-9888

**REGIONAL RESPIRATORY  
SURVEILLANCE**  
Requisition Form rev.6/2023

Patient Information		Submitter Information	
Name (Last, First):		(Your Institution's Agency Number If Known)	
Address:		(Your Institution's Name)	
City:	State:	Zip:	(Your Institution's Address)
Date of Birth:	Gender:	M	F
Occupation:		(Telephone Number)	
Your Patient ID Number (optional):		Health Care Provider Full Name:	
Your Specimen ID Number (optional):		Institution ID:	<i>WSLH Use Only</i> Study: VI Reg SURV

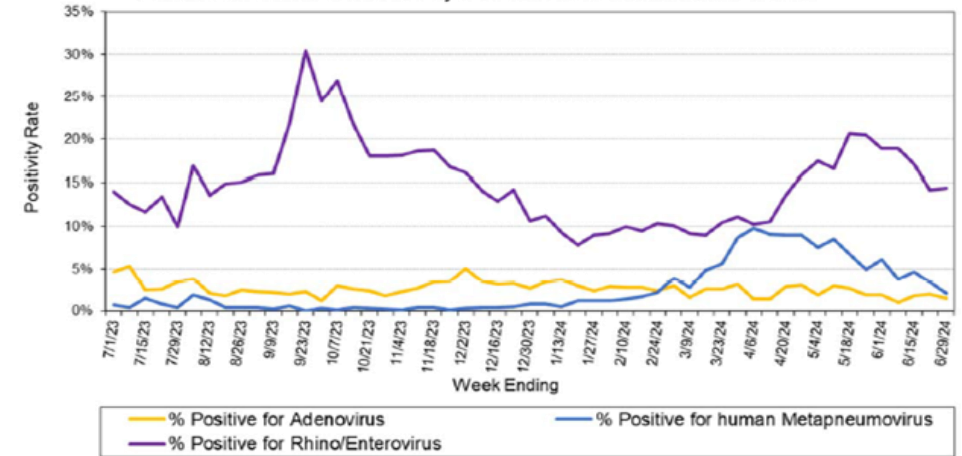




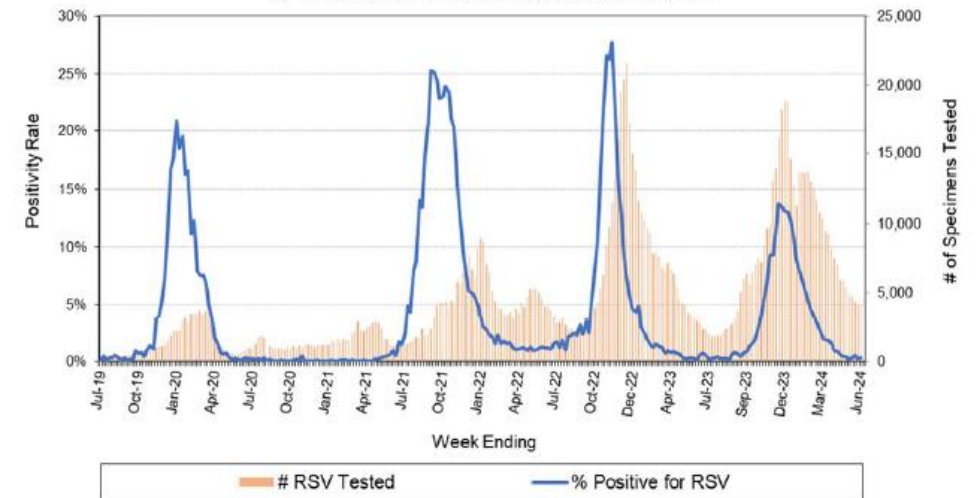
# Why Submit Data?

- Testing data reporting helps track positivity rates of pathogens in WI!
  - Provide situational awareness
    - What is circulating
    - When season begins, peaks and ends
    - Identify outbreaks
  - Determine geographic spread
  - Observe season-to-season trends
- Participate in national surveillance programs

Positivity Rate of **Adenovirus, hMPV and Rhino/Enterovirus** by PCR at Wisconsin Laboratories




Positivity Rate and Number of Specimens Tested for **RSV** by PCR at Wisconsin Laboratories from 2019-24



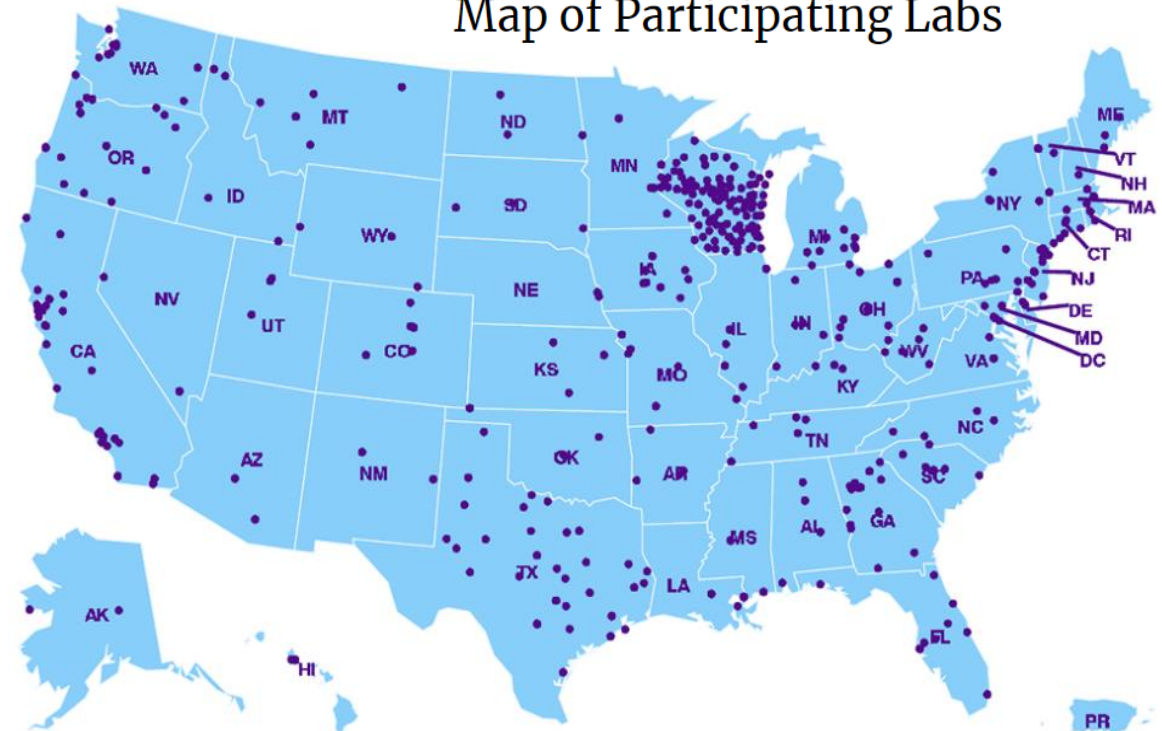


# National Surveillance Programs

- The National Respiratory and Enteric Virus Surveillance System (NREVSS, CDC)
- COVID Data Tracker (CDC)
-  (CDC)

## The National Respiratory and Enteric Virus Surveillance System (NREVSS)

Map of Participating Labs





# Wisconsin Surveillance Data Distribution

- WSLH Bi-weekly Laboratory Surveillance Report
  - Subscribe at: [wcln@slh.wisc.edu](mailto:wcln@slh.wisc.edu)
- Wisconsin - DHS
  - Respiratory Surveillance Report:  
<https://www.dhs.wisconsin.gov/disease/respiratory.htm>
  - Respiratory Illness Dashboard:  
<https://www.dhs.wisconsin.gov/disease/laboratory-based-data.htm>



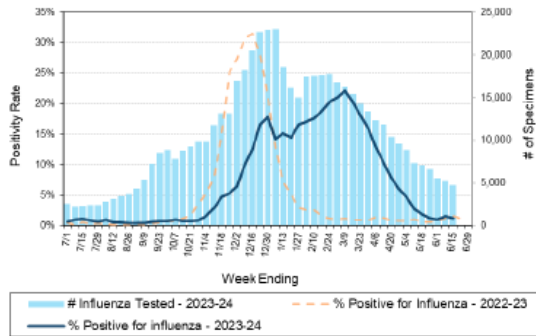
# Laboratory Surveillance Report

\*\* For a selection of pathogens, participating Wisconsin clinical laboratories voluntarily report to WSLH on a weekly basis the total number of tests performed, and the number of those tests with positive results.

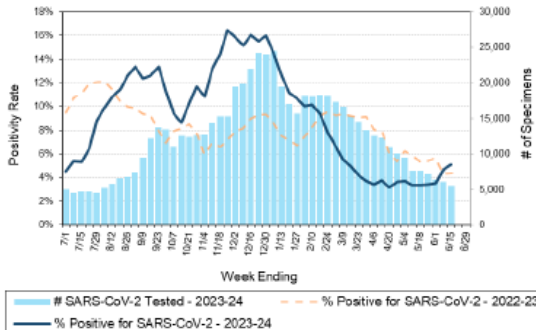
## To enhance surveillance activities, and monitor for avian influenza, each week please send:

- PCR/Molecular Testing sites:
  - ◊ All influenza positive specimens
  - ◊ Especially, Influenza A specimens:
    - That fail to subtype (Ct <35)
    - With swine, bovine or avian exposure
    - With international travel history
- All Testing Sites:
  - ◊ Up to 5 SARS-CoV-2 positive specimens

Number Tested and Positivity Rate for Influenza by PCR at Wisconsin Laboratories



Number Tested and Positivity Rate for SARS-CoV-2 by PCR at Wisconsin Laboratories



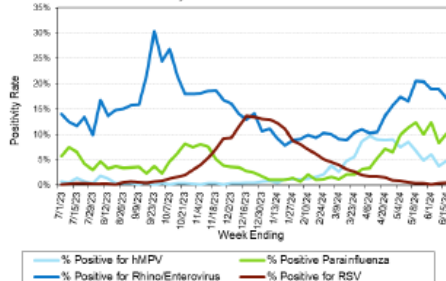
## Respiratory Snapshot:

- Influenza activity is low in Wisconsin (1.2%) and nationally (1.4%).
  - Influenza A is the dominant strain circulating (78.1%)
- Rhino/Enterovirus (17.2%) and parainfluenza virus (10.1%) activities are high in Wisconsin.
- Bordetella pertussis activity is increasing (2.2%)

## Enteric Snapshot:

- Norovirus activity is decreasing (9.1%) in Wisconsin.
- Other:
  - Group A Streptococcus activity in Wisconsin is decreasing (22.9%).

Positivity Rate of hMPV, Parainfluenza, Rhino/Enterovirus and RSV by PCR at Wisconsin Laboratories



Next Page

# Laboratory Surveillance Report

## Enteric Pathogens

Week Ending 6/15/24

	# Tested	% Positive
Norovirus***	504	9.1%
Campylobacter	588	2.7%
Rotavirus	490	2.2%
Adenovirus 40/41	444	1.6%
STEC	588	1.4%
Sapovirus	444	1.1%
Giardia	529	1.1%
Yersinia enterocolitica	533	0.9%
Salmonella	588	0.7%
Astrovirus	444	0.7%
Cyclospora	458	0.7%
Shigella/EIEC	549	0.5%
Plesiomonas shigelloides	477	0.4%
Aeromonas	39	0.0%
E. coli O157	172	0.0%
Vibrio	519	0.0%
Cryptosporidium	529	0.0%
Entamoeba histolytica	515	0.0%

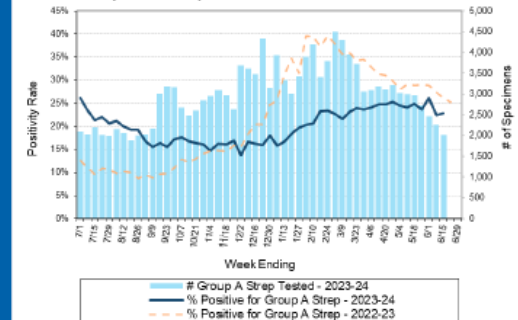
\*\*\*BioMerieux has announced an increased risk of false positive norovirus results with the BioFire FilmArray GI panel, which may increase the statewide norovirus percent positivity \*\*\*

## Respiratory Pathogens

Week Ending 6/15/24

	# Tested	% Positive
Rhinovirus/Enterovirus	1264	17.2%
Parainfluenza	1055	10.1%
SARS-CoV-2	5482	5.1%
Human metapneumovirus	1087	4.8%
Bordetella pertussis	786	2.2%
Adenovirus	1075	1.8%
Influenza	4696	1.2%
Seasonal coronaviruses	979	1.0%
RSV	4221	0.5%

Number Tested and Positivity Rate for Group A Streptococcus by PCR at Wisconsin Laboratories



## Additional Information

- Additional information on respiratory pathogens can be found on the DHS website: <https://www.dhs.wisconsin.gov/disease/respiratory.htm>
- The WSLH SARS-CoV-2 genomic dashboard is available here: <https://dataportal.slh.wisc.edu/sc2/dashboard>
- The influenza, RSV and respiratory virus activity graphs can be viewed here: <http://www.slh.wisc.edu/wcln-surveillance/surveillance/virology-surveillance/>
- The bacterial, viral and parasitic activity graphs can be viewed here: <http://www.slh.wisc.edu/wcln-surveillance/surveillance/gastropathogen-surveillance/>

To subscribe to this report, email [WCLN@slh.wisc.edu](mailto:WCLN@slh.wisc.edu)





# Wisconsin Surveillance Data Distribution

- Bi-weekly Laboratory Surveillance Report
  - Subscribe at: [wcln@slh.wisc.edu](mailto:wcln@slh.wisc.edu)
- Wisconsin - DHS
  - Respiratory Virus Surveillance Report: <https://www.dhs.wisconsin.gov/disease/respiratory.htm>
  - Respiratory Illness Dashboard: <https://www.dhs.wisconsin.gov/disease/laboratory-based-data.htm>

**RESPIRATORY VIRUS SURVEILLANCE REPORT**  
Week 21, Ending May 28, 2023

Wisconsin Department of Health Services | Division of Public Health  
Bureau of Communicable Diseases | Communicable Diseases Epidemiology Section  
[www.dhs.wisconsin.gov/dph/bcd.htm](https://www.dhs.wisconsin.gov/dph/bcd.htm) | [dhsdphbcd@dhs.wi.gov](mailto:dhsdphbcd@dhs.wi.gov)

P-02346

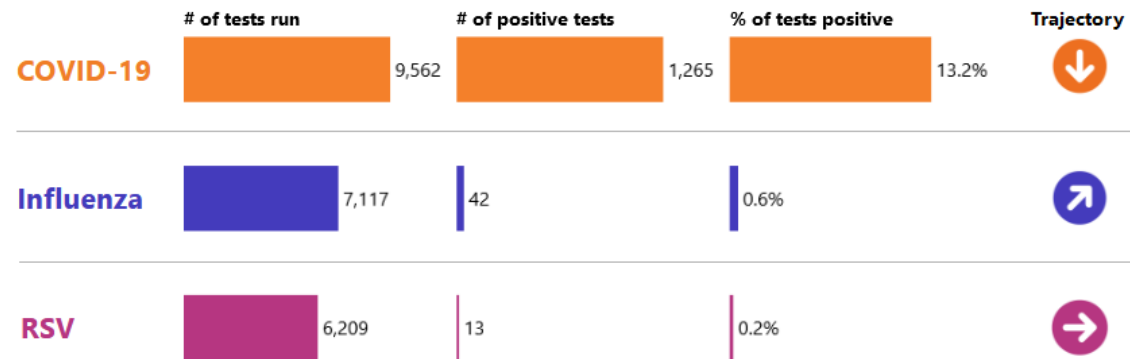


# DHS Respiratory Illness Dashboard

Laboratory-based data for COVID-19, influenza, RSV, and other viruses

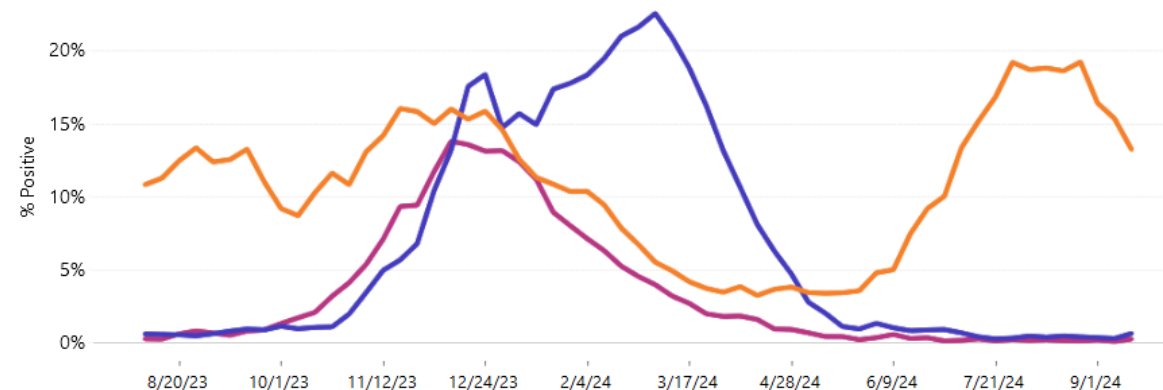
Testing details and trajectory of positive results for COVID-19, influenza, and RSV

Week of: September 15, 2024 - September 21, 2024

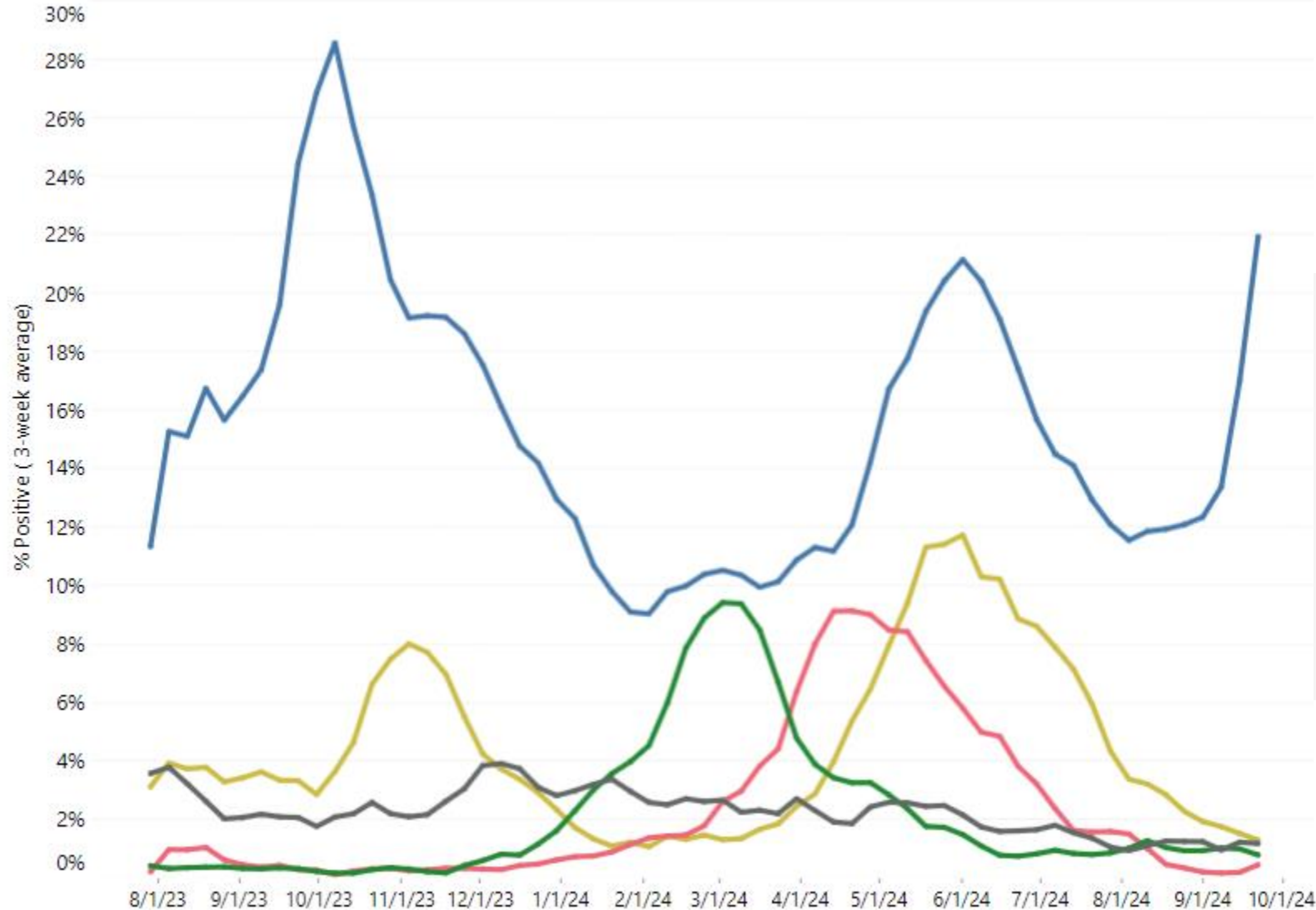


Percent (%) of reported test results positive for COVID-19, influenza, and RSV by week

Data are interactive. **Hover over lines** to see more information.



# DHS Respiratory Illness Dashboard



**Explore data using interactive options**

Use the check boxes to view data for any of the following viruses

- Adenovirus
- Coronavirus (seasonal)
- COVID-19
- HMPV
- Influenza
- Parainfluenza
- Rhinovirus/Enterovirus
- RSV



# Respiratory Surveillance in Wisconsin

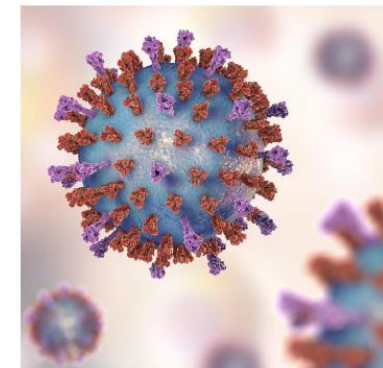
- Overall picture: A unified approach to respiratory surveillance
  - Plans are outlined in the “Laboratory-Based Surveillance Plan 2024-25” booklet
  - .PDF version available online at:  
[www.slh.wisc.edu/wcln-surveillance/](http://www.slh.wisc.edu/wcln-surveillance/)

## Two Branches of Surveillance:

- Reporting of clinical testing data
- Submission of surveillance specimens



Laboratory-Based Surveillance  
Plan 2024-2025



Surveillance program  
overviews, submission  
instructions and 2023-24  
data summaries





**Table 3: Respiratory Specimen Submission Requests**

Pathogen Specific Respiratory Surveillance		
Influenza Surveillance		
Submitter Testing Method:	Season	
	Off Season (June-October)	Influenza Season (Winter/Spring*)
PCR/Molecular	<u>ALL</u> influenza positives	One influenza-related hospitalization per week AND Unsubtypable influenza A positives (Ct < 35) AND Influenza A positive specimens with: <ul style="list-style-type: none"> <li>• International travel history</li> <li>• Bovine, swine or avian exposure</li> </ul>
Antigen	<u>ALL</u> influenza positives	Influenza A positive specimens with: <ul style="list-style-type: none"> <li>• International travel history</li> <li>• Bovine, swine or avian exposure</li> </ul>
SARS-CoV-2 Surveillance		
PCR/Molecular OR Antigen	Five positive SARS-CoV-2 samples per week for genomic surveillance	
Legionella Surveillance		
Culture, PCR OR Urine Antigen	<b>Specimens from all <i>Legionella</i> positive patients:</b> <ul style="list-style-type: none"> <li>• Sputum or BAL from Urine Antigen positive patients (NOT URINE)</li> <li>• Isolates</li> </ul>	
Site Specific Respiratory Surveillance		
University Health	The first 3 respiratory specimens per week from symptomatic patients (regardless of initial test results, all year round)	
Sentinel Surveillance	The first 3 respiratory specimens per week from symptomatic patients (regardless of initial test results, all year round)	



# Respiratory Surveillance Network

## 1. Pathogen Specific Programs:

- Influenza\*
- SARS-CoV-2\*

\*Includes all PCR/Molecular and/or Antigen Testing laboratories

- Enterovirus positive CSF specimens

## 2. Site-Specific Programs:

- Enrolled Sentinel Surveillance Sites
- University Health Clinics





# Influenza Surveillance: Specimen Requests

- Influenza positive specimens by an **Antigen Testing** method

Submit **ALL** out of season influenza positive specimens to WSLH



- During Flu season, please submit influenza A positive specimens with:

CATTLE/BOVINE  
CONTACT



SWINE/PIG  
CONTACT



AVIAN/POULTRY  
CONTACT



INTERNATIONAL  
TRAVEL

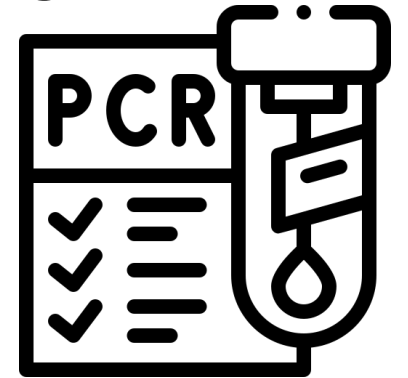




# Influenza Surveillance: Specimen Requests

- Influenza positive specimens by a **PCR/Molecular** testing method

Submit **ALL** out of season influenza positive specimens to WSLH



- During Flu season, please submit:
  - ONE influenza-related hospitalization per week**
  - Also:**

CATTLE/BOVINE  
CONTACT



SWINE/PIG  
CONTACT



AVIAN/POULTRY  
CONTACT



INTERNATIONAL  
TRAVEL



INFLUENZA A  
UNSUBTYPABLE (Ct < 35)





# What Does WSLH Do with Influenza Positive Specimens?

1. Perform Influenza SARS-CoV-2 Multiplex PCR
  - Monitor for performance issues with commercial tests
2. Perform influenza A Subtyping and B Lineage with CDC primer sets
  - **Monitor for the emergence of avian and novel influenza in humans**
3. Submit specimens to the “National Influenza Reference Center” pipeline
  - WSLH performs virus isolation and whole genome sequencing
  - CDC performs influenza virus characterization



# National Influenza Surveillance

- Early season positives are critical:
  - Inform vaccine strain selection
  - Provide samples to make candidate vaccine viruses



Please send **ALL** off season influenza positive specimens to WSLH

The WHO recommends that **trivalent** vaccines for use in the 2024-2025 northern hemisphere influenza season contain the following:

#### **Egg-based vaccines**

- an A/Victoria/4897/2022 (H1N1)pdm09-like virus;
- an A/Thailand/8/2022 (H3N2)-like virus; and
- a B/Austria/1359417/2021 (B/Victoria lineage)-like virus.

#### **Cell culture- or recombinant-based vaccines**

- an A/Wisconsin/67/2022 (H1N1)pdm09-like virus;
- an A/Massachusetts/18/2022 (H3N2)-like virus; and
- a B/Austria/1359417/2021 (B/Victoria lineage)-like virus.



# SARS-CoV-2 Surveillance: Specimen Requests

- SARS-CoV-2 positive specimens by an **Antigen or PCR/Molecular Testing** methods

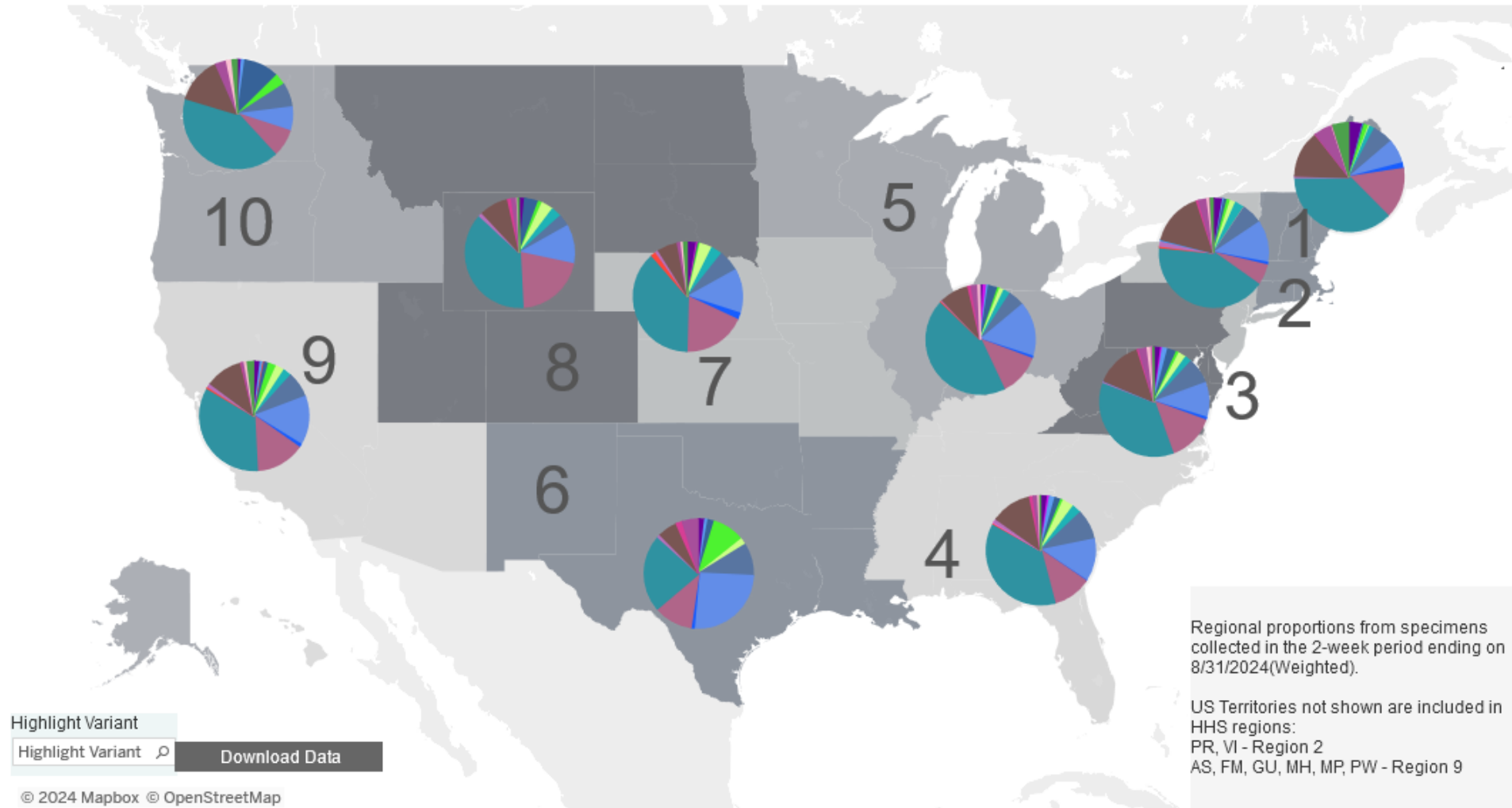
Submit up to 5 SARS-CoV-2 positive specimens per week  
to WSLH





# Monitoring of SARS-CoV-2 Variants

Weighted Estimates for 8/18/2024 – 8/31/2024 by HHS Region







# Enterovirus Surveillance: Specimen Requests

- Enterovirus-positive CSF specimens detected with an Enterovirus-specific molecular method.
- New request this year!

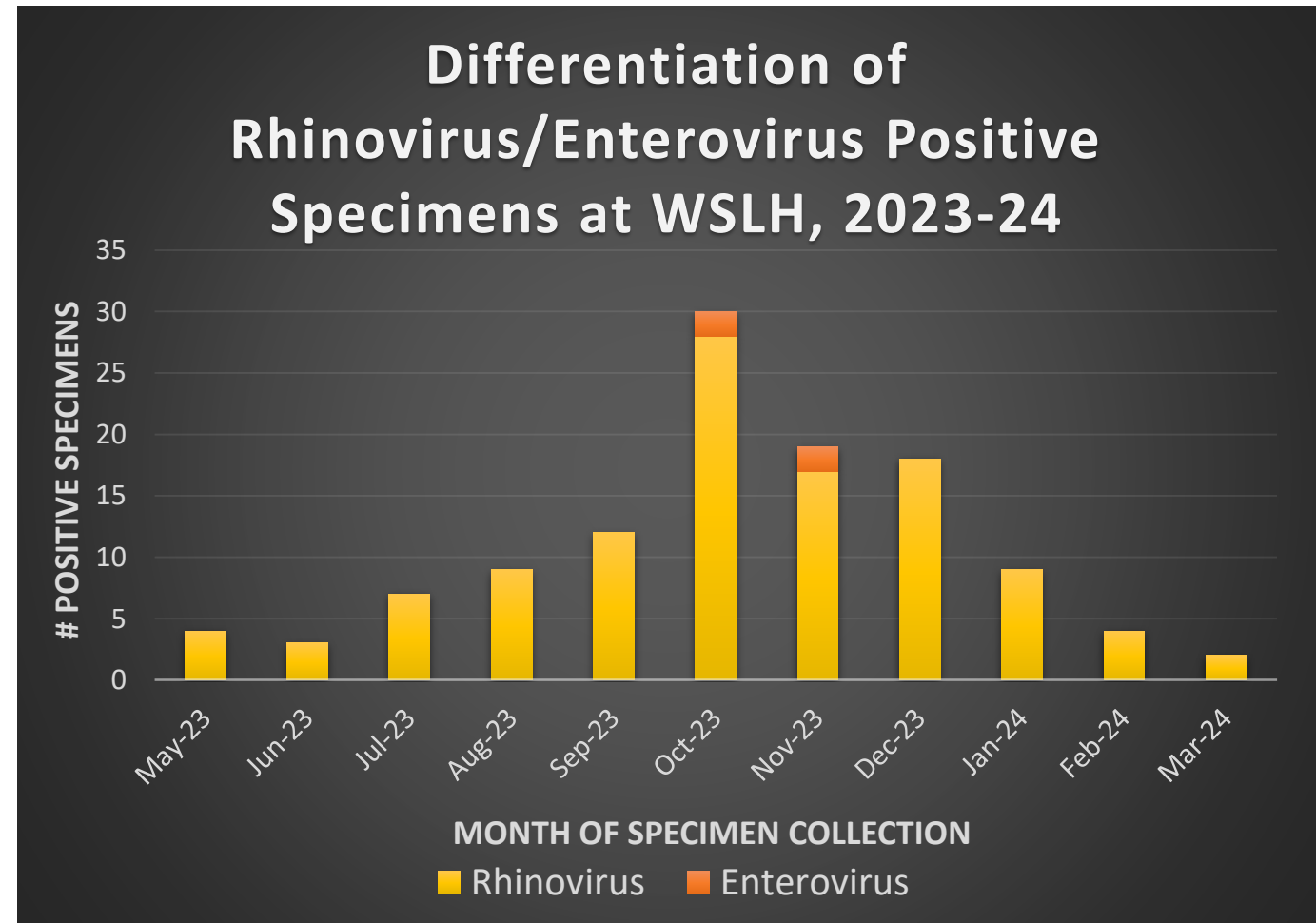
**Submit ALL Enterovirus positive CSF specimens to WSLH**

Table 7. Invasive Pathogen Specimen Submission Requests		
Pathogen	Specimen Type	Testing Performed at WSLH
<i>Haemophilus influenzae</i>	Isolates or CSF	Identification and serotyping
<i>Listeria monocytogenes</i>	Isolates	Identification and molecular subtyping (WGS)
<i>Neisseria meningitidis</i>	Isolates or CSF	Identification, antimicrobial susceptibility testing and serogrouping
<i>Streptococcus pneumoniae</i>	Isolates or CSF	Identification, antimicrobial susceptibility testing and serotyping performed on: <ul style="list-style-type: none"><li>• CSF (Identification PCR only)</li><li>• CSF isolates</li><li>• Non-CSF isolates that are:<ul style="list-style-type: none"><li>• Non-susceptible to clinically relevant antibiotics</li><li>• Suspected vaccine failure</li><li>• Suspected treatment failure</li><li>• Outbreak related isolates</li></ul></li></ul>
<i>Cronobacter</i> spp.	Isolates from infants	Identification and molecular subtyping (WGS)
<i>Enterovirus</i>	CSF	Molecular typing (NGS)
<i>Blastomyces</i>	Isolates	Species identification
Other organisms suspected of being part of a cluster or outbreak of public health significance	Isolates or specimens	Consult with Wisconsin Division of Public Health Epidemiologists to inquire about testing
Gram negative isolates from sterile body sites that are unidentifiable using commercial systems	Isolates	Phenotypic and sequenced based identification will be performed

# What Does WSLH with Enterovirus Positive Specimens?



- Perform Rhinovirus/Enterovirus differentiation PCR
- Perform Enterovirus Typing on confirmed enterovirus positive specimens
- Data and specimens are submitted to CDC to increase National Enterovirus surveillance





# Respiratory Surveillance Network

## 1. Pathogen Specific Programs:

- Influenza\*
- SARS-CoV-2\*

\*Includes all PCR/Molecular and/or Antigen Testing laboratories

- Enterovirus positive CSF specimens

## 2. Site-Specific Programs:

- Enrolled Sentinel Surveillance Sites
- University Health Clinics

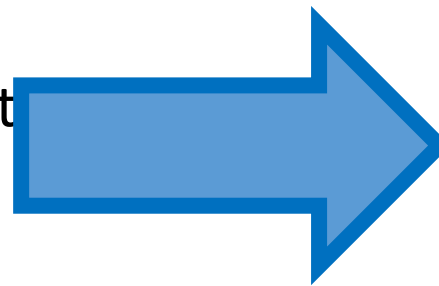


# Respiratory Surveillance: Specimen Requests

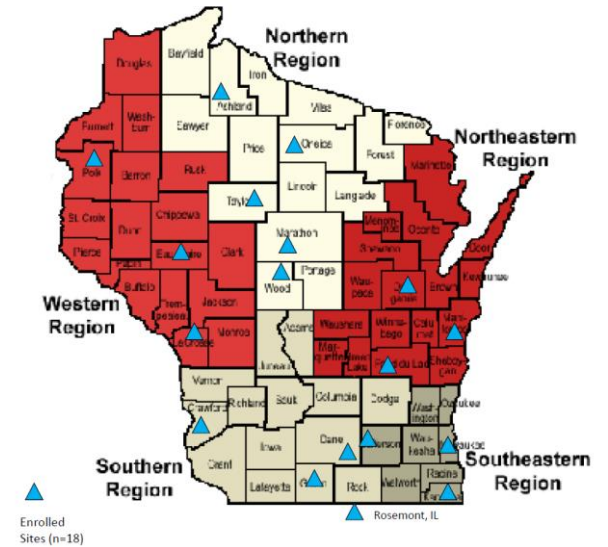
- Enrolled Sentinel Surveillance Sites
  - 17 labs in 5 public health regions
  - Provide randomized respiratory specimens weekly, all year

Submit the up to 3 specimens per week from patients presenting with respiratory symptoms to WSLH.

- Tested with influenza and SARS-CoV-2 multiplex PCR
- Subset also tested with a 20-target respiratory pathogen panel for **surveillance only**



Enterovirus  
RSV  
Adenovirus





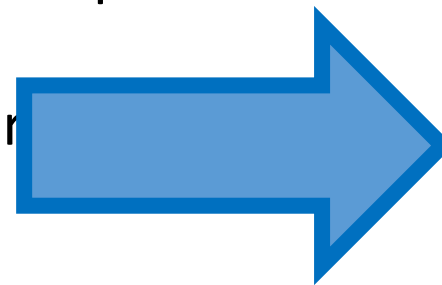
# Respiratory Surveillance: Specimen Requests

- University Health Clinics
  - Monitor influenza, SARS-CoV-2 and other respiratory pathogens impacting student health.
  - Monitor for severe adenovirus infections.



Submit the up to 3 specimens per week from patients presenting with respiratory symptoms to WSLH.

- Tested with influenza and SARS-CoV-2 multiplex PCR.
- Subset also tested with a 20-target respiratory pathogen panel



Enterovirus  
RSV  
Adenovirus



# WSLH Provides Respiratory Surveillance Supplies!!

- Order **FREE** Supplies

- Specimen collection kits
- Insulated shippers and cold packs
- Customized requisition forms



- Contact our Clinical Orders Department at: **800-862-1088**

- Transport of surveillance specimens is available at **NO COST** when you send specimens using Purple Mountain Solutions

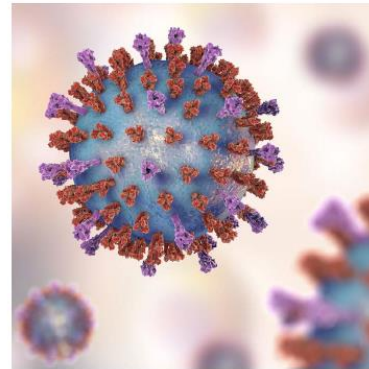
- <https://purplemountainsolutions.com/>







## Laboratory-Based Surveillance Plan 2024-2025



Surveillance program  
overviews, submission  
instructions and 2023-24  
data summaries

Your participation in the Wisconsin surveillance system is **vital** to monitor for emerging novel pathogens with pandemic potential and other pathogens that impact community health.



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