

NH Outreach Practices during COVID-19 Response

Christine Bean, APHL CLO

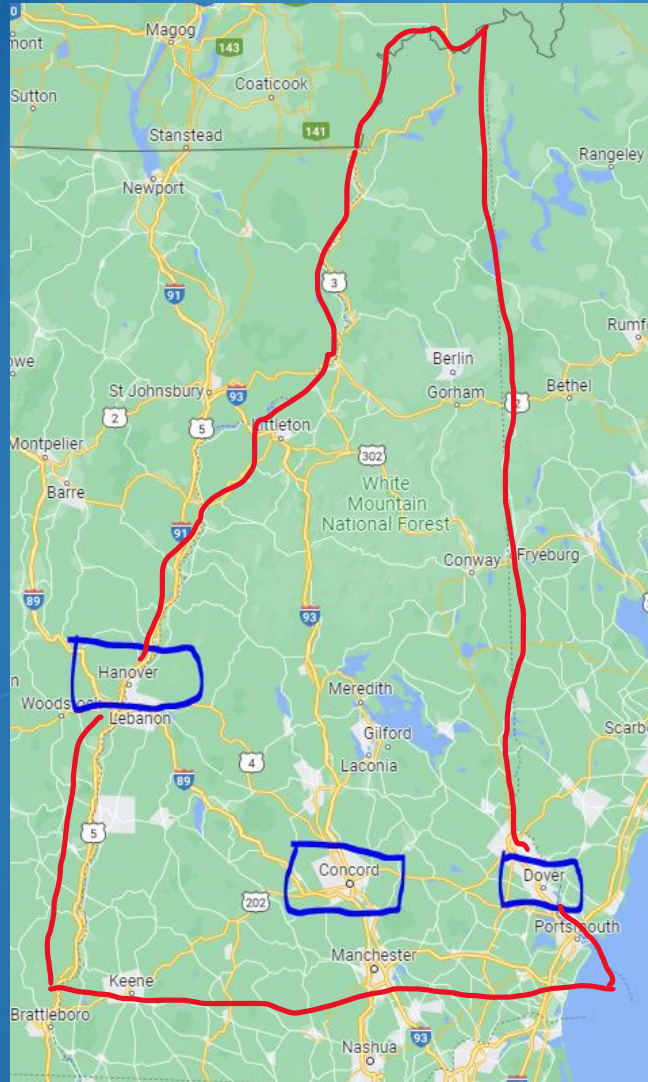
Fengxiang Gao, NH PHL Director

Joel Lefferts, DHMC Asst. Dir. CGAT Lab DHMC

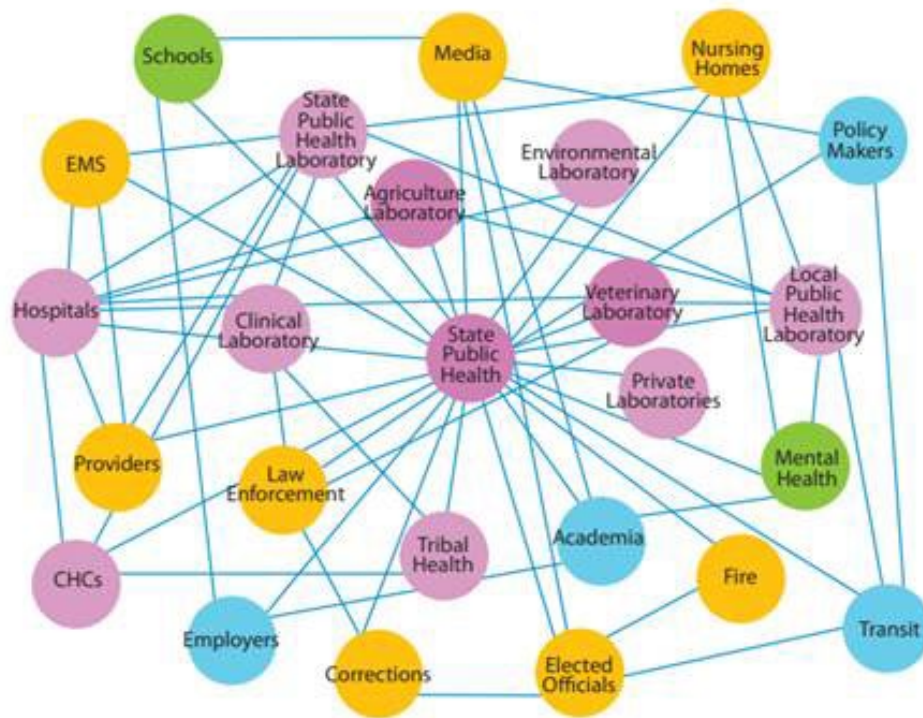
Elise Sullivan, UNH COVID Lab Manager

Quality Improvement Forum
December 15, 2022

New Hampshire



State Public Health Laboratory System



Communication and Outreach

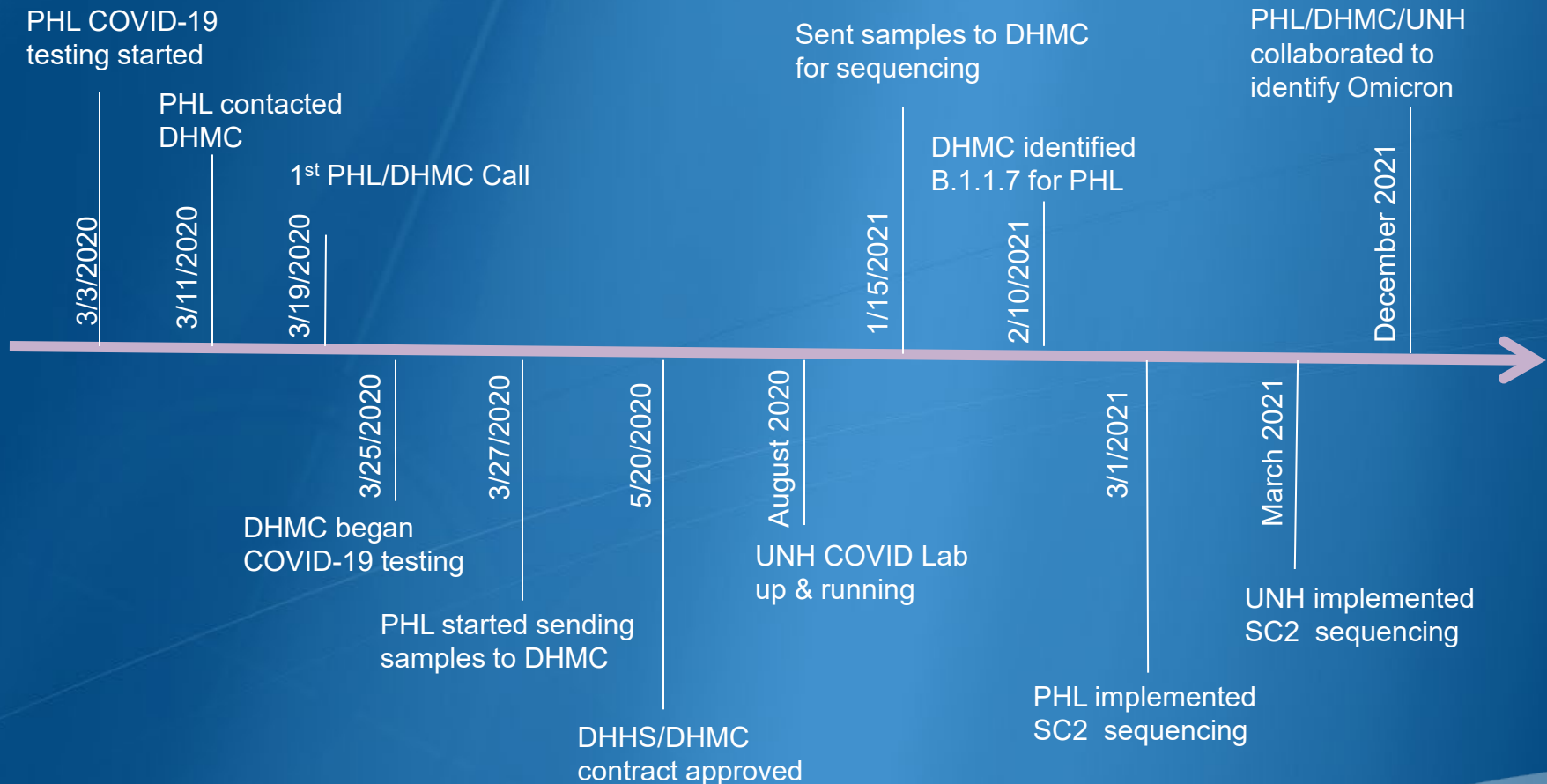
- Communication- method and frequency
- Partners:
 - Sentinel laboratories- Abbott ID Now distribution
 - Academic partners- Supplies from research labs
 - Reference laboratories- CMD shared positives for PHL sequencing

Testing management

- Reference laboratories utilized
- Hospital laboratory capacity
- Dispersement of Abbott ID Now systems
- Academic partner testing at DHMC and UNH
 - Distribution of samples



COVID-19 Response Timeline



Relationships Matter!

- State partners working together for years-relationships existed
- Many PHL staff are graduates of UNH
- Hospital partners were called upon in previous surge events (GI Anthrax and HCV outbreak)
- Forensic lab staff assisted
- New partners
 - National Guard- 16 members assigned for PHL
 - Department of Corrections



Challenges

- Testing surge beyond capacity
- Supply shortages required sharing resources and flexing to different testing methods
- New staff onboarding and training
- Lab staff burnout
- Sample quality issues
- Sample and patient accessioning

Lessons Learned

- Reach out to partners early and often
- System partners shared resources
- PHL assisted with partner test verification
- Testing quality was always a priority
- Timely information sharing
- LIS/IT support and infrastructure critical
- Increase electronic connections across/between LIS in PHL system

Contact information

- Christine Bean Christine.bean@aphl.org
- Fengxiang Gao Fengxiang.gao@dhhs.nh.gov
- Joel Lefferts Joel.A.Lefferts@hitchcock.org
- Elise Sullivan Elise.Sullivan@unh.edu

Question and Discussion

COVID-19 Response in NH: Perspective of an Academic Medical Center

Joel A. Lefferts PhD, HCLD, DABCC

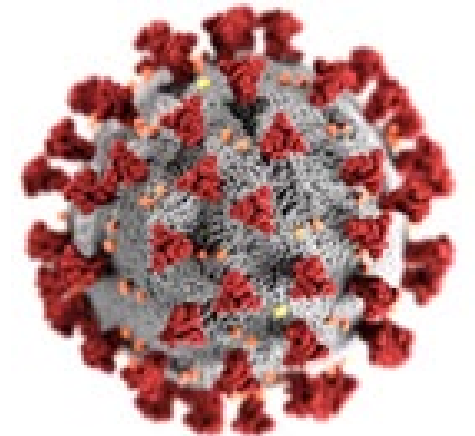
Assistant Director, Laboratory for Clinical Genomics and Advanced Technology (CGAT)

Dartmouth-Hitchcock Medical Center

Associate Professor of Pathology and Laboratory Medicine

Geisel School of Medicine at Dartmouth

Lebanon, NH



The COVID-19 Timeline

- January 30: global public health emergency (WHO)
- January 31: US travel ban on foreign nationals with travel to China
- February 2: First death outside China (Philippines)
- February 11: disease named "COVID-19" by WHO (caused by SARS-CoV-2)
- February 19: outbreak in Iran
- February 21: outbreak in Italy
- February 29: first death in US
- March 8: lock-down in Italy
- March 11: 'Pandemic' declaration by WHO; US bans travel from Europe
- March 13: US national emergency

First discussion of testing at DHMC

Testing options at DHMC being discussed

NH Public Health Lab starts testing; DHMC starts efforts to offer testing

Multiple options for testing identified: ORDERING

3/13: weekend validation of manual CDC assay go-live 3/18

3/20: weekend validation of automated Abbott assay; go-live 3/23



Setting up Testing in Feb/March/April 2020

- Limited samples for validation
 - Shared samples (NH Public Health Lab: some of first positives in the state)
 - BEI/ATCC: Isolated virus, Extracted RNA, inactivated virus, Commercial controls and verification panels
- Limited supplies:
 - Extraction kits (donations from Dartmouth College research labs)
 - Swabs and transport media
 - Media made in cytogenetics lab
 - Swabs and transport media from NH-PHL



Testing Changes Spring 2020 onwards

- Additional validations (discussions and samples from NH-PHL):
 - Saline
 - Asymptomatic
 - Dry swabs
- Regulatory Uncertainties
 - FDA
 - CDC
 - EUAs
 - ????
 - Input from NH-PHL invaluable

CDC EUA

- Max of 29 samples per run
- ~5 hours per batch
 - 1 hour accessioning
 - 1 hour extraction
 - 1 hour RT-PCR set up
 - 1.5 hour RT-PCR
- **Very manual, labor intensive, batches of 20-30 samples**



Increasing Capacity at DHMC in 2020: Abbott m2000

- 3/18: EUA issued for Abbott m2000 assay
- 3/19 (Thurs): Abbott kits delivered
- 3/21-3/22 (Sat-Sun): Validation runs
- 3/23 (Mon): First clinical run with Abbott assay
- Up to 94 samples per run
 - ~5 hours for 24 samples; 7 hours for 94 samples; 10 runs per day)
- 3/24 (Tuesday):
 - started accepting samples from NH PHL to reduce growing backlog at state lab
- Batches of 24-96: up to ~500 per day per instrument
- Two instruments already in place pre-pandemic
 - HIV, HCV, CMV, HBV
- 3rd m2000 Installed 7/2/20
- M-F: day shift only (pre-COVID) → M-F 3 shifts; Sat-Sun 1-2 shifts



Abbott Alinity

- August/September 2020
- 1000 tests per day
- Now runs majority of routine tests



Testing split between Molecular (CGAT) and Microbiology Labs

- Molecular Lab
 - CDC assay
 - Abbott m2000
 - Abbott Alinity

- Microbiology Lab
 - Hologic Panther (Aptima)
 - Diasorin ('rapid')

COVID Testing Strategy

CGAT

Micro

Receiving

Supervisors

Techs

Outreach

LIS

CRC

Directors

NH PHL

Purchasing

Safety

Incident Command

Managers





Beyond NAAT for Diagnosis and Screening

- Sequencing
- Wastewater

SARS-CoV-2 Sequencing at Dartmouth-Hitchcock

- Started sequencing August 2020
- Using automated library prep with small batches (~10-15)
- ~120 samples sequenced between August 2020 and March 2021 (Ion S5/Chef ThermoFisher)
- Funding for sequencing ~5000 DHMC residual clinical samples July 2021- June 2022 (NIGMS, NIH) with most sequencing sent to UNH
- Partnership with UNH extends funding for 2nd year
- Additional samples to NH-PHL for sequencing



Sending a Few DHMC Samples to UNH for Sequencing

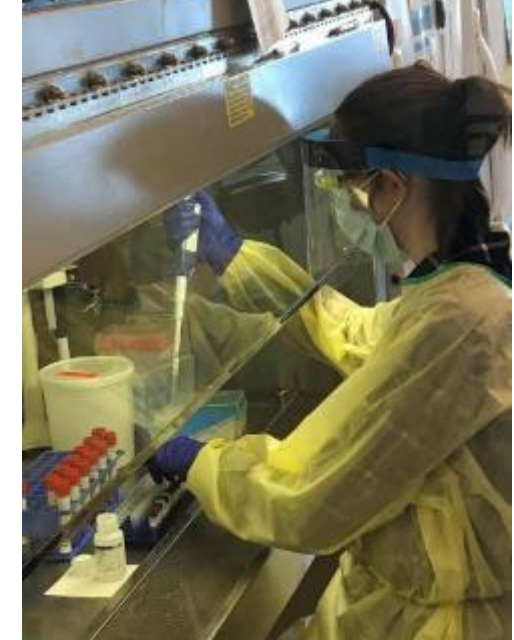
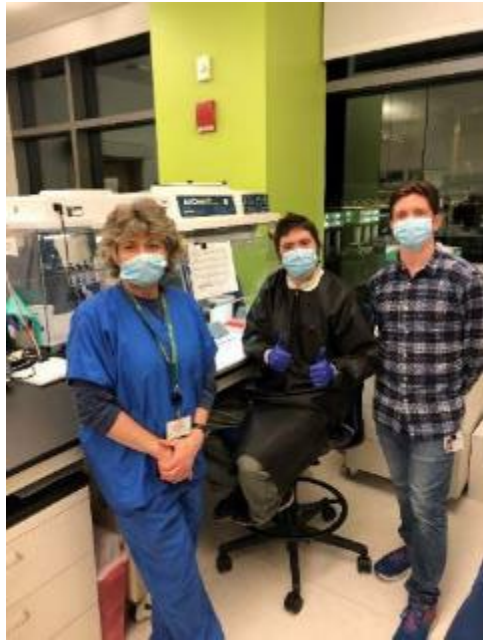


Wastewater Surveillance (DHMC funding from private donor)



DHMC Acknowledgments

- Gregory J. Tsongalis
- Heather Steinmetz
- Michael Harhen
- Isabella Martin
- Nisalda Carreiro
- Many current and former techs, interns
- Diana Toledo and Shivaprasad Sathyanarayana
- Wastewater:
 - Jacqueline Hubbard
 - Isabella Martin
 - Diana Toledo
 - Ashlee Robbins
 - Torrey Gallagher
- Sequencing
 - Sophie Deharvengt
 - Donald Green
 - Shivaprasad Sathyanarayana
- Partners at UNH and NH-PHL



-Hitch
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COVID-19 RESPONSE IN NH: PERSPECTIVE OF AN ACADEMIC INSTITUTION

Elise Sullivan PhD

COVID Lab Manager

University of New Hampshire

Durham, NH

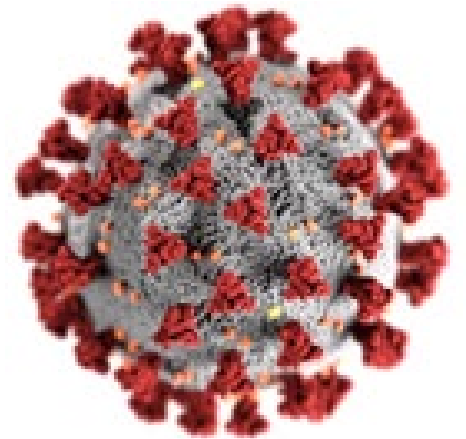
Kelley Thomas, Ph.D.

Director, Hubbard Center for Genomics Studies

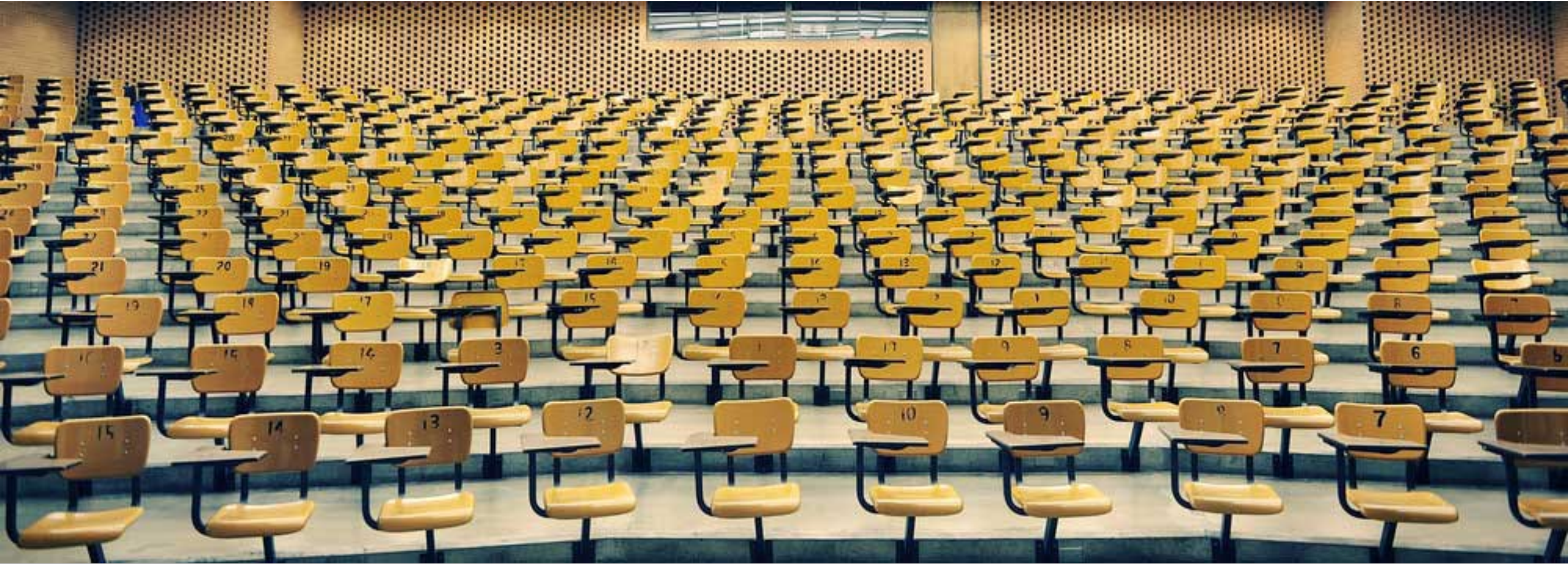
Professor, Dept. Molecular, Cellular, and Biomedical Sciences

University of New Hampshire

Durham, NH 03824



SPRING 2020



UNH campus closed....

SPARK

2021 RESEARCH REVIEW



- Plan: Design, equip, staff a new CLIA lab (summer 2020)
- Target volume: 4,000 PCR specimens per day
- Turn around time: 24 hrs
- Lab Strategy: Pooling and automation
- Public Health Strategy: Test-Trace-Isolate

In This Issue
Research
Rising to the
Challenge



University of
New Hampshire

Opening Day, August 28, 2020



PROCESS: SPECIMEN RECEIVING



Software: Plate Manager (built-in house by Anthony Westbrook)

PROCESS: SPECIMEN TRANSFER



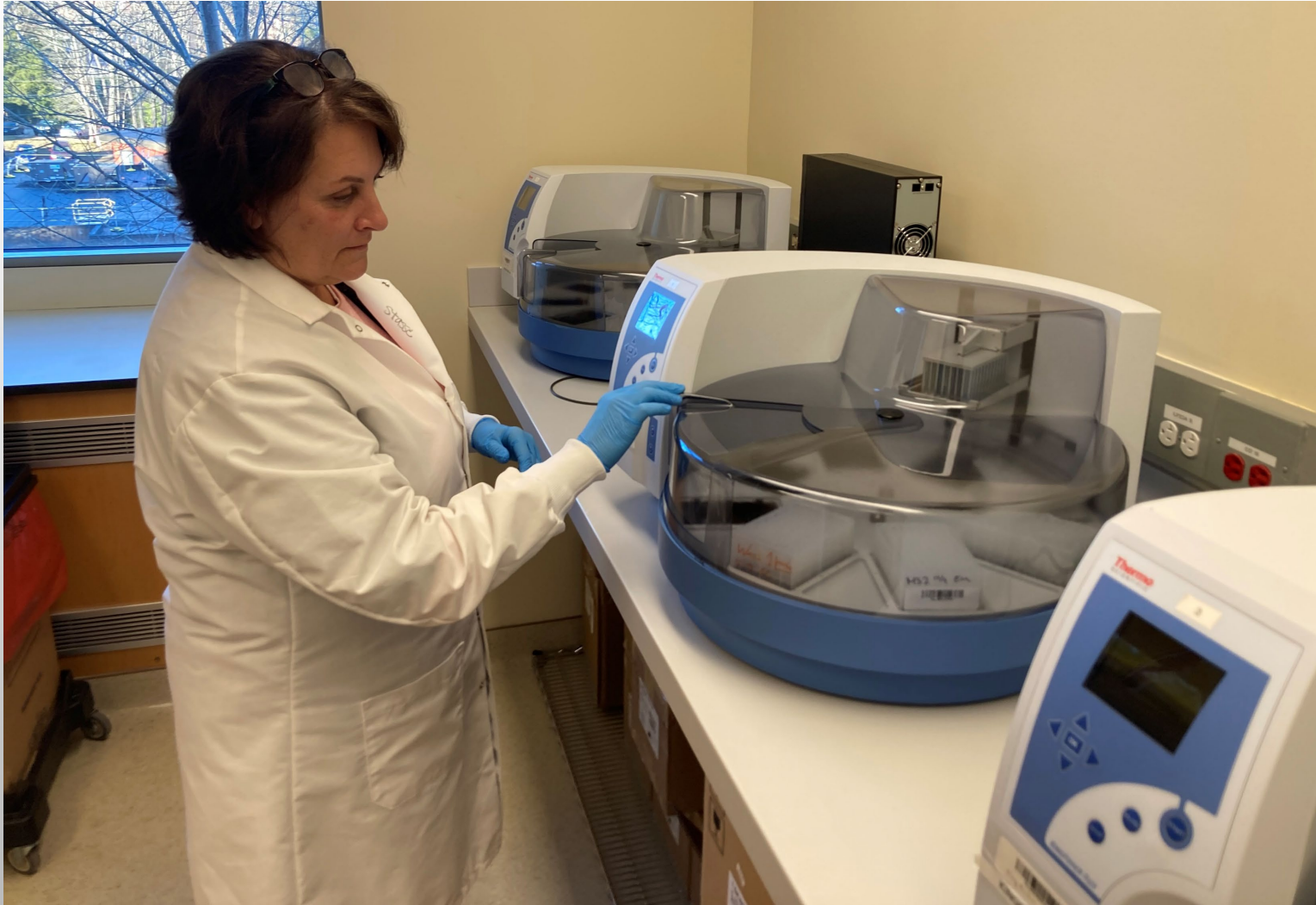
From tubes to 96-well plate format in Integra Assist Plus

PROCESS: POOLING/UNPOOLING



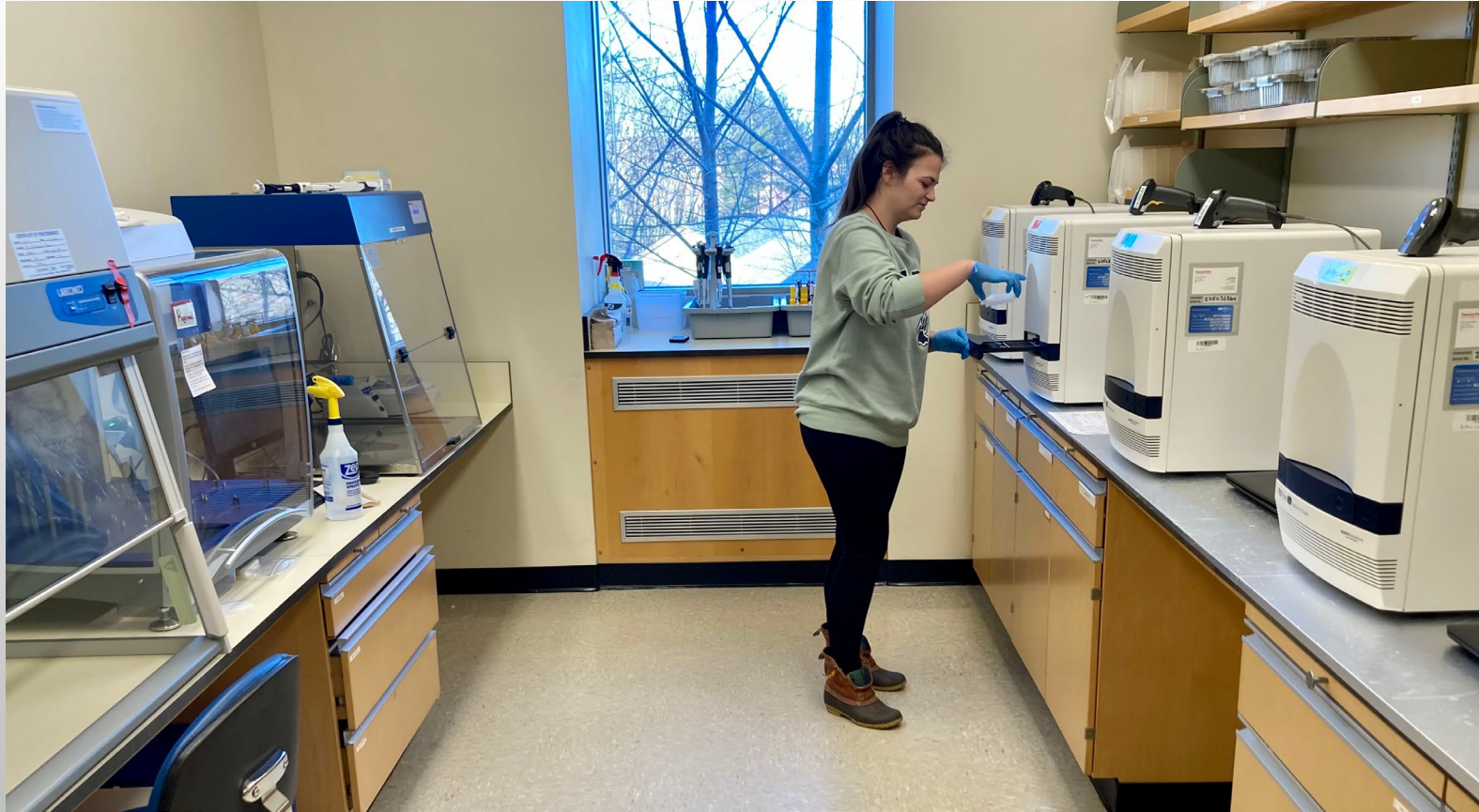
Eppendorf EpiMotion 5073

PROCESS: RNA EXTRACTION



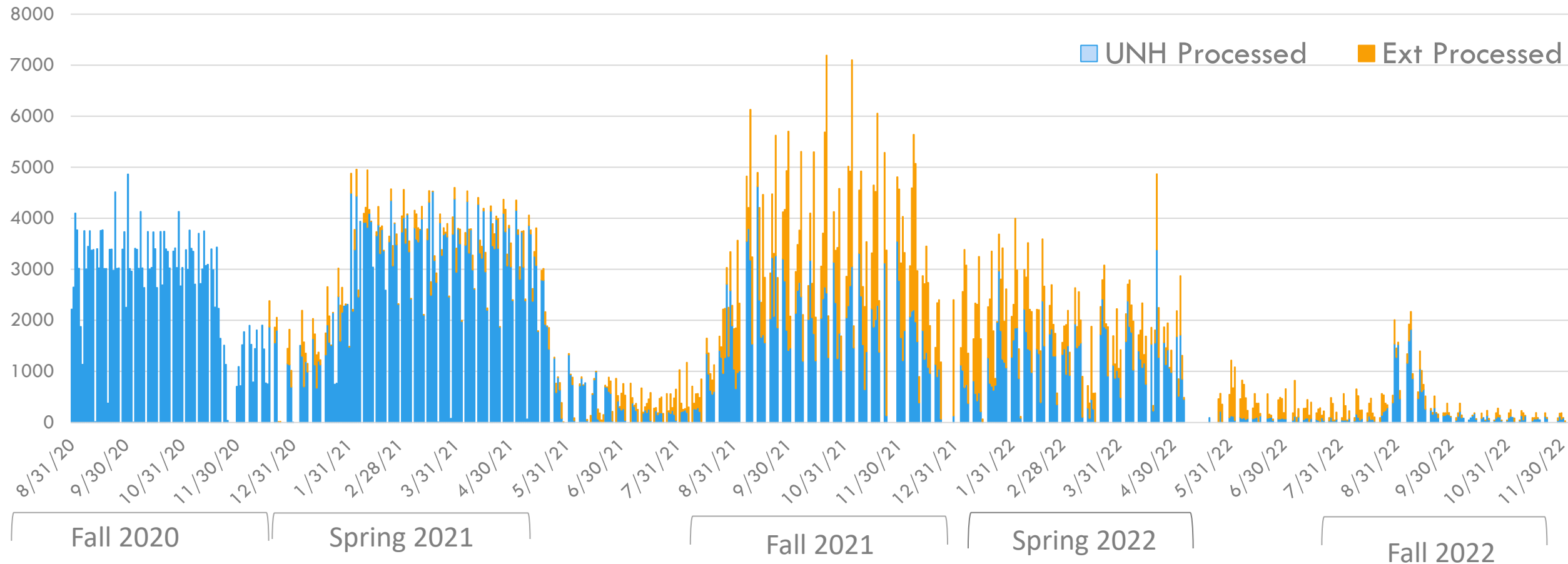
Kingfisher Extraction, ThermoFisher

PROCESS: REAL-TIME RT PCR



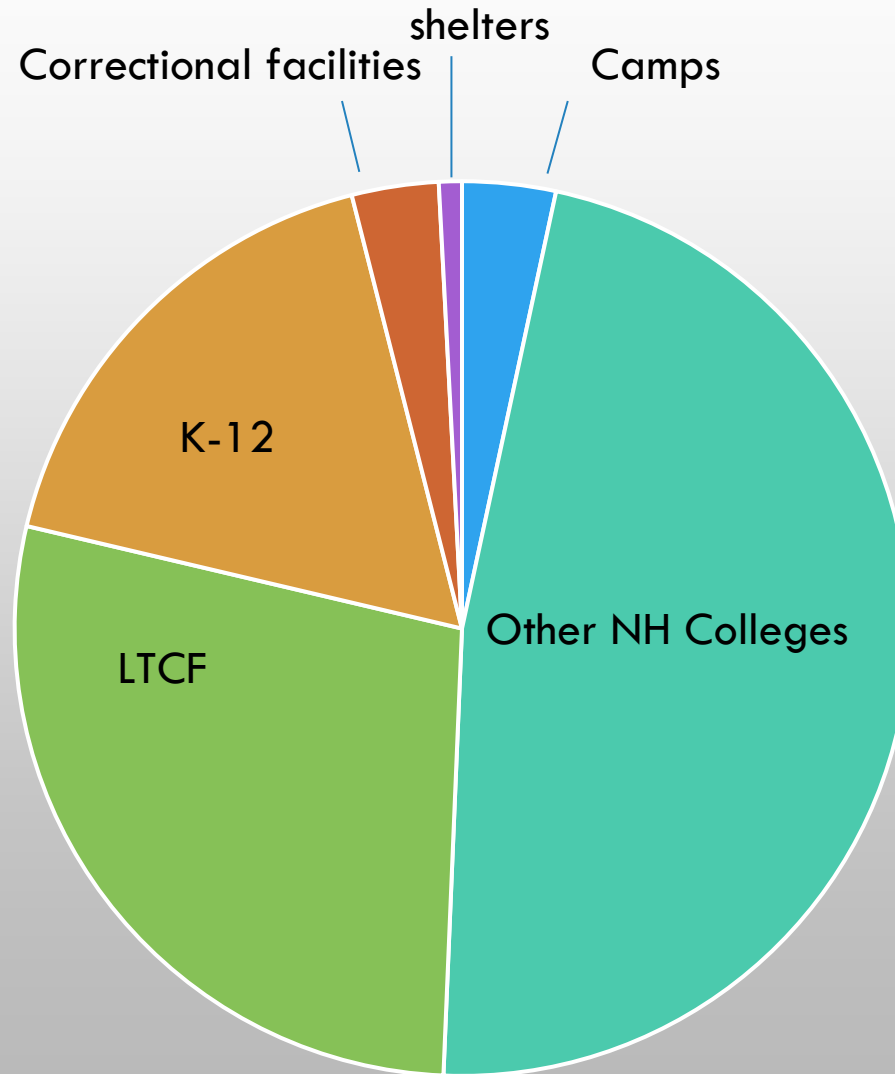
ThermoFisher COVID -19 COMBO Kit TaqPath Assay
PCR set up on Eppendorf EpiMotion 5073
7500 Fast Dx Real Time PCR Instrument

Specimens Processed – UNH vs External



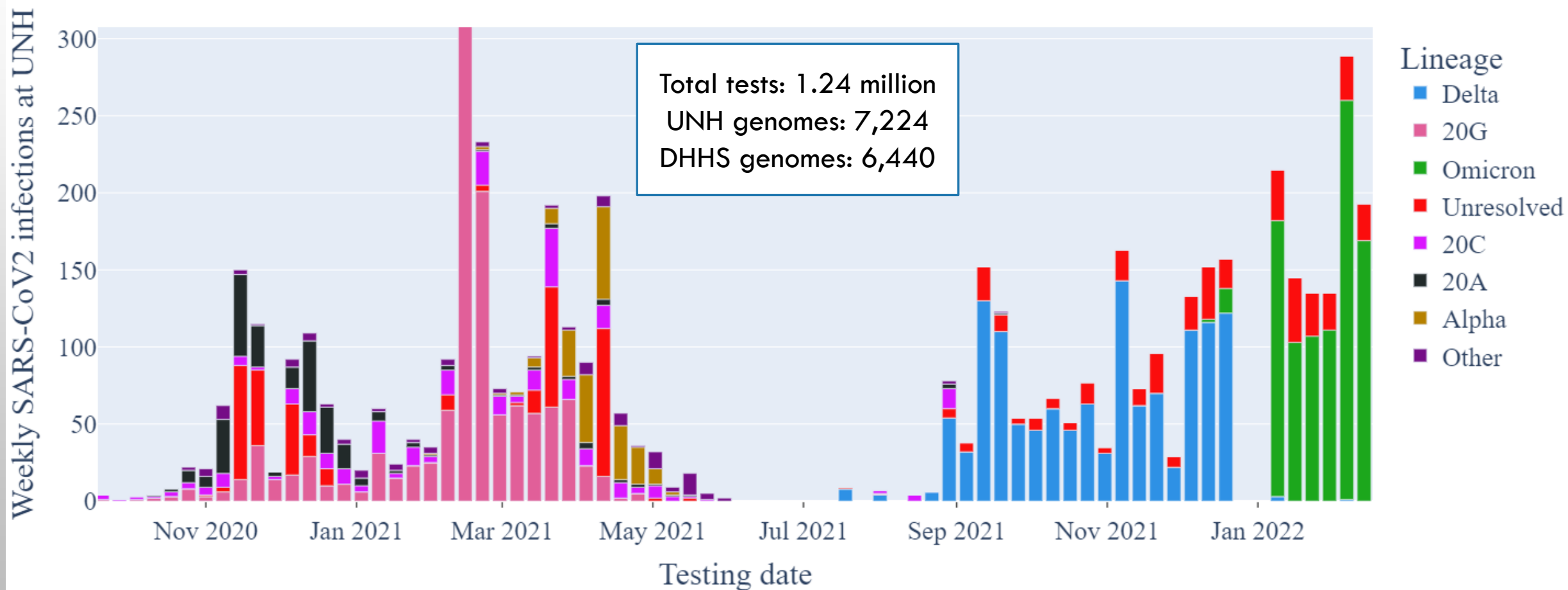
EXTERNAL NH TESTING

TOTAL: 413,750

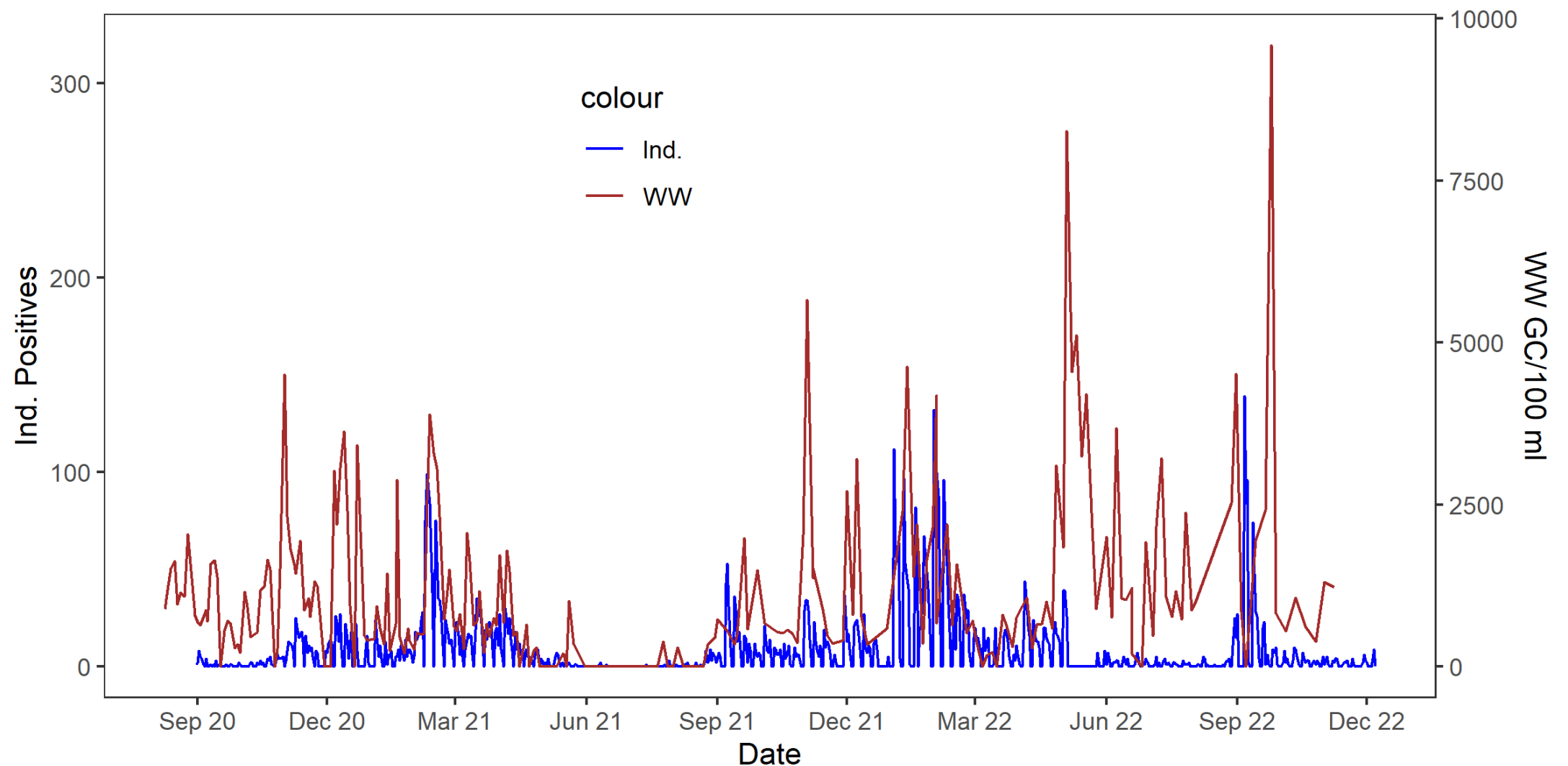


■ camps ■ colleges ■ LTCF ■ K-12 ■ Dept of Corr ■ Shelters

Weekly SARS-CoV-2 infections at the University of New Hampshire



UNH WASTEWATER TESTING





ACKNOWLEDGEMENTS:

MARIAN MCCORD, SR VICE PROVOST OF RES
JEFF LAPAK, INNOVATIONS

COVID LAB STAFF

SEQUENCING
HCGS STAFF
DR. RICK COTE

WASTEWATER:
DR. PAULA MOUSER
KELLEN SAWYER



COVID Lab Specimen processing March 28, 2022