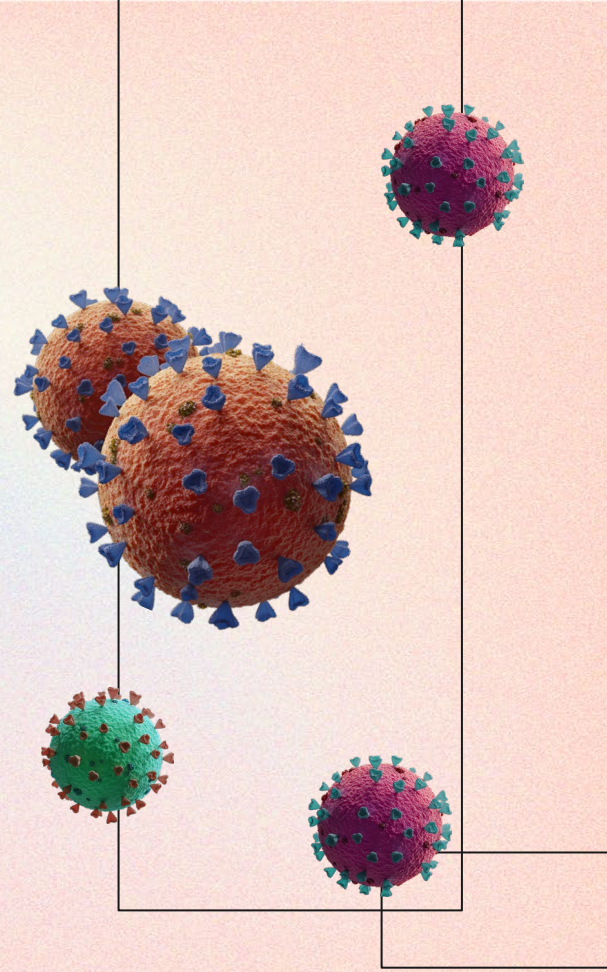


---

# Feasibility and Functionality of SARS-CoV-2 Rapid Testing in K-12 School Health Offices

A pilot surveillance initiative in the Oregon School District (WI)

---





# TABLE OF CONTENTS

**01**

## **Project History**

Research in the Oregon School District and surrounding areas

**03**

## **Results**

RADT testing data and school health staff assessment

**02**

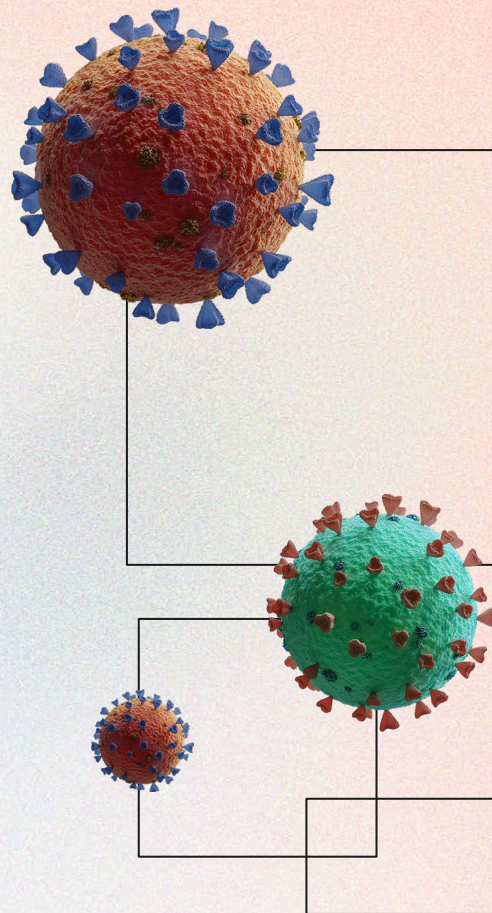
## **Implementation**

Training, in-school setup and trouble-shooting

**04**

## **Lessons learned**

Implications for the continuation of in-school testing

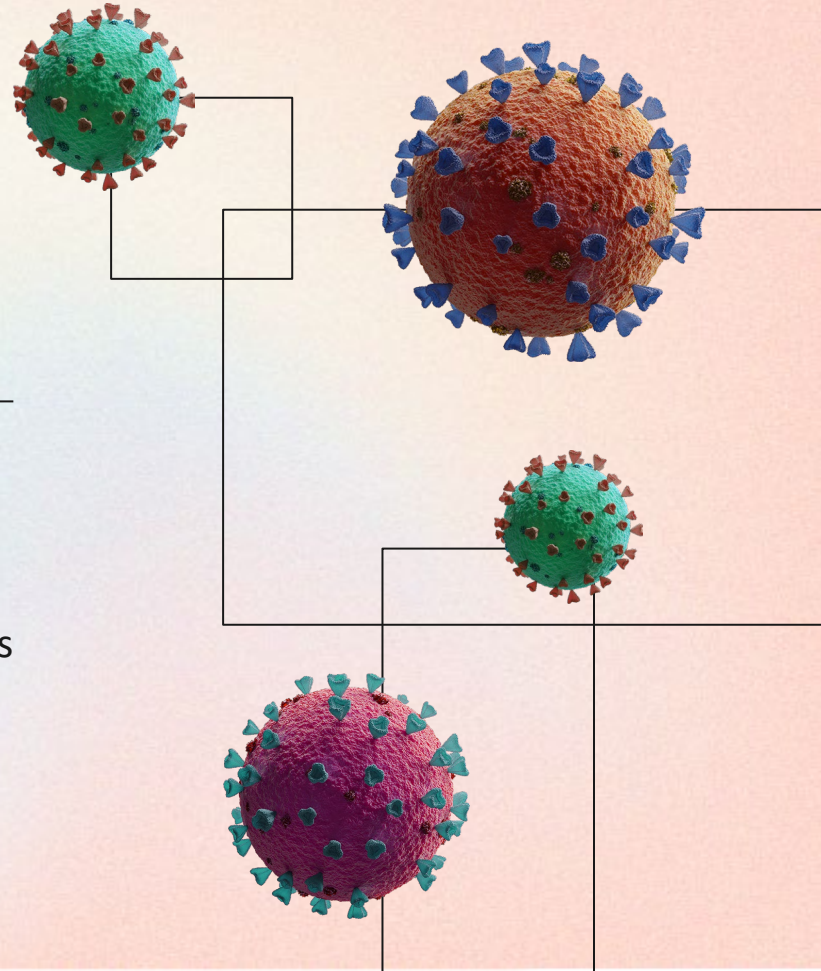


# 01

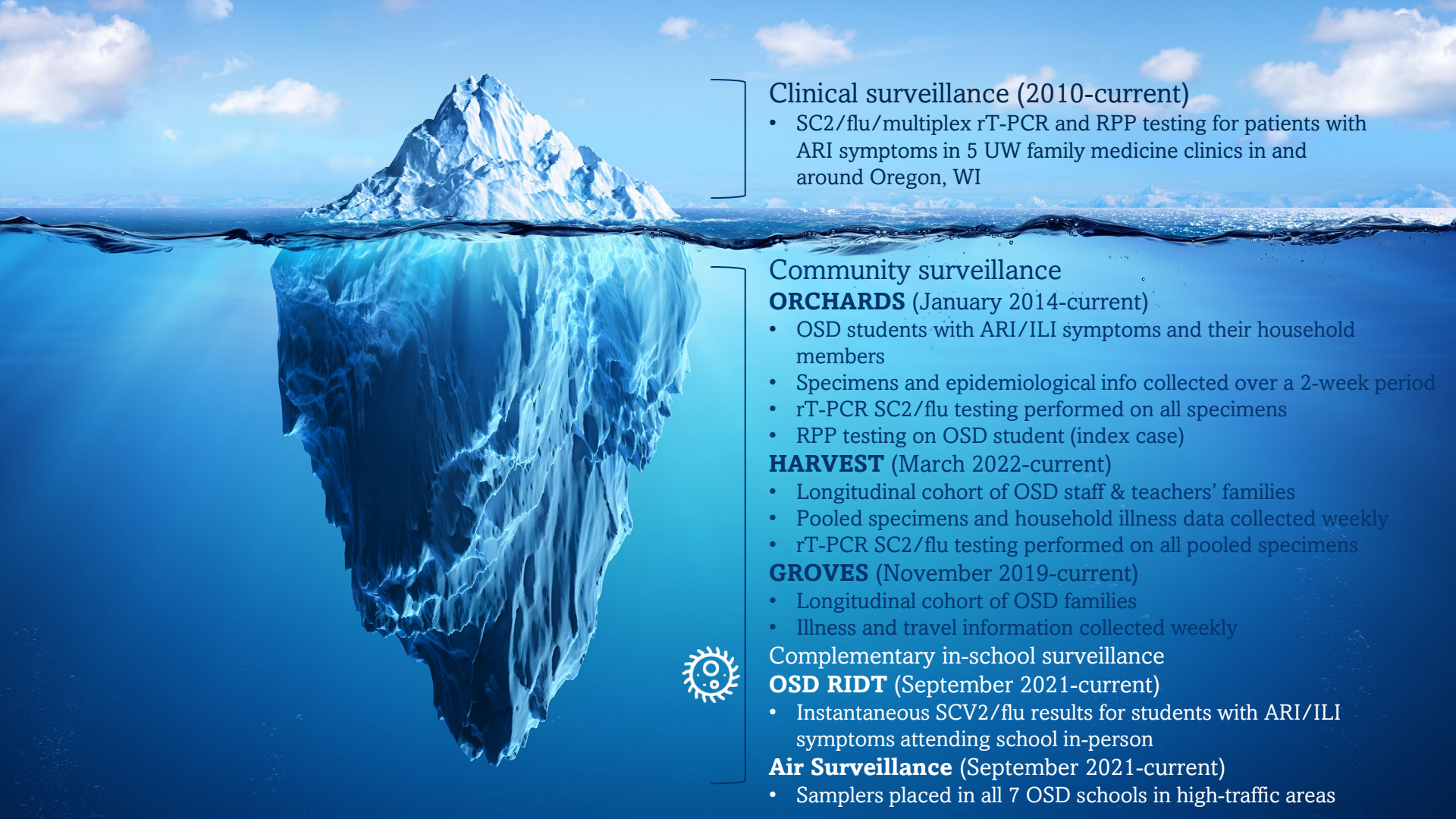
---

## Project history

An introduction to our surveillance research in the Oregon School District and surrounding communities







### Clinical surveillance (2010-current)

- SC2/flu/multiplex rT-PCR and RPP testing for patients with ARI symptoms in 5 UW family medicine clinics in and around Oregon, WI

### Community surveillance

#### **ORCHARDS** (January 2014-current)

- OSD students with ARI/ILI symptoms and their household members
- Specimens and epidemiological info collected over a 2-week period
- rT-PCR SC2/flu testing performed on all specimens
- RPP testing on OSD student (index case)

#### **HARVEST** (March 2022-current)

- Longitudinal cohort of OSD staff & teachers' families
- Pooled specimens and household illness data collected weekly
- rT-PCR SC2/flu testing performed on all pooled specimens

#### **GROVES** (November 2019-current)

- Longitudinal cohort of OSD families
- Illness and travel information collected weekly

### Complementary in-school surveillance

#### **OSD RIDT** (September 2021-current)

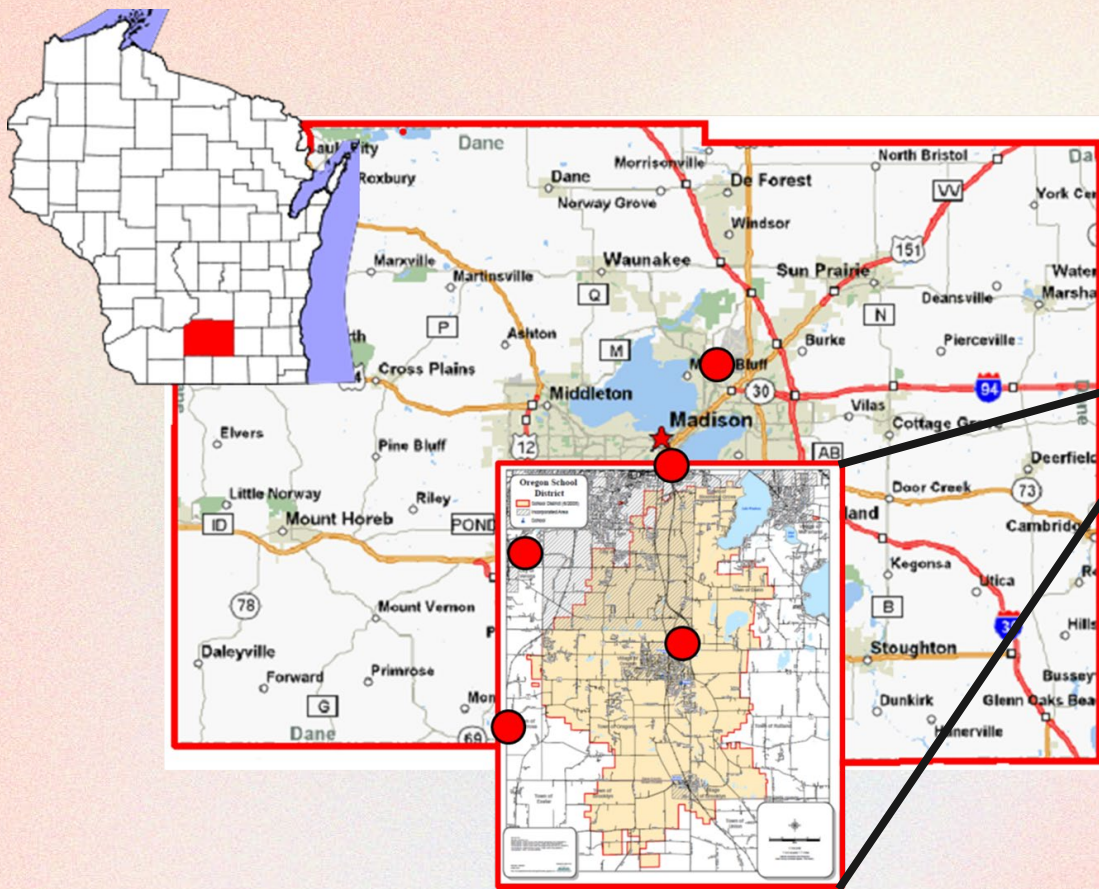
- Instantaneous SCV2/flu results for students with ARI/ILI symptoms attending school in-person

#### **Air Surveillance** (September 2021-current)

- Samplers placed in all 7 OSD schools in high-traffic areas







## Oregon School District

● = Surveillance Clinic

# ORCHARDS

**(ORegon CHild Absenteeism due to Respiratory Disease Study)**  
*(2014-present)*

- ❖ Flagship study in Oregon, WI established in 2014
- ❖ Oregon School District composed of 3 elementary, 1 combined elementary-intermediate, 1 intermediate, 1 middle, and 1 high school
- ❖ Enrollment ~ 4,000 K-12 children
- ❖ 438 families enrolled during the 2021-2022 school year
- ❖ Tracking general and cause-specific absenteeism since September 2014
- ❖ Students with 2+ respiratory symptoms invited to participate
- ❖ Households of ill students added to testing in September 2016
- ❖ 24,000+ specimens collected over 9 influenza seasons

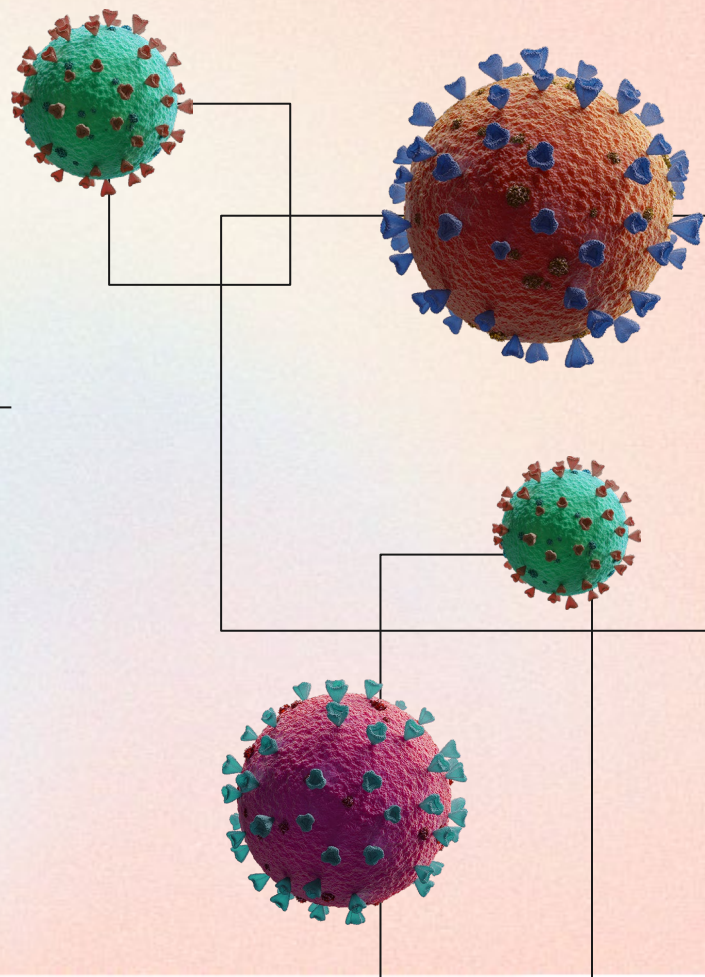


# 02

---

## Implementation

Instrument training, equipment setup and  
systematic data collection



# Joint Venture

- ❖ Our research team: *facilitation*
- ❖ QuidelOrtho Corporation: *in-kind contribution*
  - SOFIA 2 FIA analyzers (7)
  - Flu + SARS antigen FIA test kits
  - myVirena platform use
- ❖ Oregon School District: *participation by school health staff*
- ❖ Wisconsin Department of Health Services: *COVID-connect and funded rT-PCR testing of rapid negative specimens*
- ❖ Vendor – Fitchburg Pharmacy: *rapid negative pcr testing*



# Training & equipment setup

- ❖ **Sofia 2 Fluorescent Immunoassay Analyzers** placed in the health offices of all 7 Oregon School District schools
- ❖ Sofia 2 Flu + SARS Antigen FIA test kits provided to OSD schools
- ❖ Two researchers from our team conducted trainings for health office staff in August 2021 prior to the Fall semester

*Trainings included:*

-  *Demonstration and instructions for Sofia 2 FIA testing*
-  *Assistance setting up COVID-Connect reporting*
-  *Selection of symptomatic students/staff*
- ❖ Results reported in near real-time to the myVirena platform via cloud technology
- ❖ Negative RADT specimens sent to local laboratory for confirmatory rT-PCR testing



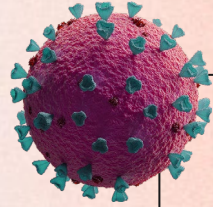


## Participant selection and testing

- ❖ Parents/guardians of OSD students had the option to consent their children for testing at the beginning of the school year
- ❖ Students and staff were eligible for testing if they had at least two of the following symptoms:  
*fever, chills, cough, shortness of breath/difficulty breathing, fatigue, muscle or body aches, headache, new loss of taste or smell, sore throat, nasal congestion or runny nose, nausea or vomiting, and diarrhea*
- ❖ Testing process took about 20 minutes  
*3 minutes to register in COVID-Connect*  
*1-2 minutes to swab*  
*15 minutes to run the test*
- ❖ 13 health office staff (4 nurses, 9 health aides)



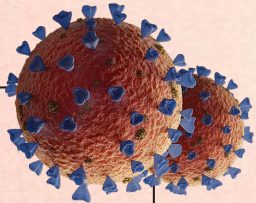
# IN-SCHOOL TESTING TIMELINE



## Symptomatic student/staff is identified



2+ respiratory symptoms, consented for testing and willing to be swabbed



## Participant is swabbed and registered in COVID-Connect



School health staff enter demographic/symptom information into COVID-Connect and collect a nasal swab

## Flu + SARS RADT performed



Health staff prepare specimen for testing using Sofia 2 FIA analyzer. If negative second swab collected for pcr testing

[15 minutes]

## Results available



RADT results are shared with participant and family if <18yo, sent virtually to myVirena

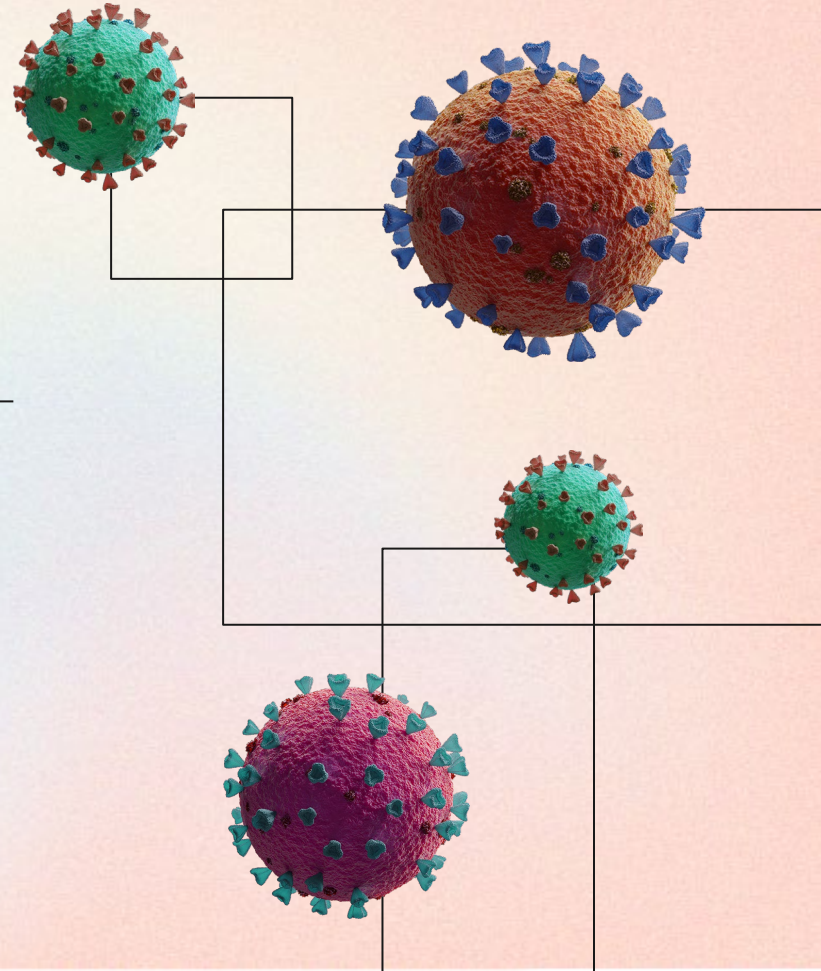


# 03

---

## Results

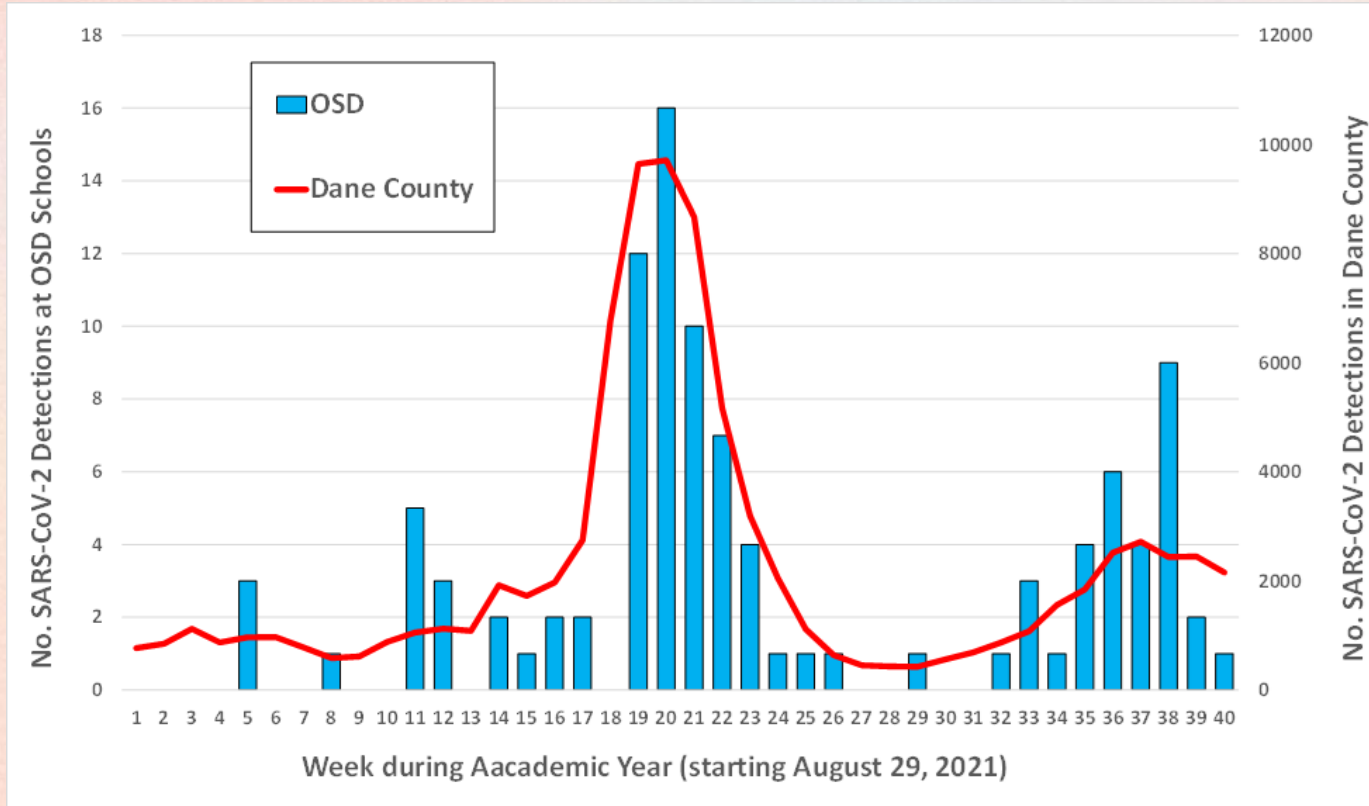
Qualitative & quantitative





# Testing data

- ❖ 1,226 rapid antigen diagnostic tests (RADTs) run during the 2021-2022 school year
  - 103** specimens positive for SARS-CoV-2
  - 35** specimens positive for Flu A, **20** positive for Flu B
  - 6** specimens tested positive for both SARS-CoV-2 and Flu A
  - 6** (0.5%) specimens yielded invalid results
- ❖ Participants included 940 OSD students (77%) & 286 OSD staff members (23%)  
Average tested student **10.9 years** (SD  $\pm$  3.8 years)
- ❖ Percent positivity for OSD testing mirrored county levels (8.4 vs 9.2%, resp.)



Number of SARS-CoV-2 detections per week within K-12 schools of the Oregon School District (**OSD: blue bars**) and in Dane County, Wisconsin (**red line**) from August 29, 2021, through June 4, 2022

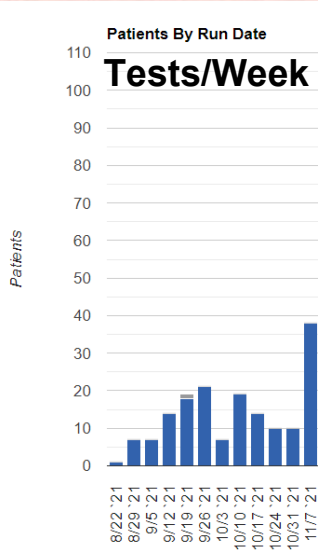


| OSD lag/lead | Spearman's Correlation   |                  | Generalized additive model results for the OSD count relationship with Dane County count, after accounting for the estimated time-form |      |                  |
|--------------|--------------------------|------------------|----------------------------------------------------------------------------------------------------------------------------------------|------|------------------|
|              | Estimated Spearman's rho | p-value          | Estimate                                                                                                                               | SE   | P=value          |
| 2-week lag   | 0.55                     | <0.001           | -66.2                                                                                                                                  | 61.2 | 0.289            |
| 1-week lag   | 0.66                     | <0.001           | 96.8                                                                                                                                   | 59.5 | 0.115            |
| None         | <b>0.69</b>              | <b>&lt;0.001</b> | <b>247.5</b>                                                                                                                           | 49.6 | <b>&lt;0.001</b> |
| 1-week lead  | 0.63                     | <0.001           | <b>280.6</b>                                                                                                                           | 45.8 | <b>&lt;0.001</b> |
| 2-week lead  | 0.57                     | <0.001           | 92.0                                                                                                                                   | 66.2 | 0.176            |

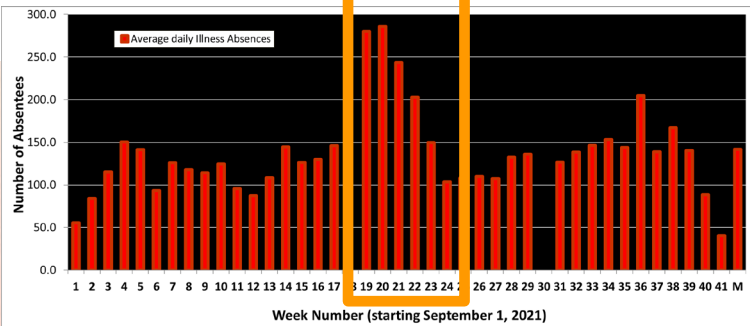
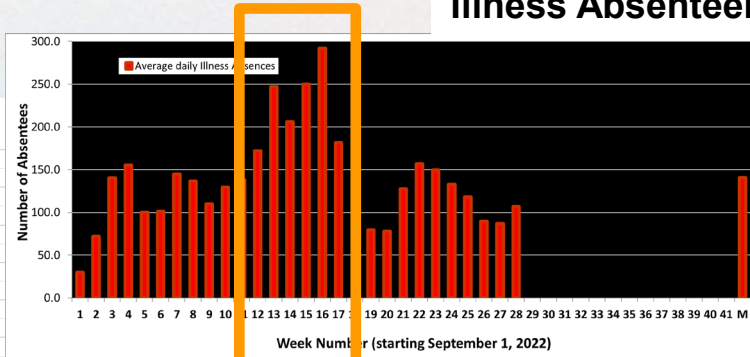
- ❖ Cross-correlation between Dane County and OSD weekly positive tests was maximal with no lag ( $r_s = 0.69$ ,  $P < 0.001$ )
- ❖ GAM analyses showed 1-week lead & no lag models has significant positive associations ( $P < 0.001$ )

September 2021 to Present

Omicron Surge



Illness Absenteeism



Influenza

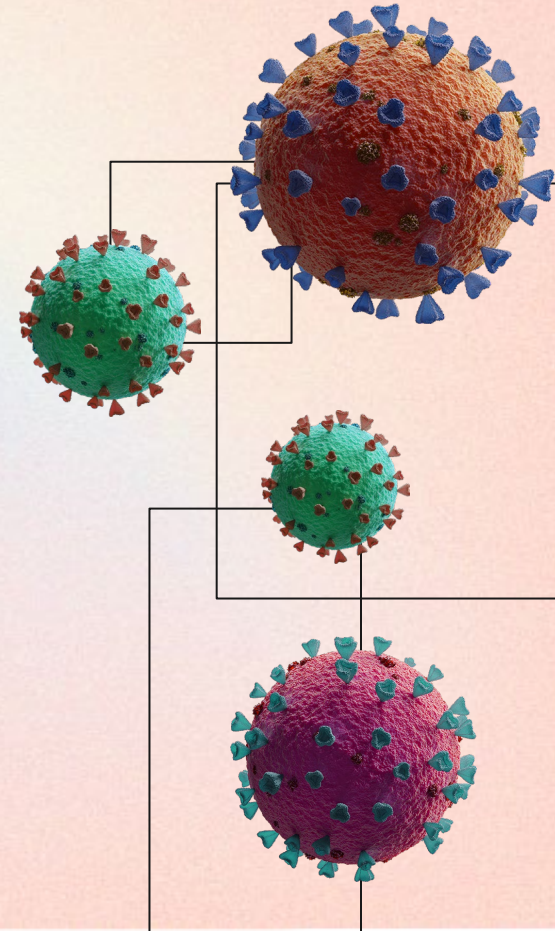
Illness Absenteeism



## Feasibility Assessment: School Health Staff Survey Results

|                                                                | Sofia® rapid testing* | PCR testing* | COVID Connect* |
|----------------------------------------------------------------|-----------------------|--------------|----------------|
| How easy was this resource to use?                             | 4.62                  | ---          | 3.46           |
| How easy was it to collect a nasal swab for this test?         | 4.77                  | 4.45         | ---            |
| Would you like to utilize this resource next year?             | 12/13                 | 11/13        | 12/13          |
| How helpful was in-person training?                            | 4.83                  | 4.58         | 4.67           |
| How confident were you in the accuracy of these results?       | 4.23                  | 4.92         | ---            |
| How useful was this resource for detecting cases of COVID-19?  | 4.54                  | 4.85         | ---            |
| How useful was this resource for detecting cases of Influenza? | 4.46                  | ---          | ---            |
| How easy was it to select students and staff for testing?      | 3.83                  | ---          | ---            |

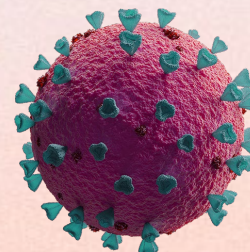
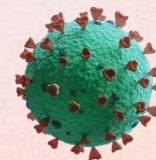
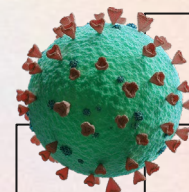
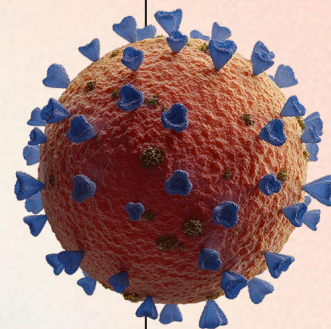
\*Ratings reported on a Likert scale from 1 (very difficult, not at all helpful, not at all useful, or not at all confident) to 5 (very easy, very helpful, very useful, or very confident)



## Functionality Assessment: School Health Staff Survey Results

|                                           | Before training | After training | Mean change | p value      |
|-------------------------------------------|-----------------|----------------|-------------|--------------|
| How confident are you in your ability to: |                 |                |             |              |
| Identify COVID-like symptoms              | 3.85            | 4.46           | +0.62       | 0.054        |
| Register a student in COVID Connect       | 1.54            | 4.46           | +2.92       | <b>0.001</b> |
| Collect a nasal swab                      | 3.54            | 4.77           | +1.23       | <b>0.008</b> |
| Perform a Sofia® rapid test               | 1.69            | 4.69           | +3.00       | <b>0.002</b> |
| Report test results to parent             | 3.38            | 4.69           | +1.31       | <b>0.014</b> |

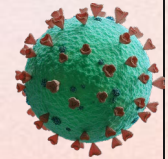
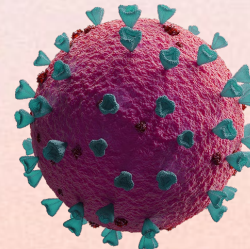
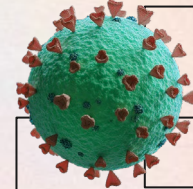
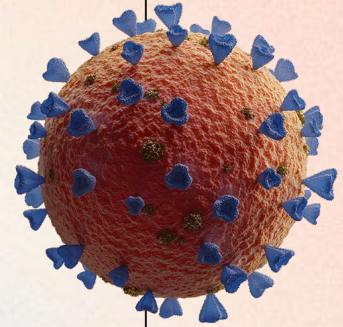
Ratings were reported on a Likert scale (1 = not at all confident, 2 = slightly confident, 3 = somewhat confident, 4 = fairly confident, 5 = very confident).





# Troubleshooting: Common issues

- Uncertainty about returning to school
- Fear of getting covid from specimens
- Health office staff already very overworked
- Unfamiliar with Sofia
- Covid Connect (state reporting system) difficulties
- Figuring out how to work with vendor

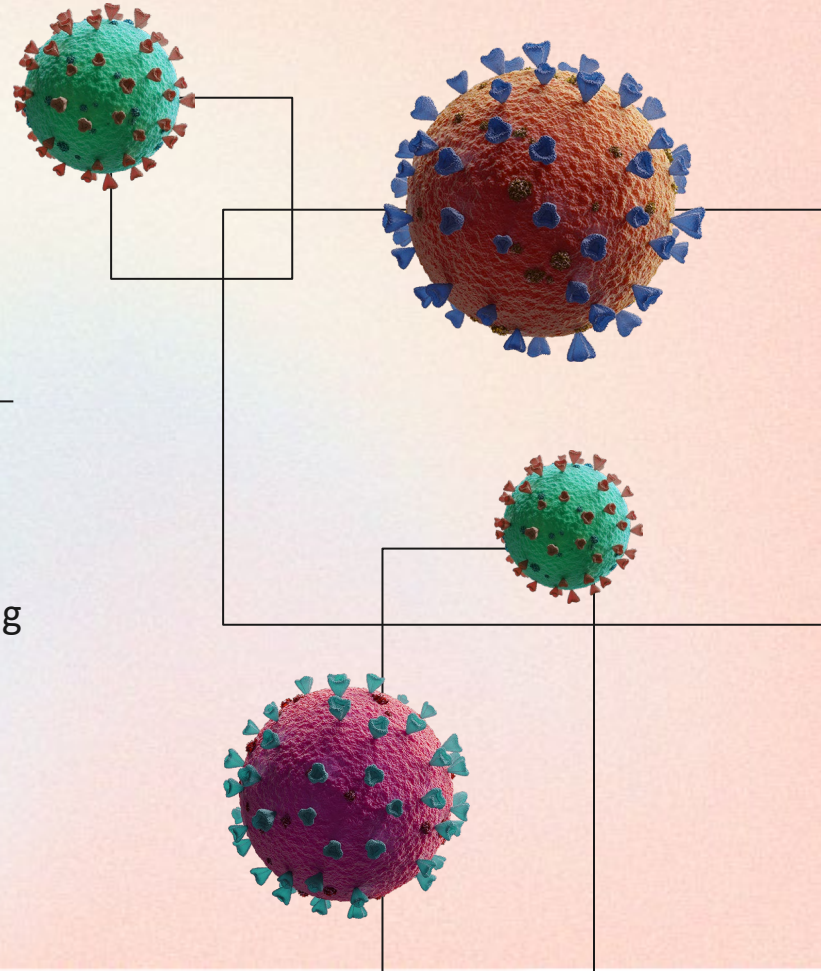


# 04

---

## Lessons learned

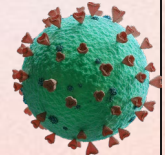
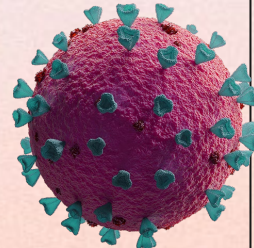
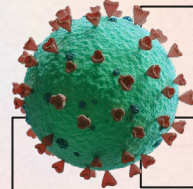
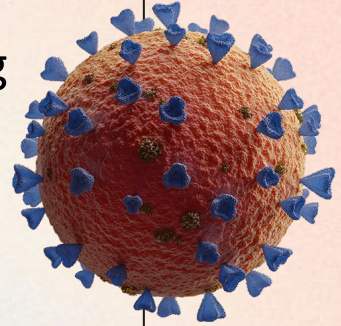
Implications for the continuation of in-school testing





# Lessons learned

- ❖ School health offices will readily use rapid antigen testing
- ❖ Rapid tests were relatively easy to perform
- ❖ Reporting into state system was cumbersome
- ❖ Good utilization across the age range and across schools
- ❖ High acceptability from health office staff
- ❖ Low rate of invalid tests (<1%)
- ❖ Moderate levels of SARS-CoV-2 detected (8.4%)
- ❖ Good Comparability with county-wide testing
- ❖ Parents appreciated the convenience and no cost



---

# Acknowledgements

## Temte research team

- ☐ Jonathan Temte, principal investigator
- ☐ Shari Barlow
- ☐ Cristalyne Bell
- ☐ Emily Temte
- ☐ Carly Hamer
- ☐ Cecilia He
- ☐ Kelly Johnson
- ☐ Alea Sabry
- ☐ Sarah Walters
- ☐ Maureen Goss

## OSD Health Office Staff

- ☐ Rebecca McCabe

## WI Dept. of Health Services

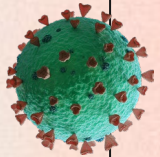
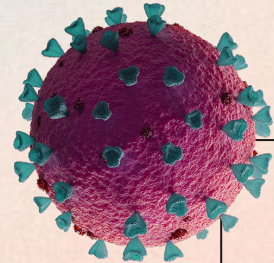
- ☐ Alicia Boehme
- ☐ Claire Evers

## Fitchburg Pharmacy

- ☐ Thad Schumacher

## QuidelOrtho

- ☐ John Tamerius
- ☐ Sush Reddy





---

# Thank you!

Questions?

Shari Barlow, Program Manager  
*[Shari.Barlow@fammed.wisc.edu](mailto:Shari.Barlow@fammed.wisc.edu)*

---

