



Surveillance Droids: What News from the Galaxy



Allen Bateman, PhD, MPH, D(ABMM)

Director, Communicable Disease Division

Wisconsin State Laboratory of Hygiene

September 2024



Key take-home points

1. Clinical laboratory participation in surveillance, through sharing data and specimens with the WSLH, is the bedrock of critical statewide surveillance activities.



Your participation in the Wisconsin surveillance system is vital to monitor infectious diseases of public health importance!

2. Surveillance data and specimens are used for many important things, including situational awareness of transmission levels of various pathogens, identifying issues with commercially-available tests, and allowing WSLH to perform enhanced characterization of pathogens to identify outbreaks.
3. The 2024-2025 Laboratory-Based Surveillance Plan has been published. Most requests are similar from past years, but there have been some changes, which are listed in an “Updates for the 2024-25 Season” section.



Outline

- WSLH Laboratory-based Surveillance Plan
- For each surveillance section:
 - Why we conduct the surveillance
 - Statewide/national surveillance programs
 - Requests (data and/or specimens) of clinical labs
 - Data – how it is used
- Surveillance sections
 - Respiratory pathogens
 - Vectorborne pathogens
 - Enteric pathogens
 - Antibiotic resistant pathogens
 - Invasive pathogens





Outline

- **WSLH Laboratory-based Surveillance Plan**
- For each surveillance section:
 - Why we conduct the surveillance
 - Statewide/national surveillance programs
 - Requests (data and/or specimens) of clinical labs
 - Data – how it is used
- **Surveillance sections**
 - Respiratory pathogens
 - Vectorborne pathogens
 - Enteric pathogens
 - Antibiotic resistant pathogens
 - Invasive pathogens



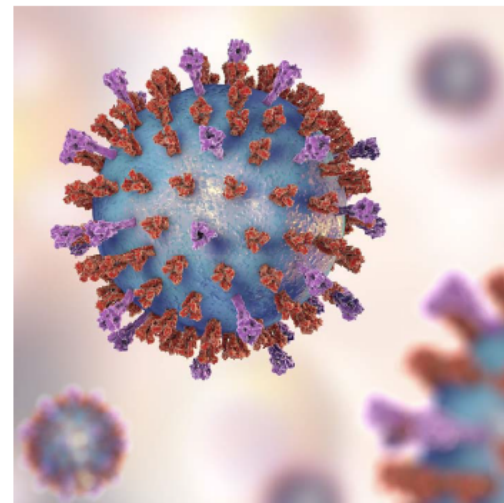
Laboratory-based Surveillance Plan



- Detailed instructions
 - Description of surveillance requests
 - Web-based reporting instructions
 - Data summaries
-
- Mailed out 2 weeks ago
 - Available on website
-
- Reviewed and updated annually – try to keep it as streamlined as possible!



Laboratory-Based Surveillance Plan 2024-2025



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



Wisconsin State Laboratory of Hygiene
UNIVERSITY OF WISCONSIN-MADISON

Search For: Search

ABOUT WSLH WSLH SERVICES **LAB NETWORKS & SURVEILLANCE** RESEARCH SUPPORT CENTER NEWS & PUBLICATIONS PAY YOUR BILL

Wisconsin's Public, Environmental and Occupational Health Laboratory Since 1903

PFAS Compliance Testing

COVID-19
Information about Wastewater Surveillance

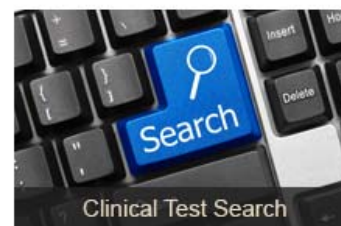
Mpox

WSLH News

August 14, 2024

Labor Day 2024 Holiday Hours

Please note the following changes to the Wisconsin State Laboratory of Hygiene's operations for the Labor Day holiday. As always, if you have an off-hours emergency, please call the WSLH [...]



SECURE ONLINE PAYMENT

Easily pay your WSLH Invoice with a credit card online!

Pay Now

<http://www.slh.wisc.edu/>

- 4 Lab Networks & Surveillance
 - Wisconsin Clinical Laboratory Network
 - Training Events
 - 4 Surveillance
 - Bacteriology Surveillance
 - Mycobacteriology Surveillance
 - Virology Surveillance
 - Gastropathogen Surveillance
 - Wisconsin Mycobacteriology Laboratory Network
 - Communicable Diseases
 - Emergency Response

Clinical Testing Data Surveillance

In collaboration with other public health partners, the WSLH has developed data-driven statewide respiratory and gastrointestinal pathogen surveillance programs in Wisconsin. Weekly reporting of diagnostic testing data to WSLH is important so that public health partners know what communicable diseases are impacting community health in Wisconsin. The complete Laboratory-based surveillance plan for the 2023-24 season is available at the bottom of this page.

Wisconsin Respiratory Surveillance Program:

The aim of this program is to gain situational awareness of the respiratory pathogens circulating in Wisconsin, including geographic spread and positivity rates. **All Sites** in Wisconsin performing PCR/molecular and/or rapid antigen testing for respiratory pathogens are asked to submit their testing data on a **weekly basis** (number tested, number positive) **all year round**.

Wisconsin Acute Diarrheal Illness Surveillance Program:


The aim of this program is to gain awareness of the gastrointestinal pathogens effecting community health in Wisconsin. The WSLH requests that clinical labs submit gastropathogen PCR testing data for bacterial, parasitic and viral pathogens on a **weekly basis** (number tested, number positive), **all year round**.

Testing Data Submission Instructions

[Click Here to Report Wisconsin Test Data](#)

Surveillance Reports

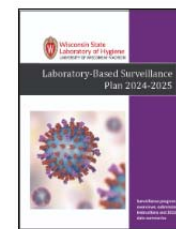
Wisconsin Laboratory Surveillance Report (WSLH)

- o Current 
- o Archive
- o Sign-up for the Wisconsin Laboratory Surveillance Report



Wisconsin Division of Public Health Weekly ILI Report (WDPH)

[2024-2025 Laboratory-Based Surveillance Plan](#)



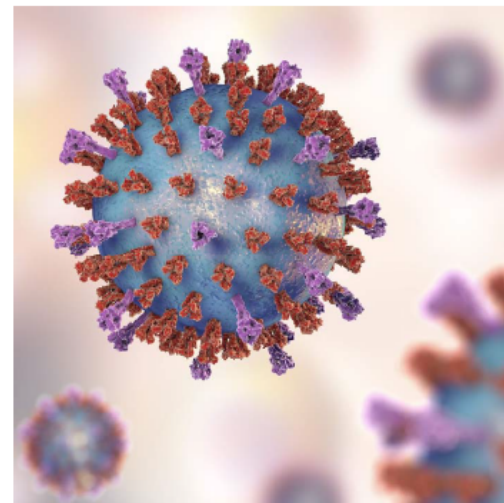
Laboratory-based Surveillance Plan



- Detailed instructions
 - Description of surveillance requests
 - Web-based reporting instructions
 - Data summaries
-
- Mailed out 2 weeks ago
 - Available on website
-
- Reviewed and updated annually – try to keep it as streamlined as possible!




Laboratory-Based Surveillance Plan 2024-2025



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

Home | UWSMPH | UW-Madison | Directory | Contact | Careers Search For:



Wisconsin State Laboratory of Hygiene
UNIVERSITY OF WISCONSIN-MADISON

ABOUT WSLH | WSLH SERVICES | **LAB NETWORKS & SURVEILLANCE** | RESEARCH SUPPORT CENTER | NEWS & PUBLICATIONS | PAY YOUR BILL

- 4 Lab Networks & Surveillance
 - Wisconsin Clinical Laboratory Network
 - Training Events
 - 4 Surveillance
 - Bacteriology Surveillance
 - Mycobacteriology Surveillance
 - Virology Surveillance
 - Gastropathogen Surveillance
 - Wisconsin Mycobacteriology Laboratory Network
 - Communicable Diseases
 - Emergency Response

Clinical Testing Data Surveillance

In collaboration with other public health partners, the WSLH has developed data-driven statewide respiratory and gastrointestinal pathogen surveillance programs in Wisconsin. Weekly reporting of diagnostic testing data to WSLH is important so that public health partners know what communicable diseases are impacting community health in Wisconsin. The complete Laboratory-based surveillance plan for the 2023-24 season is available at the bottom of this page.

Wisconsin Respiratory Surveillance Program:

The aim of this program is to gain situational awareness of the respiratory pathogens circulating in Wisconsin, including geographic spread and positivity rates. **All Sites** in Wisconsin performing PCR/molecular and/or rapid antigen testing for respiratory pathogens are asked to submit their testing data on a **weekly basis** (number tested, number positive) **all year round**.


Wisconsin Acute Diarrheal Illness Surveillance Program:


The aim of this program is to gain awareness of the gastrointestinal pathogens effecting community health in Wisconsin. The WSLH requests that clinical labs submit gastropathogen PCR testing data for bacterial, parasitic and viral pathogens on a **weekly basis** (number tested, number positive), **all year round**.

[Click Here to Report Wisconsin Test Data](#)

Surveillance Reports

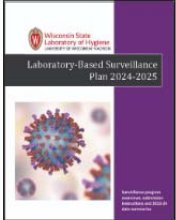
Wisconsin Laboratory Surveillance Report (WSLH)

- o Current 
- o Archive
- o Sign-up for the Wisconsin Laboratory Surveillance Report



Wisconsin Division of Public Health Weekly ILI Report (WDPH)

2024-2025 Laboratory-Based Surveillance Plan






Web-based data reporting

Wisconsin Laboratory Surveillance Reporting

Institution ID

Please enter your institution's ID to access the report form. Please email 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

0%

Surveillance data requests



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>		
Gastrointestinal Pathogens - PCR/Molecular Detection		
<i>Aeromonas</i>	<i>Campylobacter</i>	<i>Clostridioides difficile</i>
<i>E. coli</i> O157	<i>Plesiomonas shigelloides</i>	<i>Salmonella</i>
<i>Shigella</i> / Enteroinvasive <i>E.coli</i> (EIEC)	Shiga-like toxin-producing <i>E. coli</i> (STEC)	<i>Vibrio</i>
<i>Yersinia enterocolitica</i>	Adenovirus 40/41	Astrovirus
Norovirus	Rotavirus	Sapovirus
<i>Cryptosporidium</i>	<i>Cyclospora cayetanensis</i>	<i>Entamoeba histolytica</i>
<i>Giardia lamblia</i>		

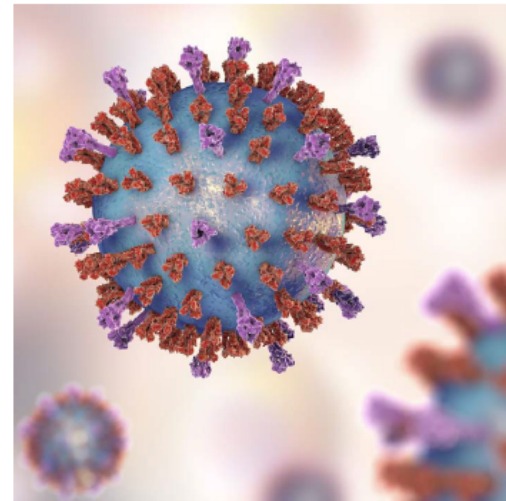


Laboratory-based Surveillance Plan

- Detailed instructions
 - Description of surveillance requests
 - Web-based reporting instructions
 - Data summaries
-
- Mailed out 2 weeks ago
 - Available on website
-
- Reviewed and updated annually – try to keep it as streamlined as possible!




Laboratory-Based Surveillance Plan 2024-2025



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

Home | UWSMPH | UW-Madison | Directory | Contact | Careers Search For:



Wisconsin State Laboratory of Hygiene
UNIVERSITY OF WISCONSIN-MADISON

ABOUT WSLH | WSLH SERVICES | **LAB NETWORKS & SURVEILLANCE** | RESEARCH SUPPORT CENTER | NEWS & PUBLICATIONS | PAY YOUR BILL

- 4 Lab Networks & Surveillance
 - Wisconsin Clinical Laboratory Network
 - Training Events
 - 4 Surveillance
 - Bacteriology Surveillance
 - Mycobacteriology Surveillance
 - Virology Surveillance
 - Gastropathogen Surveillance
 - Wisconsin Mycobacteriology Laboratory Network
 - Communicable Diseases
 - Emergency Response

Clinical Testing Data Surveillance

In collaboration with other public health partners, the WSLH has developed data-driven statewide respiratory and gastrointestinal pathogen surveillance programs in Wisconsin. Weekly reporting of diagnostic testing data to WSLH is important so that public health partners know what communicable diseases are impacting community health in Wisconsin. The complete Laboratory-based surveillance plan for the 2023-24 season is available at the bottom of this page.

Wisconsin Respiratory Surveillance Program:
The aim of this program is to gain situational awareness of the respiratory pathogens circulating in Wisconsin, including geographic spread and positivity rates. **All Sites** in Wisconsin performing PCR/molecular and/or rapid antigen testing for respiratory pathogens are asked to submit their testing data on a **weekly basis** (number tested, number positive) **all year round**.


Wisconsin Acute Diarrheal Illness Surveillance Program:
The aim of this program is to gain awareness of the gastrointestinal pathogens effecting community health in Wisconsin. The WSLH requests that clinical labs submit gastropathogen PCR testing data for bacterial, parasitic and viral pathogens on a **weekly basis** (number tested, number positive), **all year round**.


Testing Data Submission Instructions

[Click Here to Report Wisconsin Test Data](#)

Surveillance Reports

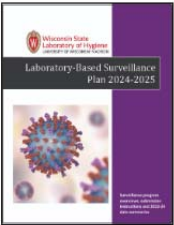
Wisconsin Laboratory Surveillance Report (WSLH)

- Current 
- Archive
- Sign-up for the Wisconsin Laboratory Surveillance Report



Wisconsin Division of Public Health Weekly ILI Report (WDPH)

2024-2025 Laboratory-Based Surveillance Plan





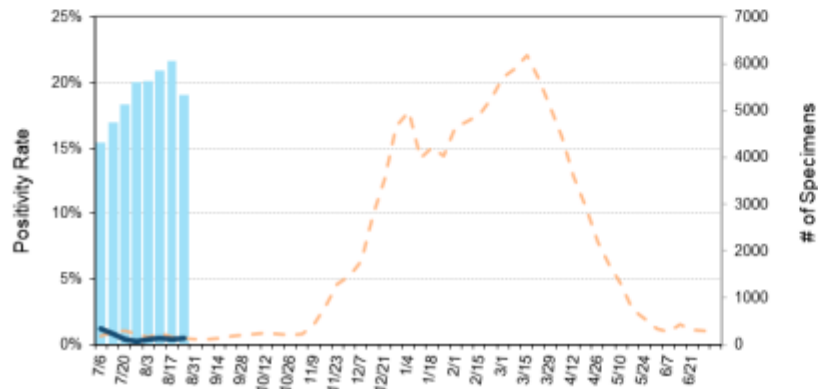

Laboratory Surveillance Report

** 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



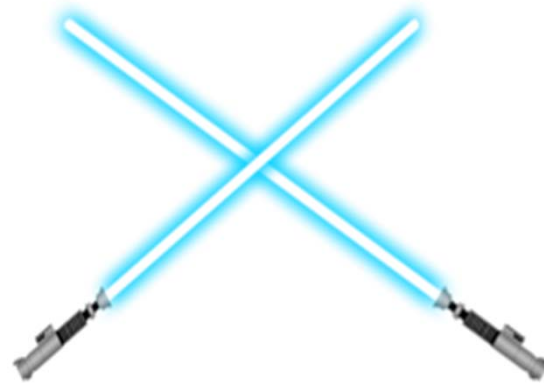
Respiratory Snapshot:

- Influenza activity is **low** in Wisconsin (0.5%) and nationally (0.4%)
 - **Influenza A** is the dominant strain circulating (85.7%)
- Rhinovirus/Enterovirus activity is **high** (12.3%) in Wisconsin.
- SARS-CoV-2 activity is **high** (18.6%)
- hMPV(0.5%), seasonal coronavirus(0.7%) and RSV(0.1%) activities are **low** in Wisconsin

Enteric Snapshot:

- Norovirus activity is **decreasing** (3.7%)
- Giardia activity is **decreasing** (1.5%)

Clicker Question



Are you signed up to receive our bi-weekly surveillance report?

- A) Yes
- B) No
- C) What is the bi-weekly surveillance report of which you speak?

Tip: if you're not yet signed up, email wcln@slh.wisc.edu to sign up!



Outline

- WSLH Laboratory-based Surveillance Plan
- For each surveillance section:
 - Why we conduct the surveillance
 - Statewide/national surveillance programs
 - Requests (data and/or specimens) of clinical labs
 - Data – how it is used
- Surveillance sections
 - Respiratory pathogens
 - Vectorborne pathogens
 - Enteric pathogens
 - Antibiotic resistant pathogens
 - Invasive pathogens





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 interest and 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

US NEWS

Missouri reports human bird flu case with no link to animals



Published on September 6, 2024

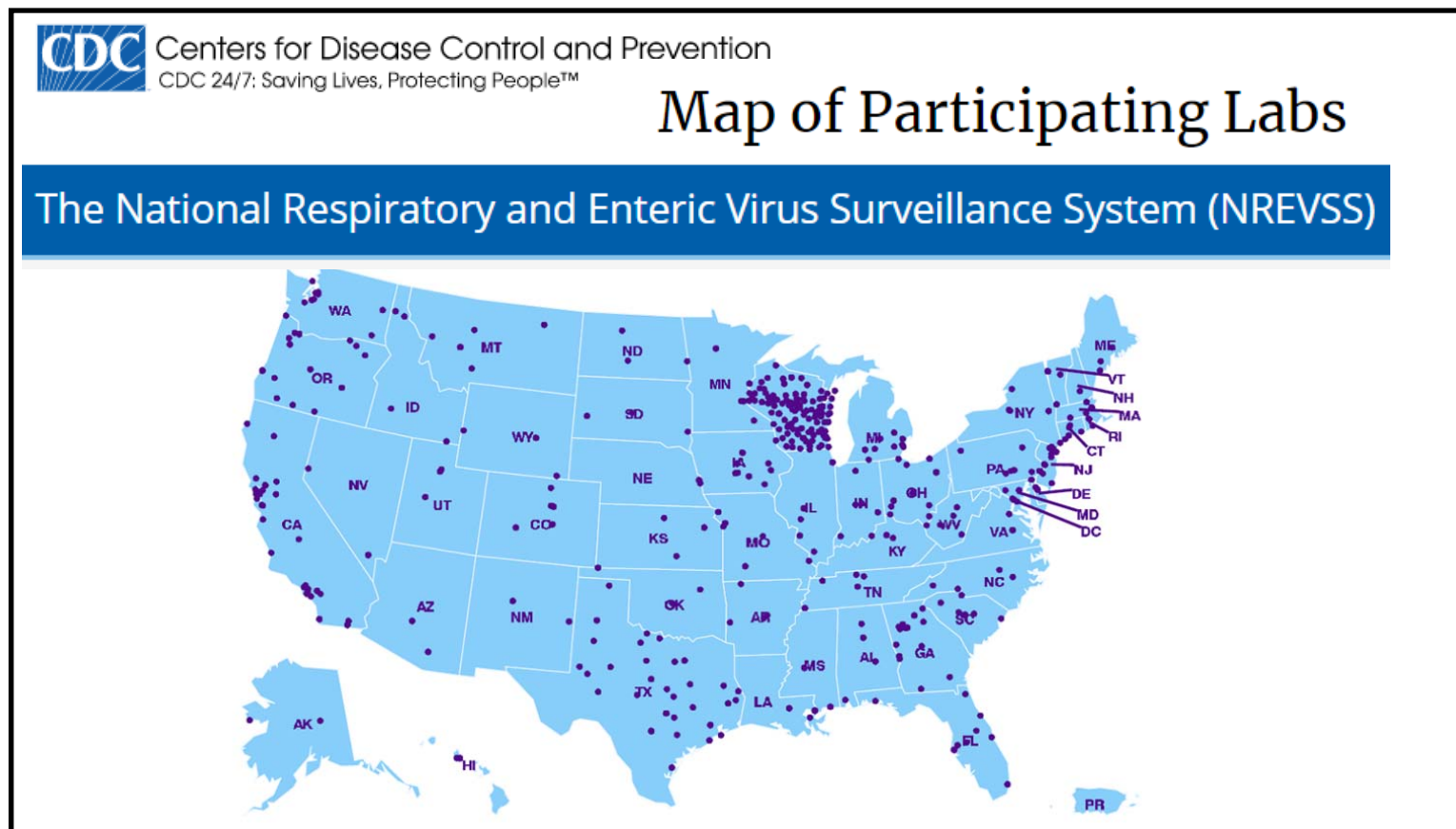
By BNO News



Respiratory Pathogens

Statewide/national surveillance programs

- National program – clinical lab testing data

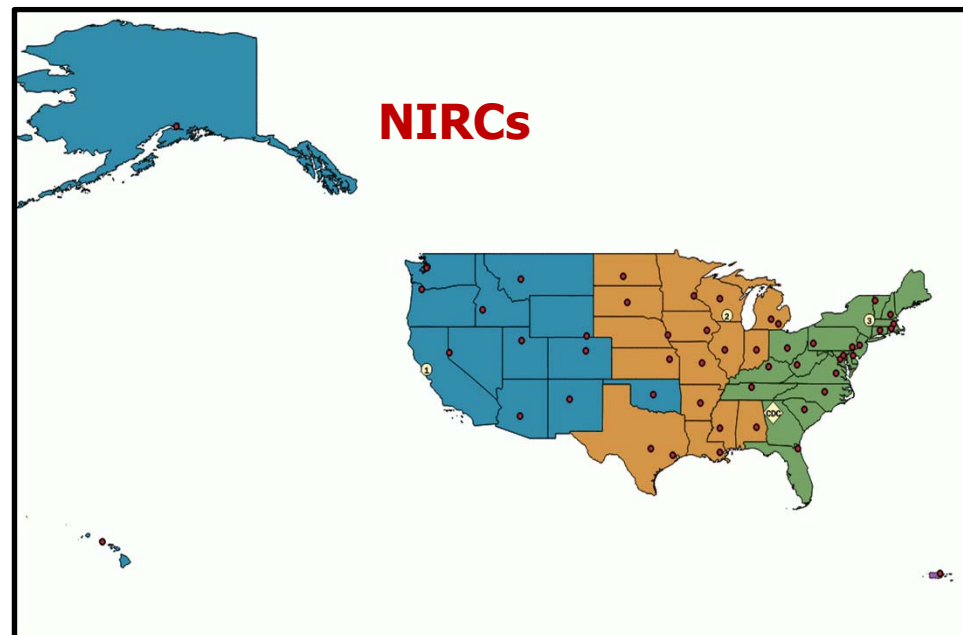
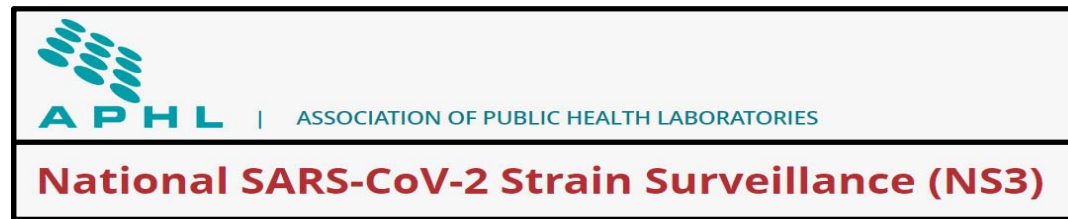




Respiratory Pathogens

Statewide/national surveillance programs

- National programs – specimen submission





Respiratory Pathogens

Statewide/national surveillance programs

- Statewide Respiratory Pathogen Surveillance
 - Weekly clinical laboratory testing data
 - Specimen submissions
 - Up to 5 SARS-CoV-2 positives per week per clinical laboratory
 - Routine submissions from enrolled sentinel surveillance sites
 - University Health clinics submissions
 - WSLH testing of suspect avian or swine influenza



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"> • International travel history • Bovine, swine or avian exposure
Antigen	<u>ALL</u> influenza positives	Influenza A positive specimens with: <ul style="list-style-type: none"> • International travel history • Bovine, swine or avian exposure
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	Specimens from all <i>Legionella</i> positive patients: <ul style="list-style-type: none"> • Sputum or BAL from Urine Antigen positive patients (NOT URINE) • Isolates 	
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 Pathogens Data and how it is used



 Wisconsin State
Laboratory of Hygiene
UNIVERSITY OF WISCONSIN-MADISON

[ABOUT WSLH](#) [WSLH SERVICES](#) [LAB NETWORKS & SURVEILLANCE](#) [RESEARCH SUPPORT CENTER](#) [NEWS & PUBLICATIONS](#) [PAY YOUR BILL](#)

« All Events

WCLN Webinar – 2024-2025 Respiratory Virus Season Update

October 2 @ 12:00 pm - 1:00 pm

2024-2025 Respiratory Virus Season Update

Presenter:

- **Allen Bateman, Ph.D., D(ABMM)**, Director of Communicable Disease Division, Wisconsin State Laboratory of Hygiene

SARS-CoV-2 Genomic Surveillance

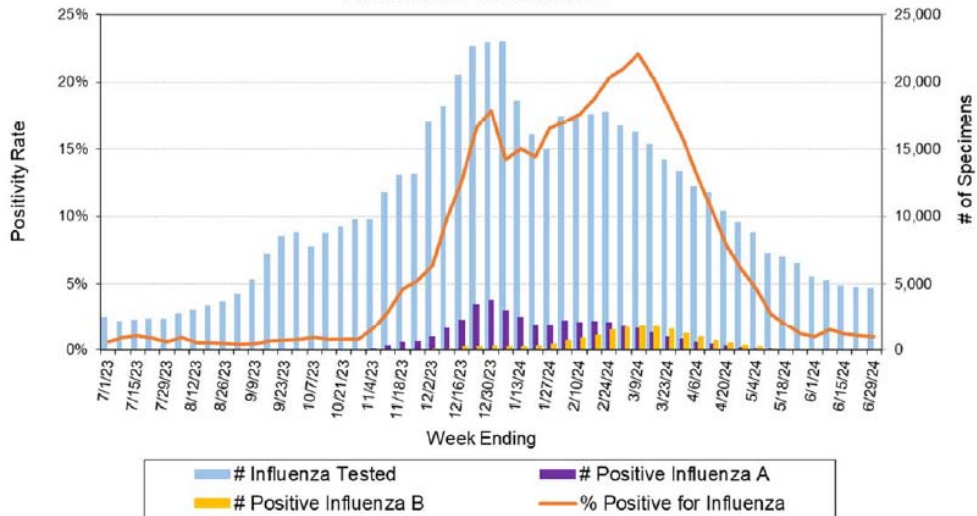


<https://covid.cdc.gov/covid-data-tracker/#variant-proportions>

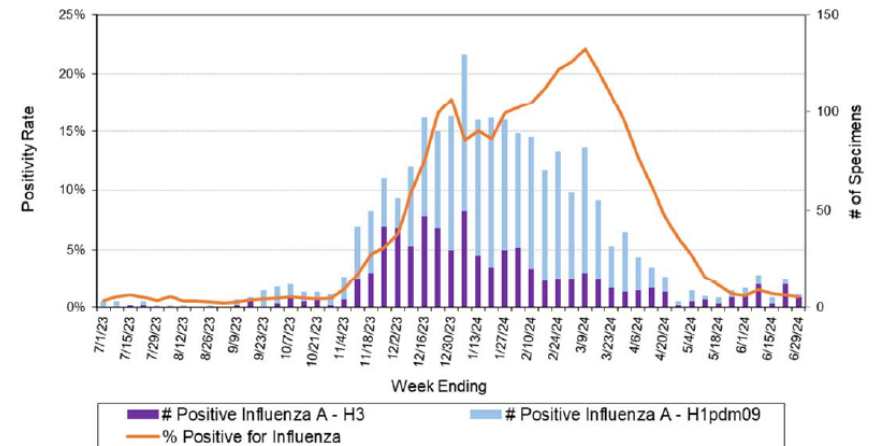
Influenza: 2023-24 was a long season



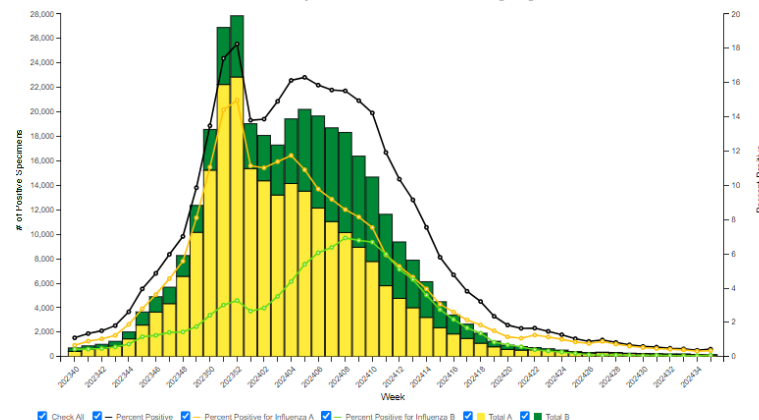
Number Tested and Positivity Rate for **Influenza** by PCR at Wisconsin Laboratories



Influenza A Specimens Subtyped by PCR at Wisconsin Laboratories



Influenza Positive Tests Reported to CDC by Clinical Laboratories, National Summary, 2023-24 Season, week ending Aug 31, 2024



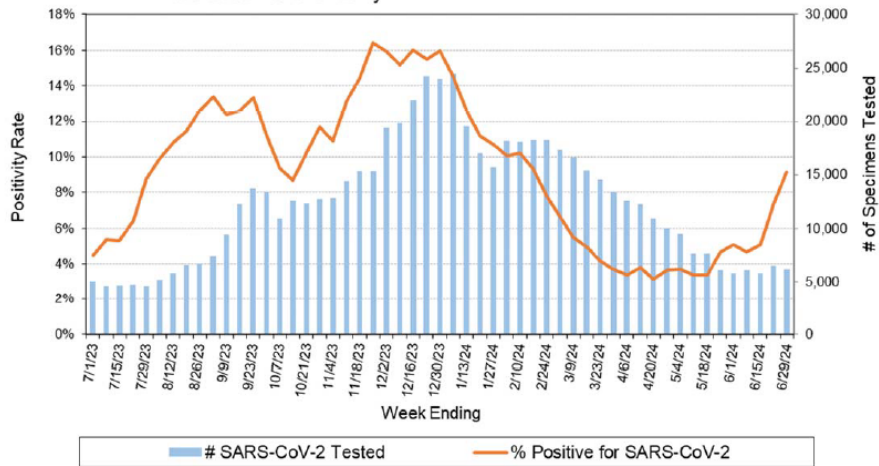
[View Additional Graphs and Data](#) | [Download Chart Data](#) | [Download PowerPoint Presentation](#)

<https://www.cdc.gov/flu/weekly/index.htm>

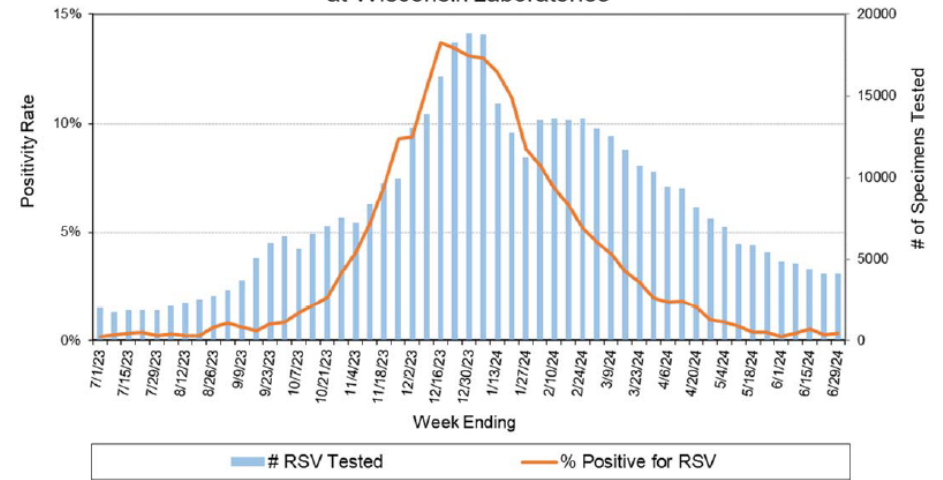
2023-24 SARS-CoV-2 and RSV



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



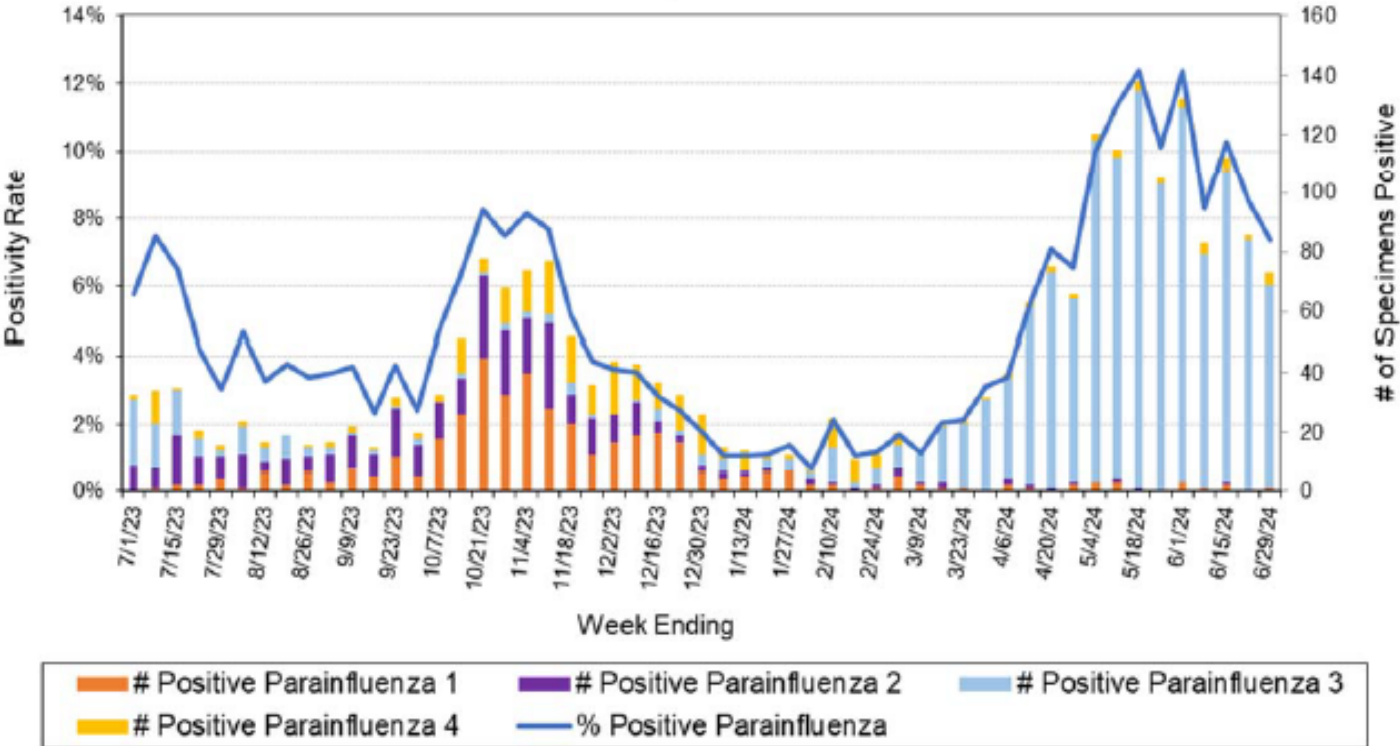
Positivity Rate and Number of Specimens Tested for **RSV** by PCR at Wisconsin Laboratories





2023-24 Parainfluenza viruses

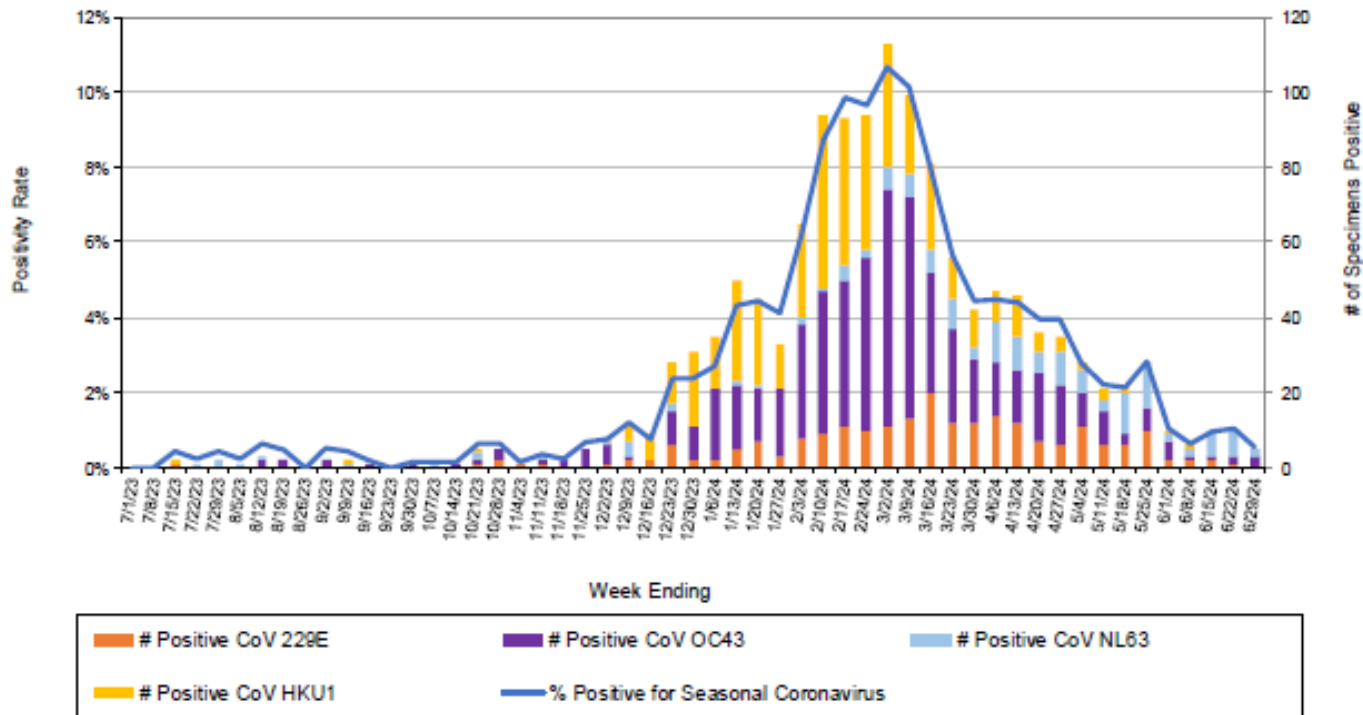
Positivity Rate and Number of Specimens Positive for Parainfluenzavirus by PCR at Wisconsin Laboratories



2023-24 Seasonal Coronaviruses



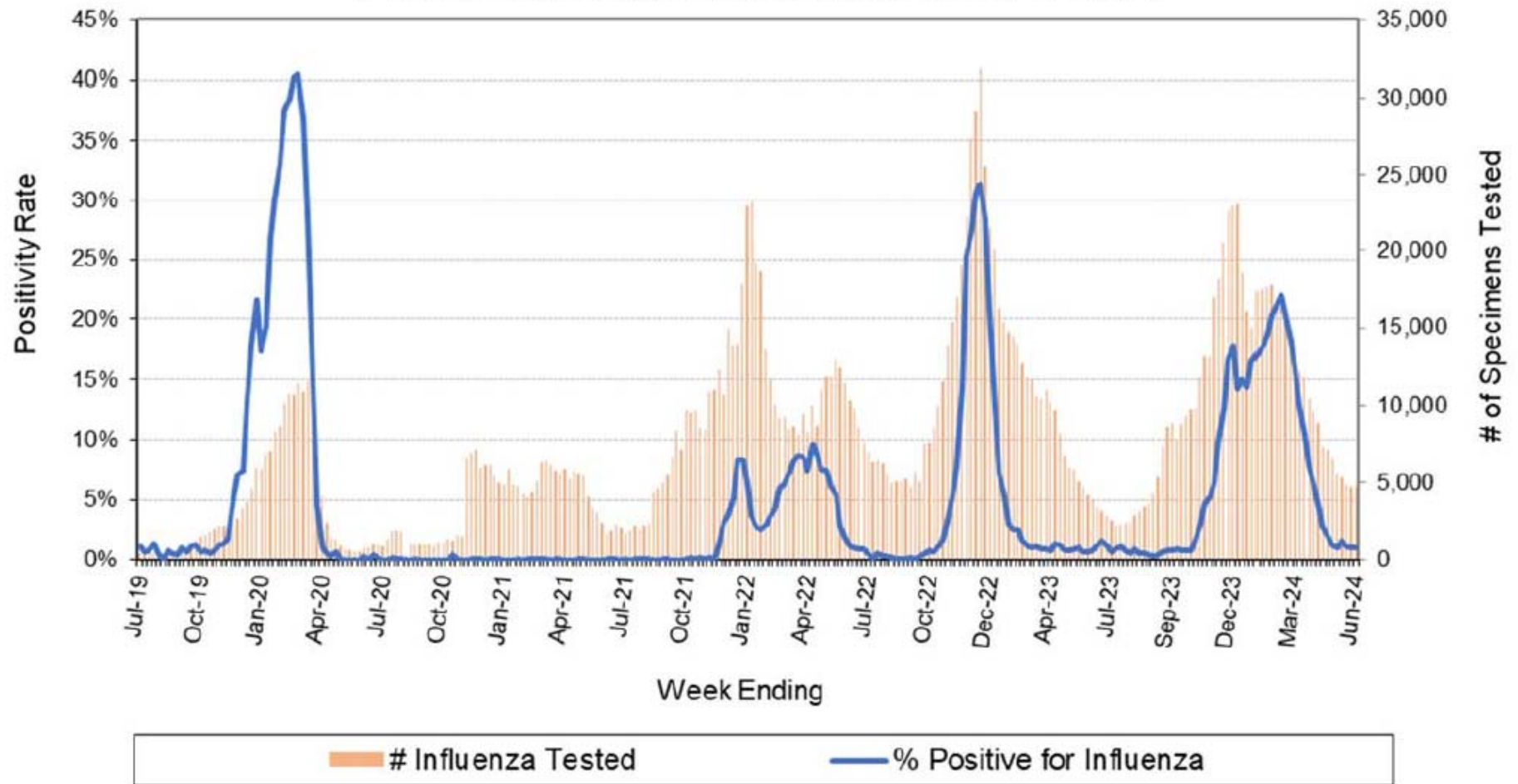
Positivity Rate and Number of Specimens Positive for **Seasonal Coronaviruses** by PCR at Wisconsin Laboratories



The past 5 years



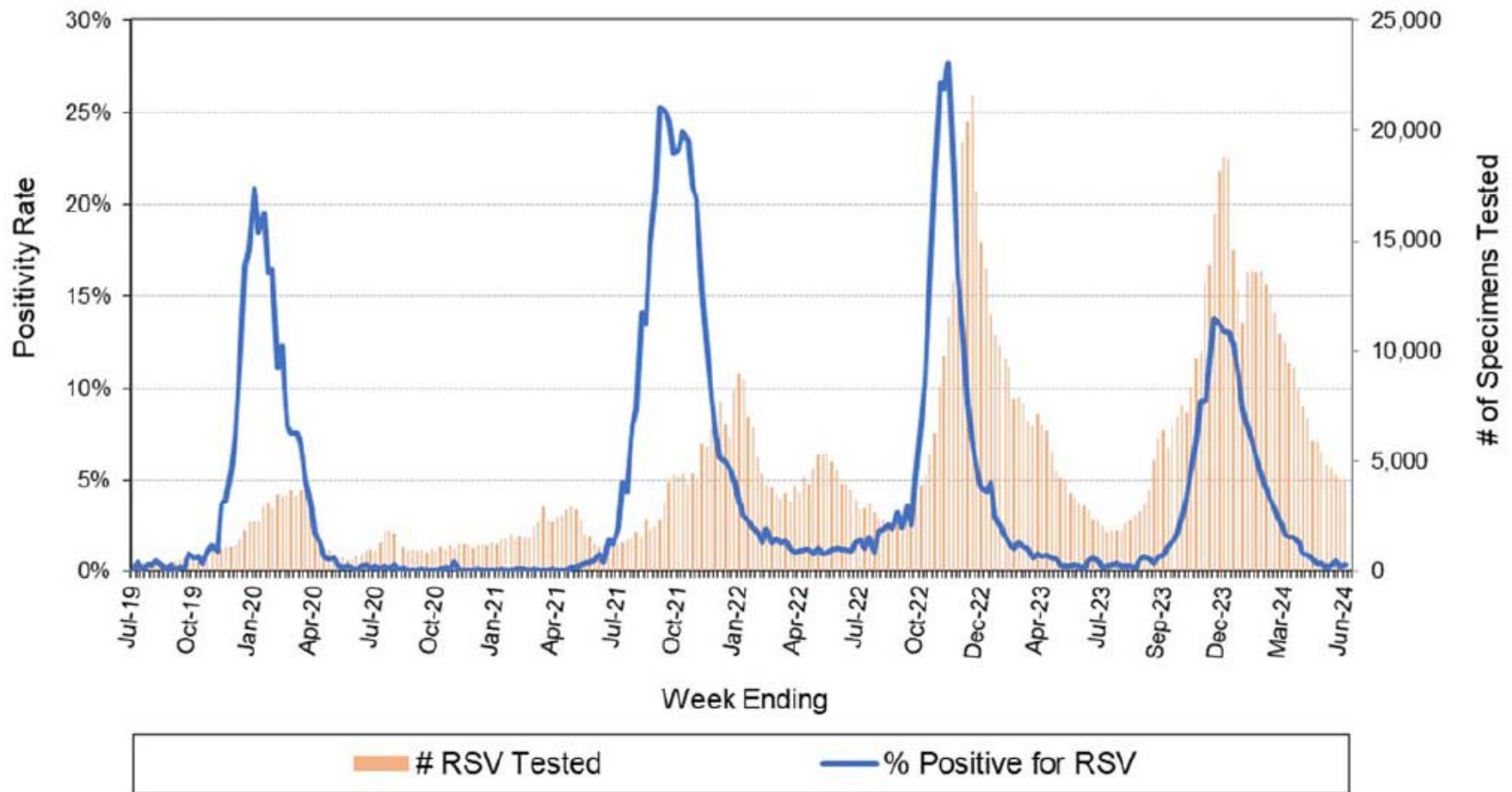
Positivity Rate and Number of Specimens Tested for **Influenza** by PCR at Wisconsin Laboratories from 2019-24



The past 5 years



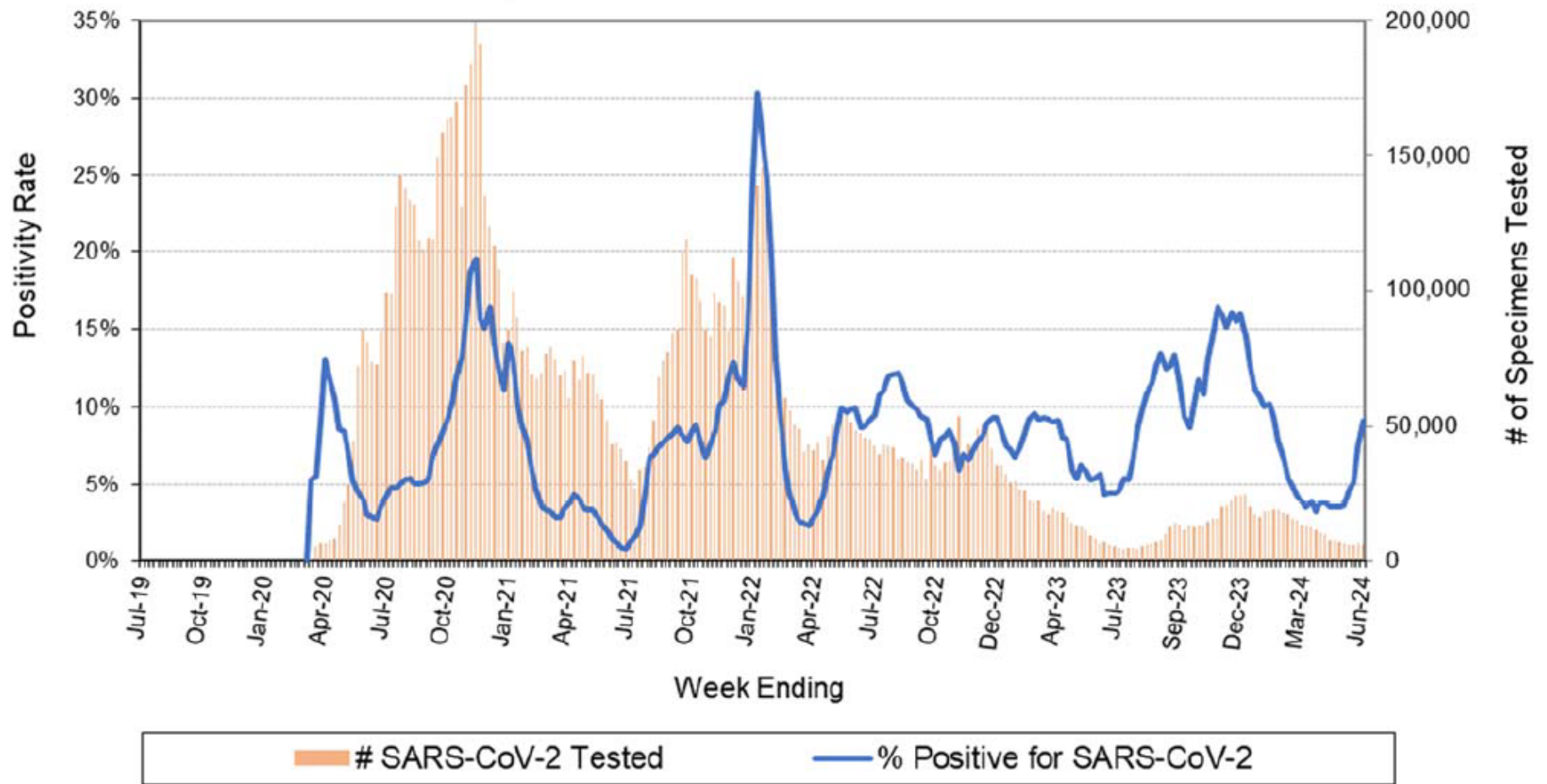
Positivity Rate and Number of Specimens Tested for **RSV** by PCR at Wisconsin Laboratories from 2019-24



The past 5 years



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



Clicker question: Respiratory Virus Reportable Conditions



SARS-CoV-2 results:

- A) All SARS-CoV-2 test results (positive and negative) are reportable to DHS
- B) No SARS-CoV-2 test results are reportable to DHS
- C) SARS-CoV-2 positive test results are reportable to DHS for hospitalized patients and pediatric deaths
- D) What does reportable to DHS mean?



Disease Reporting

Wisconsin has [communicable disease reporting requirements, P-02566 \(PDF\)](#), that support public health's responsibilities to control the incidence and spread of communicable diseases in our state.

The diseases and conditions listed on this page are considered to have significant public health impact, and any confirmed or suspected cases must be reported promptly.

Clicker question: Respiratory Virus Reportable Conditions



SARS-CoV-2 results:

- A) All SARS-CoV-2 test results (positive and negative) are reportable to DHS
- B) No SARS-CoV-2 test results are reportable to DHS
- C) SARS-CoV-2 positive test results are reportable to DHS for hospitalized patients and pediatric deaths**
- D) What does reportable to DHS mean?



Disease Reporting

Wisconsin has [communicable disease reporting requirements, P-02566 \(PDF\)](#), that support public health's responsibilities to control the incidence and spread of communicable diseases in our state.

The diseases and conditions listed on this page are considered to have significant public health impact, and any confirmed or suspected cases must be reported promptly.

Reminder: Respiratory Virus Reportable Conditions



- Gone are the days of all SARS-CoV-2 results being reportable
- What is reportable now: patients who are positive for influenza, RSV, or SARS-CoV-2 who are either:
 - Hospitalized patients (>24h)
 - Pediatric deaths

Date: September 29, 2023

BCD 2023-04

To: Wisconsin Local Health Departments, Tribal Health Agencies, Health Care Providers, and Infection Preventionists

From: Ryan Westergaard, MD, PhD, MPH
Chief Medical Officer and State Epidemiologist for Communicable Diseases

Respiratory Syncytial Virus (RSV)-associated hospitalizations and RSV-associated Pediatric Deaths are Now Reportable Conditions in Wisconsin

PLEASE DISTRIBUTE WIDELY

Summary

- Starting November 1, 2023 RSV-associated hospitalizations and RSV-associated pediatric deaths among Wisconsin residents are reportable to DHS.
- This change will bring RSV surveillance in alignment with influenza virus surveillance.



Outline

- WSLH Laboratory-based Surveillance Plan
- For each surveillance section:
 - Why we conduct the surveillance
 - Statewide/national surveillance programs
 - Requests (data and/or specimens) of clinical labs
 - Data – how it is used
- Surveillance sections
 - Respiratory pathogens
 - **Vectorborne pathogens**
 - Enteric pathogens
 - Antibiotic resistant pathogens
 - Invasive pathogens





Vectorborne Pathogens

Why conduct surveillance

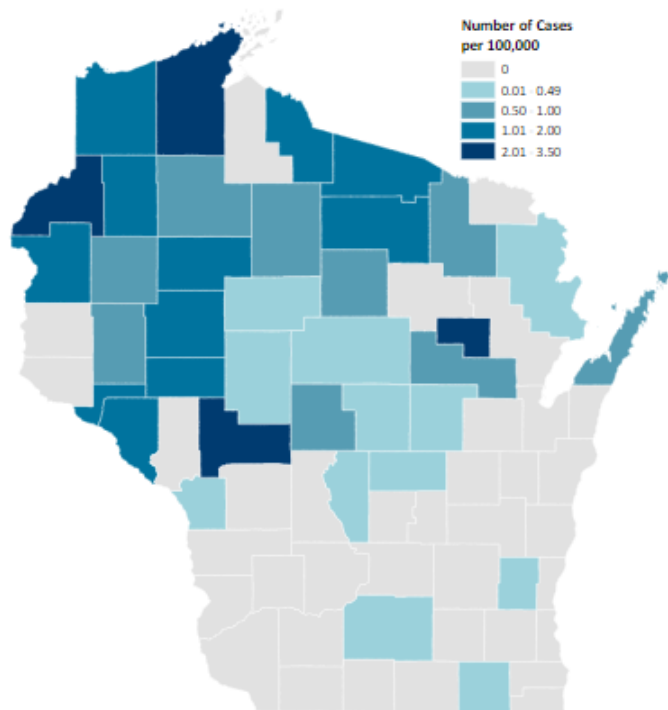
- Identify and track species of certain vectorborne pathogens
- Track malaria drug resistance

Table 4. Vector-borne Pathogen Specimen Submission Requests		
Pathogen	Specimen Type	Testing Performed at WSLH
Malaria	Positive thick and thin blood smears or residual EDTA blood	Species confirmation via microscopy and PCR. Residual EDTA forwarded to CDC for Malarial Drug Resistance Surveillance in <i>Plasmodium falciparum</i>
Babesia	Positive thick and thin blood smears or residual EDTA blood	Confirmation of <i>B. microti</i> by PCR. Unknown species forwarded to CDC for confirmation
Ehrlichia (species unknown)	Residual blood and/or nucleic acid	Forwarded to CDC for species identification (if speciation not available at your lab)

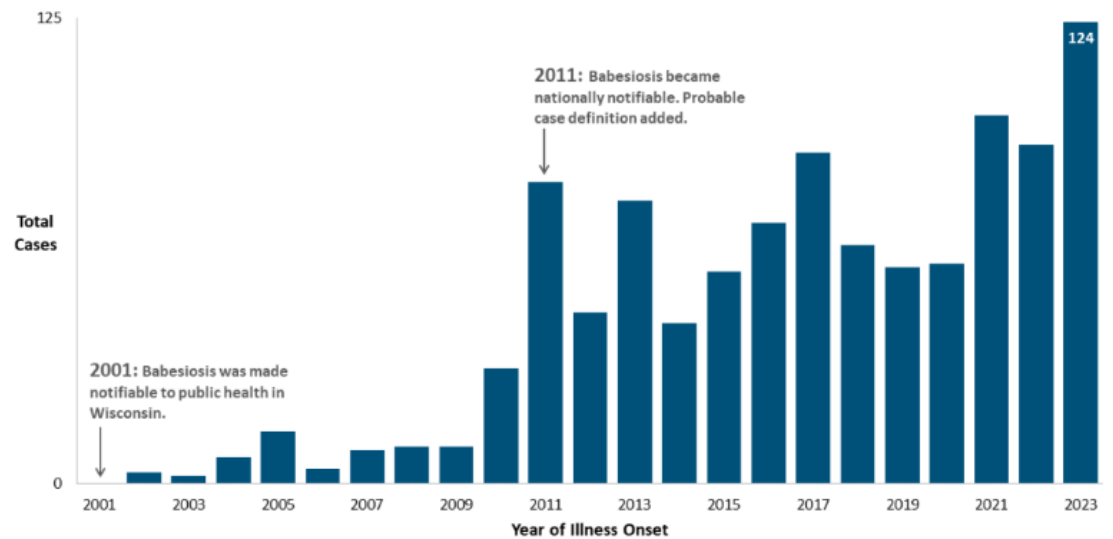
Vectorborne Pathogens Data and how it is used



Average Annual Incidence of Ehrlichiosis (*E. muris eauclairensis*)
in Wisconsin, 2009-2023

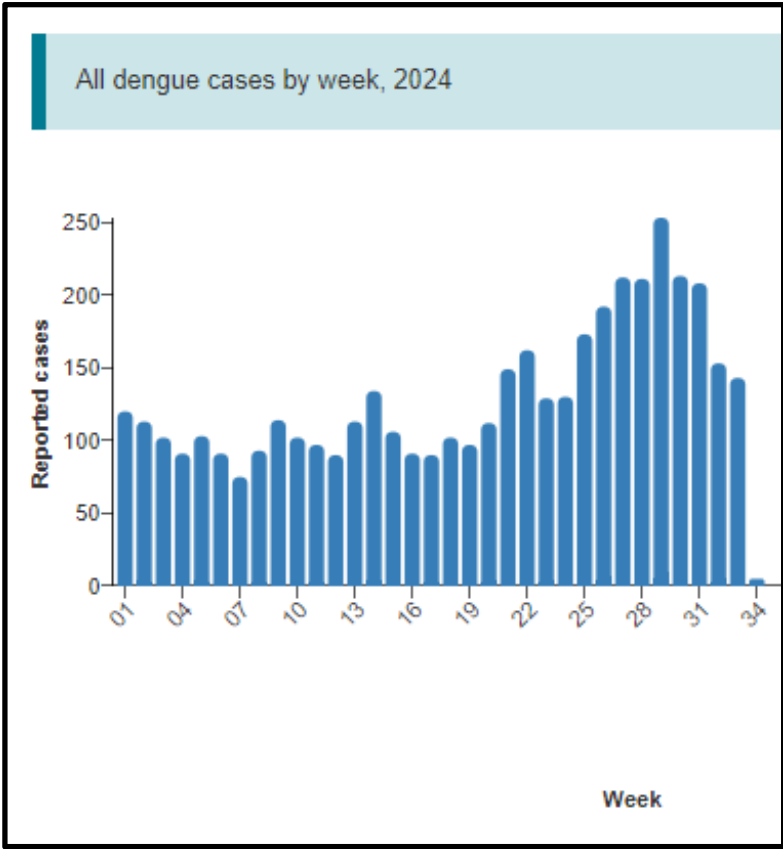
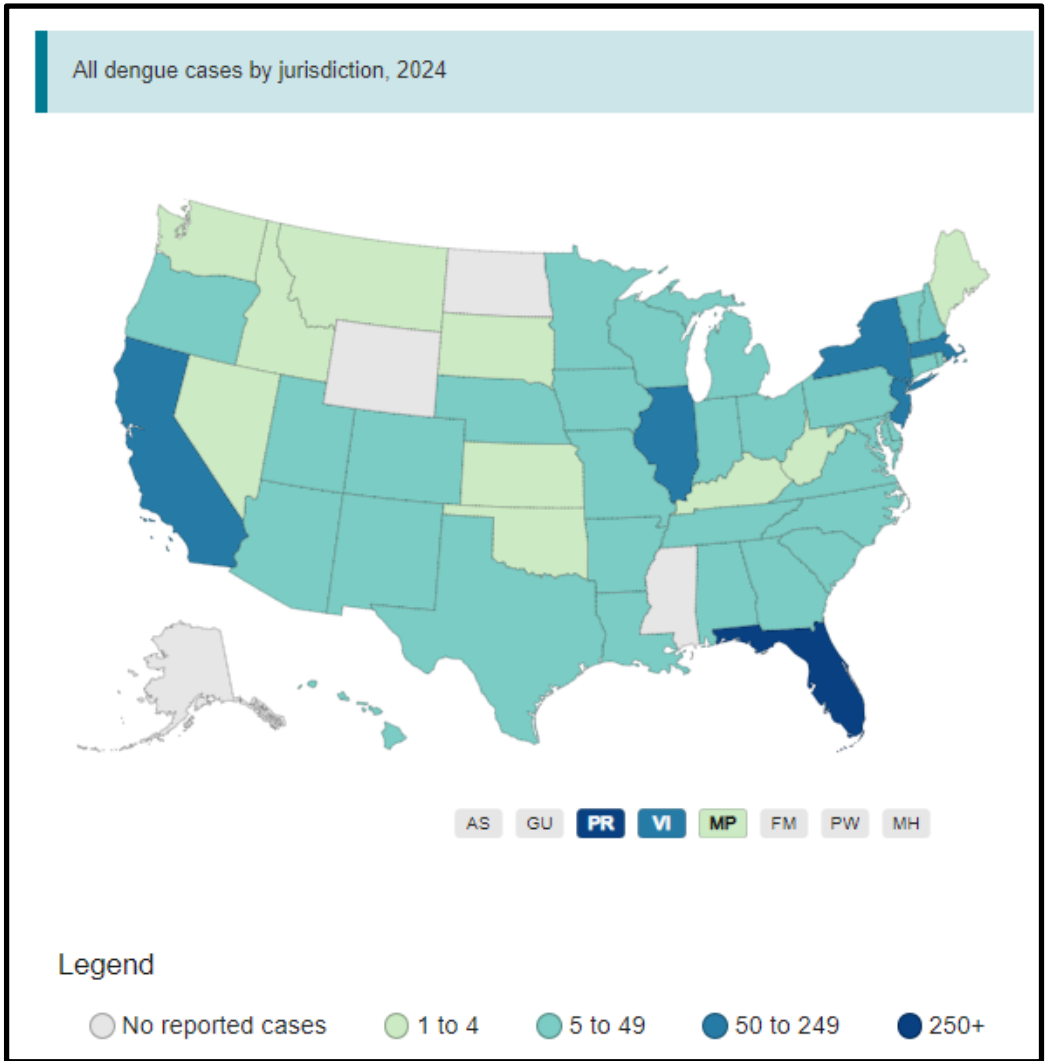


Babesiosis Cases in Wisconsin



<https://www.dhs.wisconsin.gov/tick/ehrlichiosis-data.htm>
<https://www.dhs.wisconsin.gov/tick/babesiosis-data.htm>

Vectorborne Pathogens Data and how it is used



<https://www.cdc.gov/dengue/data-research/facts-stats/current-data.html>



Outline

- WSLH Laboratory-based Surveillance Plan
- For each surveillance section:
 - Why we conduct the surveillance
 - Statewide/national surveillance programs
 - Requests (data and/or specimens) of clinical labs
 - Data – how it is used
- Surveillance sections
 - Respiratory pathogens
 - Vectorborne pathogens
 - **Enteric pathogens**
 - Antibiotic resistant pathogens
 - Invasive pathogens





Enteric Pathogens

Why conduct surveillance

- Situational awareness of what is circulating, to inform clinical decision-making and public health response
- Track norovirus genotypes to guide future vaccine strain selection
- Identify foodborne/waterborne outbreaks
 - *Cyclospora*
 - *Cryptosporidium*
 - Norovirus
 - *Salmonella*
 - Shiga-toxin producing *E. coli* (STEC)
- Trace-back foodborne outbreaks to individual foods/water/other exposures, and stop those exposures



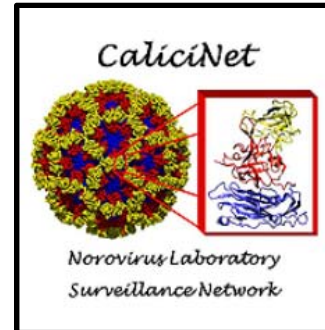
Gastrointestinal (GI) Pathogens

National surveillance programs

- PulseNet
 - *Salmonella*
 - STEC



- CaliciNet
 - Norovirus



- CryptoNet
 - *Cryptosporidium*



- NARMS
 - AST of certain enteric bacteria





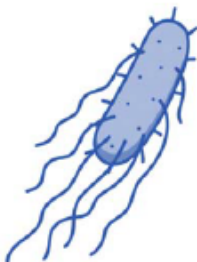
Table 5. Enteric Pathogen Specimen Submissions*		
Pathogen	Specimen Type	Testing Performed at WSLH
<i>Campylobacter</i> species	Isolates or stool	Identification, antimicrobial susceptibility testing and molecular subtyping (WGS) will be performed as necessary
Enterohemorrhagic/Shiga Toxin-Producing <i>E. coli</i> (EHEC/STEC)	Isolates, stool or enrichment broth	Identification, serotyping and molecular subtyping (WGS)
<i>Salmonella</i> species	Isolates or stool	Identification, serotyping, antimicrobial susceptibility testing and molecular subtyping (WGS)
<i>Shigella</i> species and <i>Enteroinvasive E.coli</i> (EIEC)	Isolates or stool	<i>Shigella</i> identification, serogrouping, antimicrobial susceptibility testing; and molecular subtyping
<i>Vibrio</i> Species	Isolates or stool	Identification and referral to CDC
<i>Yersinia</i> species	Isolates or stool	Identification
<i>Cryptosporidium</i> species	Stool	Identification** and genotyping (and/or referral to CDC) and WGS
<i>Cyclospora cayetanensis</i>	Stool	Molecular subtyping and/or referral to CDC
Rotavirus	Stool	<u>One positive per week</u> for molecular subtyping/genotyping (performed at CDC)

*Consult with the Wisconsin Division of Public Health Foodborne Disease Epidemiologists to inquire about testing of any other organisms that are suspected of being in a cluster or outbreak of public health significance.

2023 *Salmonella* Outbreak Investigation

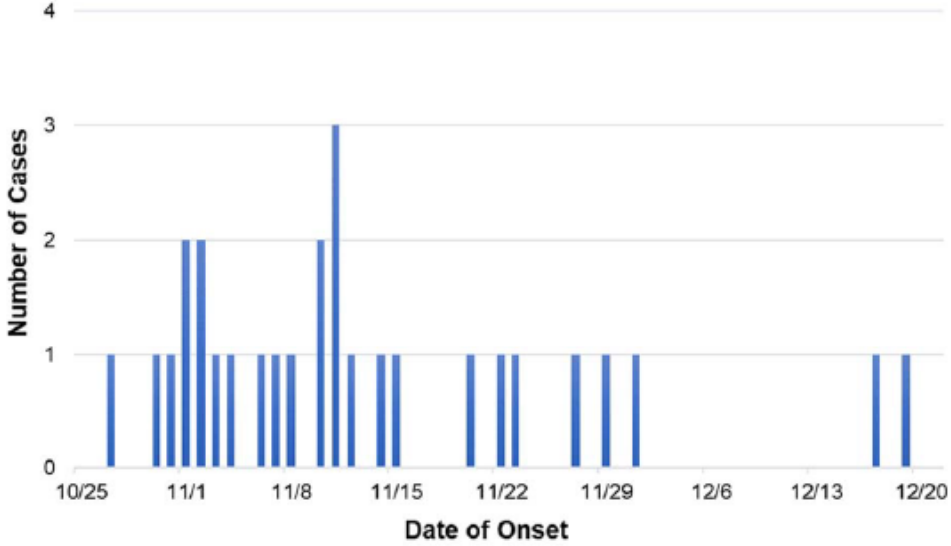


In November 2023, the Wisconsin Department of Health Services (DHS) worked to investigate a multistate outbreak of *Salmonella* Sundsvall and *Salmonella* Oranienburg infections linked to cantaloupe. Ultimately, 407 people in 44 states were infected with one of the two outbreak strains. Twenty-nine of those illnesses occurred in Wisconsin residents across 17 counties.



Salmonella Sundsvall had never been identified in a Wisconsin resident prior to this outbreak. Because the WSLH performs serotyping on all referred *Salmonella* isolates and positive specimens, DHS and local health departments were able to quickly gather more detailed information about melons that case-patients consumed before illness. This resulted in faster removal of contaminated produce from store shelves and prevention of further illness. The multistate investigation led to several recalls, at least four of which involved products distributed to Wisconsin.

Cases of *Salmonella* Sundsvall and *Salmonella* Oranienburg linked to cantaloupe by date of onset, Wisconsin residents, October 2023 – December 2023 (N=28)



FOR IMMEDIATE RELEASE
September 6, 2024



DHS Identifies Salmonella Infections Linked to Eggs Sold in Wisconsin

Forty-two people in Wisconsin have become sick, product now recalled, and consumers advised to check for products in their homes

42 x 30 = 1,260 estimated illnesses

GI Pathogens: Norovirus



In 2022 I presented:

- WI clinical lab switched from another GI panel to the BioFire GI
 - With old GI panel, most of samples sent to us confirmed by our norovirus PCR
 - With BioFire GI, fewer samples confirmed as positive by our PCR
- What's the reason for the low confirmation?
 - Contamination at the lab?
 - False positives?
 - Higher sensitivity of BioFire GI?
 - Other?
- Current investigation with the clinical lab, WSLH, and BioFire/BioMerieux. If anything major comes of it, we will definitely let you all know



January 2024:

	
Class 2 Device Recall BIOFIRE FilmArray Gastrointestinal (GI) Panel	
Manufacturer Reason for Recall	Due to potential signals of increased false positive Norovirus results when using the gastrointestinal (GI) panel.



Clicker question:

In addition to norovirus, what BioFire GI target has also had issues with false positives in recent years?

- A) *Vibrio cholerae*
- B) *Cryptosporidium*
- C) *Campylobacter*
- D) None of the above
- E) All of the above





Clicker question:

In addition to norovirus, what BioFire GI target has also had issues with false positives in recent years?

- A) *Vibrio cholerae*
- B) *Cryptosporidium*
- C) *Campylobacter*
- D) None of the above
- E) **All of the above**





GI Pathogens: *Campylobacter*

- A lab switched from another GI panel to BioFire GI, and noticed lots of 'culture negative' results from WSLH surveillance testing
- What's the reason for the low confirmation?
 - Contamination at the lab?
 - False positives?
 - Higher sensitivity of BioFire GI?
- Current investigation with the clinical lab, WSLH, and BioFire/BioMerieux
- WSLH fellow wrote a paper; currently in CDC review prior to journal submission
- If anything major comes of it, we will definitely let you all know
- Norovirus, *Cryptosporidium* (2022), and *Campylobacter* issues all discovered due to surveillance testing.
 - Surveillance allows the identification of issues with commercially-available tests
 - Please continue to reach out to us if you notice something weird!





Outline

- WSLH Laboratory-based Surveillance Plan
- For each surveillance section:
 - Why we conduct the surveillance
 - Statewide/national surveillance programs
 - Requests (data and/or specimens) of clinical labs
 - Data – how it is used
- Surveillance sections
 - Respiratory pathogens
 - Vectorborne pathogens
 - Enteric pathogens
 - **Antibiotic resistant pathogens**
 - Invasive pathogens





Antibiotic Resistant Pathogens

Why conduct surveillance

- Antimicrobial resistance is a public health concern as multi-drug resistant pathogens become more common
- WSLH is the Midwest Regional Laboratory for the CDC-coordinated Antimicrobial Resistance Laboratory Network (AR Lab Network)
- Overarching goal of AR Lab Network testing is rapid identification and containment of resistant pathogens



Antibiotic Resistant Pathogens

Statewide/national surveillance programs



Antibiotic Resistance Laboratory Network (AR Lab Network / ARLN)

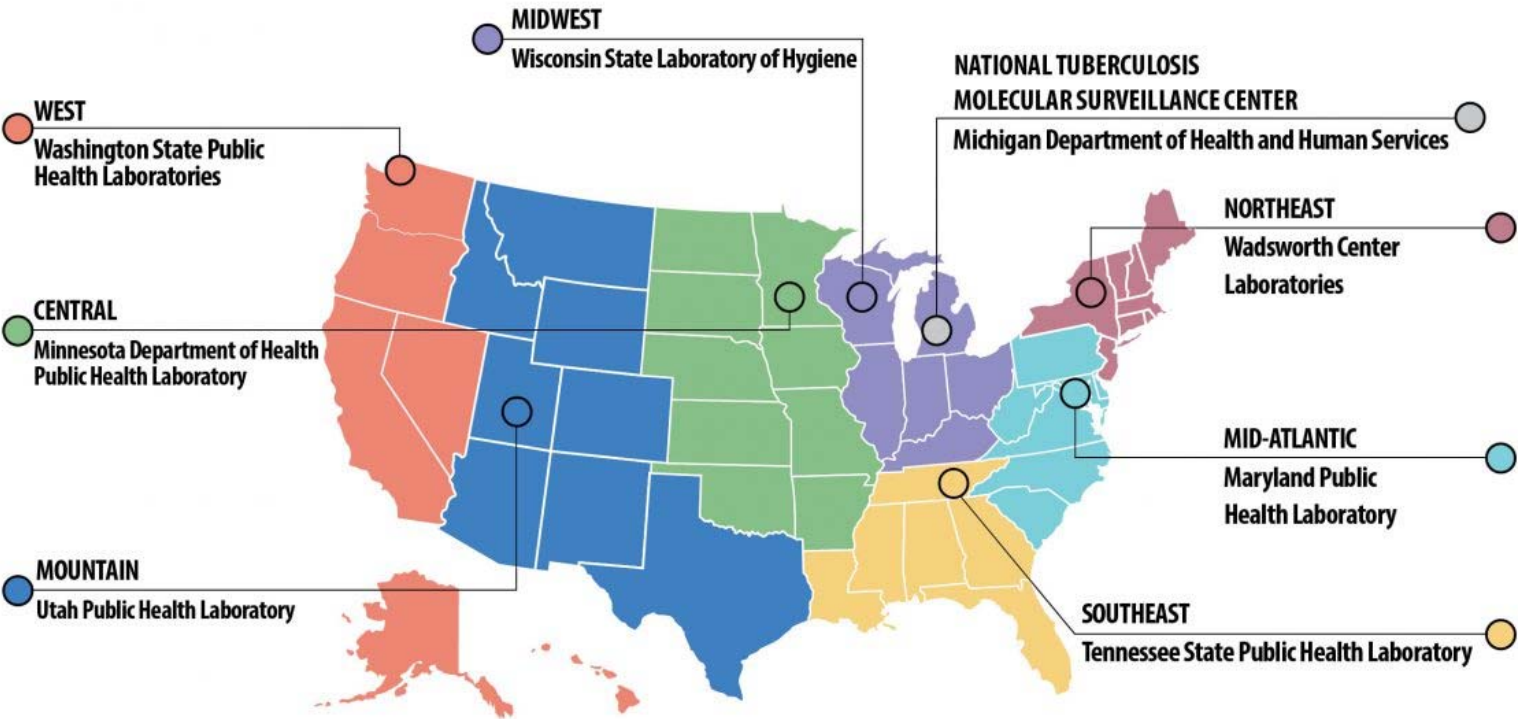




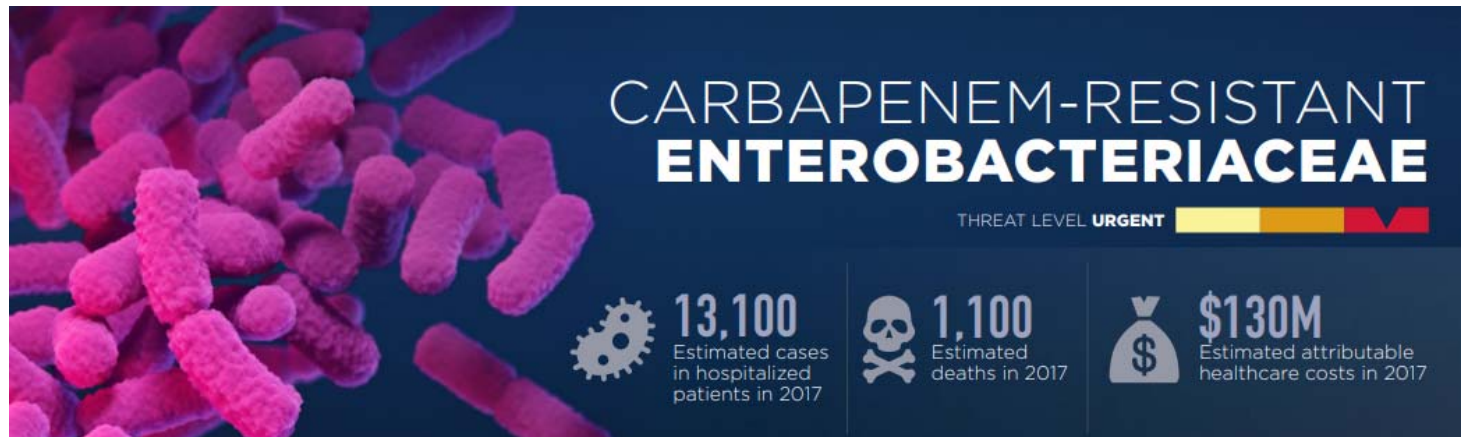
Table 6. Antimicrobial Resistance Specimen Submissions		
Pathogen	Resistance Traits	Testing Performed at WSLH
Pan-resistant organisms	Resistant to all drugs tested in your laboratory	Identification, antimicrobial susceptibility testing, AR-targeted PCR and referral to CDC as necessary
<i>Candida auris</i>	N/A	Identification, antimicrobial susceptibility testing and molecular subtyping.
<i>Enterobacterales</i>	Resistant to any carbapenems (CRE)**	Identification, antimicrobial susceptibility testing, carbapenemase screen, AR-targeted PCR and molecular subtyping
<i>Staphylococcus aureus</i>	Non-susceptible to vancomycin (VRSA)	Identification, antimicrobial susceptibility testing and referral to CDC as necessary
<i>Pseudomonas aeruginosa</i> ***	<ul style="list-style-type: none"> Resistant to carbapenems other than ertapenem AND Non-susceptible to cefepime and/or ceftazadime 	Identification, antimicrobial susceptibility testing, carbapenemase screen, AR-targeted PCR and molecular subtyping
<i>Acinetobacter baumannii</i>	Resistant to any carbapenems (CRAB)	Identification, antimicrobial susceptibility testing, AR-targeted PCR and molecular subtyping
<i>Aspergillus fumigatus</i> isolates from invasive infections	N/A	Isolates will be forwarded to the Maryland Department of Health for surveillance of azole resistance

** Exception: *Proteus* spp., *Providencia* spp., and *Morganella* spp., that are resistant to imipenem only but are not resistant to meropenem or doripenem. These isolates may have elevated imipenem MICs by mechanisms other than production of carbapenemases. These isolates will also be susceptible to other beta-lactams.

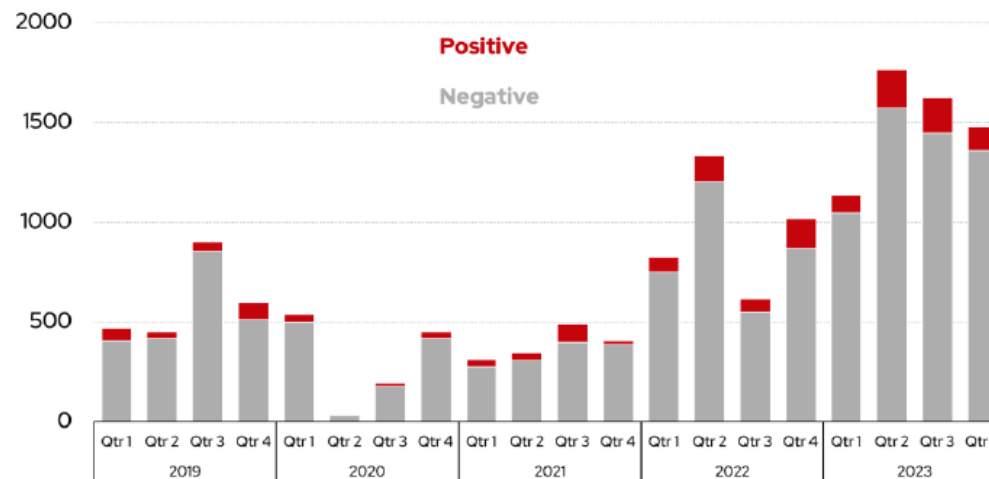
***Exception: Do not submit resistant *Pseudomonas aeruginosa* isolates from cystic fibrosis patients. These isolates can be highly resistant but are most likely due to other factors than the presence of a carbapenemase.

Antibiotic Resistant Pathogens

Data and how it is used



Midwest Region colonization testing using CARBA-R PCR tests, 2019-2023

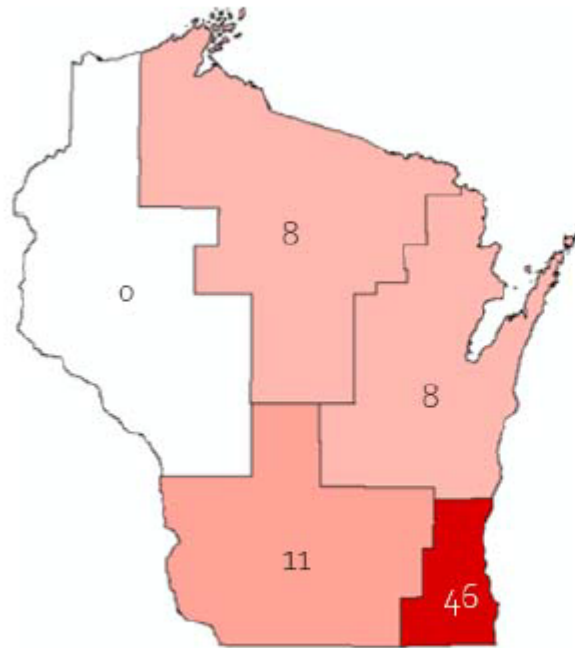


<https://www.cdc.gov/drugresistance/biggest-threats.html>

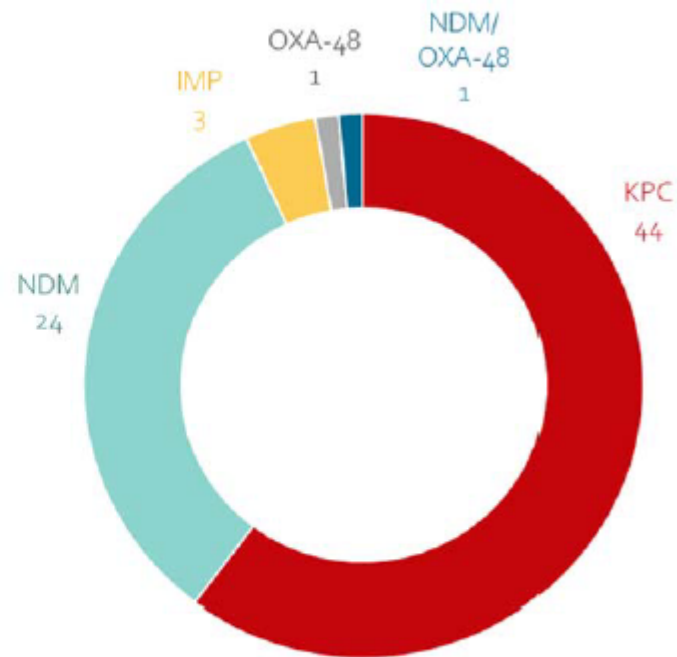
Antibiotic Resistant Pathogens Data and how it is used



Carbapenemases detected at WSLH in CRE Isolates from Wisconsin laboratories in 2023



Carbapenemase detections in CRE isolates, by region of the state.



Carbapenemase genes detected in CRE isolates by AR-targeted RT-PCR.

- KPC and NDM most often seen in *K. pneumoniae*



Antibiotic Resistant Pathogens

Data and how it is used



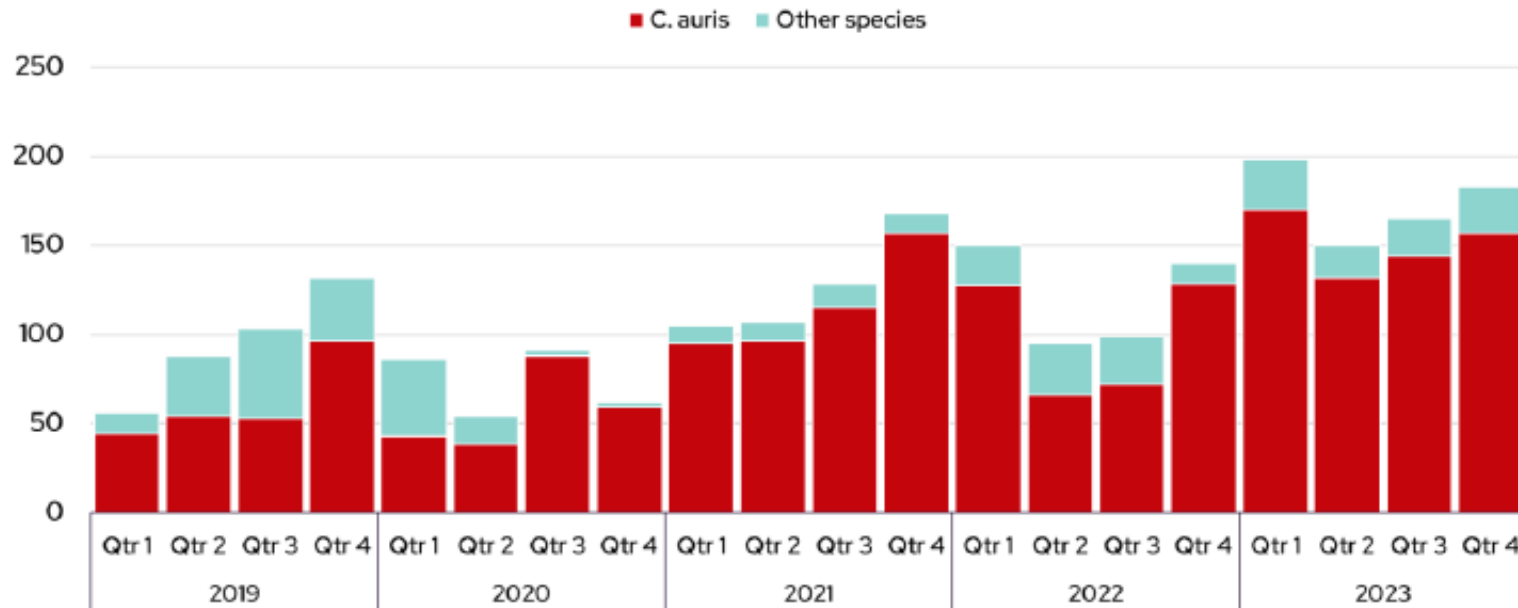
- Highly drug-resistant yeast
- Causes invasive infections associated with high mortality
- Spreads easily in healthcare settings

<https://www.cdc.gov/drugresistance/biggest-threats.html>



Candida isolates in the Midwest Region

Midwest Region *Candida* isolate testing, 2019-2023



Clicker question:



What is the best empiric treatment for *Candida auris*?

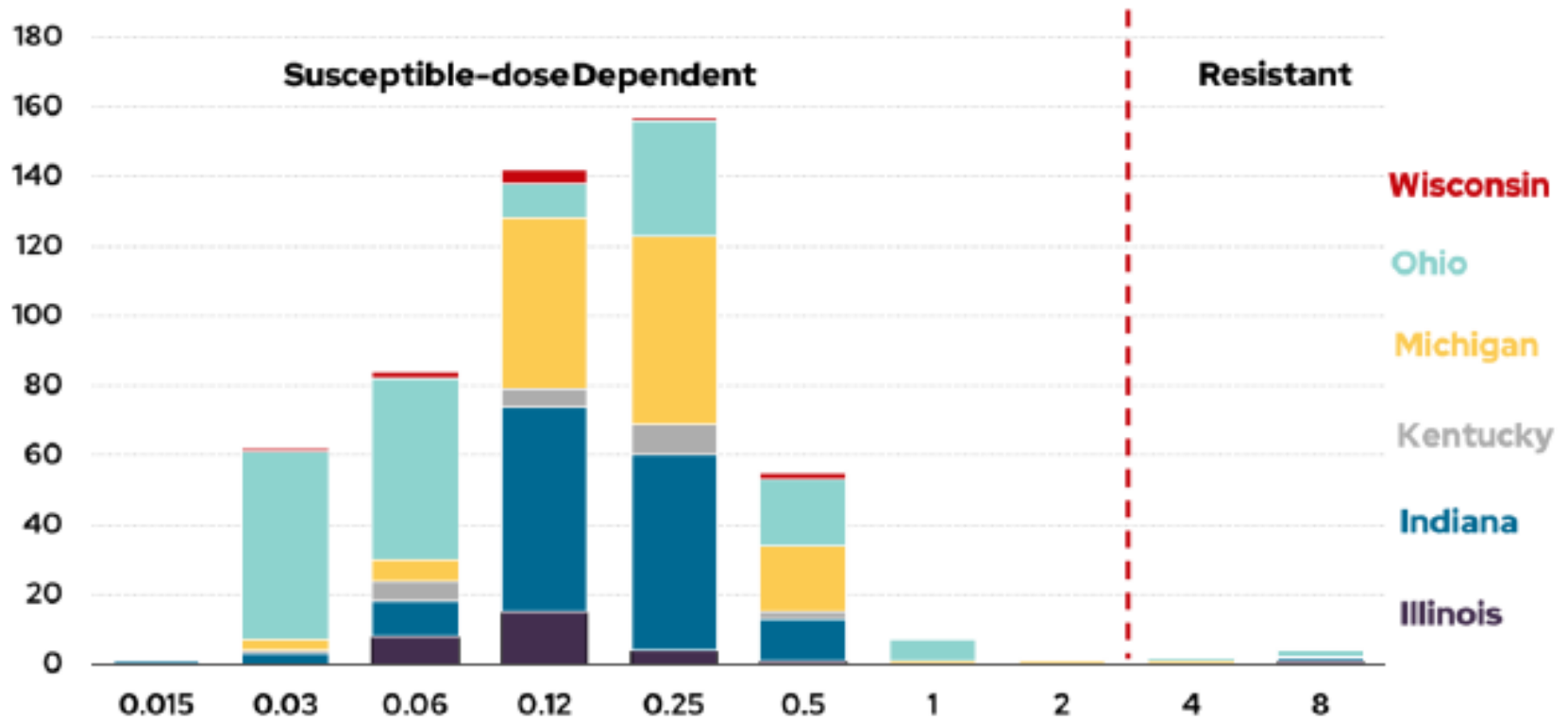
- A) Fluconazole
- B) Micafungin
- C) Amphotericin B





Candida isolates in the Midwest Region

Midwest Region *Candida auris* Micafungin Susceptibility Profiles by state, 2023



Clicker question:



What is the best empiric treatment for *Candida auris*?

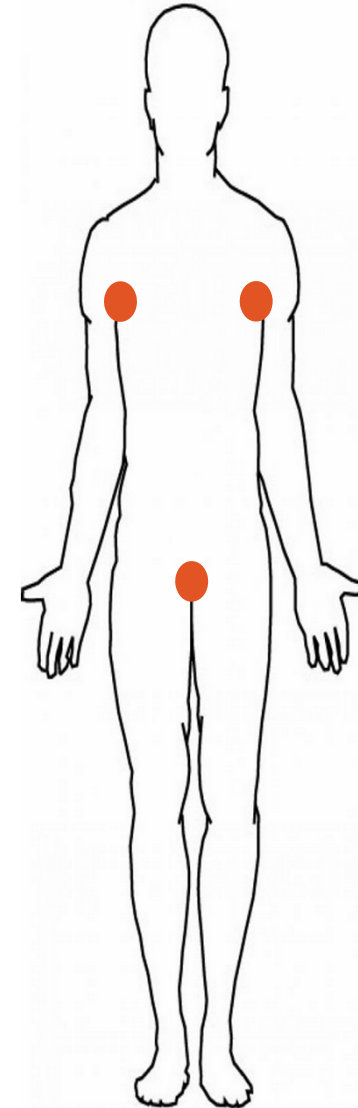
- A) Fluconazole
- B) Micafungin**
- C) Amphotericin B





Identify a positive patient isolate: what to do next?

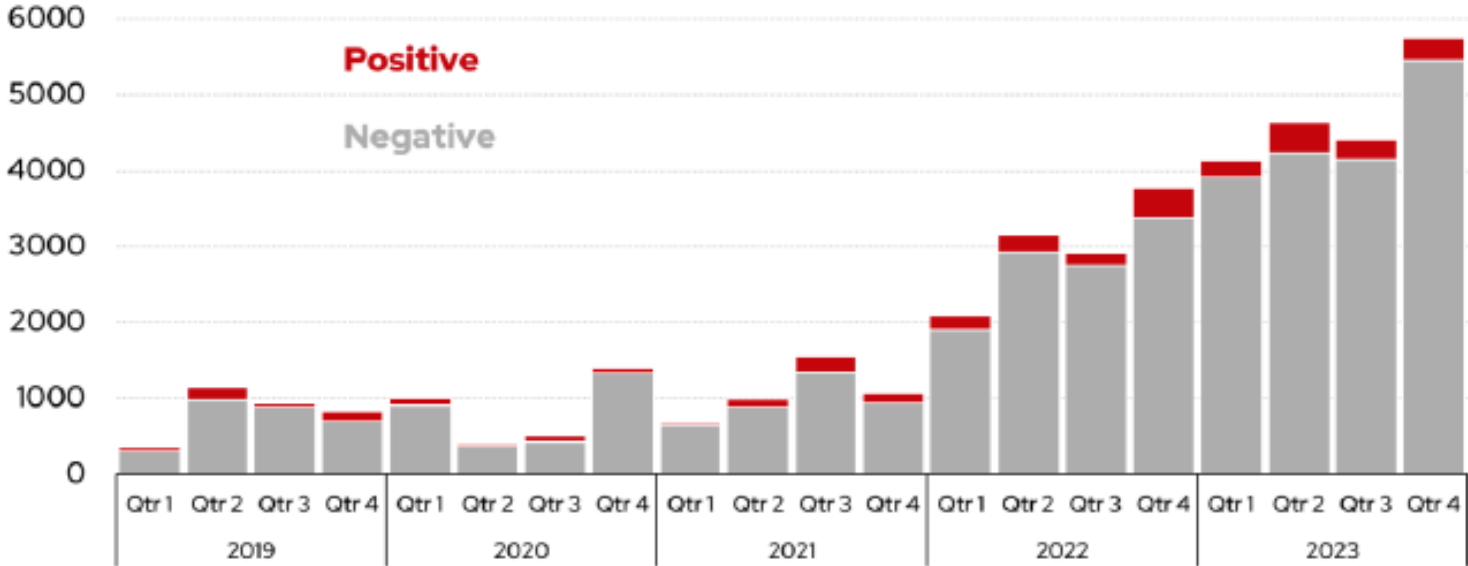
- Treat patient
- Identify and prevent transmission (colonization screening)
 - Contact tracing around a newly identified case
 - Point prevalence surveys of the facility or wing
 - Admission screening
 - Goals:
 - Determine if transmission has occurred
 - Initiate contact precautions on colonized patients to prevent further spread
- Axilla-groin E-swab





Candida auris colonization tests in the Midwest

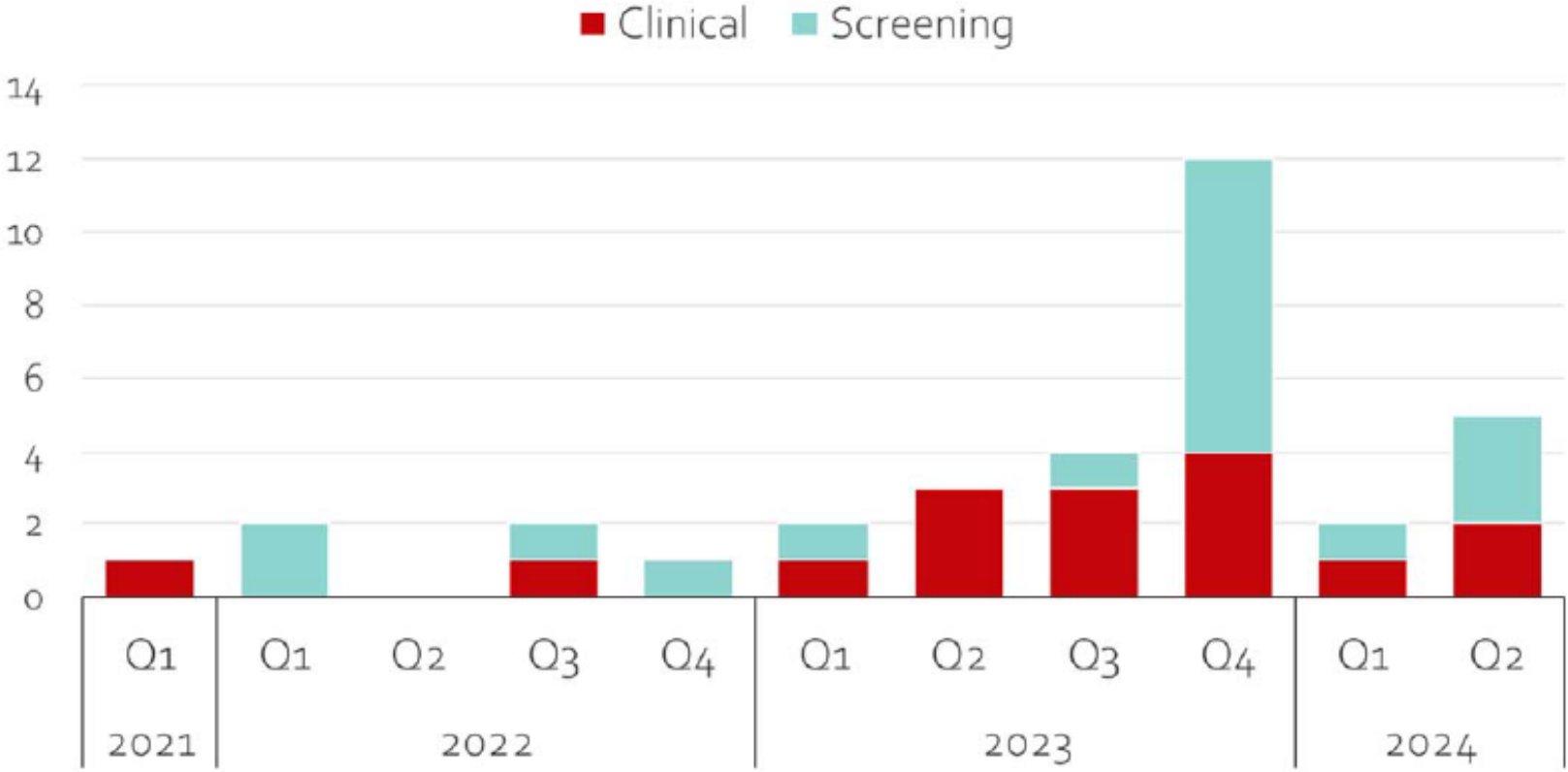
Midwest Region *Candida auris* colonization testing, 2019-2023



Candida auris colonization tests in the Midwest



Candida auris Cases Detected in Wisconsin from Clinical Cases (Infections) and Colonization Screenings





Carbapenem-resistant *Acinetobacter baumannii* (CRAB)

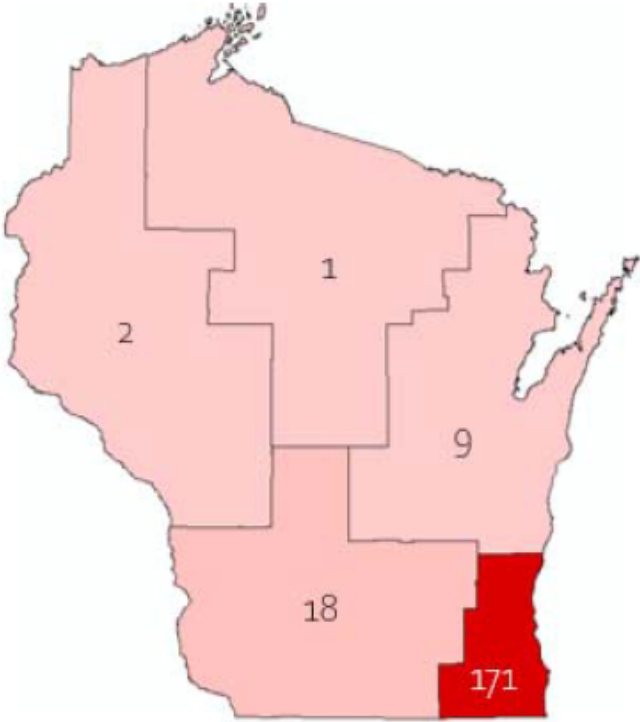


- Cause pneumonia, wound, bloodstream, and urinary tract infections
 - Infections tend to occur in ICUs
- Usually carry plasmid-encoded β -lactamases with carbapenemase activity (OXA-23, OXA-24/40, and OXA-58)
- Some *Acinetobacter* are resistant to nearly all antibiotics
 - Few new drugs in development

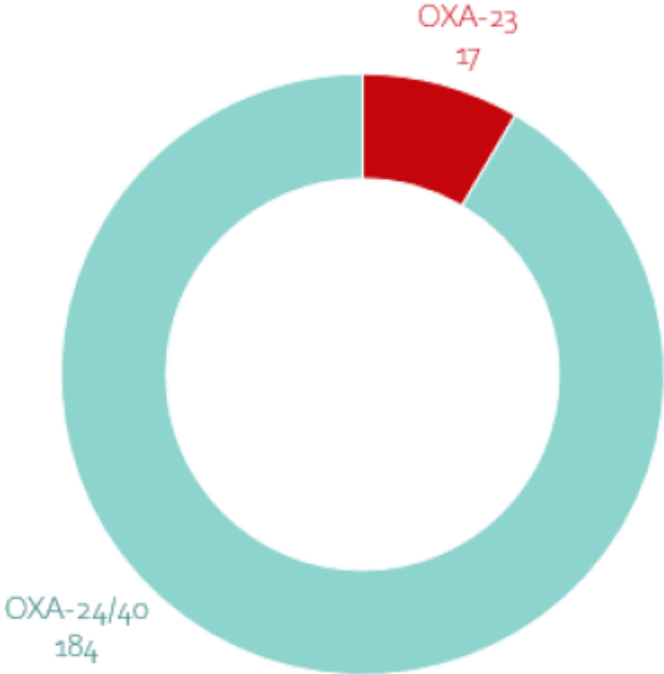


Carbapenem-resistant *Acinetobacter baumannii* (CRAB)

Carbapenemases detected at WSLH in clinical CRAB isolates from Wisconsin laboratories in 2023



Carbapenamase detections in CRAB isolates, by region of the state.



Carbapenamase genes detected in CRAB isolates by AR-targeted RT-PCR.



Outline

- WSLH Laboratory-based Surveillance Plan
- For each surveillance section:
 - Why we conduct the surveillance
 - Statewide/national surveillance programs
 - Requests (data and/or specimens) of clinical labs
 - Data – how it is used
- Surveillance sections
 - Respiratory pathogens
 - Vectorborne pathogens
 - Enteric pathogens
 - Antibiotic resistant pathogens
 - Invasive pathogens





Invasive Pathogens

Why conduct surveillance

- Identify outbreaks of *Listeria* and *Cronobacter*
- Subtyping to track subtypes/genotypes
 - Vaccine match for *Streptococcus pneumoniae*, *Haemophilus influenzae*, and *Neisseria meningitidis*
- Identify trends in enterovirus genotypes (EV-D68, etc.) to inform disease severity and future vaccines
- Track trends and species of *Blastomyces*
- Identify new pathogens causing disease
 - *Elizabethkingia* outbreak in 2016



Invasive Pathogens

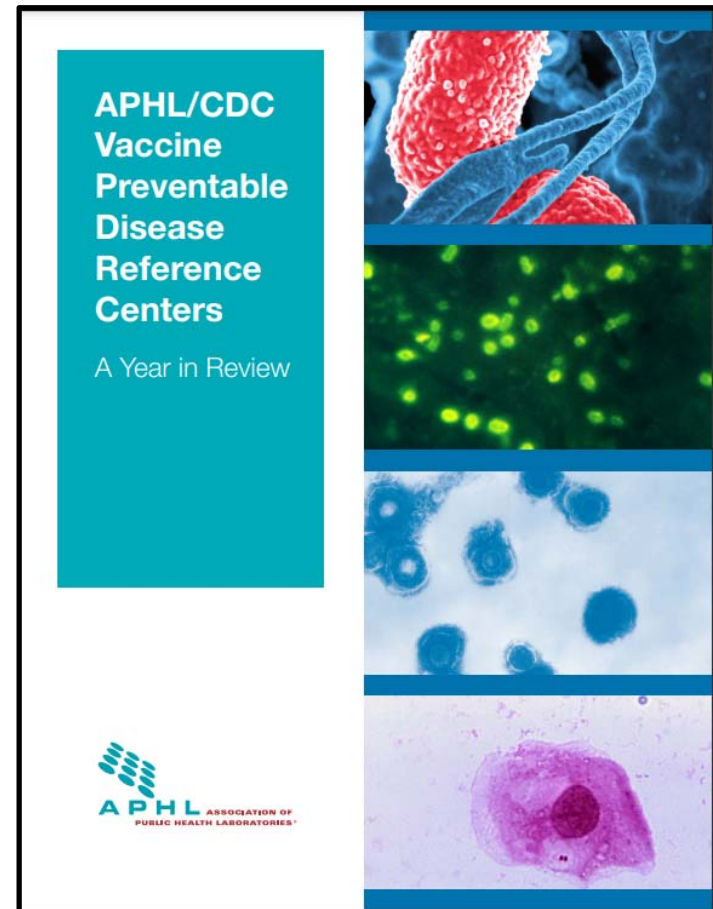
Statewide/national surveillance programs

Statewide

- Wisconsin Invasive Bacterial Laboratory Surveillance program
- WSLH requests submission of isolates of invasive pathogens listed in Surveillance Plan
- In the absence of an isolate, submit CSF specimens positive for these pathogens by a laboratory CIDT method

National

- Vaccine preventable diseases (VPD) Reference Centers

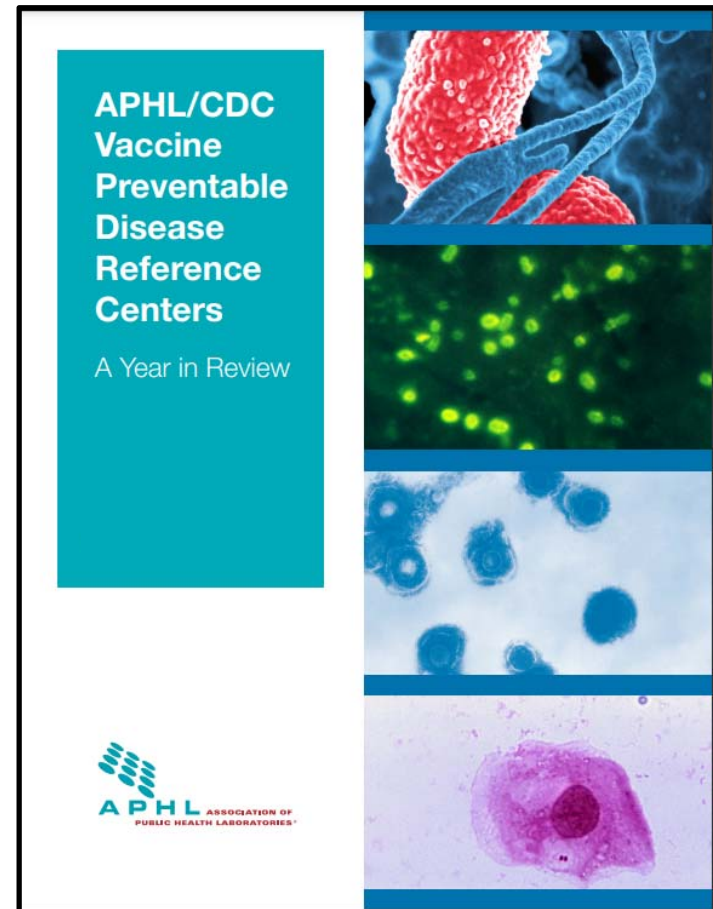




Invasive Pathogens

Statewide/national surveillance programs

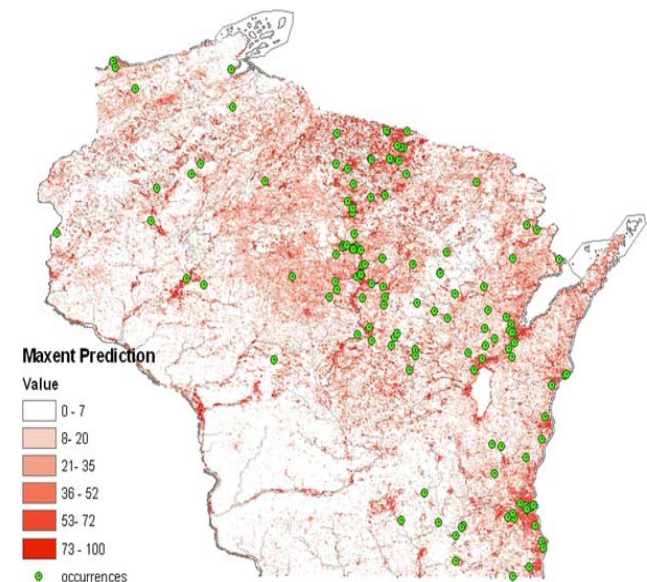
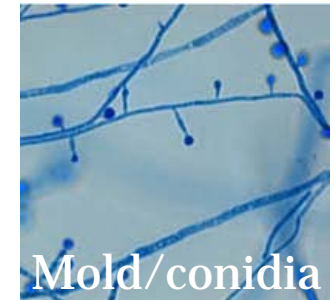
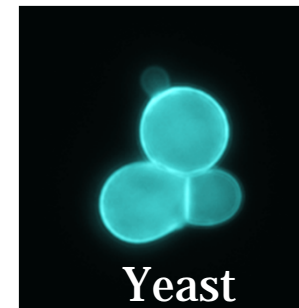
- VPD Reference Centers
 - PCR
 - Sequence-based subtyping/genotyping
- Viral (CA, MN, NY, WI)
 - Measles
 - Mumps
 - Rubella
 - VZV
- Bacterial (MN, WI)
 - *Streptococcus pneumoniae*
 - *Haemophilus influenzae*
 - *Neisseria meningitidis*





New Blastomyces Surveillance

- Dimorphic fungus endemic to North America
- Wisconsin is the hotspot!
 - 10x higher rate than any other state
- Outbreaks occur often, but we still don't know much about this fungus
- We are requesting all isolates from Wisconsin residents
- Testing will include species level identification and may lead to further characterization as needed



Reed, KD, Meece, JK, Archer JR, Peterson, AT
*Ecological Niche Modeling of Blastomyces dermatitidis
in Wisconsin. PLoS One. 2008*



Cronobacter in infants



Date: March 25, 2024

BCD 2024-01

To: Wisconsin Local Health Departments, Tribal Health Agencies, Health Care Providers, and Infection Preventionists

From: Ryan Westergaard, MD, PhD, MPH, Chief Medical Officer and State Epidemiologist for Communicable Diseases

Invasive *Cronobacter* Infection Among Infants is Now a Reportable Condition in Wisconsin

PLEASE DISTRIBUTE WIDELY

Summary

- Starting May 1, 2024, all cases of invasive *Cronobacter* infections among Wisconsin infants (less than 12 months old) are reportable to DHS.
- This change will bring *Cronobacter* reportability in alignment with its status as a nationally notifiable disease.

Clicker question:



How many cases of invasive *Cronobacter* are there in the U.S. each year?

- A) 0-10
- B) 10-100
- C) 100-1,000
- D) We don't know
- E) Do you mean coronavirus?





Clicker question:

How many cases of invasive *Cronobacter* are there in the U.S. each year?

- A) 0-10
- B) 10-100
- C) 100-1,000
- D) We don't know**
- E) Do you mean coronavirus?

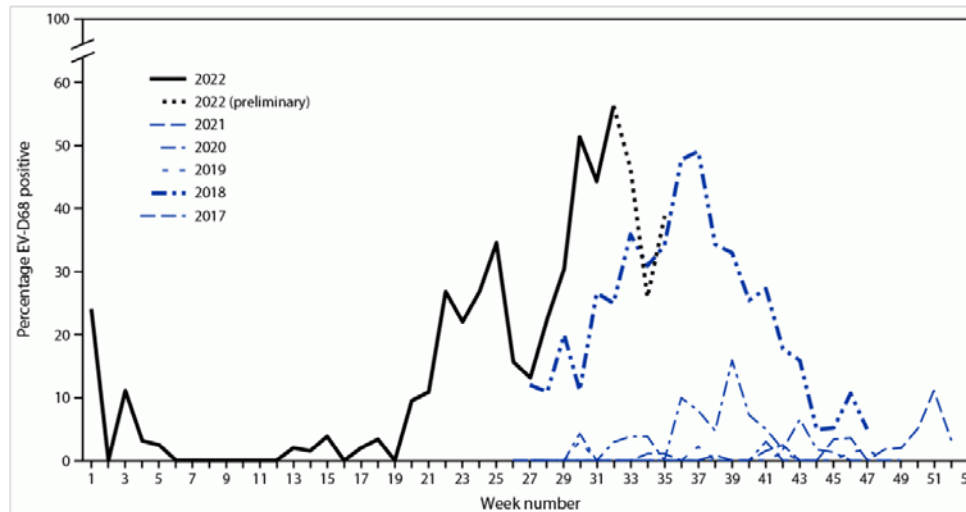
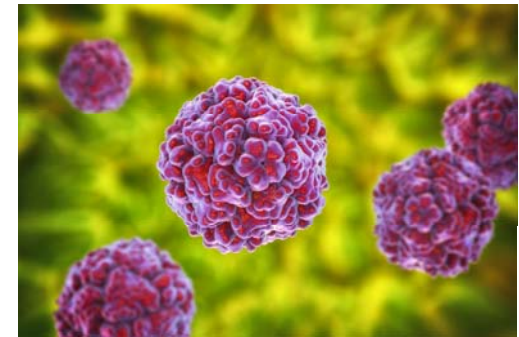
CDC typically receives reports of about 2 to 4 infections in infants per year, but before 2024 Minnesota and Michigan were the only states that required reporting.

<https://www.cdc.gov/cronobacter/about/index.html>

Enterovirus surveillance



- 2022, huge peak of EV-D68
- 5,633 children with ARI seeking emergency care in late summer
 - RV/EV detected in 26.4% of all children
 - EV-D68 detected in 17.4% of all children
- Large concern for surge of acute flaccid myelitis (AFM)



Abbreviation: EV-D68 = enterovirus D68.

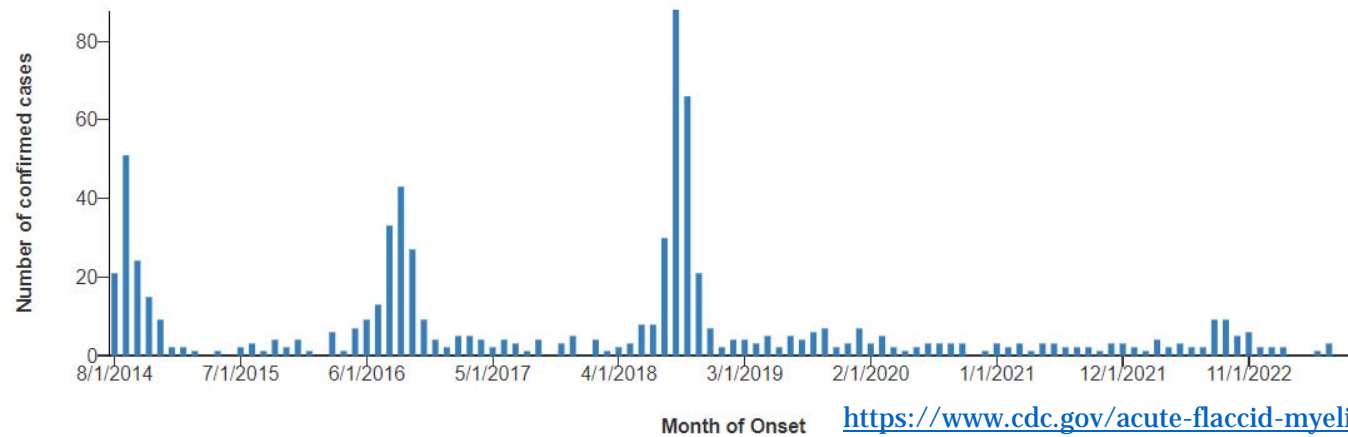
https://www.cdc.gov/mmwr/volumes/71/wr/mm7140e1.htm?s_cid=mm7140e1_x

Acute Flaccid Myelitis (AFM)



- Thankfully, no large AFM peak in 2022

Confirmed AFM cases by CDC



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



Enterovirus Surveillance Testing at the VPD Reference Centers



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"> • CSF (Identification PCR only) • CSF isolates • Non-CSF isolates that are: <ul style="list-style-type: none"> • Non-susceptible to clinically relevant antibiotics • Suspected vaccine failure • Suspected treatment failure • Outbreak related isolates
<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



Invasive Pathogens

Data and how it is used

Listeria and *Cronobacter*: find and stop outbreaks!

TODAY ON THE SHOW SHOP WELLNESS PARENTS FOOD LIFE TODAY PLAZA TODAY *all day*

July 26, 2024, 10:28 AM CDT / Updated Aug. 29, 2024, 2:46 PM CDT / Source: **TODAY**

Boar's Head deli meat recall due to listeria leads to 9 deaths

The recall was issued after Boar's Head meat was tested in connection with an ongoing listeria outbreak that has also left 57 people hospitalized.

BBC
NEWS

Wal-Mart recalls baby formula after infant dies

🕒 23 December 2011

Invasive Pathogens

Data and how it is used



N. meningitidis: track serogroups and antibiotic resistance

Public Health Strategies for Antibiotic-resistant *Neisseria meningitidis*

KEY POINTS

- CDC has detected penicillin- and ciprofloxacin-resistant serogroup Y meningococcal isolates in the United States.
- Using these antibiotics for invasive meningococcal disease in areas with resistance can increase suffering and death.
- Due to these concerns, CDC issued updated guidance related to treatment, prophylaxis, and surveillance.

Updates for the 2024-25 Season

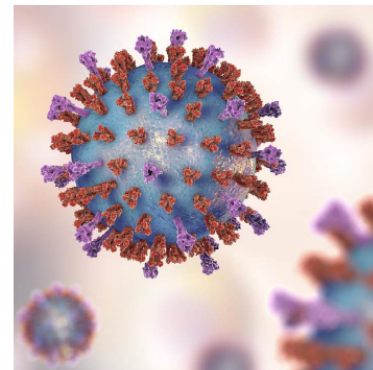


Table 1. Updates to Data and Specimen Submission Requests for the 2024-25 Season

Pathogen	Surveillance Type	What is Requested
Updated Requests		
<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"> • Sputum or BAL from Urine Antigen positive patients (NOT URINE) • Isolates (pg 12)
<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)
No Longer Requested		
<i>Aeromonas species</i>	Specimens - Enteric Pathogens	Isolates or stools
<i>Plesiomonas shigelloides</i>	Specimens - Enteric Pathogens	Isolates or stools



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.

