

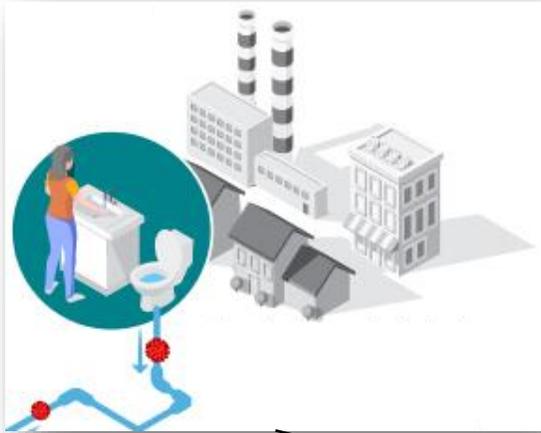
Ohio Wastewater Monitoring Network Update

OTCO/ April 3, 2024

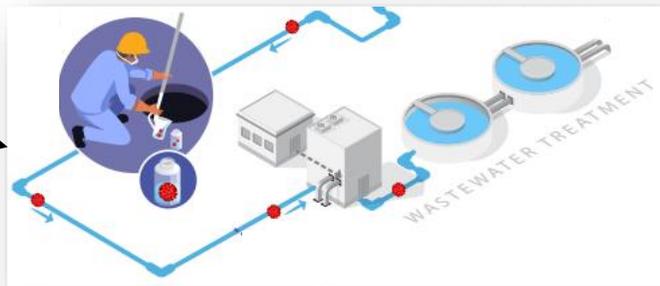
- **Zuzana Bohrer, Health Planning Administrator 2**

Wastewater monitoring and public health

Infected individuals deposit virus into sewage system.



Samples are collected at the wastewater treatment plant.



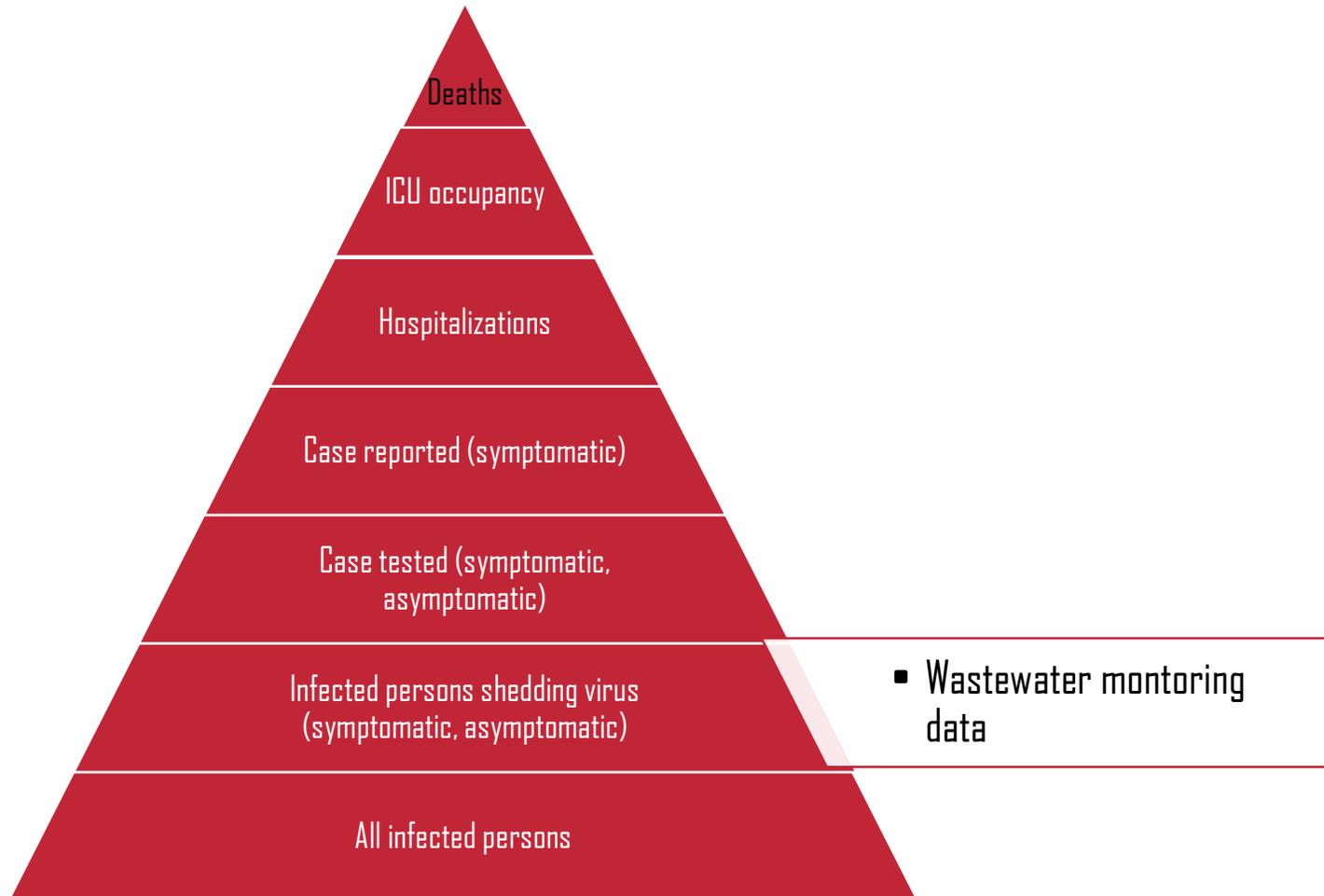
Samples are processed and viral RNA is quantified in laboratories.



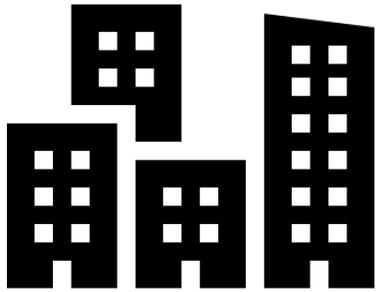
Public health officials assess trends to prioritize resources.



How does wastewater complement other monitoring strategies?



Ohio's wastewater monitoring goals



Provide information on infectious disease prevalence and trends in Ohio communities.



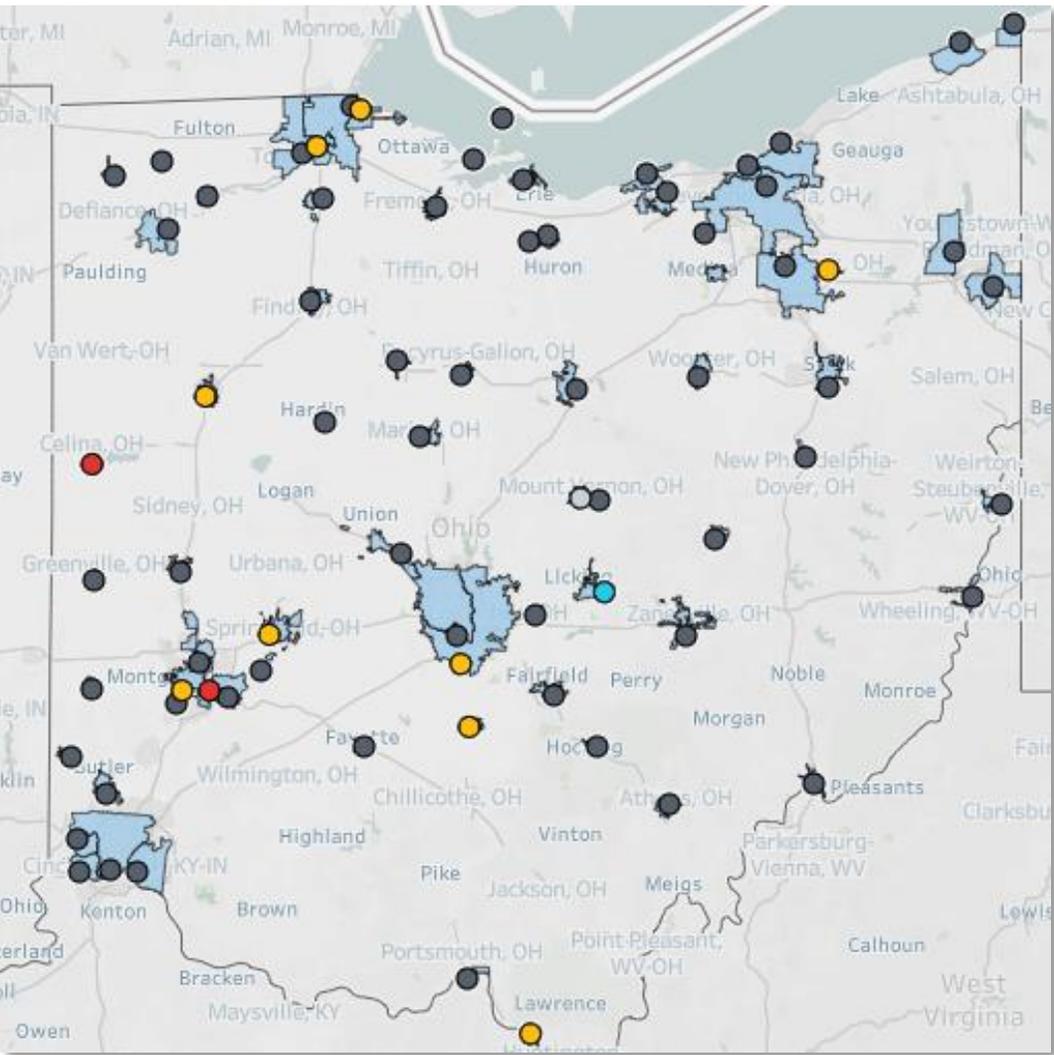
Monitor the increase of infectious disease trends as a leading indicator of disease occurrence.



Inform decisions to prioritize resources during an outbreak.



Inform any needed community interventions to help limit the spread of infectious disease.



Monitoring locations

- 76 locations twice a week.
- 84% locations have three years of data.
- Monitoring covers ~5.5 million Ohio residents in 55 counties.
- Monitored population per location ranges from 1,000 - 655,000.

Weekly Schedule

Sampling

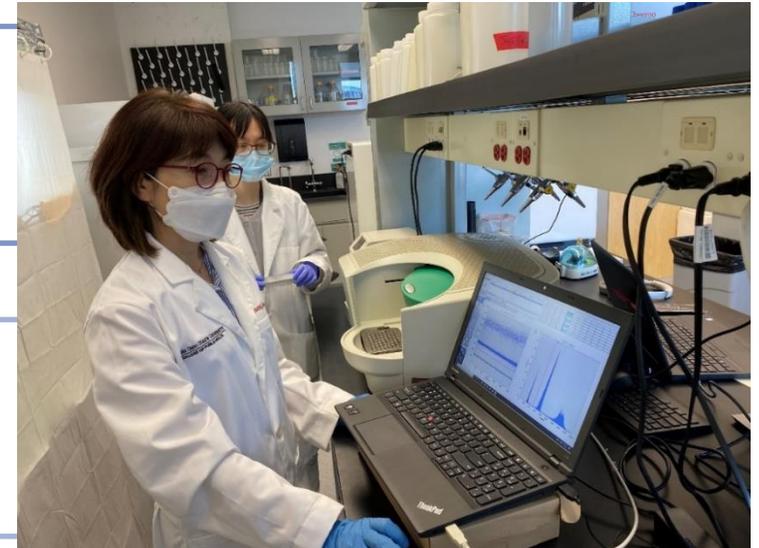
- Utility collects influent sample twice a week; supplies are provided.
- Sample stored at refrigerator temperature until sample pick-up (few hours).
- Sample picked up by courier, and supplies dropped off for next sample.

Analysis

- July 2022 only ODH Public Health Lab.
- One consistent method.
- Lab analyses quantification in 24 hours.

Application

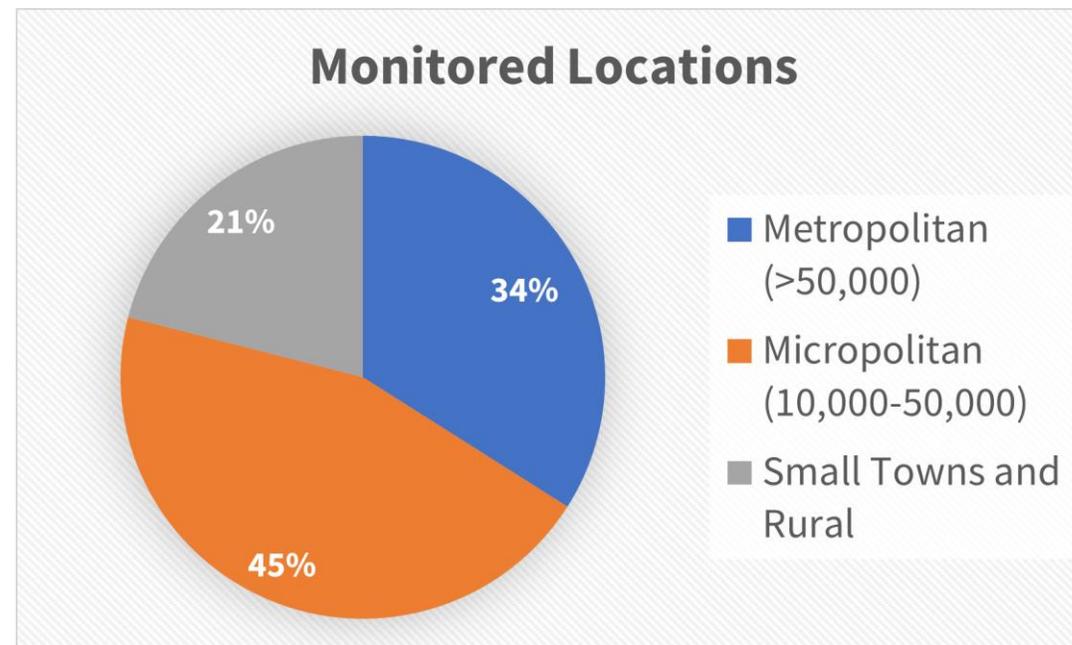
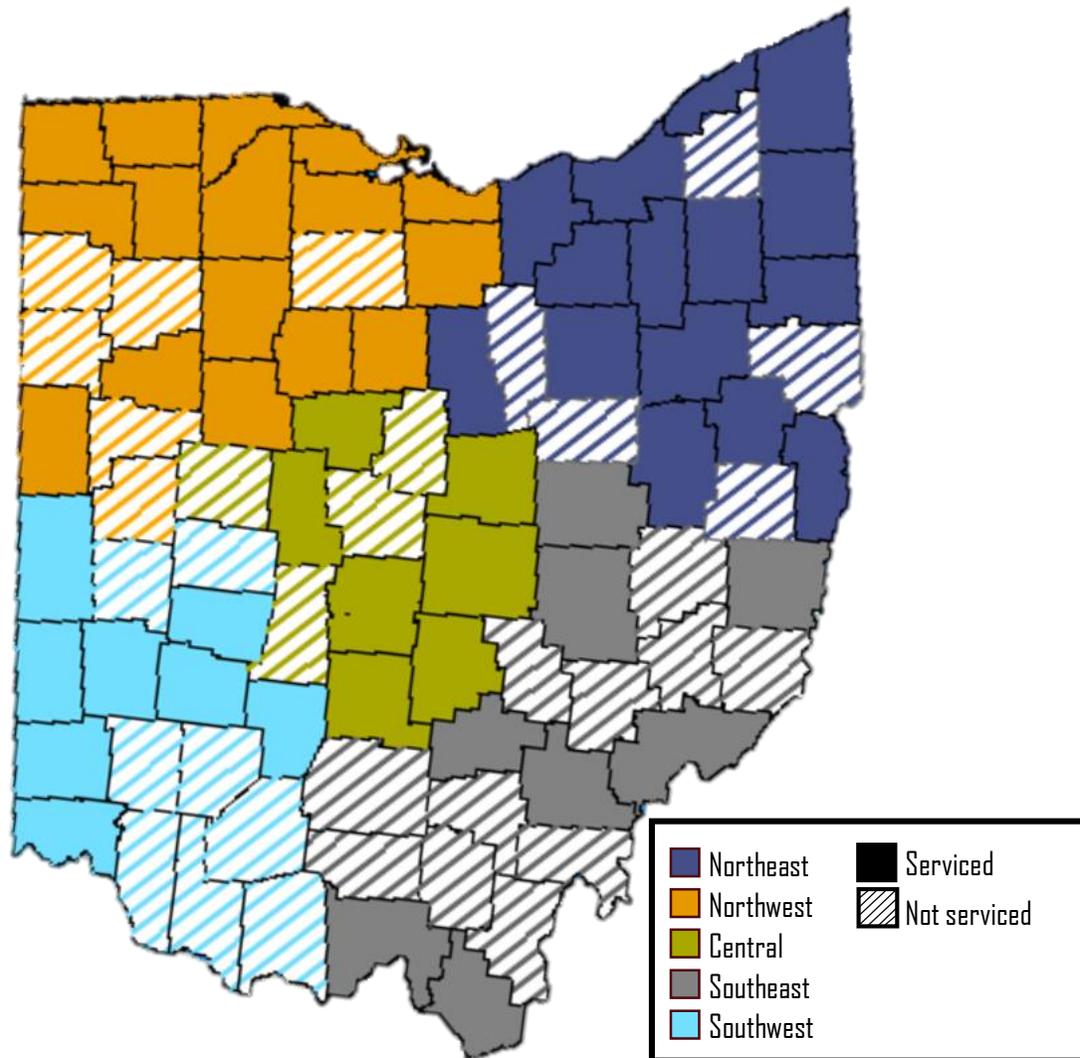
- Data from utility and lab compiled.
- ODH dashboard update.
- Trend analyses and alerting communities.



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Early infectious disease increases notifications.

Statewide representation



Wastewater SARS-CoV-2 virus monitoring

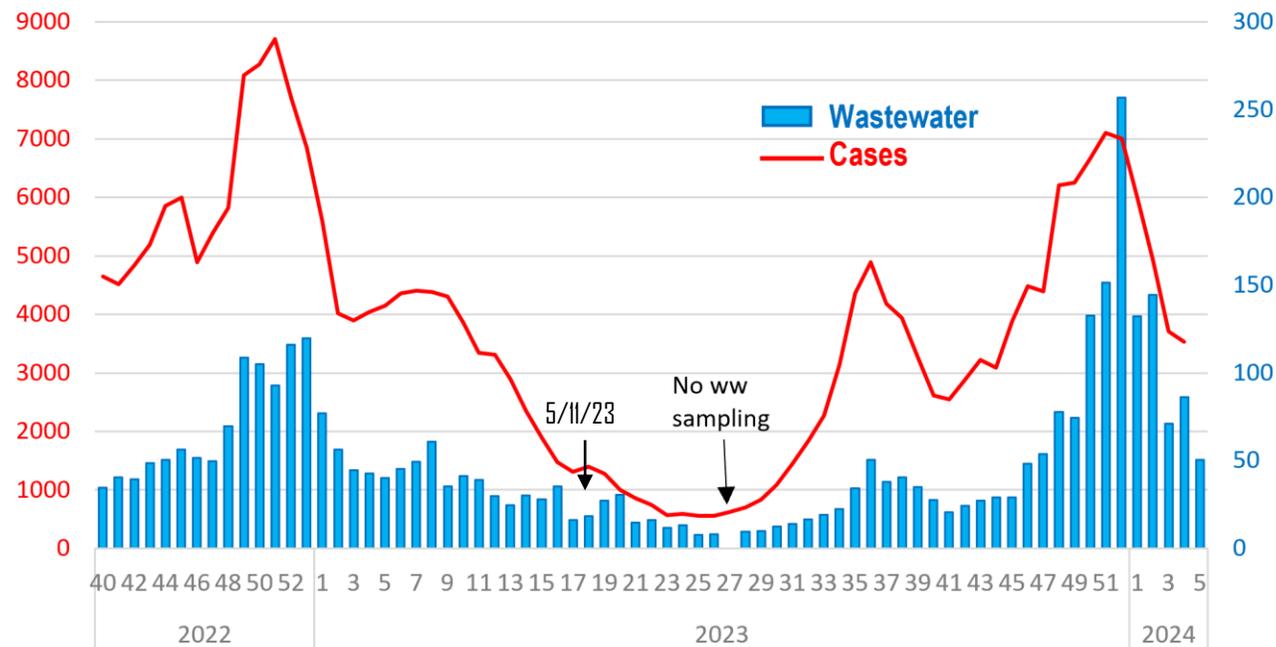
- Season update and variants

SARS-CoV-2 in wastewater

The average of COVID-19 **viral gene copies in wastewater** mirrors the number of **reported clinical cases**.

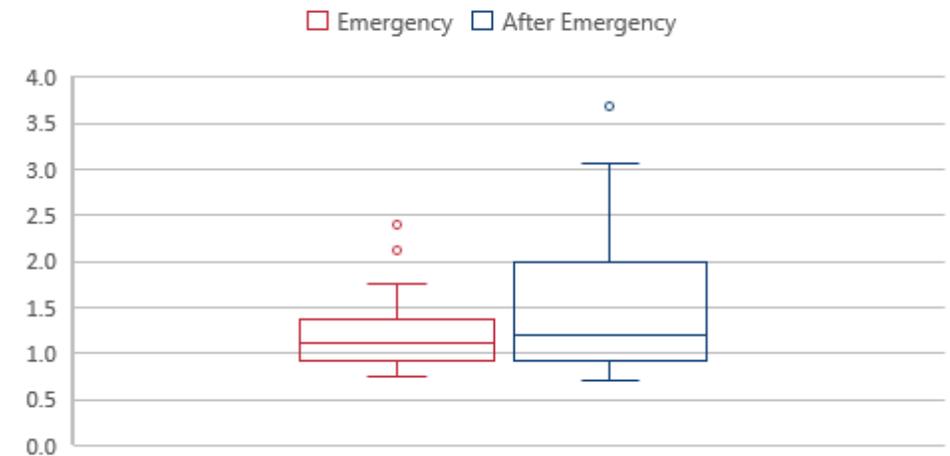
*wastewater reported in weekly average million gene copies/person/day

*cases reported in weekly sewersheds sum

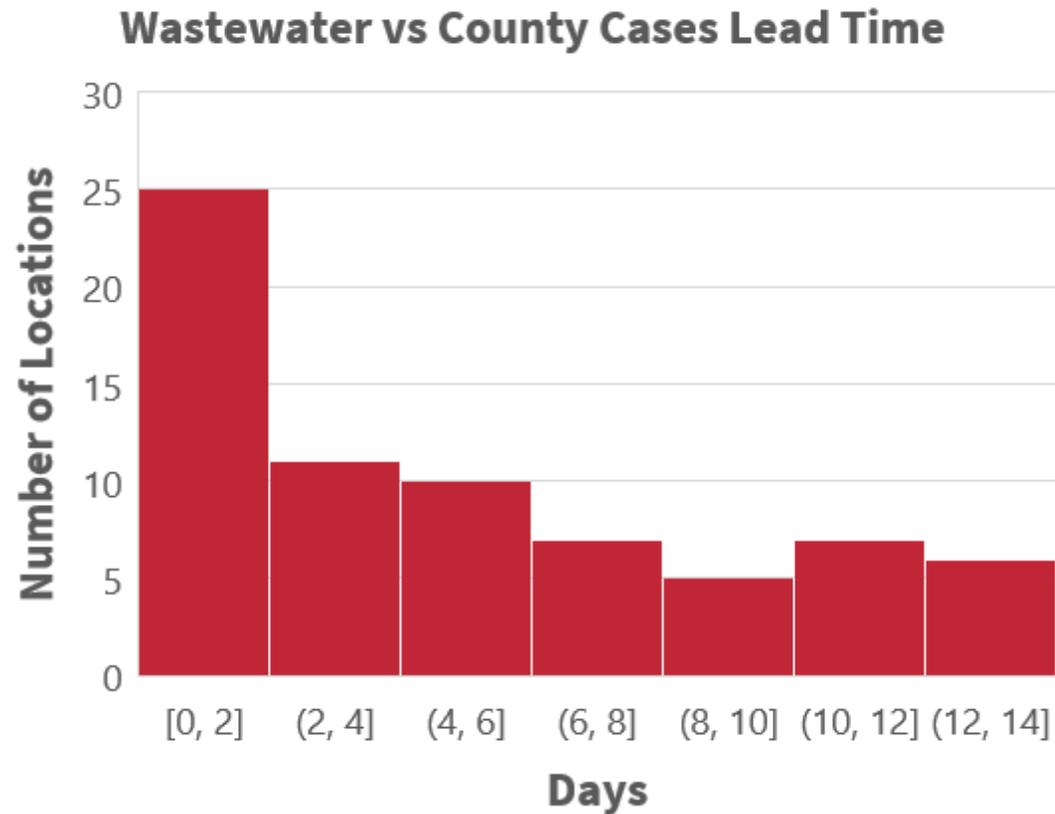


- Public health emergency ended 5/11/23

WASTEWATER CASE RATIO

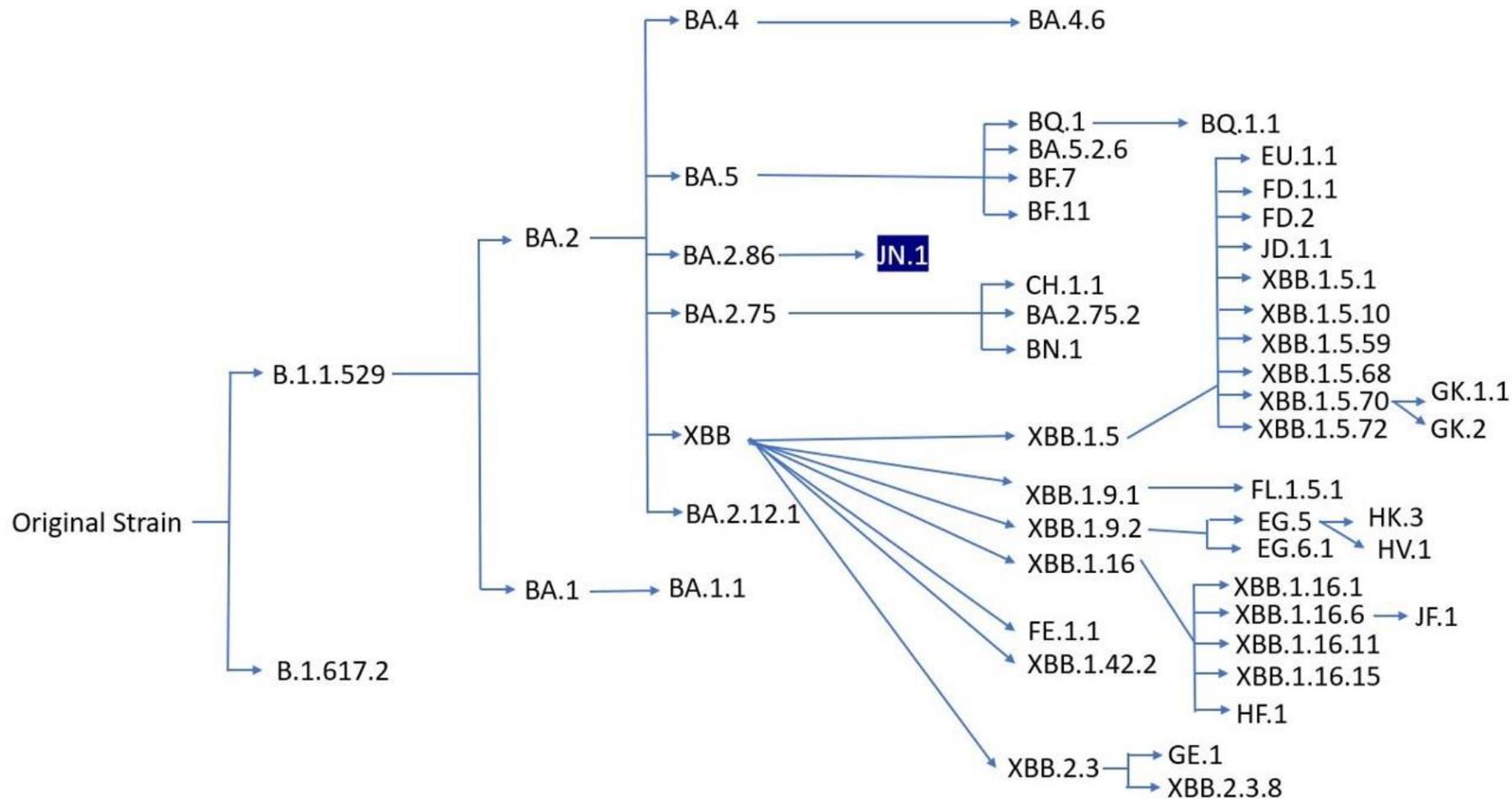


Wastewater SARS-CoV-2 and county cases



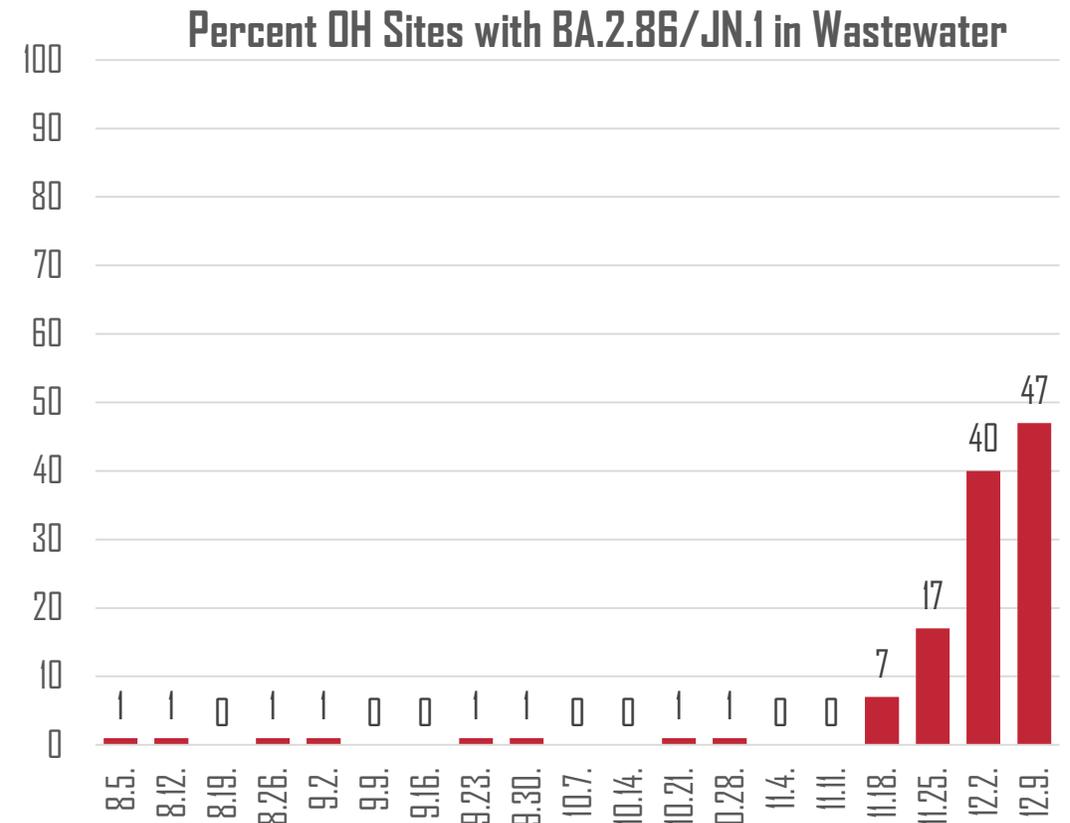
- All wastewater SARS-CoV-2 loads correlated with county cases (Sept 2022 – Aug 2023).
- The percent of the county population served by the WWTP did not affect the wastewater-case correlations.
- Median lead time was 4 days.

SARS-CoV-2 variants



SARS-CoV-2 wastewater variants BA.2.86/JN.1

- CDC considered BA.2.86 notable due to its large number of unique mutations.
- First OH detection Lorain Co. wastewater sample from 7.30. (CDC alert on 8/21/23).
- 8/25/23 - 1st case with BA.2.86 variant in Lorain co.
- Sporadic ww detections until 11/18/23.

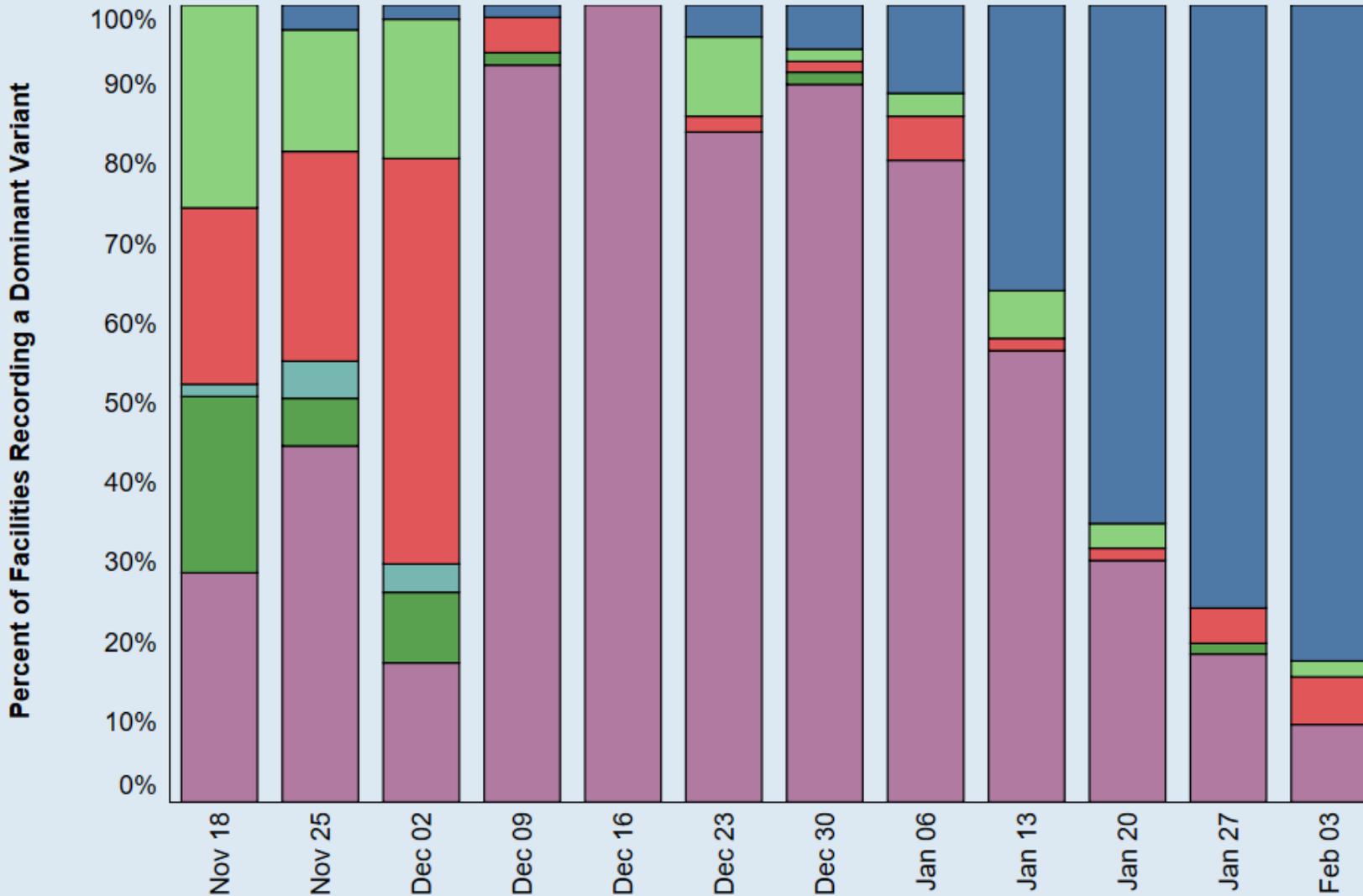


State of Ohio | COVID-19 Dominant Variants in Wastewater

Last Updated: 2/9/2024

Updated Thursdays

This dashboard calculates the highest proportion (i.e., dominant) variant at each wastewater facility with sufficient levels of SARS-CoV-2 to allow for successful sequencing in a given week. The figure shows the proportion of sites with dominant variants circulating in Ohio each week.



Top Lineages

Select weekly interval(s) with the slider tool below to filter table.

Collection Date for Week Ending

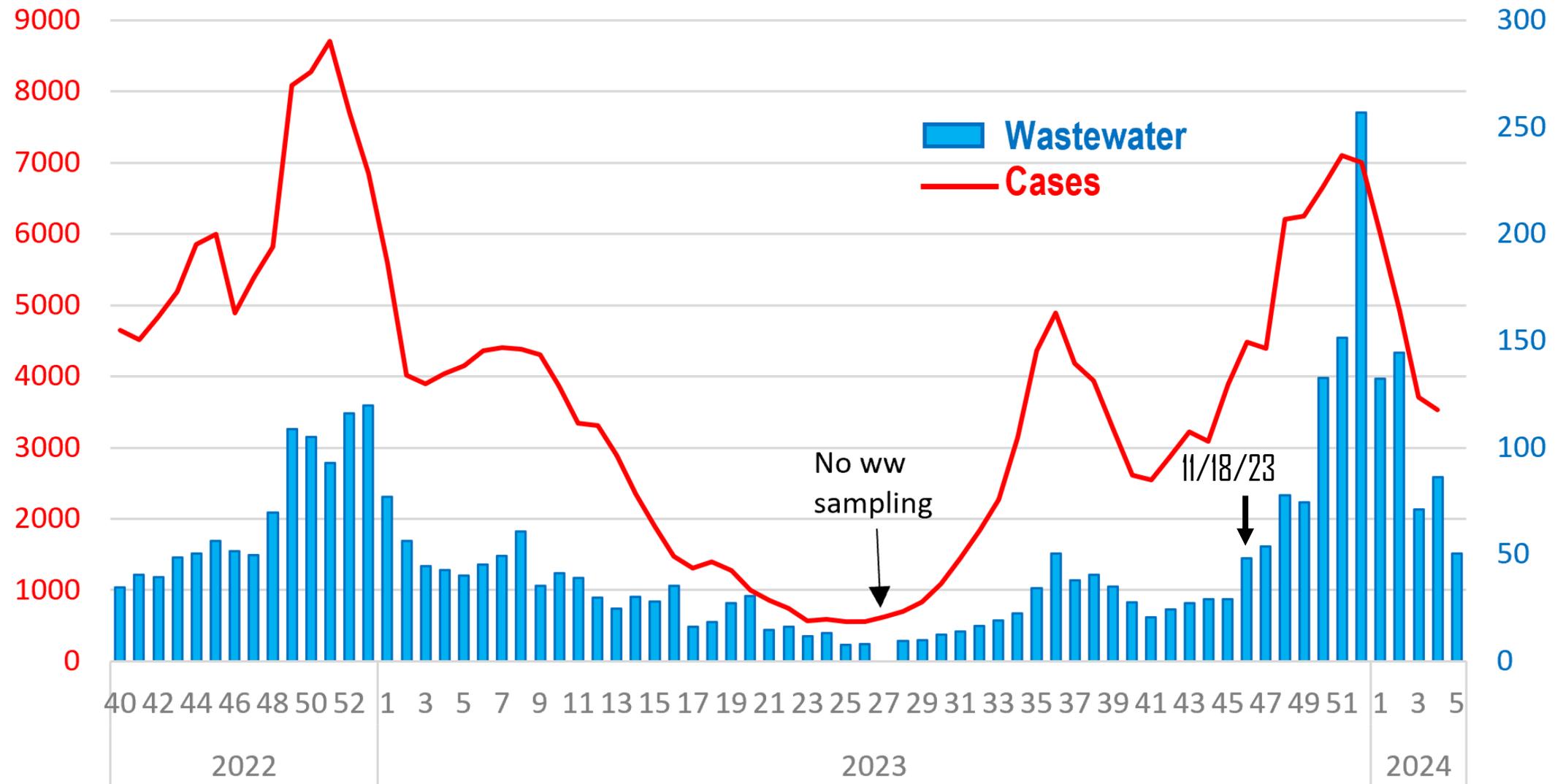
2/3/2024

Variant	% of Total	Color
BA.2.86/JN.1	82.35%	Blue
EG.5	1.96%	Green
HV.1	5.88%	Red
XBB.1*	9.80%	Purple

The average of COVID-19 **viral gene copies in wastewater** mirrors the number of **reported clinical cases**.

*wastewater reported in weekly average million gene copies/person/day

*cases reported in weekly sewersheds sum



SARS-CoV-2 wastewater monitoring summary



- Location specific data represent county trends.
- Prevalence in wastewater was higher this winter than last winter.



- 8 notifications of significant increases sent this season.
- Threshold reevaluation under way to adjust for post pandemic times.



- Resources not limited.

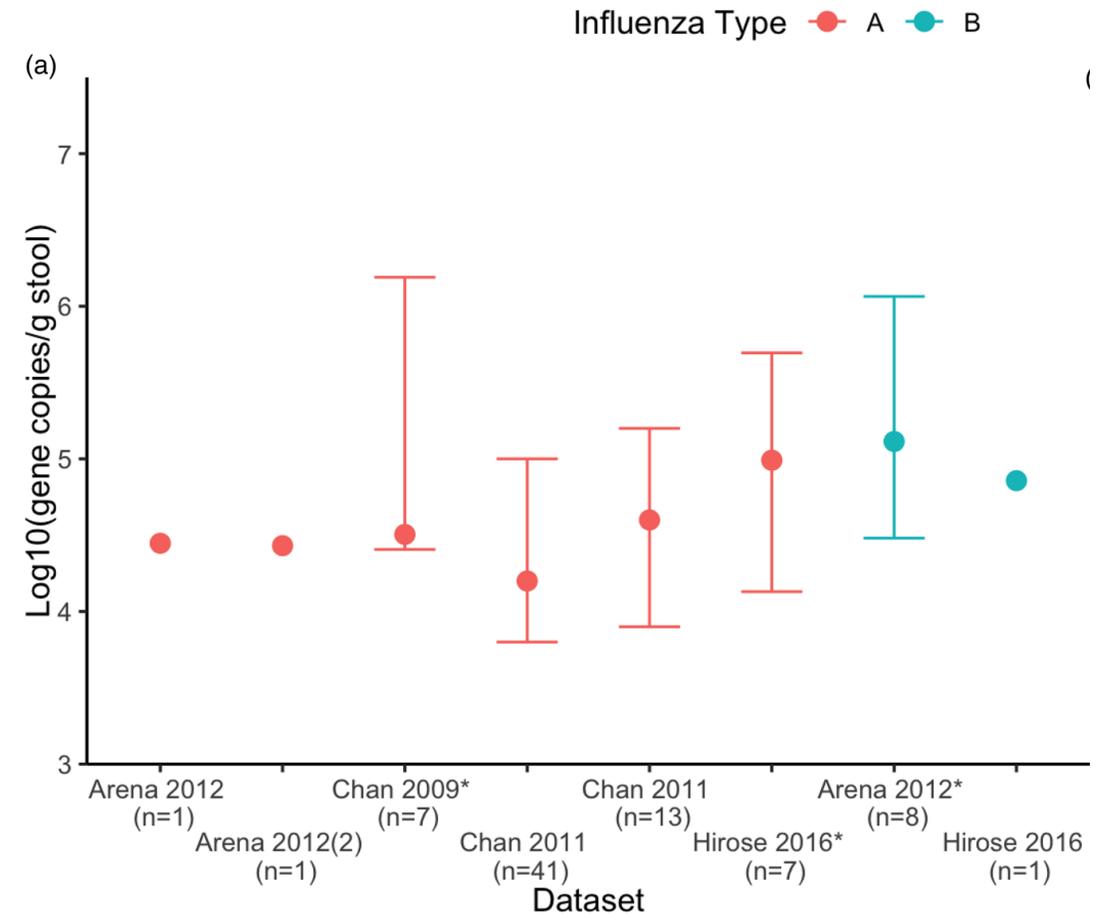
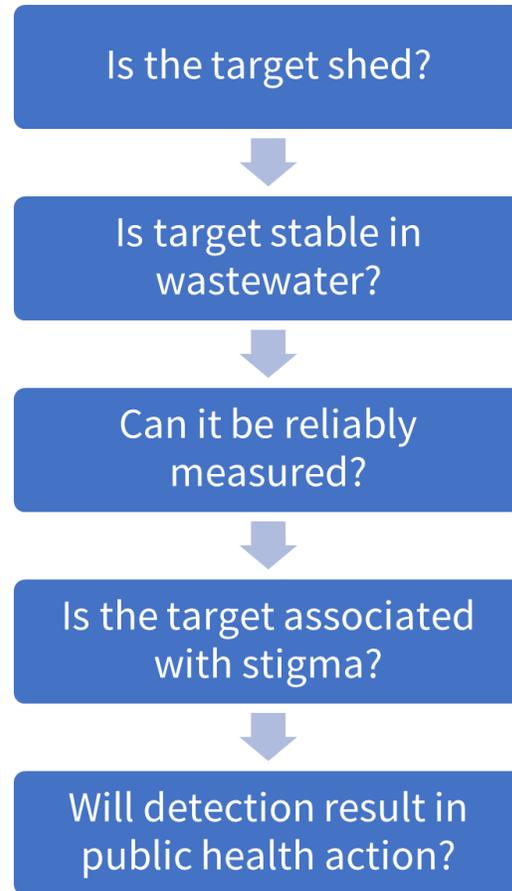


- Preventative action is determined by the local health district.
- Messaging is the most common action.

Wastewater Influenza virus monitoring

- October 2023 – January 2024

Onboarding new targets



Influenza wastewater monitoring goals

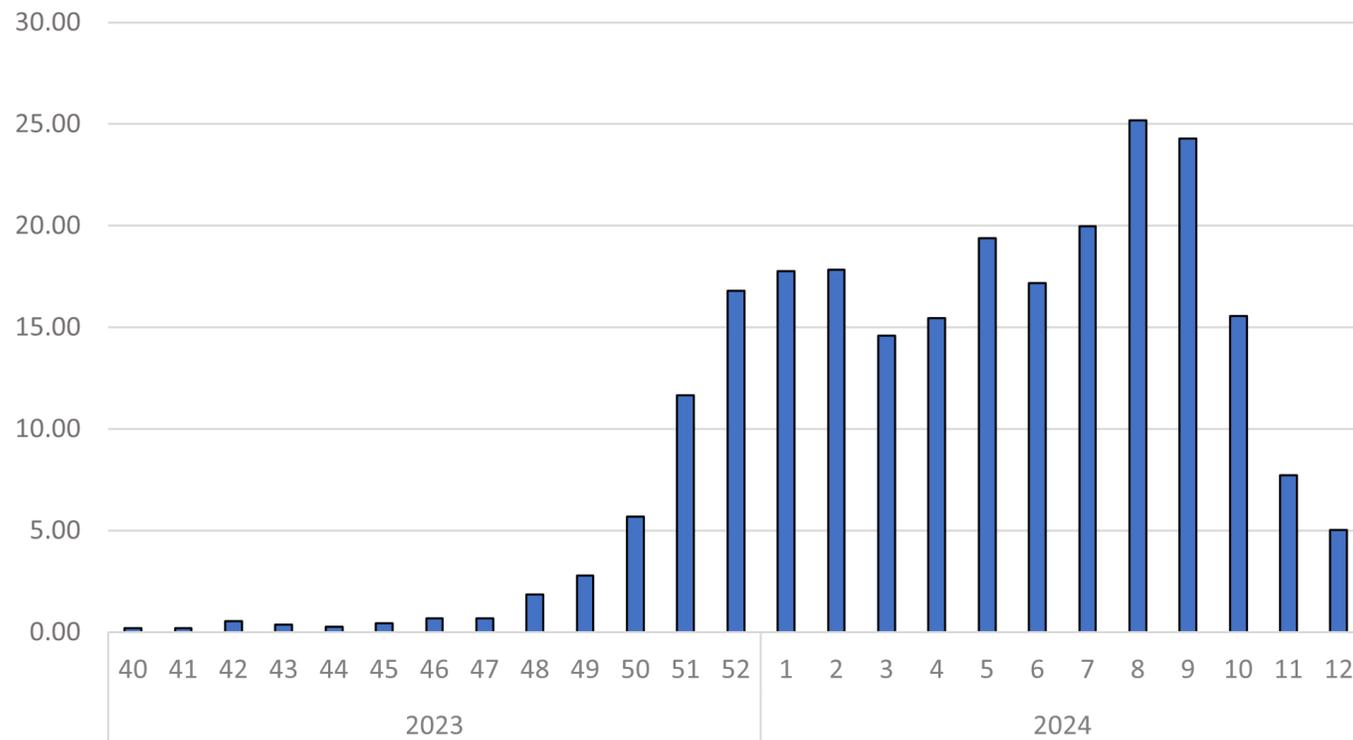
Wastewater monitoring complements current syndromic surveillance and in addition:

- Provides information on the circulation of influenza in communities by capturing unreported cases.
- Helps differentiate between COVID-19, influenza illness and other diseases with overlapping symptoms.
- Provides early indication of the beginning of flu season.

Wastewater influenza and clinical indicators

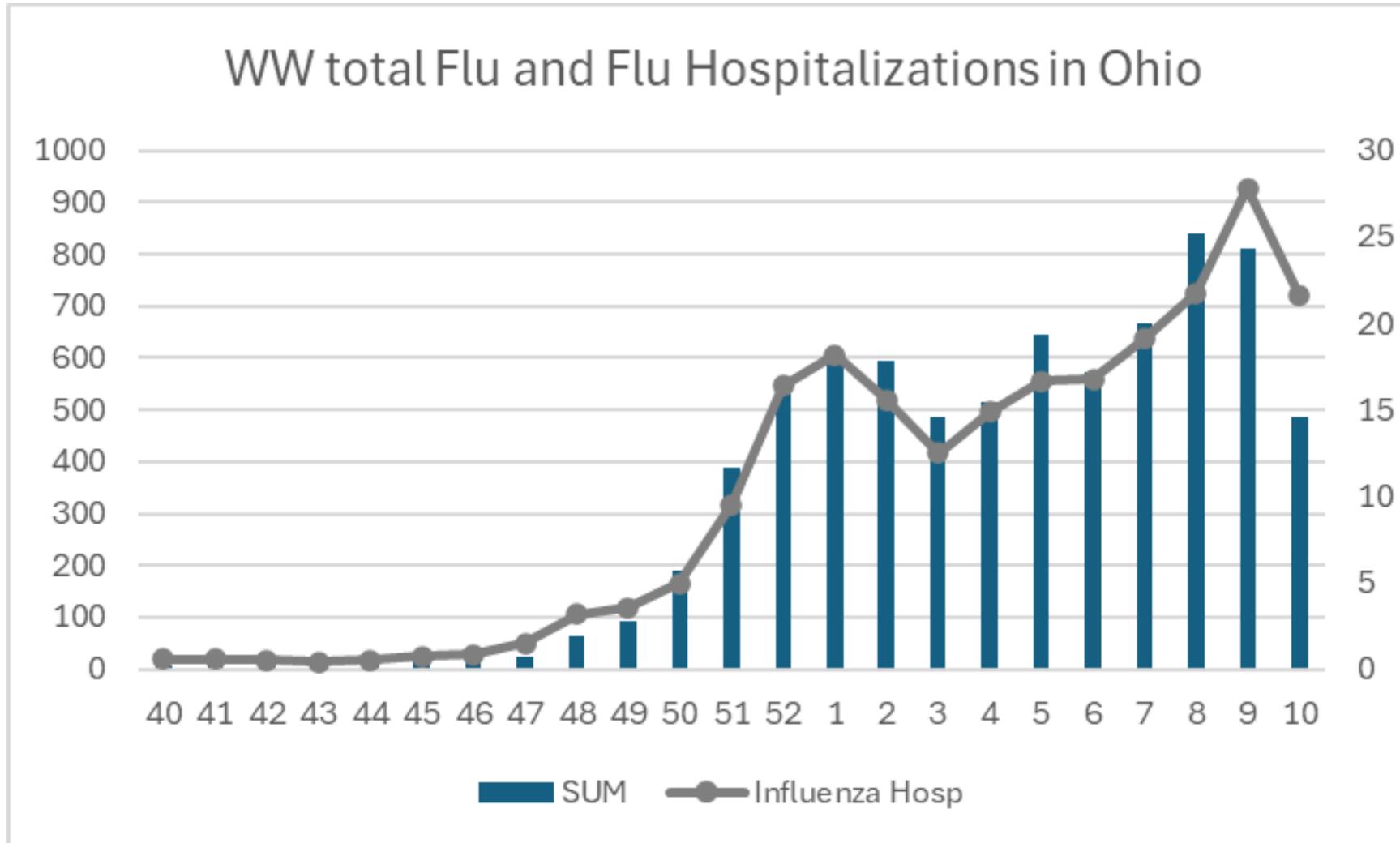
The average number of **Influenza A and B** viral gene copies detected in wastewater.

*wastewater reported in weekly average million gene copies/person/day



- Statewide trend significantly correlated with clinical indicators.
- Wastewater was leading indicator for influenza hospital counts and laboratory confirmed tests.

Wastewater influenza and Flu hospitalizations



Influenza wastewater outlook

After first influenza season, we will work to:

- Incorporate wastewater monitoring into the seasonal influenza activity report and/or other dashboards.
- Add RSV wastewater monitoring to further differentiate among diseases with overlapping symptoms.
- Evaluate influenza trends and develop threshold to provide early warning to communities.

Program website and dashboard

An official State of Ohio site. [Here's how you know](#) ▼

🌐 Language Translation



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MONITORING DATA



Ohio Wastewater Monitoring Network

Wastewater monitoring data are invaluable leading indicators of when infectious disease trends are increasing or decreasing in a community.

NEXT STEPS



Photo used with permission from OSU Dr. Hull lab.

- Address gaps in monitored areas and improve data quality.
- Evaluate additional monitoring targets prioritized by ODH and CDC.
- Evaluate current thresholds.

QUESTIONS?

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**Department of
Health**