

A landscape photograph featuring a vibrant rainbow arching across a blue sky with scattered white clouds. In the foreground, a large, rustic brown ceramic pot filled with a creamy, golden-brown soup sits on a grassy field. The background shows rolling green hills and a line of trees under the bright sky.

Data goldmine: Maximizing Insights from WCLN Surveillance Data

Matthew Martin, Ph.D.
Annie Sanchez, Ph.D.

Matthew Martin, Ph.D. CDC LLS Fellow 2022



Annie Sanchez, Ph.D. CDC LLS Fellow 2023



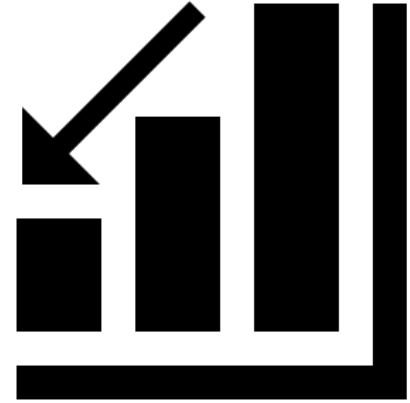
LCDR Abigail



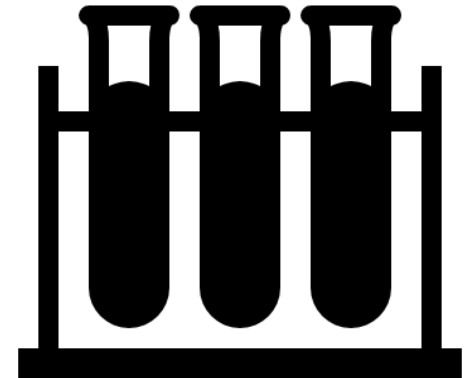
Wisconsin State
Laboratory of Hygiene
UNIVERSITY OF WISCONSIN-MADISON

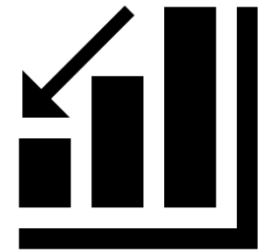
Laboratory-Based Surveillance Plan 2023-2024

Testing Data

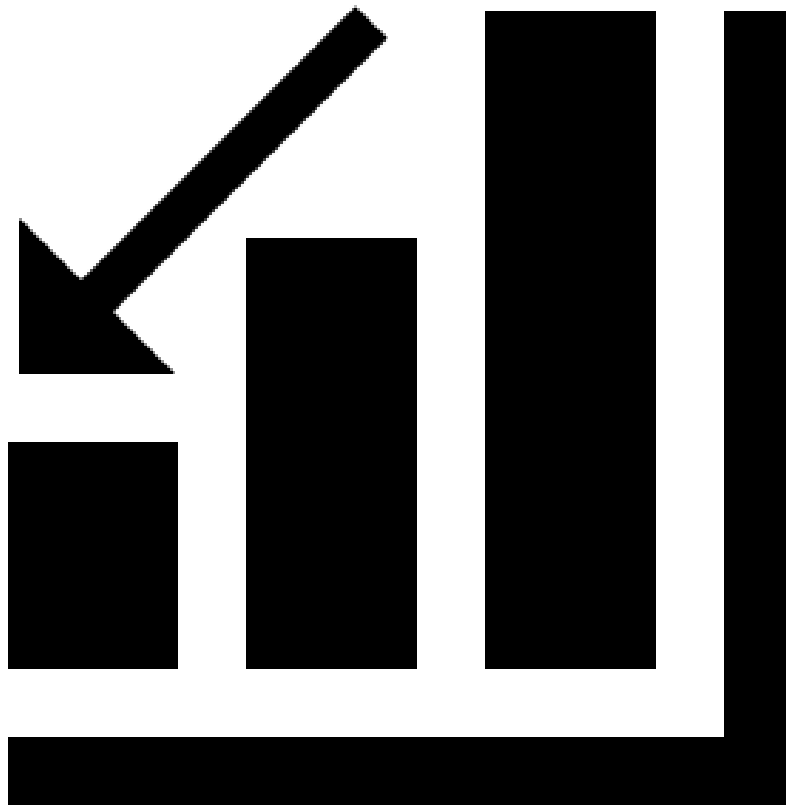


Specimens

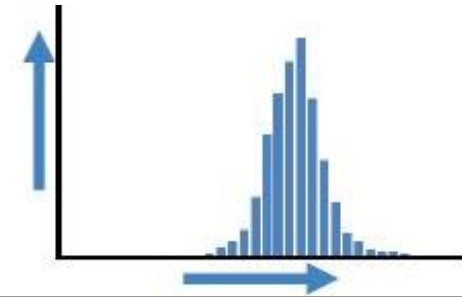




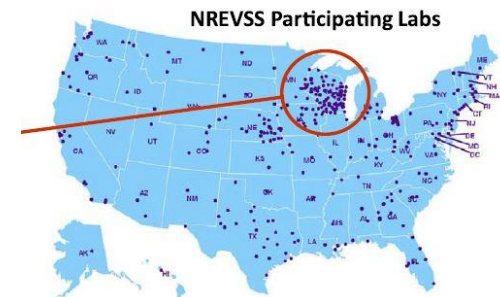
Testing Data

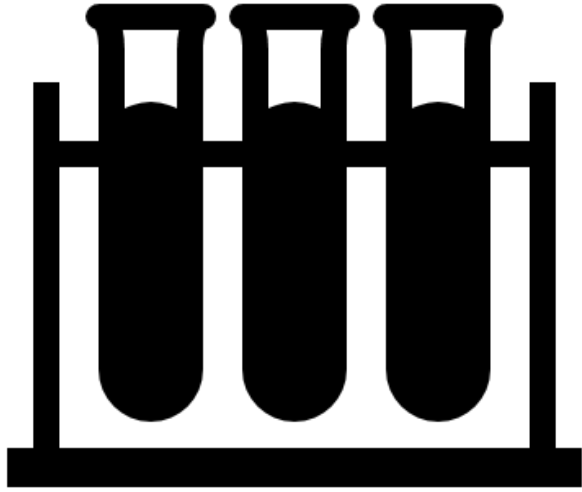


Situational Awareness

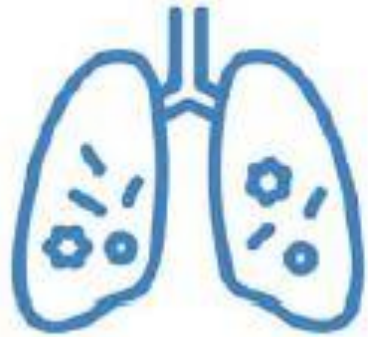


National Surveillance





Specimens



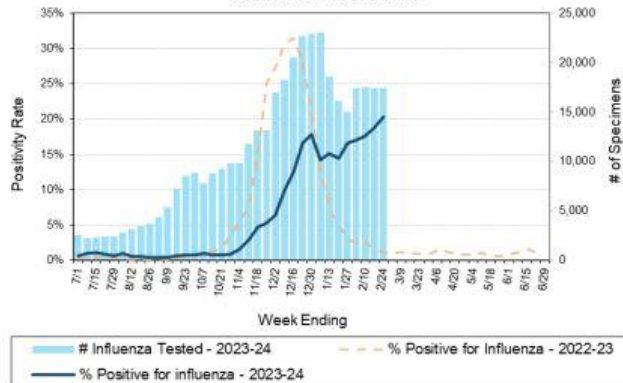
Laboratory Surveillance Report

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

To enhance surveillance activities, each week please send:

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

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



Respiratory Snapshot:

- Influenza activity is **high** in Wisconsin (20.3%) and nationally (14.2%).
 - **Influenza A** is the dominant strain circulating (66%)
 - **H1pdm09** is the dominant Influenza A subtype circulating (55%).
- Rhino/Enterovirus (10.1%) and Seasonal coronavirus (9.6%) activities are **high** in Wisconsin.

Enteric Snapshot:

- Norovirus activity is **high** (15.8%) in Wisconsin.

Other:

- Group A Streptococcus activity in Wisconsin is **high** (23.3%).



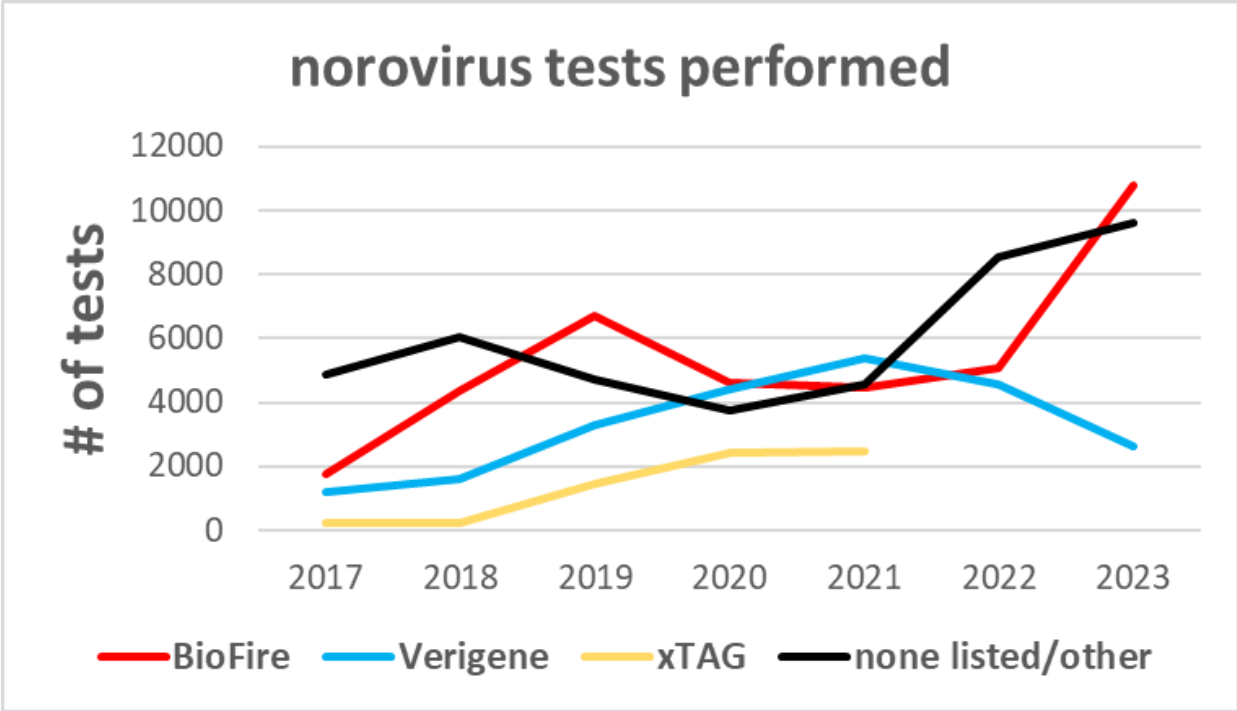
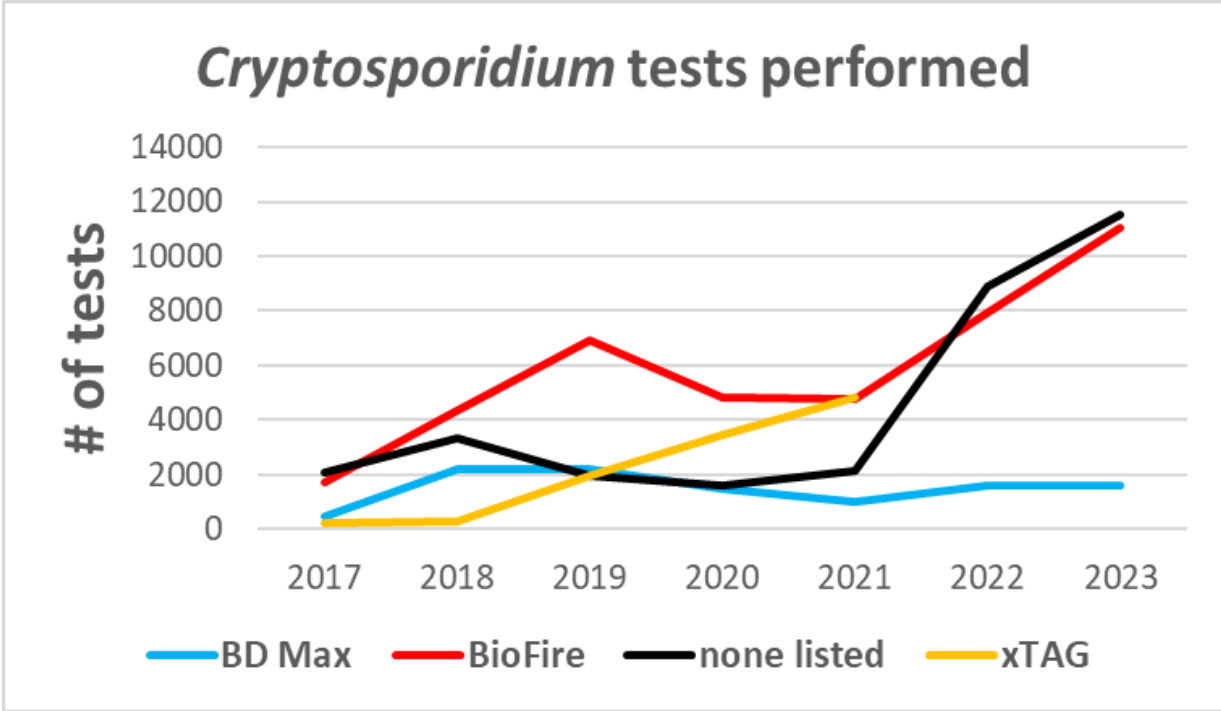
**Wisconsin State
Laboratory of Hygiene**
UNIVERSITY OF WISCONSIN-MADISON

Laboratory-Based Surveillance Plan 2023-2024

What else could we be doing with all this data?



Use of rapid molecular platforms has been increasing



Problems with detection accuracy have been reported



November 2022

BIOFIRE GI PANEL *Cryptosporidium* Update

Dear Valued BIOFIRE® FILMARRAY® Customer,

The purpose of this letter is to inform you that bioMérieux has received an increased number of reports of unconfirmed *Cryptosporidium* results (i.e. “false positive” results)



IMPORTANT:

URGENT: MEDICAL DEVICE RECALL

BIOFIRE® FILMARRAY® Gastrointestinal (GI) Panel – Ref. Number: RFIT-ASY-0116 & RFIT-ASY-0104

FSCA 5812 – Increased Risk of False Positive Norovirus Results with the BIOFIRE® FILMARRAY® Gastrointestinal (GI) Panel

January 26, 2024

To the attention of the Laboratory Director

bioMérieux Reference: FSCA 5812

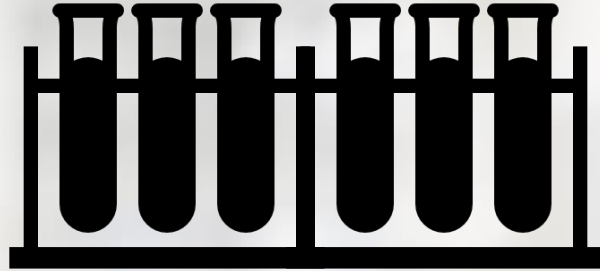
Table 1 - Affected Product

Product Name	Reference #	Kit Lot #	Expiration Date
BIOFIRE GI Panel	RFIT-ASY-0116 (30-pack) RFIT-ASY-0104 (6-pack)	N/A – All lot numbers	N/A – All unexpired product

Can we detect instrument problems with the data?



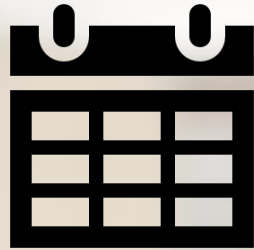
What information is submitted?



tested



positive

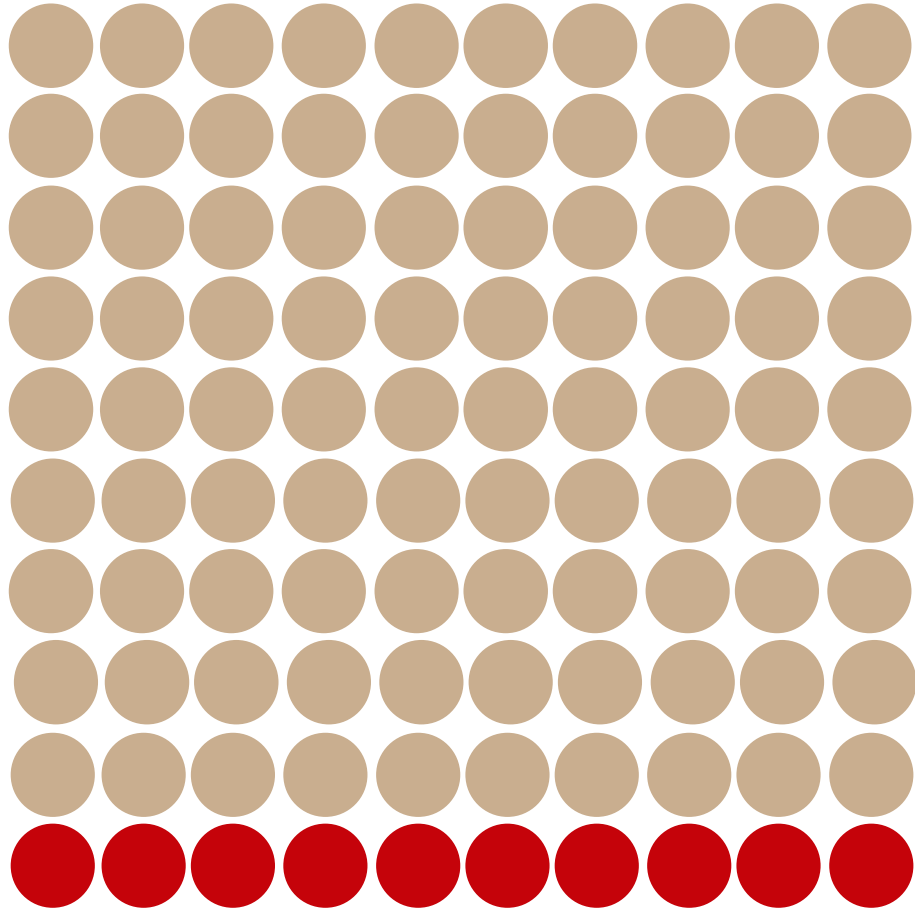


Week tested



Testing platform

How can we use this information?



$$\frac{\text{\# positive}}{\text{\# tested}} = \% \text{ positivity}$$

Cryptosporidium

Cases

Leading cause of waterborne disease outbreaks from 2001-2010

Symptoms

Diarrhea, vomiting, nausea, stomach pain, dehydration, weight loss, fever

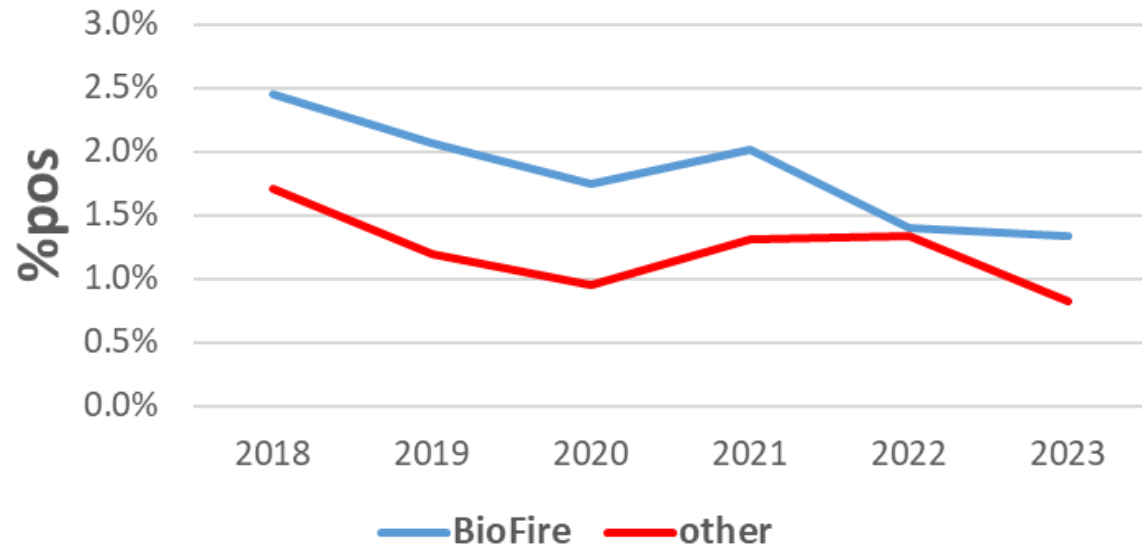
Sample type

Stool

BioFire %positivity trended higher from 2018-2021

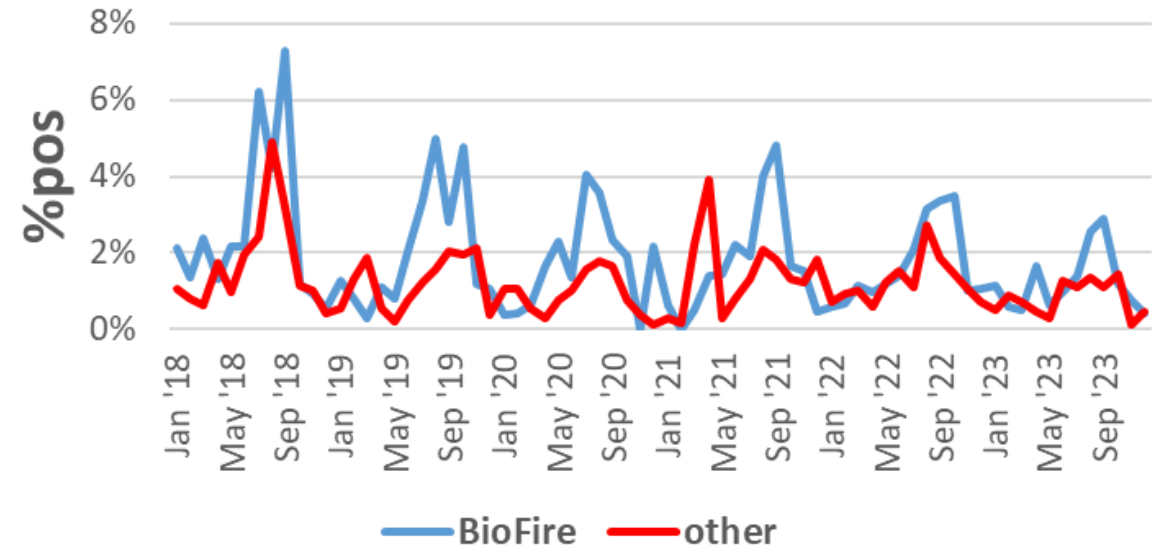
yearly

Cryptosporidium %positivity



monthly

Cryptosporidium %positivity



Norovirus

Cases/year

19-21 million in the U.S.

Symptoms

Diarrhea, vomiting, nausea,
stomach pain

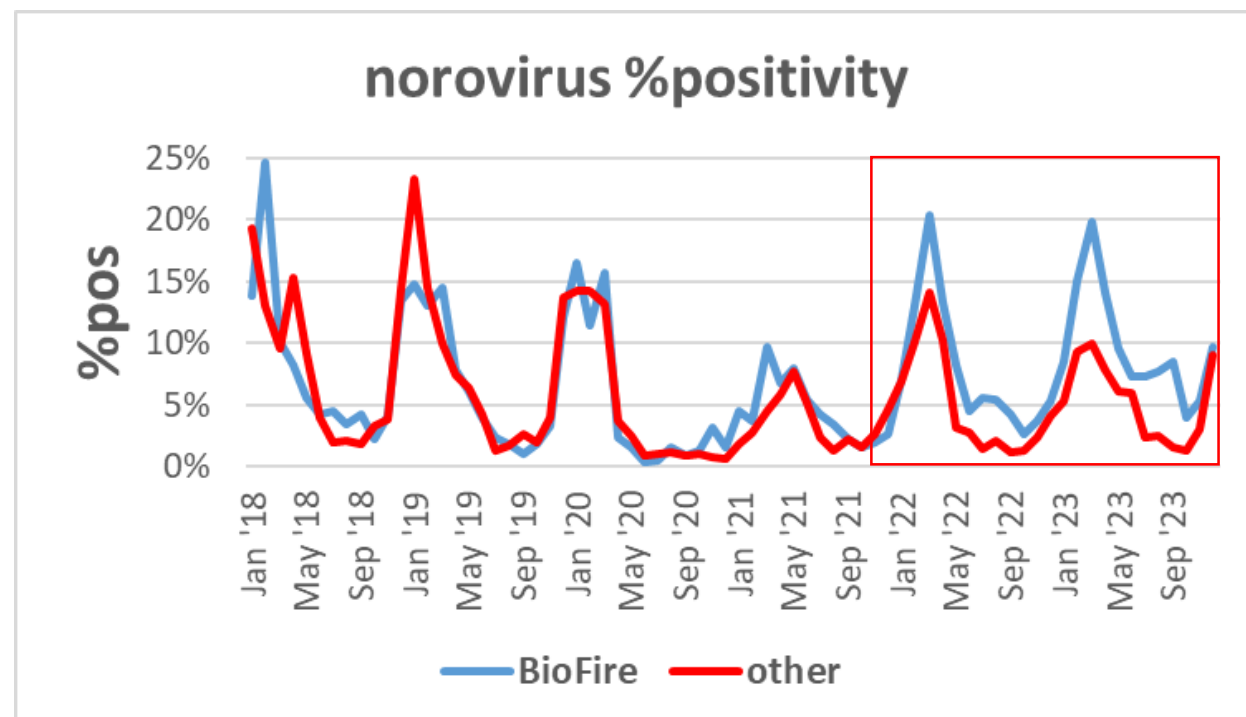
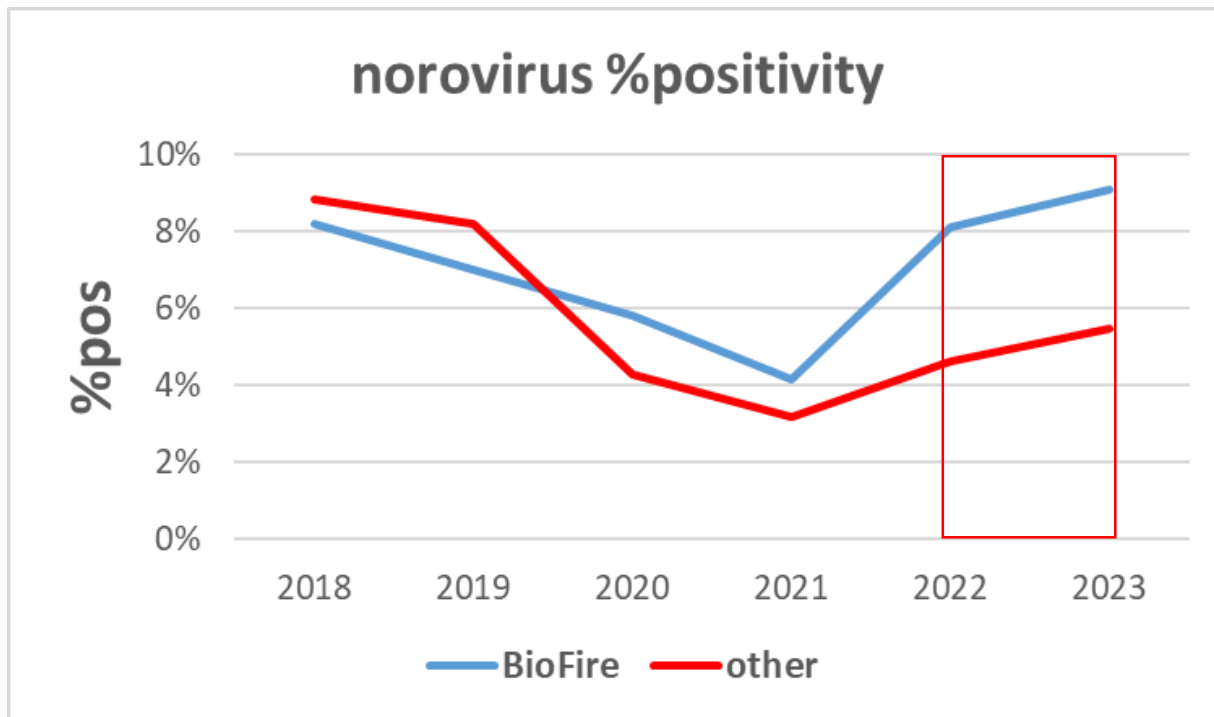
Sample type

Stool

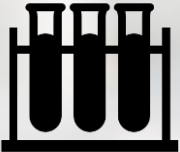
~Two-fold increase in BioFire %positivity from 2022-2023

yearly

monthly



Clinical specimens can give further insight



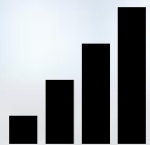
CIDT-positive specimens



Sent to WSLH

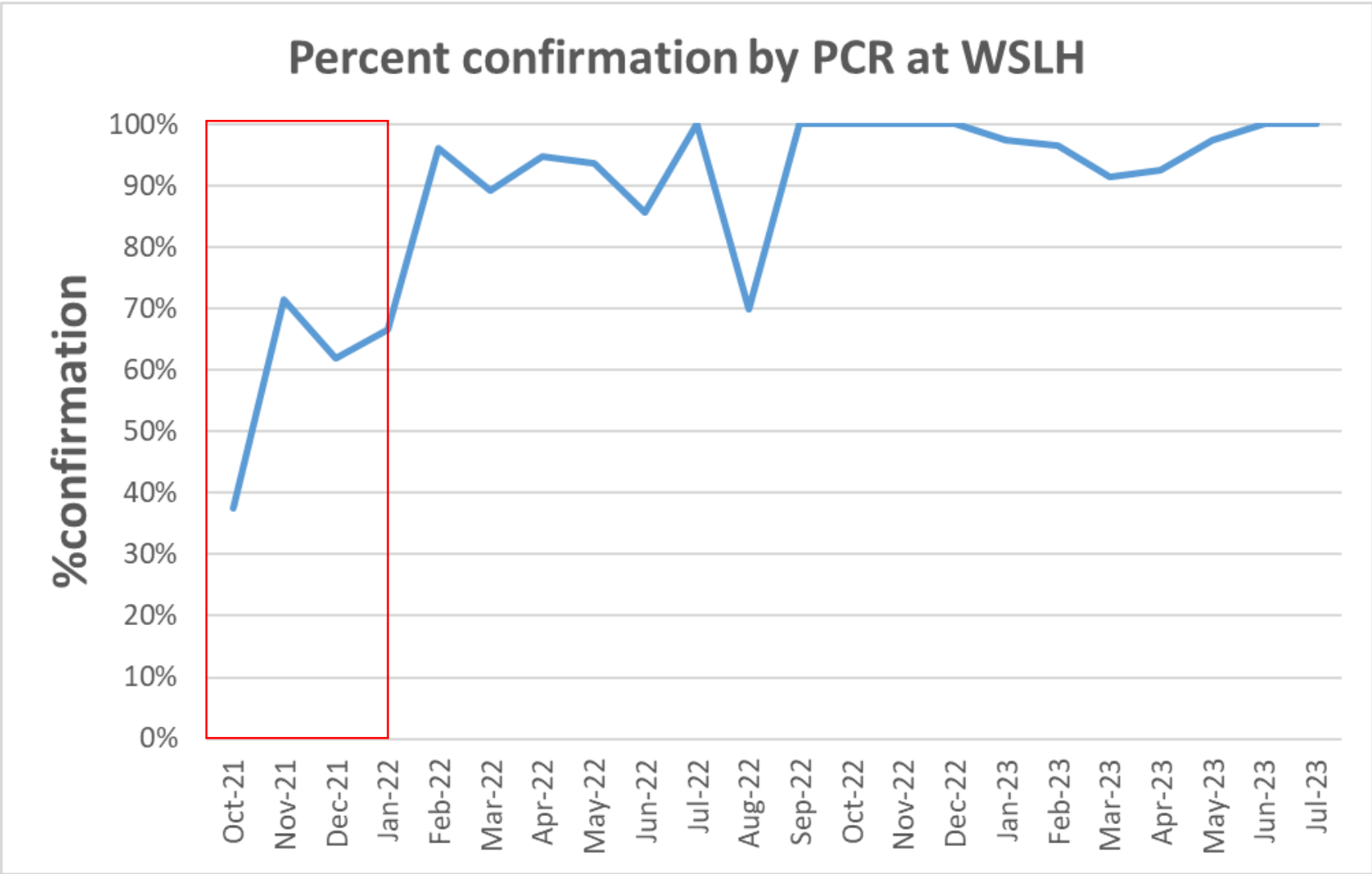


Confirmatory PCR

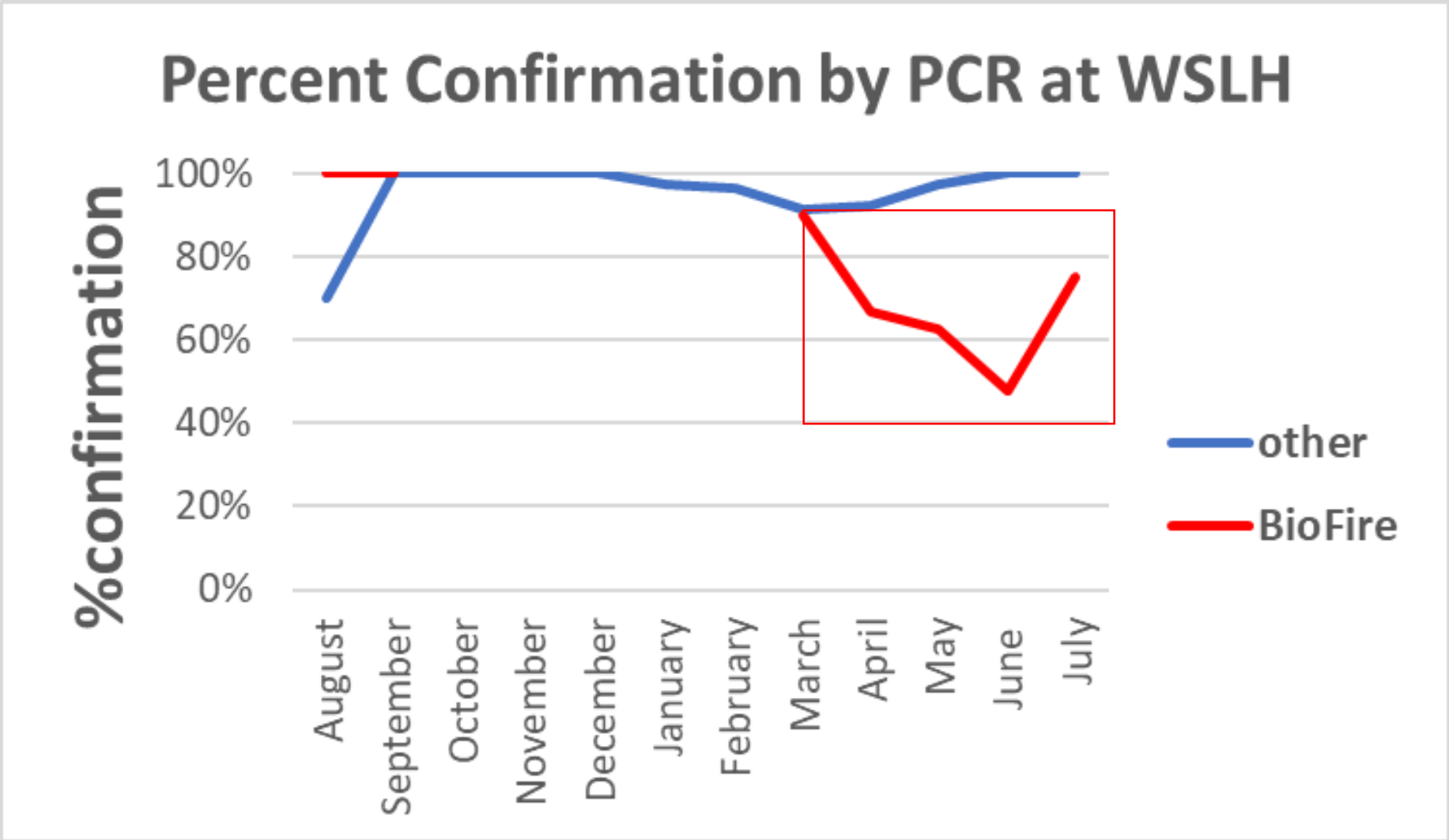


%confirmation

Confirmation testing at WSLH suggests instrument issues



Confirmation testing at WSLH suggests instrument issues



Performance and Impact of the BioFire FilmArray Gastrointestinal Panel on a Large *Cyclospora* Outbreak in Wisconsin, 2018

Allen C. Bateman^a, Youngmi J. Kim^a, Ana I. Guaracao^a, Jordan L. Mason^b, Rachel F. Klos^b, David M. Warshauer^a

^aCommunicable Disease Division, Wisconsin State Laboratory of Hygiene, Madison, Wisconsin, USA

^bDivision of Public Health, Wisconsin Department of Health Services, Madison, Wisconsin, USA



Other gastrointestinal organisms?

Campylobacter

Salmonella

Shiga toxin
producing *E.coli*

Campylobacter

Cases/year

~1.5 million in the U.S.

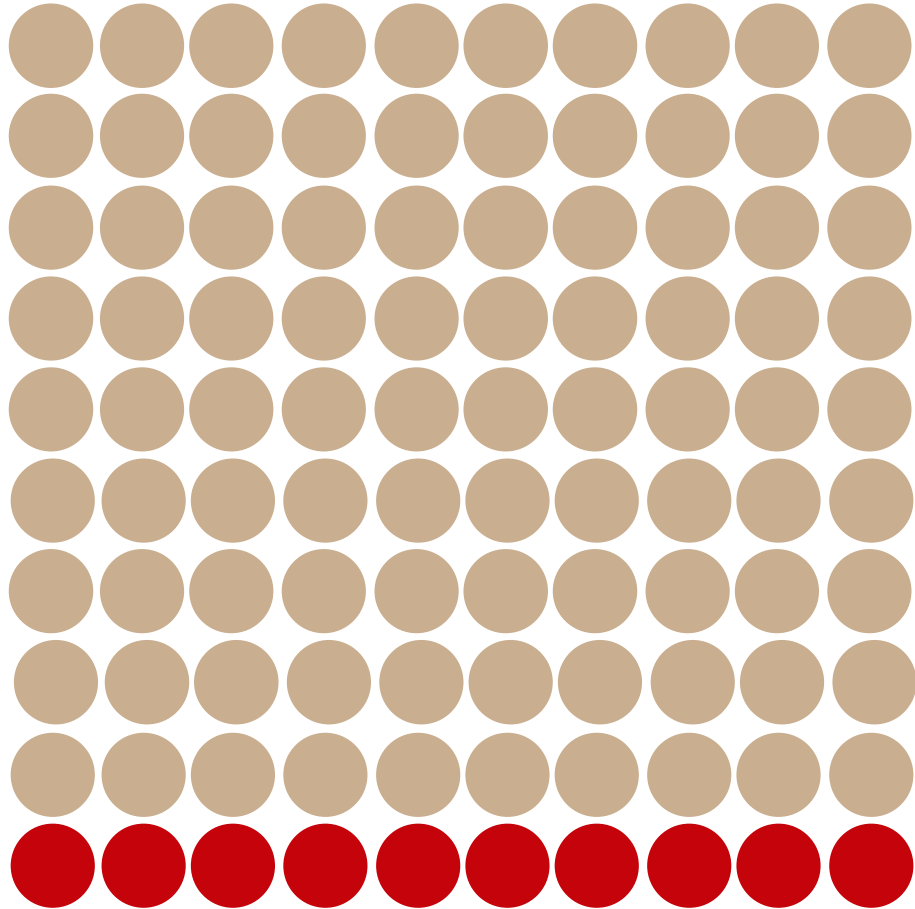
Symptoms

Nausea, vomiting, and
diarrhea

Sample type

Stool

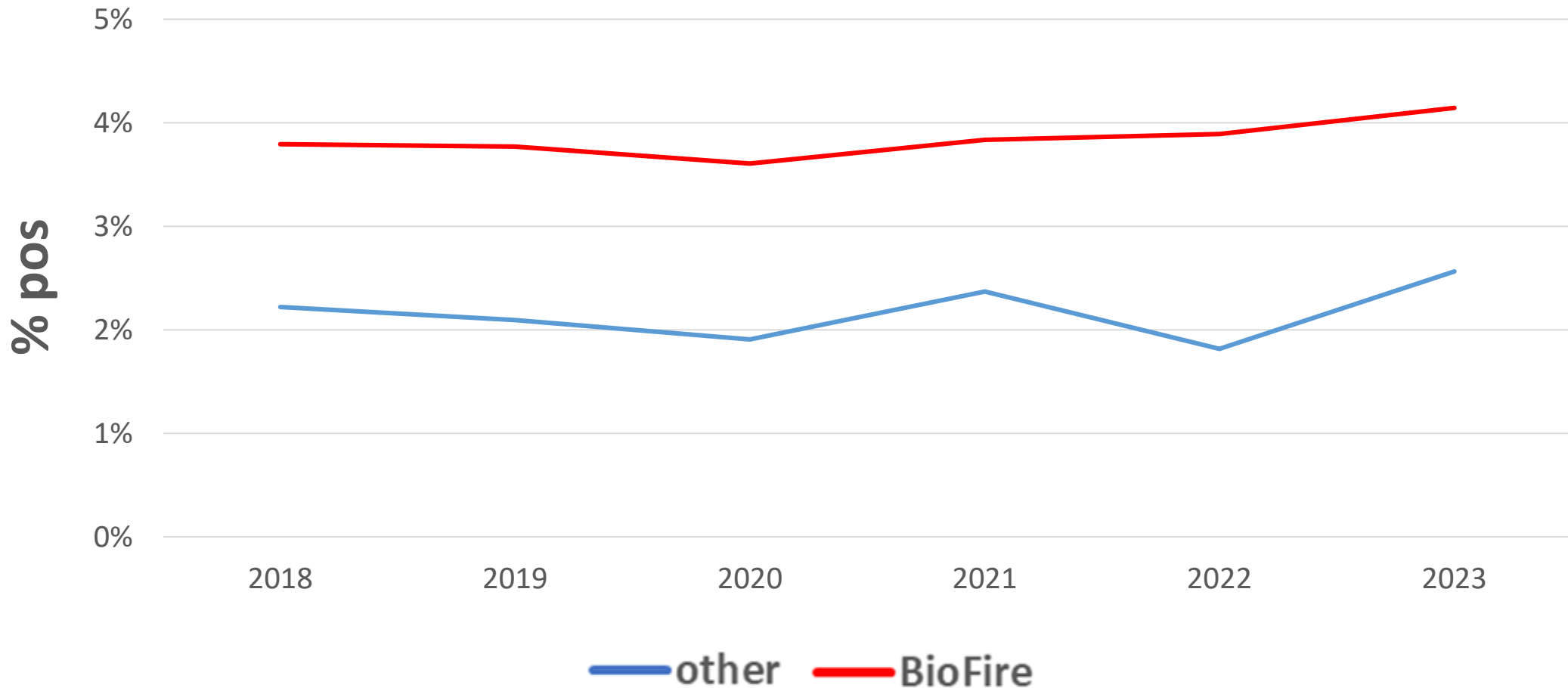
Percent positivity by instrument



$$\frac{\text{\# positive}}{\text{\# tested}} = \% \text{ positivity}$$

Higher % positivity from Biofire tested samples

Campylobacter Percent Positivity



WSLH testing can give further insight



CIDT-positive
specimens



Sent to WSLH

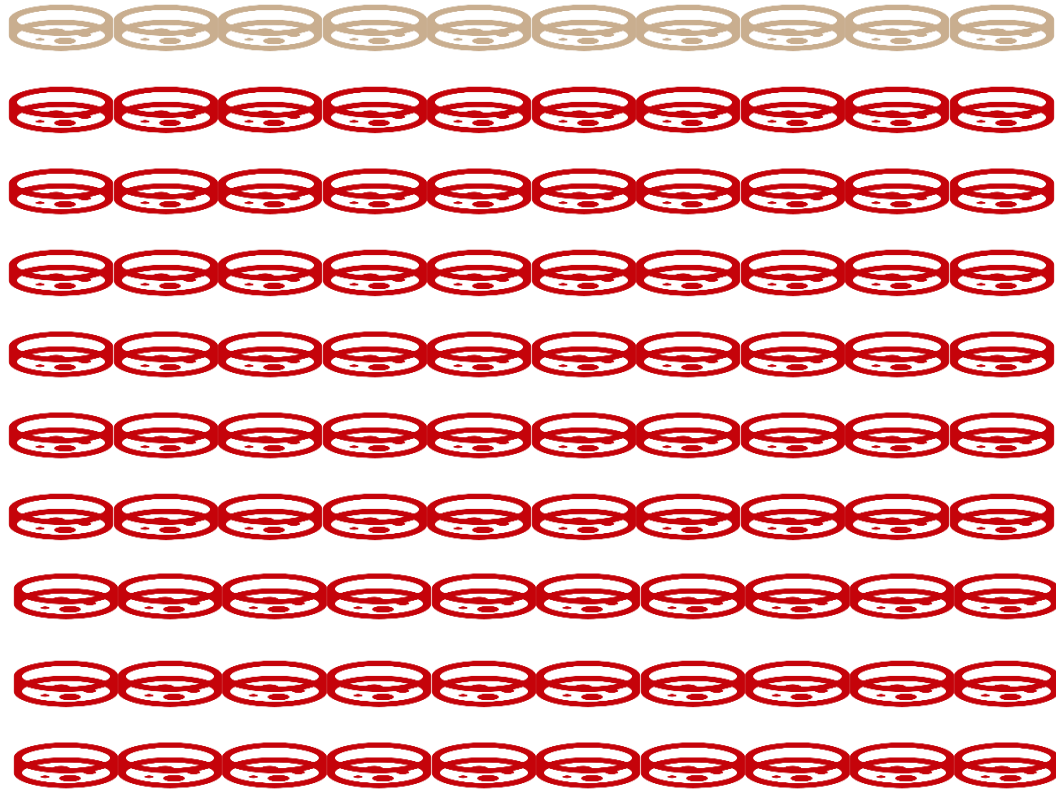


Culture for
isolate



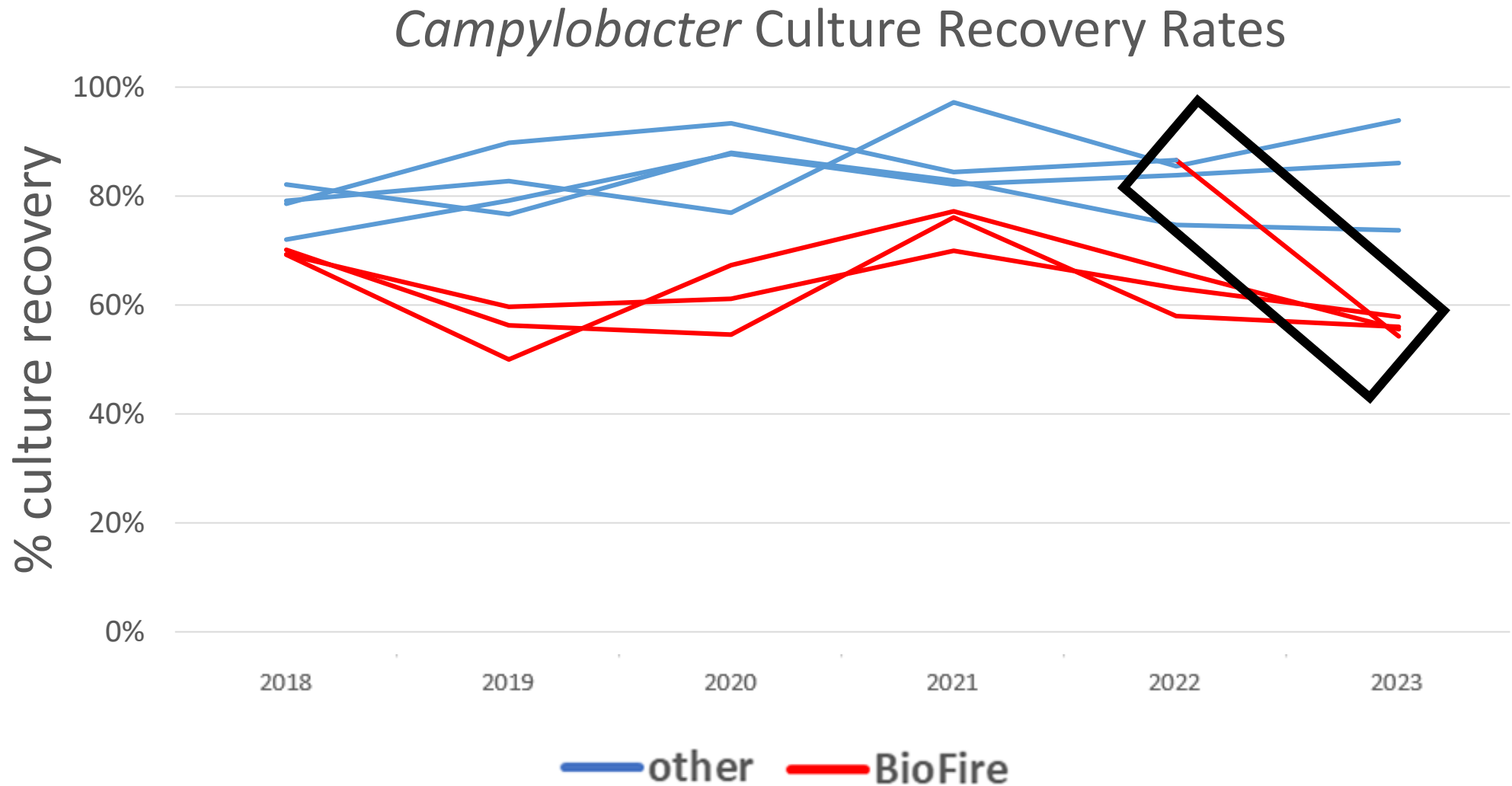
Test reports

WSLH testing can give further insight



$$\frac{\text{\# growth}}{\text{\# tested}} = \% \text{ recovery}$$

Lower colony recovery rates from BioFire-using labs



Salmonella

Cases/year

~1.35 million in the U.S.

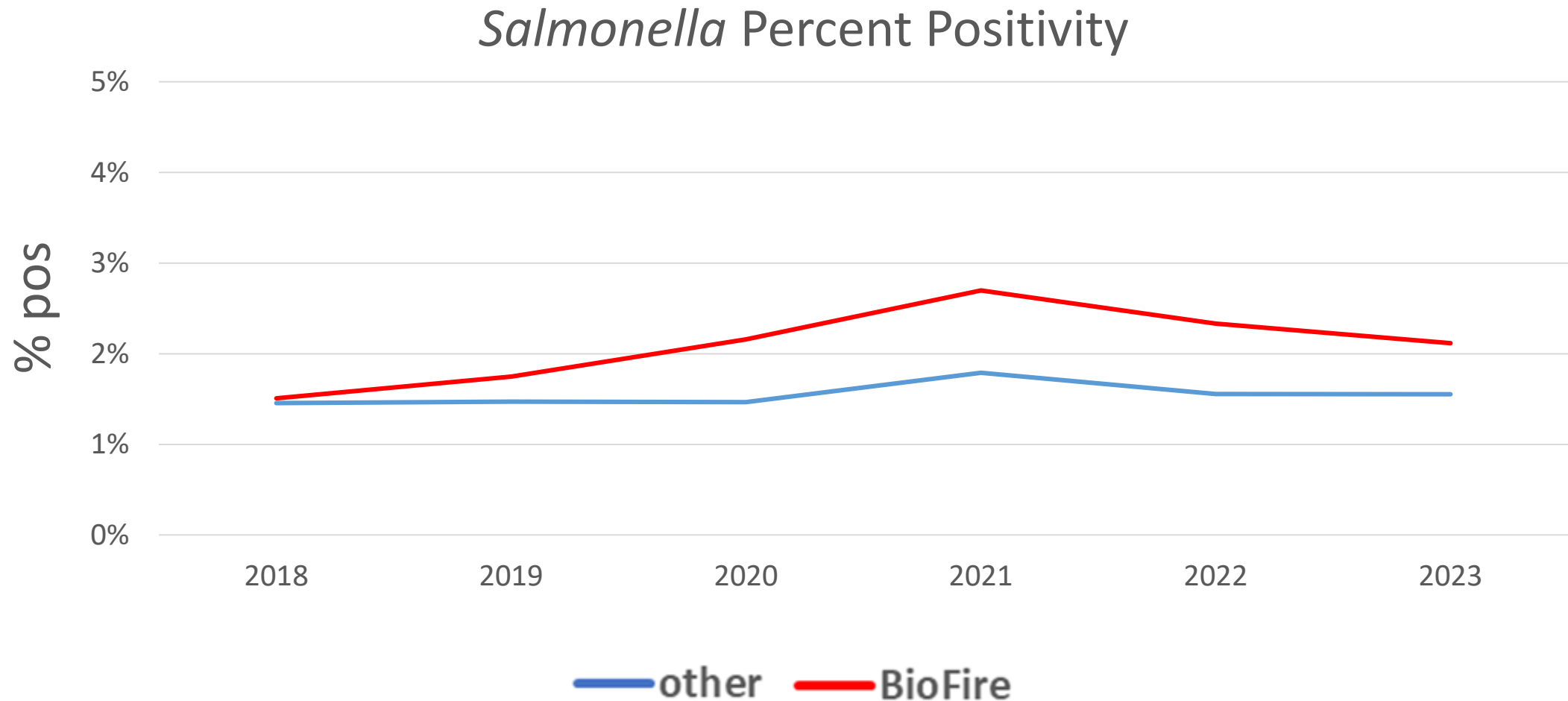
Symptoms

Diarrhea, fever and
stomach cramps

Sample type

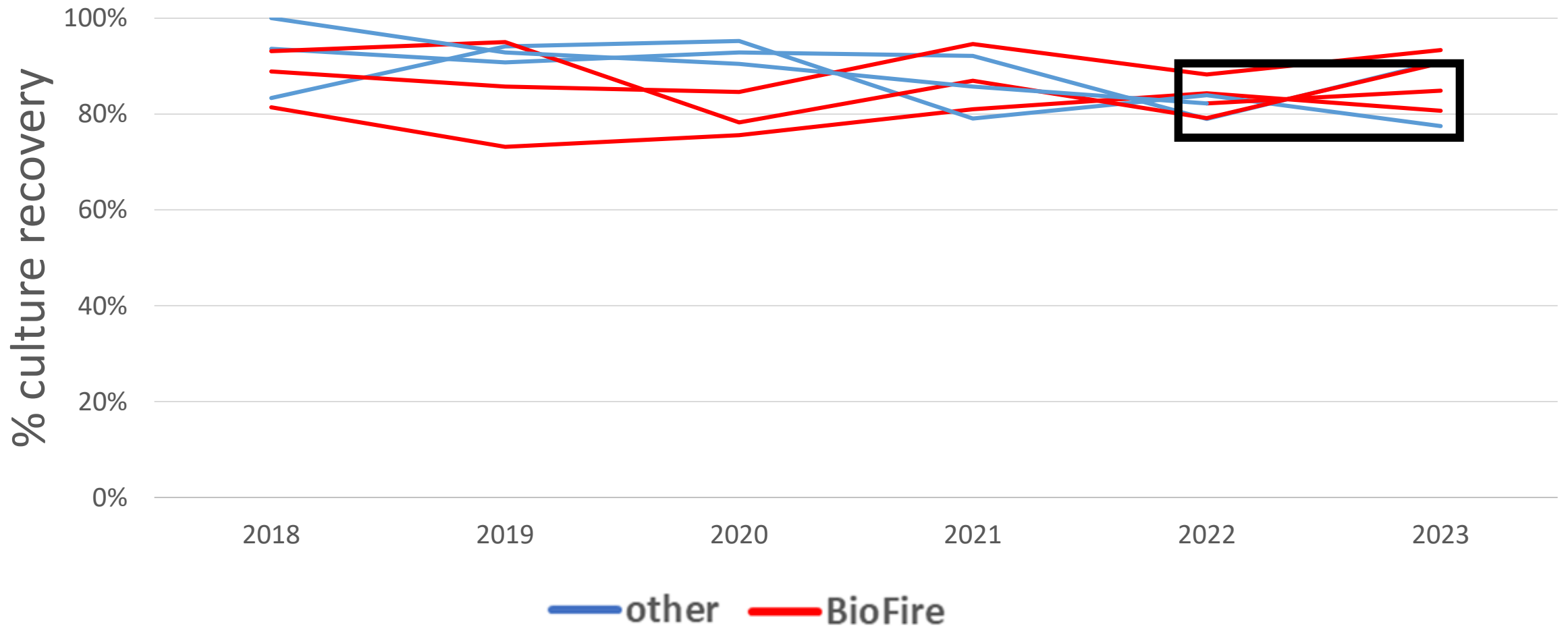
Stool

Increase % positivity for *Salmonella* using BioFire



No changes in culture recovery for *Salmonella*

Salmonella Culture Recovery Rate



Shiga-toxin producing *E. coli*

Cases/year

~265,000 in the U.S.

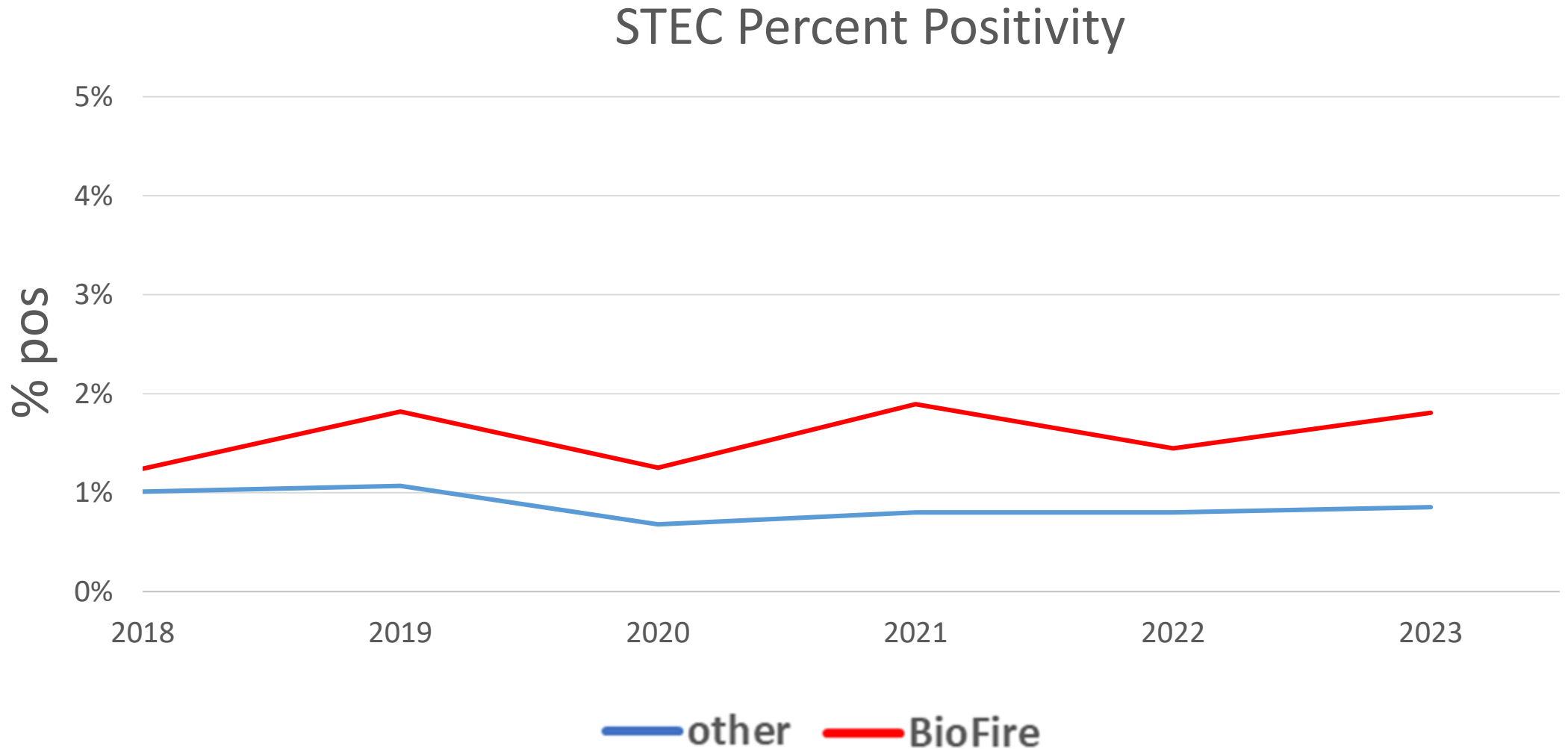
Symptoms

Bloody diarrhea and
hemolytic uremic syndrome

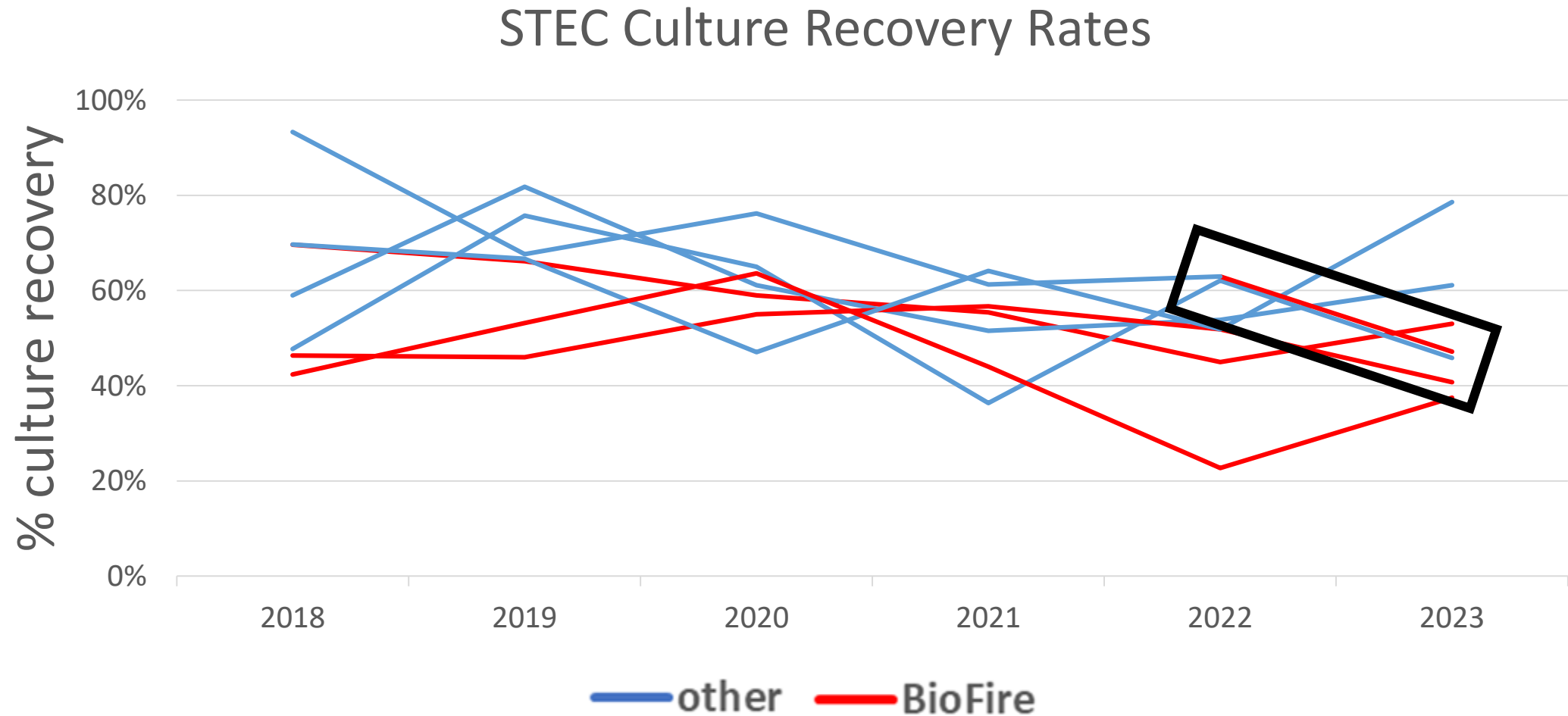
Sample type

Stool

Increase % positivity for STEC using BioFire



No changes in culture recovery for STEC



BioFire results are organism dependent

Campylobacter

↑ % positivity

↓ % culture
recovery

Salmonella

↑ % positivity

↔ % culture
recovery

STEC

↑ % positivity

↔ % culture
recovery



Thank you for your
submissions!

Lab Networks & Surveillance

- Wisconsin Clinical Laboratory Network
- Training Events

Surveillance

- Bacteriology Surveillance
- Mycobacteriology Surveillance
- Virology Surveillance
- Gastropathogen Surveillance
- Wisconsin Mycobacteriology Laboratory Network
- Communicable Diseases
- Emergency Response

Clinical Testing Data Surveillance

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


Wisconsin Respiratory Surveillance Program:

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

Wisconsin Acute Diarrheal Illness Surveillance Program:

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

Testing Data Submission Instructions



Click Here to Report
Wisconsin Test Data



slh.wisc.edu/wcln-surveillance/surveillance/

Contact Information

Wisconsin Clinical Laboratory Network

WCLN@slh.wisc.edu

Erin.Bowles@slh.wisc.edu

WSLH Clinical Orders

800-862-1088

Purple Mountain Solutions

800-990-9668

Purplemountainsolutions.com



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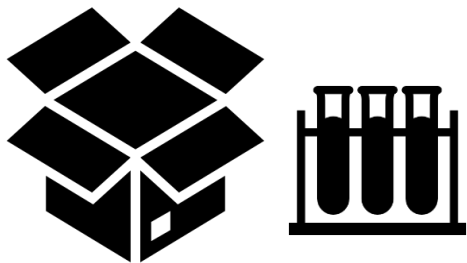
Purplemountainsolutions.com



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Laboratory-Based Surveillance Plan 2023-2024

NO COST



Specimen shipping supplies
and requisition forms

NO COST



Specimen transport
to WSLH



slh.wisc.edu/wcln-surveillance/surveillance/

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Thank you!

Speaker Contact:

Matthew Martin, Ph.D.

Matthew.Martin@slh.wisc.edu

Annie Sanchez, Ph.D.

Annie.Sanchez@slh.wisc.edu

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