



The Sorting Hat Makes Sense of Data (Surveillance update)

2023 WCLN Regional Meeting

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Outline

- Public Health Surveillance Data Sources
- Overview of the WSLH Surveillance Program
 - Changes to the booklet
 - Why surveillance is important
 - How the data is used
- Surveillance data updates
 - Respiratory pathogens
 - Enteric pathogens
 - Invasive infections
 - Vaccine preventable diseases
 - Sexually transmitted infections



Public Health Surveillance Data Sources



- Nationally Notifiable Diseases
 - Required reporting dictated by national statutes
<https://www.cdc.gov/nndss/index.html>
- Wisconsin Reportable Diseases
 - Required reporting dictated by state statutes
www.dhs.wisconsin.gov/publications/p02566.pdf
- WSLH Surveillance
 - Optional reporting and sample submission requested by WSLH
 - Allows for rapid and agile changes to reporting requests

Wisconsin Communicable Disease Reporting Requirements



DHS Chapter 145: Establishes a surveillance system for the purpose of controlling the incidence and spread of communicable diseases in Wisconsin.

Agency Responsibilities:

Department of Health Services

- General supervision throughout the state of the health of citizens.
- Maintain a public health system "in cooperation with local health departments."
- May issue orders to local health departments.

Local Health Departments

- LHDs have primary responsibility for communicable disease follow-up.
- Local health "may do what is reasonable and necessary for the prevention and suppression of disease." – [Wis. Stat. § 252.03\(2\)](#)
- Local health officers "shall promptly take all measures necessary to prevent, suppress and control communicable diseases. . ." – [Wis. Stat. § 252.03\(1\)](#)

Disease Reporting Requirements:

CATEGORY I: Diseases are of urgent public health importance and **shall be reported by telephone to the patient's local health officer or to the local health officer's designee upon identification of a case or suspected case**, pursuant to s. [DHS 145.04 \(3\) \(a\)](#). In addition to the immediate report, complete and fax, mail or electronically report an Acute and Communicable Diseases Case Report ([DHS F-44151](#)) to the address on the form, or enter the data into the Wisconsin Electronic Disease Surveillance System, **within 24 hours**. Public health intervention is expected as indicated. See s. [DHS 145.04 \(3\) \(a\)](#).

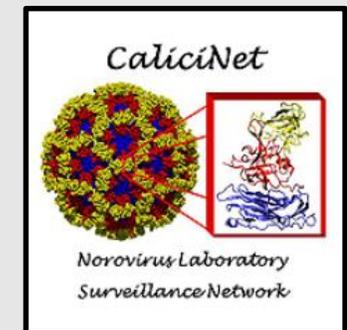
CATEGORY II: Diseases **shall be reported by fax, mail, or electronic reporting to the patient's local health officer or to the local health officer's designee on an Acute and Communicable Disease Case Report ([DHS F-44151](#)) or by other means or by entering the data into the Wisconsin Electronic Disease Surveillance System within 72 hours of the identification of a case or suspected case**. See s. [DHS 145.04 \(3\) \(b\)](#).

ENFORCEMENT: Any person who willfully violates or obstructs the execution of any state statute or rule, county, city or village ordinance or departmental order under this chapter and relating to the public health, for which no other penalty is prescribed, shall be imprisoned for not more than 30 days or fined not more than \$500 or both. – [Wis. Stat. § 252.25](#)

Laboratory Surveillance Programs



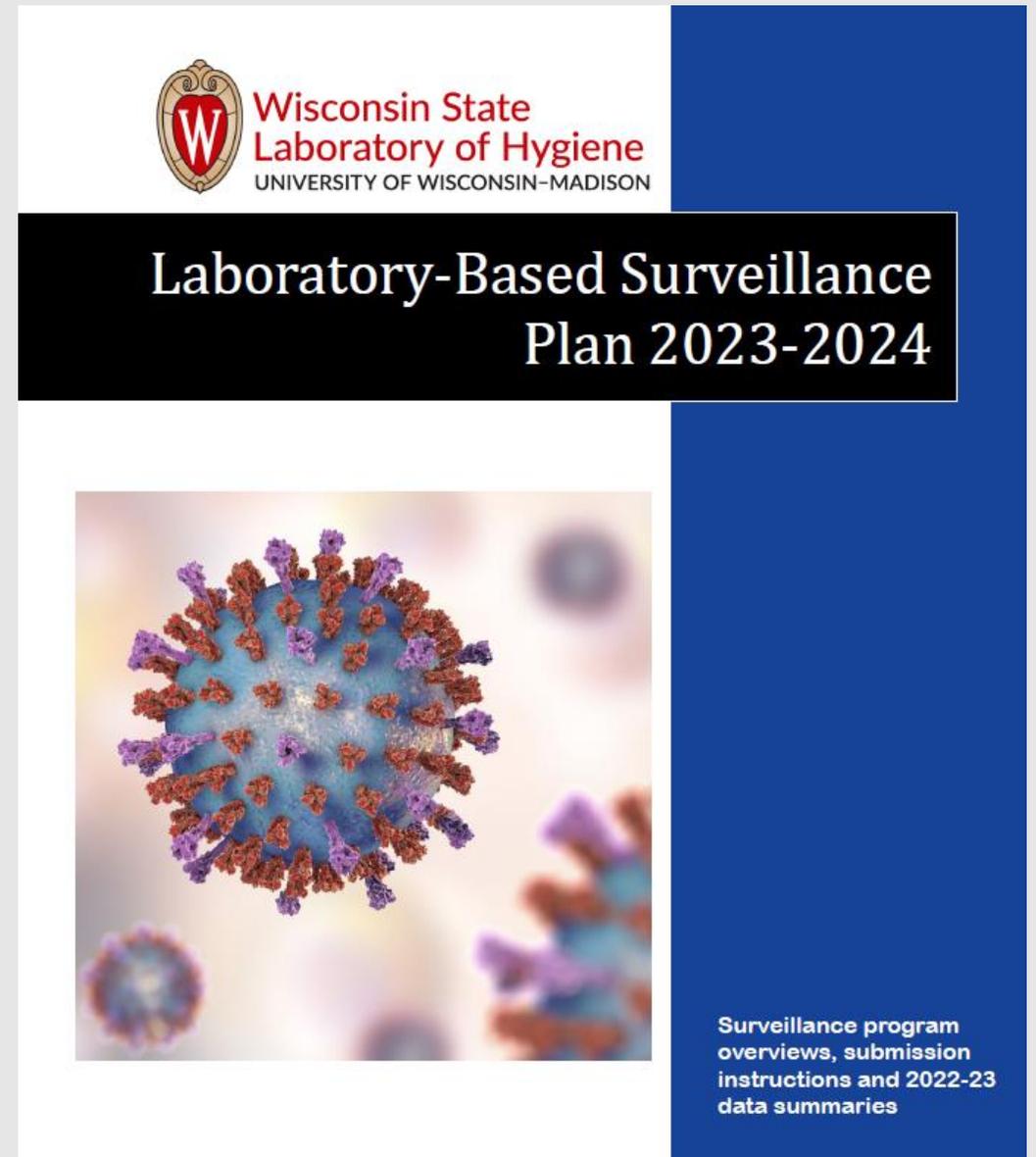
- Antimicrobial Resistance (AR Lab Network)
- Wisconsin Enteric Pathogens (WEPS)
 - PulseNet, NARMS, CaliciNet
- Invasive Bacterial Surveillance (IBLS)
- Vectorborne Diseases
- Vaccine Preventable Diseases (VPD)
- Influenza and Respiratory Diseases (NIRC)
- Waterborne Diseases (WBD OSS)
 - Cyclospora, CryptoNet, Giardiasis





What Does the Booklet Include?

- How surveillance data is used and why it's important.
- What data is requested and how to report.
- Isolate and specimen submission requests and how to submit them.
- Surveillance data from the past year.





Surveillance Plan Booklet Updates

- Overall, we broadened the language and format to be more inclusive of all surveillance programs organized by the CDD.
- For each section, we included more details on the purpose of the program, what testing is performed at WSLH, the specimen types accepted, and the requisition form needed for submission.

Wisconsin State Laboratory of Hygiene **Laboratory-Based Surveillance Plan, 2023-24**

What Do We Do With These Specimens?

Respiratory surveillance specimens submitted to the WSLH are tested with the CDC Influenza SARS-CoV-2 multiplex PCR assay to confirm the initial result.

Influenza Positive Specimens:

- WSLH performs the CDC influenza A subtyping and CDC B lineage on all influenza positive specimens received.
- Whole genome sequencing is performed on a selection of influenza positive specimens received at the WSLH.

SARS-CoV-2 Positive Specimens:

- Whole genome sequencing is performed on a selection of SARS-CoV-2 positive specimens received at WSLH.
- WSLH submits specimens to the National SARS-CoV-2 Strain Surveillance (NS3) program to enhance national surveillance efforts. (<https://covid.cdc.gov/covid-data-tracker/#variants-genomic-surveillance>).

Specimens Negative for Influenza and SARS-CoV-2:

- An enhanced 22-target respiratory pathogen panel is performed on a selection of surveillance specimens.

Why Submit Specimens?

To detect novel or reassortant influenza viruses:

WSLH performs influenza A subtyping and B lineage on all influenza positive specimens received. This is important for the detection of any variant or emerging influenza viruses with pandemic potential.



To see what else is circulating:

WSLH performs an enhanced 22-target respiratory pathogen panel on a selection of surveillance specimens, in addition to performing influenza and SARS-CoV-2 PCR.



To perform genomic surveillance:

Whole genome sequencing is performed on a selection of specimens positive for SARS-CoV-2 and influenza. Sequencing is useful to detect novel variants and monitor antiviral resistance.



To participate in national influenza surveillance:

WSLH submits a selection of influenza positive specimens from around the state to the national influenza surveillance pipeline. These specimens are used to inform vaccine strain selection and provide CDC with vaccine candidates.



Surveillance Plan Booklet Updates



- ***NEW*** Separate table for data reporting

Pathogens consolidated into one data field:
 Vibrio cholera* (report under Vibrio)
 Shigella* (report under Shigella/Enteroinvasive E. coli (EIEC))

Table 1: 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>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>
Rotavirus	Sapovirus	<i>Cryptosporidium</i>
<i>Cyclospora cayetanensis</i>	<i>Entamoeba histolytica</i>	<i>Giardia lamblia</i>

Surveillance Data Request Changes



Pathogens removed:

PCR/Molecular Detection:

- C. pneumoniae
- M. pneumoniae
- Adenovirus (non-respiratory)
- Enterovirus (non-respiratory)
- Measles
- Mumps
- Parechovirus
- Rubella
- VZV
- EPEC
- EAEC
- ETEC
- Clostridium difficile
- Herpes

Antigen Detection:

- Varicella Zoster Antigen detection

No data requests added!

Packet Updates- continued



Look for updated requisition forms!

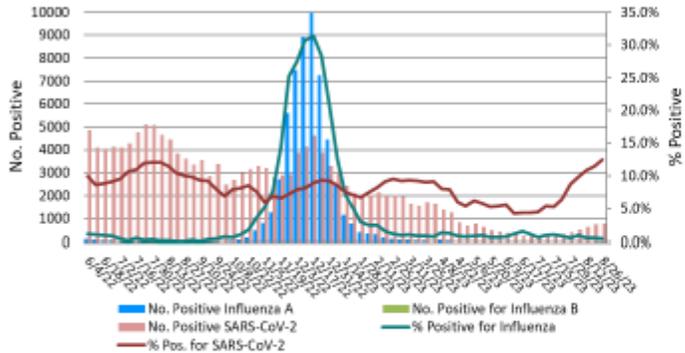
- WSLH is now performing SARS-CoV-2 testing for surveillance only
- Respiratory requisition forms have been updated to include SARS-CoV-2 genomic surveillance as a reason for submission option. The old SARS-CoV-2 specific requisition form will no longer be sent out.
- A customized copy of the new respiratory requisition form and the ARLN requisition form was sent in the mailing to each site along with a copy of the booklet.
- Mergers- if you still do rapid testing on site, please report separately from your core lab!

WSLH Laboratory Surveillance Report



Laboratory Surveillance Report

% Positive for Influenza and SARS-CoV-2 by PCR (Wisconsin), June 2022 to Week Ending August 26, 2023



Influenza

- Influenza activity is low in Wisconsin (0.5%) and nationally (0.8%).

SARS-CoV-2

- SARS-CoV-2 activity is **HIGH** in Wisconsin (12.5%).
- Omicron subvariant EG.5 is emerging/natant circulating (~15-20%)

Links:

- The WSLH sequencing dashboard is available here: <https://dataportal.slh.wisc.edu/sc2dashboard>
- A current summary of COVID-19 data for Wisconsin can be found here: <https://www.dhs.wisconsin.gov/covid-19/data.htm>
- The influenza, RSV and respiratory virus activity graphs can be viewed here: <http://www.slh.wisc.edu/wcIn-surveillance/surveillance/virology-surveillance/>
- The bacterial, viral and parasitic activity graphs can be viewed here: <http://www.slh.wisc.edu/wcIn-surveillance/surveillance/gastropathogen-surveillance/>

To enhance surveillance activities during the off-season, each week please send:

- ◊ **All influenza positive specimens**
- ◊ **Up to 5 SARS-CoV-2 positive specimens**

Week Ending Aug 26, 2023*

Resp. Pathogen PCR	# Tested	% Positive
SARS-CoV-2	6346	12.5
Rhinovirus/Enterovirus	469	14.9
Parainfluenza	466	3.2
<i>B. pertussis</i>	131	0.8
RSV	2568	0.5
Influenza	3508	0.5
Human metapneumovirus	461	0.4
Adenovirus	5	0.0
Seasonal coronaviruses	5	0.0

Other Surveillance Data-Wisconsin:

Respiratory pathogens

- Rhinovirus/Enterovirus and SARS-CoV-2 activities are high.

Gastropathogens

- Other pathogens detected include: Adenovirus 40/41 (1.1%), *Plesiomonas shigelloides* (0.3%), *Vibrio cholerae* (0.3%) and *Yersinia enterocolitica* (0.2%).

Week Ending Aug 26, 2023*

GI Pathogen PCR	# Tested	% Positive
Norovirus	429	5.6
<i>Campylobacter</i>	436	4.6
<i>Salmonella</i>	436	4.1
<i>E. coli</i> 0157	97	3.1
STEC	424	1.9
<i>Cryptosporidium</i>	435	1.8
Sapovirus	376	1.3
Rotavirus	426	0.9
<i>Giardia</i>	435	0.9
<i>Cyclospora</i>	376	0.8
<i>Shigella</i>	271	0.4

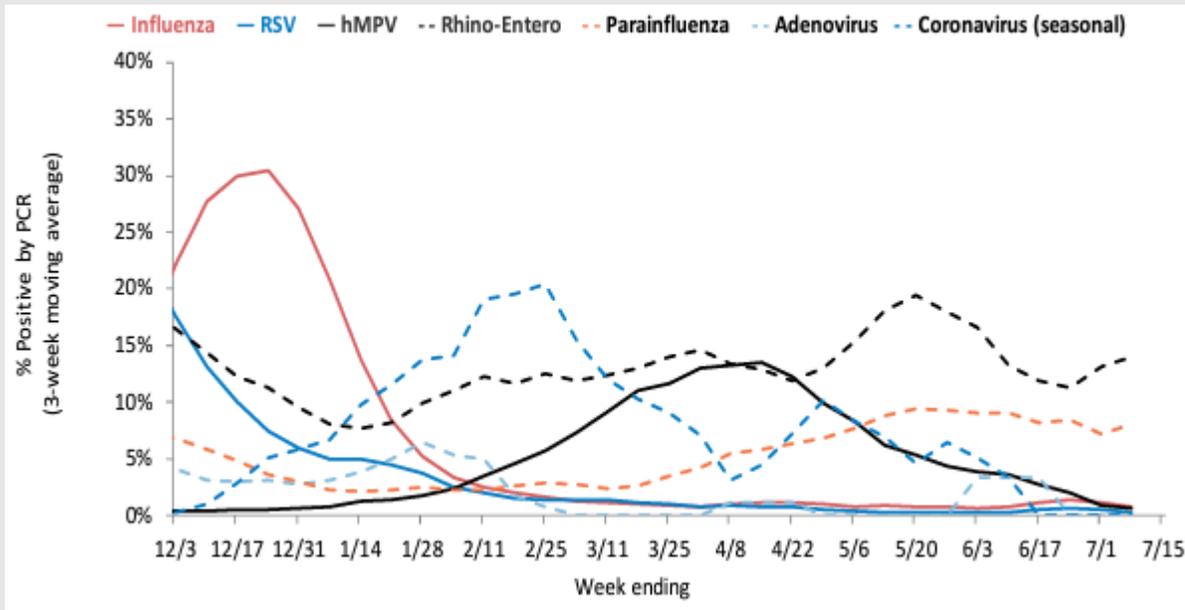
DHS Respiratory Virus Surveillance Report



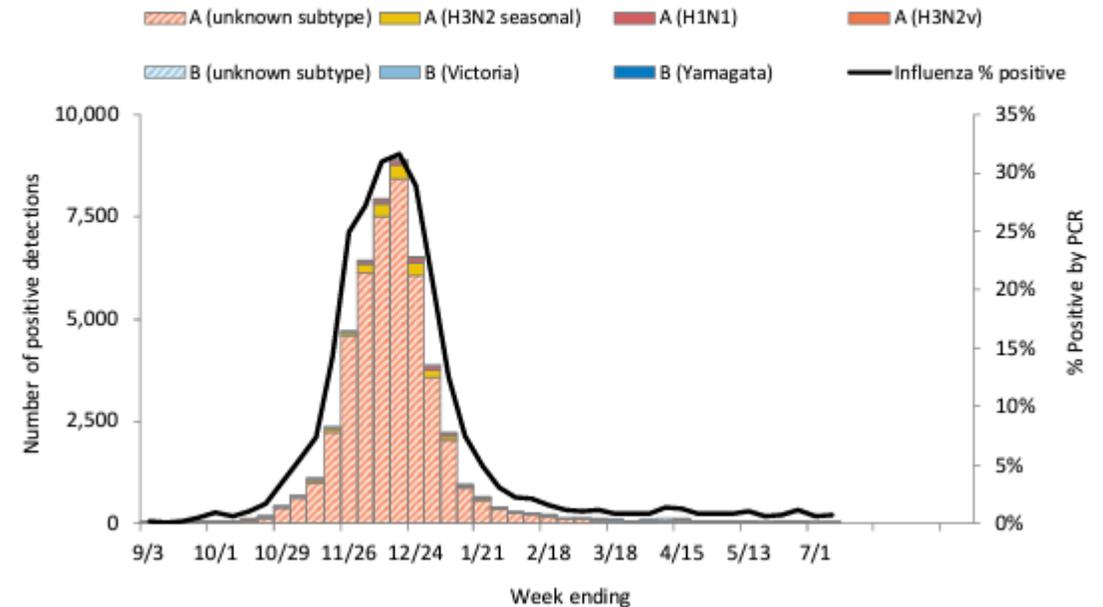
RESPIRATORY VIRUS SURVEILLANCE REPORT

Week 28, Ending July 8, 2023

Wisconsin Department of Health Services | Division of Public Health
Bureau of Communicable Diseases | Communicable Diseases Epidemiology Section
www.dhs.wisconsin.gov/dph/bcd.htm | dhsdphbcd@dhs.wi.gov



Wisconsin positive influenza results and subtypes by PCR





The Value of Reporting

Benefits of Reporting

- Can help stop transmission!
- Early recognition of outbreaks
- Tracking drug resistance and spread of pathogens
- Evaluation of vaccine efficacy
- Inform on strains for future vaccines
- Helps focus resources to areas that need it most
- Trend data
 - Help doctors diagnose patients
 - Optimize your resources for testing
 - Know when the season has started!
 - Ability to detect problems with a test

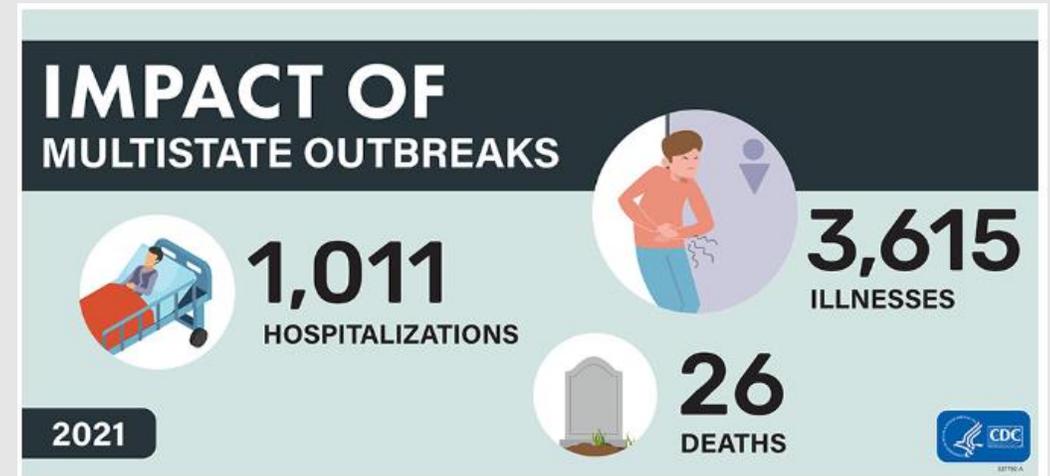
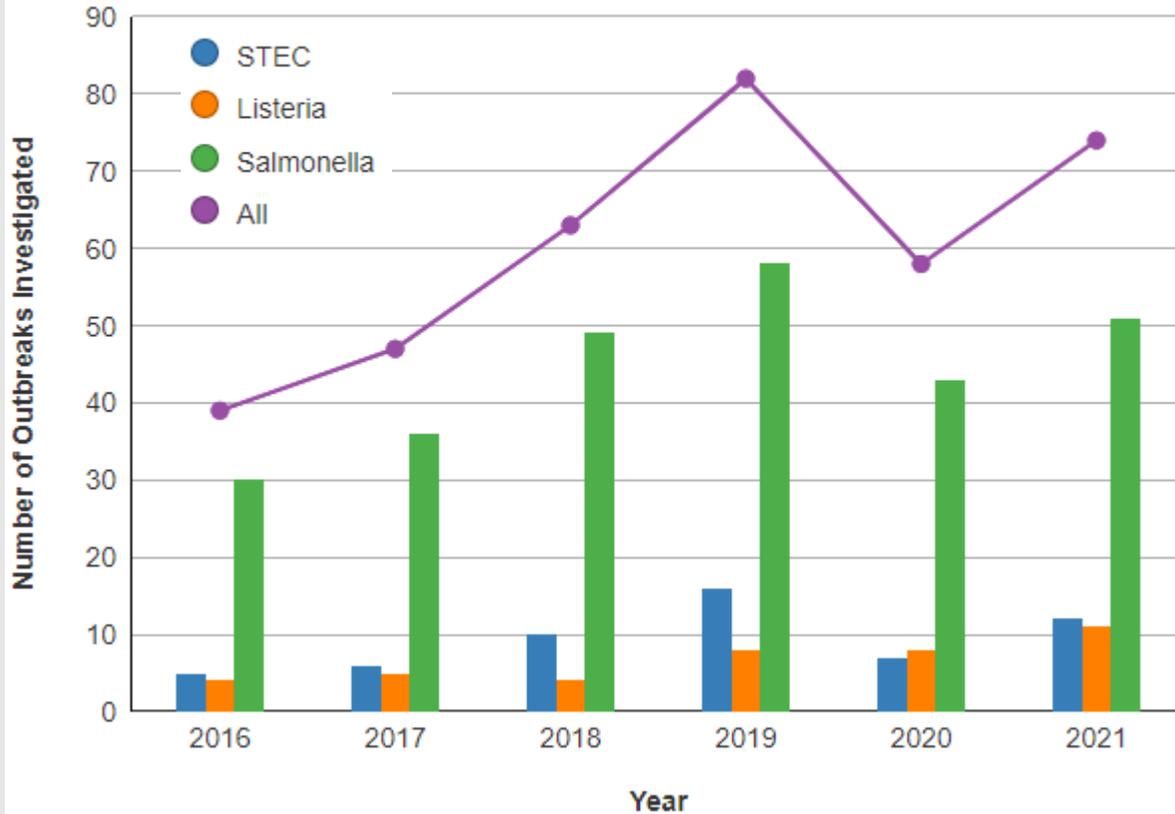
Who Uses This Data?

- Public health organizations
 - CDC, DHS, LTHD, WSLH
- Medical providers
- Laboratories
- The public/Media
- Manufacturers
 - Vaccine development
 - Testing needs

Outbreaks



Figure 1. Number of Multistate Outbreaks Investigated, by Year and Pathogen



Outbreak Announcements



Foodborne Outbreaks in the past year

Contaminated Food	Germ	Year
Ice Cream	<i>Listeria monocytogenes</i>	2023
Ground Beef	<i>Salmonella</i> Saint Paul	2023
Raw Cookie Dough	<i>Salmonella</i> Enteritidis	2023
Flour	<i>Salmonella</i> Infantis	2023
Frozen Strawberries	Hepatitis A	2023
Leafy Greens	<i>Listeria monocytogenes</i>	2023
Alfalfa Sprouts	<i>Salmonella</i> Typhimurium	2022
Raw Oysters	Norovirus	2022

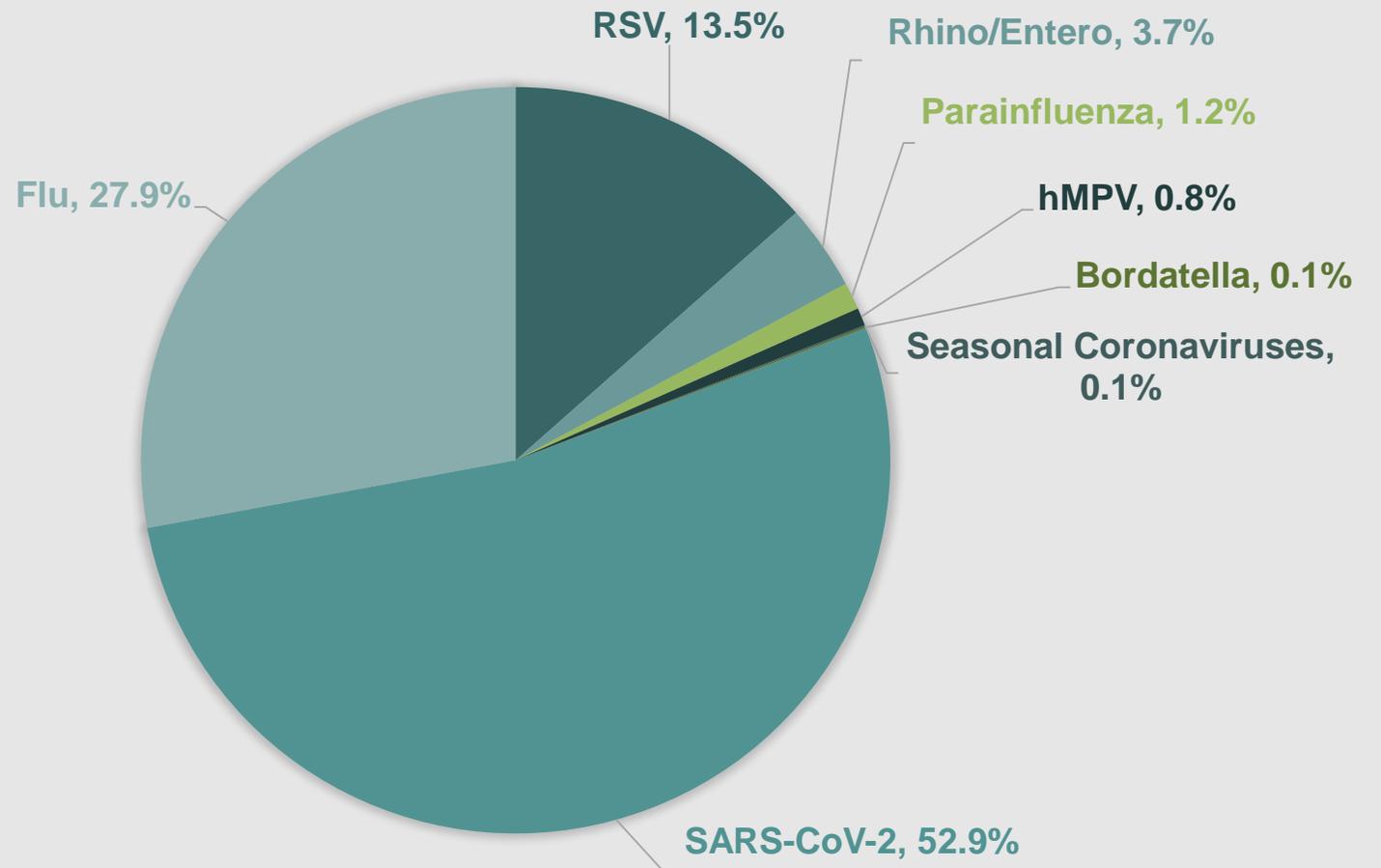


Surveillance Data



Respiratory Pathogens

OF INFECTIONS REPORTED IN THE PAST YEAR





WCLN Webinar – 2023-2024 Respiratory Virus Season Update

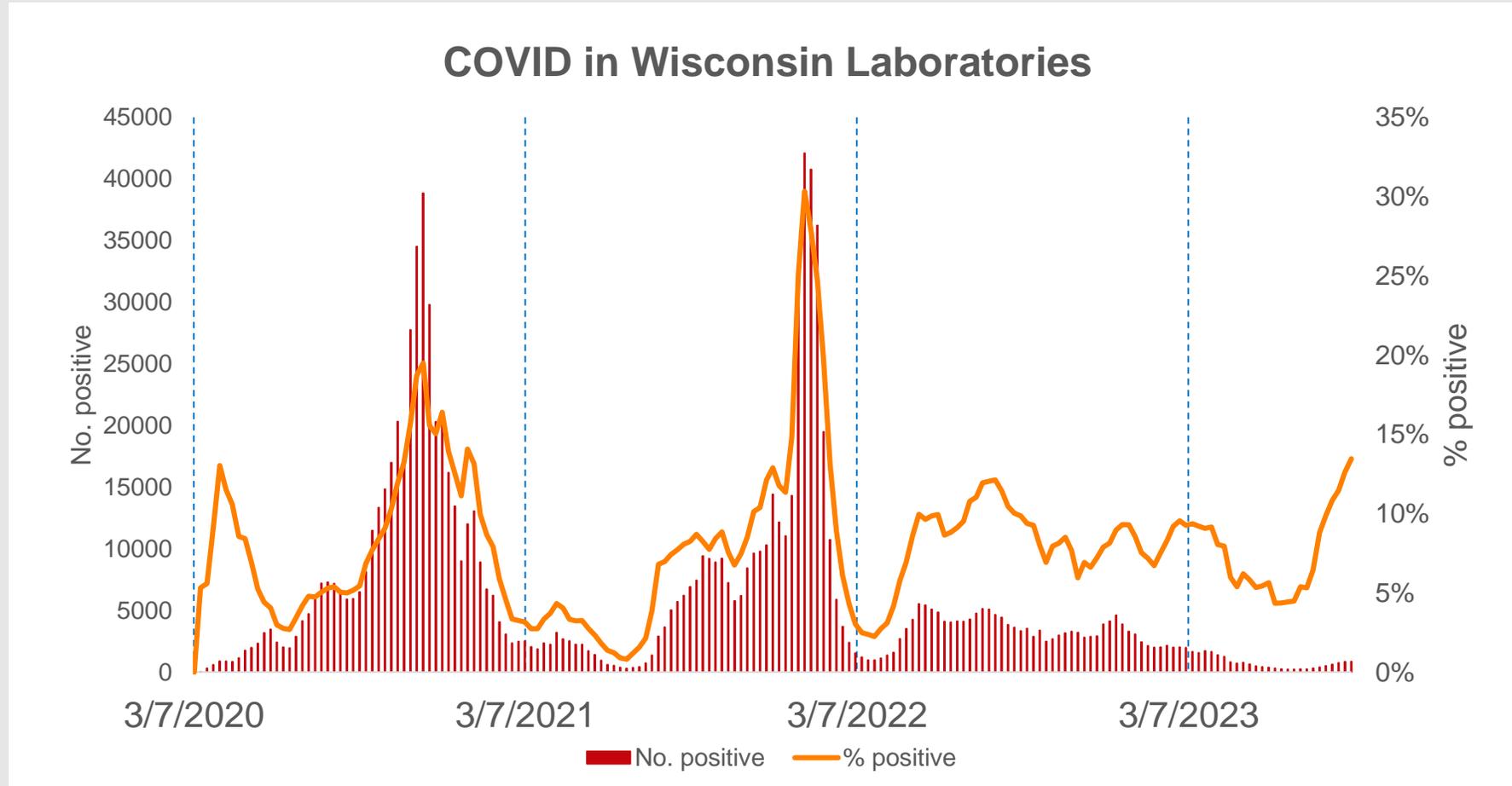
September 21 @ 12:00 pm - 1:00 pm

2023-2024 Respiratory Virus Season Update

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

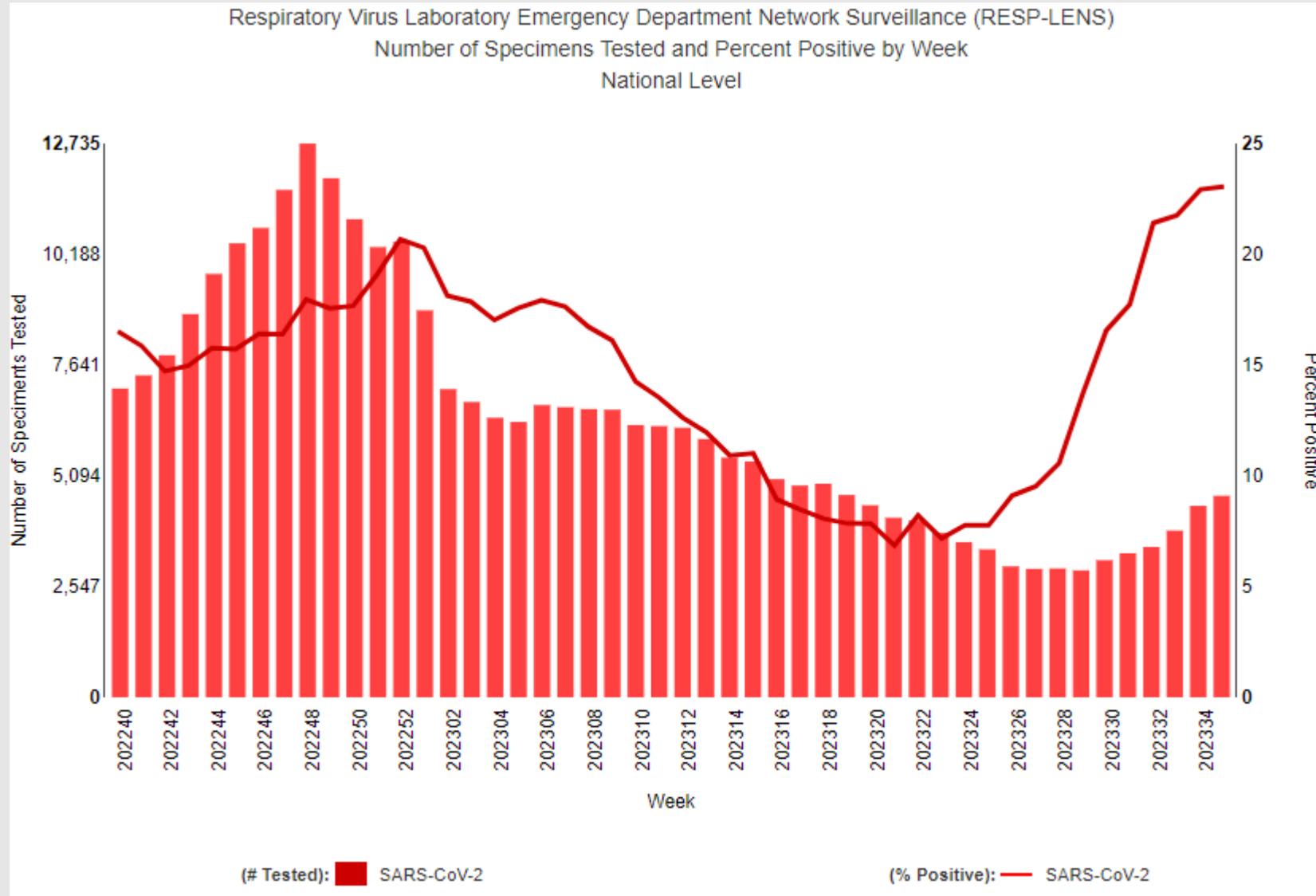
SARS-CoV-2: Surveillance



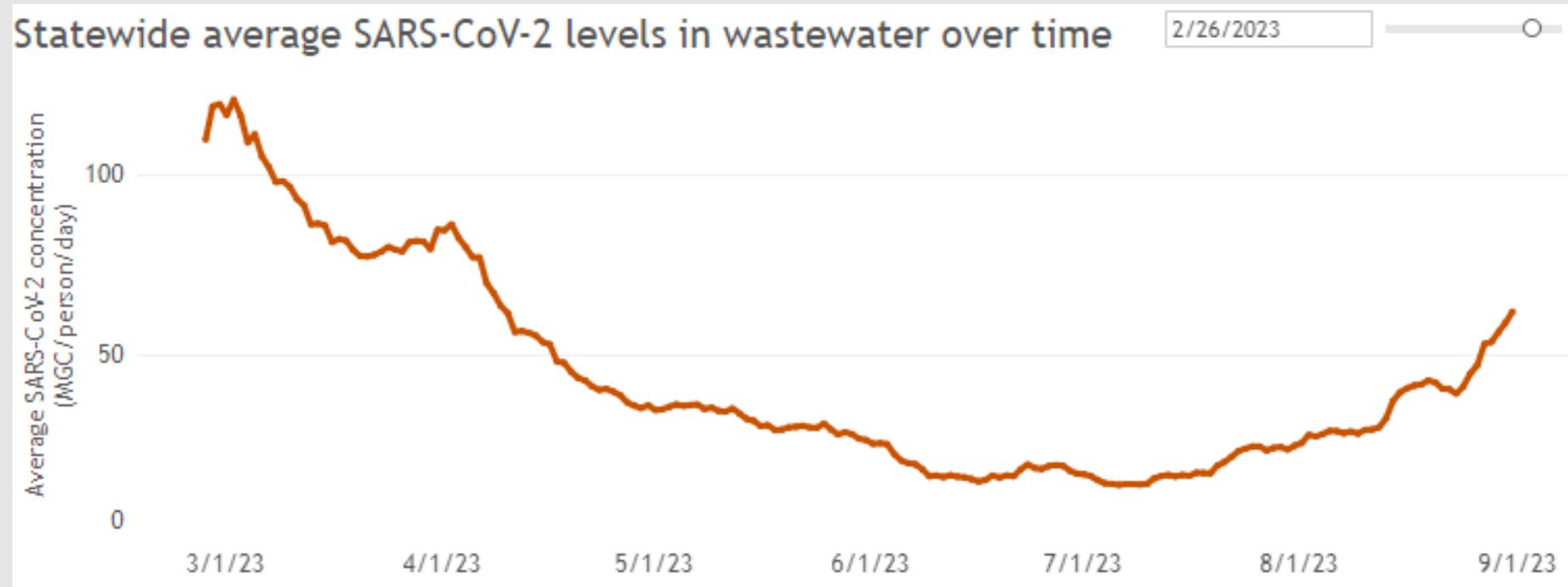
2023 Surveillance sample submission request

SARS-CoV-2	
All Sites	Five positive SARS-CoV-2 samples per week for genomic surveillance

Data Indicates Another Wave



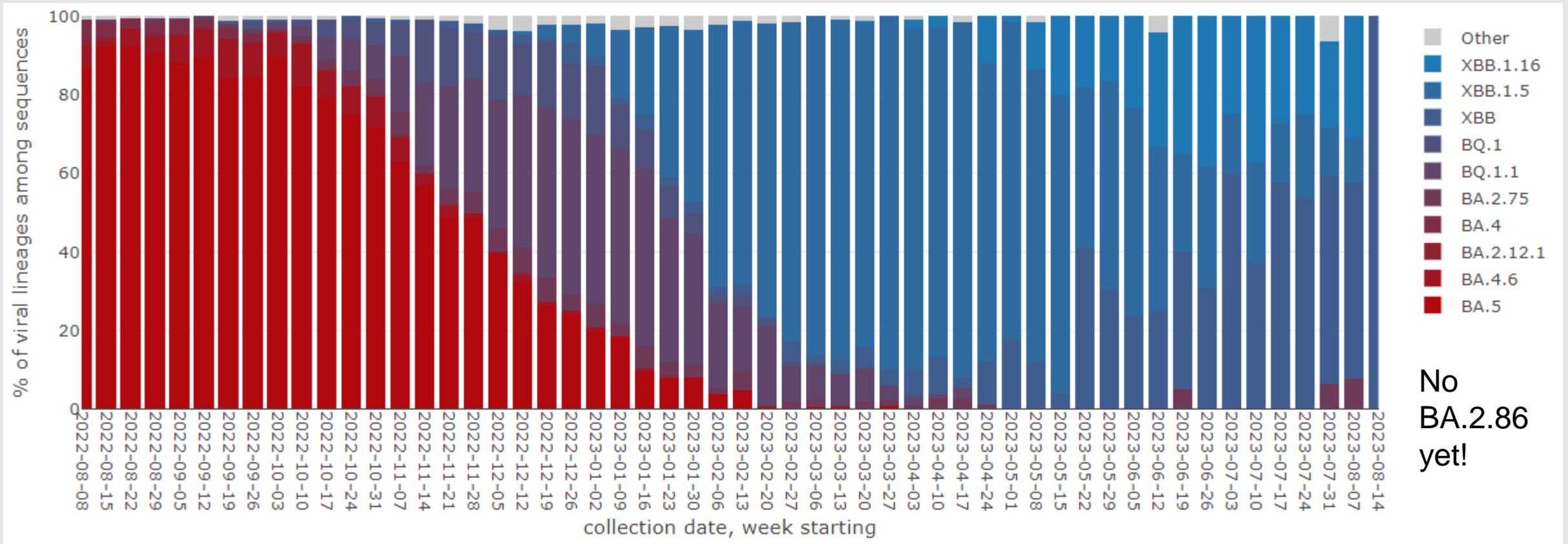
COVID Wastewater Surveillance



SARS-CoV-2: Sequencing



Watching for BA.2.86



No
BA.2.86
yet!

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



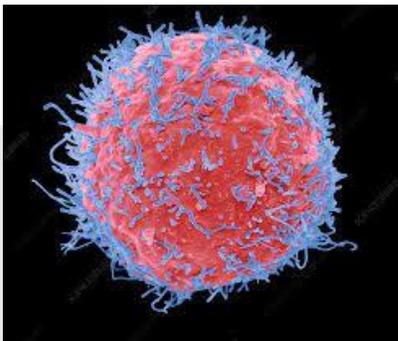
NIRC

National Influenza Reference Center





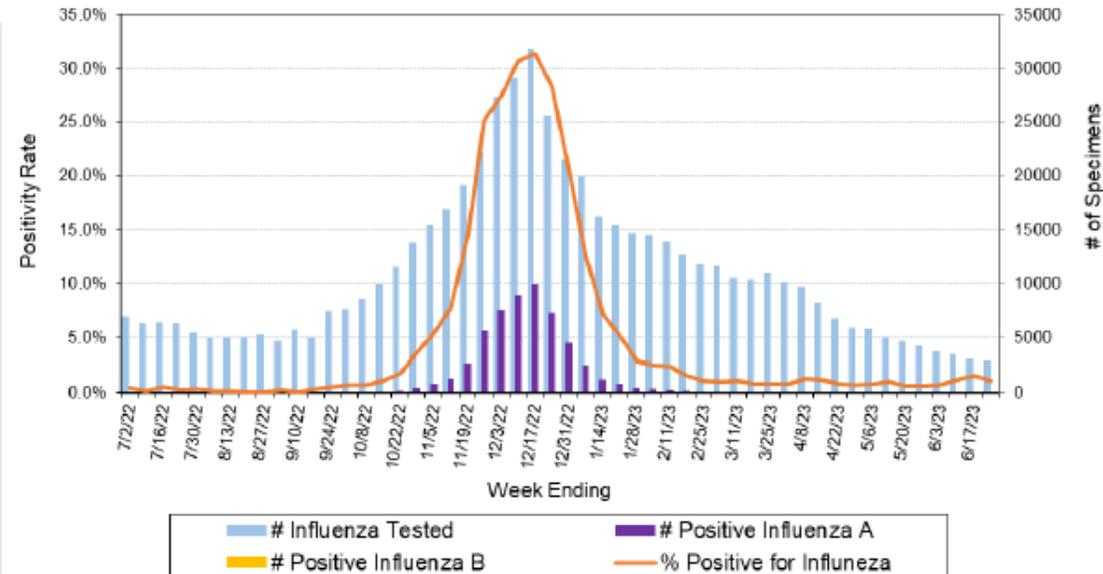
Influenza



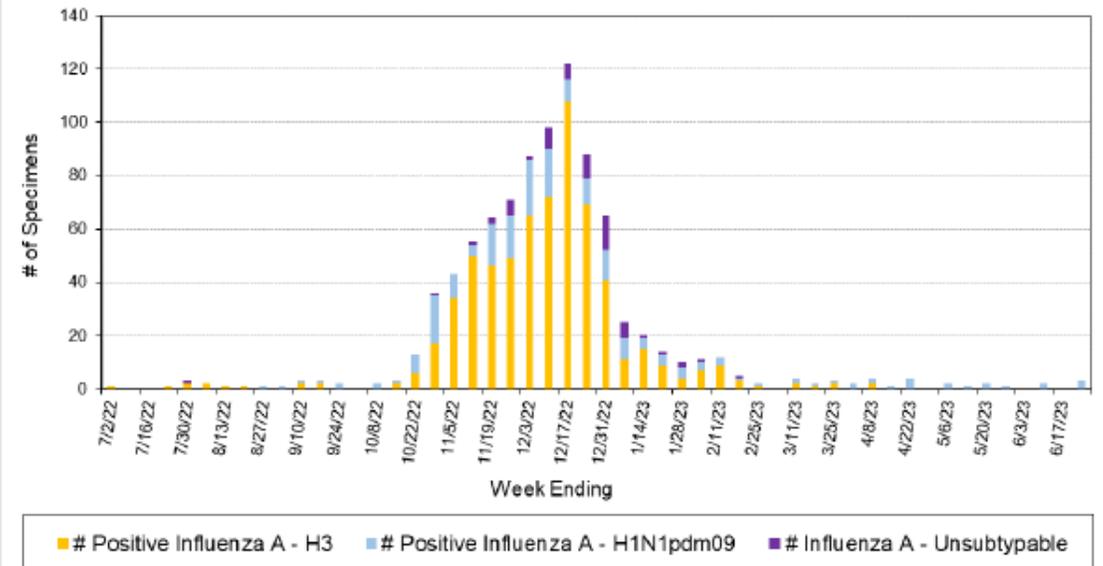
2023 Surveillance sample submission request

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	The first influenza A or B of the season	Influenza A positive specimens with: <ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> International travel history Swine exposure
Sentinel Surveillance	The first 3 respiratory specimens per week from symptomatic patients (regardless of initial test results)		
University Health	Up to 3 respiratory specimens per week from symptomatic patients (regardless of initial test results)		

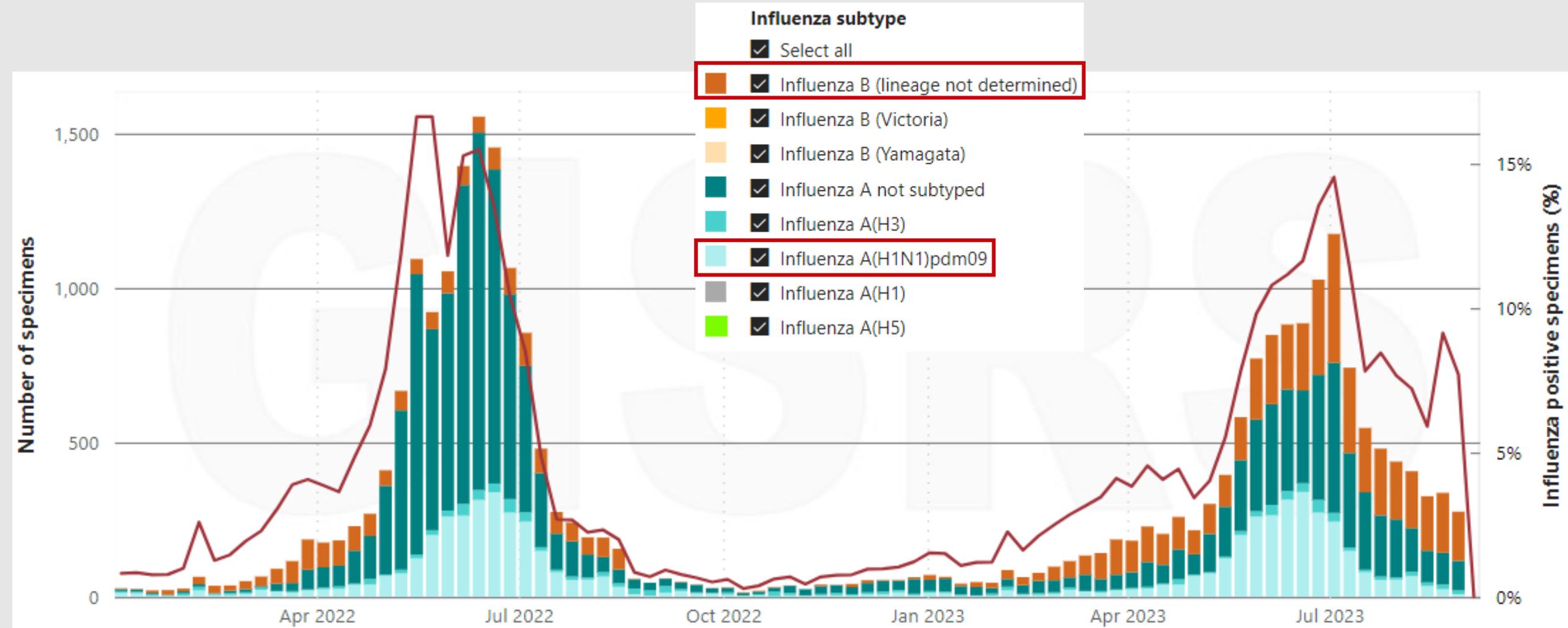
Number Tested and Positivity Rate for **Influenza** by PCR at Wisconsin Laboratories



Influenza A Specimens Subtyped at the Wisconsin State Laboratory of Hygiene



Australian 2023 Flu season (WHO data)

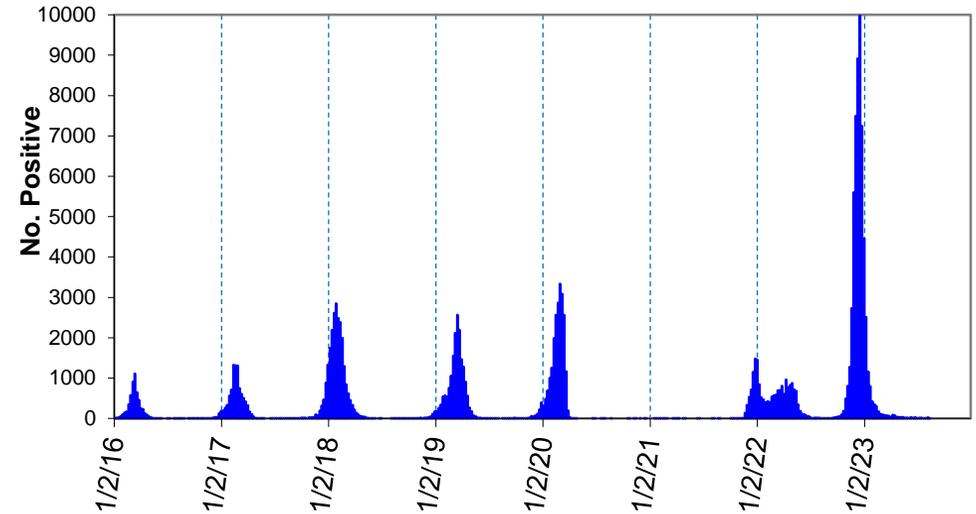


Flu- over time

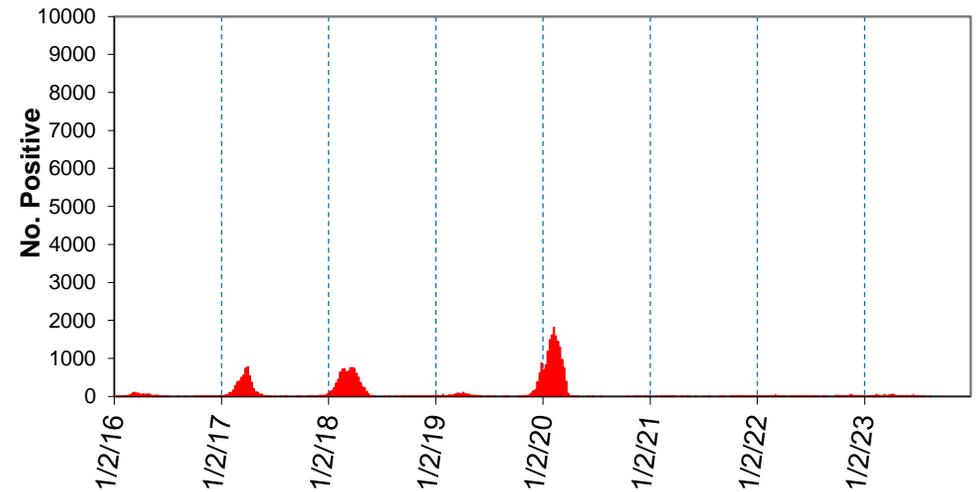


- Large peak in 2020
- No peak in 2021
- Odd double peak in 2022
- Large peak in 2023
- No Flu B peak since 2020

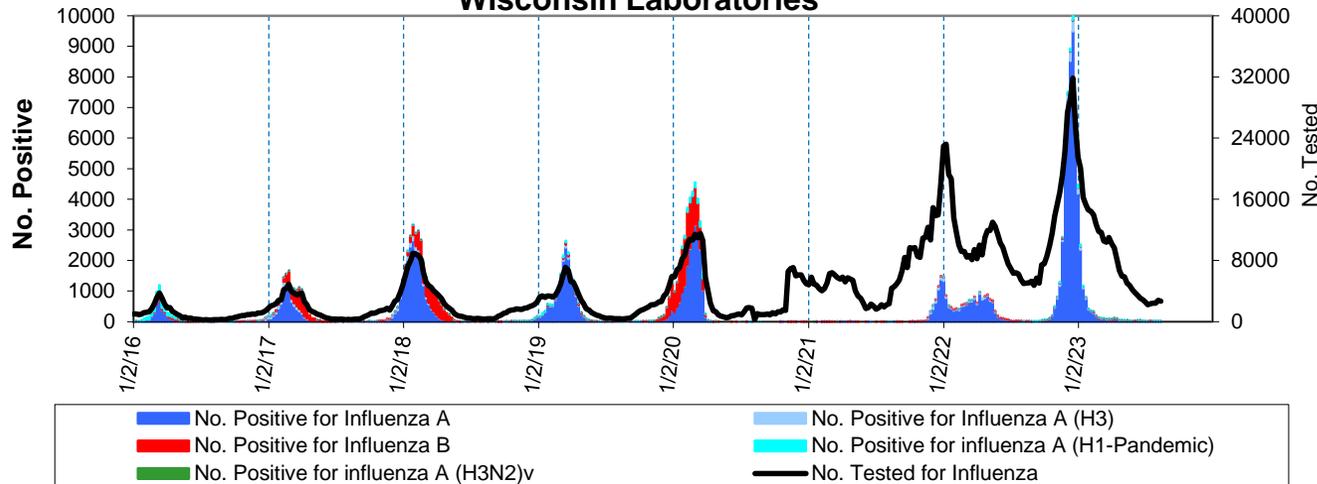
Flu A at Wisconsin Laboratories



Flu B at Wisconsin Laboratories



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

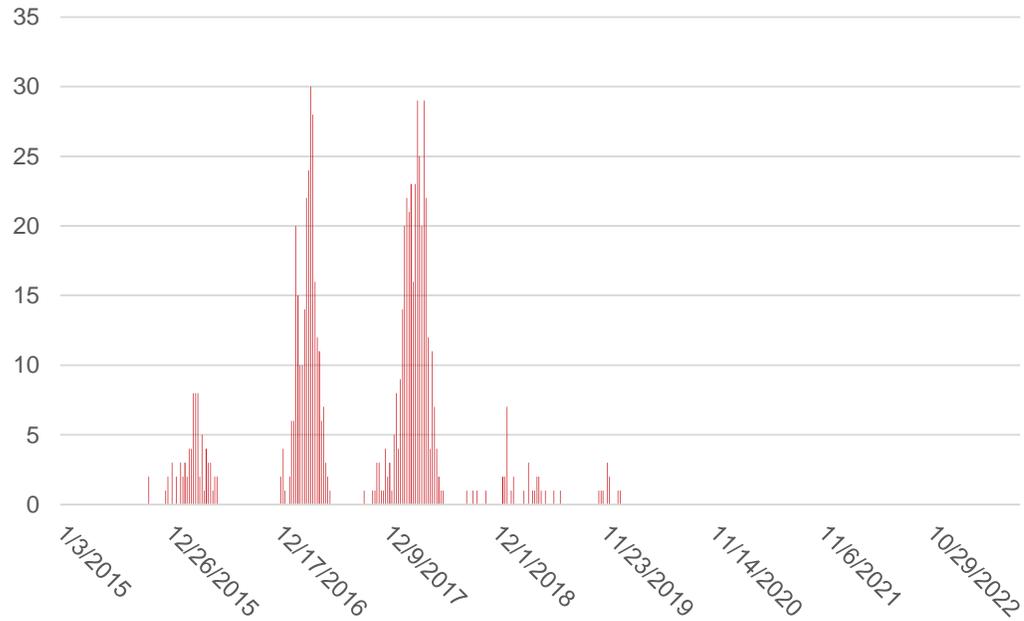


Flu B

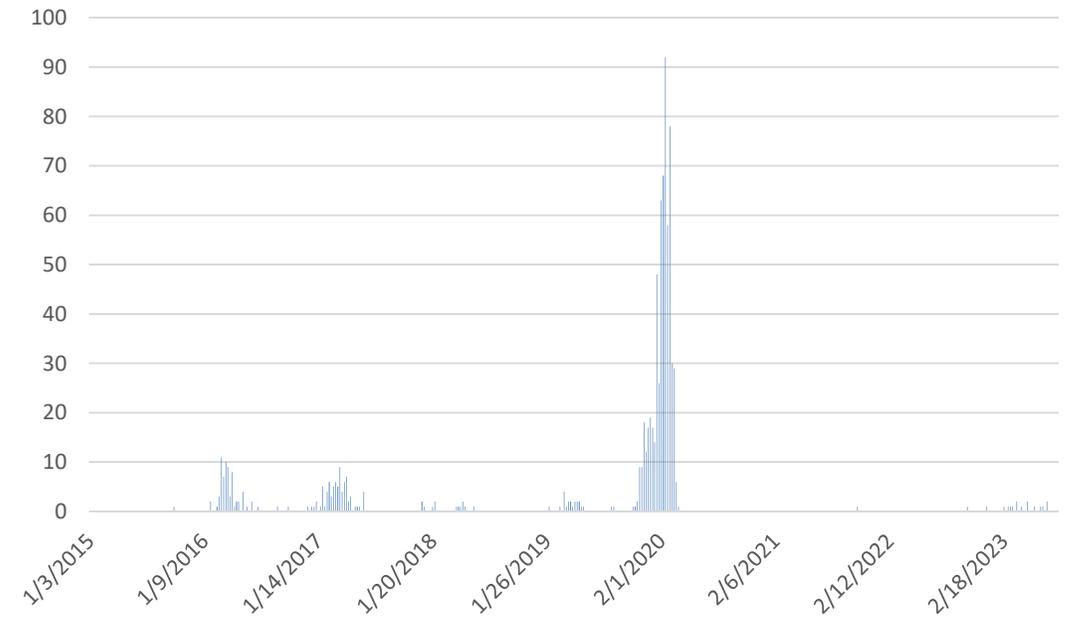


Extinct?

Flu B (Yamagata)

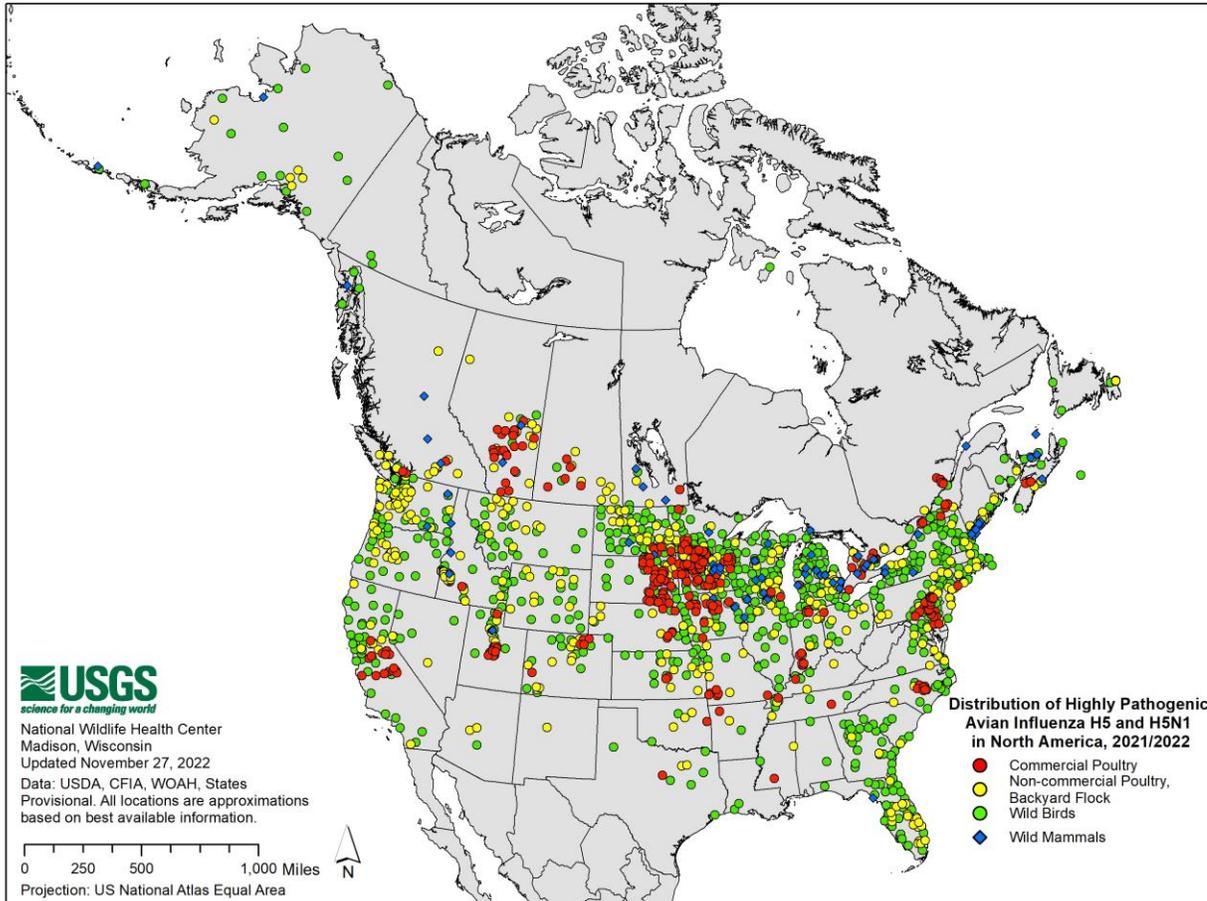
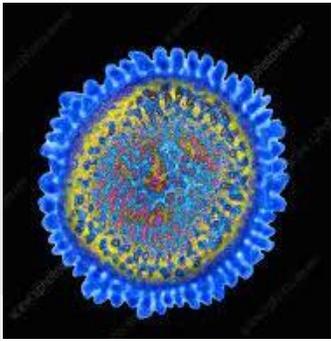


Flu B (Victoria)



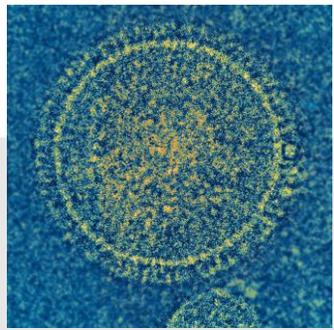


Avian Influenza

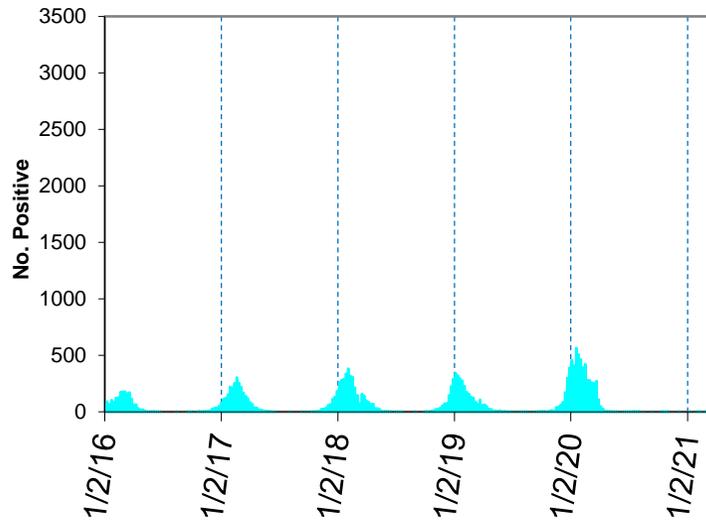


* Surveillance helped us know it wasn't spreading in humans!

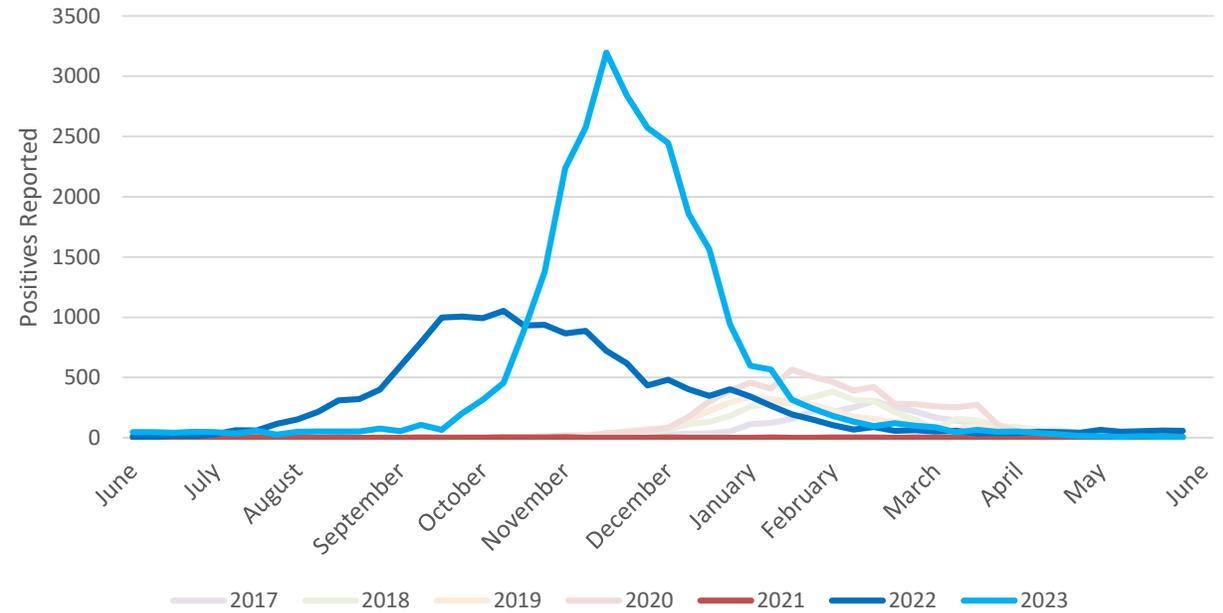
Respiratory Syncytial Virus (RSV)



RSV at Wisconsin Laboratories

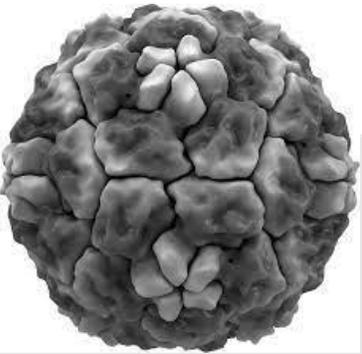


RSV Seasonal Trends in Wisconsin Laboratories



- No peak in 2020
- 2022 was 4 months early and twice as large as usual
- 2023 was 2 months early and 6 times larger than usual
- Prevalence just starting to pick up, similar to last year

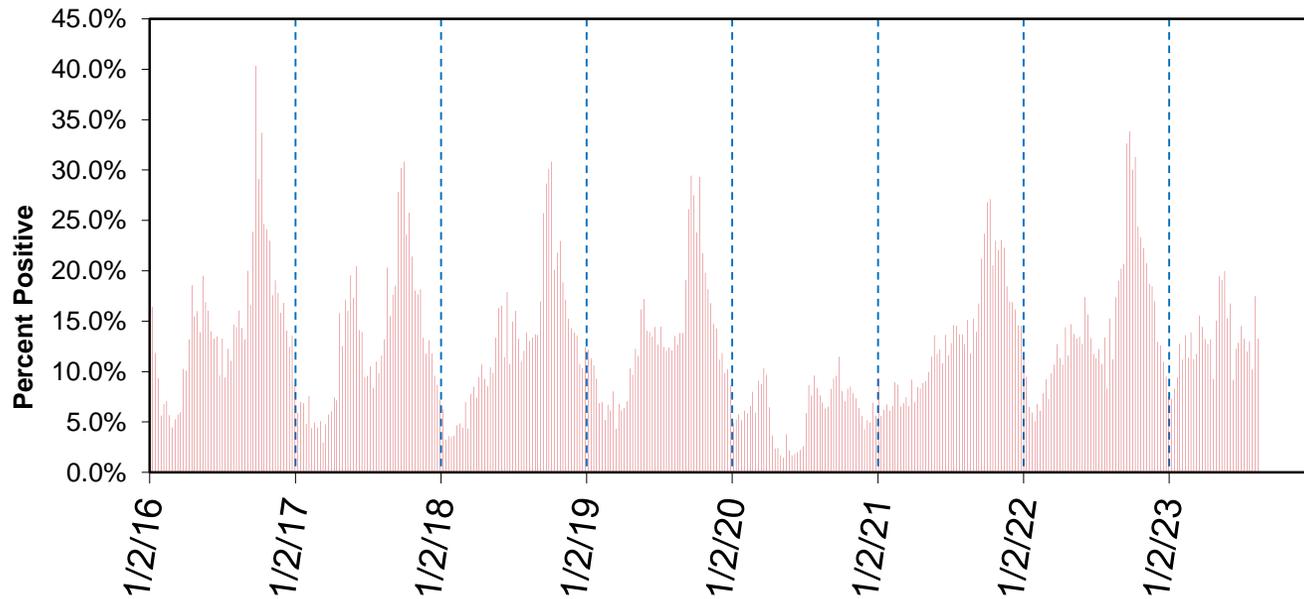
Vaccine now available!



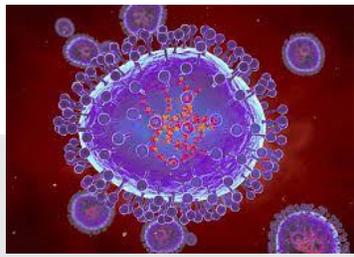
Rhino/Enterovirus



Rhino/Enterovirus at Wisconsin Laboratories



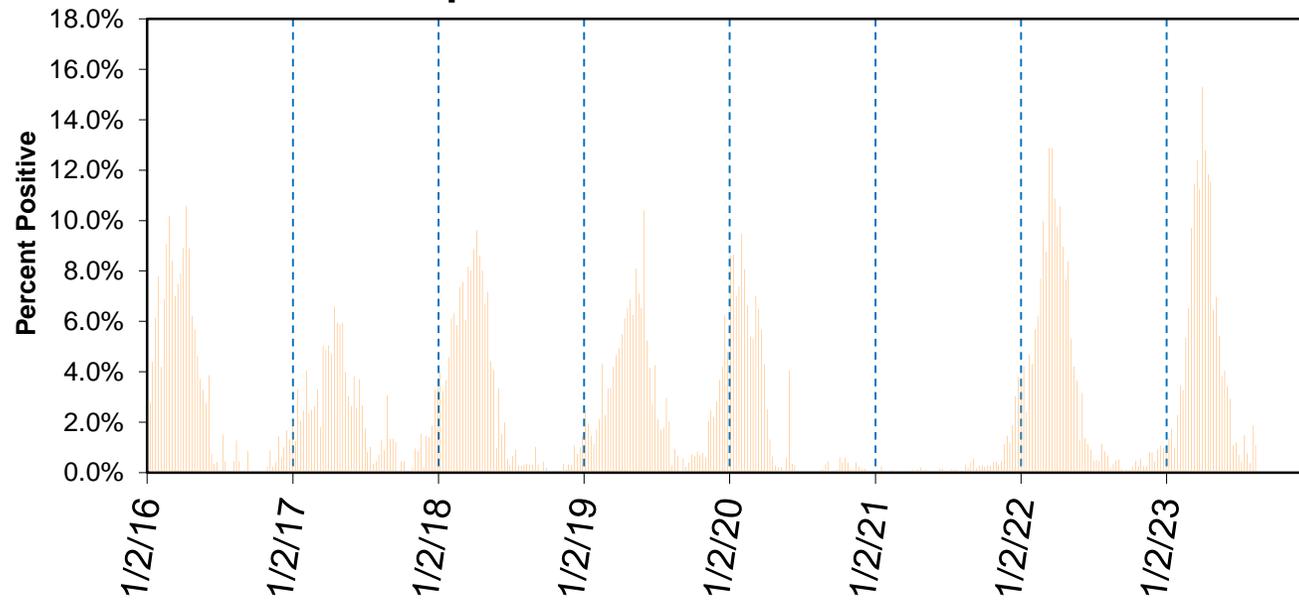
- Cases reduced in 2020
- Peak season just starting now

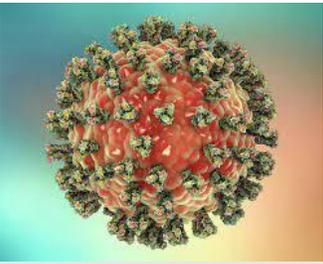


Human Metapneumovirus



Human Metapneumovirus at Wisconsin Laboratories

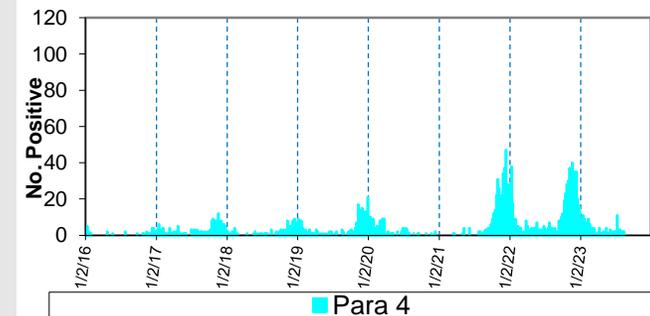
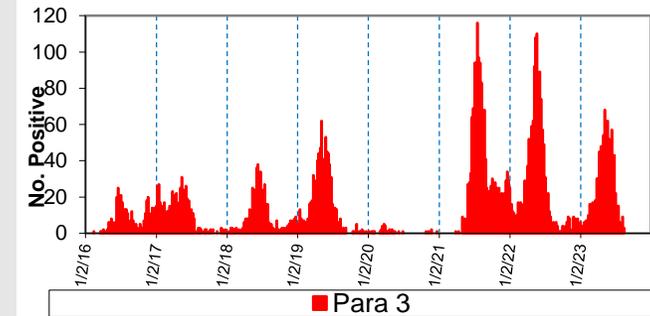
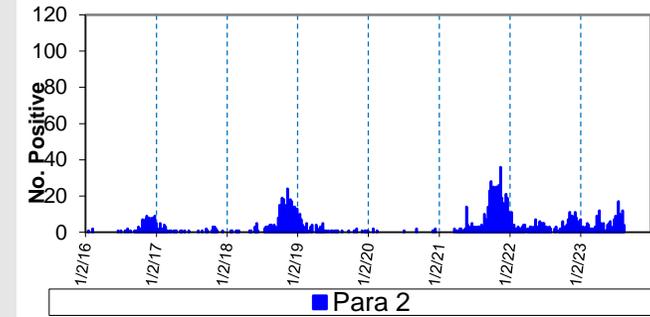
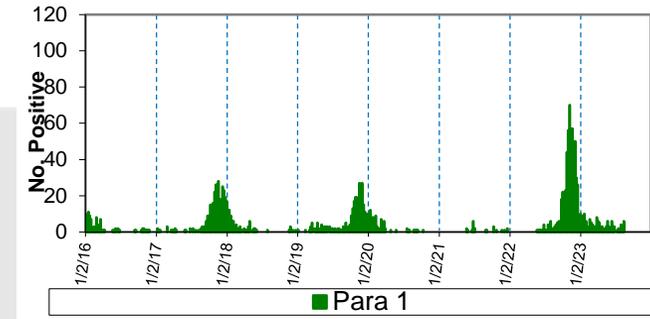
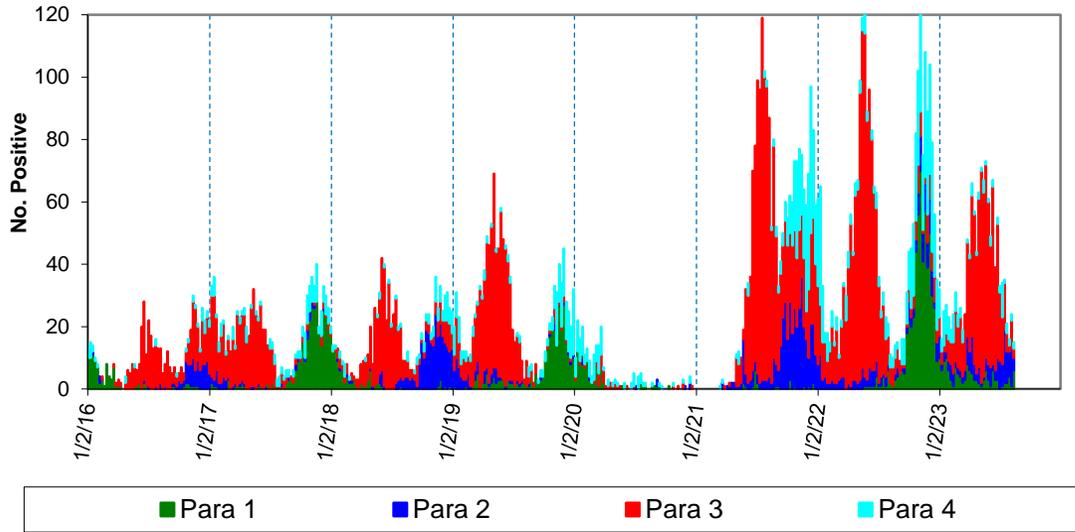




Parainfluenza

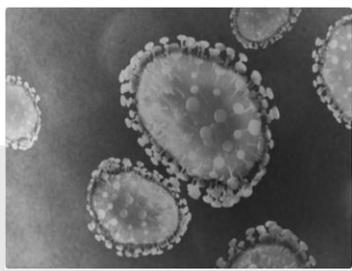


Number of Specimens Positive for Parainfluenza by PCR at Wisconsin Laboratories

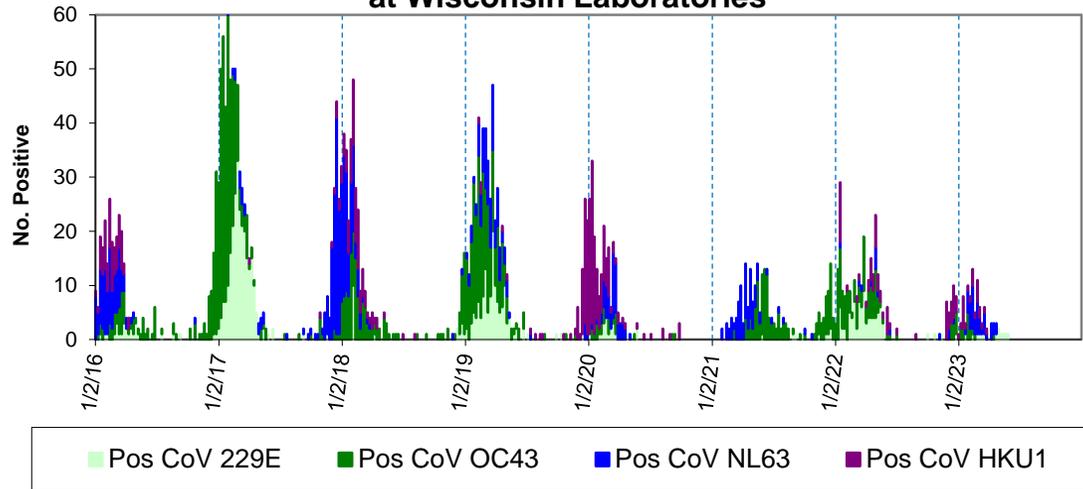


- Increase in Para 1 in 2022
- Increase in Para 3 and 4 in 2021 and 2022

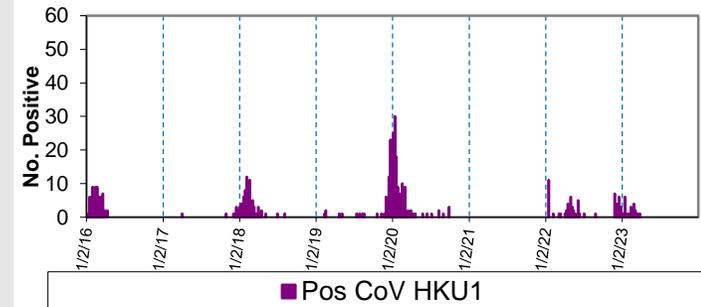
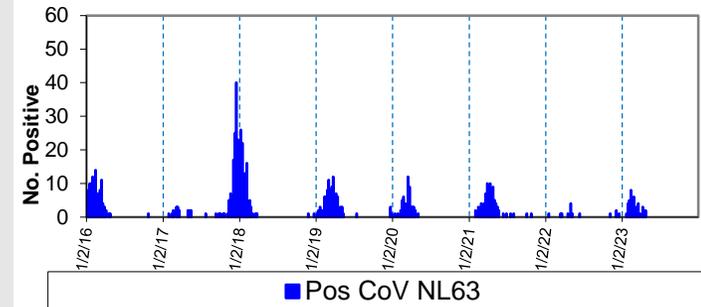
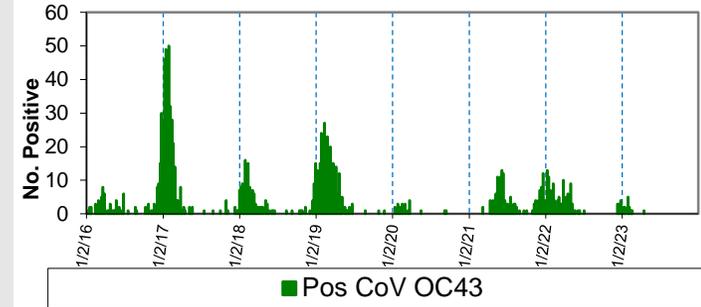
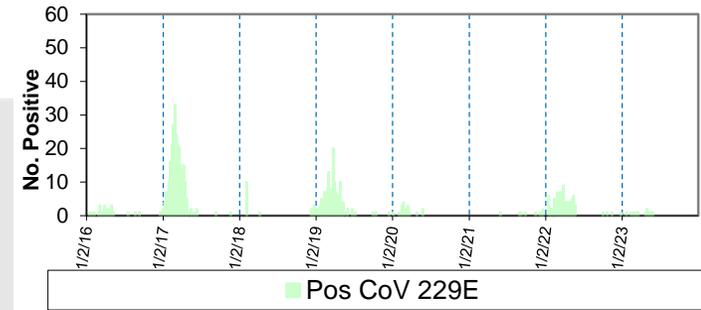
Seasonal Coronaviruses



Number of Specimens Positive for Coronavirus by PCR at Wisconsin Laboratories



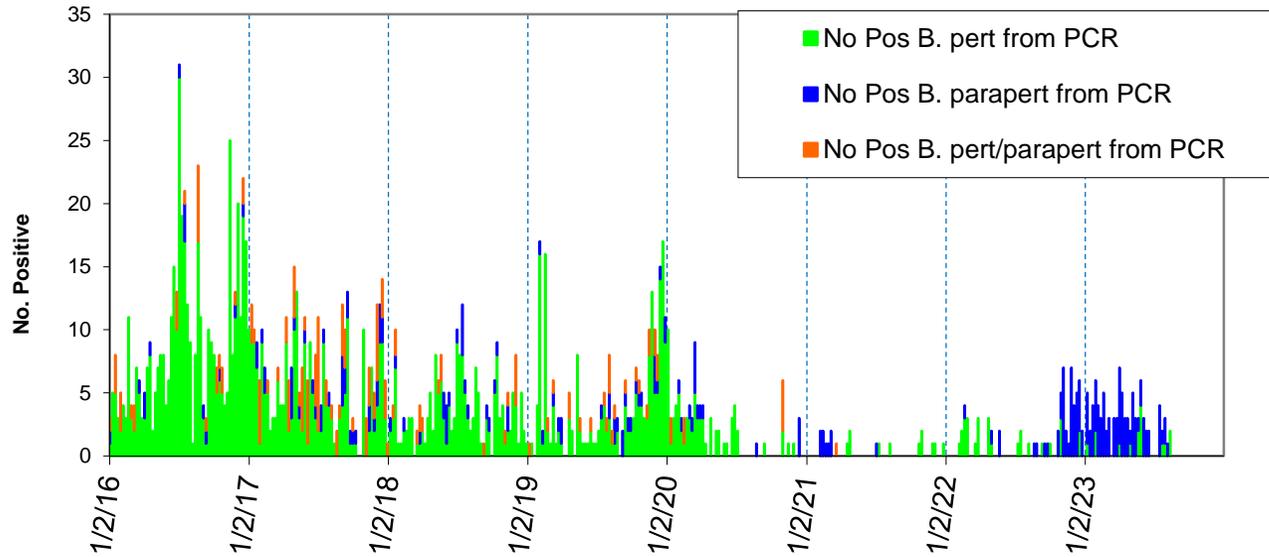
- General decrease in seasonal coronaviruses



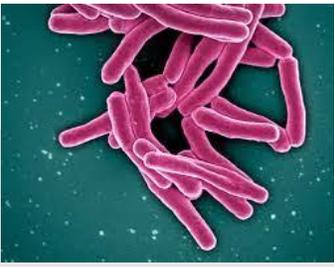
Pertussis



***Bordetella* at Wisconsin Laboratories**



- Steady decline in Pertussis
- Recent spike in *B. parapertussis*



Tuberculosis



- 2023 Wisconsin Mycobacteriology Laboratory Network Conference is in person again this year!
- Wednesday, November 8th at the DoubleTree, Madison East location
- Registration and additional information coming in the next few weeks
- If any questions, please contact Nate (TB Team lead)



Nathan Simon PhD

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Microbiologist III
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608-224-4265



There were 52 new Report-Verified Cases of Tuberculosis in Wisconsin in 2022. 45 Wisconsin patients had culture-confirmed tuberculosis with susceptibility testing performed[‡].

Number of Wisconsin Patients with New Isolations of *Mycobacterium tuberculosis* complex

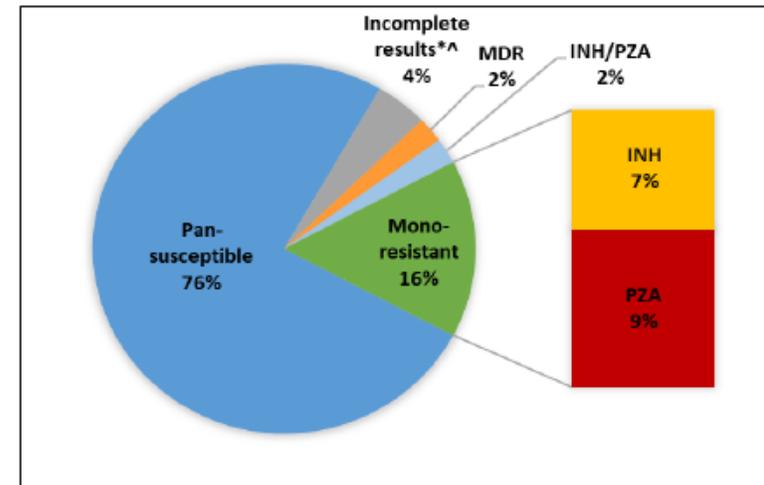
County of Residence	Brown	Clark	Dane	Dodge	Jefferson	Kenosha	La Crosse	Marathon	Milwaukee	Outagamie	Walworth	Waukesha	Winnebago	TOTALS
Pulmonary	1	1	8	1	1	3		3	12	2	1	2	1	36
Extra-pulmonary*	1					1	1		5			1		9
Totals	2	1	8	1	1	4	1	3	17	2	1	3	1	45

(‡) 4 cases were clinically diagnosed with no culture growth, 3 cases were MTBC PCR-positive with no culture growth

(*)Extra-Pulmonary sources of isolation: 2 abscess, 1 abdomen fluid, 1 brain, 1 CSF, 1 neck, 1 pleural fluid, 1 spine, 1 thigh fluid

2022 Wisconsin TB Patient Drug Susceptibility Summary

<i>M. tuberculosis</i> complex First-Line Drug Susceptibility Testing [§]	
Susceptible to all first-line drugs	34
Resistant to INH (0.2 and 1µg/ml)	3
Resistant to rifampin only	0
Resistant to ethambutol only	0
Resistant to PZA only	4
Resistant to INH (0.2 and 1µg/ml) and PZA poly-resistant	1
Multi-drug resistant (MDR) [#]	1
non-viable or unable to perform	2 ^{*^}
TOTAL	45



(§) TB First-Line Drugs tested: isoniazid (INH) 0.2 and 1.0 µg/ml, rifampin (RIF) 1.0 µg/ml, ethambutol (EMB) 5.0 µg/ml, pyrazinamide (PZA) 100 µg/ml

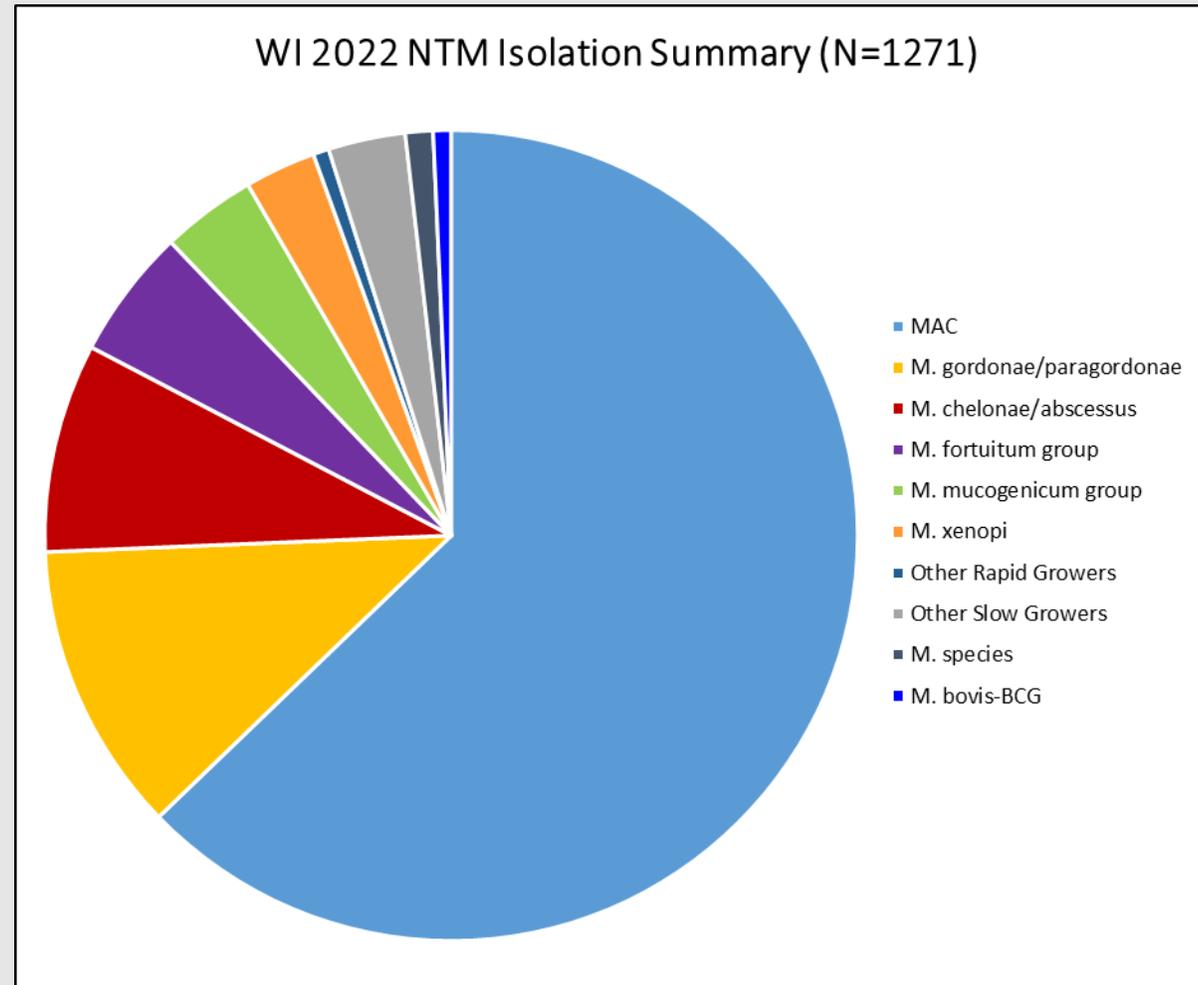
(#) MDR = resistant to at least INH and rifampin; This isolate was resistant to INH, RIF, and EMB.

(*) One isolate failed to grow in IIRE susceptibility cultures—Molecular testing at CDC predicted isolate susceptible to INH, RIF. Susceptible to PZA.

(^) One isolate was mixed with a rapidly-growing mycobacterium species. Unable to isolate pure MTBC and obtain susceptibility results.



Non-tuberculous *Mycobacteria* (NTM)

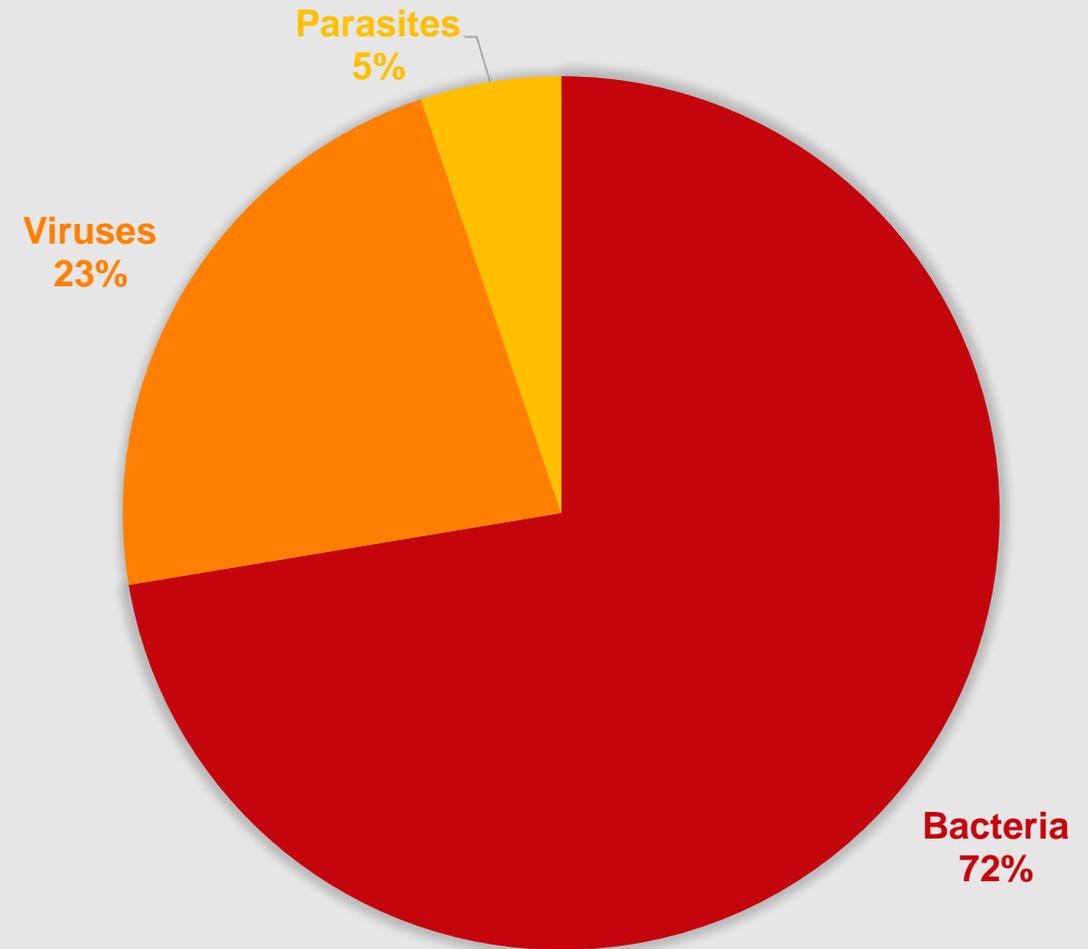


*About 300 more than last year



POSITIVE REPORTED IN THE LAST YEAR

Enteric Surveillance

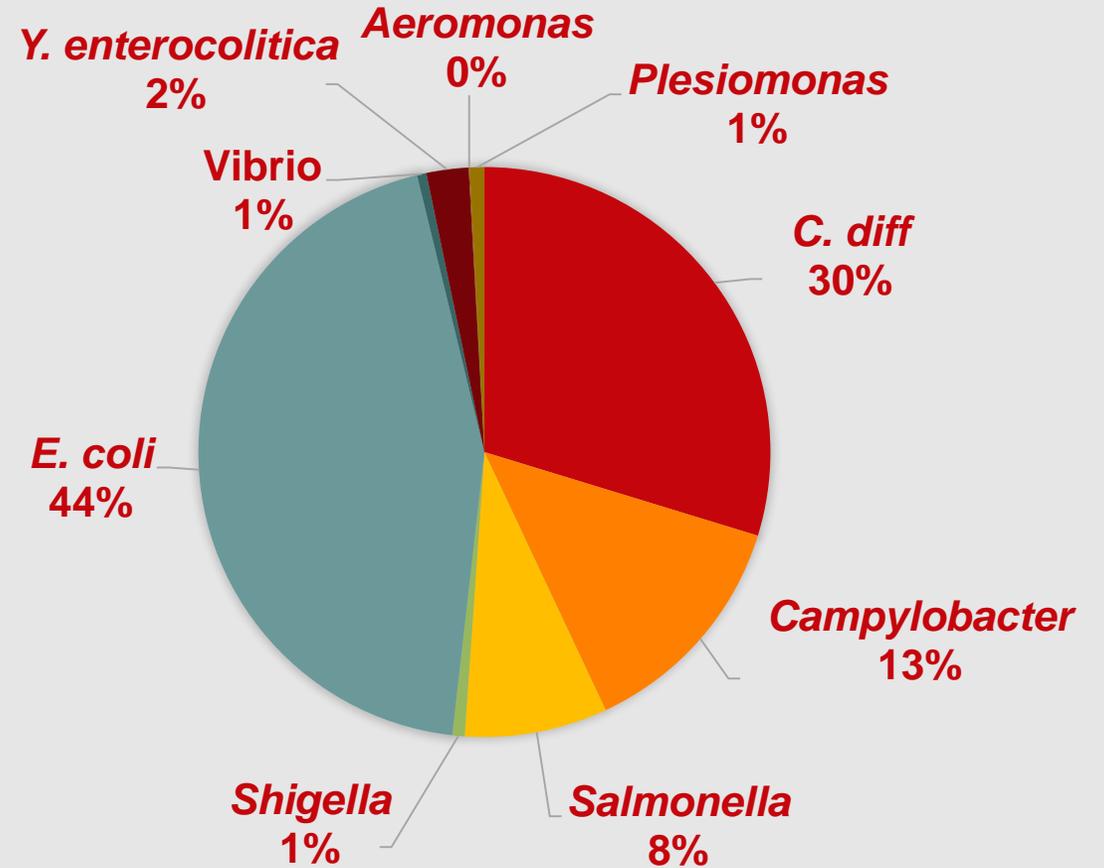


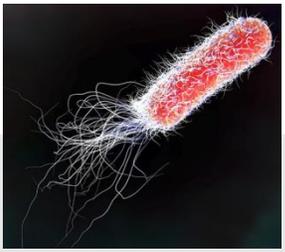
Bacterial



Table 4. Enteric Pathogen Specimen Submissions*		
Pathogen	Specimen Type	Testing Performed at WSLH
<i>Aeromonas</i> species	Isolates or stool	Identification
<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>Plesiomonas shigelloides</i>	Isolates or stool	Identification
<i>Salmonella</i> species	Isolates or stool	Identification, serotyping, antimicrobial susceptibility testing and molecular subtyping (WGS)
<i>Shigella</i> species and Enteroinvasive <i>E. coli</i> (EIEC)	Isolates or stool	Identification and antimicrobial susceptibility testing; Molecular subtyping will be performed as necessary
<i>Vibrio</i> Species	Isolates or stool	Identification and referral to CDC
<i>Yersinia</i> species	Isolates or stool	Identification

OF ENTERIC BACTERIA REPORTED IN THE LAST YEAR



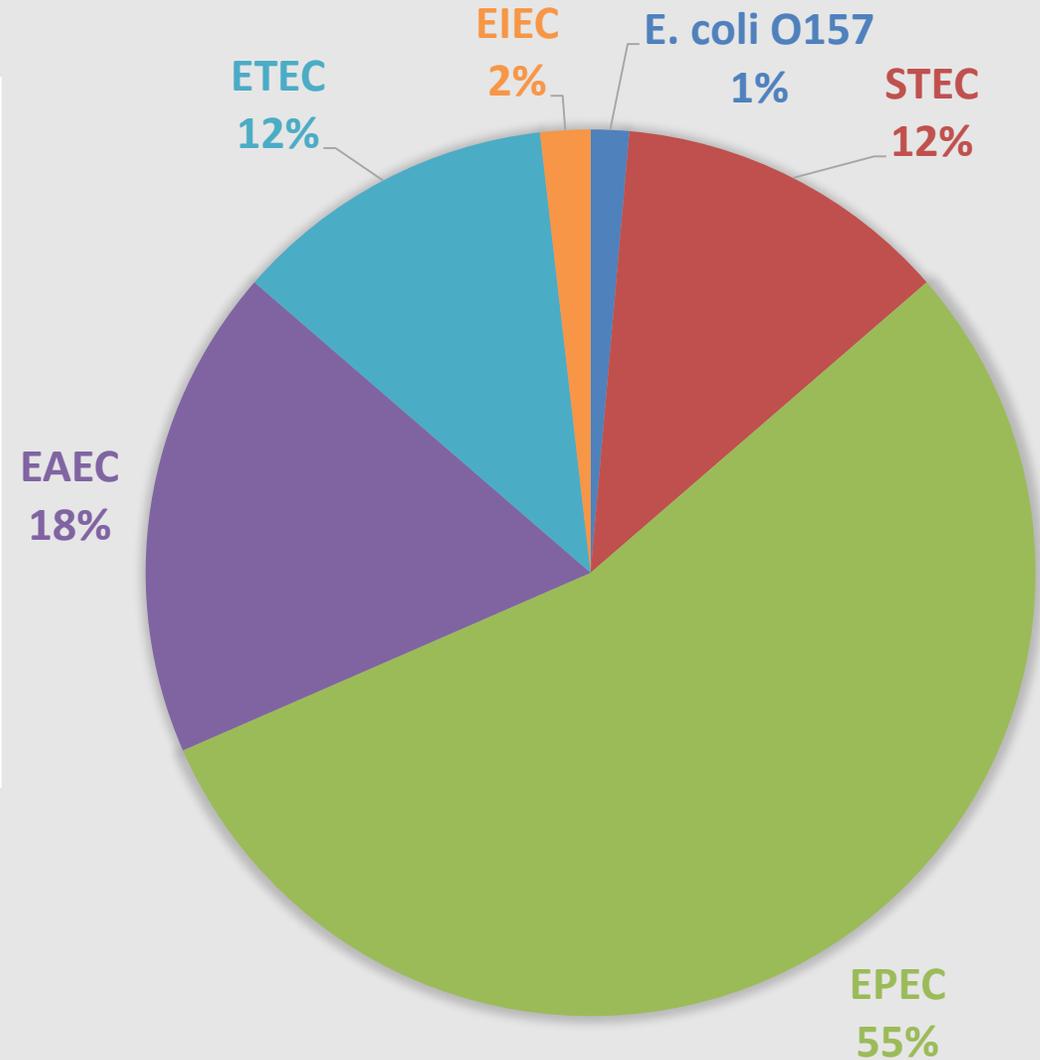
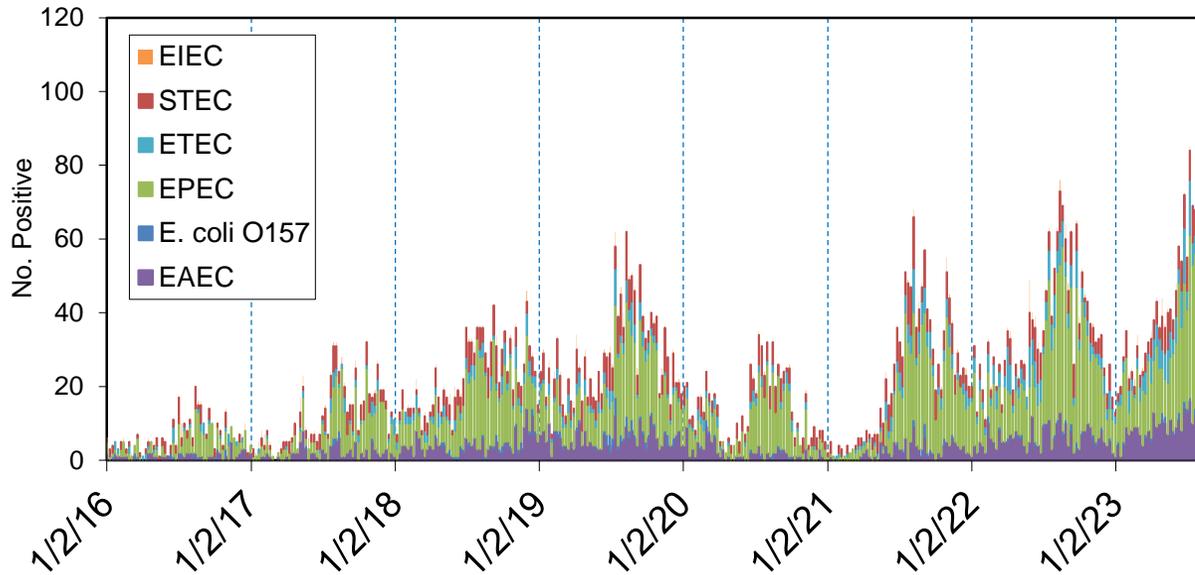


E. coli



POSITIVE REPORTED IN THE LAST YEAR

E. coli at Wisconsin Laboratories

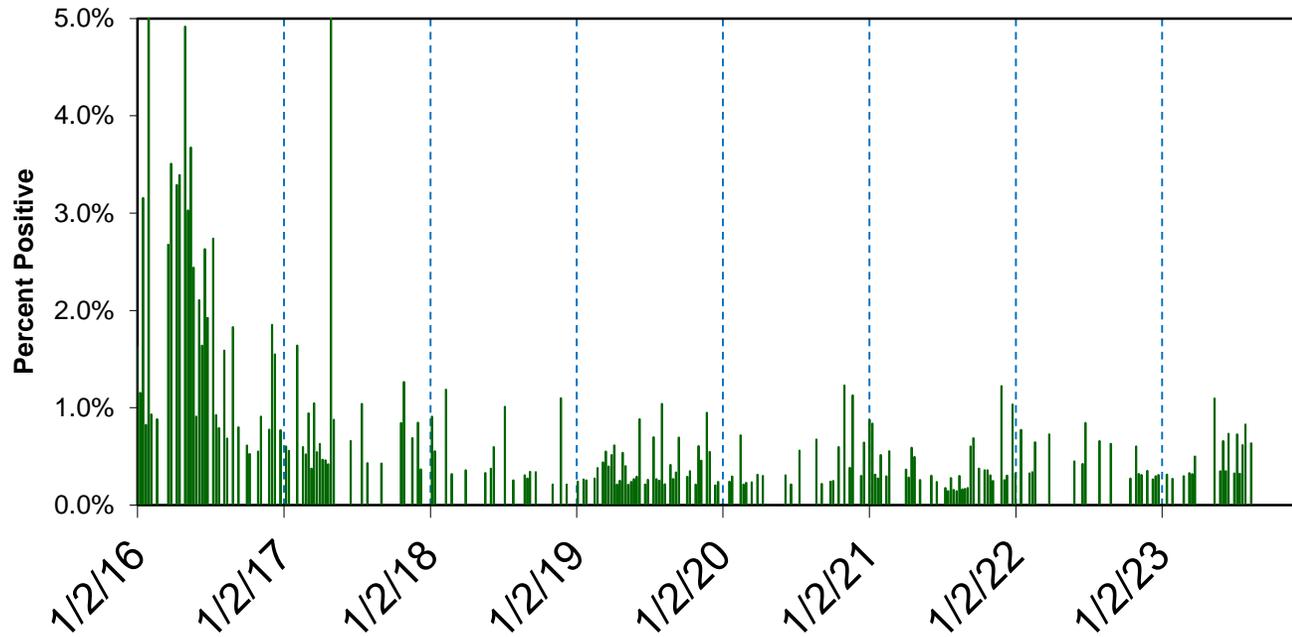




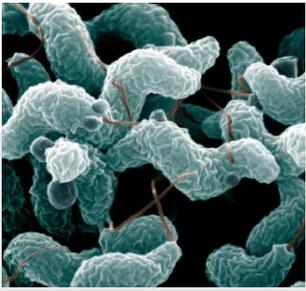
Shigella



Shigella at Wisconsin Laboratories



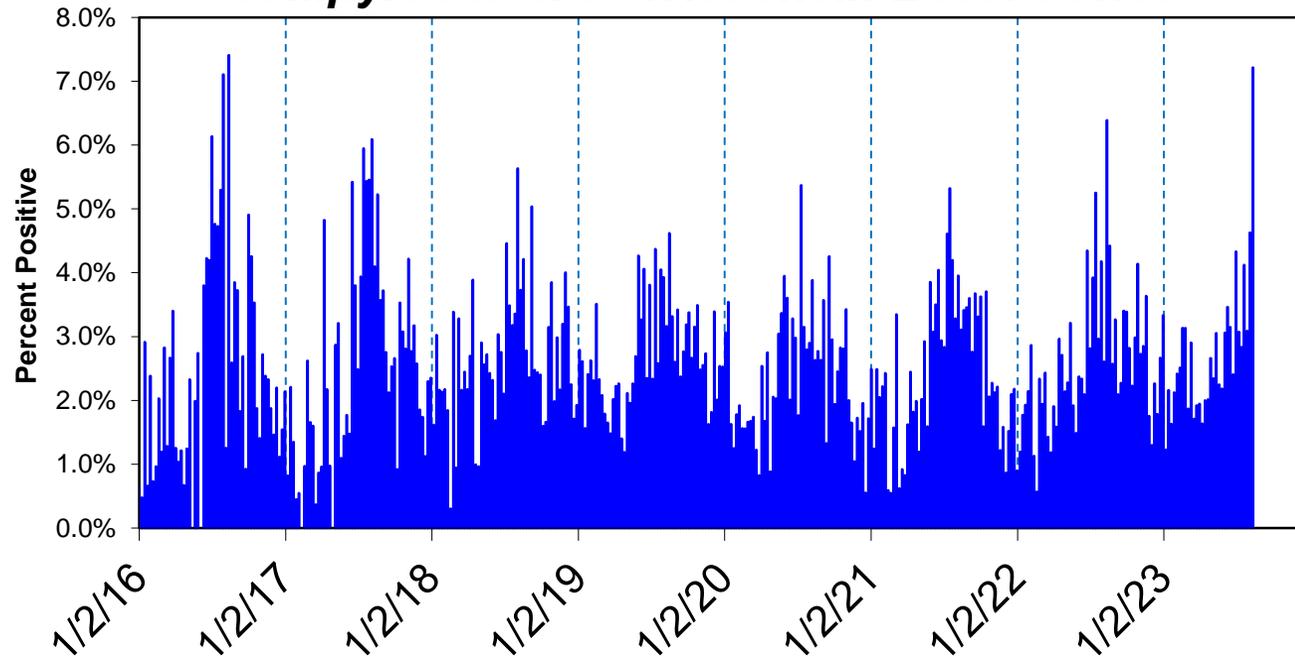
- Overall low rates
- No real impact from the pandemic



Campylobacter



***Campylobacter* at Wisconsin Laboratories**



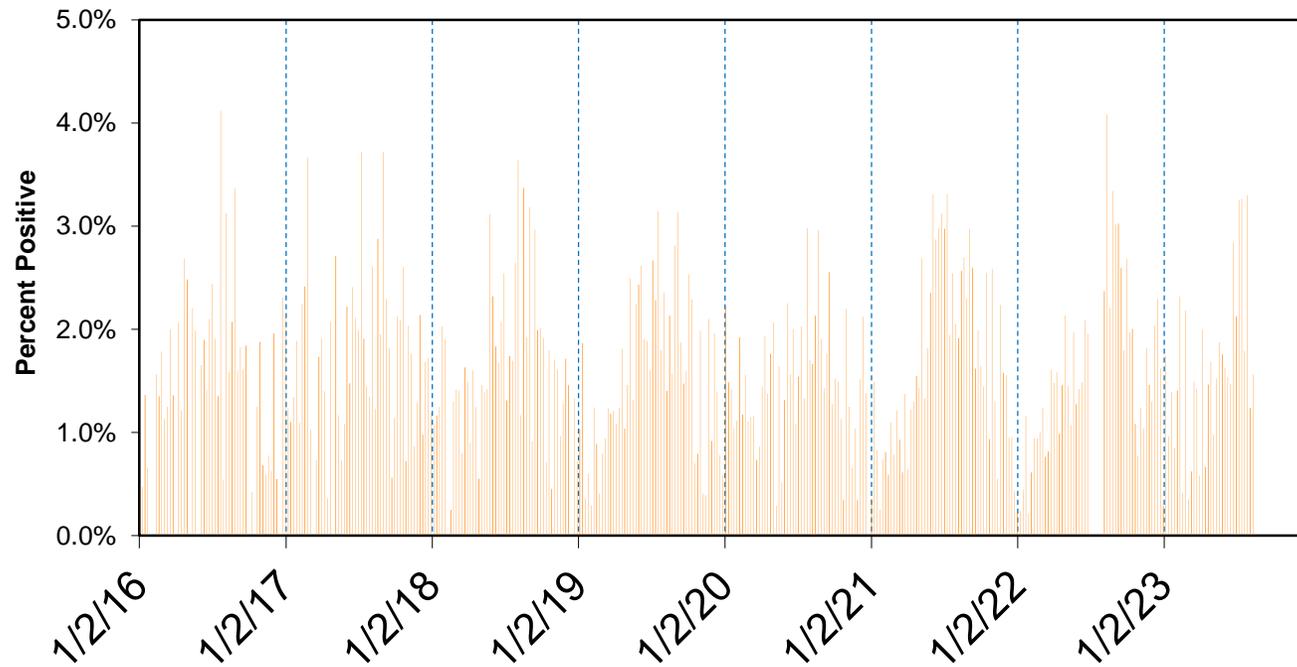
- Summer peaks
- No real impact from the pandemic



Salmonella



Salmonella at Wisconsin Laboratories



- Summer peaks
- No real impact from the pandemic

Salmonella Outbreaks



Backyard Poultry

[Print](#)

Investigation Notice

Posted July 20, 2023

Public health officials are investigating multistate outbreaks of *Salmonella* linked to contact with backyard poultry. Any backyard poultry can carry *Salmonella* germs that can make you sick. Always take steps to stay healthy around your flock.

Fast Facts

- Illnesses: 690 (280 new)
- Hospitalizations: 141 (57 new)
- Deaths: 0
- [States](#): 47 and Puerto Rico (3 new)
- Investigation status: Active (first posted on May 19, 2023)



Salmonella Outbreak Linked to Small Turtles

[Print](#)

Investigation Notice

Posted August 18, 2023

Public health officials are investigating a multistate outbreak of *Salmonella* linked to small turtles. Although any turtle can carry *Salmonella* germs that can spread to you and make you sick, turtles with shells less than 4 inches long are a known source of illness. Always take steps to stay healthy around your small turtles.

Fast Facts

- Illnesses: 26
- Hospitalizations: 9
- Deaths: 0
- [States](#): 11
- Investigation status: Active

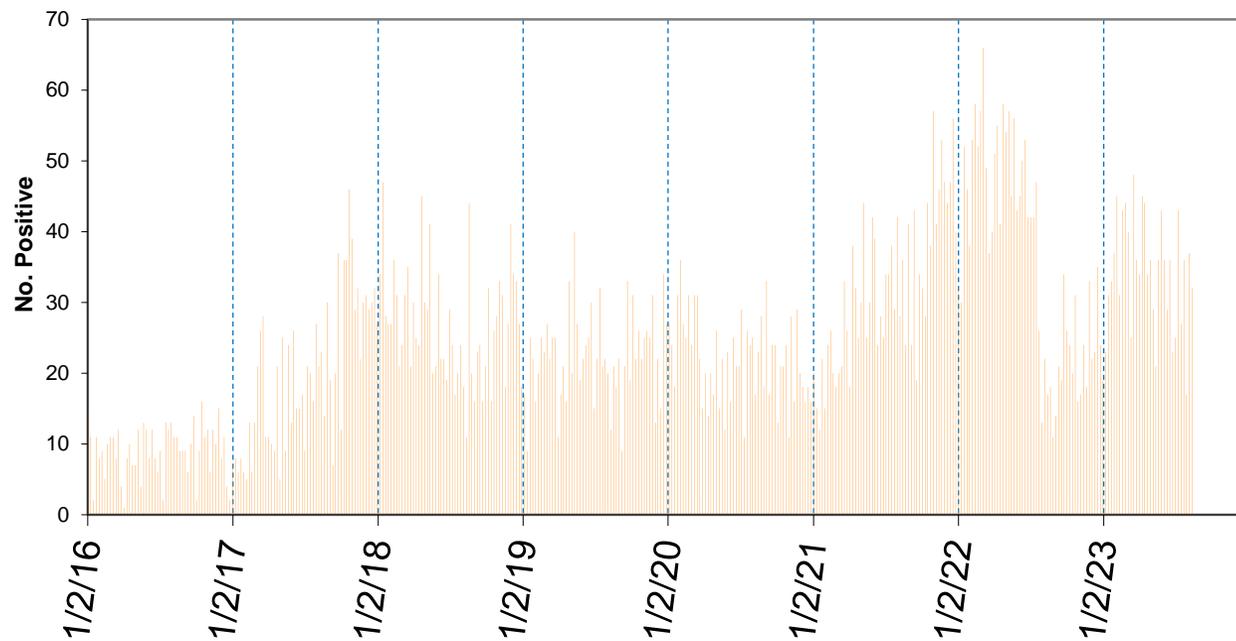




C. diff



***Clostridium difficile* at Wisconsin Laboratories**



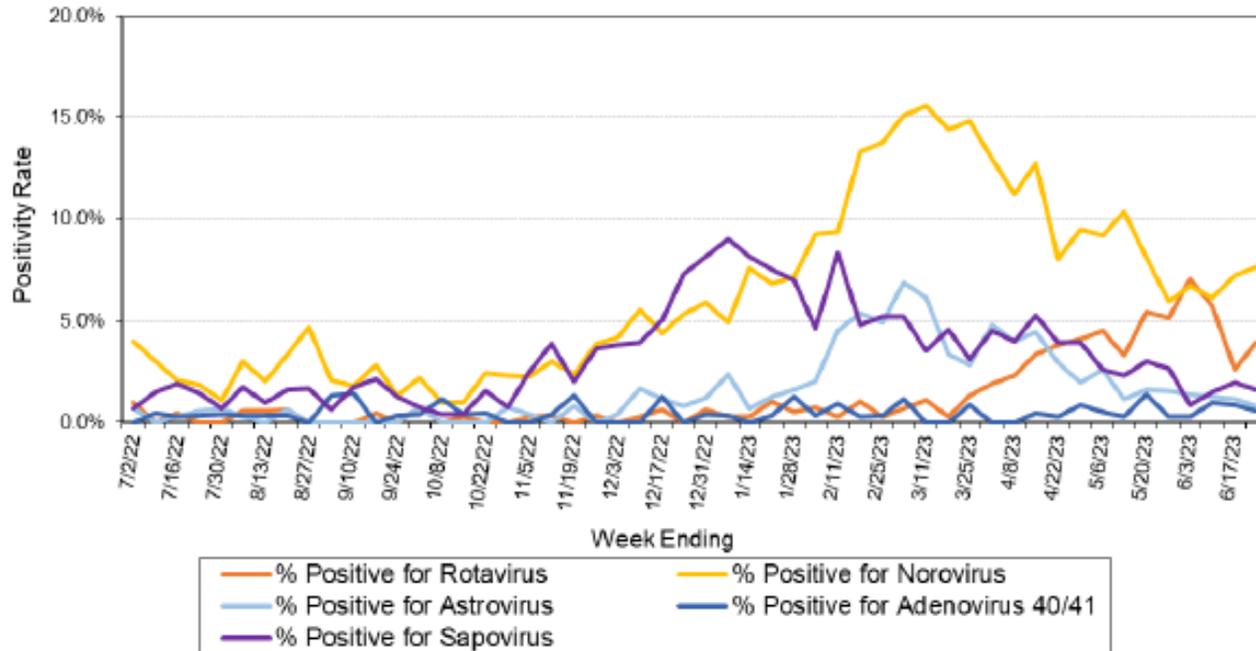
- No observable seasonality
- Jump in cases late during the pandemic

Viral Enteric Pathogens

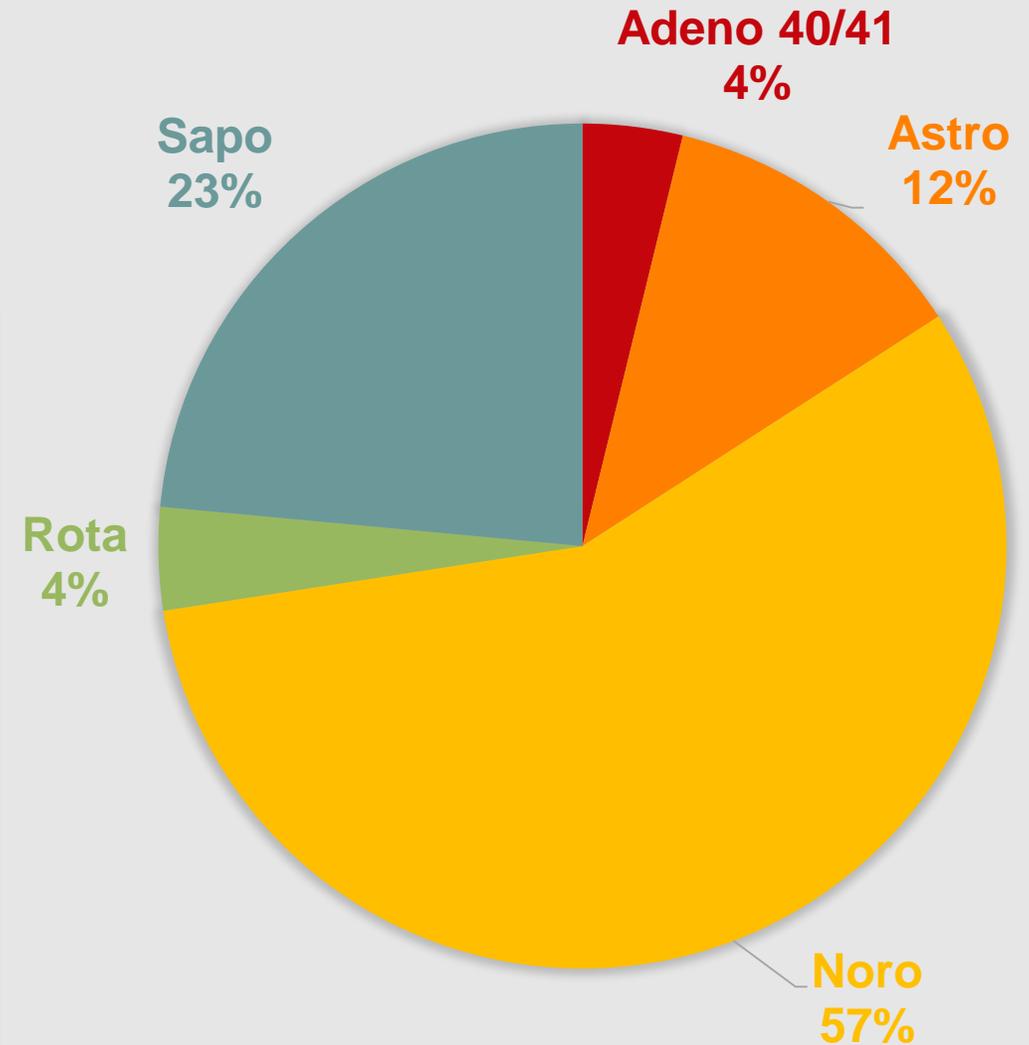


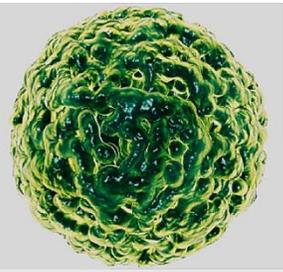
Table 4. Enteric Pathogen Specimen Submissions*		
Pathogen	Specimen Type	Testing Performed at WSLH
Rotavirus	Stool	One positive per week for molecular subtyping/genotyping

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



POSITIVES REPORTED IN THE PAST YEAR

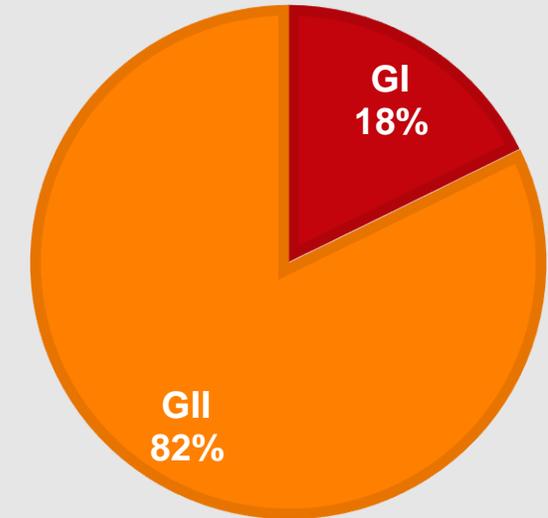
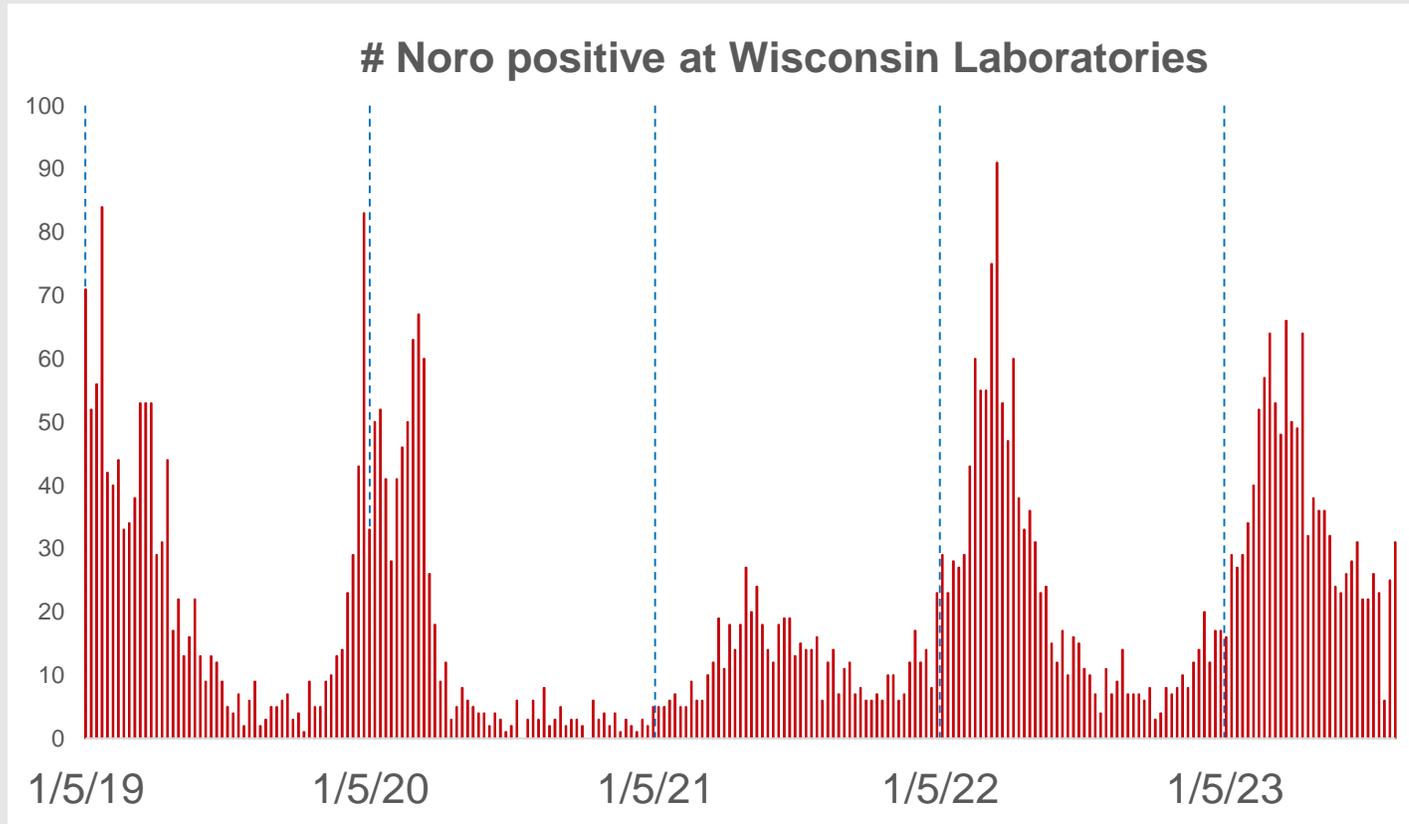




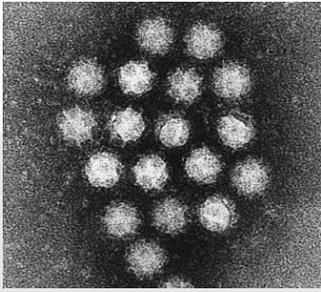
Norovirus



Of those genotyped, mostly GII



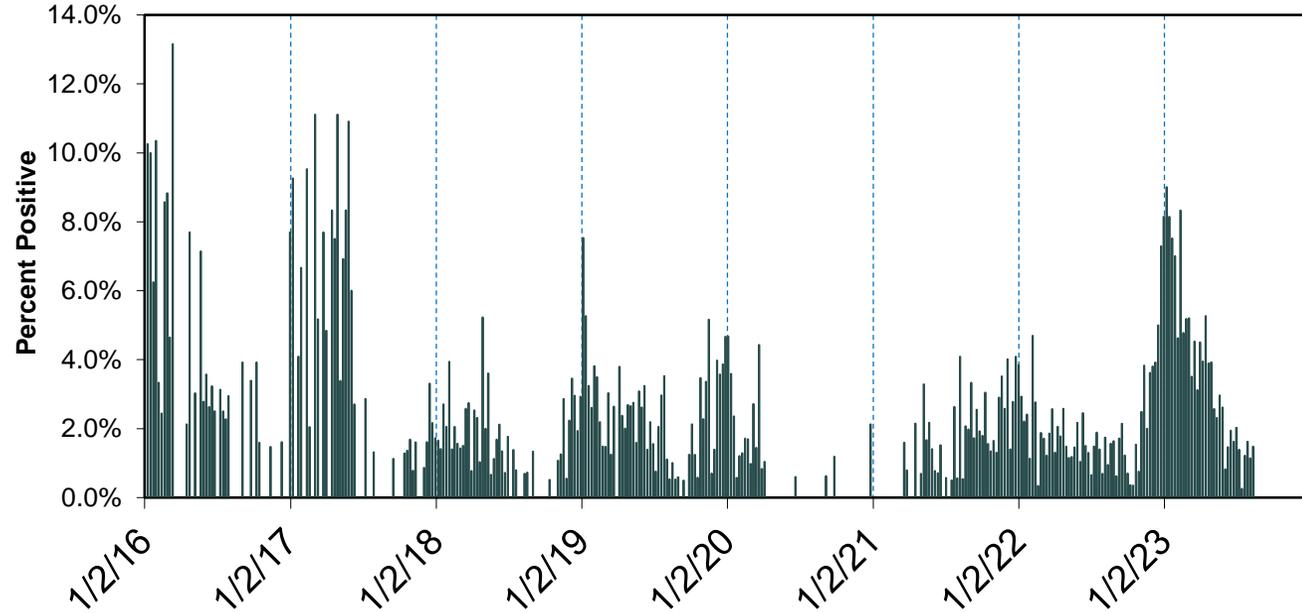
- Reduction and delay in cases during the pandemic



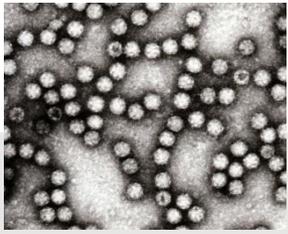
Sapovirus



Sapovirus at Wisconsin Laboratories



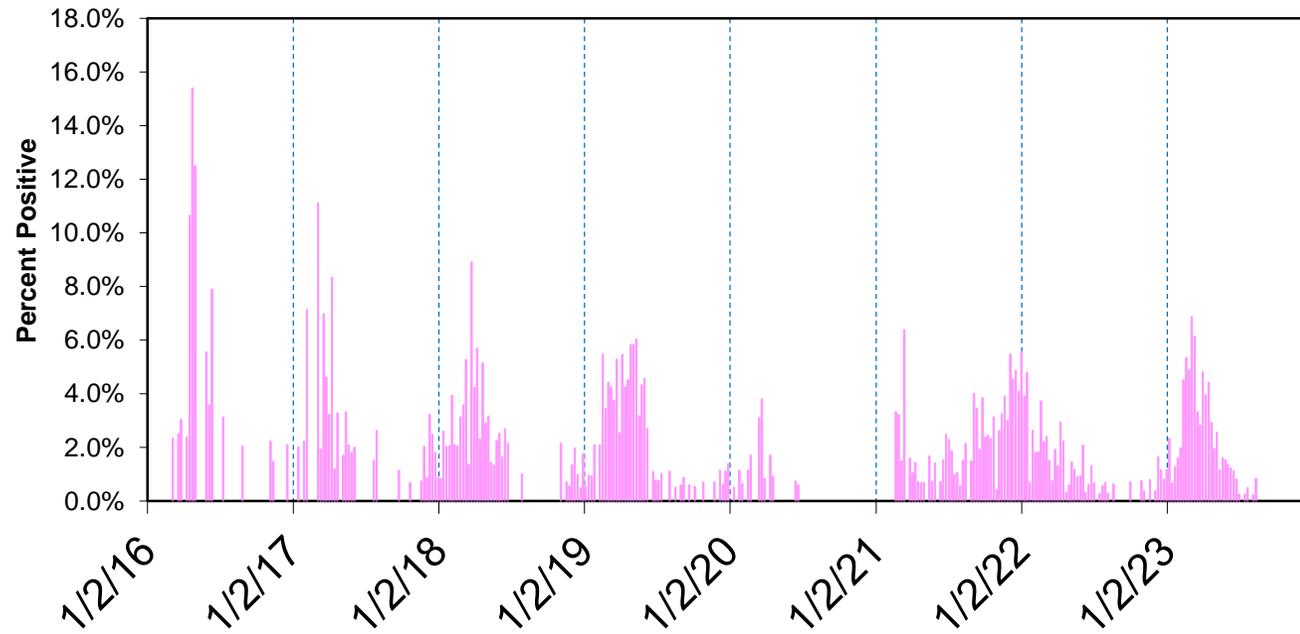
- Significant reduction during the pandemic



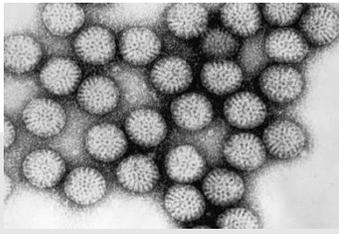
Astrovirus



Astrovirus at Wisconsin Laboratories



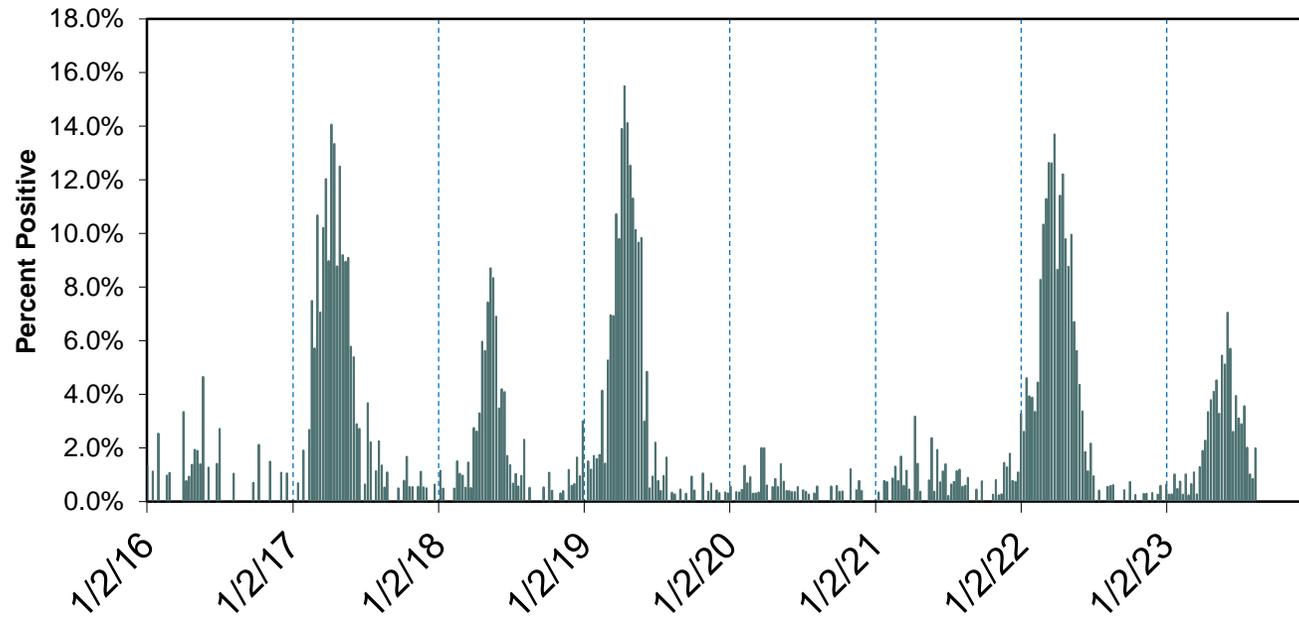
- Significant reduction during the pandemic



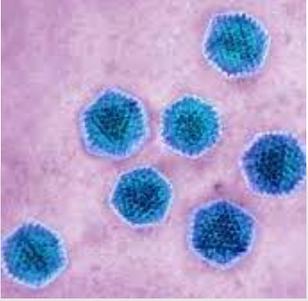
Rotavirus



Rotavirus at Wisconsin Laboratories



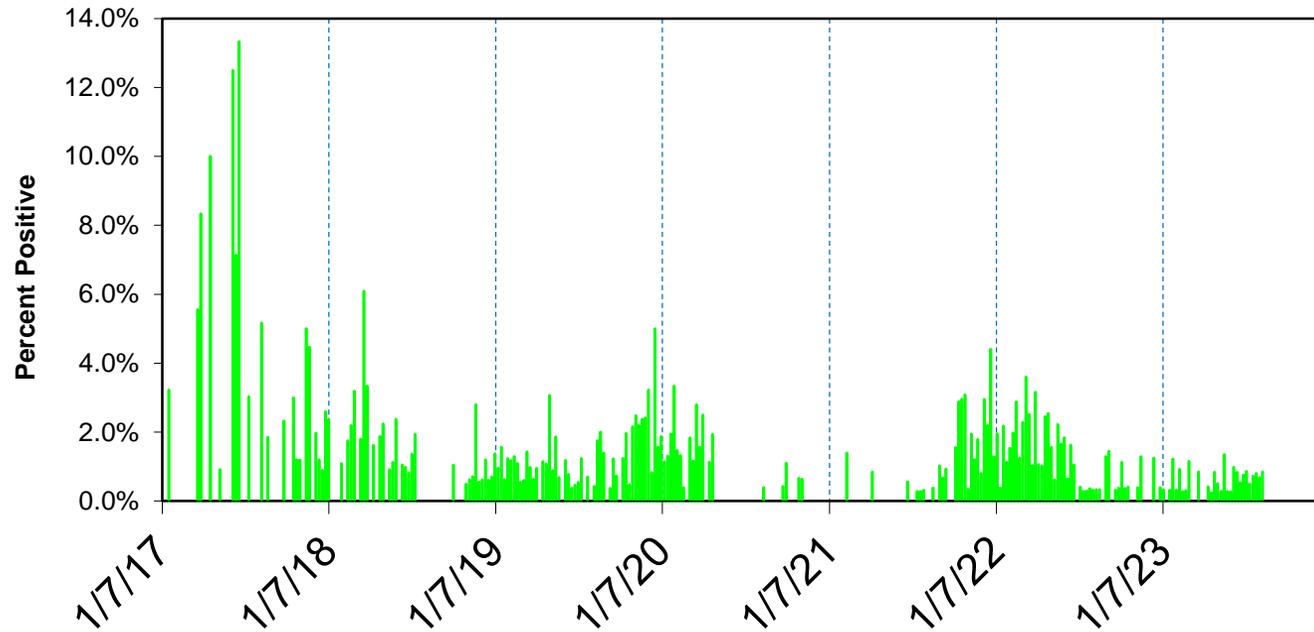
- Significant reduction during the pandemic



Adenovirus 40/41



Adenovirus at Wisconsin Laboratories



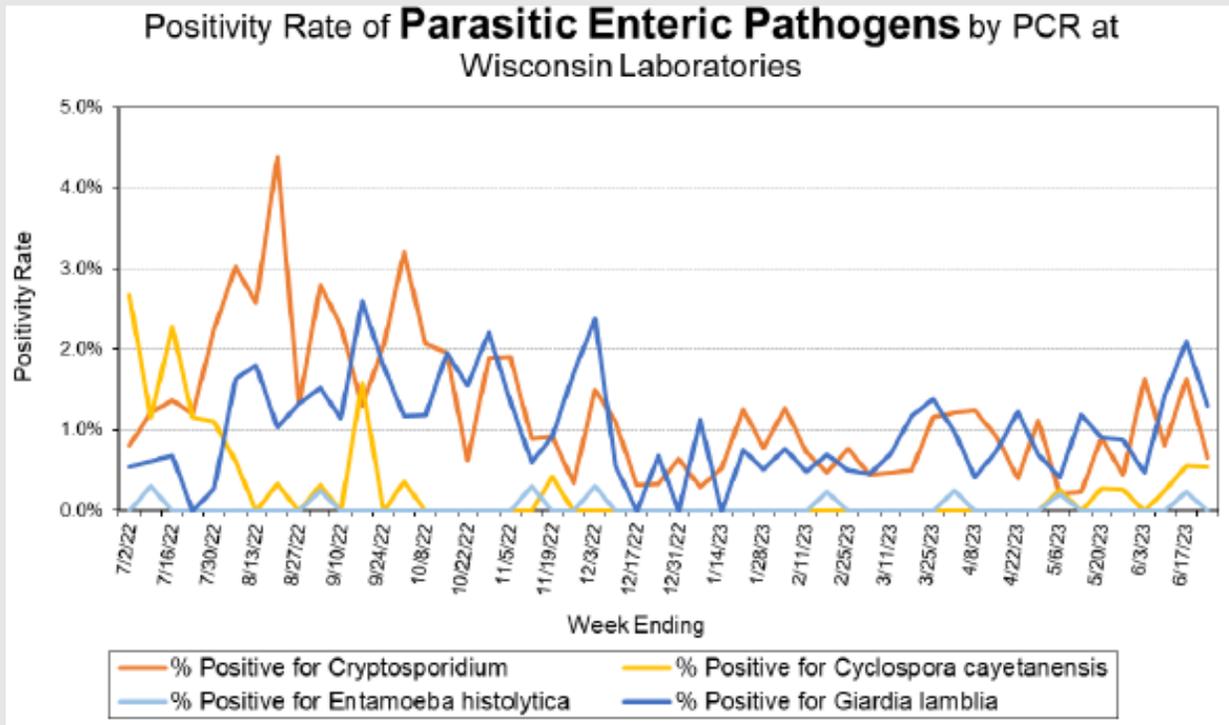
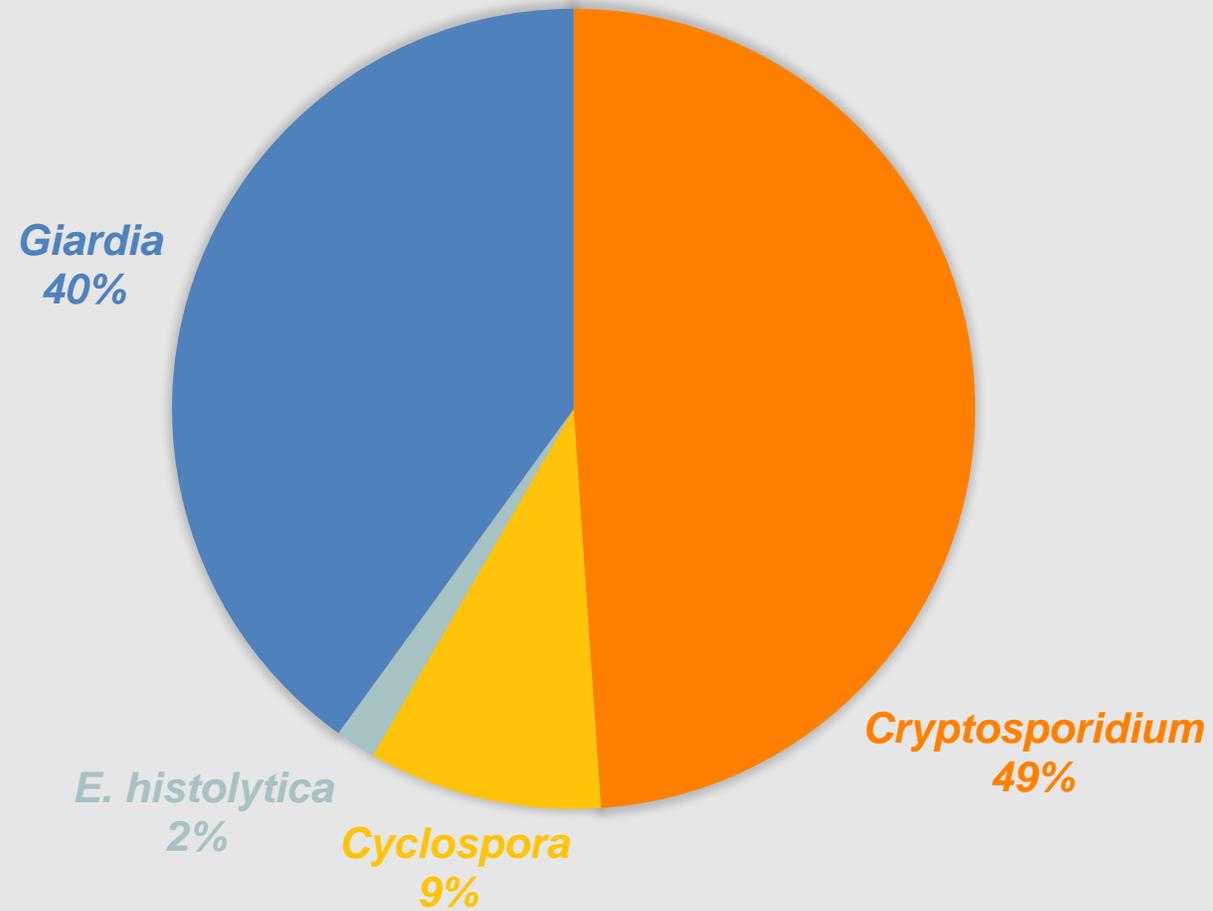
- Reduction during the pandemic

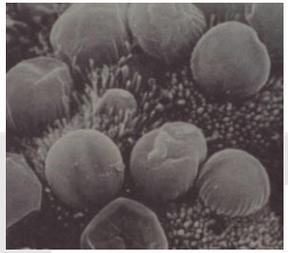
Parasites



Table 4. Enteric Pathogen Specimen Submissions*		
Pathogen	Specimen Type	Testing Performed at WSLH
<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

POSITIVE REPORTED IN THE PAST YEAR



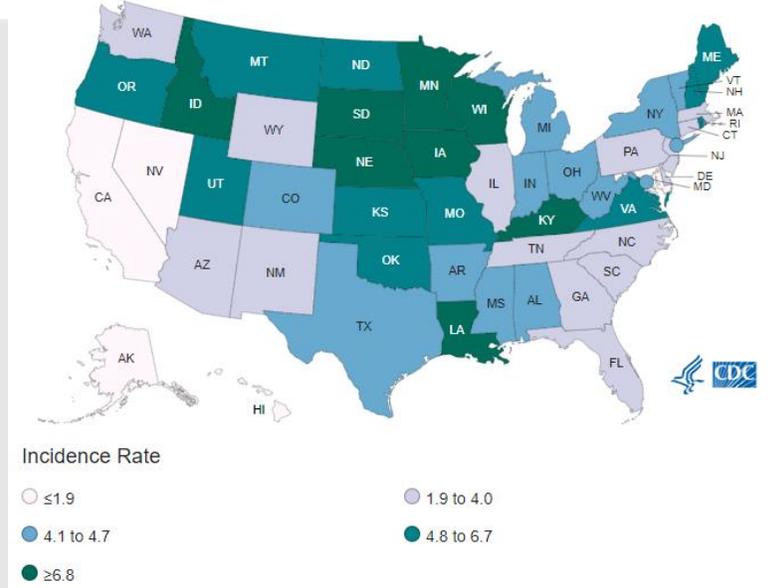
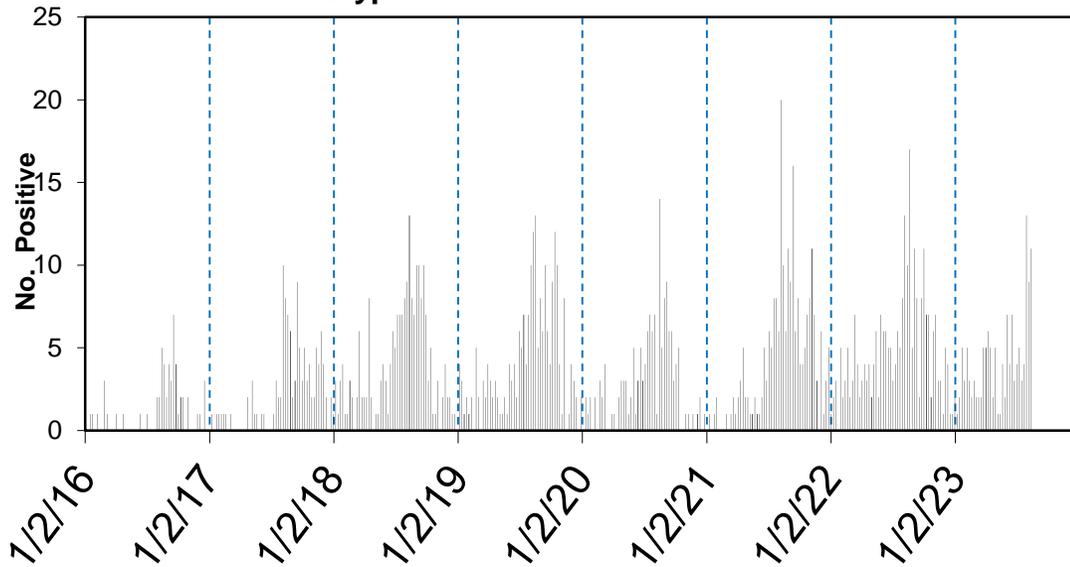


Cryptosporidium

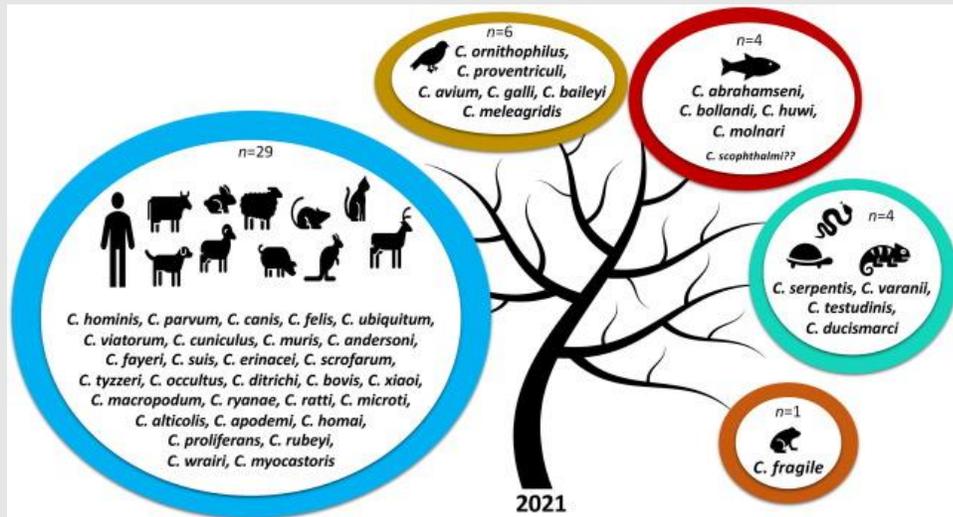
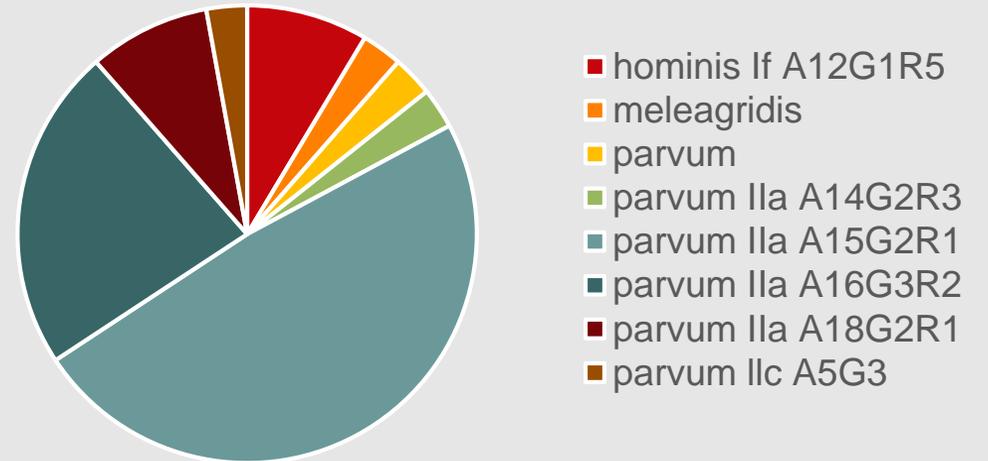


<https://www.cdc.gov/healthywater/surveillance/cryptosporidium/cryptosporidium-2019.html>

Crypto at Wisconsin Laboratories



Crypto Genotypes in 2023

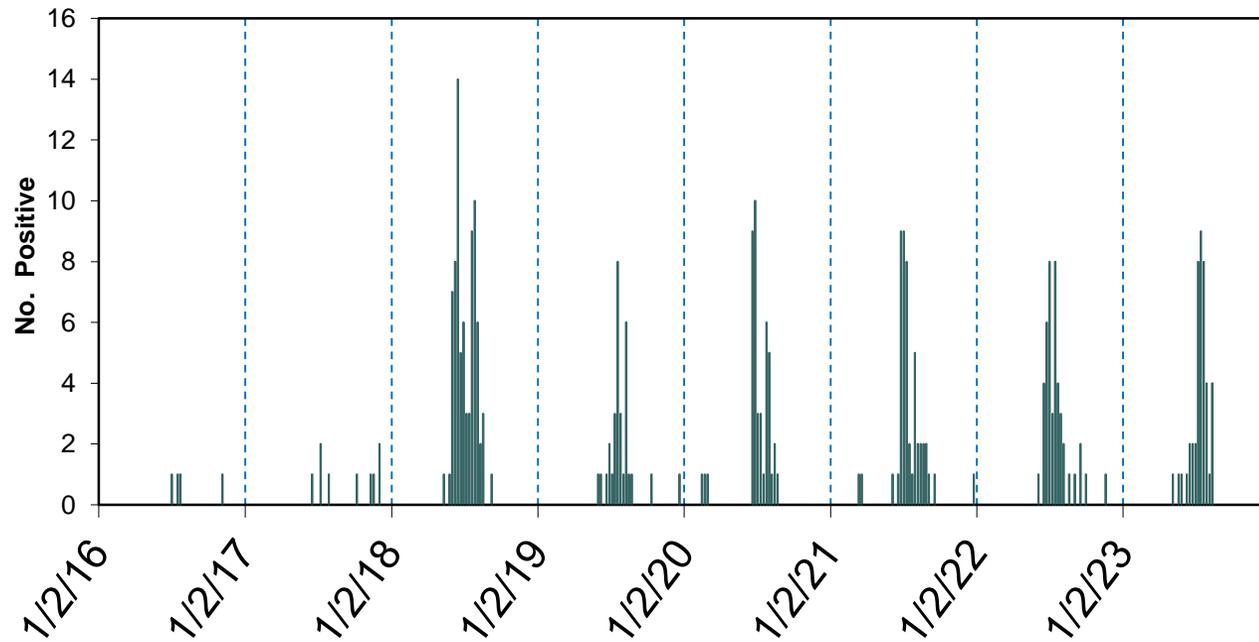




Cyclospora



Cyclospora at Wisconsin Laboratories



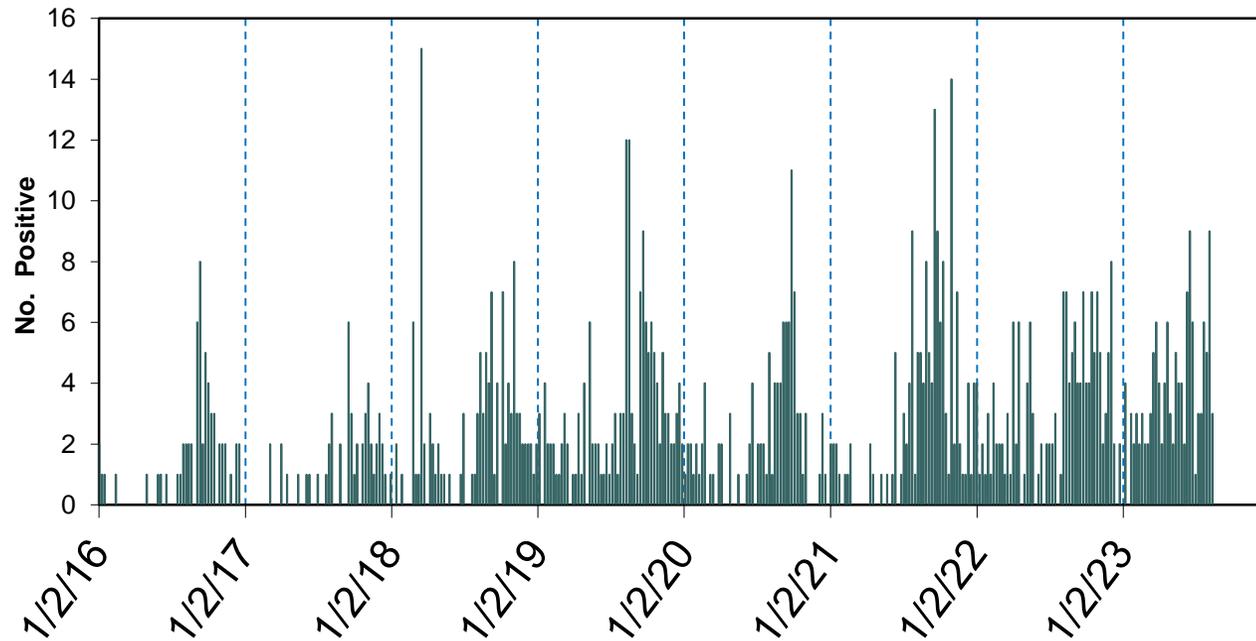
- No observable impact during the pandemic



Giardia lamblia



***Giardia lamblia* at Wisconsin Laboratories**



- No observable impact during the pandemic



Invasive Infections

Invasive Infections



Table 6. Invasive Bacteria 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
Gram negative isolates from sterile body sites that are unidentifiable using commercial systems	Isolates	Phenotypic and sequenced based identification will be performed

- 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

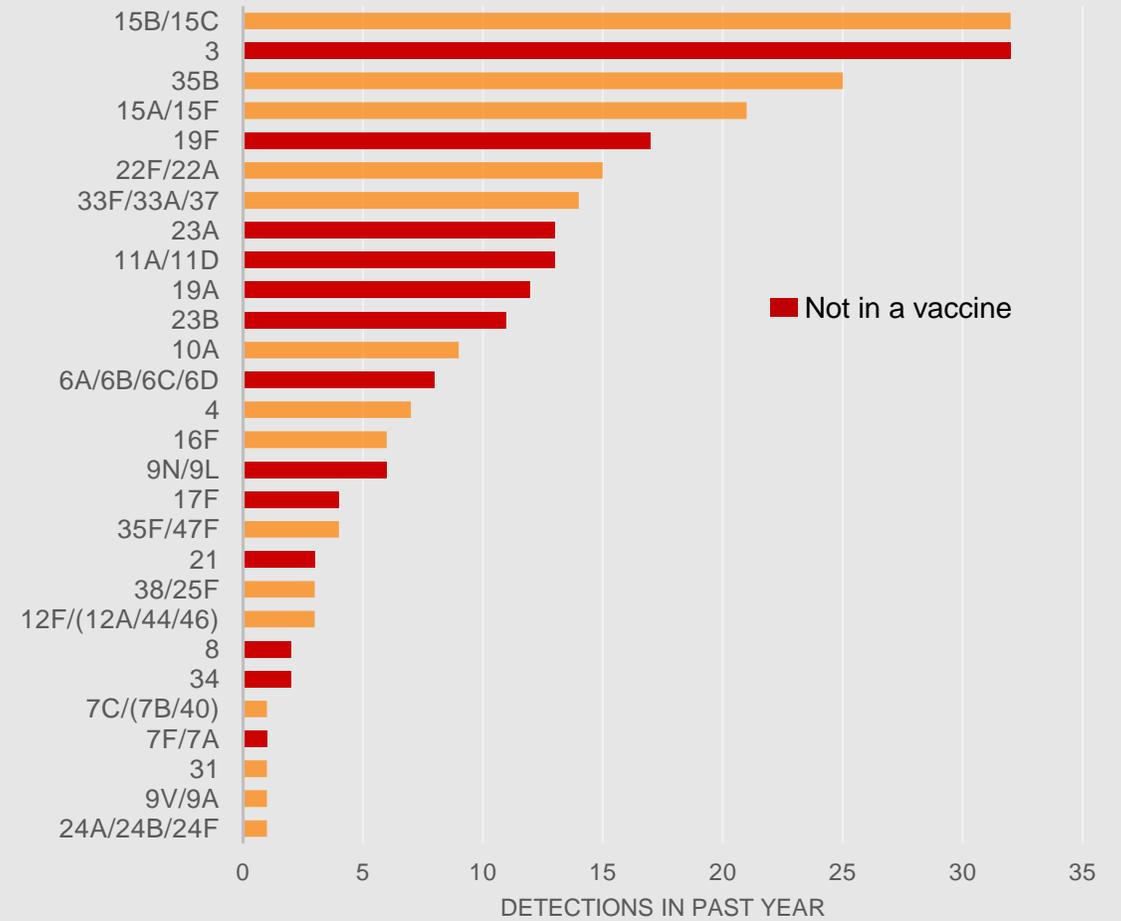


Streptococcus pneumoniae

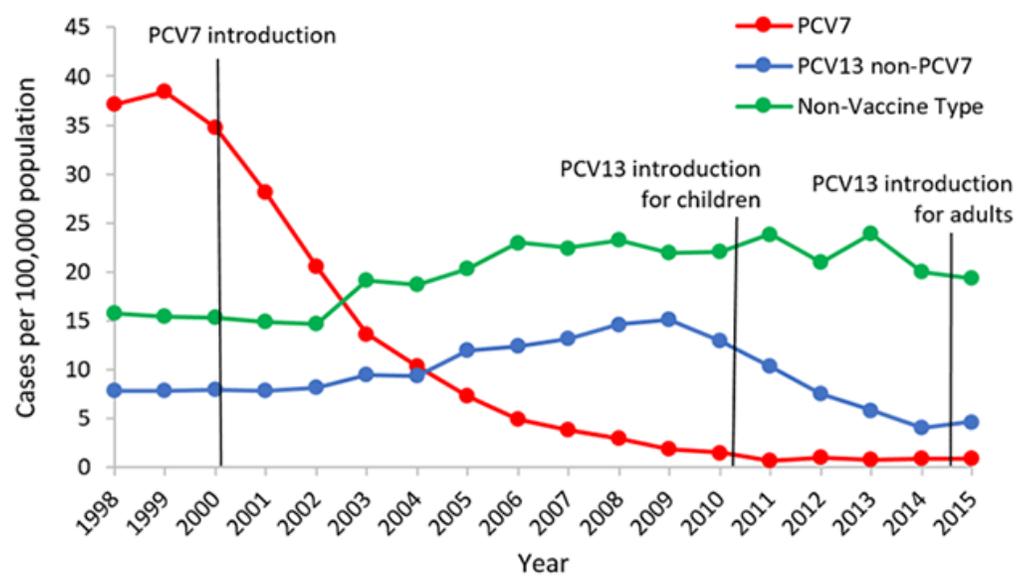


Table 6. Invasive Bacteria Specimen Submission Requests**

Pathogen	Specimen Type	Testing Performed at WSLH
<i>Streptococcus pneumoniae</i>	Isolates or CSF	Identification, antimicrobial susceptibility testing and serotyping* *serotyping performed upon request on: <ul style="list-style-type: none"> • CSF isolates • Isolates non-susceptible to clinically relevant drugs • Possible failure of therapy or vaccine or outbreak related isolates



- 99% drop in pediatric cases after first vaccine released



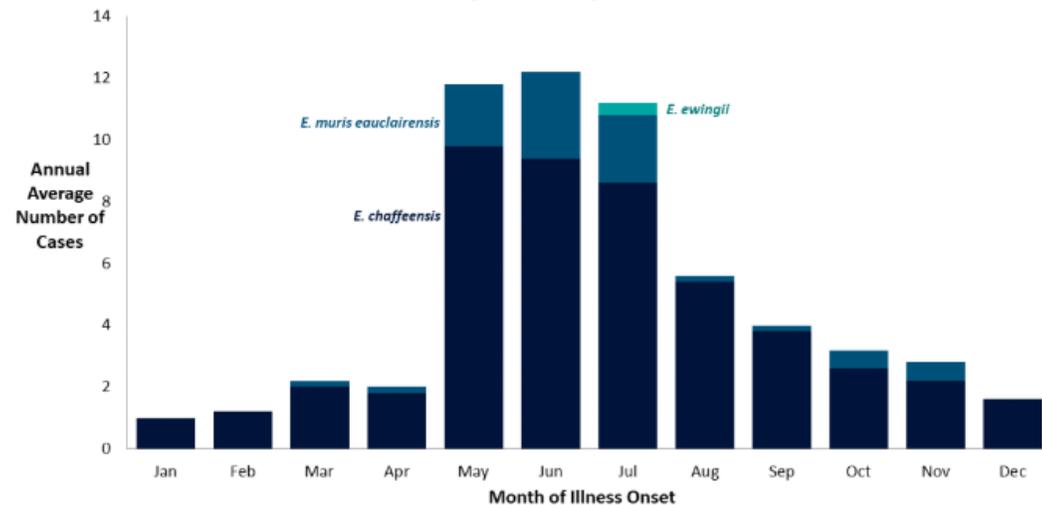
Vector-borne Pathogens

[Health Alert Network \(HAN\) No. 496 – Important Updates on Locally Acquired Malaria Cases Identified in Florida, Texas, and Maryland](#)
08/28/2023 2:15 PM

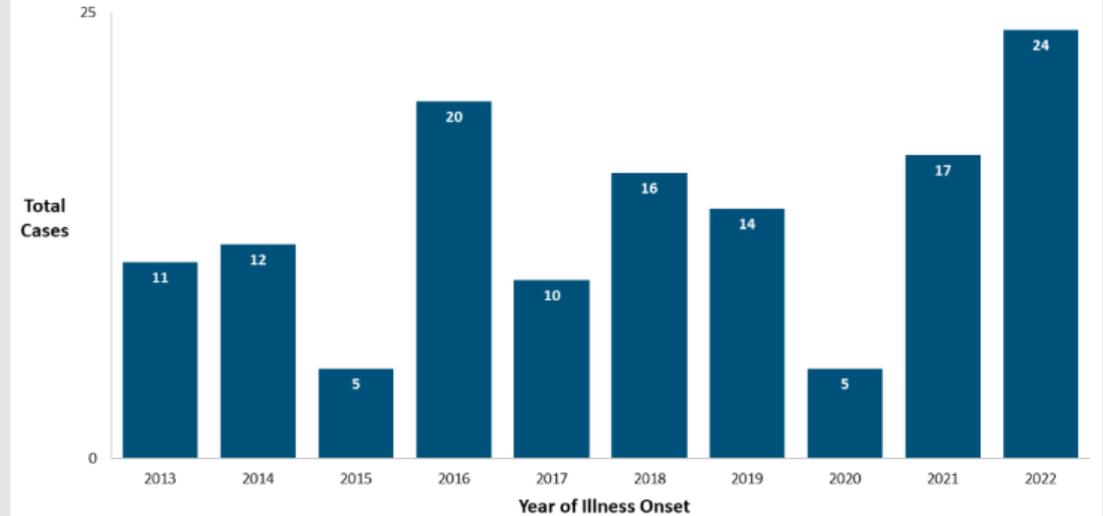
Table 3. Vector-borne Pathogen Specimen Submission Requests		
Pathogen	Specimen Type	Testing Performed at WSLH
Malaria	Positive thick and thin blood smears or residual EDTA blood	Species confirmation via microscopy and PCR. Residual EDTA forwarded to CDC for Malarial Drug Resistance Surveillance in <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)

Average Ehrlichiosis Cases by Month (2016-2020)

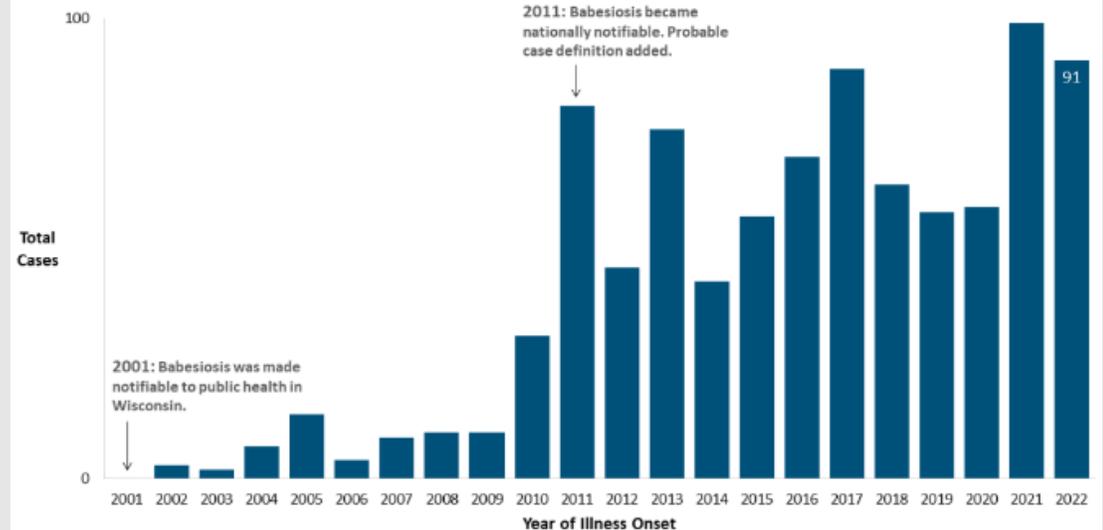
Ehrlichiosis cases are most common in the months of May, June, and July in Wisconsin.



Wisconsin Travel-associated Malaria Cases



Babesiosis Cases in Wisconsin

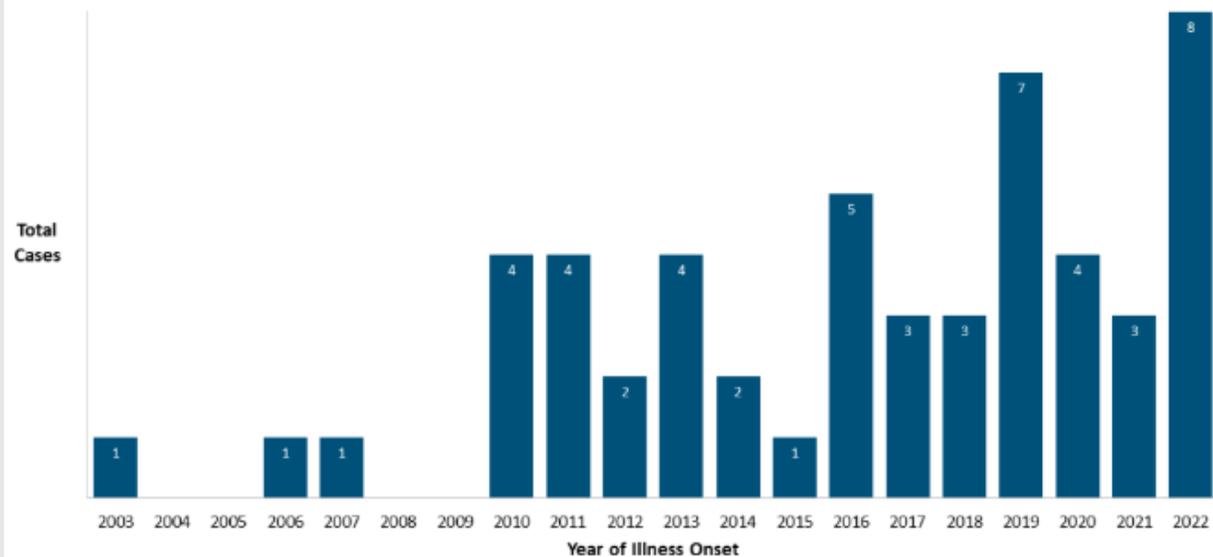




Tick borne diseases

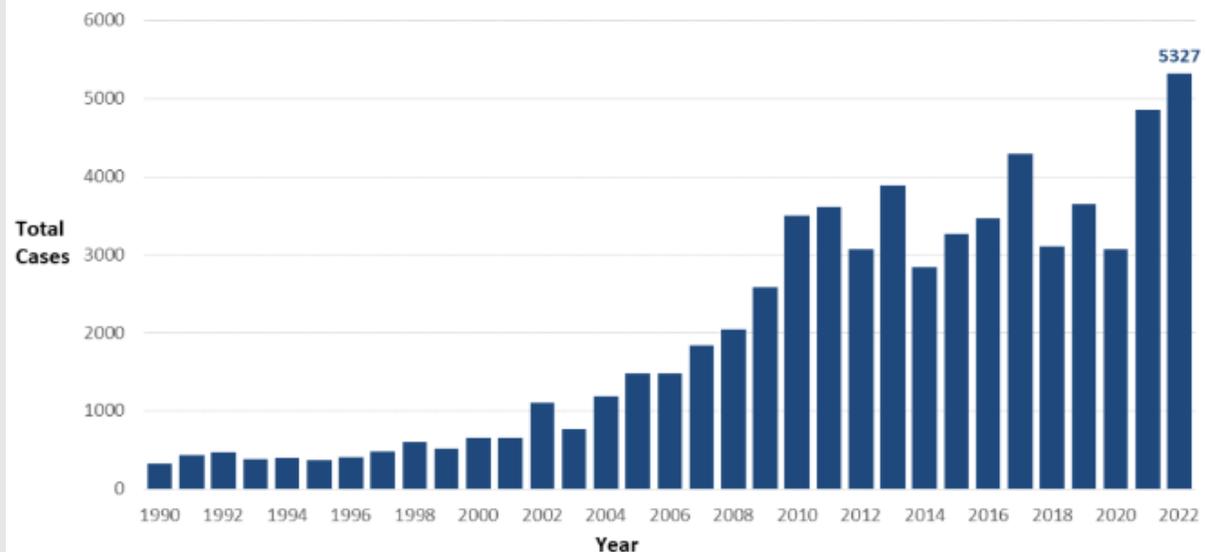


Powassan Virus Cases in Wisconsin



Lyme Disease (*B. burgdorferi*) Cases in Wisconsin

Lyme disease cases in Wisconsin are increasing.

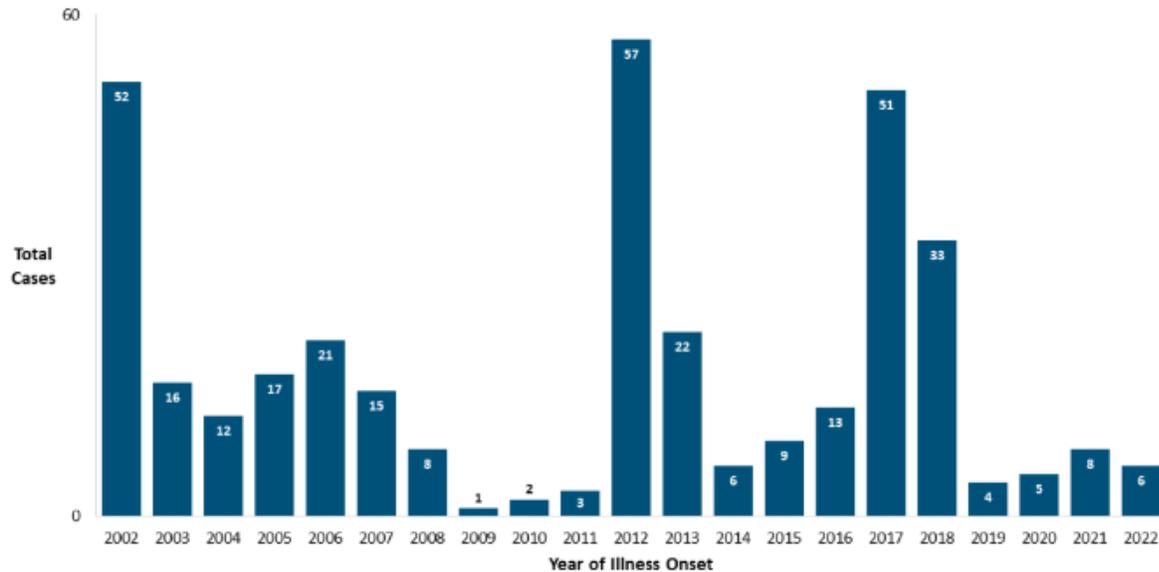




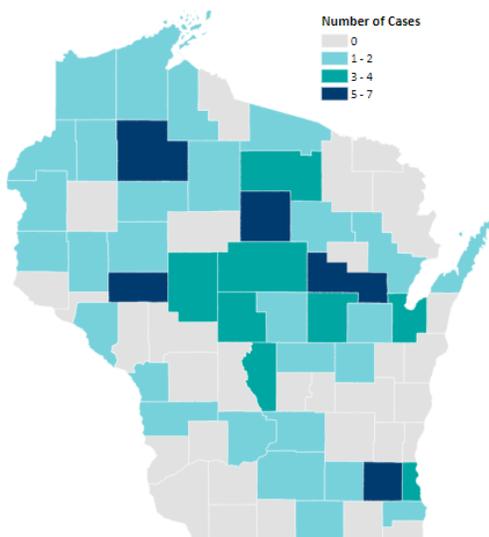
Arboviruses



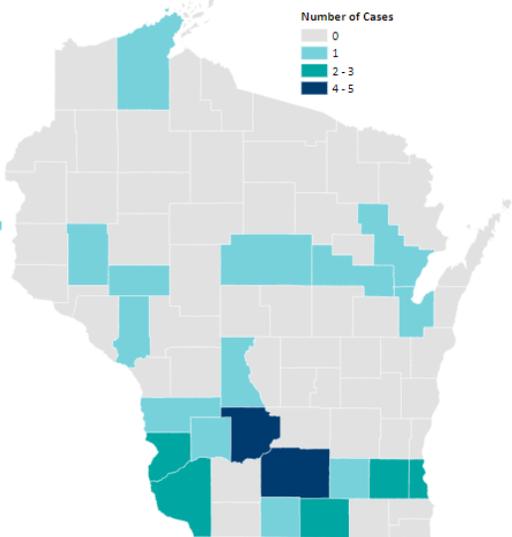
West Nile Virus Cases in Wisconsin



Jamestown Canyon Virus Cases in Wisconsin (2017-2021)

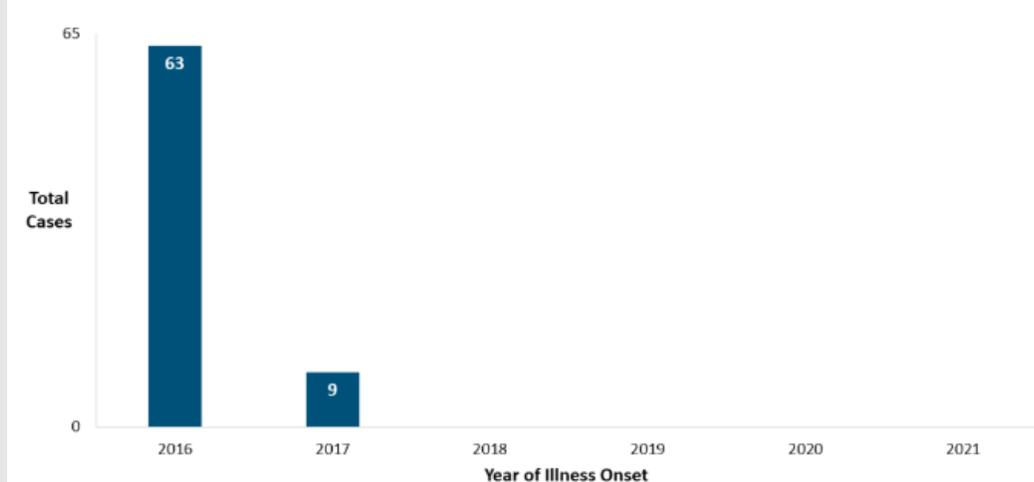


La Crosse Encephalitis Virus Cases in Wisconsin (2012-2021)



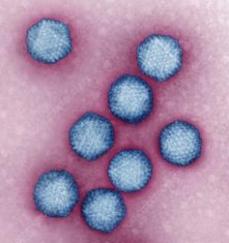
EEE
7 cases from
1964-2022

Travel-associated Zika Virus Cases in Wisconsin

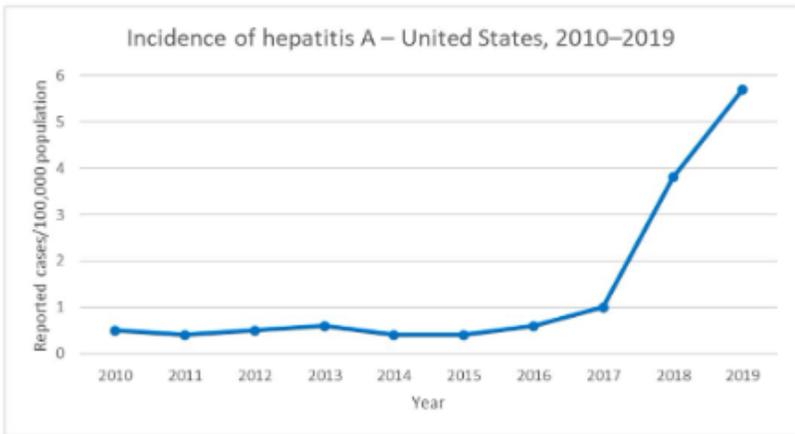




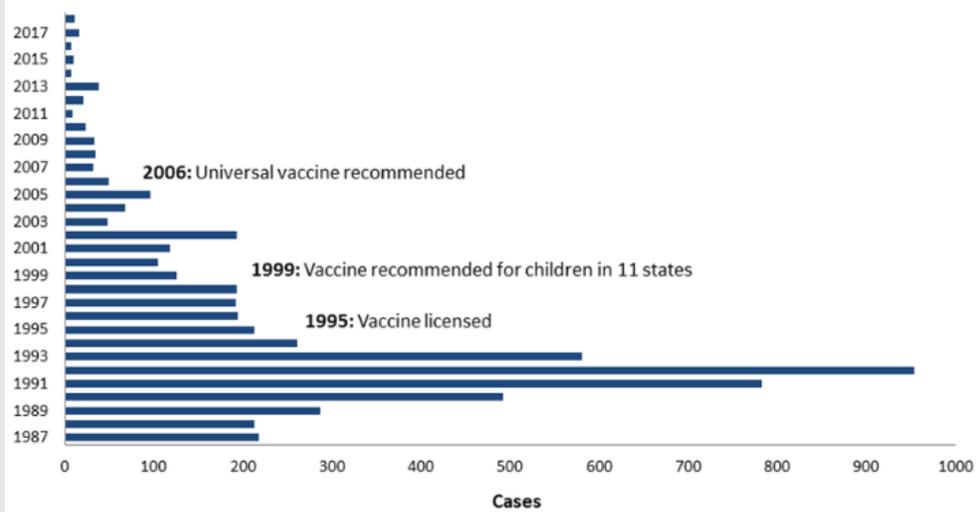
Hepatitis A



Hepatitis A Cases in the United States



Hepatitis A Virus Cases in Wisconsin, 1987-2018



HEPATITIS A OUTBREAKS

WIDESPREAD PERSON-TO-PERSON OUTBREAKS OCCURRING IN THE U.S.

Vaccination is the best prevention

Assess and Vaccinate:

- People who use drugs
- People experiencing homelessness
- Men who have sex with men
- People who are currently or were recently incarcerated
- People with chronic liver disease

Since 2016, 37 states have publicly reported:



44,903
CASES



61%
HOSPITALIZATIONS



423
DEATHS

As of August 4, 2023



ONE DOSE
of HepA vaccine

95%
protection in
healthy adults

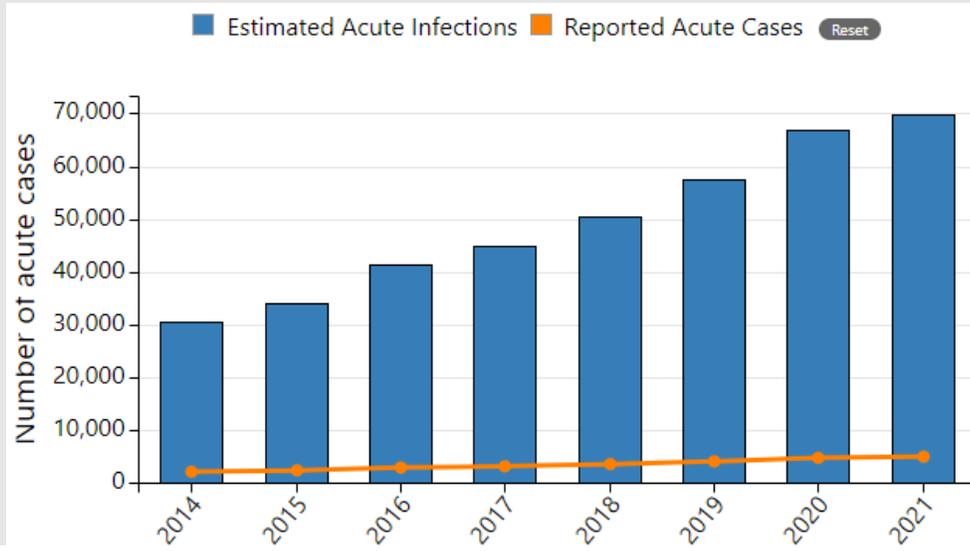
CONTROLS
OUTBREAKS
of hepatitis A



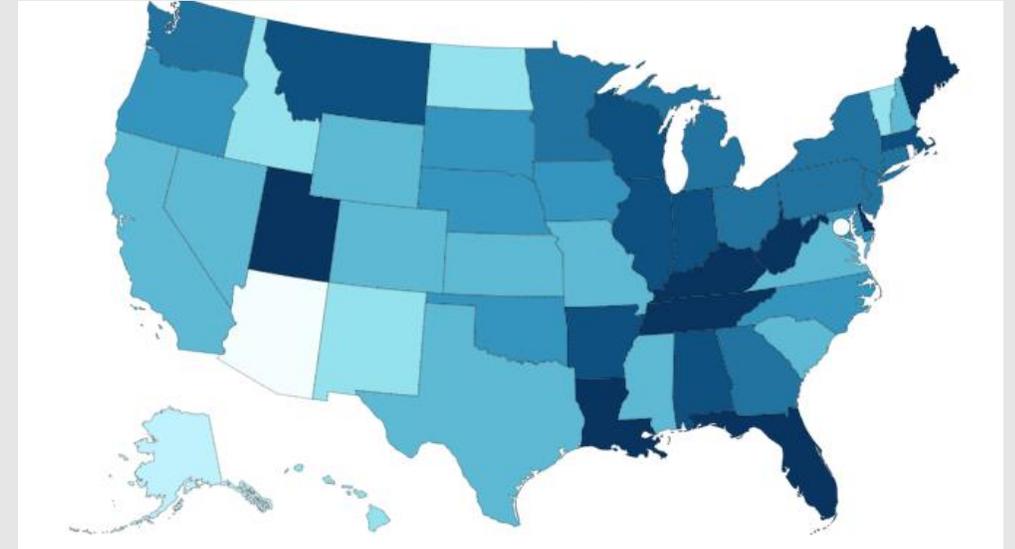
www.cdc.gov/hepatitis/HepAOutbreak



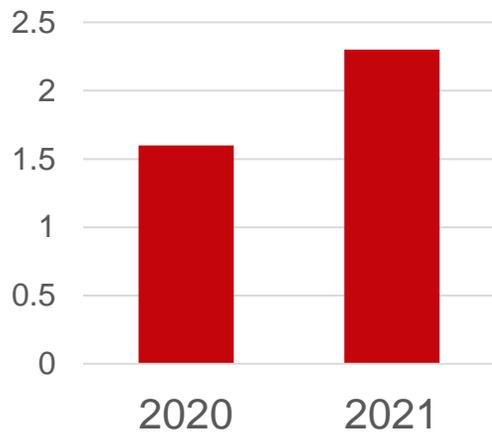
Hepatitis C



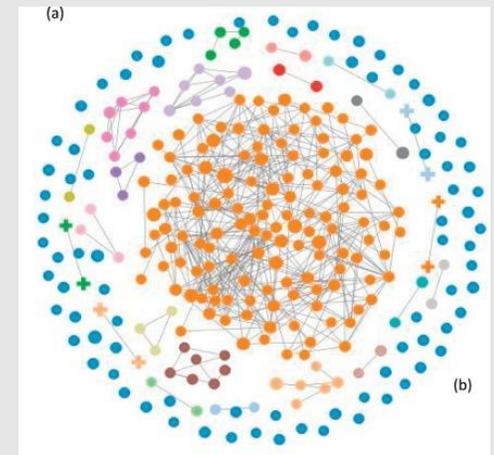
HCV infection rate per 100,000



WI HCV infection rate per 100,000

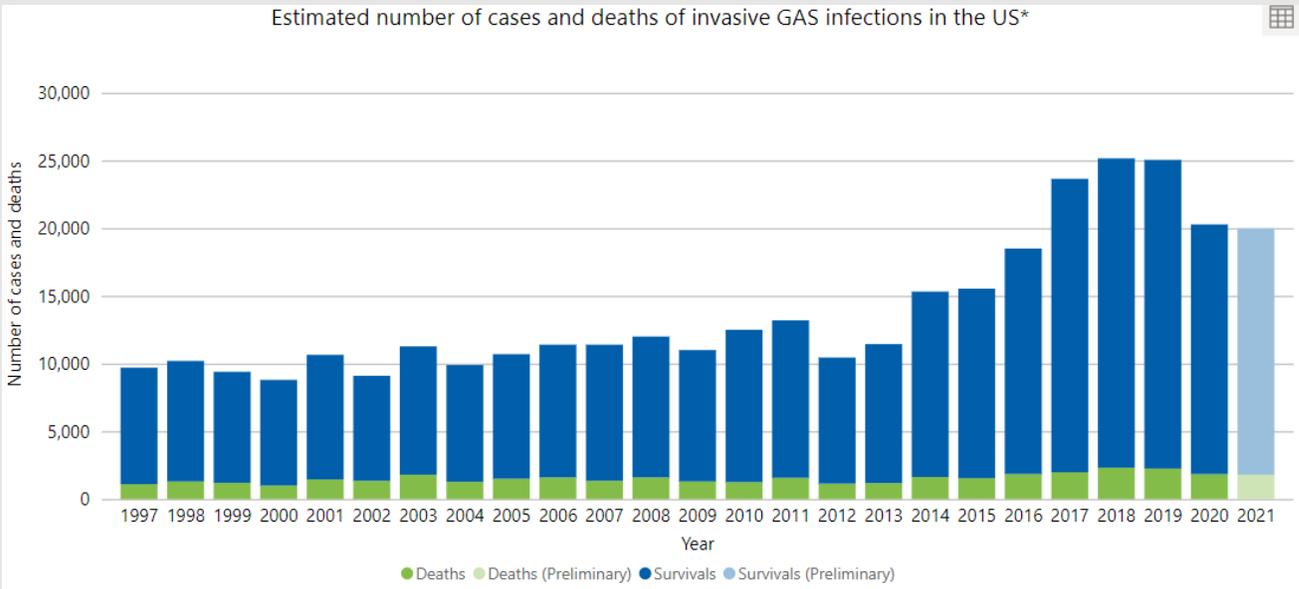


- Most often transmitted by IV drug use.
- No vaccine available
- New WI HCV surveillance program- GHOST
 - 1mL of residual serum from Ab+ patients



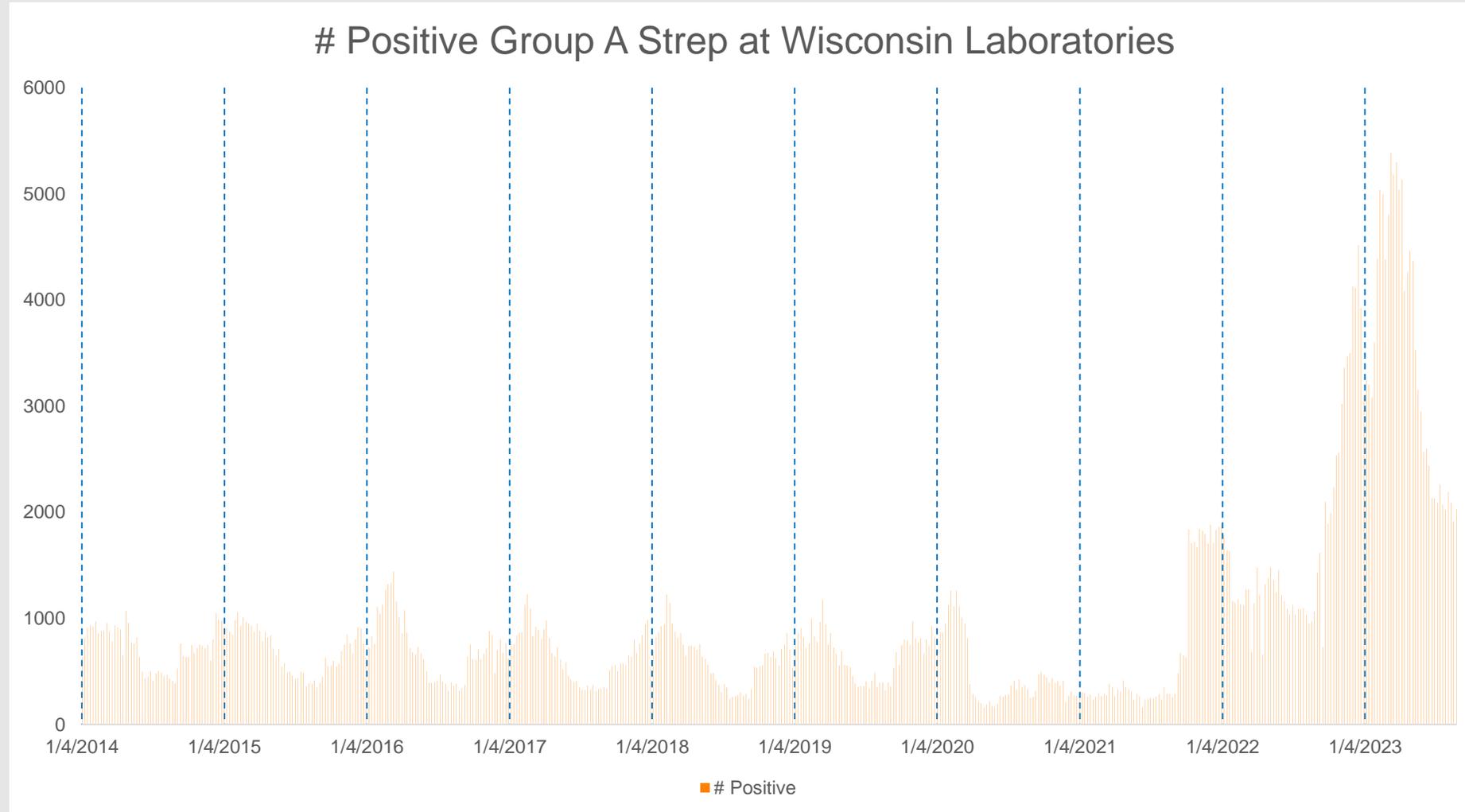


Group A Strep



- Recent unusual uptick in Group A Strep cases

Group A Strep



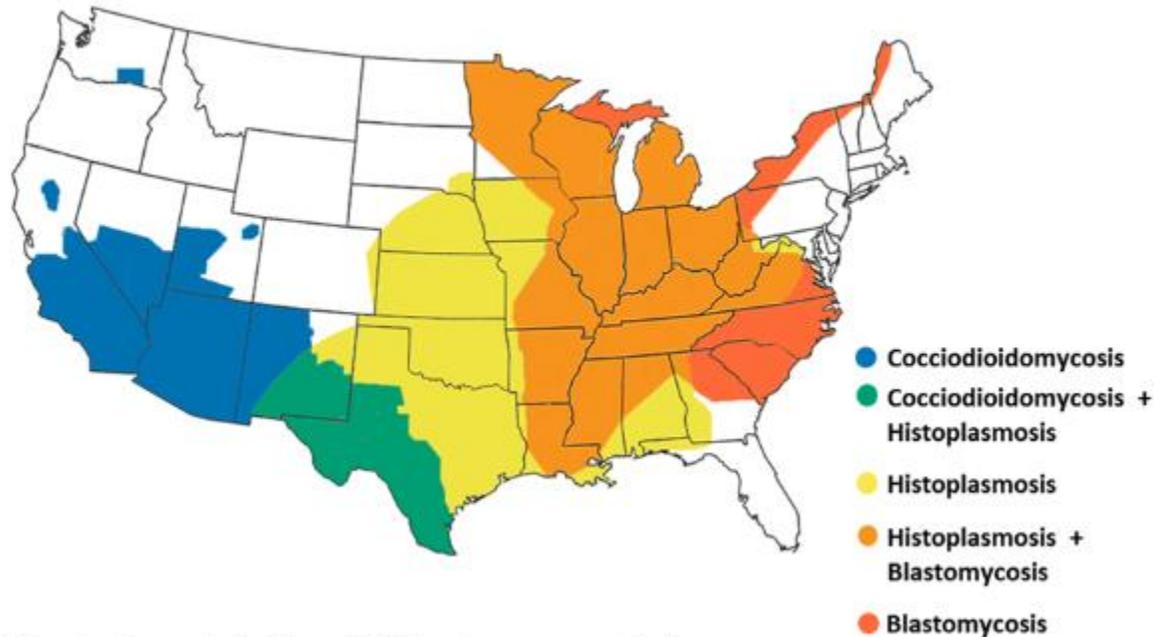
Fungal Infections



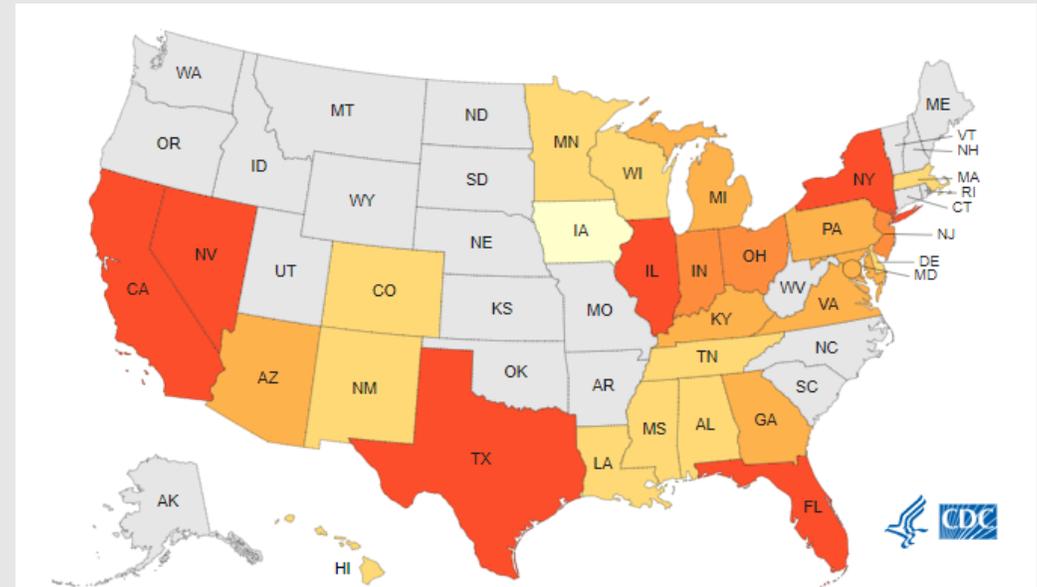
[Health Alert Network \(HAN\) No. 492 - Important Updates on Outbreak of Fungal Meningitis in U.S. Patients Who Underwent Surgical Procedures under Epidural Anesthesia in Matamoros, Mexico](#)

06/01/2023 5:30 PM

Areas where fungi are found in the environment.*

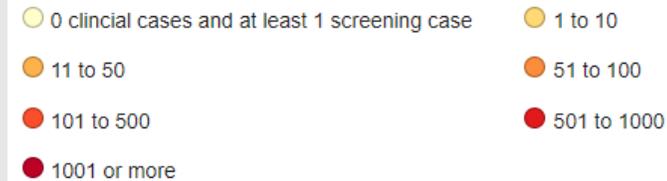


*Map has been adapted from CDC. Borders are approximate.



Number of *C. auris* clinical cases through December 31, 2022

In the most recent 12 months, there were 2,377 clinical cases and 5,754 screening cases (January 2022 - December 2022).



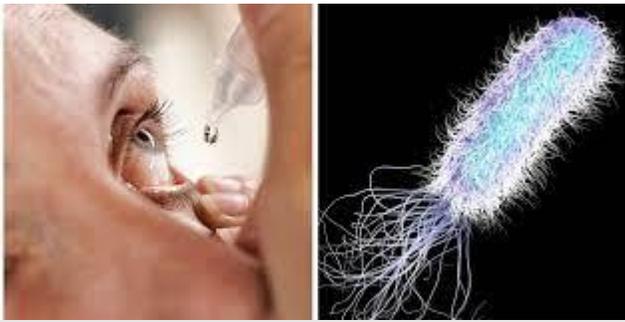


Antimicrobial Resistance

Table 5. 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
Candida: <ul style="list-style-type: none"> • <i>C. auris</i>, • <i>C. haemulonii</i>, • Invasive <i>C. glabrata</i> • Unusual* and/or hard to ID Candida 	N/A	Identification, antimicrobial susceptibility testing and referral to CDC as necessary
Enterobacteriaceae	Resistant to any carbapenems	Identification, antimicrobial susceptibility testing, carbapenemase screen, AR-targeted PCR and referral to CDC as necessary
Staphylococcus aureus	Non-susceptible to vancomycin	Identification, antimicrobial susceptibility testing and referral to CDC as necessary
Pseudomonas aeruginosa	<ul style="list-style-type: none"> • Resistant to carbapenems other than ertapenem AND • Non-susceptible to cefepime and/or ceftazidime 	Identification, antimicrobial susceptibility testing, carbapenemase screen, AR-targeted PCR and referral to CDC as necessary
Acinetobacter baumannii	Resistant to any carbapenems	Identification, antimicrobial susceptibility testing, AR-targeted PCR and referral to CDC as necessary
Aspergillus fumigatus isolates from invasive infections	N/A	Isolates will be forwarded to the Maryland Department of Health for surveillance of azole resistance

*Any species other than *C. albicans*, *C. parapsilosis*, *C. dubliniensis*, *C. lusitanae*, *C. tropicalis*, or *C. krusei*

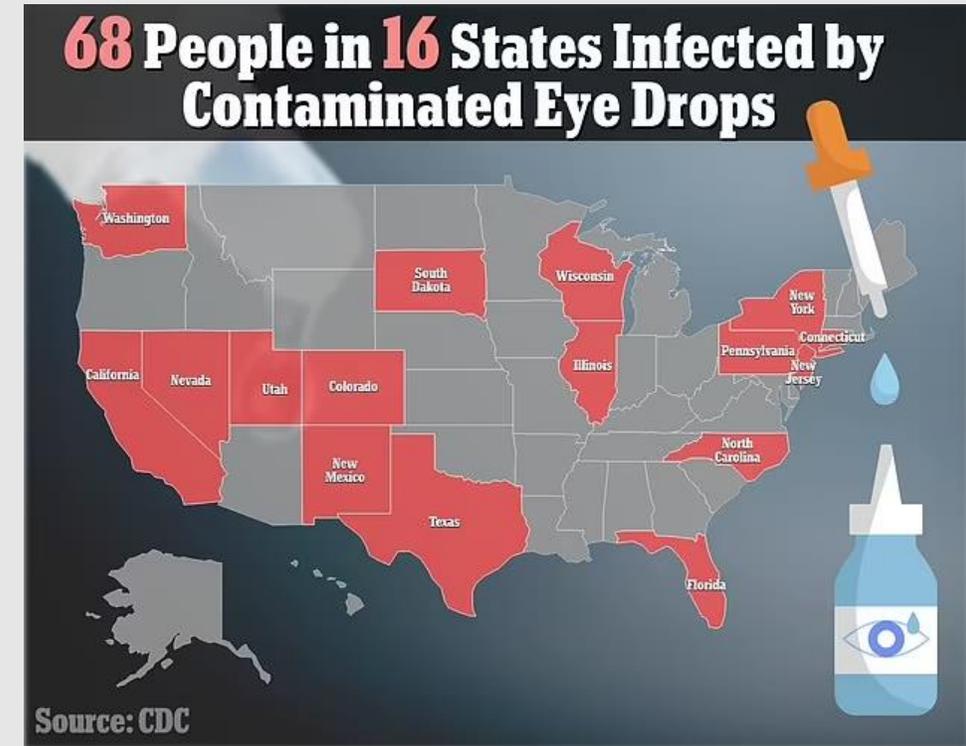
*More to come from Megan Lasure!



Outbreak Alert- *Pseudomonas*

[Health Alert Network \(HAN\) No. 485 -Outbreak of Extensively Drug-resistant *Pseudomonas aeruginosa* Associated with Artificial Tears](#)
02/01/2023 7:00 PM

FDA warns consumers not to purchase or use EzriCare Artificial Tears due to potential contamination



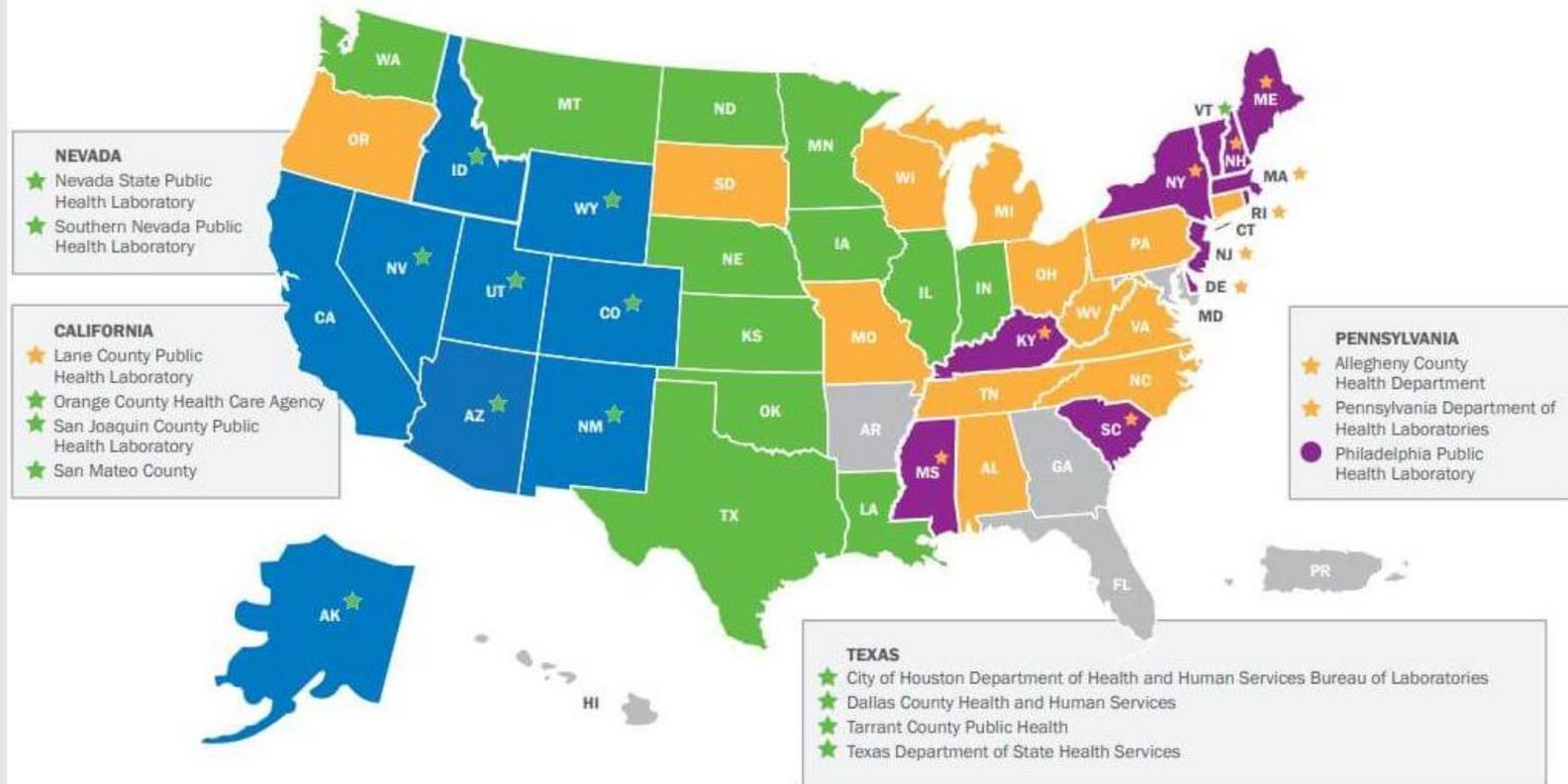


Vaccine Preventable Diseases

VPD Regions



ENROLLED PHL VPD REFERENCE CENTER ASSIGNMENTS: VIRAL AND BACTERIAL



Viral VPD Reference Center

- California Department of Public Health Viral and Rickettsial Disease Laboratory
- Minnesota Department of Health (Wadsworth Center)
- New York State Department of Health (Wadsworth Center)
- Wisconsin State Laboratory of Hygiene

Bacterial VPD Reference Center assignment if different than the Viral VPD Reference Center

- ★ California Department of Public Health Viral and Rickettsial Disease Laboratory
- ★ Minnesota Department of Health (Wadsworth Center)
- ★ New York State Department of Health (Wadsworth Center)
- ★ Wisconsin State Laboratory of Hygiene

What testing is available at a VPD Reference Center?



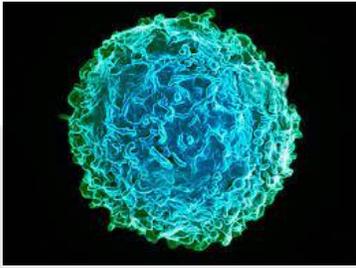
Viral Diseases	real time RT-PCR	Genotyping+	Serology	Maximum Turn Around Times	Network
Measles	✓	✓		PCR: 2 business days Genotyping: 10 business days ^	VPD Reference Centers
Mumps	✓	✓			
Rubella	✓	✓			
Varicella-zoster	✓	✓			
Bacterial Diseases	real time PCR	Serotyping/ Grouping	Serology	Maximum Turn Around Times	Network
<i>B. pertussis</i>	✓		✓	PCR: 2 business days Serology: 5 business days Serotyping/grouping: 5 business days	VPD Reference Centers
<i>H. influenzae</i>	✓	✓			
<i>N.meningitidis</i>	✓	✓			
<i>S. Pneumoniae*</i>	✓	✓			

^Maximum turn around time for Measles Vaccine PCR Assay (MeVA) is 3 Days+Genotyping will be performed on all PCR positive specimens unless otherwise indicated as part of larger outbreak



How this helps your patients

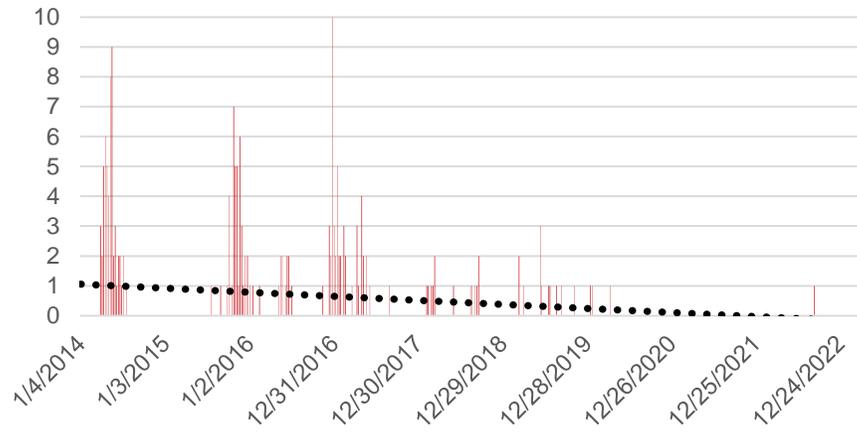
- Provides situational awareness to providers on what is circulating.
- Informs on public health response.
- AST, serotyping, and vaccine vs wild type testing can inform on treatment approaches and immune function of a patient.



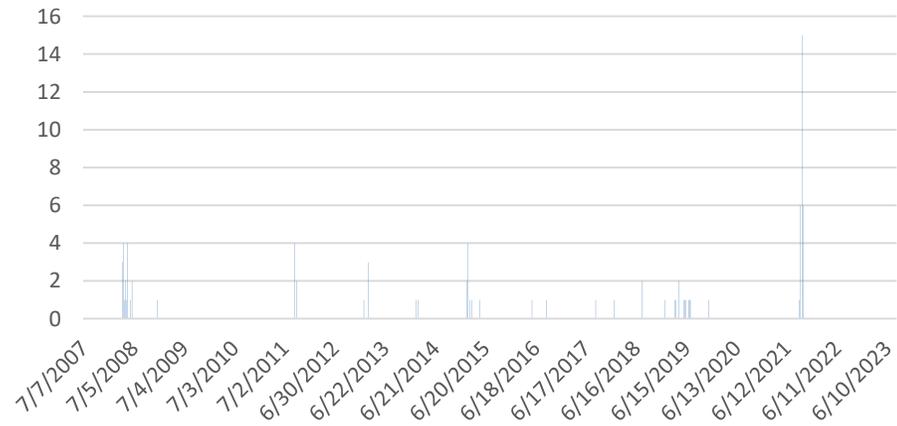
Measles, Mumps, Rubella



positive for **Mumps** at Wisconsin Laboratories



positive for **Measles** at Wisconsin Laboratories



3 Rubella
reported in past
16 years



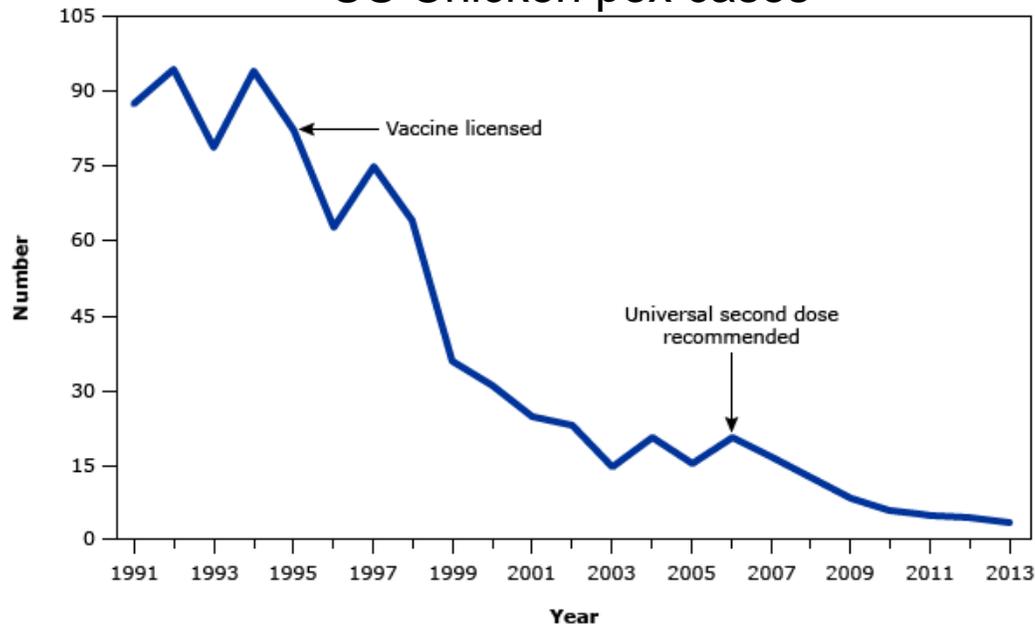
VZV (Varicella Zoster Virus)



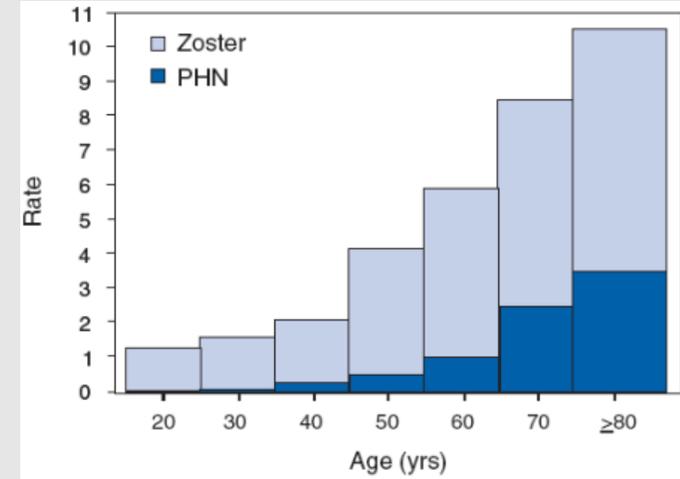
Chickenpox



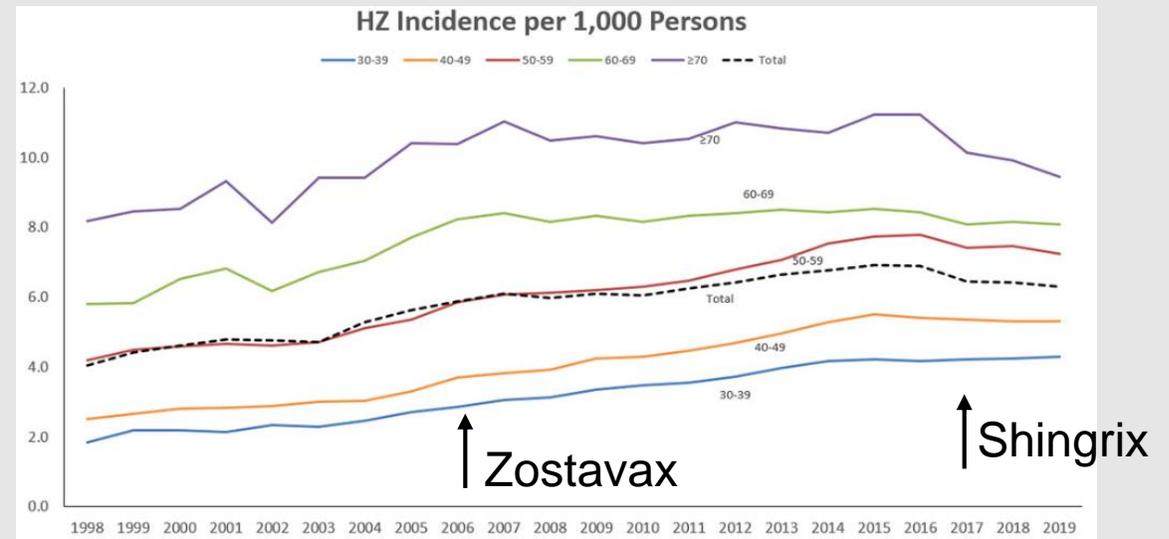
US Chicken pox cases



Shingles

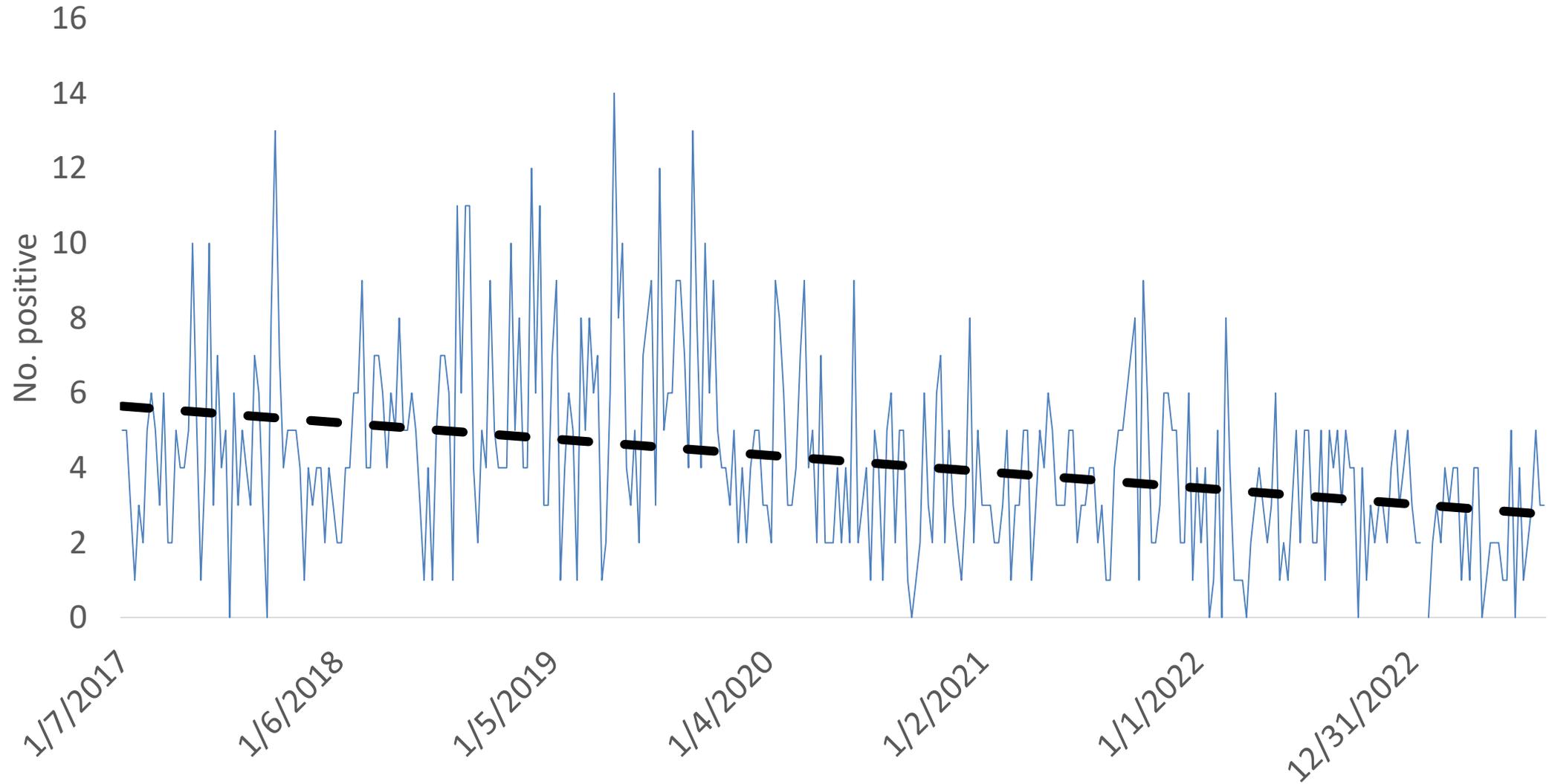


US Shingles incidence





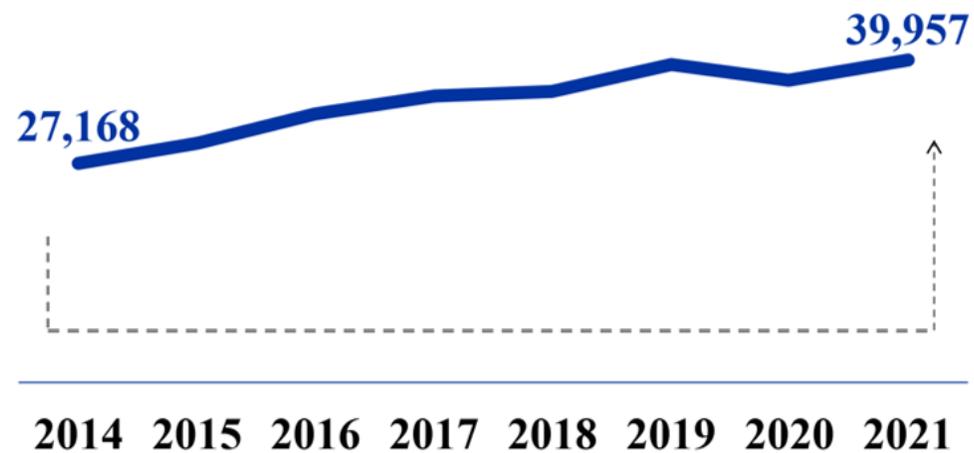
VZV at Wisconsin Laboratories



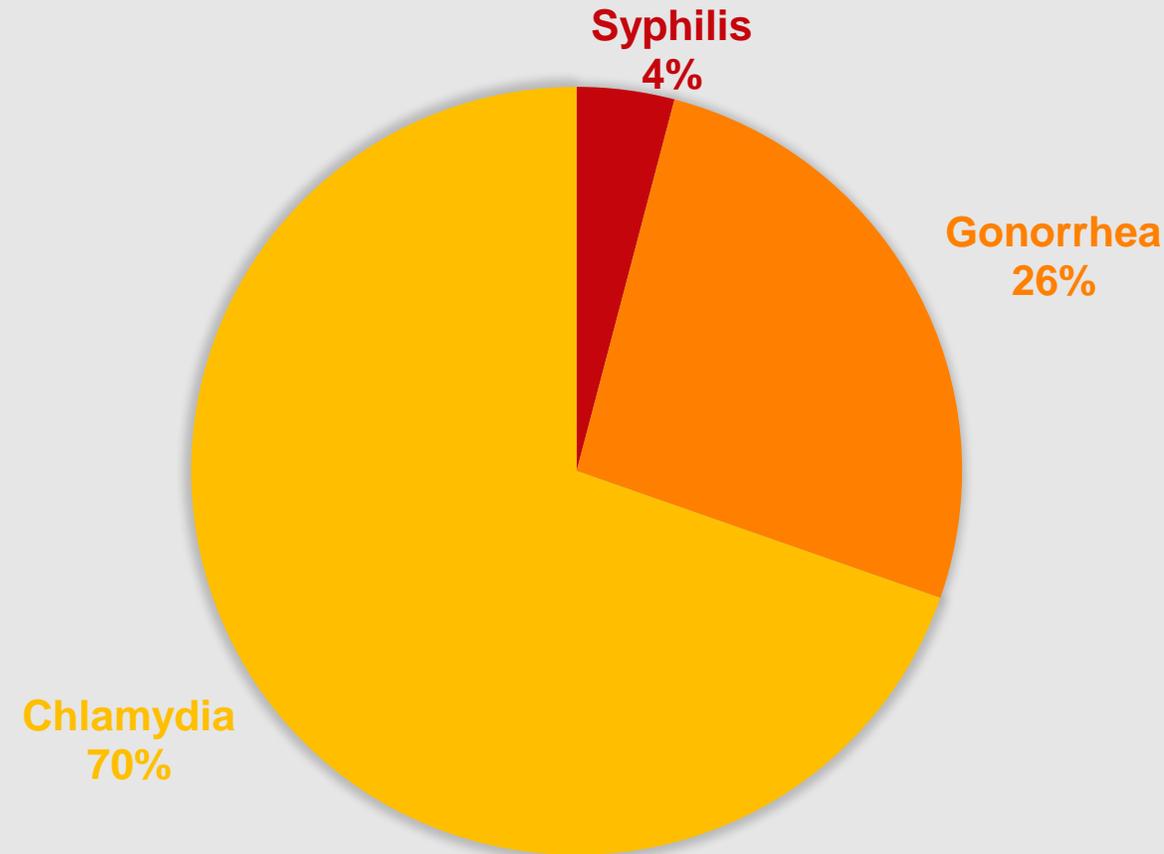


STIs

The number of reported **STI cases** have increased **47%** in Wisconsin from 2014-2021.



STI RATES IN WISCONSIN, 2021



STI Rates



Syphilis rate (per 100,000 people) doubled in 2021

Chlamydia rate increased
6.2% in 2021



Gonorrhea rate increased
2.9% in 2021



Syphilis rate increased
100% in 2021



2017 2018 2019 2020 2021

2017 2018 2019 2020 2021

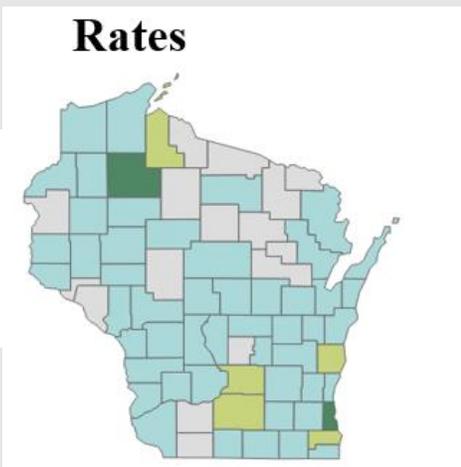
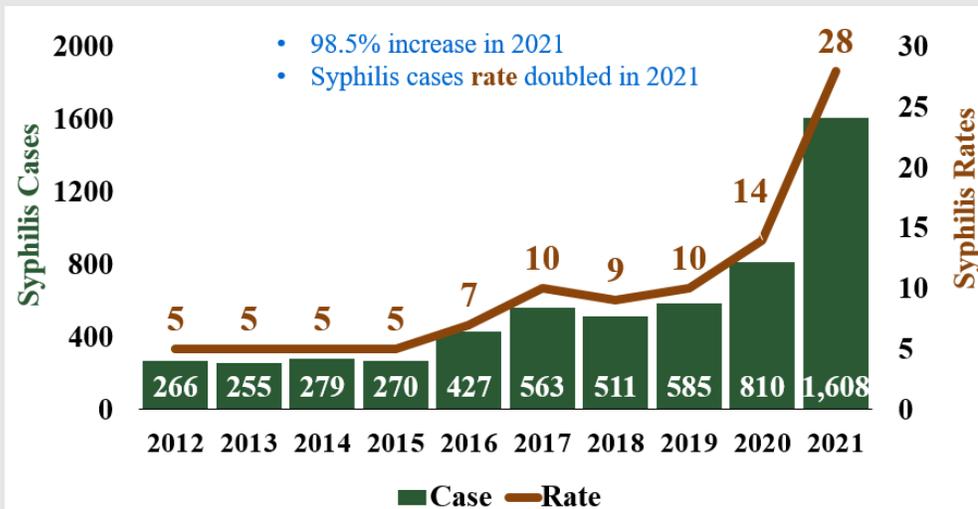
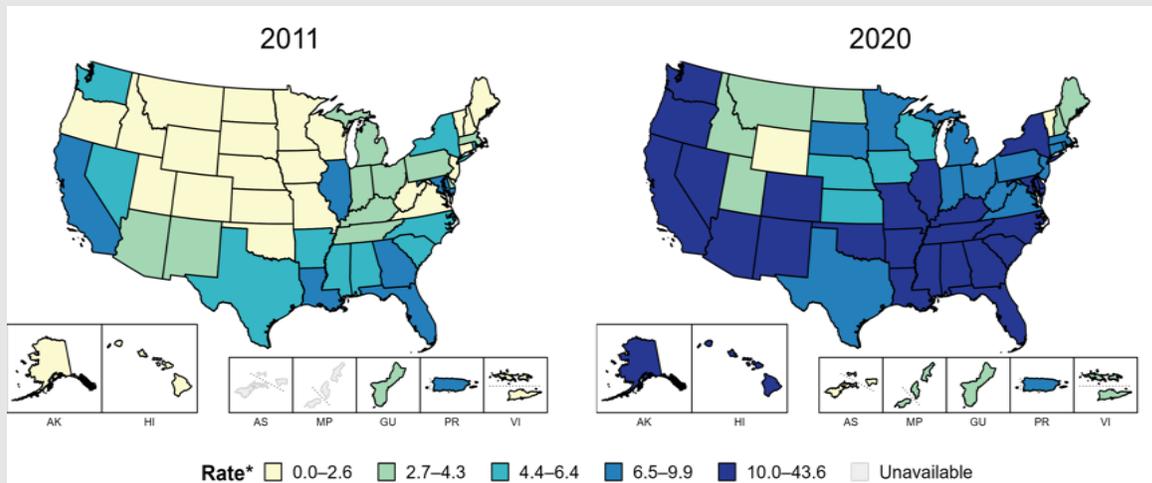
2017 2018 2019 2020 2021



Syphilis

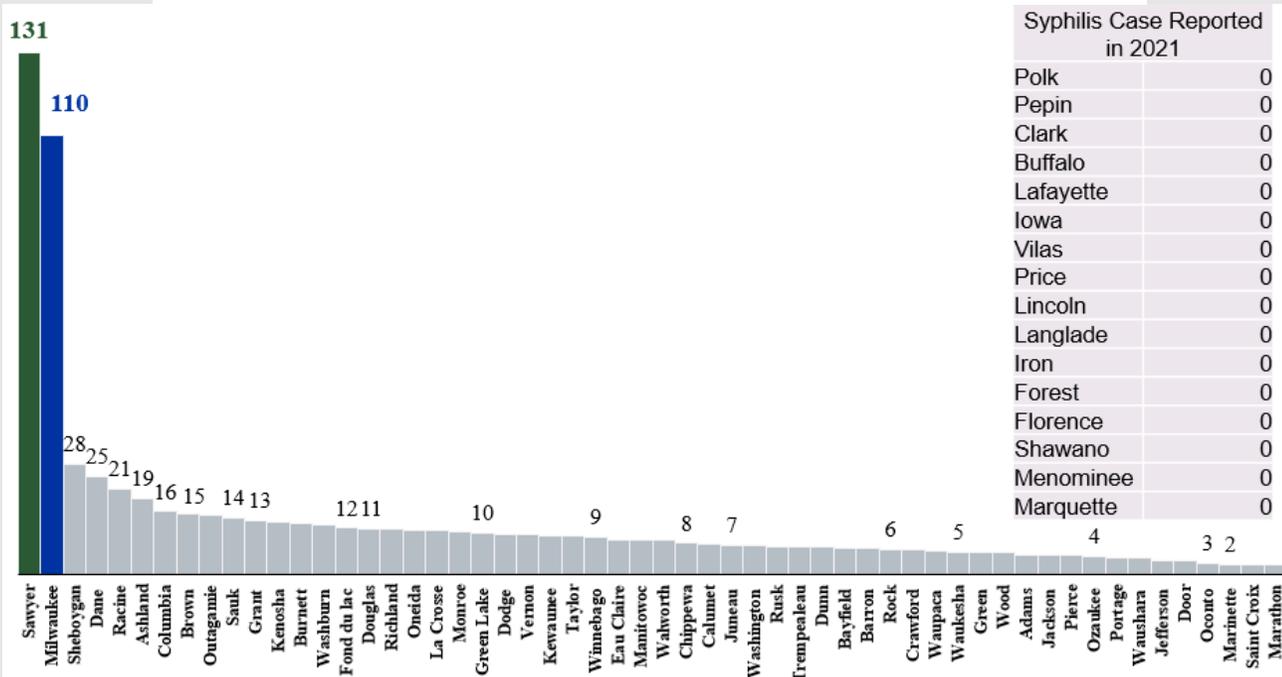


Syphilis is a growing problem



Syphilis rate range

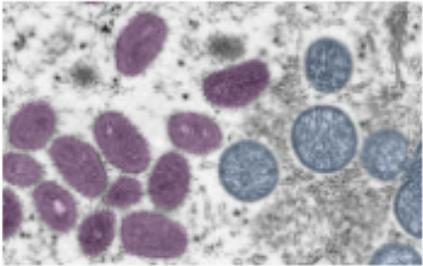
- 0
- 1–15
- 16–30
- 31–131



Syphilis Case Reported in 2021

Polk	0
Pepin	0
Clark	0
Buffalo	0
Lafayette	0
Iowa	0
Vilas	0
Price	0
Lincoln	0
Langlade	0
Iron	0
Forest	0
Florence	0
Shawano	0
Menominee	0
Marquette	0

Mpox

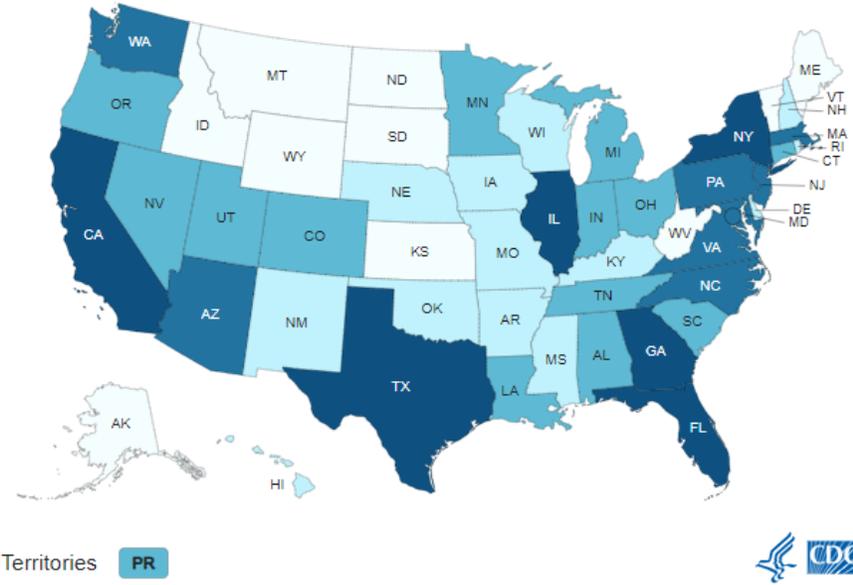


2022 Multi-National Mpox Response (EOC Activation: June 2022-present)

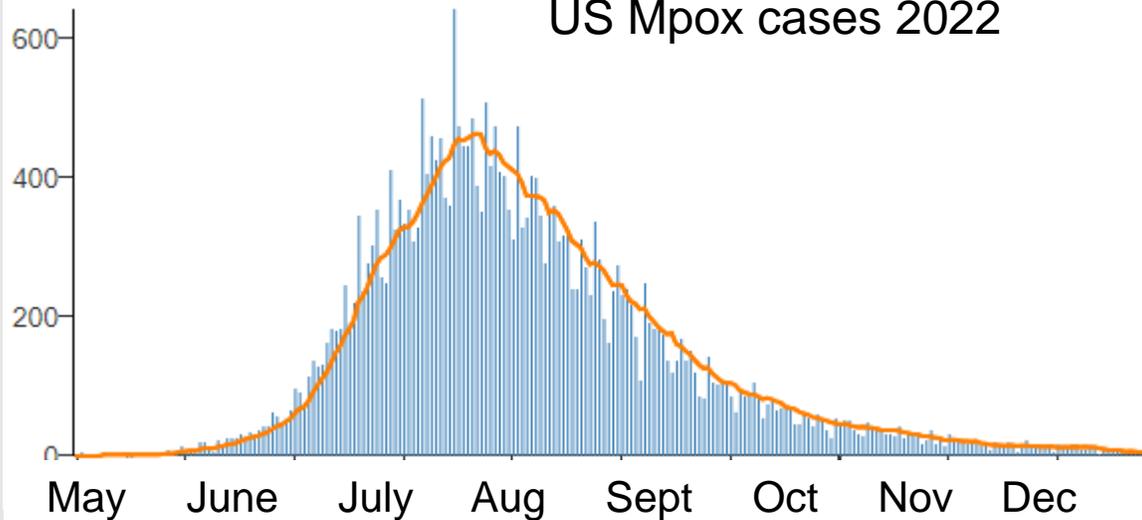
The U.S. Centers for Disease Control and Prevention (CDC) activated its Emergency Operations Center (EOC) on Tuesday,

June 28, 2022, to support public health partners in responding to the 2022 Multi-National Mpox Response. CDC continues to closely monitor the situation and updates its website as information becomes available. To learn more about the outbreak, visit the [mpox Web page](#).

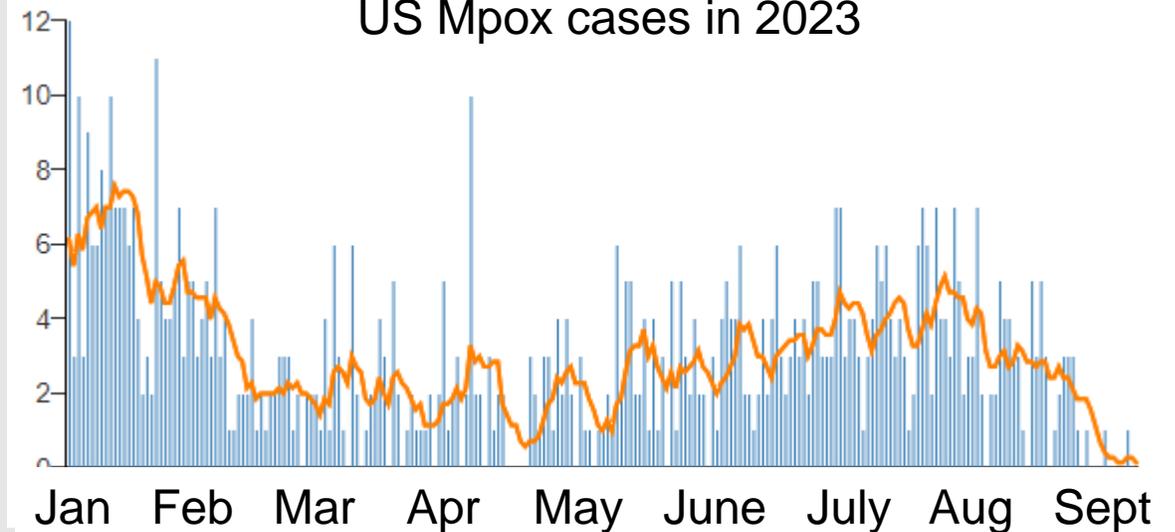
Data as of September 23, 2022



US Mpox cases 2022



US Mpox cases in 2023



***Cronobacter* in infants**



CSTE Recommends Making Invasive *Cronobacter* Infection in Infants Nationally Notifiable

The Council of State and Territorial Epidemiologists (CSTE) approved a [position statement](#) during its meeting in June that recommends making invasive *Cronobacter* infection in infants nationally notifiable to CDC. The position statement also establishes standardized criteria for case identification and classification (case counting) to be used for public health surveillance purposes and recommends public reporting of confirmed and probable cases. The position statement was developed by CSTE members along with experts from CDC, FDA and APHL.

Resources



CDC

- <https://www.cdc.gov/pneumococcal/surveillance.html>
- <https://www.cdc.gov/widgets/diseaseandconditions/data-maps.html?deliveryName=DM6448>
- <https://www.cdc.gov/vaccines/pubs/surv-manual/chpt01-dip.html>
- <https://wwwn.cdc.gov/narmsnow/>
- <https://www.cdc.gov/mmwr/volumes/65/rr/rr6502a1.htm>

DHS

- <https://www.dhs.wisconsin.gov/publications/p01792-9-2019.pdf>

WSLH

- <http://www.slh.wisc.edu/wcln-surveillance/surveillance/>