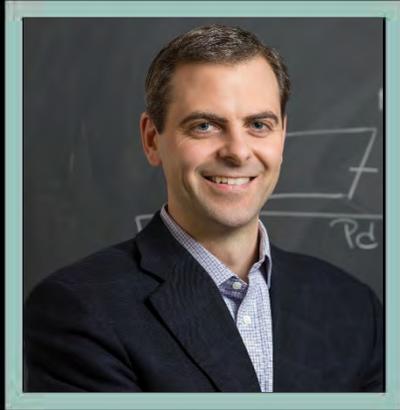


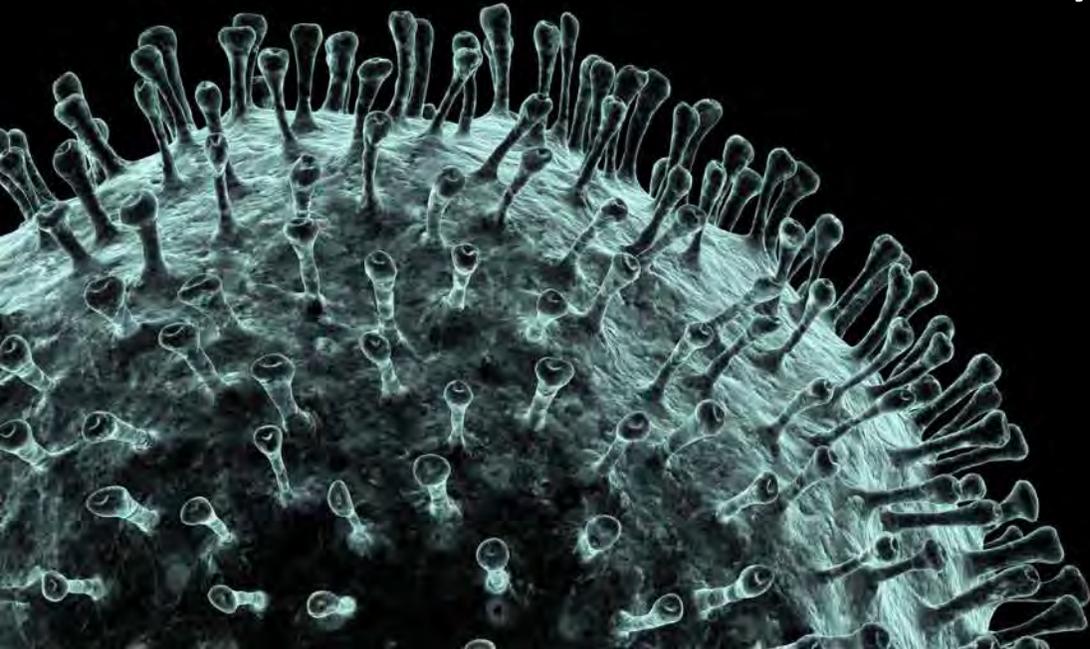
COVID-19 Conversations



Martin Burke

May and Ving Lee Professor for Chemical
Innovation

University of Illinois



COVID19Conversations.org

[#COVID19Conversations](https://twitter.com/COVID19Conversations)



COVID-19

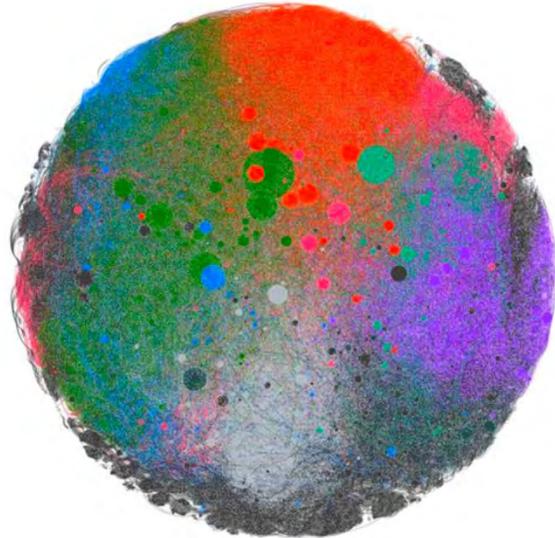


SHIELD

Target TEST Tell

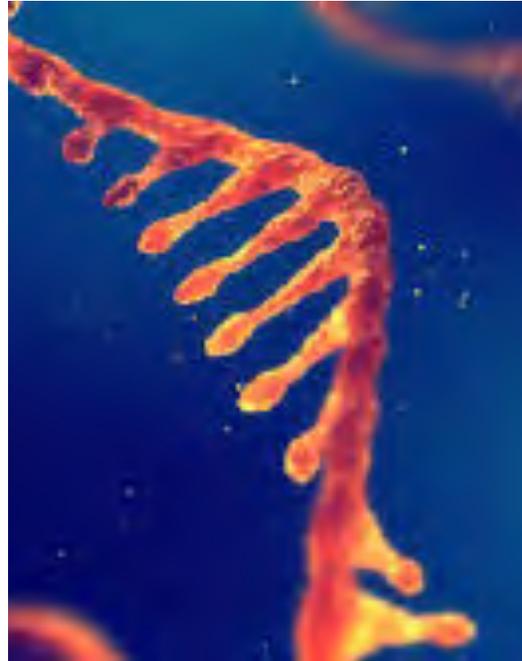
Martin D. Burke, MD/PhD
University of Illinois at Urbana-Champaign

Target



Modeling to guide test frequency and scheduling

TEST



COVID TEST

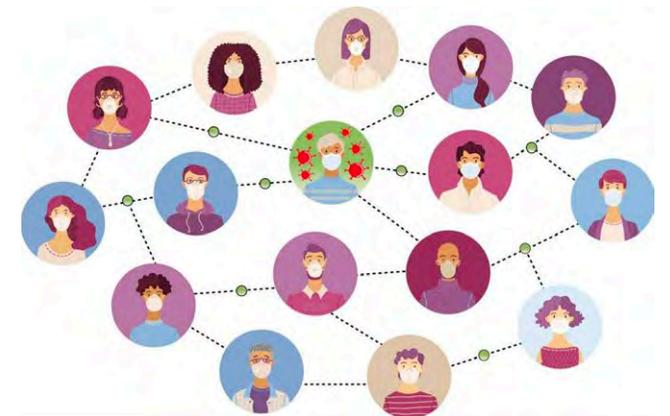
Direct saliva → PCR test for SARS-CoV-2 that is fast and scalable

Tell



Digital exposure notifications

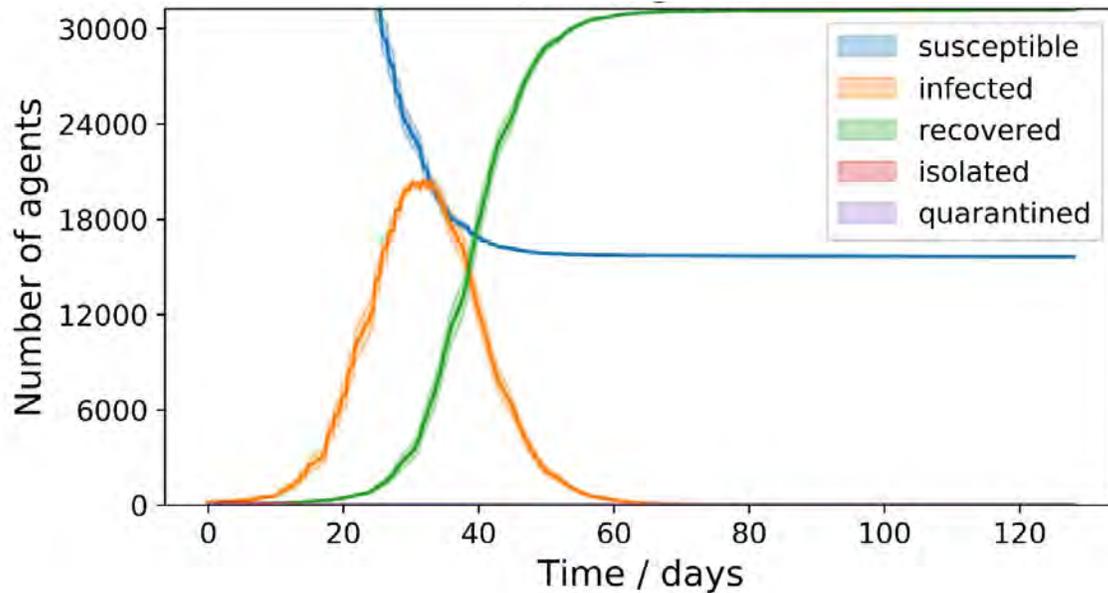
+



manual contact-tracing

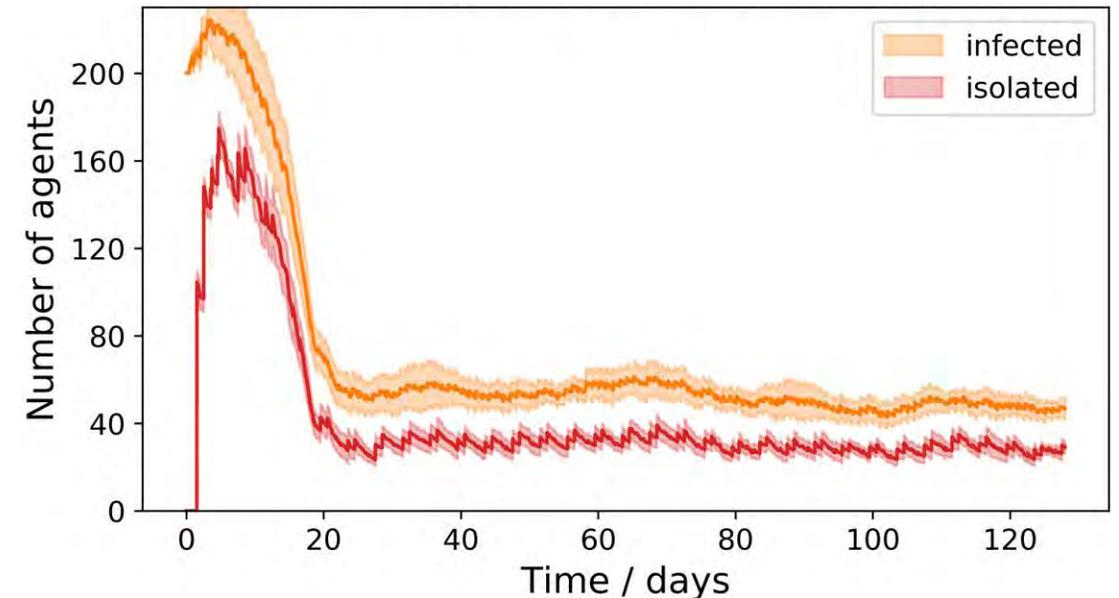
Modeling for SHIELD at UIUC with 2x/week testing, masks, classes >50 online, & manual contact tracing

If we do nothing...
30,000 infections



If we do SHIELD

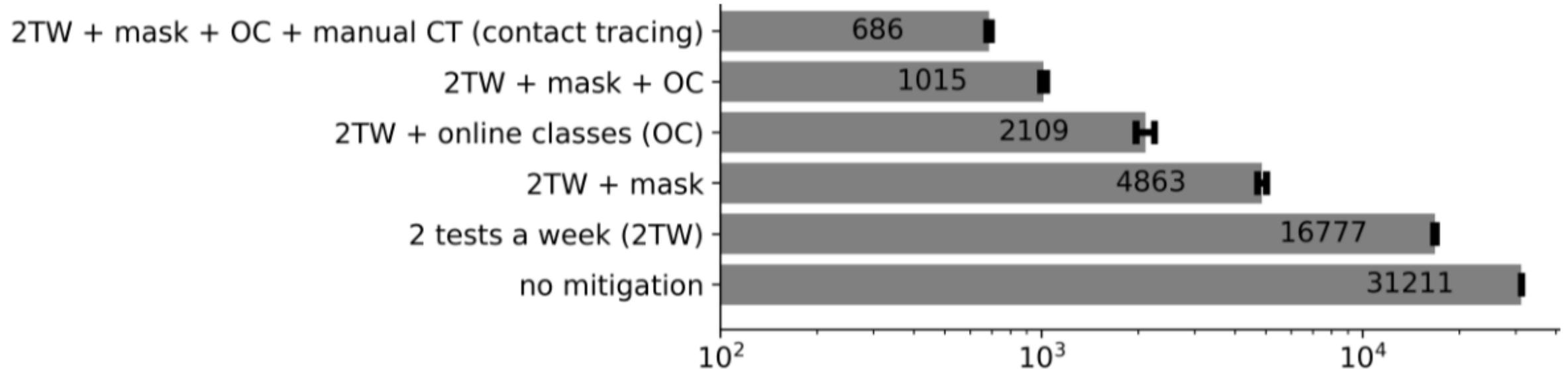
- 700 total infections
- Manageable by public health
- Initial “bump” when students arrive is crushed by SHIELD mitigations
- Outcome: safer environment
- Students educated in person, local economy stays open



Detailed modeling of 45,000 students working and socializing, transmitting SARS-CoV-2 via proximity and aerosol

Ahmed Elbanna, Nigel Goldenfeld, Sergei Maslov, Alexei Tkachenko, Zach J. Weiner, Tong Wang, George N. Wong, Hantao Zhang

SHIELD works by multi-layer approach



Estimate for how many students will be infected over the whole semester (including 200 initial imports)

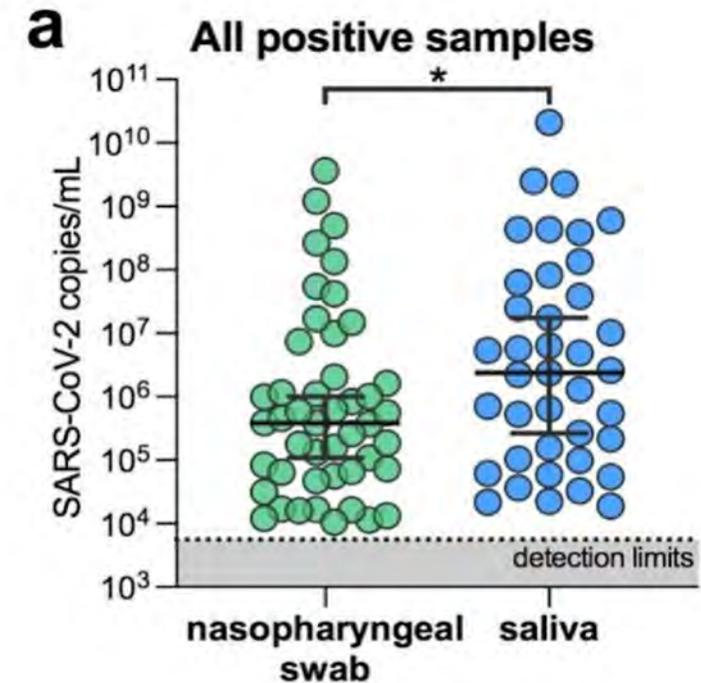
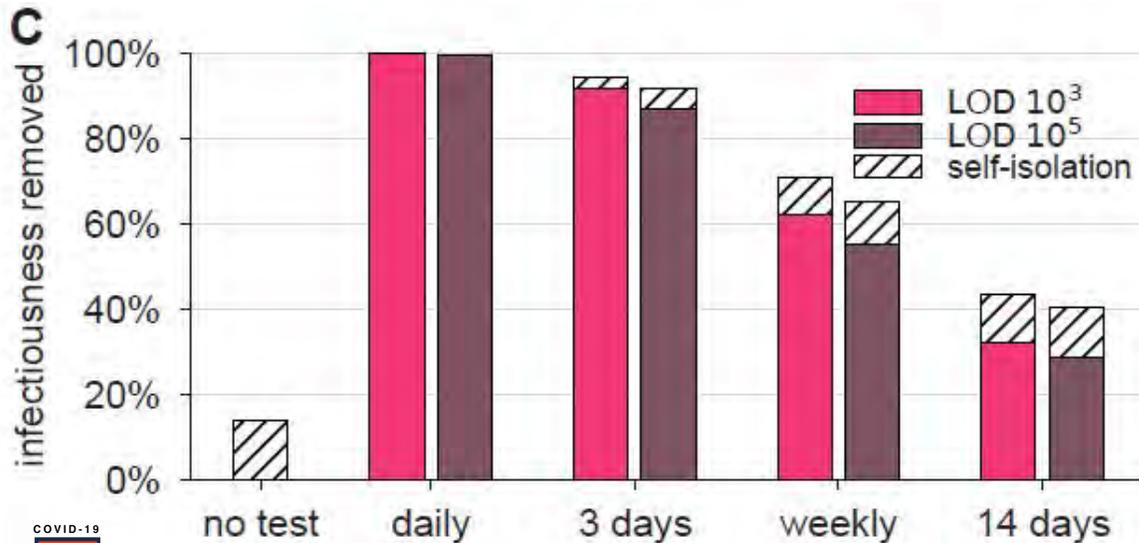
Test – why saliva?

Scientific/medical considerations:

- Saliva likely provides a more relevant indication of infectiousness
- Early report of excellent sensitivity in saliva

Logistical considerations:

- Avoids swab and VTM (supply chain limiting)
- Easy and rapid self collection
- No/less need for health-care workers
- Much easier on patient
- Compatible with frequent repeat testing



medRxiv 2020.04.16.20067835

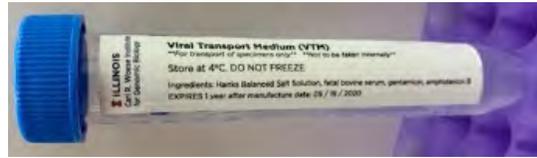
medRxiv 2020.06.22.20136309

Test – addressing bottlenecks

Standard method:



NP swab



Viral Transport Medium



RNA purification kit



RT-qPCR

Saliva (FDA EUA approval April 2020):



Saliva collection



RNA purification kit



RT-qPCR

UIUC testing vision (Paul Hergenrother):

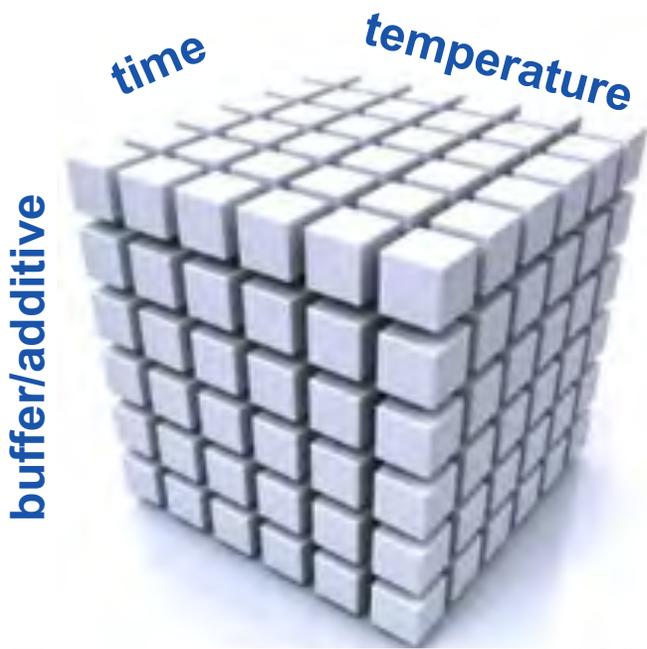


Saliva collection



RT-qPCR

COVID TEST



saliva



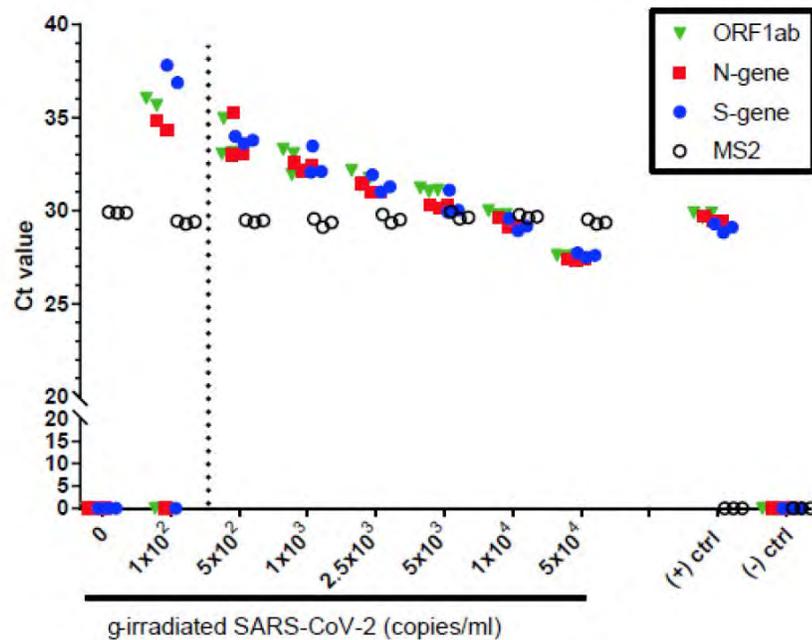
1. Heat at 95 C for 30 min

2. Add TBE/Tween buffer

PCR



Results in 3-6 h



Saliva-Based Molecular Testing for SARS-CoV-2 that Bypasses RNA Extraction

Diana Ranoa, Robin Holland, Fadi G Alnaji, Kelsie Green, Leyi Wang, Christopher Brooke, Martin Burke, Tim Fan, Paul J Hergenrother

doi: <https://doi.org/10.1101/2020.06.18.159434> Bridged to FDA EUA 8-18-2020

<https://www.biorxiv.org/content/10.1101/2020.06.18.159434v1>

Complementary method from team at Yale (FDA EUA approved 8-15-2020)

<https://www.medrxiv.org/content/10.1101/2020.08.03.20167791v1>

LOD = 500-1000 copies/mL

TEST: Transformation of VetMed Diagnostics Lab into human COVID-19 testing facility

I COLLEGE OF VETERINARY MEDICINE
UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

NEWS CALENDAR DIRECTORY CONTACT INTRANET LIBRARY SEARCH

LEIYI WANG

I ILLINOIS
Carl R. Woese Institute
for Genomic Biology



UNIVERSITY OF ILLINOIS COLLEGE OF VETERINARY MEDICINE > DVM RESOURCES > VETERINARY DIAGNOSTIC LABORATORY

DVM RESOURCES /

- Referral Services
- Veterinary Diagnostic Laboratory**
- Look Up Tests
- Laboratory Users Guide
- Register for Access to Online

GO TO SUBMISSION FORMS

OVERVIEW

The Veterinary Diagnostic Laboratory provides diagnostic medical testing for infectious agents, toxins, and other causes of disease in animal diagnostic samples submitted by veterinary practitioners serving animal owners, public officials associated with public health, law or wildlife management, and scientists with collaborative research projects.

Veterinary Diagnostic Laboratory

For Correspondence
1224 Veterinary Medicine Basic Sciences Building
2001 South Lincoln Avenue
Urbana, IL 61802
vdldirectoroffice@vetmed.illinois.edu

For Specimens
P.O. Box U



NATIONAL GEOGRAPHIC

ANIMALS | CORONAVIRUS COVERAGE

Seven more big cats test positive for coronavirus at Bronx Zoo

A Malayan tiger at the Bronx Zoo, photographed in 2017. Five of the zoo's tigers and three of its lions have tested positive for the virus that causes COVID-19.



Tim Fan and Paul Hergenrother

Logistics of testing 20,000 students/faculty/staff a day

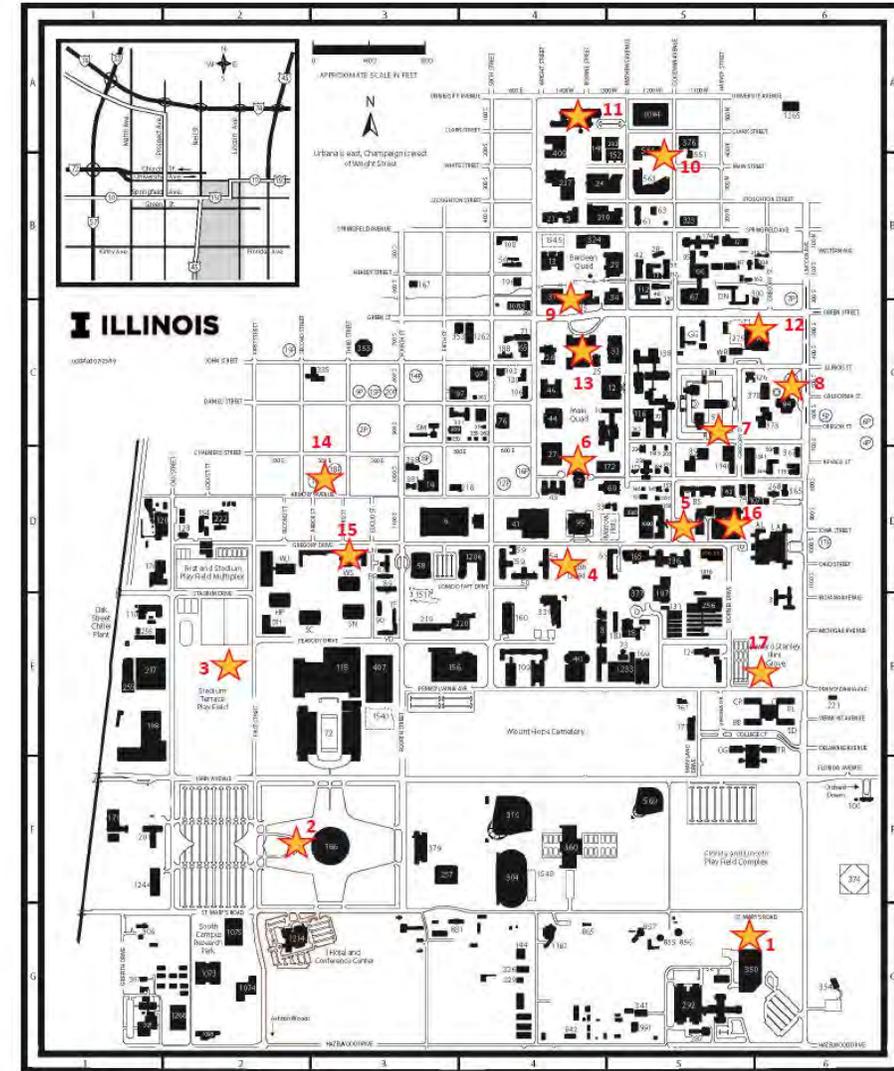
40 testing lines on campus (20+ locations)

Large tents, allowing for distancing

Easy scan-in system (scan I-card, label printed and affixed to tube)

Samples brought to the vet diagnostic facility every hour

Have run **>300,000 tests** on students/faculty/staff July-September with this process, typically results within hours not days



1. Veterinary Medicine (Tent on North Side of Basic Sciences Building)
2. State Farm Center (West Entrance)
3. Lot 31 (Tent Near Peabody Dr. & First St.)
4. South Quadrangle (Tent East of David Kinley Hall)
5. Freer Hall (Tent at NE Corner of Gregory Dr. & Goodwin Ave.)
6. Foellinger Auditorium (Forecourt)
7. Krannert Center for the Performing Arts (Tent on South Patio)
8. Alice Campbell Alumni Center (Tent North of Building)
9. Graziano Plaza (Tent Between Everitt Lab and Engineering Hall)
10. NCSA Building (Tent East of Building)
11. Beckman Institute (Atrium)
12. ISR (Illinois Street Residence Halls, Lower Level)
13. Illini Union (Room 314)
14. Washington Park (Tent)
15. SDRP (Student Dining & Residential Programs Building, Second Floor)
16. CRCE (Campus Recreation Center East)
17. Illini Grove (Tent East of Tennis Courts)
18. Illinois Fire Service Institute (11 Gerty Drive) - Not Shown on Map



THANK YOU
HEALTHCARE
WORKERS!



Safer in ILLINOIS

POWERED BY
I ROKWIRE

Get started



Join the fight against COVID-19

Track and manage your health to help
keep our Illinois community safe

Continue



How it works

Testing and limiting exposure are key
to slowing the spread of COVID-19.

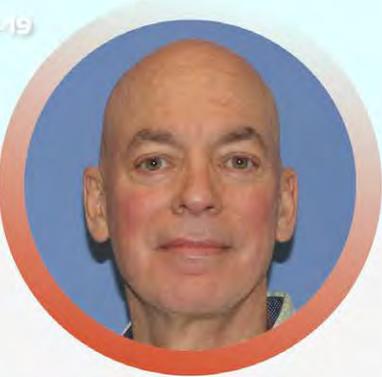
You can use this app to:

- Provide any COVID-19 symptoms you experience
- Automatically receive or enter test results from your healthcare provider
- Allow your phone to send exposure notifications to you and the people you've come in contact with during the last 14 days

Next

Tell

COVID-19



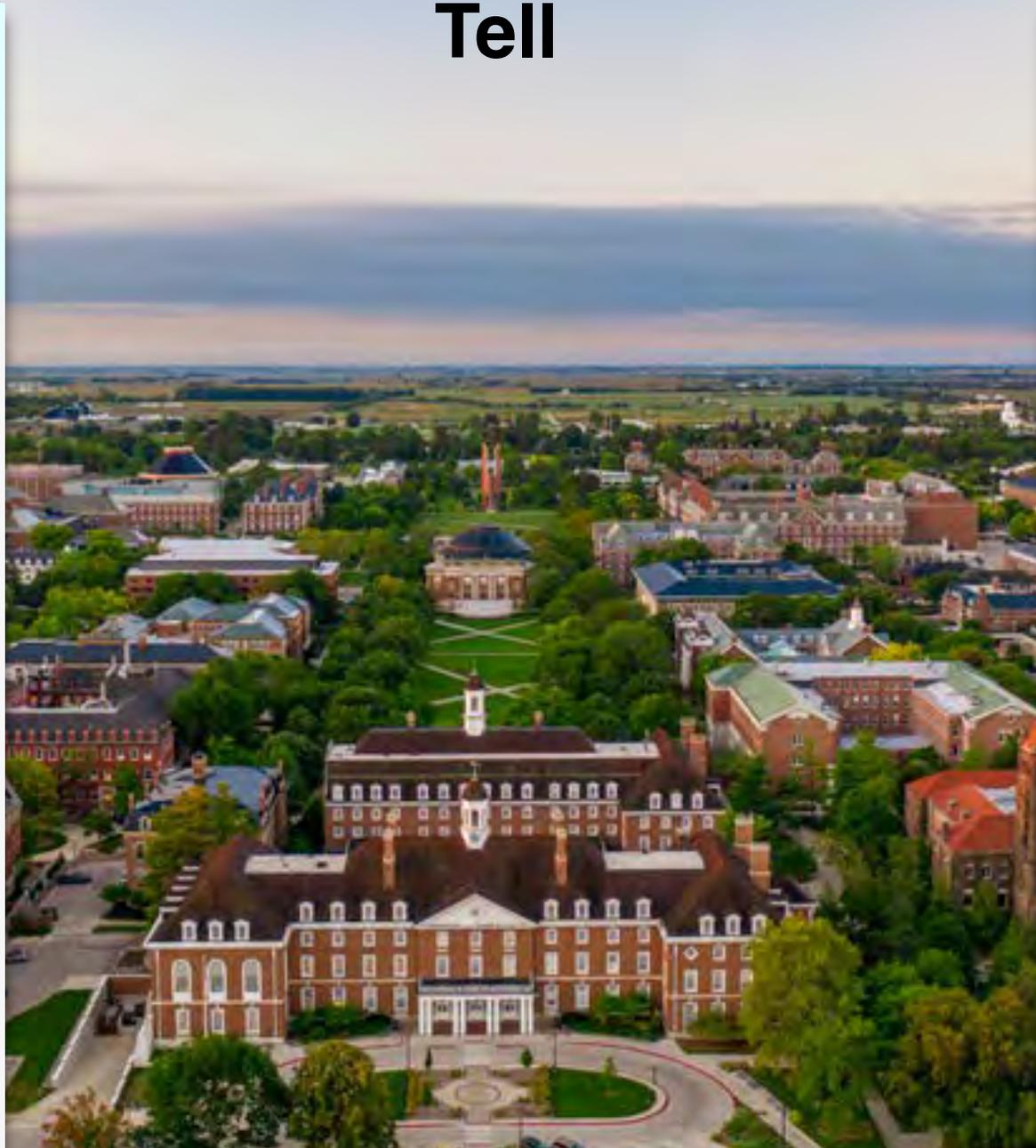
William C Sullivan
Faculty/Staff

Champaign, Illinois ▾



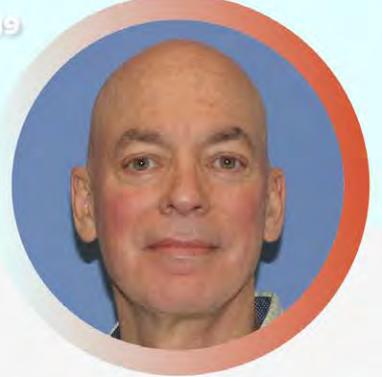
Building Access
GRANTED





2:26

COVID-19



William C Sullivan
Faculty/Staff

Champaign, Illinois ▾



Building Access
DENIED





Results

Total Test Results

304,740

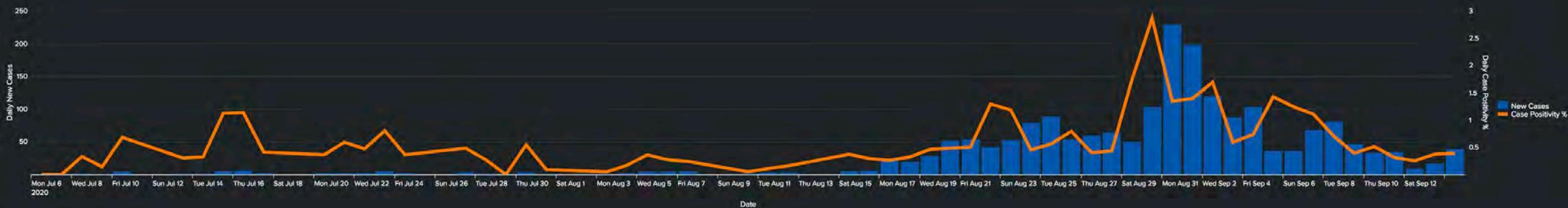
Past 7-Day Case Positivity Rate

0.44%

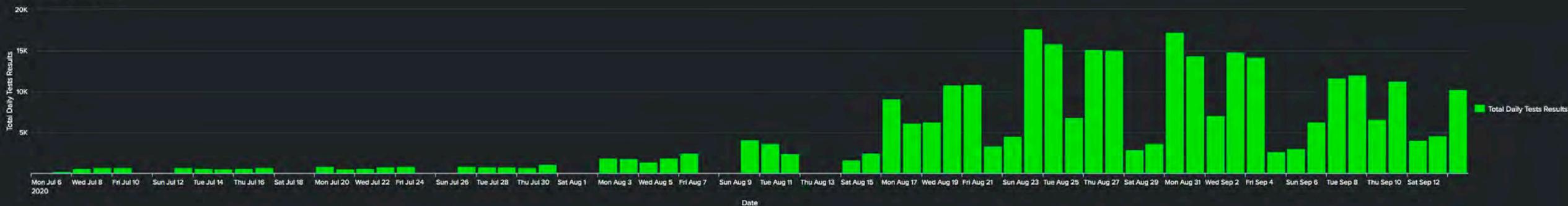
Case positivity is unique new cases/total number of test results.

Unique New Cases

Unique New Cases are the first time an individual is detected COVID-19 positive by the SHIELD saliva test



Total Number of Daily Tests



Results

Total Test Results

304,740

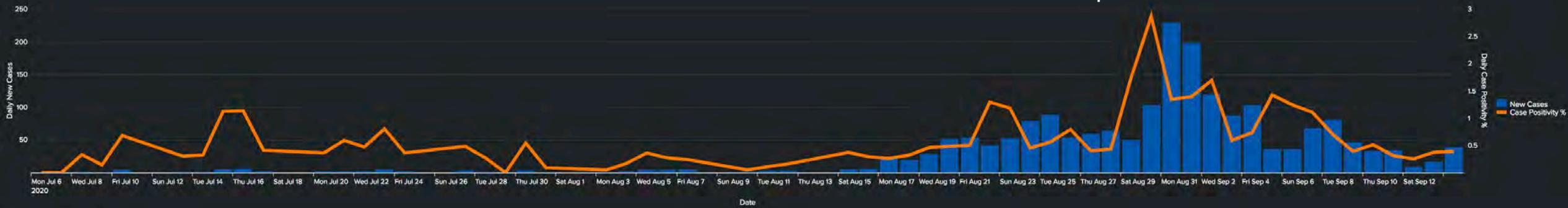
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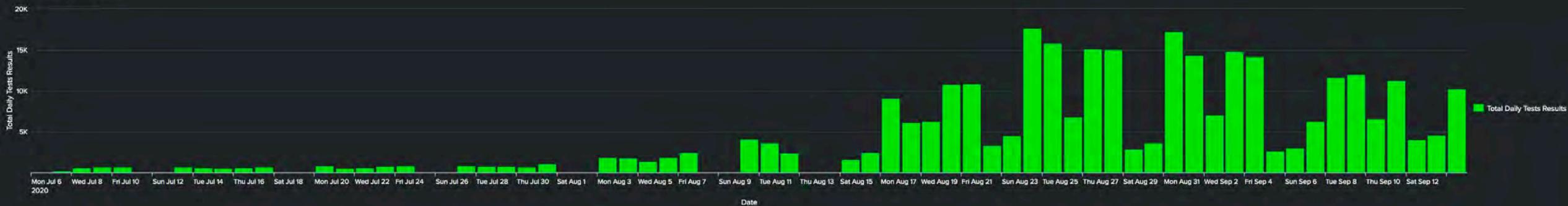
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Total Number of Daily Tests



Results

Total Test Results

304,740

Past 7-Day Case Positivity Rate

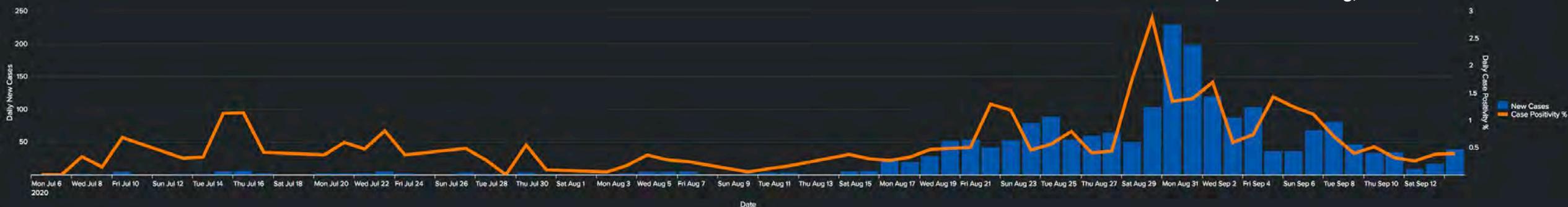
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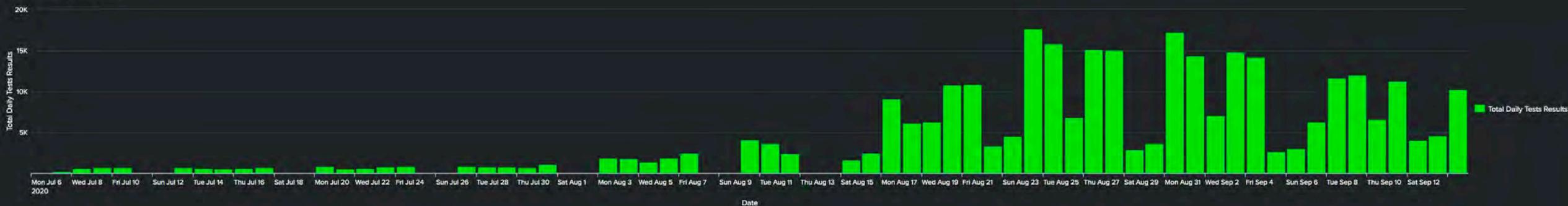
Unique New Cases

Unique New Cases are the first time an individual is detected COVID-19 positive by the SHIELD saliva test

- Essential activities only for undergraduates, prioritized testing, and SHIELD Team 30



Total Number of Daily Tests



Key Takeaways

- **Fast/frequent testing can help mitigate the spread of COVID-19 in a large university community**
- **Testing is not a silver bullet; it should be integrated into a wholistic approach that includes epidemiological modeling, contact tracing, masks, social distancing, and community engagement.**
- **I-COVID direct saliva→PCR test enables fast/frequent testing on scale**
- **Prioritized testing can maximize impact**
- **Mechanisms to help people that test positive get safely isolated quickly, and to support/enforce isolation and quarantine are important**