



Good and Plenty

Review of WCLN Surveillance



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Director, Communicable Disease Division

Wisconsin State Laboratory of Hygiene

September 2022



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



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 you
 - Data – how it is used
- Surveillance sections
 - Respiratory pathogens
 - Gastropathogens
 - Antibiotic resistant pathogens
 - Invasive bacteria
 - Vectorborne pathogens
 - Other
 - Monkeypox
 - Tuberculosis
 - Rabies





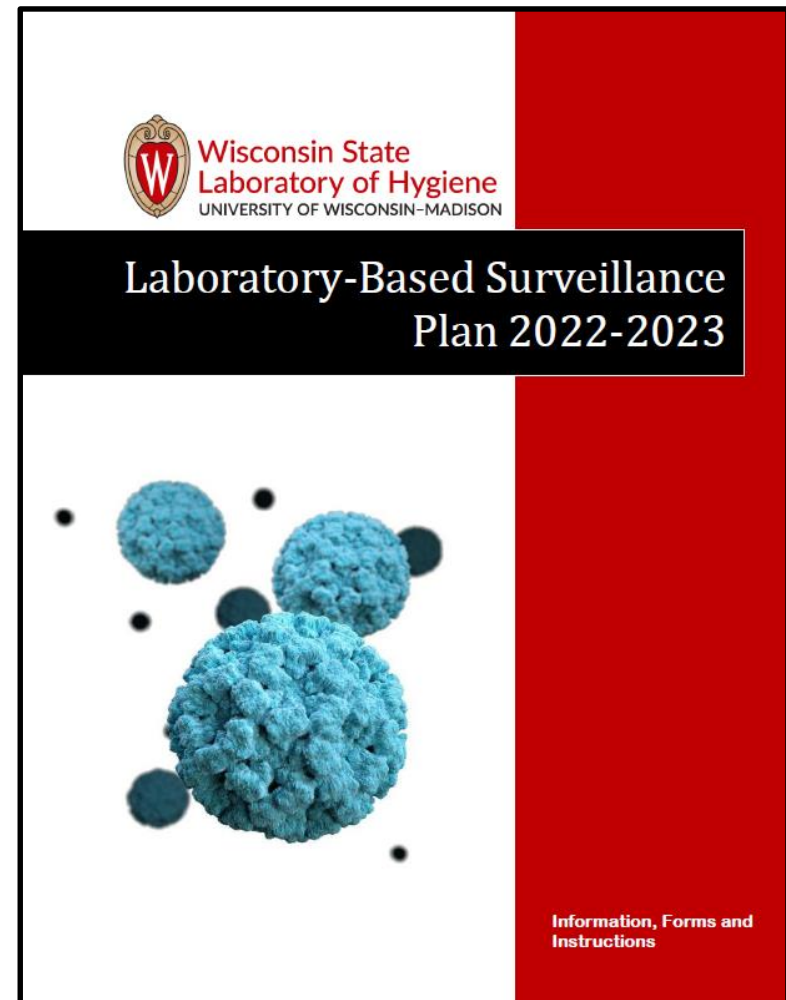
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Laboratory-based Surveillance Plan

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





Clicker question

- A) I know all about the WSLH Lab-based Surveillance Plan
- B) I know a little bit about the WSLH Lab-based Surveillance Plan
- C) This is the first I've heard of this plan thingy
- D) I'm getting the coffee you told us to get a few slides ago



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WSLH News

August 29, 2022

Labor Day 2022 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-

August 23, 2022

New Mycoplasma genitalium Test



Clinical Test Search

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The Laboratory Surveillance Reports web page provides access to the current laboratory-based surveillance reports and graphs that are generated as a testing reports provided by Wisconsin laboratories and other test sites. The graphs include both current and historical graphs and, in some cases, both statewide and regional data. Descriptions of Wisconsin's laboratory-based surveillance programs are also available on this web page.

Reporting Your Results

Click Here to Report
Wisconsin Test Data

Click Here to Access
Web-based Laboratory
Reporting (WLR) Of
Reportable Disease

For more information regarding reportable diseases, please see the following:

- Wisconsin Department of Health Services (DHS) Disease Reporting
- DHS Reportable Disease Statute, Chapter 145
- DHS Chapter 145 Appendix A, List of Reportable Diseases and Conditions

Surveillance Reports

Wisconsin Laboratory Surveillance Report (WSLH)

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

2022-2023 Laboratory-Based Surveillance Plan





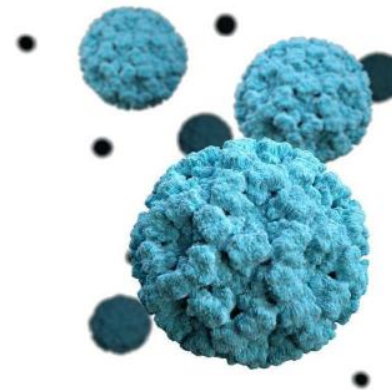
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Laboratory-Based Surveillance Plan 2022-2023



Information, Forms and
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2022-2023 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%



Web-based data reporting

- Confirm contact information
- Choose antigen or PCR/molecular testing

Select the method below to enter data; you must also select "Next".

- ☐ Antigen Detection
- ☐ PCR / Molecular

Back

Next

17%



Web-based data reporting

- For each pathogen tested, fill in the number tested, number positive, and assay used
 - Antigen
 - PCR/molecular

RSV Testing - Antigen Detection

Please report the number of specimens tested and the number positive for RSV.

	Number Tested	Number Positive
RSV		

SARS-CoV-2 (COVID) - PCR

Please report the number of specimens tested and the number positive for COVID.

	Number Tested	Number Positive
COVID		



Web-based data reporting

Thank You!

Thank you for your report!

If you have any questions or updates, please email wcln@slh.wisc.edu

To go to WSLH Web site: <http://www.slh.wisc.edu/>

Back

Submit

83%



Clicker question

- A) My lab routinely reports weekly data to WSLH
- B) My lab reports data sometimes
- C) I don't know if my lab reports or not
- D) I'm not from a lab
- E) Still waiting in the coffee line...



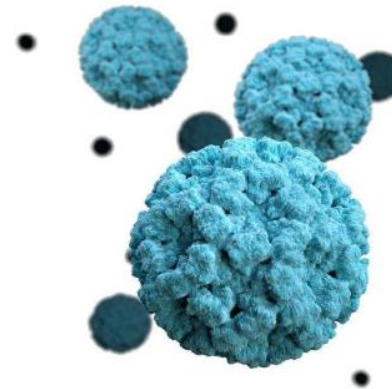
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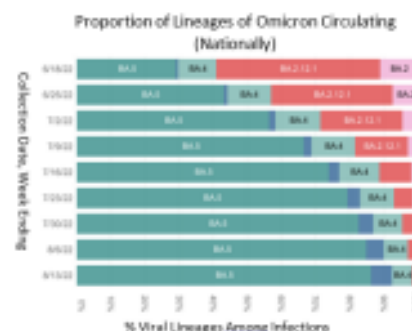
September 6, 2022

Laboratory Surveillance Report

SARS-CoV-2 & Influenza Surveillance Updates:

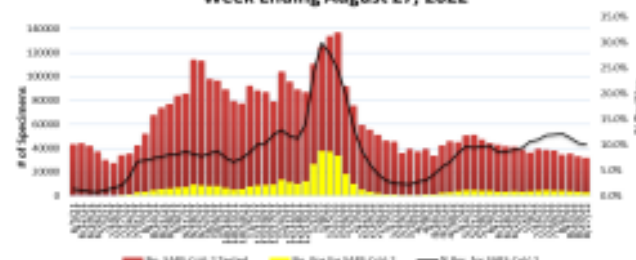
SARS-CoV-2

- SARS-CoV-2 activity is high in Wisconsin (10.0%) and nationally (14.6%).
- Omicron lineage BA.5 [and its sublineages] was the predominant lineage detected nationally (85-90%).



<https://covid.cdc.gov/covid-data-tracker/#viral-lineage-section>

% Positive SARS-CoV-2 by PCR (Wisconsin), June 2021 to Week Ending August 27, 2022



% Positive for Influenza by PCR (Wisconsin), June 2021 to Week Ending August 27, 2022



Influenza

- Influenza activity is low in Wisconsin (0.1%) and nationally (0.5%).
- The dominant Influenza subtype is H3N2.

To enhance surveillance activities, the WSLH asks labs to please send:

1. A sampling of specimens from influenza-related hospitalizations (e.g. 1 per week).
2. Influenza A specimens that fail to subtype ($C_t < 35$) if subtyping for 2009 pdmH1 and H3 were performed.
3. Please send up to 5 SARS-CoV-2 specimens per week.

Links:



Clicker question

- A) I receive the WSLH Laboratory Surveillance report every two weeks
- B) I don't receive it but would like to
(psst! Email wcln@slh.wisc.edu to be added to the list)
- C) I don't receive it and don't want to
(If you click this option, it'll be a long hour for you – better get comfortable for a nap now)



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Respiratory Pathogens

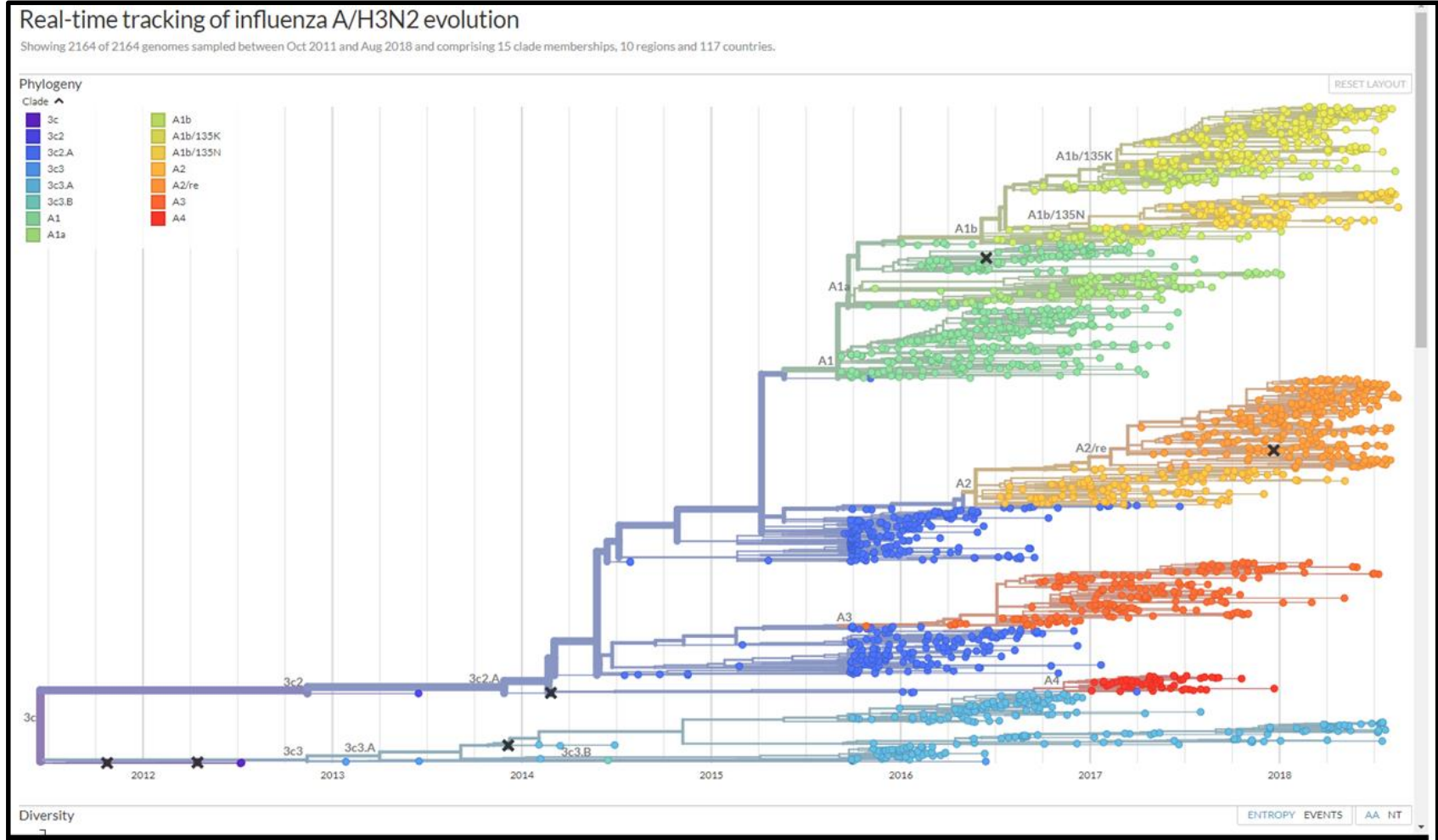
Why conduct surveillance (not an exhaustive list!)

- Respiratory pathogens overall
 - Situational awareness of what is circulating, to inform clinical decision-making and public health response
- SARS-CoV-2
 - Situational awareness to inform mitigation measures
 - Number of cases, hospitalizations, deaths
 - Genomic surveillance
 - Track virus lineages/variants of interest and concern
 - Inform monoclonal antibody use
 - Inform vaccine strain inclusion (BA.4/BA.5 Omicron subvariants in updated booster)



Respiratory Pathogens

Why conduct surveillance - 2





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
 - Rapid influenza antigen confirmation
 - University Health clinics submissions
 - WSLH testing of suspect avian or swine influenza



Respiratory Pathogens

Statewide/national surveillance programs

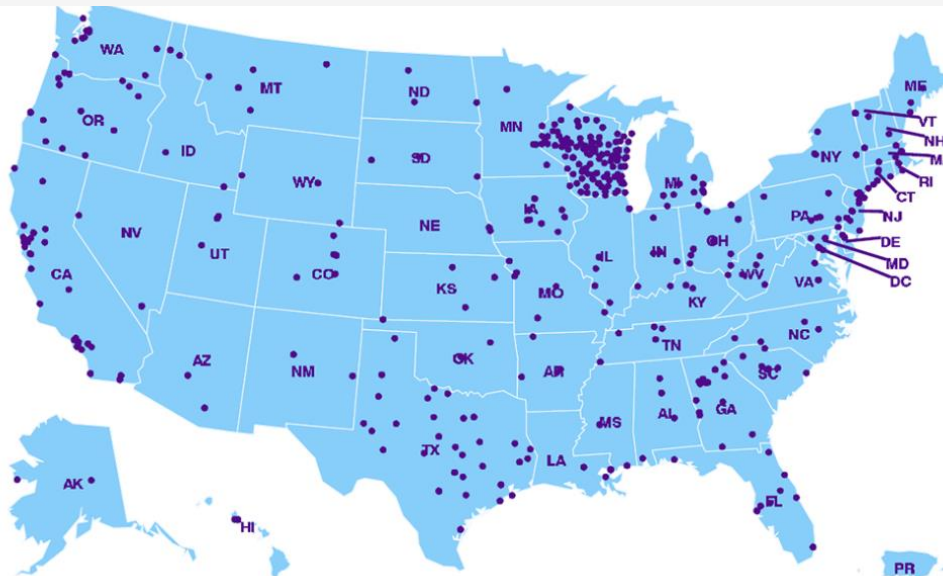
- National program – clinical lab testing data



Centers for Disease Control and Prevention
CDC 24/7: Saving Lives, Protecting People™

Map of Participating Labs

The National Respiratory and Enteric Virus Surveillance System (NREVSS)

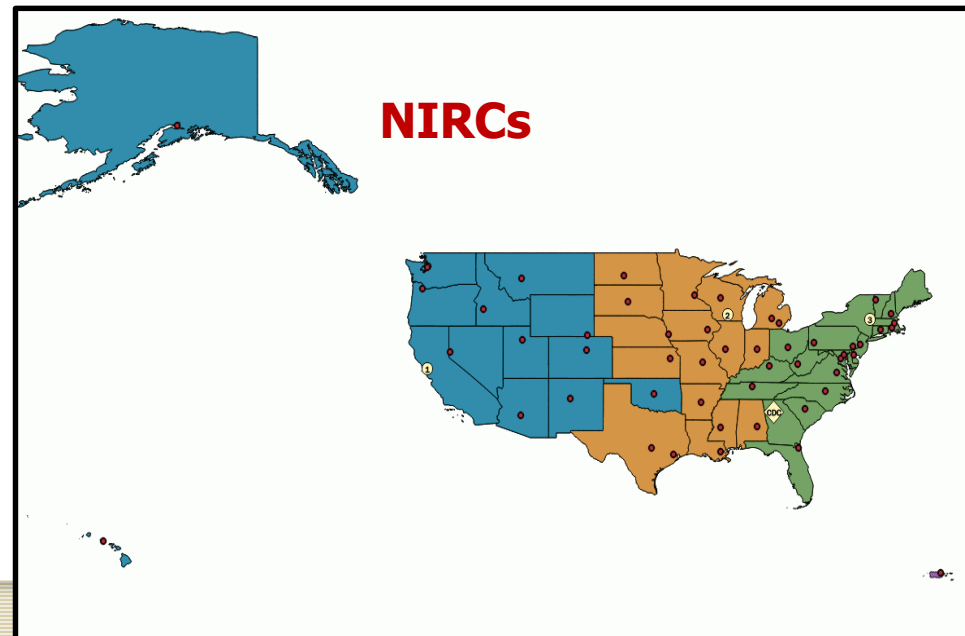
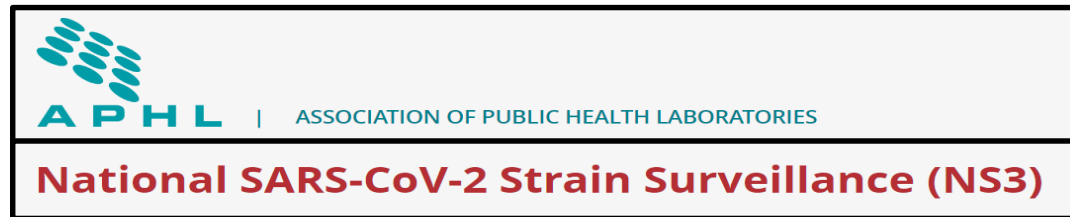




Respiratory Pathogens

Statewide/national surveillance programs

- National programs – specimen submission



Laboratory-based Surveillance in Wisconsin

Respiratory Pathogen Surveillance

Background:

Laboratory-based surveillance for influenza and other respiratory pathogens is coordinated by the Wisconsin State Laboratory of Hygiene (WSLH), in collaboration with the Wisconsin Division of Public Health and the Centers for Disease Control and Prevention (CDC). This multi-element laboratory-based surveillance program has enabled us to achieve the four key objectives of routine influenza surveillance that include:

Table 1: Laboratory Testing Data Requested for Respiratory Pathogens

Pathogen	Testing Data requested	Frequency to Report
Respiratory Pathogens - Antigen Detection		
Influenza A/B	Number detected and number tested	Weekly
SARS-CoV-2		
RSV		
Respiratory Pathogens - PCR/Molecular Detection		
Influenza A/B	Number detected and number tested	Weekly
SARS-CoV-2		
Non-influenza respiratory pathogens (RSV, Rhinovirus, etc)		
B. pertussis and parapertussis		

Table 2: Specimens Requested for Submission to WSLH for Additional Testing

Testing Site:	Season		
	Off Season (June-September)	Early Season (Fall*)	Respiratory Season (Winter/Spring*)
Influenza and Other Respiratory Viruses			
Rapid Testing	<u>ALL</u> influenza positives	First influenza A or B of the year	Influenza A positive specimens with: - International travel history - Swine exposure
PCR/Molecular	<u>ALL</u> influenza positives	<u>ALL</u> influenza Positives	One influenza-related hospitalization per week AND Unsubtypable influenza A positives (Ct < 35) AND Influenza A positive specimens with: - International travel history - Swine exposure



Respiratory Pathogens

Data and how it is used



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« All Events

WCLN Webinar – SARS-CoV-2, Influenza and Other Respiratory Viruses Update – 2022

October 5 @ 12:00 pm - 1:00 pm

« WCLN 2022 Regional Meetings (9/22)

SARS-CoV-2, Influenza and Other Respiratory Viruses Update – 2022

Presenters:

- **Allen Bateman, Ph.D., D(ABMM)**, Director of Communicable Disease Division, Wisconsin State Laboratory of Hygiene
- **Erika Hansen, M.S.**, Virology Lead, Communicable Disease Division, Wisconsin State Laboratory of Hygiene



SARS-CoV-2 in the U.S. since the beginning

U.S. trends

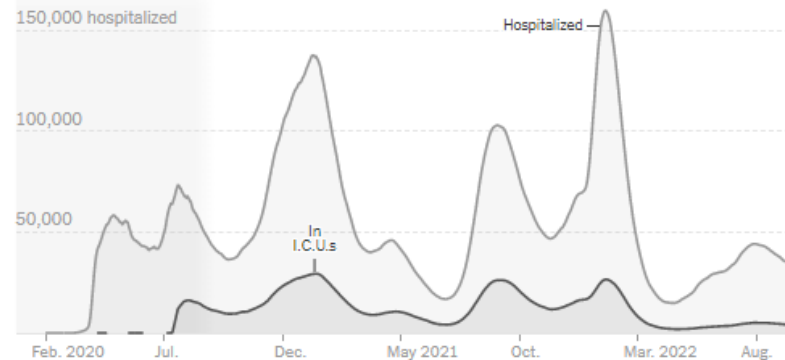
All time Last 90 days

New reported cases by day

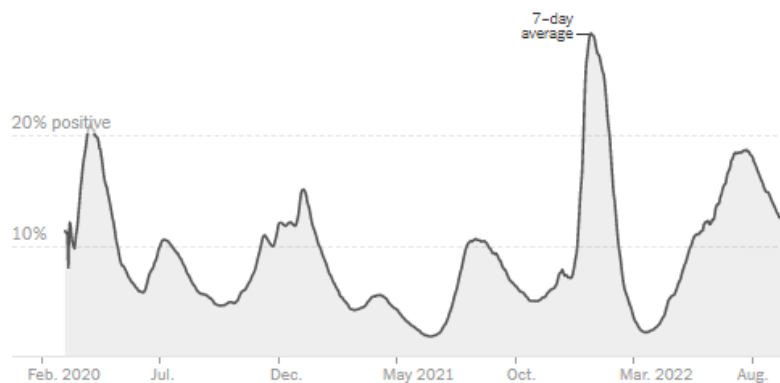


Covid patients in hospitals and I.C.U.s

Early data may be incomplete.



Test positivity rate



New reported deaths by day

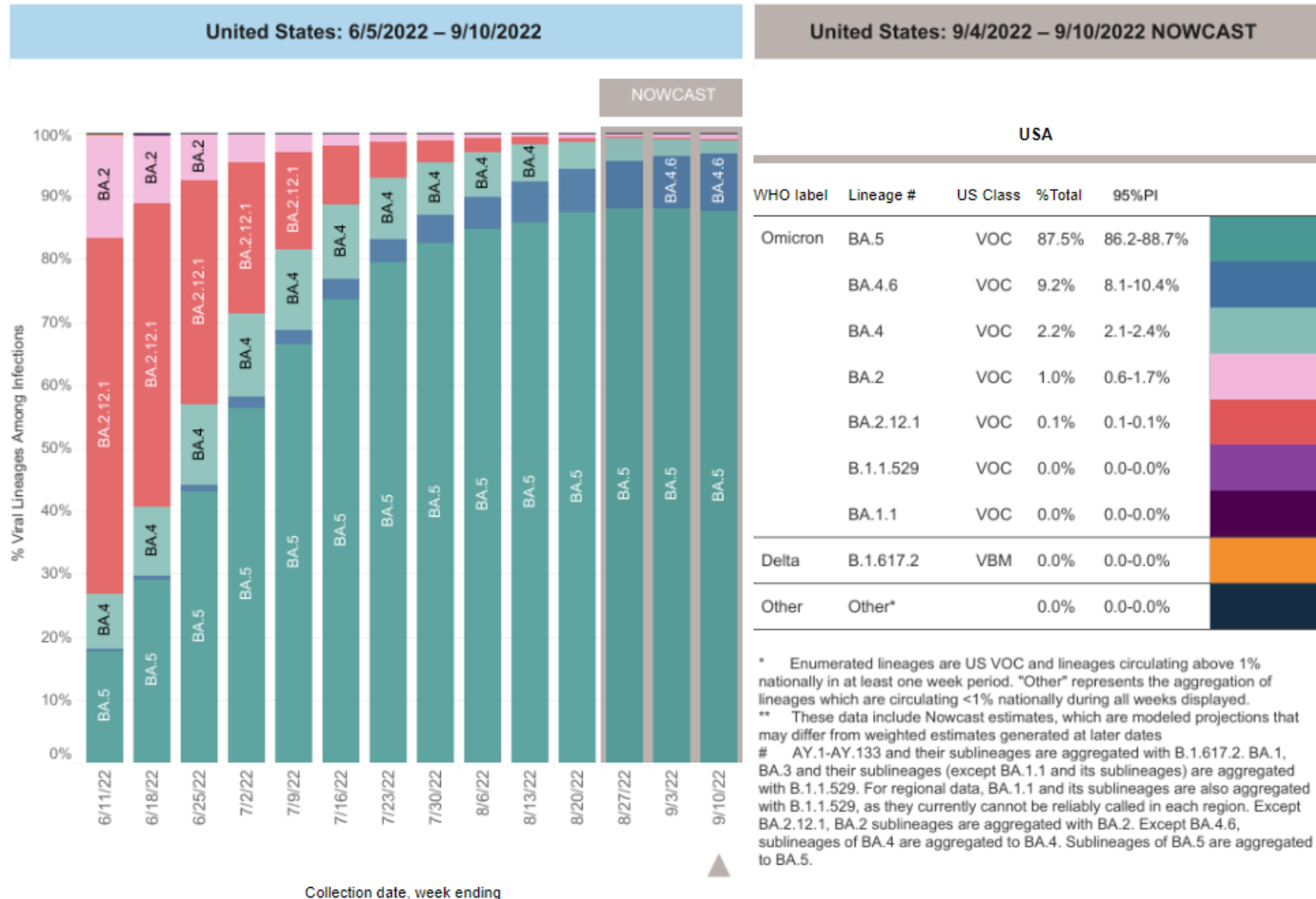


[About this data](#)

<https://www.nytimes.com/interactive/2021/us/covid-cases.html>



SARS-CoV-2 Genomic Surveillance





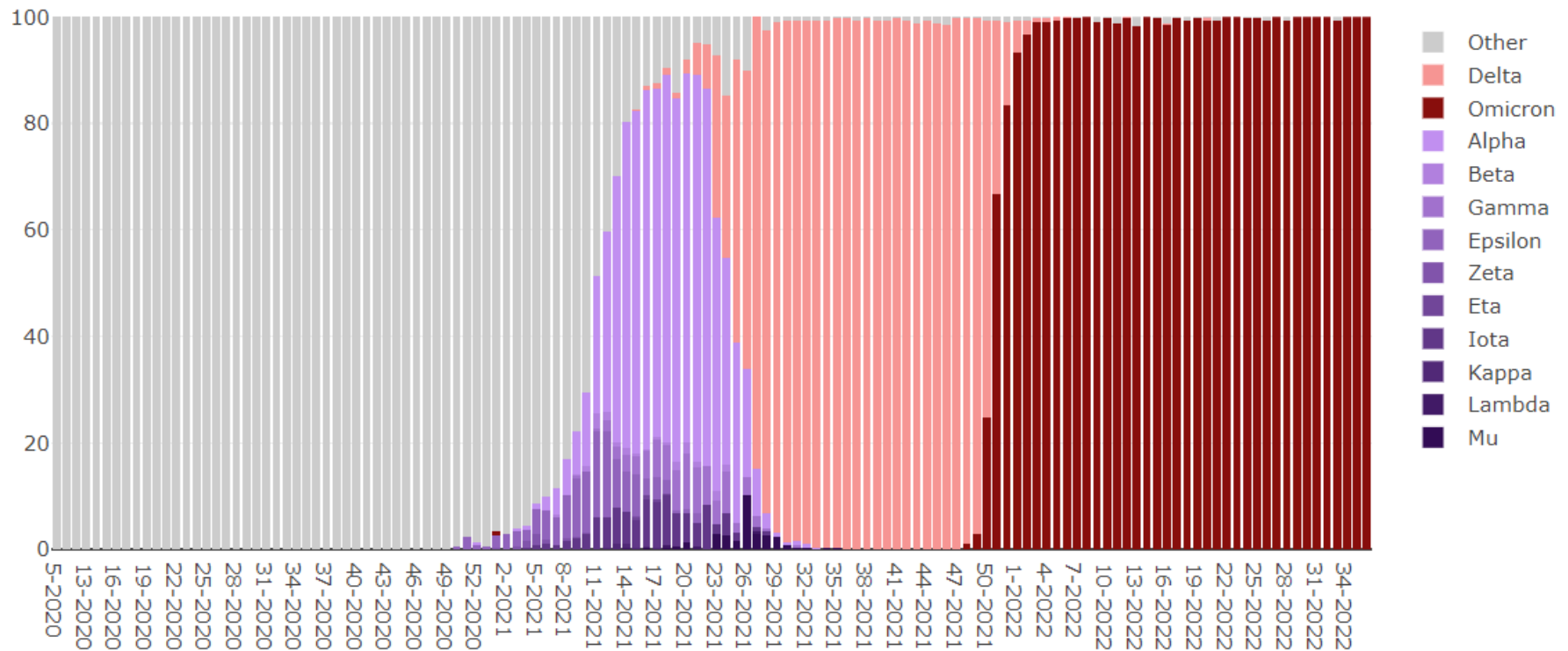
SARS-CoV-2 Genomic Surveillance in Wisconsin

Proportion of Variants

Variants of Concern

Variants Being Monitored

Search Variants

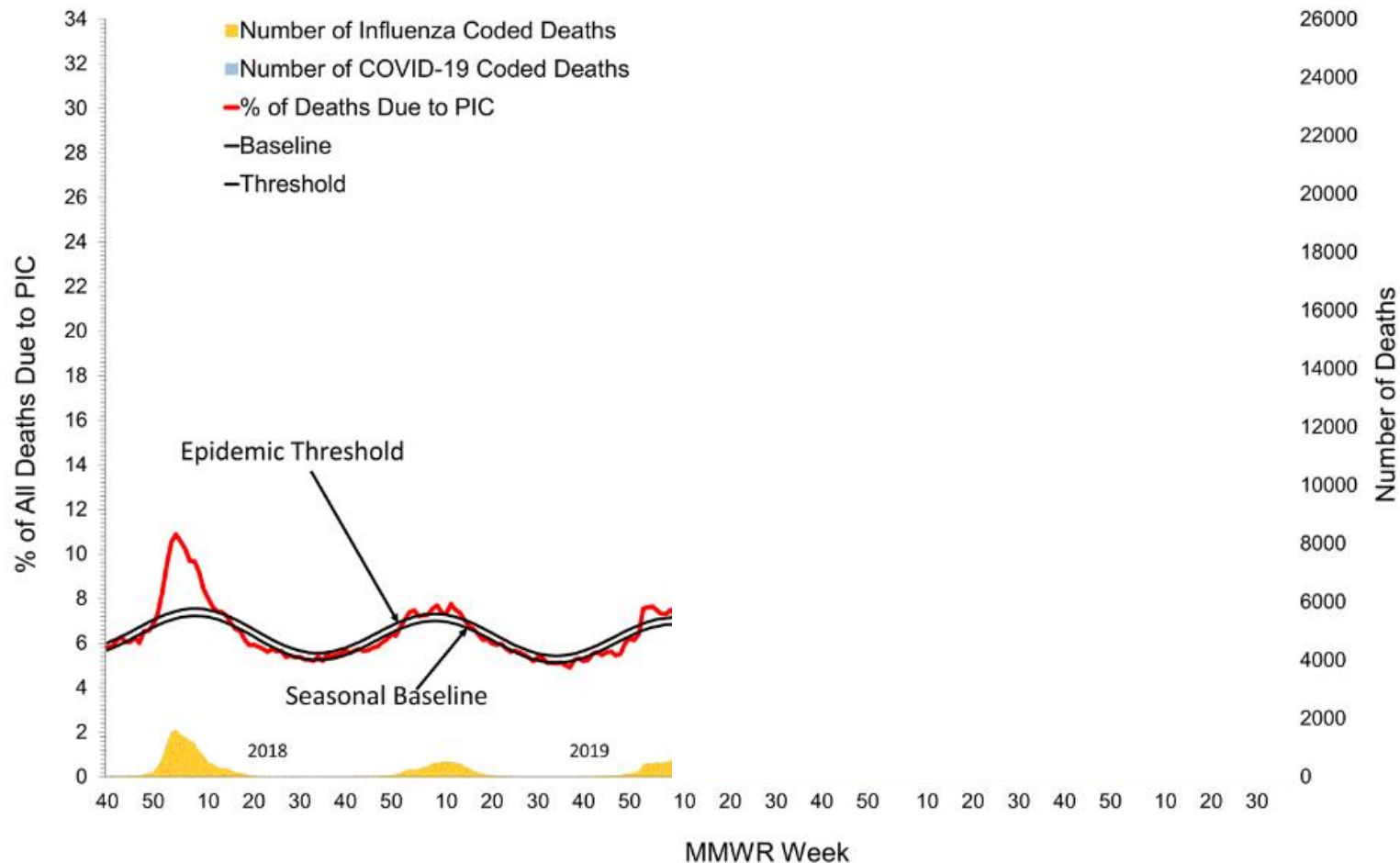


<https://dataportal.slh.wisc.edu/sc2dashboard>



Pneumonia, Influenza, and COVID-19 Mortality from the National Center for Health Statistics Mortality Surveillance System

Data as of September 8, 2022

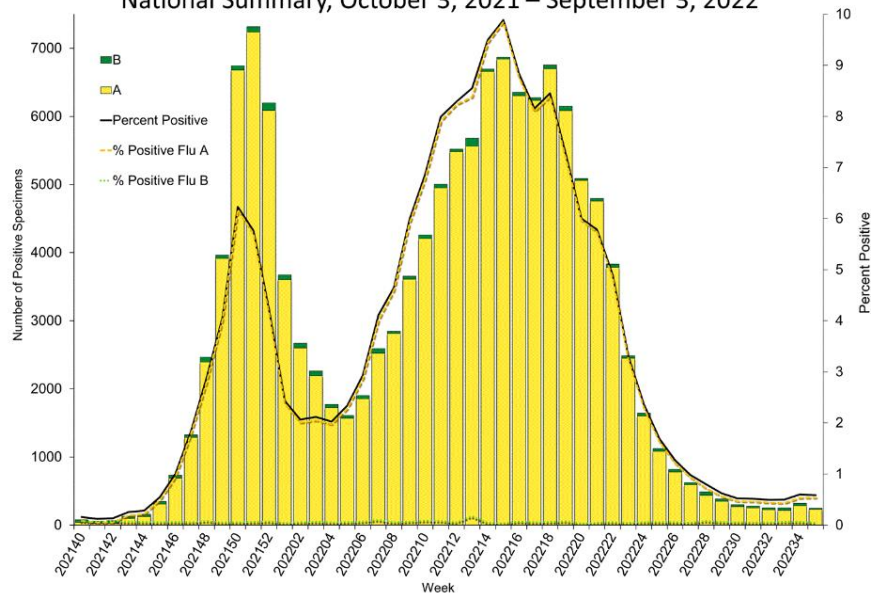




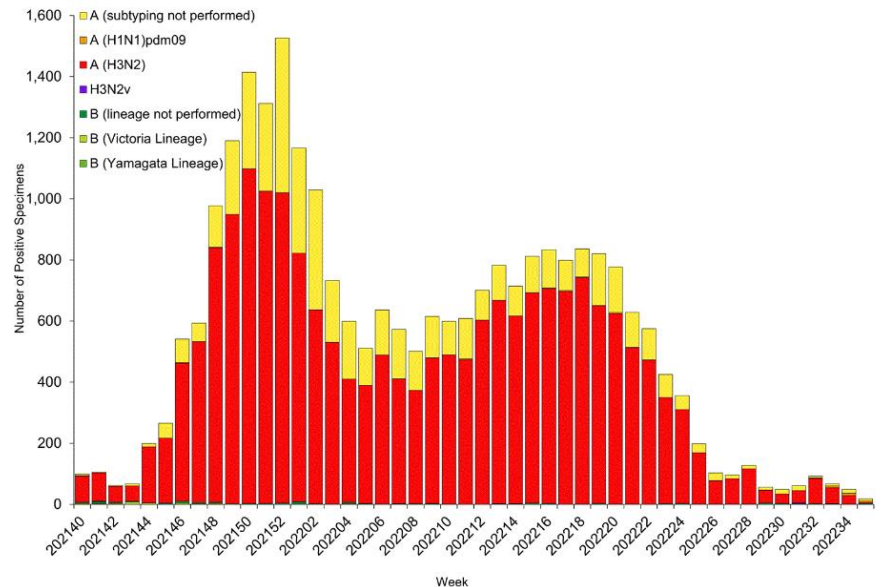
Influenza in the U.S.

2021-22 was a moderate season

Influenza Positive Tests Reported to CDC by U.S. Clinical Laboratories,
National Summary, October 3, 2021 – September 3, 2022



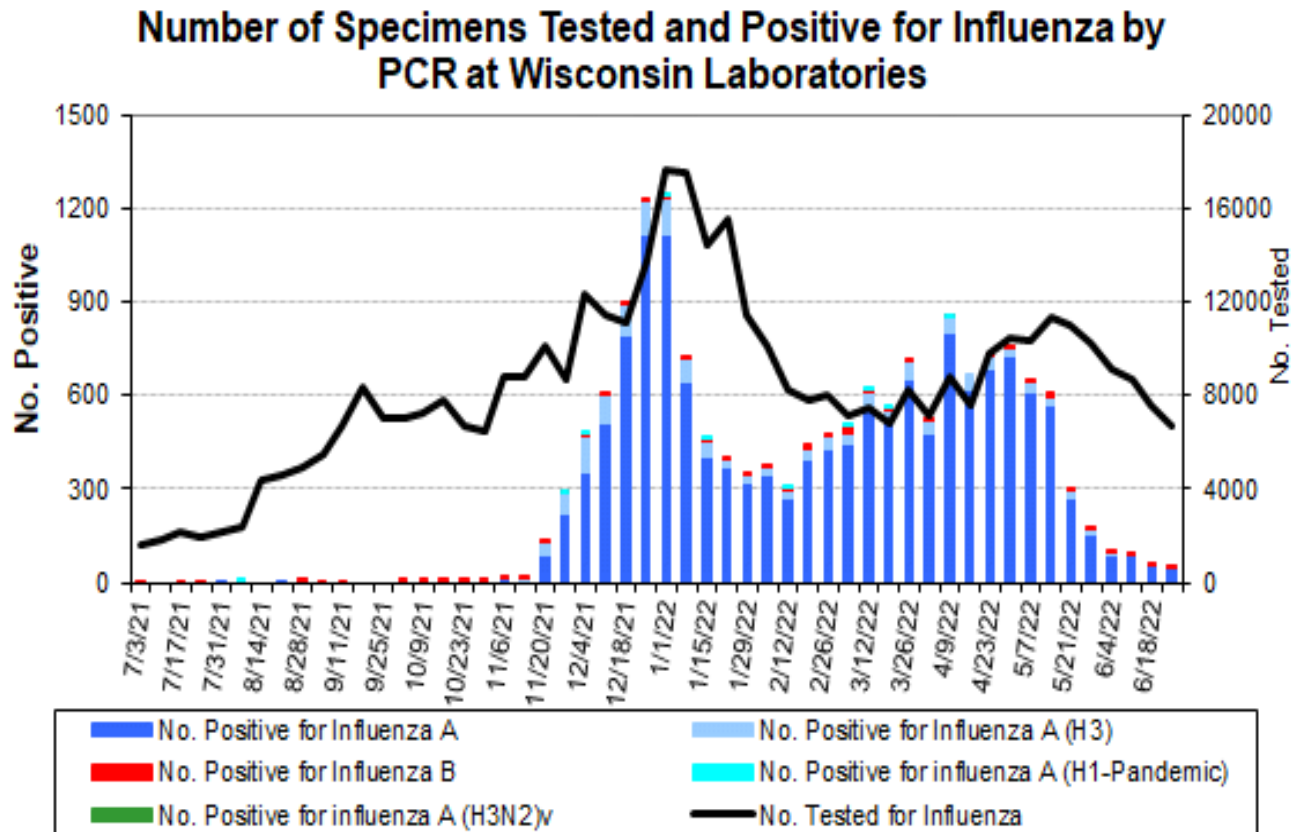
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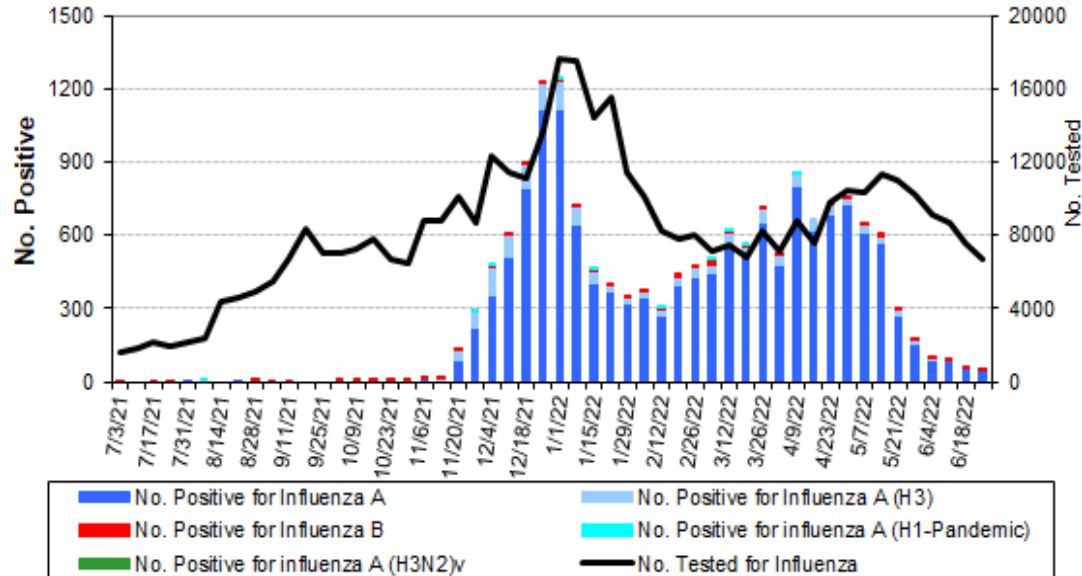
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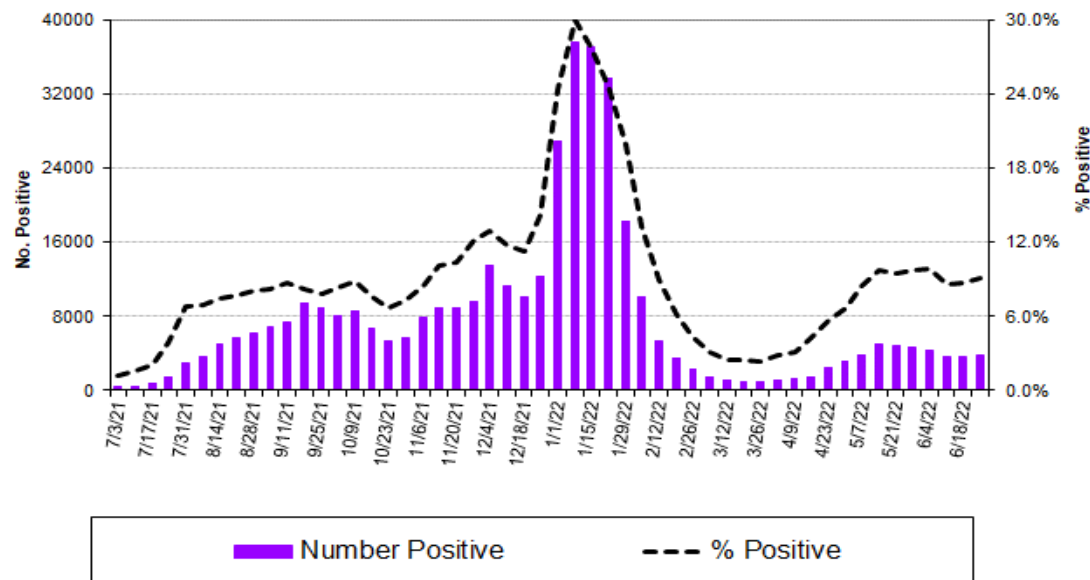


Number of Specimens Tested and Positive for Influenza by PCR at Wisconsin Laboratories



Influenza and Omicron in Wisconsin

Number of Specimens Tested, Positive and the Percent Positive for COVID-19 by PCR at Wisconsin Laboratories 2021-2022





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Gastrointestinal (GI) Pathogens

Why conduct surveillance

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



Gastrointestinal (GI) Pathogens

Statewide surveillance programs

Wisconsin Acute Diarrheal Illness Surveillance Program – Data Summaries

- Similar to the respiratory surveillance data
- Clinical labs submit GI pathogen PCR testing weekly data for enteric targets including bacterial, parasitic and viral pathogens
- WSLH aggregates the data and provides summary reports in the bi-weekly Laboratory Surveillance Reports

Wisconsin Enteric Pathogens Surveillance – Specimen Submissions

- WSLH requests positive stool specimens (by PCR) or enteric isolates for further identification, serogroup/serotype, molecular subtype or whole genome sequencing.
- To recognize and respond to clusters and outbreaks of GI in Wisconsin. The resulting laboratory data is used by epidemiologists at the WDPH to determine linkage to potential food and environmental point sources.



Gastrointestinal (GI) Pathogens

National surveillance programs

- PulseNet
 - *Salmonella*
 - STEC
- CaliciNet
 - Norovirus
- CryptoNet
 - *Cryptosporidium*
- NARMS
 - AST of certain enteric bacteria

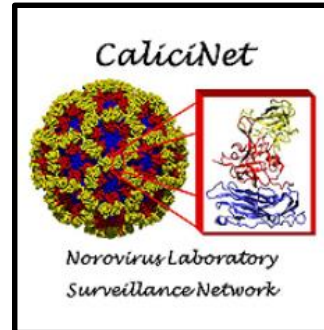




Table 3. Gastropathogen Lab Testing Data and Specimen Submission Requests

Pathogen	Testing Data to Report	Frequency to Report	Send specimens to WSLH
Gastropathogens (PCR or other CIDT)			
<i>Aeromonas</i> species	Number detected and number tested	Weekly	Isolates or stool for identification
<i>Campylobacter</i> species			Isolates or stool for 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 for identification, serotyping and molecular subtyping (WGS)
<i>Plesiomonas shigelloides</i>			Isolates or stool for identification
<i>Salmonella</i> species			Isolates or stool for identification, antimicrobial susceptibility testing and molecular subtyping (WGS)
<i>Shigella</i> species and Enteroinvasive <i>E.coli</i> (EIEC)			Isolates or stool for identification and antimicrobial susceptibility testing; Molecular subtyping will be performed as necessary



Table 3. Gastropathogen Lab Testing Data and Specimen Submission Requests

Pathogen	Testing Data to Report	Frequency	Send specimens to WSLH
Gastropathogens (PCR or other CIDT)			
<i>Vibrio</i> Species	Number detected and number tested	Weekly	Isolates or stool for identification and referral to CDC
<i>Yersinia</i> species			Isolates or stool for identification
<i>Cryptosporidium</i> species			Stool for identification* and genotyping
<i>Cyclospora cayetanensis</i>			Stool for molecular subtyping and/or referral to CDC
Rotavirus			<u>One positive per week</u> for molecular subtyping/genotyping
Any other organism suspected of being in a cluster or outbreak of public health significance			Consult with Wisconsin Division of Public Health Foodborne Disease Epidemiologists; isolates or stool for identification and molecular subtyping as applicable
<i>Clostridioides difficile</i>			WSLH does not request submission of this organism at this time
Norovirus			WSLH does not request routine submission of this organism at this time unless specifically requested by the WDPH or WSLH



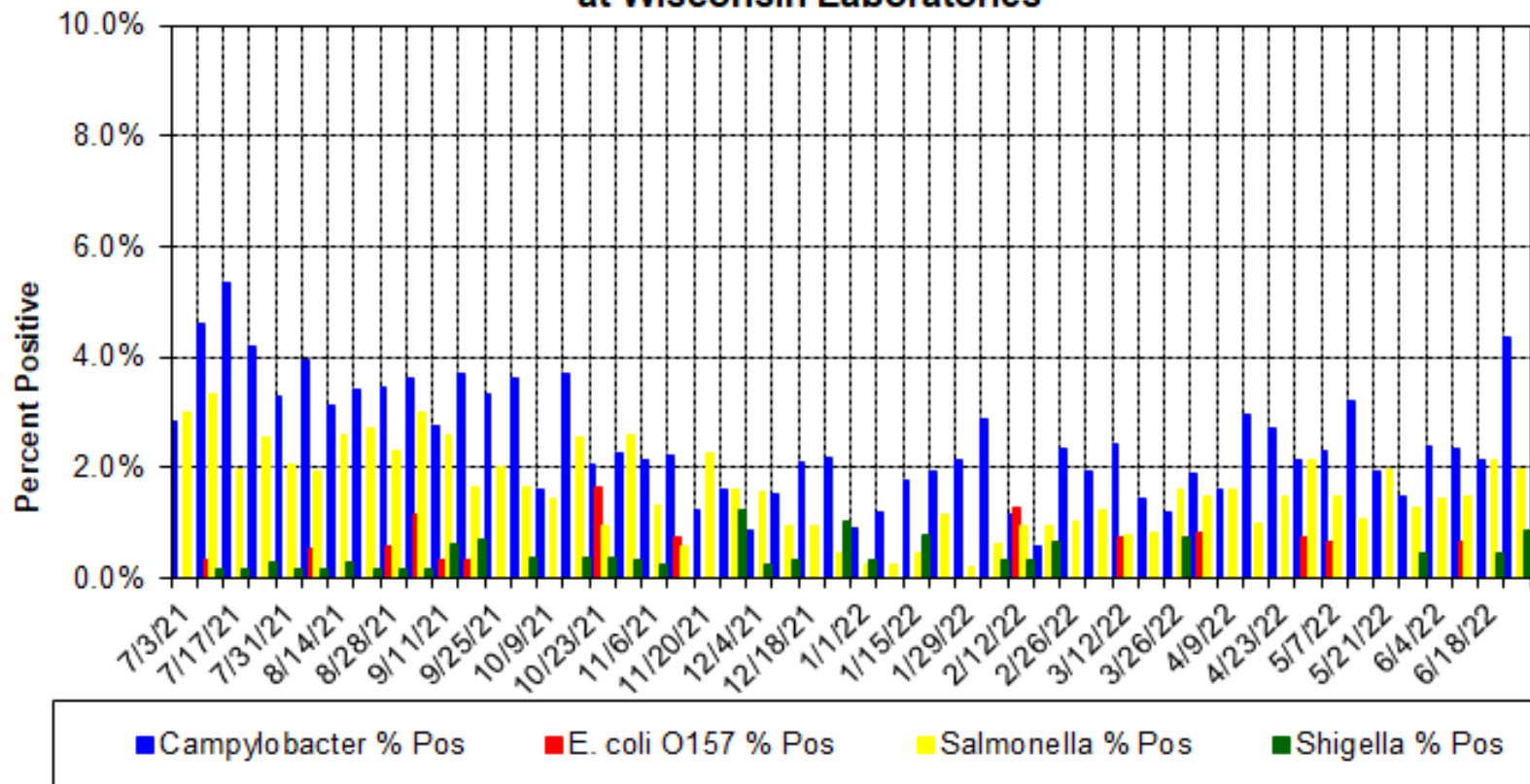
Pathogen	Testing Data to Report	Frequency	Send specimens to WSLH
Gastropathogens (PCR or other CDT)			
Astrovirus	Number detected and number tested	Weekly	WSLH does not request submission of these organisms at this time unless specifically requested by the WDPH.
Sapovirus			
Adenovirus F (40/41)			
Enteropathogenic, Enteraggretative and Enterotoxigenic <i>E. coli</i> (EPEC, EAEC and ETEC)			
<i>Giardia</i> species			
<i>Entamoeba histolytica</i>			



GI Pathogens

Data and how it is used

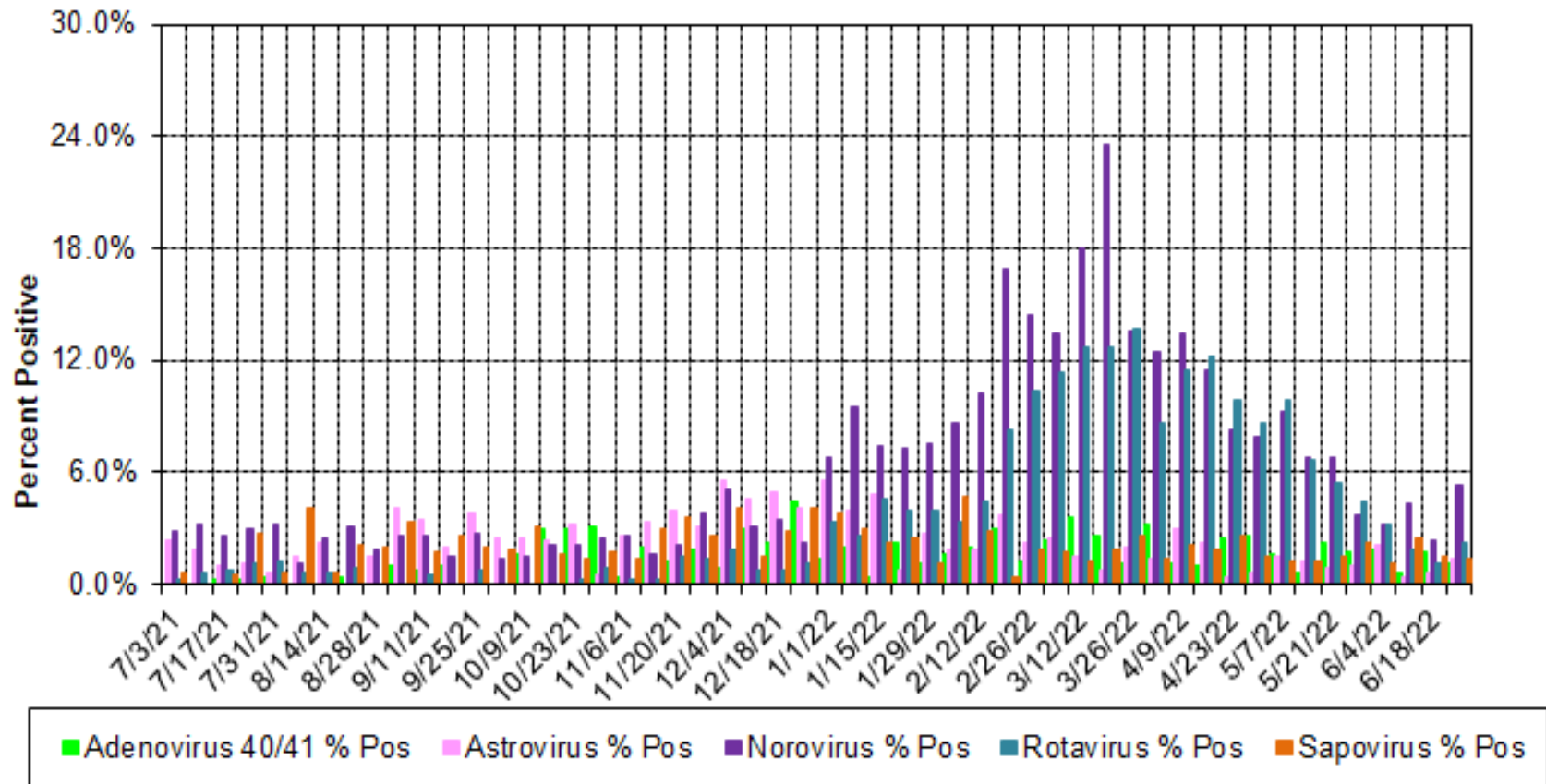
**Positivity of Bacterial Enteric Pathogens by PCR
at Wisconsin Laboratories**





GI Pathogens

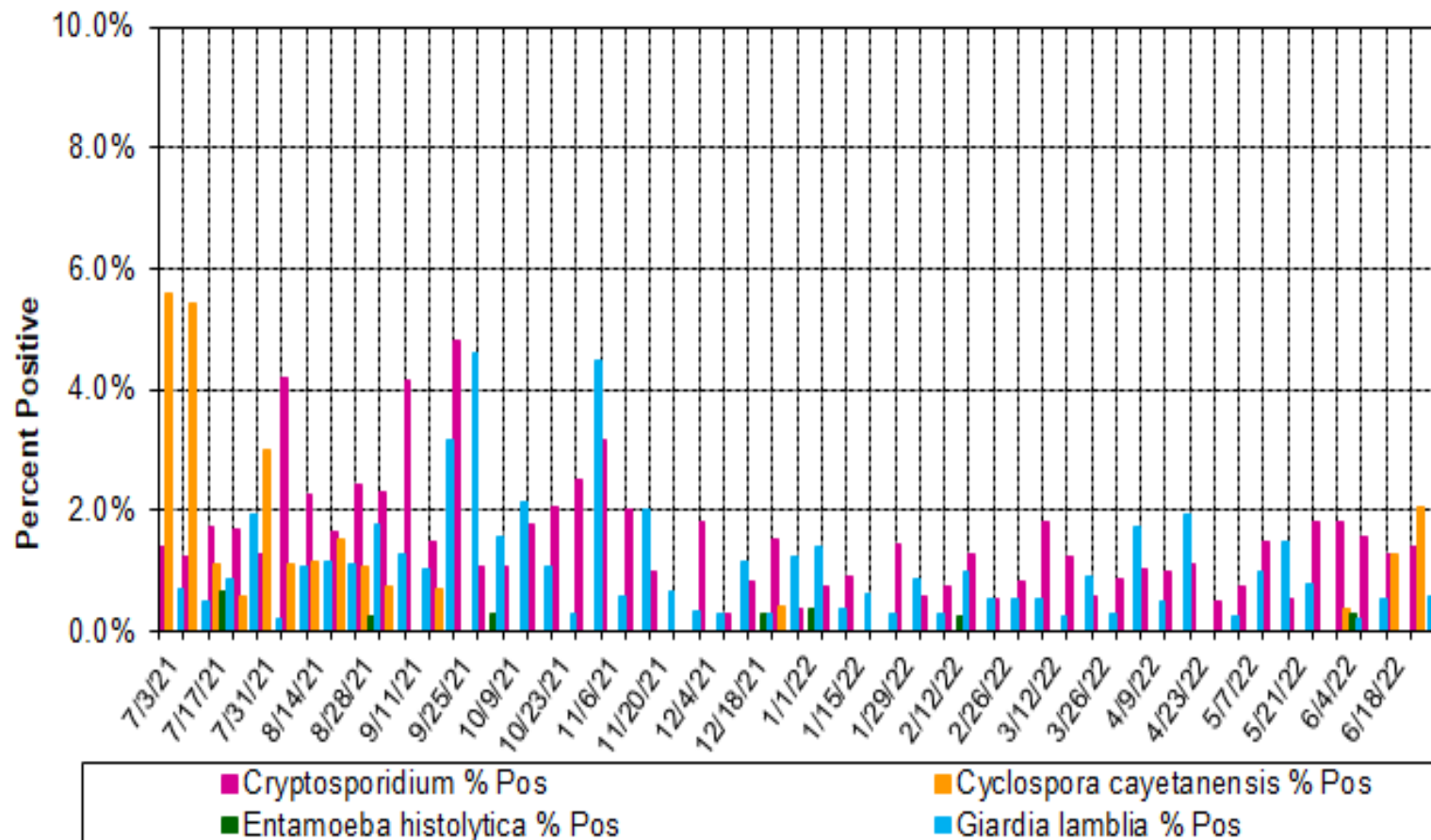
**Positivity of Viral Enteric Pathogens by PCR
at Wisconsin Laboratories**





GI Pathogens

Positivity of Parasitic Enteric Pathogens by PCR
at Wisconsin Laboratories





GI Pathogens: *Salmonella*

PulseNet numbers in WI:

- ~1,000 *Salmonella*/year
- ~400 STEC/year
- handful of *Shigella*



Two *Salmonella* outbreaks identified in WI this past year

1. Multiple outbreaks of *Salmonella* infections linked to contact with live backyard poultry

- As of August 1, 2022, 884 people infected with one of the outbreak strains of *Salmonella* nationwide
- 158 hospitalizations and two deaths reported nationally
- In Wisconsin, 41 people have been infected with one of the outbreak strains of *Salmonella*, resulting in 5 hospitalizations and no deaths
- Note: case numbers are known to be significant undercount!



GI Pathogens: *Salmonella*

2. Cases of *Salmonella* associated with shelled (loose) peas produced by Green Barn Farm Market.

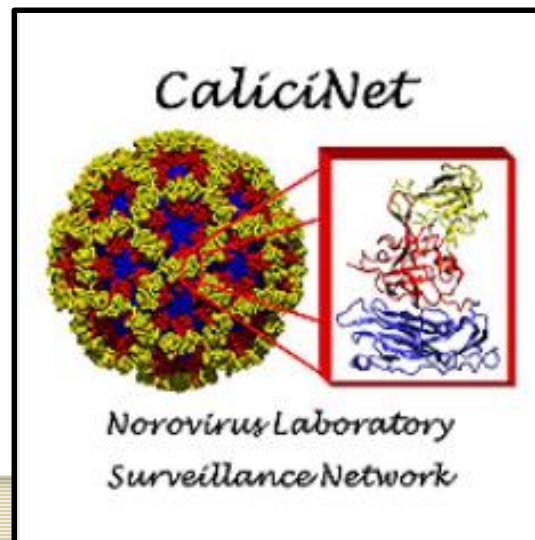
- Peas were sold at farmers markets in Ripon, Green Bay, Madison, and Fond du Lac, and Green Valley Acres Farm farm stands in Neenah.
- As of July 29, 2022, six people have been infected with the same strain of *Salmonella*. Three of the six patients have required hospitalization.
- Anyone who bought shelled (loose) peas from Green Barn Farm Market or Green Valley Acres Farm since July 1, 2022, is advised not to eat them and to throw them away, even if they are frozen.





GI Pathogens: Norovirus

- CaliciNet collects information on norovirus strains associated with GI outbreaks
- Public health labs submit laboratory data, including genetic sequences of norovirus strains
- Epidemiology data from norovirus outbreaks is also submitted
- Norovirus strains are compared with other norovirus strains in the database, helping CDC link outbreaks to a common source, monitor norovirus strains that are circulating, and identify new emerging norovirus strains

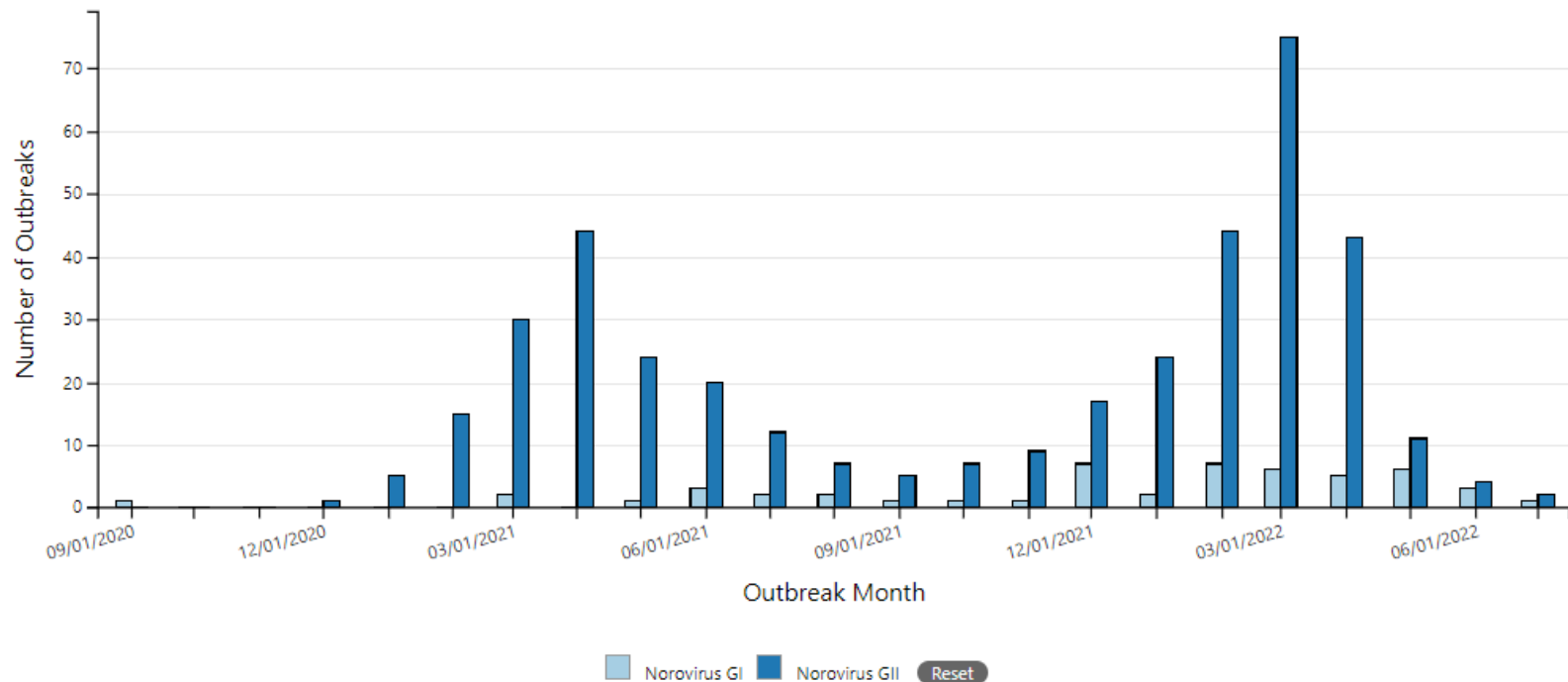




GI Pathogens: Norovirus

Number of Confirmed Norovirus Outbreaks Submitted to CaliciNet, by Genogroup

September 1, 2020 – July 31, 2022



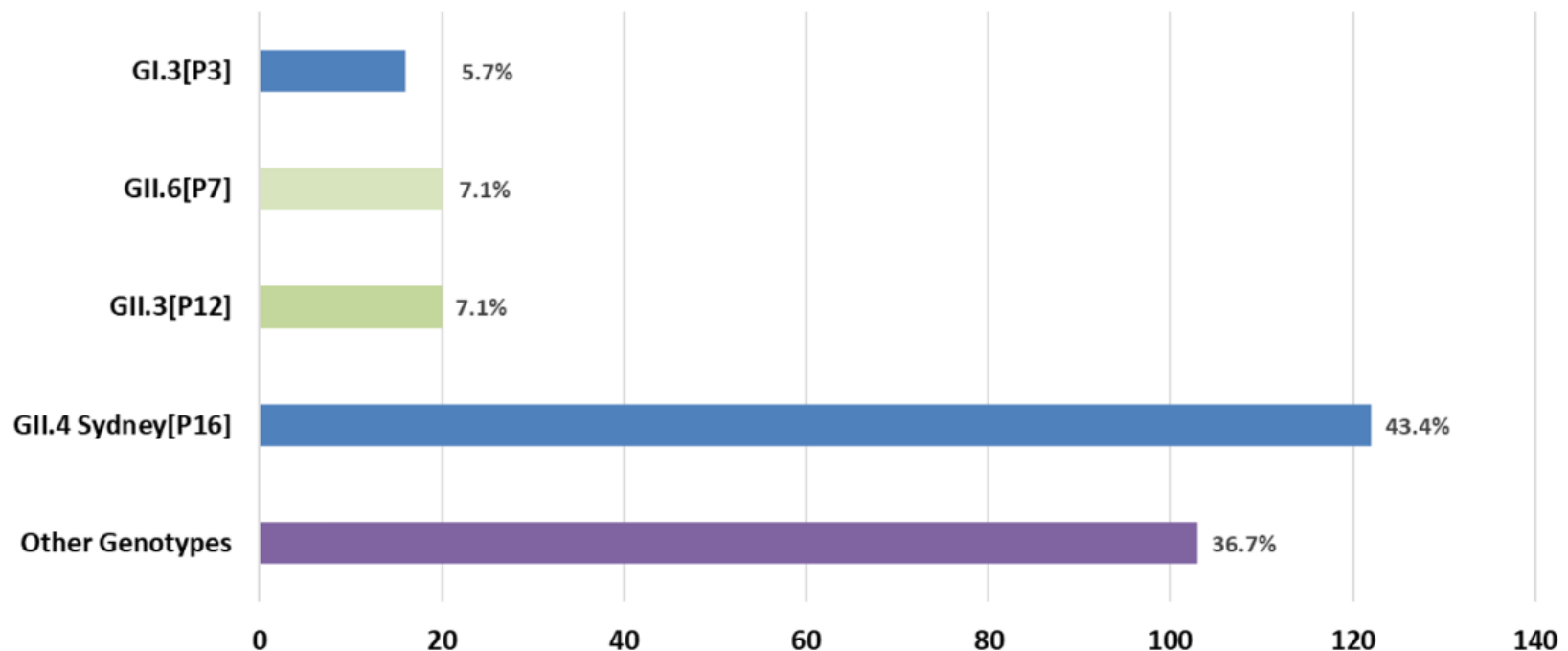
<https://www.cdc.gov/norovirus/reporting/calicinet/data.html>



GI Pathogens: Norovirus

Genotype Distribution of Norovirus Outbreaks

September 1, 2021 – July 31, 2022 (n=281)



The Other Genotypes category includes genotypes from outbreaks that each make up less than 5% of the total number of outbreaks. These genotype are: GI.1[P1], GI.2[P2], GI.3[P13], GI.4[P4], GI.5[P4], GI.7[P7], GII.12[P16], GII.17[P17], GII.17[P31], GII.2[P16], GII.4 Sydney[P12], GII.4 Sydney[P4 New Orleans], GII.7[P7], GIX.1[GII.P15]

<https://www.cdc.gov/norovirus/reporting/calicinet/data.html>



GI Pathogens: Norovirus

- 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!
- Yet another benefit of surveillance, to help assess tests/identify when certain tests may have issues
 - In future, we will routinely track percent positivity by test type to identify potential issues





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 - piratory pathogens
 - **Antibiotic resistant pathogens**
 - Invasive bacteria
 - Vectorborne pathogens
 - Other
 - Monkeypox
 - Tuberculosis
 - Rabies



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)

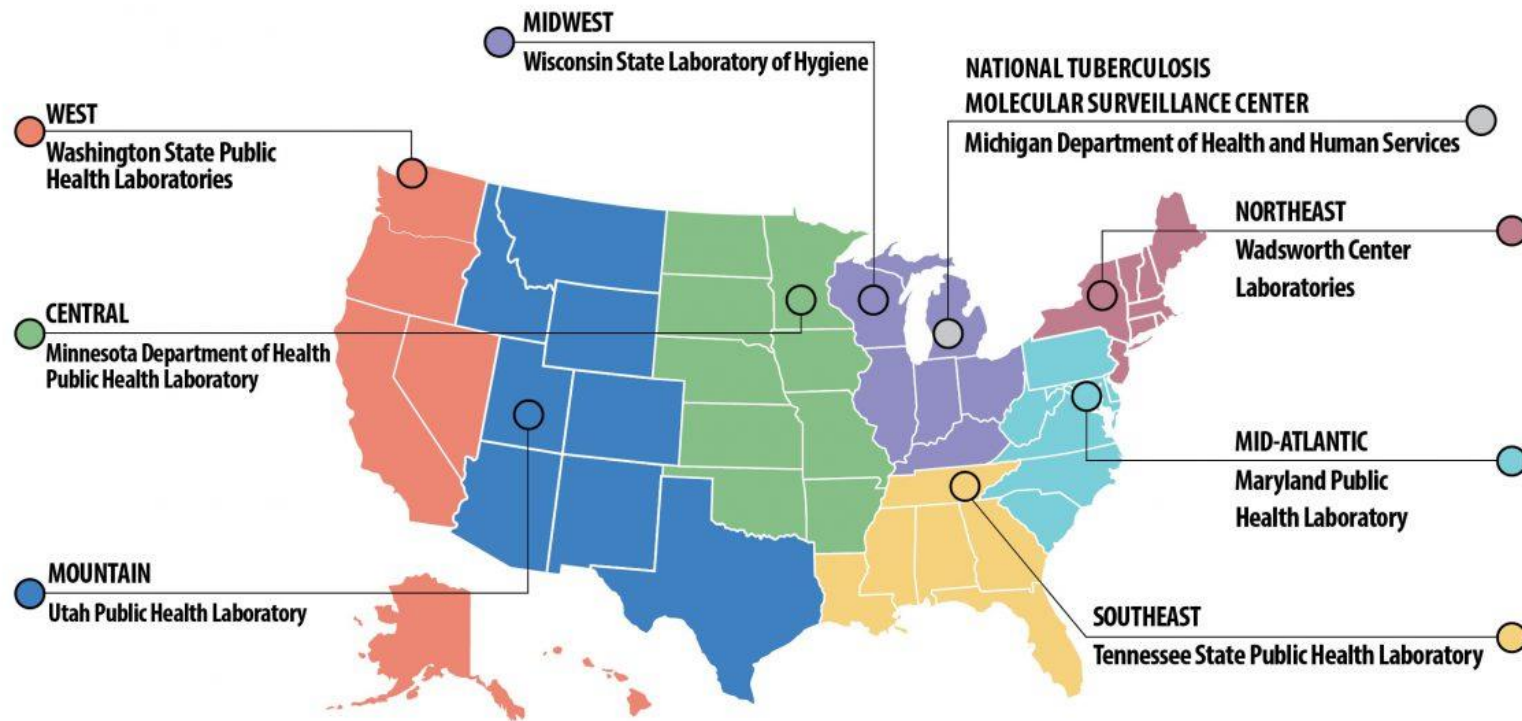




Table 4. AR Lab Testing Data and Specimen Submission Requests

Pathogen	Specimens Requested	Frequency	Confirmatory testing available at WSLH
Antimicrobial Resistance (AR)			
Pan-resistant organisms (R to all drugs tested in your laboratory)	AST results and any phenotypic or molecular targets detected submitted with isolate	As detected	Identification, antimicrobial susceptibility testing, AR-targeted PCR and referral to CDC as necessary
<i>Candida auris</i> , <i>C. haemulonii</i> , invasive <i>C. glabrata</i> and unusual* and hard to ID <i>Candida</i>			Identification, antimicrobial susceptibility testing and referral to CDC as necessary
<i>Enterobacteriaceae</i> resistant to carbapenems			Identification, antimicrobial susceptibility testing, carbapenemase screen, AR-targeted PCR and referral to CDC as necessary
<i>Staphylococcus aureus</i> (I or R to Vancomycin)			Identification, antimicrobial susceptibility testing and referral to CDC as necessary
<i>Pseudomonas aeruginosa</i> (Resistant to carbapenems other than ertapenem and non-susceptible to cefepime and/or ceftazadime)			Identification, antimicrobial susceptibility testing, carbapenemase screen, AR-targeted PCR and referral to CDC as necessary
[†] <i>Acinetobacter baumannii</i> (Resistant to carbapenems)		As detected	Identification, antimicrobial susceptibility testing, AR-targeted PCR and referral to CDC as necessary
<i>Aspergillus fumigatus</i> isolates from invasive infections			Isolates will be forwarded to the Maryland Department of Health for surveillance of azole resistance



Antibiotic Resistant Pathogens

Data and how it is used



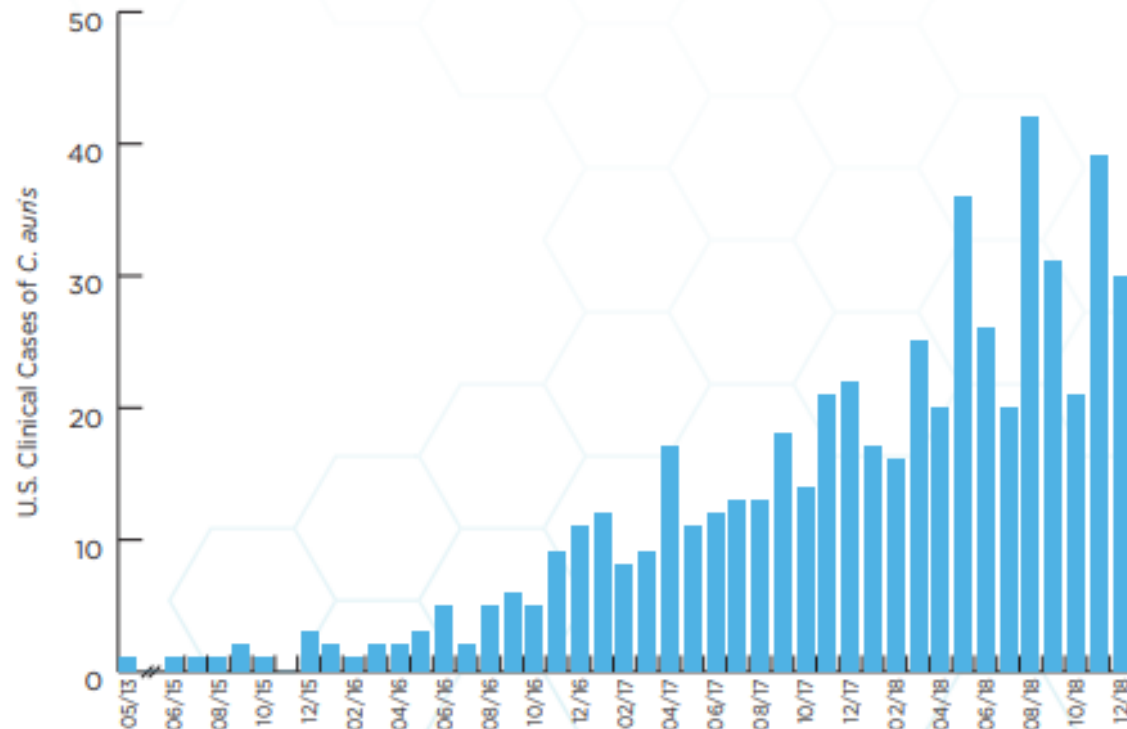
- Highly drug-resistant yeast
- Causes invasive infections associated with high mortality
- Spreads easily in healthcare settings
- Difficult to identify in the laboratory



Candida auris

CASES OVER TIME

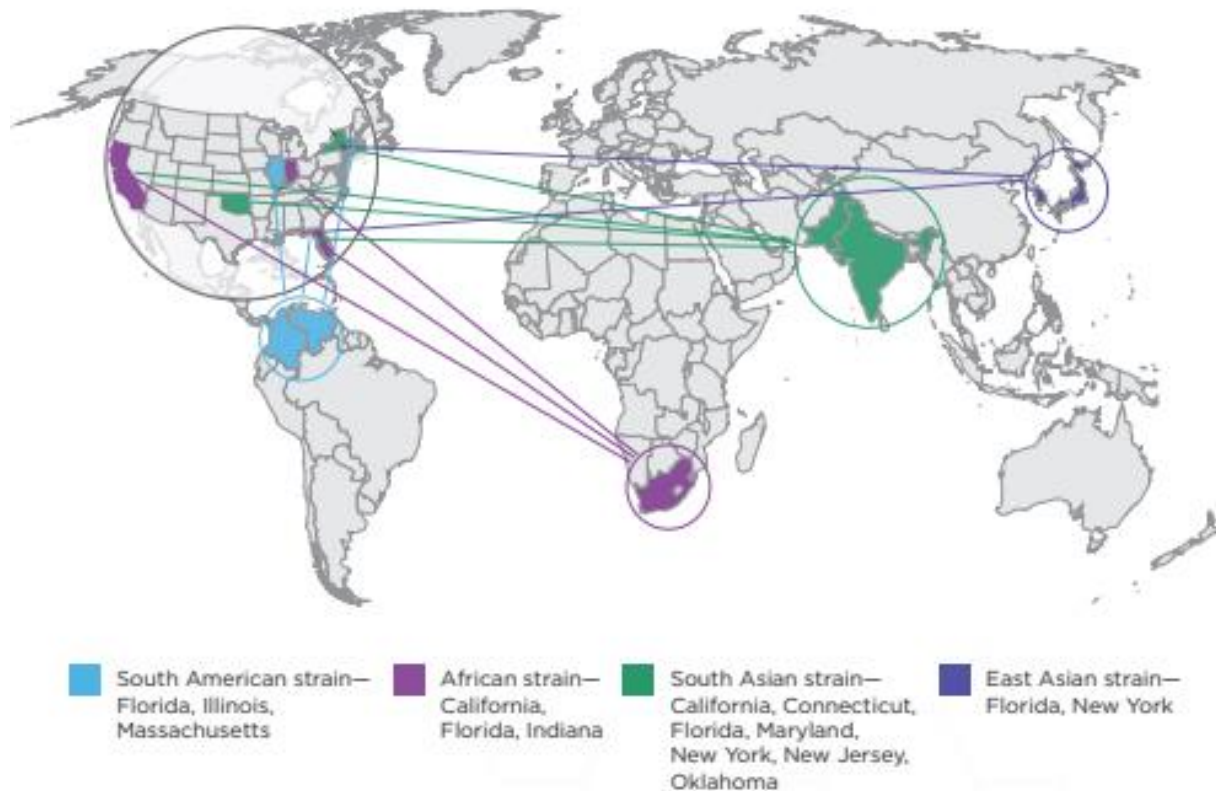
C. auris began spreading in the United States in 2015. Reported cases increased 318% in 2018 when compared to the average number of cases reported in 2015 to 2017.





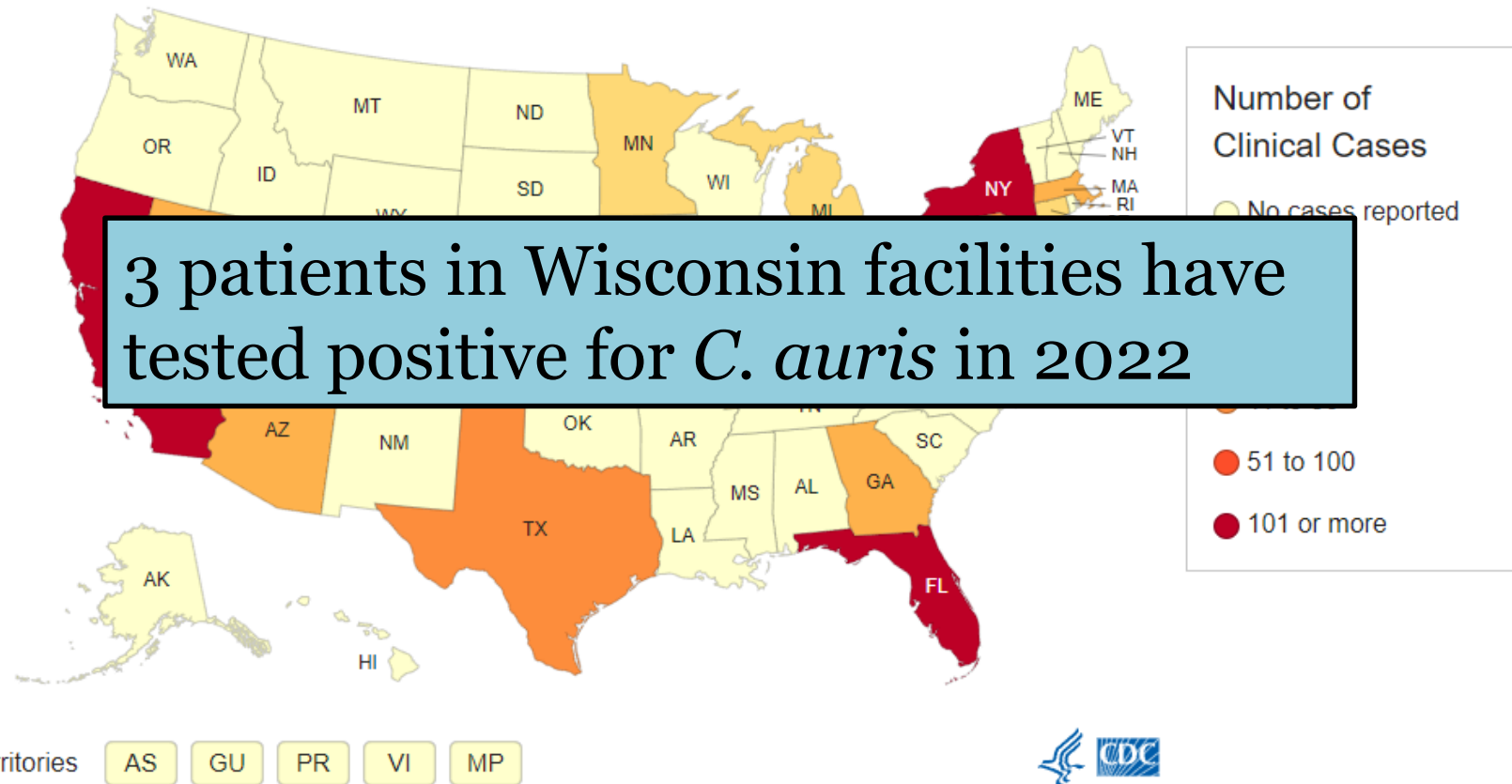
A GLOBAL THREAT

Investigators still do not know why four different strains of *C. auris* emerged around the same time across the globe. All four strains have been found in the United States, likely introduced through international travel and subsequent spread in U.S. healthcare facilities.



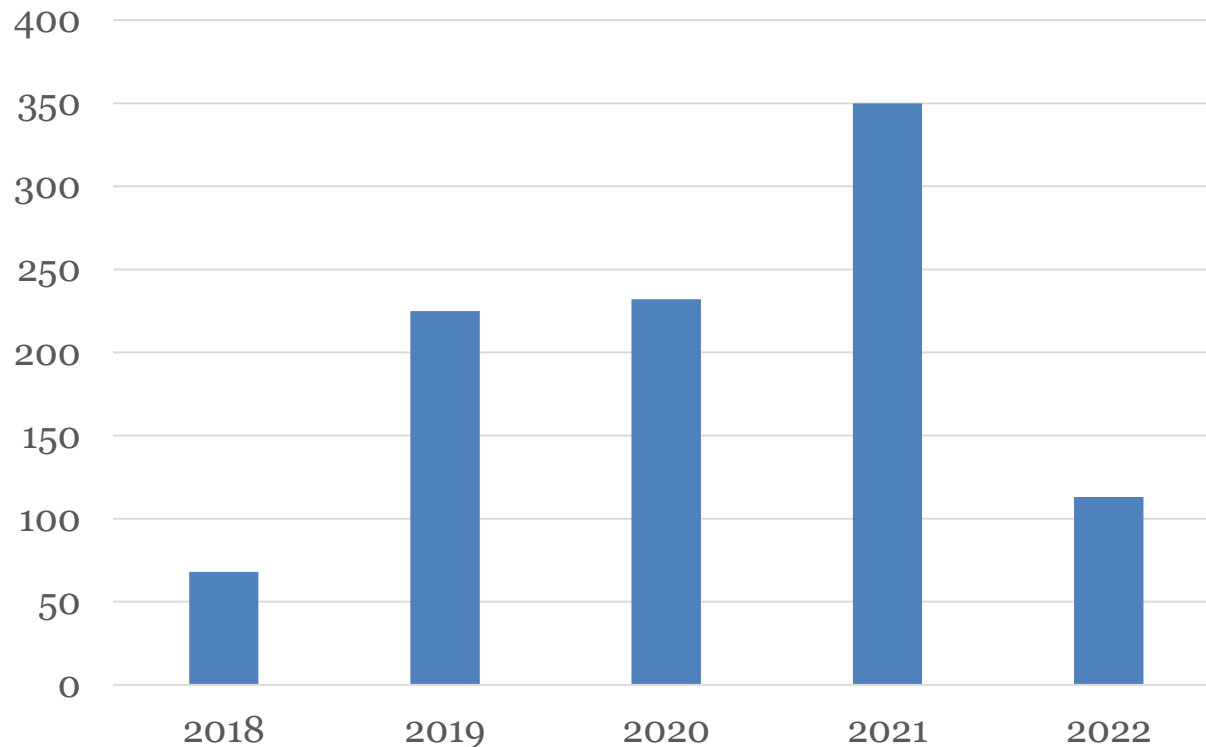
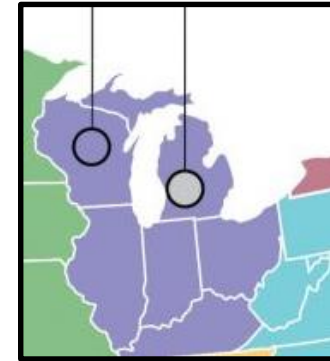


Reported clinical cases of *Candida auris*, January 01, 2021-December 31, 2021





Candida auris isolates in the Midwest Region



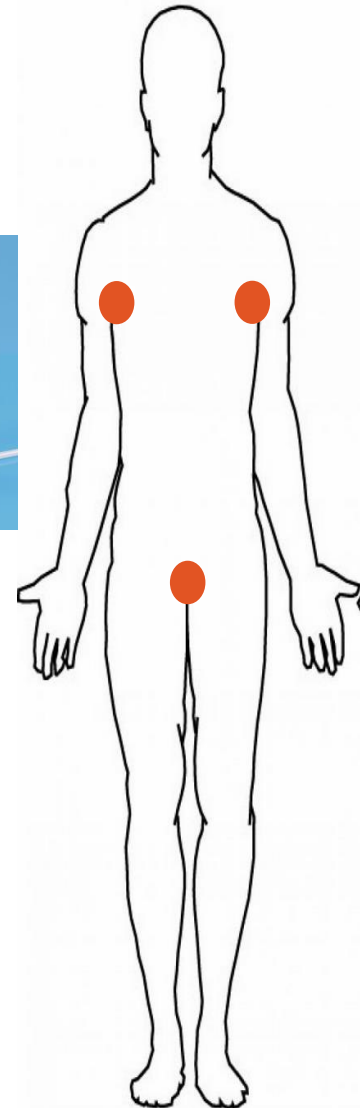


Identify a positive patient isolate: what to do next?

- 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
 - Screening of patients with overnight stay in a healthcare facility outside the U.S.
 - Screening of patients in long-term care facilities, especially those with CP-CRE and other MDROs
 - Goals:
 - Determine if transmission has occurred
 - Initiate contact precautions on colonized patients to prevent further spread

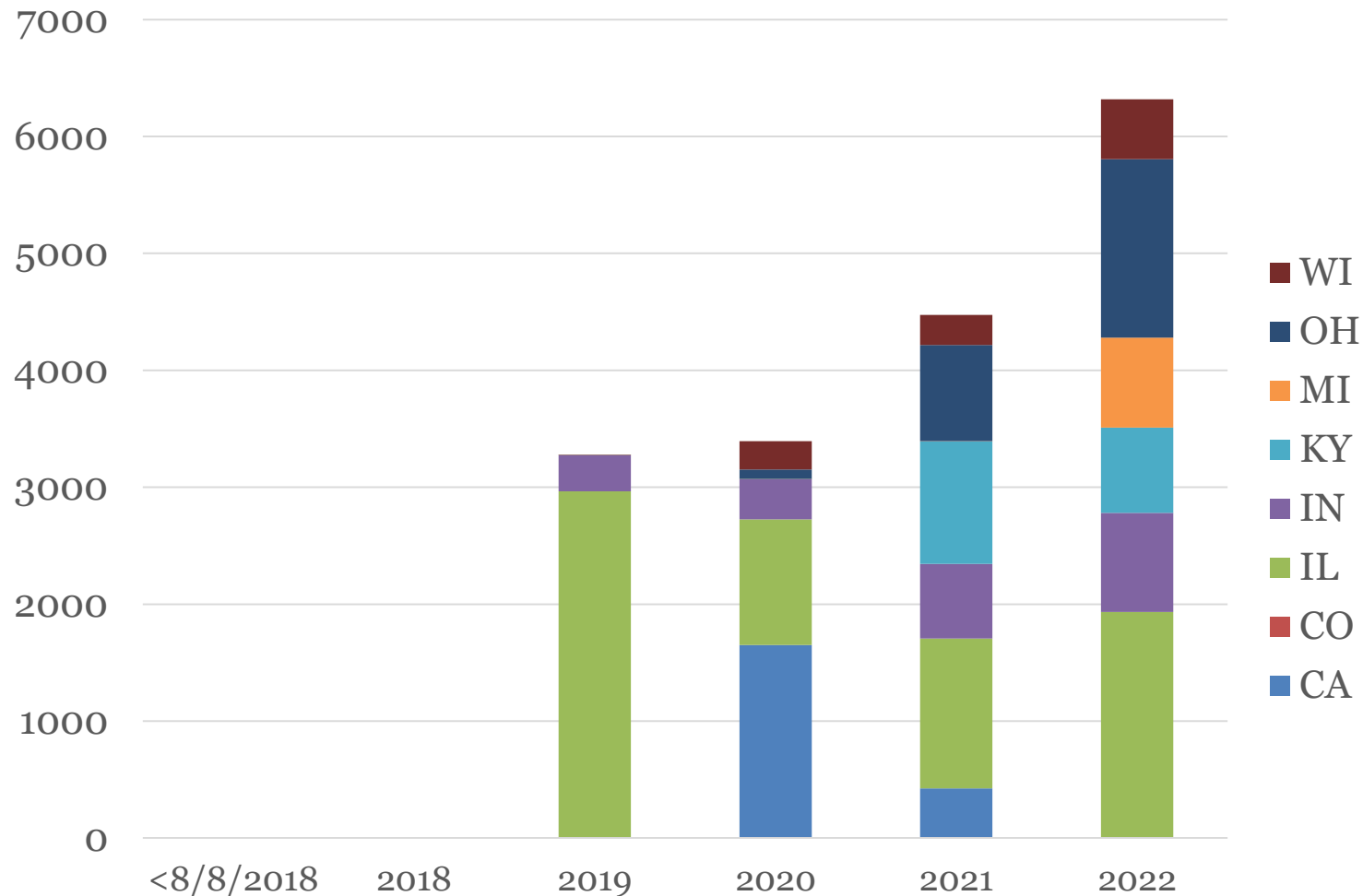
Colonization Screening: What to screen

- Most sensitive (>90%) and cost-effective swab: axilla and groin
- Patients remain persistently colonized





Candida auris colonization tests in the Midwest





Carbapenem-resistant *Acinetobacter baumannii* (CRAB)

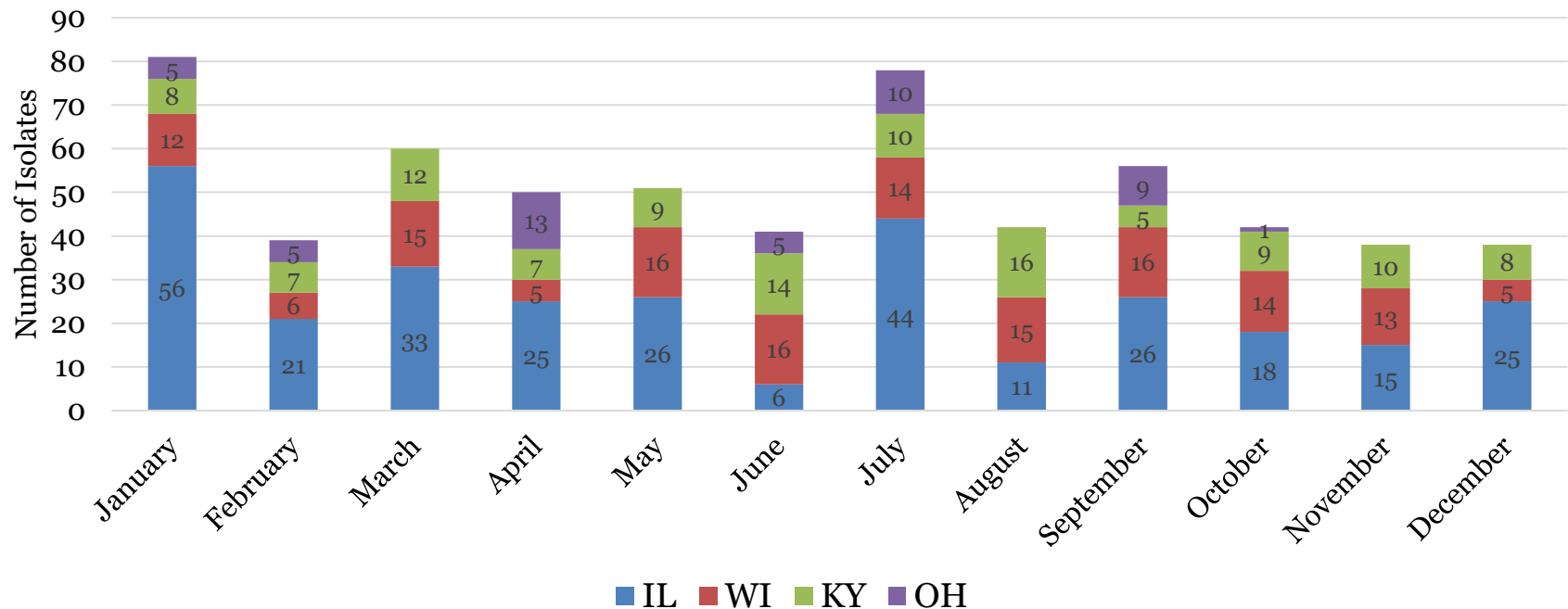


- Cause pneumonia, wound, bloodstream, and urinary tract infections
 - Infections tend to occur in intensive care units (ICUs)
- Often carry plasmid-encoded β -lactamases with carbapenemase activity (OXA-23, OXA-24/40, and OXA-58)
 - Denoted as OXA because of their ability to confer resistance to oxacillin
- Some *Acinetobacter* are resistant to nearly all antibiotics
 - Very few new drugs are in development



Carbapenem-resistant *Acinetobacter baumannii* (CRAB)

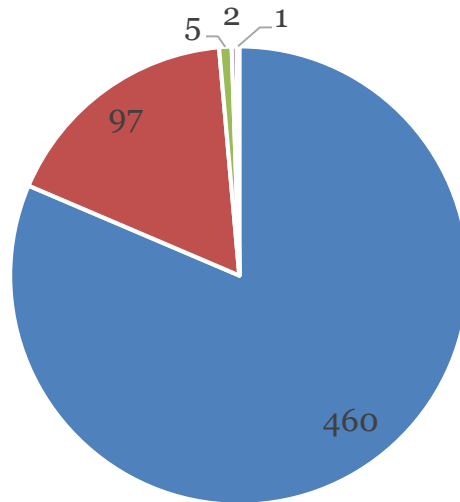
CRAB Isolates Received (2021)





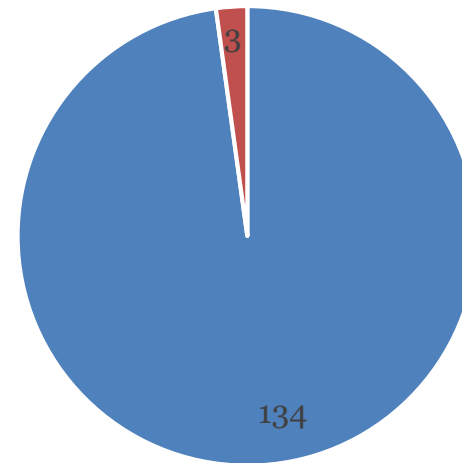
Carbapenemase Genes Detected in CRAB Isolates

Midwest region (2021)



■ OXA-24/40 ■ OXA-23 ■ NDM
■ KPC ■ OXA-58

Wisconsin (2021)

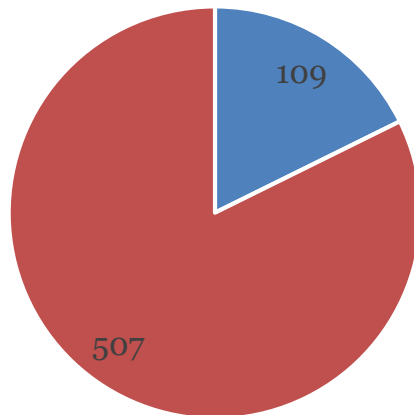


■ OXA-24/40 ■ OXA-23



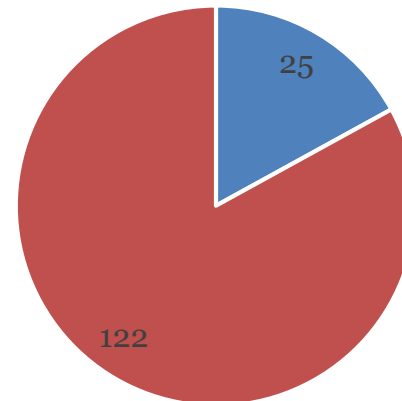
CRAB isolate susceptibility

Midwest region (2021)



- Pan-nonsusceptible
- Susceptible to at least one antibiotic

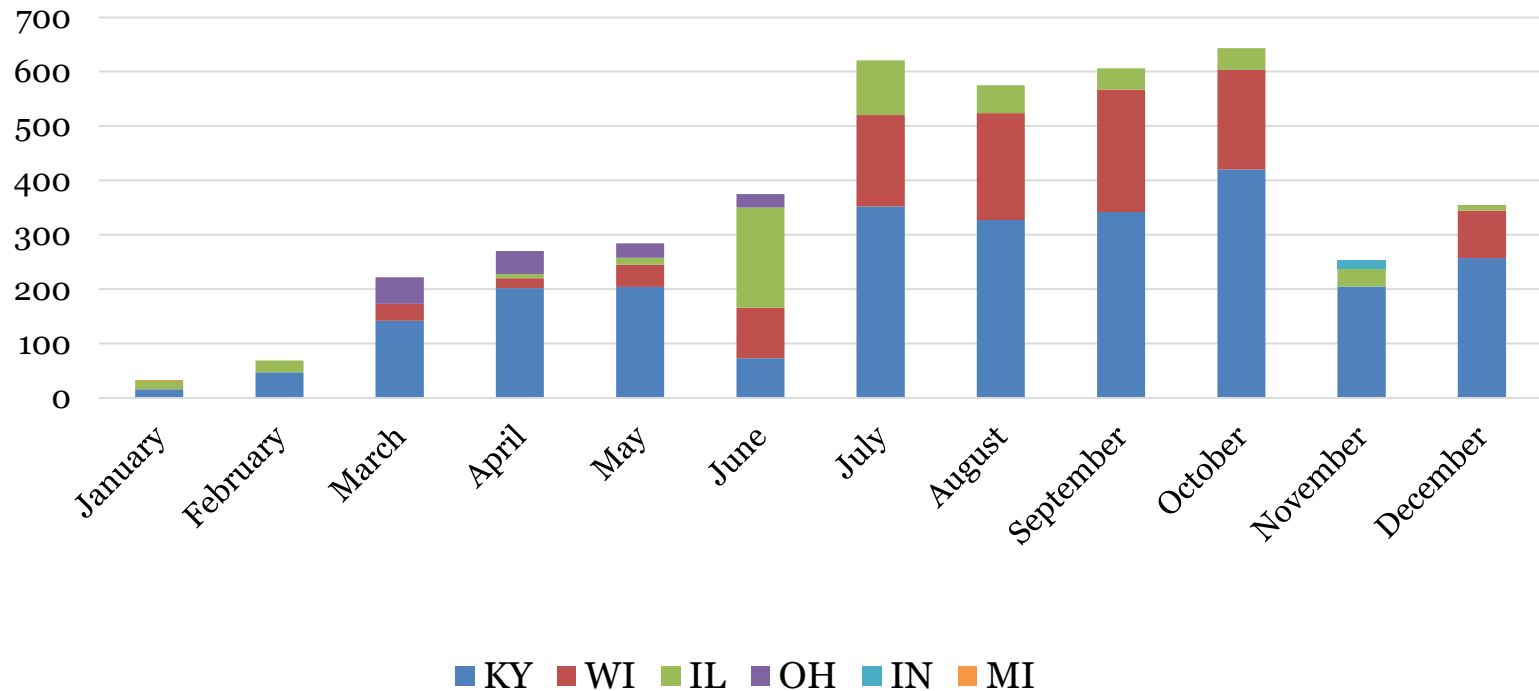
Wisconsin (2021)



- Pan-nonsusceptible
- Susceptible to at least one antibiotic



CRAB Colonization Tests Performed (2021)





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 - piratory pathogens
 - Antibiotic resistant pathogens
 - **Invasive bacteria**
 - Vectorborne pathogens
 - Other
 - Monkeypox
 - Tuberculosis
 - Rabies



Invasive Bacteria

Why conduct surveillance

- Identify outbreaks of *Listeria*
- Subtyping to track subtypes/genotypes
 - Vaccine match for *Streptococcus pneumoniae*, *Haemophilus influenzae*, and *Neisseria meningitidis*
- Antibiotic resistance testing to track trends in resistance
- Identify new pathogens causing disease
 - *Elizabethkingia* outbreak in 2016



Invasive Bacteria

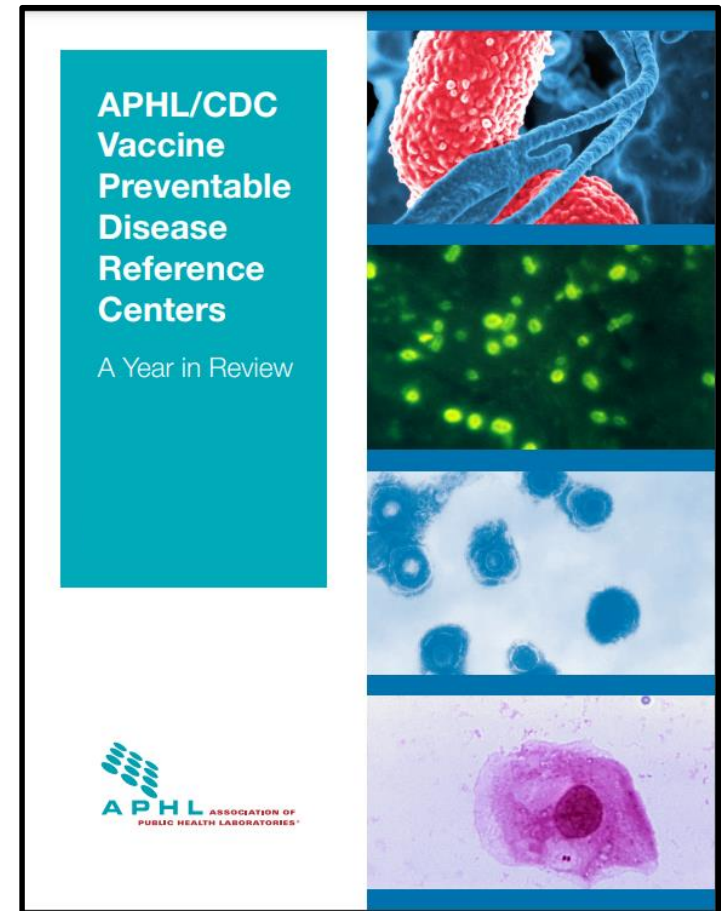
Statewide/national surveillance programs

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 Bacteria

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*

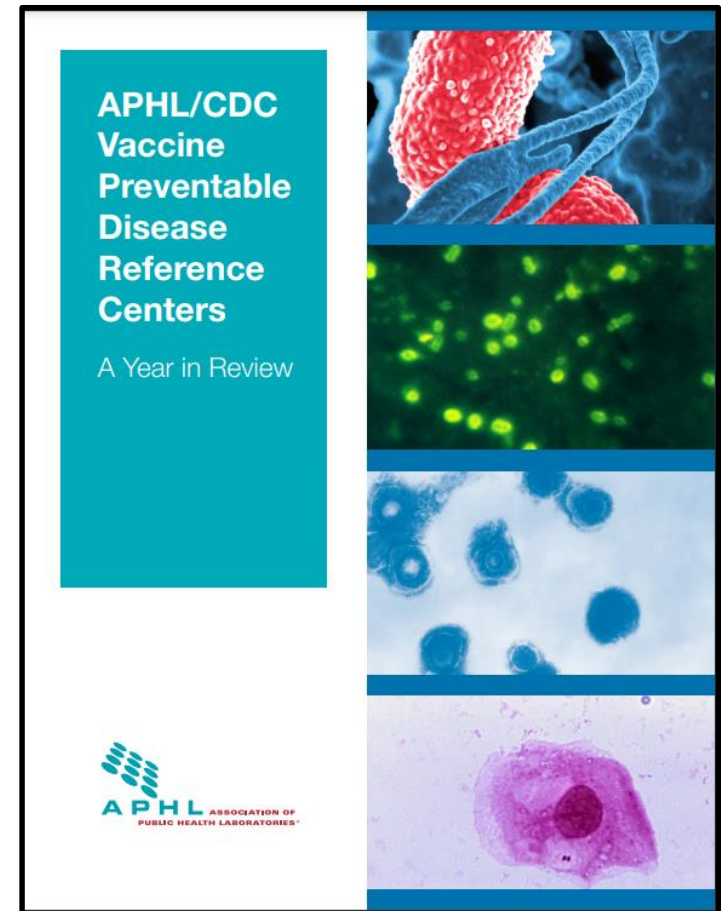




Table 5. Invasive Bacteria Specimen Submission Requests

Pathogen	Frequency to Send	Send Specimens to WSLH for Characterization
Invasive Bacteria (Blood, CSF or other sterile body site)		
<i>Haemophilus influenzae</i>	As detected	Isolates or CSF for identification and serotyping
<i>Listeria monocytogenes</i>		Isolates for identification and molecular subtyping (WGS)
<i>Neisseria meningitidis</i>		Isolates or CSF for identification, antimicrobial susceptibility testing and serogrouping
<i>Streptococcus pneumoniae</i>		Isolates or CSF for identification, antimicrobial susceptibility testing and serotyping* *serotyping performed upon request on: • CSF isolates • Isolates non-susceptible to clinically relevant drugs • Possible failure of therapy or vaccine or outbreak related isolates
Any other organisms suspected of being in a cluster or outbreak of public health significance		Consult with Wisconsin Division of Public Health Epidemiologists; Isolates for identification and molecular subtyping
Gram negative isolates from sterile body sites that are unidentifiable using commercial systems		Sequenced based and phenotypic identification will be performed



Invasive Bacteria

Data and how it is used

Listeria Outbreak Linked to Packaged Salads Produced by Dole



Posted April 4, 2022

This outbreak is over. Stay up to date on food recalls and outbreaks to avoid getting sick from eating contaminated food.

Fast Facts

- Illnesses: 18
- Hospitalizations: 16
- Deaths: 3
- States: 13
- Recall: Yes
- Investigation status: Closed

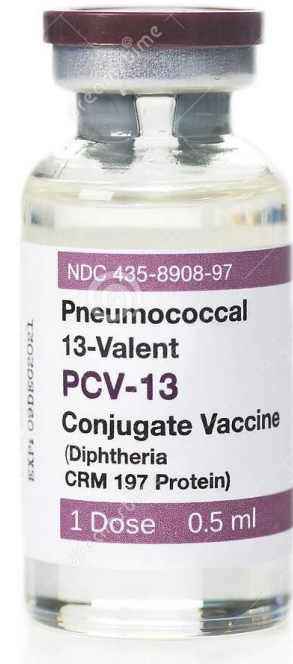


<https://www.cdc.gov/listeria/outbreaks/index.html>



Pneumococcal conjugate vaccines (PCV)

- PCV has had a major impact on the incidence of invasive disease among young children
 - 99% decrease in disease caused by the seven serotypes in PCV7
- Other serotypes not covered, and 'serotype replacement' occurred
 - Increases in invasive disease by 19A and others
- In 2010, PCV13 replaced PCV7
- Since PCV13 introduction, invasive disease caused by PCV13 serotypes has declined 90% in children
- Declines have been sustained and have not been offset by increases in non-vaccine type disease



[illegible]



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 - Other
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 - Tuberculosis
 - Rabies



NEW!

Vectorborne Pathogens

Why conduct surveillance

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



Vectorborne Pathogens

Table 6. Vectorborne Specimen Submission Requests

Pathogen	Specimens Requested	Frequency	Confirmatory testing available at WSLH
Vectorborne Pathogens			
Malaria	Positive thick and thin blood smears, residual EDTA blood	As detected	Species confirmation via microscopy and PCR. Residual EDTA forwarded to CDC for Malarial Drug Resistance Surveillance in <i>Plasmodium falciparum</i>
Babesia			Confirmation of <i>B. microti</i> by PCR. Unknown species forwarded to CDC for confirmation
Ehrlichia (unknown species)	Residual blood and/or nucleic acid		Species identification by PCR (if speciation not available at your lab)



Outline

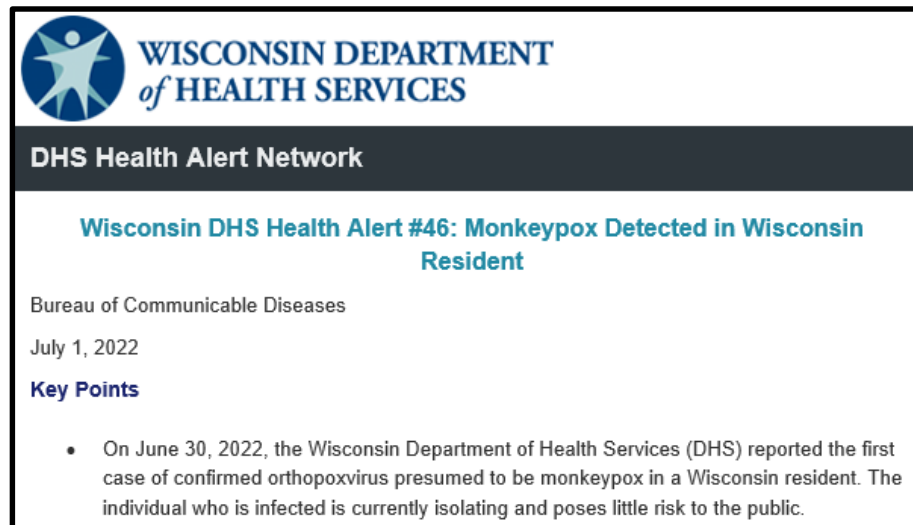
- WSLH Laboratory-based Surveillance Plan
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Monkeypox

- First U.S. case identified in Massachusetts in May 2022
- WSLH started testing June 2022
 - Existing non-variola (non-Smallpox) orthopox test
 - Send positives to CDC for confirmation of monkeypox
- First Wisconsin case on June 30, 2022



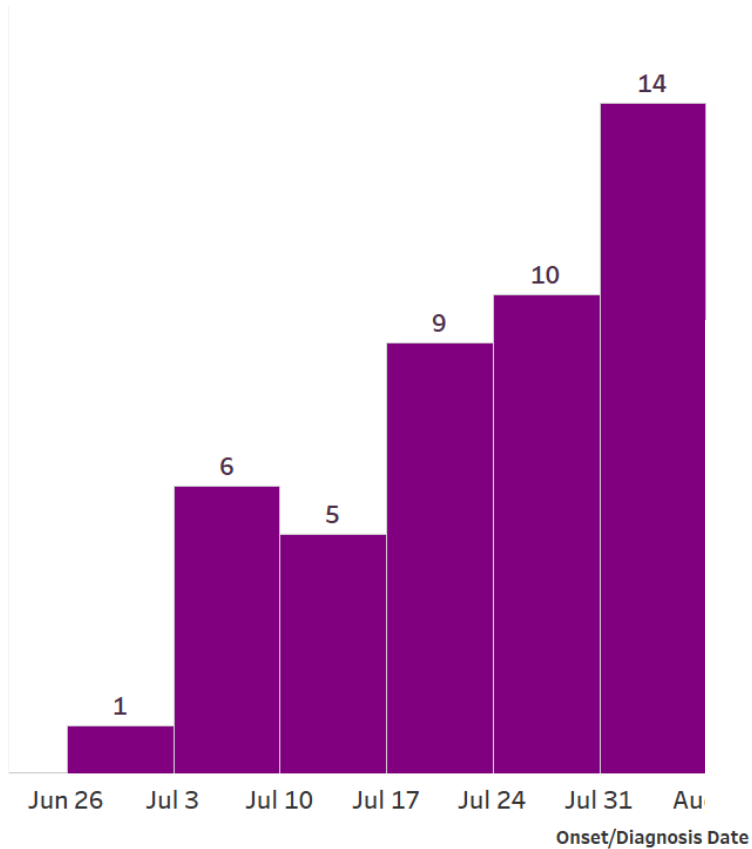
- 5 national commercial labs started testing in July
- Additional clinical microbiology labs have also started testing



Monkeypox - Wisconsin

Cases of Monkeypox in Wisconsin by Date of Onset/Diagnosis, 2022 (n=68)

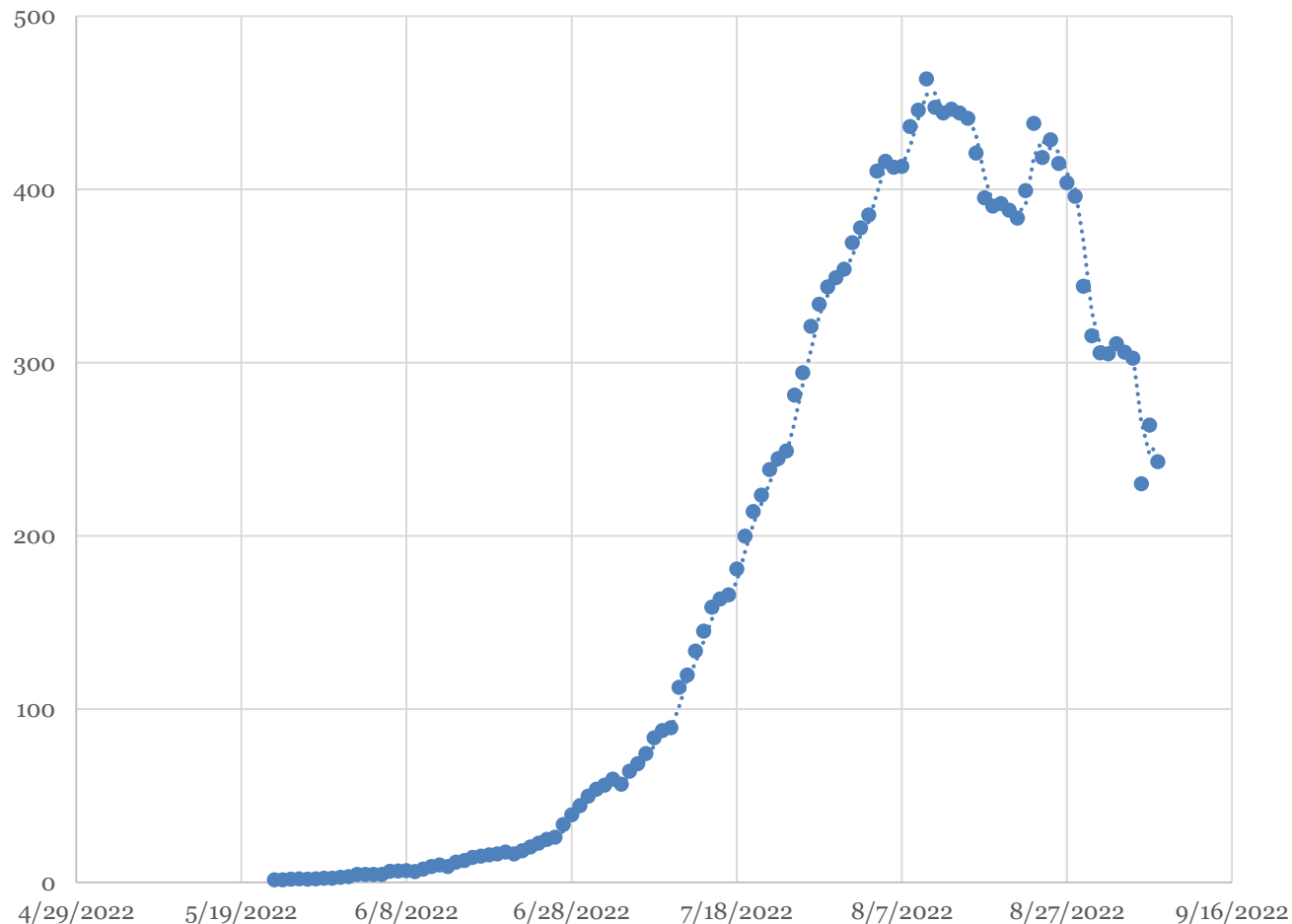
Data as of 9/13/2022





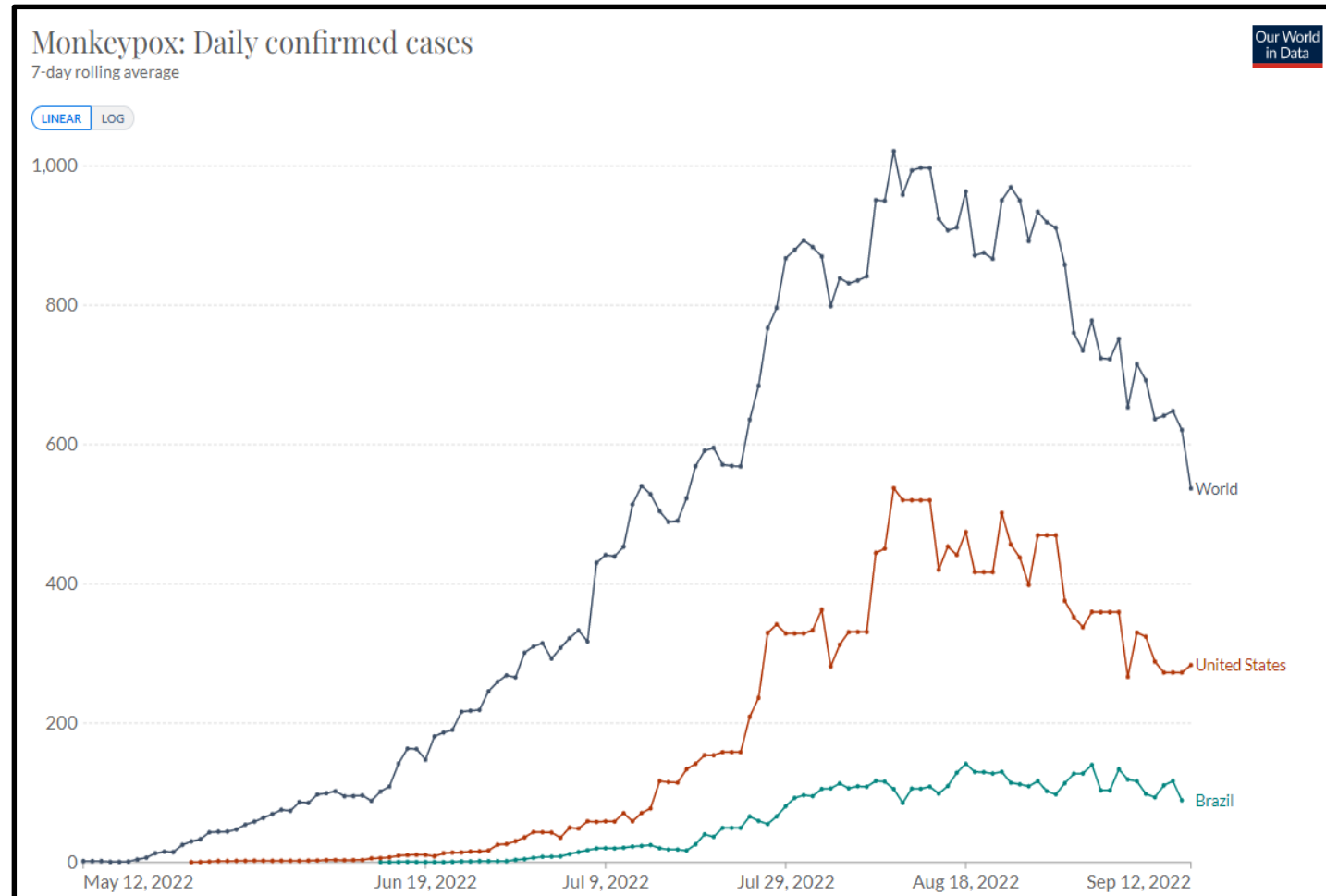
Monkeypox – U.S.

7-day average of Monkeypox Cases





Monkeypox – World



<https://ourworldindata.org/monkeypox>



Tuberculosis

- 2022 Wisconsin Mycobacteriology Laboratory Network Conference is in person again this year!
- Wednesday, November 16 at the DoubleTree, Madison East location
- Additional information in the next few weeks with pre-registration info
- If any questions, please contact Nate!



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

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Microbiologist III
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608-224-4265



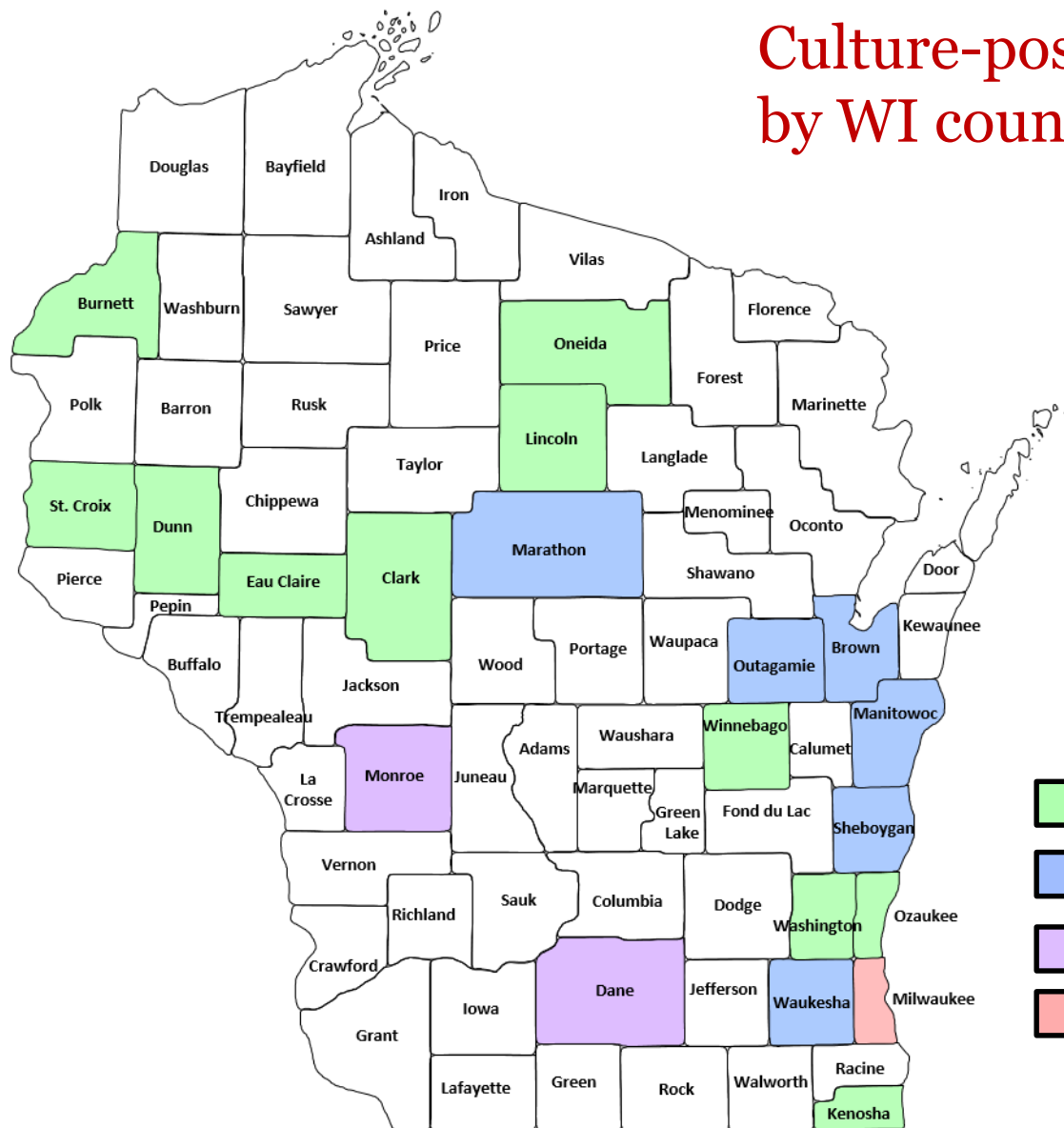
TB Cases in Wisconsin, 2011-2021 (YTD)

Year	No.	Rate*
2011	70	1.2
2012	71	0.87
2013	50	0.87
2014	48	0.83
2015	69	1.2
2016	40	0.69
2017	49	0.84
2018	50	0.84
2019	53	0.87
2020	36	0.59
2021	66	1.11
2022	40 (to date)	0.69

*People with TB per 100,000 (2.37 nationwide average)



Culture-positive TB Cases by WI county (2021)

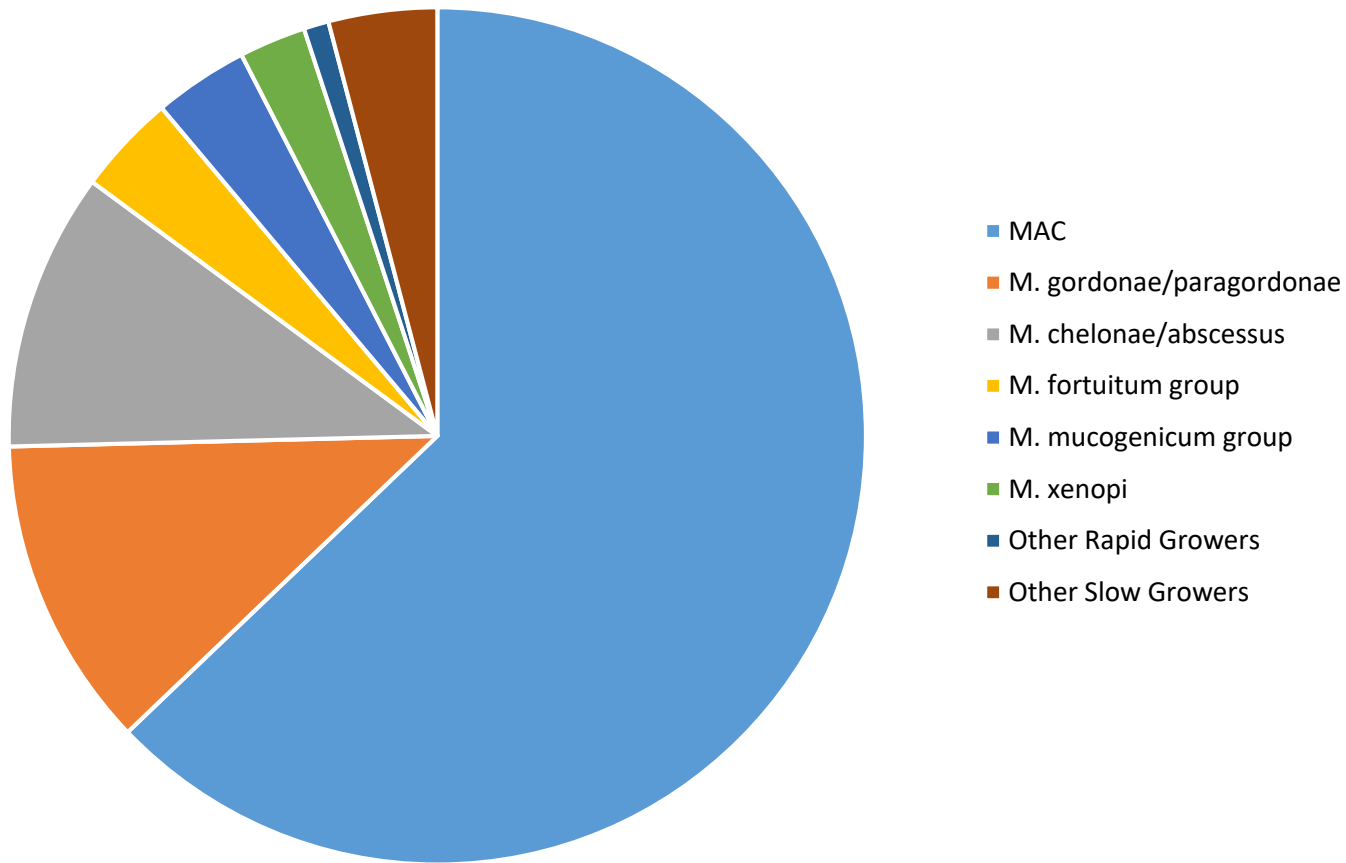


56 total cases



Non-tuberculous *Mycobacteria* (NTM)

WI 2021 NTM Isolation Summary (N=953†)



Rabies

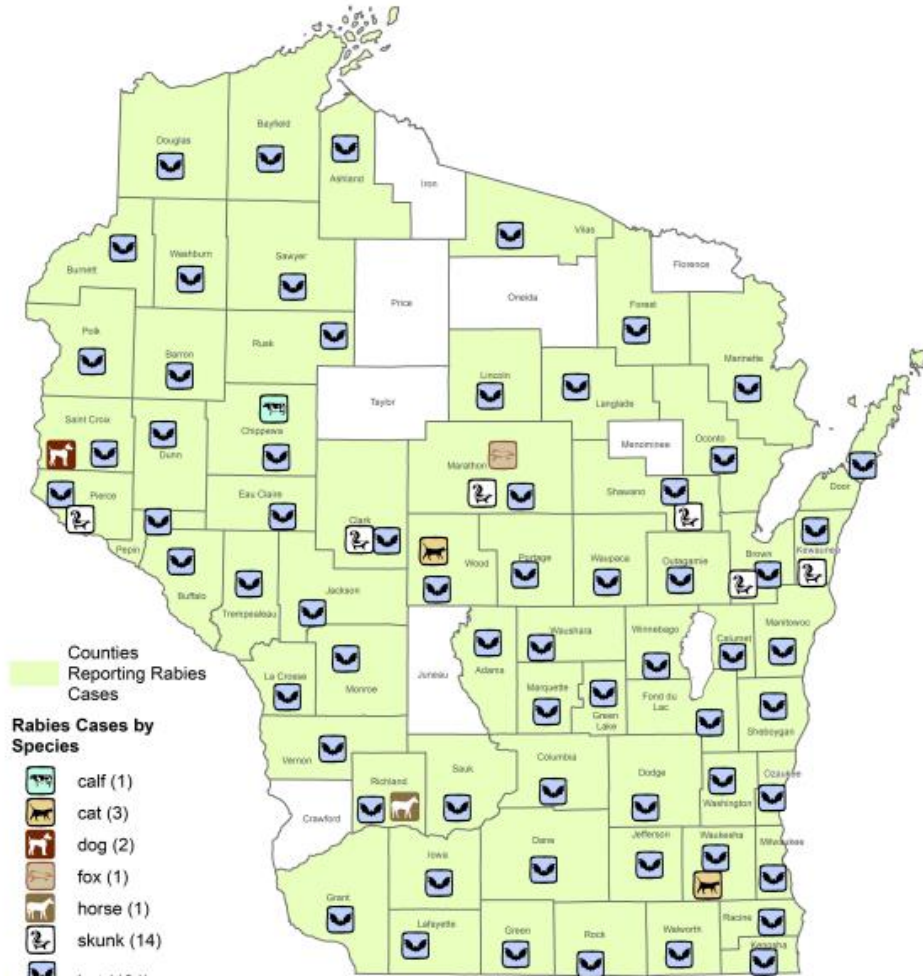


Reported Rabies Cases - 2002-2021

Wisconsin Department of Agriculture,
Trade and Consumer Protection
Division of Animal Health



1/31/2022

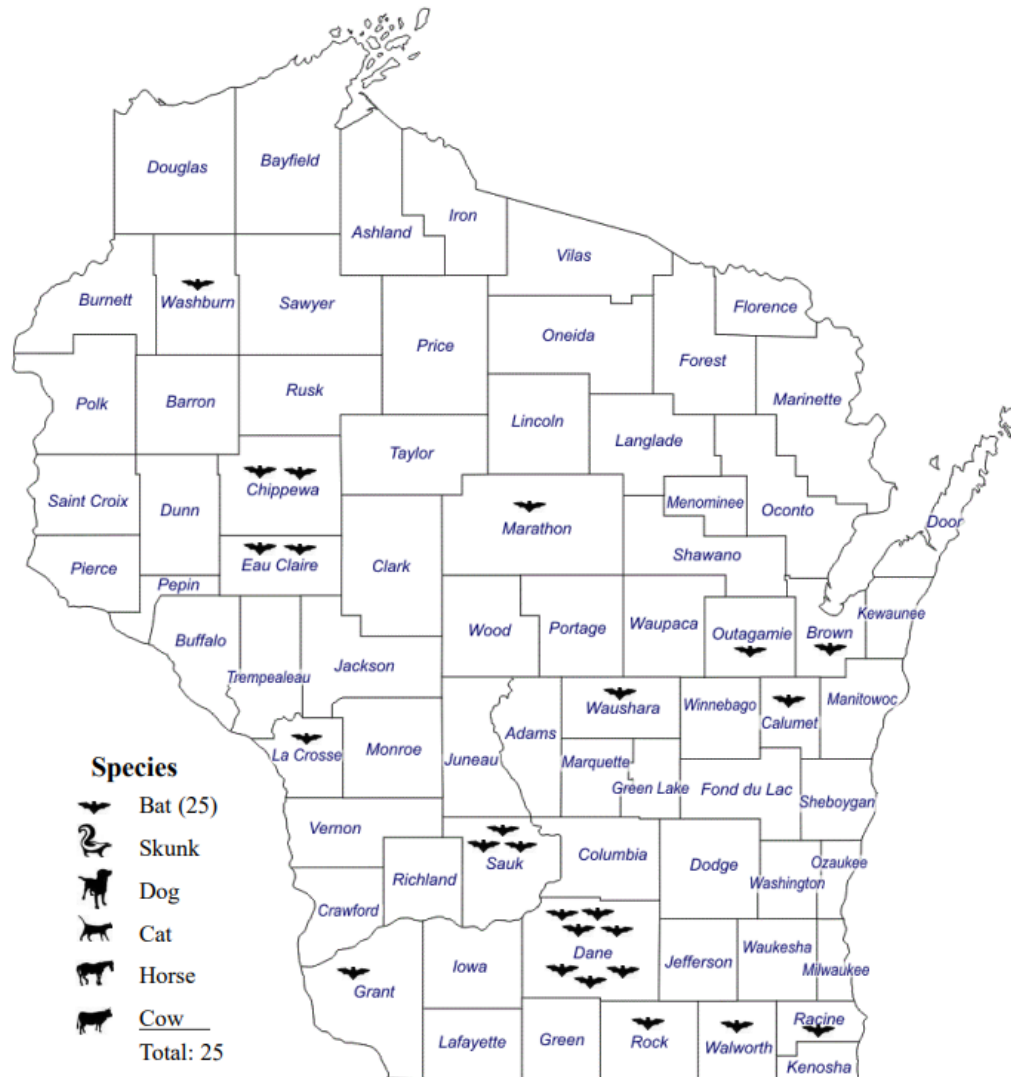


Total = 486



2020 Wisconsin Reported Rabies Cases

Last revised: April 15, 2021



Each icon represents one case.

Icon indicates county and not location in that county.



Species

- Bat (28)
- Skunk
- Dog
- Cat
- Horse
- Cow

Total: 28

https://datep.wi.gov/Pages/Programs_Services/Rabies.aspx



2022 Wisconsin Reported Rabies Cases

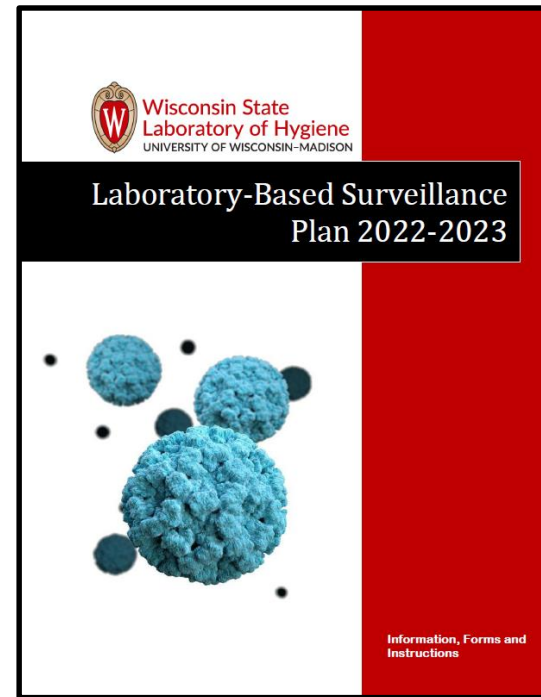
Last revised: September 6, 2022





Clicker question

- A) This talk increased my knowledge about surveillance programs that WSLH and the WCLN participate in
- B) This talk didn't increase my knowledge because I already knew all of this
- C) This talk didn't increase my knowledge for some other reason
- D) Please finish this quickly so I can go to the restroom!



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