



waterstudies.

CENTRE FOR WATER RESOURCES STUDIES | DALHOUSIE UNIVERSITY

# Wastewater Surveillance for Viruses

Partnership with AFNWA & CWRS

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# Land Acknowledgment

- *Dalhousie University is located in Mi'kma'ki, the ancestral and unceded territory of the Mi'kmaq. We are all Treaty people.*



# Waste Water Surveillance

## ⚙️ How it Works

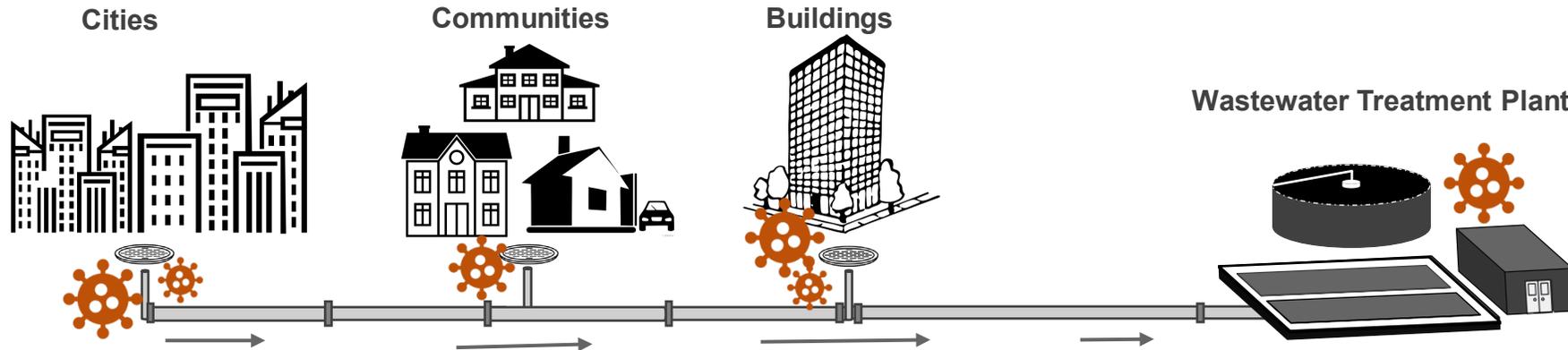
Symptomatic



Asymptomatic

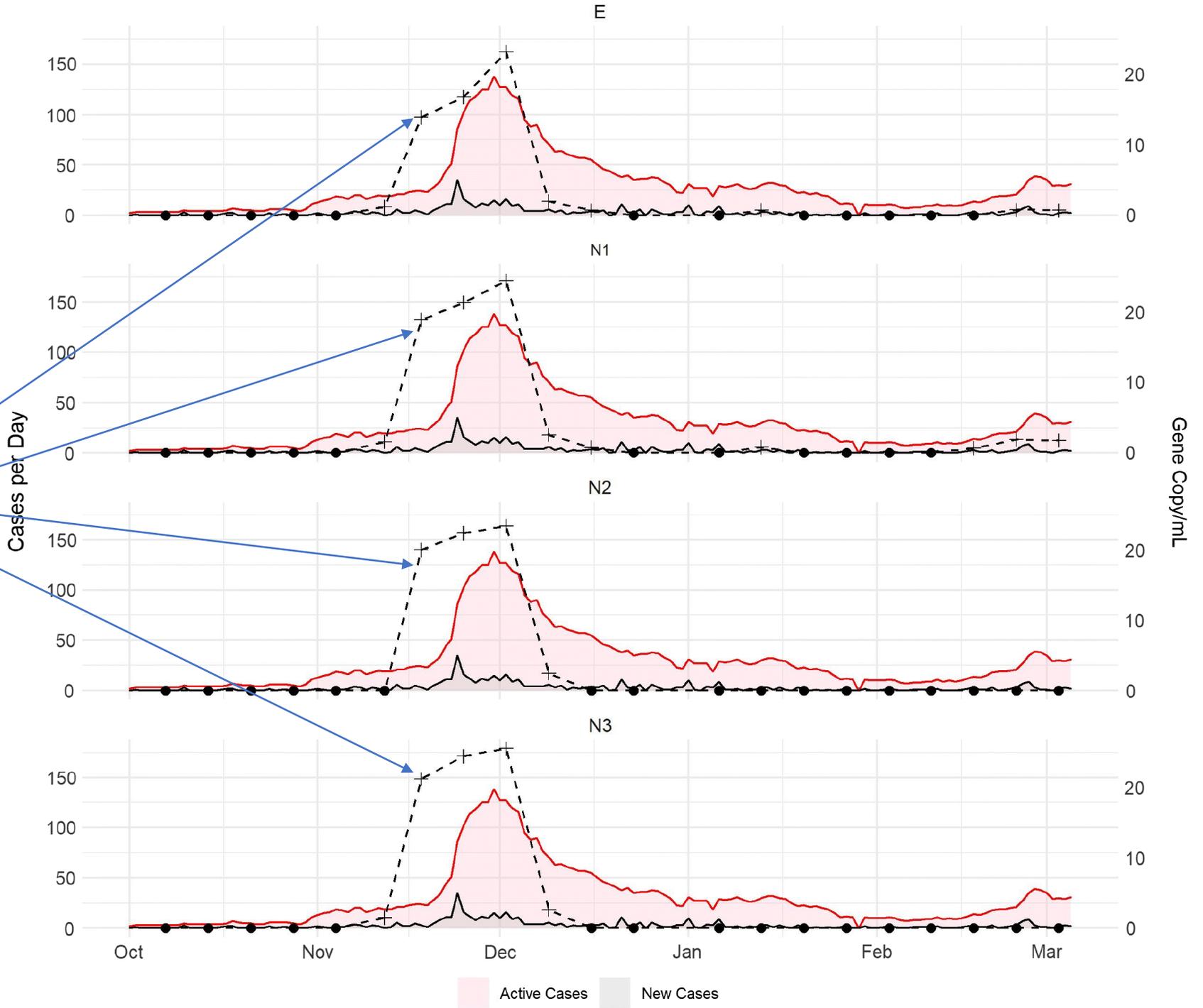


- **COVID-19 Infection**
- **Virus makes its way to the sewers**
  - Using the toilet
  - Hand washing
  - Brushing teeth
- **Captures all cases**
  - Doesn't require clinical testing
  - Anonymous
  - Community-level monitoring



# COVID-19 & Wastewater Surveillance

Gives you advanced warning of active cases



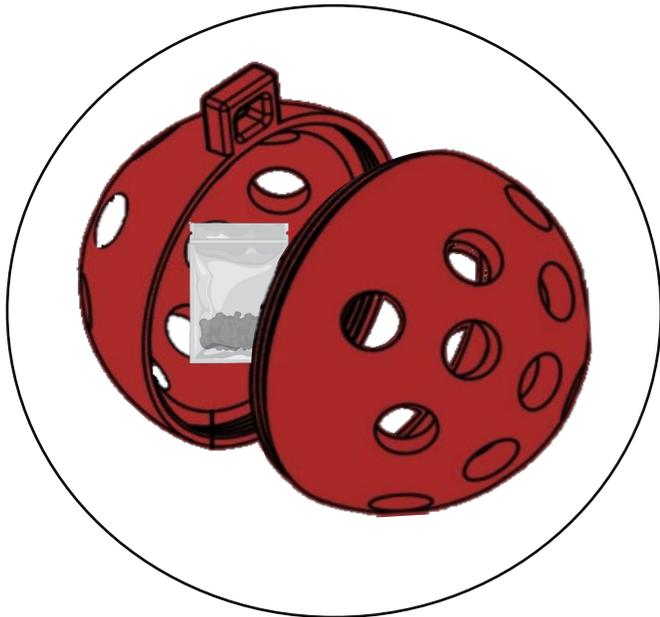
# Sampling Method

- Three common sampling methods

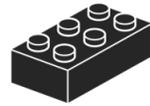


# Passive Sampler Design

- ❁ Protect adsorbent from fouling or being lost
- ❁ Safety during deployments



# Waste Water Surveillance



# Research Building Blocks



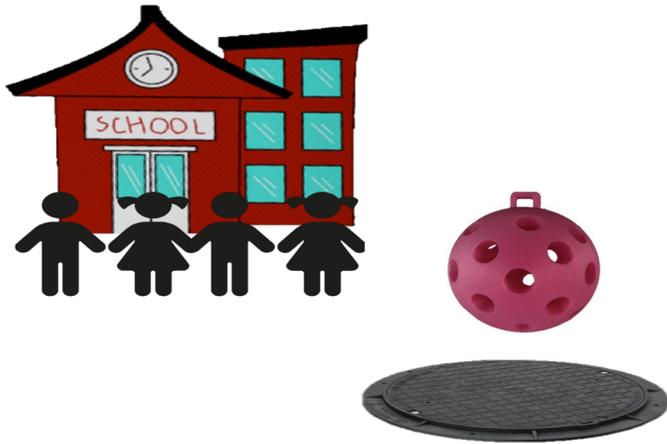
Dec 2020, few researchers were looking at passive samplers for WWS

- Dr. Moore implemented cotton gauze to detect pathogens in wastewater
- Passive samplers were being used to detect norovirus in seawater
- **Great opportunity** – cheap, safe & easy alternative to autosamplers

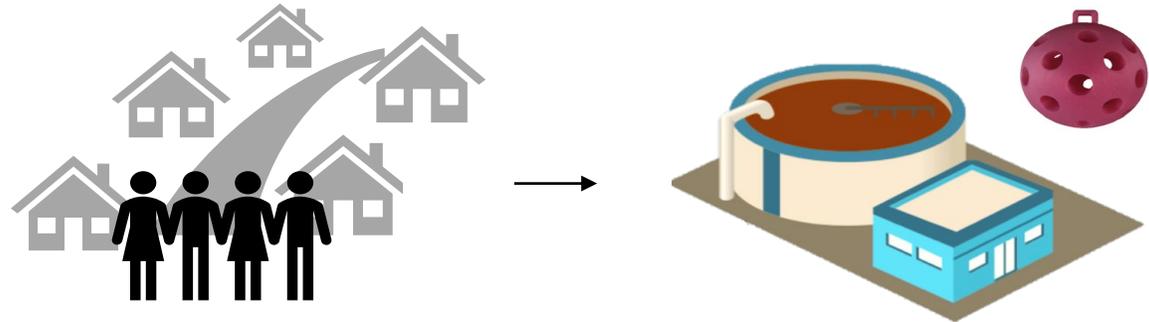
# AFNWA Community Wastewater Surveillance for SARS-CoV-2



Targeted location → school surveillance



Small WWTP → community surveillance



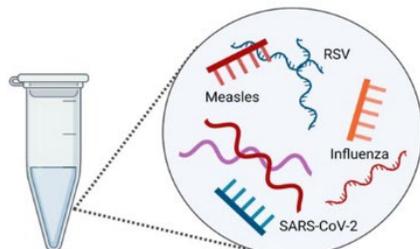
**Chief asked if we could monitor for other viral illnesses that impact a community – Influenza, RSV, Measles, etc.**

# Advanced detection of viruses from wastewater using **multiplex** RT-qPCR

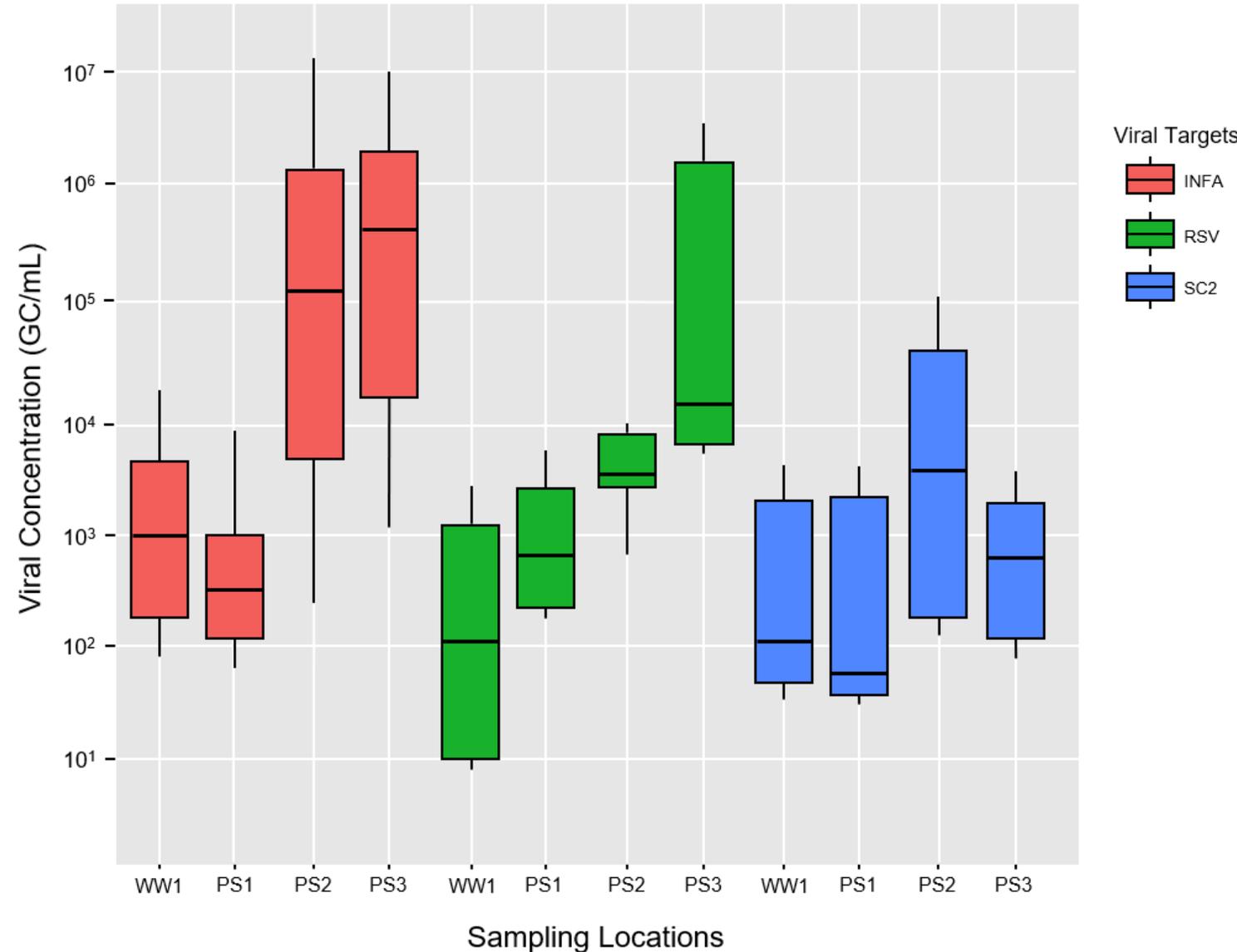
- Development of a multiplex analysis for simultaneous detection of SARS-CoV-2, Influenza, RSV & Measles



Samples collected from passive samplers



Pooled genetic material from wastewater



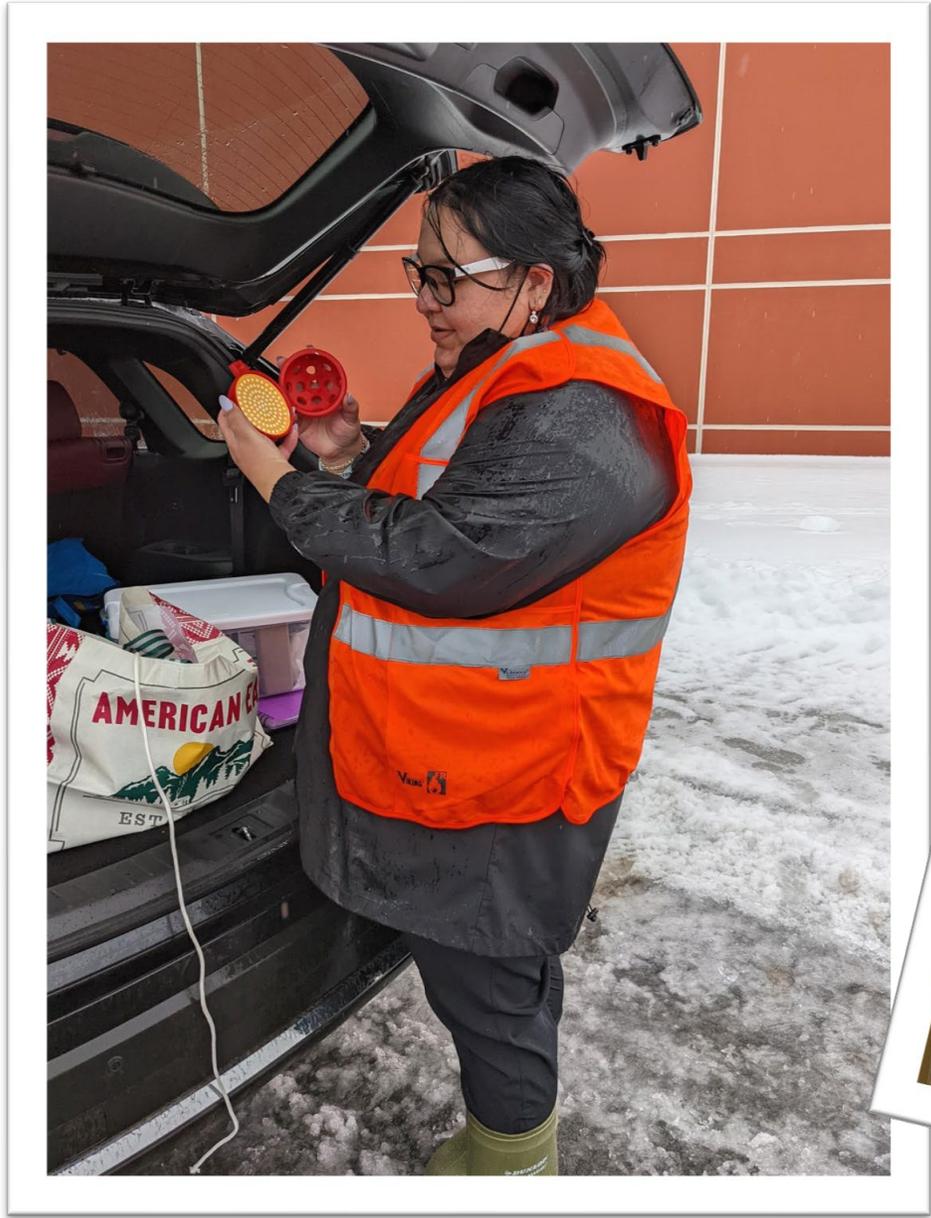
# Results from a 3-month period

Knowing these results may help guide public health actions.

Let parents know to keep kids home if they don't feel well during this flu season.

Have tests on hand if parents want to screen their kids when a positive sample is detected

Lift Station at the School				
Sampling Date	Influenza	SARS-COV-2	RSV	Measles
2022-11-17	Positive	Negative	Positive	Negative
2022-11-23	Positive	Positive	Positive	Negative
2022-12-01	Positive	Negative	Negative	Negative
2022-12-07	Negative	Positive	Negative	Negative
2022-12-19	Positive	Positive	Negative	Negative
2023-01-04	Negative	Negative	Negative	Negative
2023-01-11	Negative	Negative	Negative	Negative
2023-01-25	Negative	Negative	Negative	Negative
2023-02-01	Negative	Negative	Negative	Negative
2023-02-08	Negative	Negative	Negative	Negative
2023-02-25	Negative	Positive	Negative	Negative



Wela'lin!

Woliwon!

Questions ?

