# Wisconsin State Laboratory of Hygiene

UNIVERSITY OF WISCONSIN–MADISON

# WELCOME to the 2021 WCLN Regional Meeting!

## "The COVID-19 Pandemic Response Olympics"

# Opening Ceremonies

Today's meeting is being live streamed and recorded. Your image and voice may be captured on our broadcast and recorded. Your consent to this is assumed if you remain in the room for the Regional Meeting.

**Let the Games Begin!**



# Audience Participation

We strongly encourage you to participate in the discussions today. This meeting is for you.

- Those in person, please use the microphone stands in the room
- Those attending virtually:
  - Click "raise your hand". When we call on you turn on your video camera and un-mute and we should all be able to see you and hear you speak. (Remember to mute yourself, turn off your camera and lower your hand when you are done speaking.)
  - Or, write your question or comment in the Chat section and it will be read aloud by a moderator. Chat comments/questions are only visible to the host.

# Audience Participation

Through out the day we will have interactive polling questions through the Kahoot program. (Polling questions will not be available to those viewing this in the recording after today.)

To participate, use your phone or computer to go to **Kahoot.it** and enter the event code that is provided. . .



# Engaging and Training Future Olympians

**Resistance Training**


**Finding Creative ways to Train**

**Training Future Generations**

WISCONSIN STATE LABORATORY OF HYGIENE - UNIVERSITY OF WISCONSIN

# Engaging and Training Future Olympians
# Making the Proverbial 180:
## Clinical Laboratory Education in the Pandemic




Erik Munson
Department of Medical Laboratory Science
Marquette University

Wisconsin Clinical Laboratory Network
Laboratory Technical Advisory Group (LabTAG)

The presenter states no conflict of interest and has no financial relationship to disclose relevant to the content of this presentation.

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## You Make the Call

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# KAHOOT

What is your general feeling about online microbiology laboratory education (including practicum)?

A. I've had some experience with this; it doesn't work.

B. I've had some experience with this; gets the job done.

C. No major experience; in theory, should work well.

D. Get outta here; this won't work.

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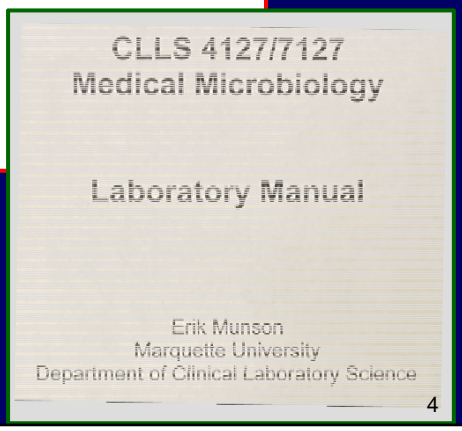
# TIMELINE

- January 2020 (MLS/CLS/MT juniors)

**Marquette University**
**College of Health Sciences**
**Department of Clinical Laboratory Science**
**CLLS 4127/7127, Medical Microbiology, 4 cr.**
**Syllabus Spring 2020**

| | |
|---|---|
| **Course Director:** | Erik Munson |
| **Office:** | Schroeder Complex 267 |
| **E-mail:** | Erik.Munson@marquette.edu |
| **Phone:** | Office: (414) 288-5848 |
| **Office Hours:** | Door is open; find me |

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# TIMELINE

- Additional MLS/CLS/MT obligations (juniors)

**Clinical Laboratory Science CLLS 4173 / 7173**
**Clinical Chemistry and Concepts 2**
**Syllabus Spring 2020**

| | |
|---|---|
| **Lecture Class** | Monday, Wednesday and Friday 9:00 – 9:50 am<br>Cramer Hall 038 |
| **Discussion Class** | Thursday 9:00 – 9:50 am<br>Cramer Hall 038 |
| **Laboratory Class** | Tuesday 2:00 pm – 4:50 pm<br>Schroeder Complex Room 299 |
| **Instructor** | **Valerie Everard-Gigot**, Ph.D., MT (ASCP); Clinical Assistant Professor;<br>Schroeder Complex Room 264D |

**Clinical Laboratory Science CLLS 4174 / 7174**
**Clinical Hematology I**
**Syllabus Spring 2020**

| | |
|---|---|
| **Lecture Class** | Monday, Wednesday and Friday 10:00 – 10:50 am<br>Cramer Hall 038 |
| **Discussion Class** | Thursday 10:00 – 10:50 am<br>Schroeder Complex 256 |
| **Laboratory Class** | Tuesday 8:00 am – 11:50 am<br>Schroeder Complex Room 299 |
| **Instructor** | **Valerie Everard-Gigot**, Ph.D, MT (ASCP); Clinical Assistant Professor;<br>Schroeder Complex Room 264D |

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# TIMELINE

- January 2020 (senior nursing students)

**MARQUETTE UNIVERSITY COLLEGE OF NURSING**
**HEAL 4930 Special Topics in Health--Microbiology**
**Section 101**
**Syllabus, Spring 2020**

| | |
|---|---|
| **Course Description:** | This special topics course will provide an overview of clinical and medical microbiology as it relates to the nursing profession. The course will include a survey of the structure, function, transmission, diagnosis, and control of common microorganisms. Special emphasis will be placed on the ancillary role of the clinical microbiology laboratory in the diagnosis of infectious diseases. |
| **Credits:** | Four |
| **Prerequisites:** | None |
| **Faculty:** | Erik Munson, Department of Clinical Laboratory Science |
| Office:<br>Phone:<br>Email: | Schroeder Complex 267<br>(414) 288-5848<br>erik.munson@marquette.edu |
| **Office hours:** | Tuesdays 1300 to 1600 |

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# TIMELINE

- March 2020 (MLS/CLS/MT juniors)

| | | | |
|---|---|---|---|
| **W Feb 26** | | Lab Prep; Antimicrobial Discussion III, IV | Finish up mold contaminants<br>Finish up slide culture (Wed.)<br>Mold pathogens<br>Begin mold mini-unknown |
| **Th Feb 27** | Mycology introduction | Bonus Round (1000): Opportunistic molds | |
| **F Feb 28** | Opportunistic molds | Bonus Round (1000): Pathogenic molds | |
| **M Mar 2** | Pathogenic molds | | |
| **W Mar 4** | | **WRITTEN EXAMINATION II** | Yeasts<br>Finish mold mini-unknown<br>Mycology Review Sheet |
| **Th Mar 5** | Yeast | | |
| **F Mar 6** | Yeast | | |
| **Mar 9-13** | $pring Break (no cla$$) | | |

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# TIMELINE

- March 2020 (senior nursing students)

| Week | Lecture/discussion date | Laboratory date | Tentative topic(s) |
|---|---|---|---|
| 6 | February 17 | | Gram-negative coccobacilli<br>Gram-negative diplococci<br>Miscellaneous Gram-negative bacilli<br>Spirochetes<br>*Chlamydia* and *Mycoplasma* |
| | | February 19 | *Haemophilus* spp.<br>*Neisseria* spp., *Moraxella* spp. |
| 7 | February 24 | | **Written examination #1**<br>Anaerobes<br>Acid-fast bacilli |
| | | February 26 | Anaerobes; aerotolerance testing<br>Introductory mycobacteriology |
| 8 | March 2 | | Basic molecular biology<br>Molecular diagnostics |
| | | March 4 | **Laboratory mini-practical examination**<br>PANTHER exercise |
| $$ | March 9 | | No class; spring break |
| | | March 11 | No laboratory; spring break |

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# TIMELINE (Spring Break)

- Oh, #$%@



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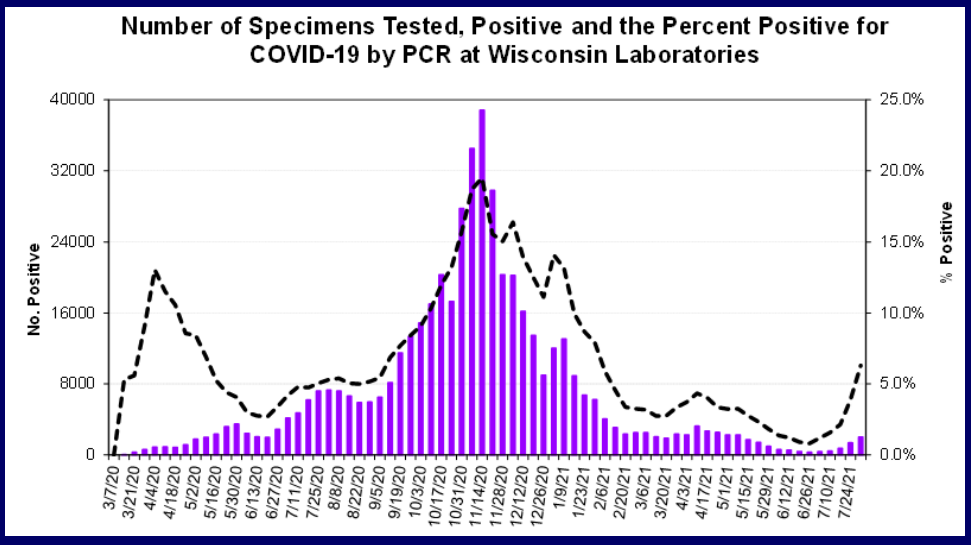
# #$%@STORM

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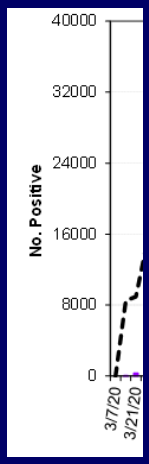
# #$%@STORM

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# WHAT DO WE DO NOW (Friday)?




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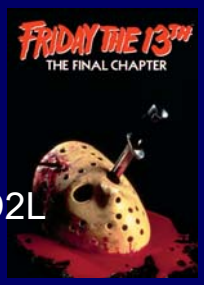
# CAN WE PULL THIS OFF (still Friday)?




- Conversion (everything) to electronic
- Which modality/format?

  We've recorded PowerPoints before; D2L Accountability
  "Getting Emails at 0300"
  Microsoft Teams…but NO HELP/RESOURCES
- Additional rumblings that faculty on-campus presence will be limited (laboratory offerings)
- Evaluations (intra-student collaboration?)

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# MAJOR ITEMS FALL INTO PLACE

- Set up meetings in Microsoft Teams via Outlook (major assist to College of Nursing--they were scrambling for a different reason)
- A major heist
- "Essential"
- Having an 18-year-old son in college

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# THE HEIST

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# THE ROLL OUT (Saturday)

- Mass communication
  - Changing expectations
  - Synchronous
  - Most of their friends have another week off
  - Some of these people may not be coming back
- How to “attend class”
  - They’ve never been on Teams, either
  - Screen-shot tip sheets (major assist to Matthew)
- Drive-up meetings to distribute printed materials

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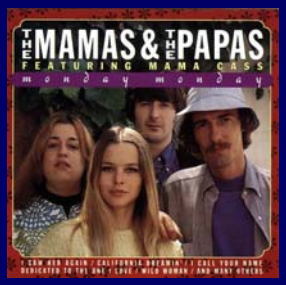
# MONDAY, MONDAY (the 16th)

- 0830-1130 Nursing students
  - Mycology PowerPoint lectures on Teams
  - Synchronous
  - Everyone showed up
    (sorry, those from California)
  - Five-point lecture quiz via Email




- 1200-1300 MLS/CLS/MT students
  - Specimen Collection lecture on Teams
  - Synchronous
  - Everyone showed up (one with bandwidth problem)
  - Five-point lecture quiz via Email

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# UNKNOWNS WITH MLS JUNIORS

- Cultivate “clinical unknowns” on multiple media
  - Snap digital images (iPad), upload to D2L
  - Everyone in class has access to “all” unknowns
  - Assign set of images the night before
- Day 1 laboratory: come with a game plan
  - Predominant organism/potential pathogen?
  - Erik will confirm Gram stain reaction (when asked)
  - What is your initial biochemical screen?
  - Which tests do you want?
- Day 2 laboratory: read reactions, ID, rationale

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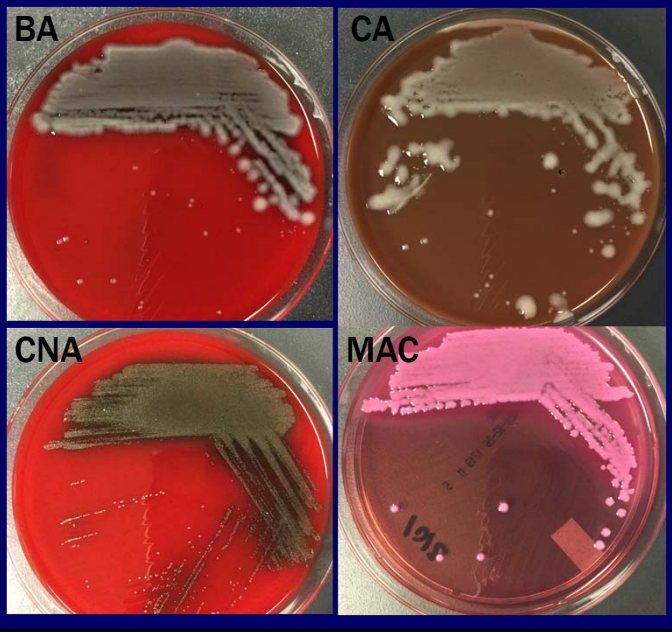
# SPECIMEN SOURCE: SPUTUM

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# UNKNOWNS WITH MLS JUNIORS

https://web.microsoftstream.com/video/f37fd7ee-1ea1-48f6-8852-1435147c8ba1

Long Dorian conversation

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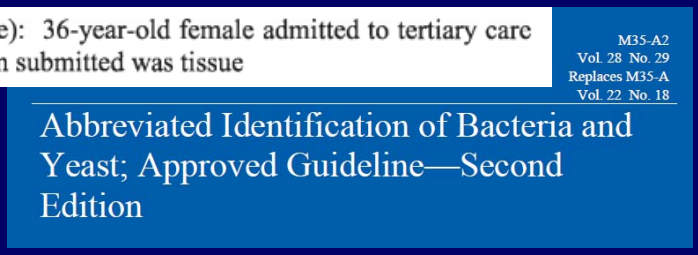
# M35 EXERCISE WITH NURSES

- Receive case presentation in advance

  We've discussed all organisms in previous lectures
  We've seen all organisms in previous lab sessions

Case B (Kristen and Annie): 36-year-old female admitted to tertiary care facility burn unit; specimen submitted was tissue




- Describe CLSI M35 document (with selected examples) just prior to beginning exercise

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# M35 EXERCISE WITH NURSES

https://web.microsoftstream.com/video/fc58a3d2-3eb2-4edb-863a-57fdf91dafdc

Short Dorian conversation

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# LIVE MICROSCOPY

https://web.microsoftstream.com/video/12c0597a-9015-4c6f-a158-c75dad0dc451

Matthew conversation

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Laboratory Practical (no “rotations”)

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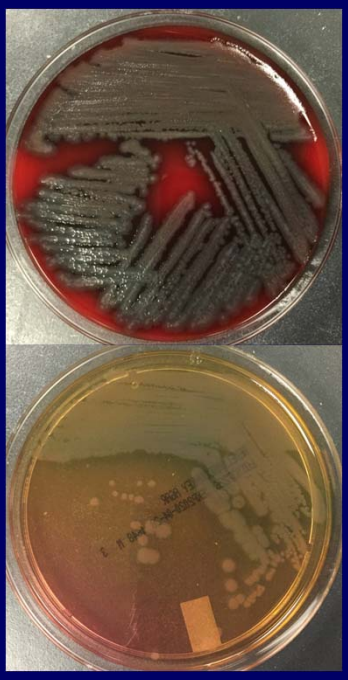
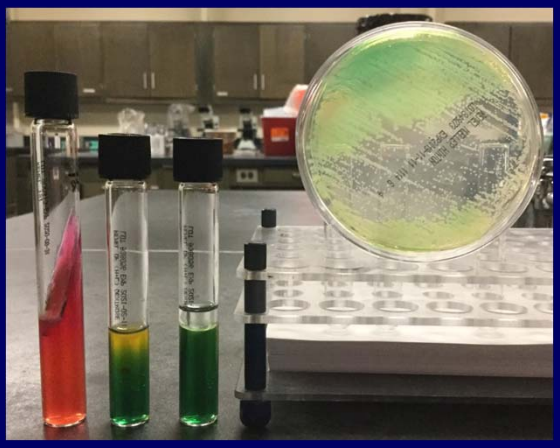
# QUESTION 6



Blood agar

MacConkey agar

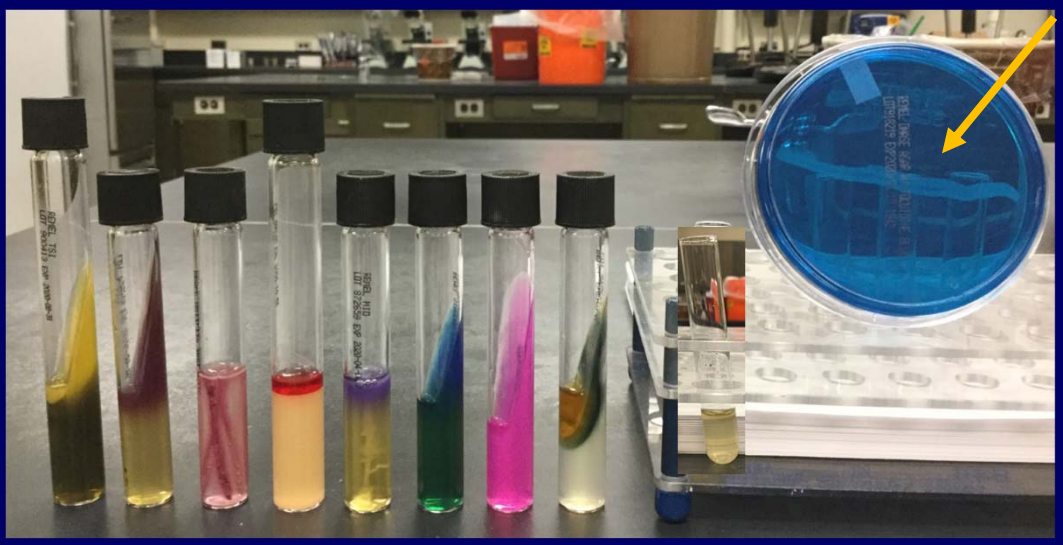


TSI OF tubes

Mueller Hinton agar

25

# QUESTION 9 (two parts)



TSI LIA Motility Indole MIO (Ornithine) Citrate Urea Phenylalanine VP DNase

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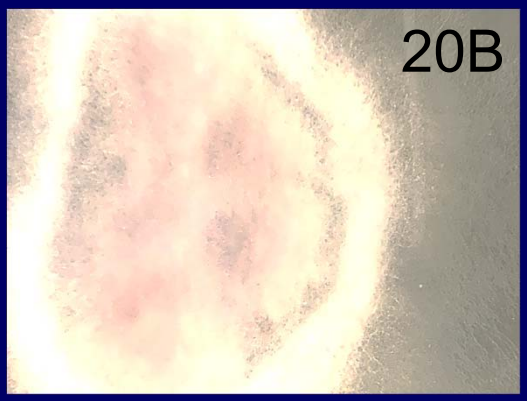
## QUESTION 20B




~4 days to grow

Microscope to Follow

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## QUESTION 25 (two parts)

Microscope Demonstrations

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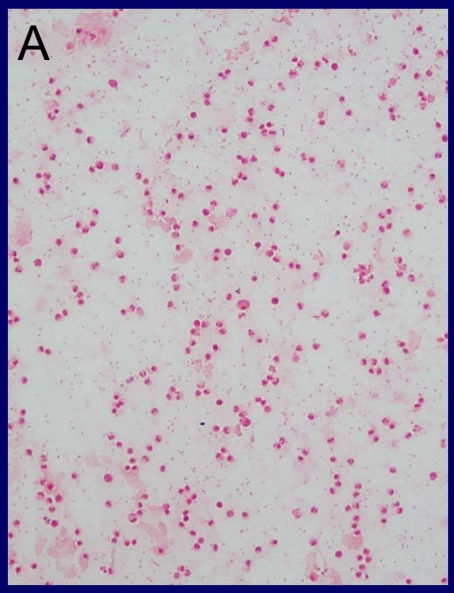
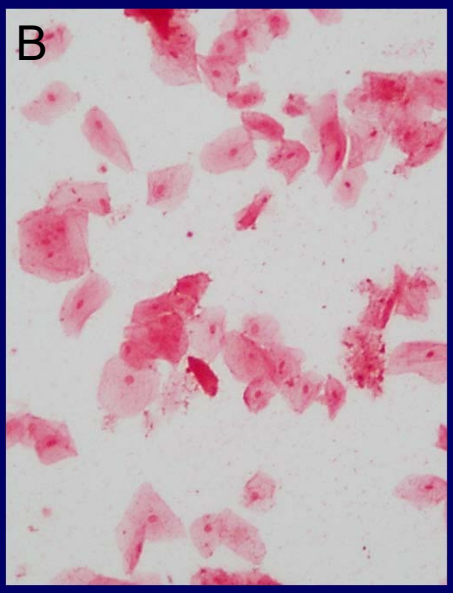
# QUESTION 2 (three parts)

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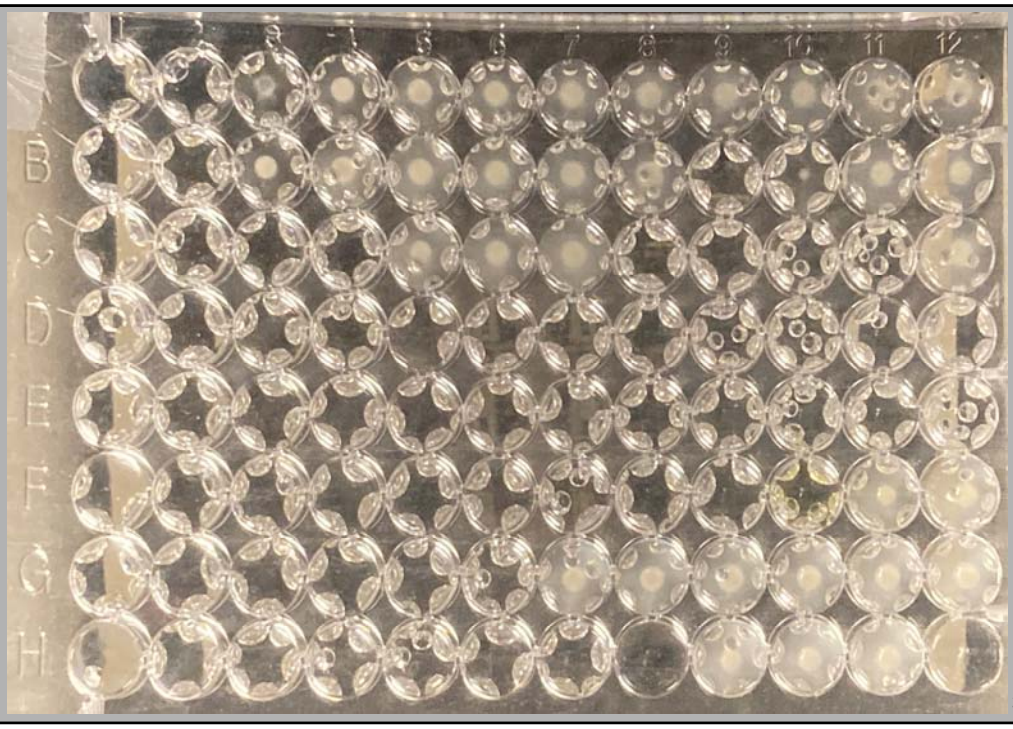


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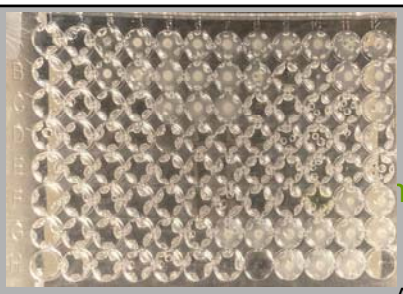

# Broth Microdilution

Refer to your protocol for
ap & dilutions/concentrations

Growth
No growth

| Left Side | Right Side |
|---|---|
| LEV levofloxacin | AMP ampicillin |
| CIP ciprofloxacin | TOB tobramycin |
| CFZ cefazolin | A/S amp-sulbactam |
| FEP cefepime | CAX ceftriaxone |
| CAZ ceftazidime | P/T pip-tazobactam |
| ERT ertapenem | FOX cefoxitin |
| MER meropenem | NIT nitrofurantoin |
| AZT aztreonam | T/S trimeth-sulfa |
| | GEN gentamicin |

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | LEV 32 | LEV 16 | LEV 8 | LEV 4 | LEV 2 | LEV 1 | LEV 0.5 | LEV 0.25 | | | | |
| B | | | | | | | | | | | | |
| C | | | | | | | | | | | | |
| D | | | | | | | | | | | | |
| E | | | | | | | | | | | | |
| F | | | | | | | | | | | | |
| G | MER 16 | MER 8 | MER 4 | MER 2 | MER 1 | MER 0.5 | | | | | | |
| H | | | | | | | | | | | | |


# Final Thoughts (Erik)


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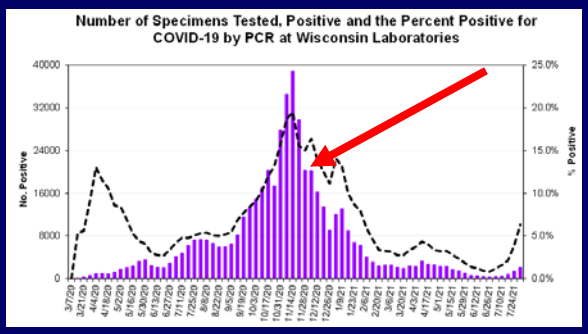
# WHAT HAPPENED IN LATE 2020/2021?

- Small class sizes facilitated in-person didactic and laboratory education (to a degree)




- Spring 2021

LOTS of catch-up with the new MLS juniors
Face coverings in lecture; N95 in laboratory

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# THE GOOD


- "We got to hear about everyone else's unknown--not just our own!"
- Regurgitation during live microscopy
- Now offer "Late Night Microscopy" review sessions
- Practical examination on PowerPoint/Teams not the worst thing in the world

Don't have to worry about "OMG, it didn't grow"
Less prep time; less co$t
May be beneficial/fair for large class sizes

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# THE BAD


- What are they really doing (lecture)?
- THEY'RE NOT ASKING QUESTIONS
- What are they really doing (exams)?
- Hemolysis, AST, molds do not digitize well; cannot sniff in TV Land

- Tactile skills (a.k.a. practice)
  - Streaking for isolation
  - Finding something on oil immersion (coccobacilli)
  - 3D aspect of microbes (LPCB; protozoa)

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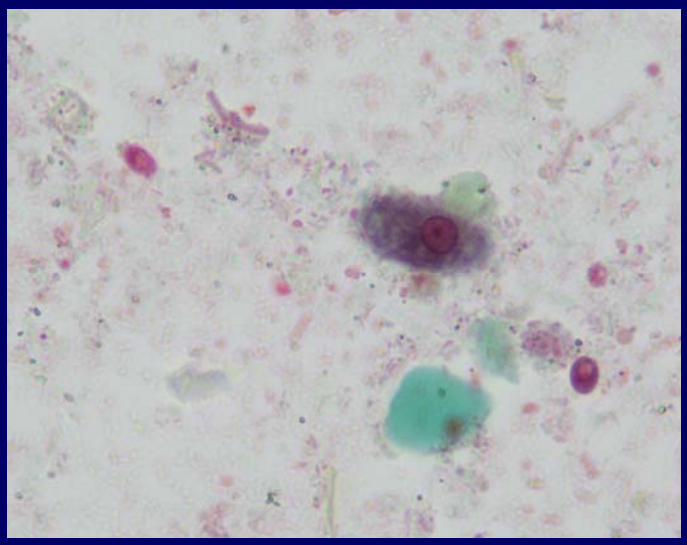
# AMOEBAE



*Entamoeba histolytica/dispar* trophozoite (trichrome, 100X)

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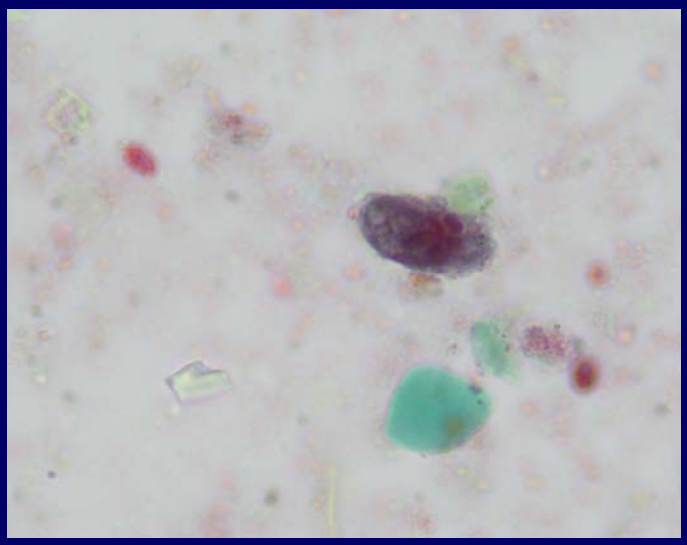
# AMOEBAE



*Entamoeba histolytica* same troph (RBC; trichrome, 100X)

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# THE UGLY

- Lose an organization tool when not in front of them
- Lose a motivational tool when not in front of them
- Loss of collaboration/camaraderie
- Bandwidth and delays
- Are they going to be ready for clinicals?
- Not letting them do anything


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## You Make the Call

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## KAHOOT

Has your opinion of on-line microbiology laboratory education (practicum) changed after listening to this?

A. Yes, this could work.

B. Yes, we're screwed.

C. My opinion did not really change.

D. I am a stubborn Scandinavian (or other applicable heritage) and am not a huge fan of change.

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# Final Thoughts (Your Turn)


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# ACKNOWLEDGMENTS

Valerie Everard-Gigot, Ph.D., MT(ASCP)
Matthew Munson
Dorian Weir
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Jim Hermanson

Sarah Alhakimi
Brittany Cassel
Lauren Crudo
Tracy Le
Madi Leafblad
Jezabel Ninaja Villa
Laura Perez Raya
Peter Stahlberg
Kristina Viegut

The real heroes in the medical and public health laboratory community

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# Engaging and Training Future Olympians

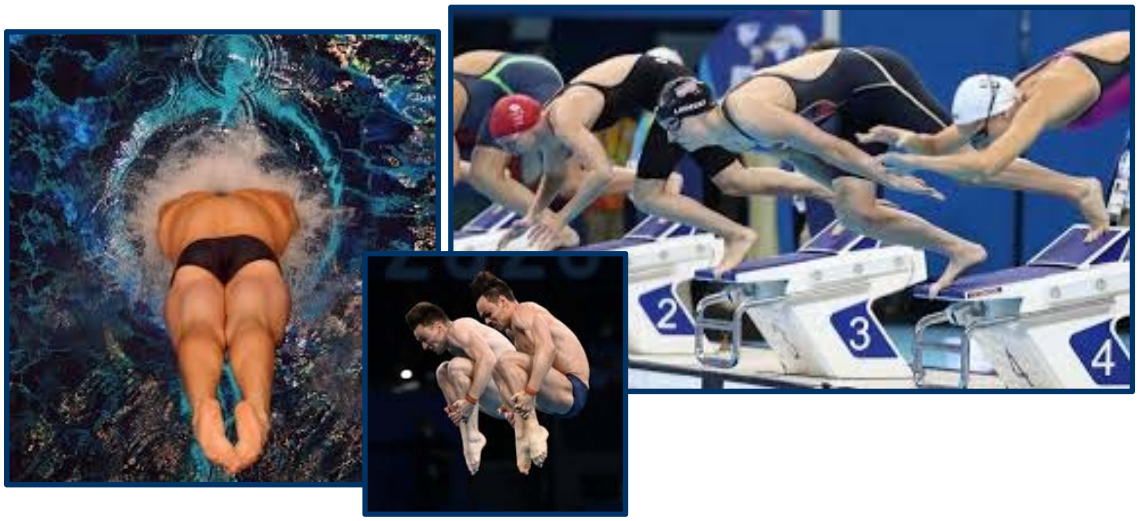
**Laboratory Panelists and Audience:**

How has the COVID-19 pandemic affected your ability to engage and train:

- Students who will comprise our future workforce?
- New employees?
- Have you had any issues hiring staff?



# Diving Into the Unknown



# Diving into the Unknown
# The Start of a Pandemic

Alana Sterkel, PhD, D(ABMM), SM(ASCP)CM
Associate Director, Communicable Disease Division
Wisconsin State laboratory of Hygiene



## Welcome Back!

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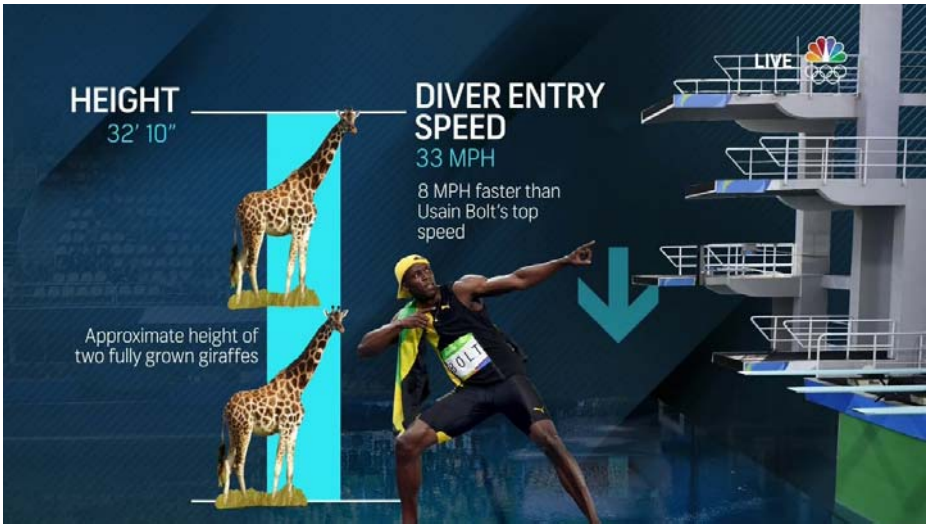
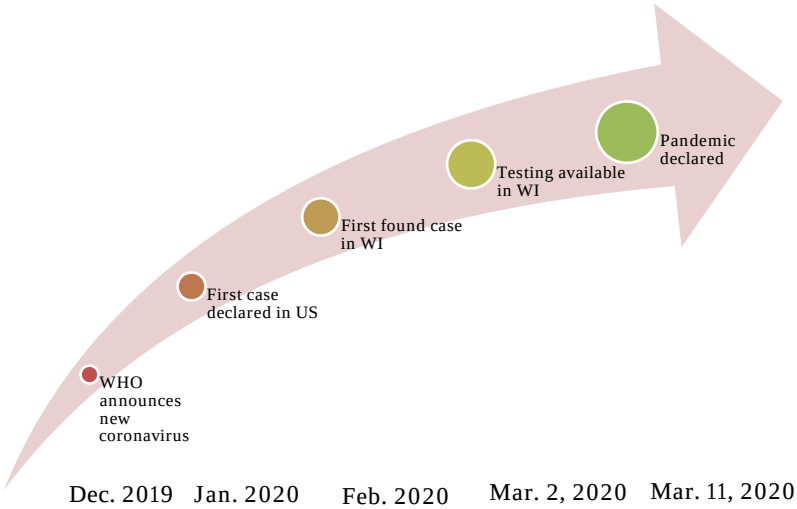
# Olympic High Dive



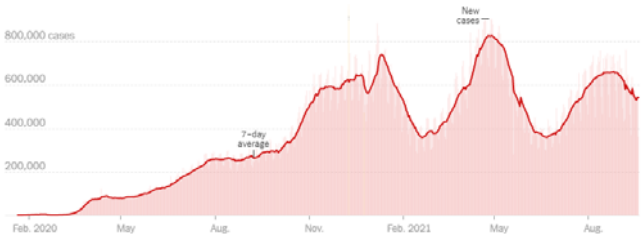



# Climbing Escalation



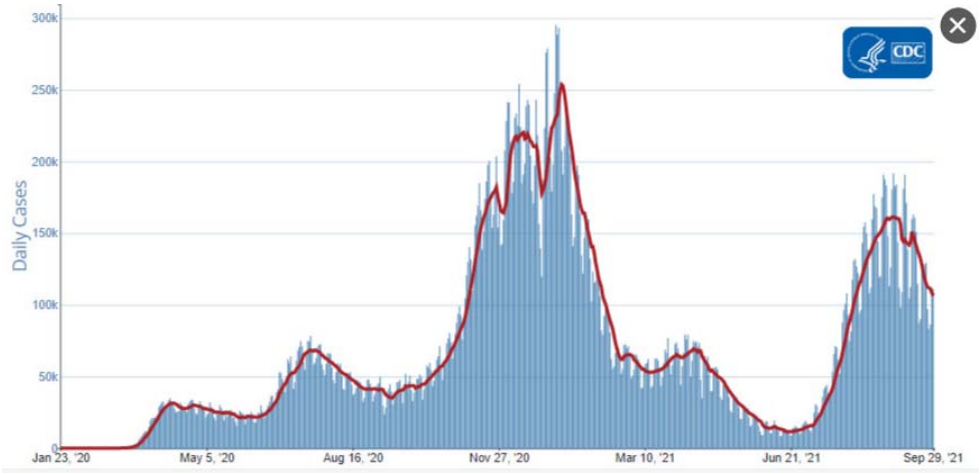
# The Fire is Lit


Worldwide case/day



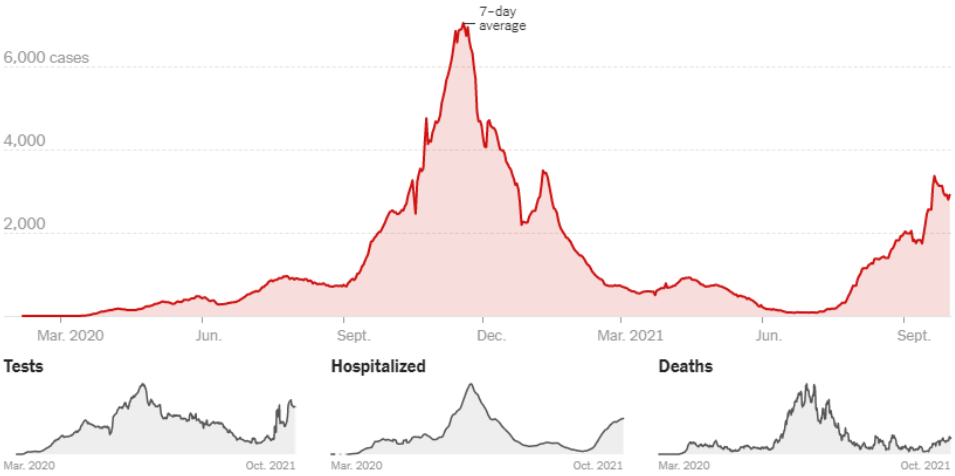



# COVID-19 in the US



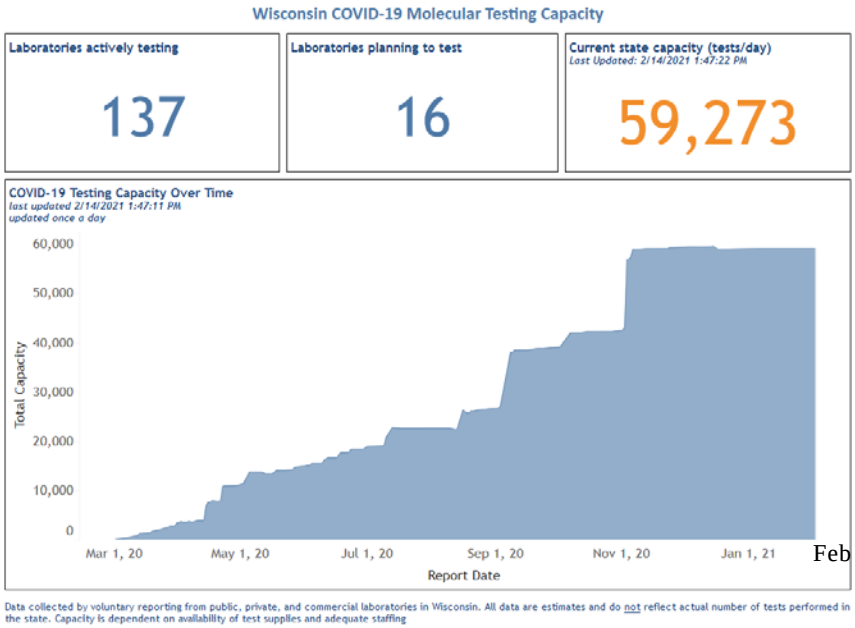

https://www.cdc.gov/coronavirus/2019-ncov/covid-data/covidview/index.html

# COVID-19 in Wisconsin

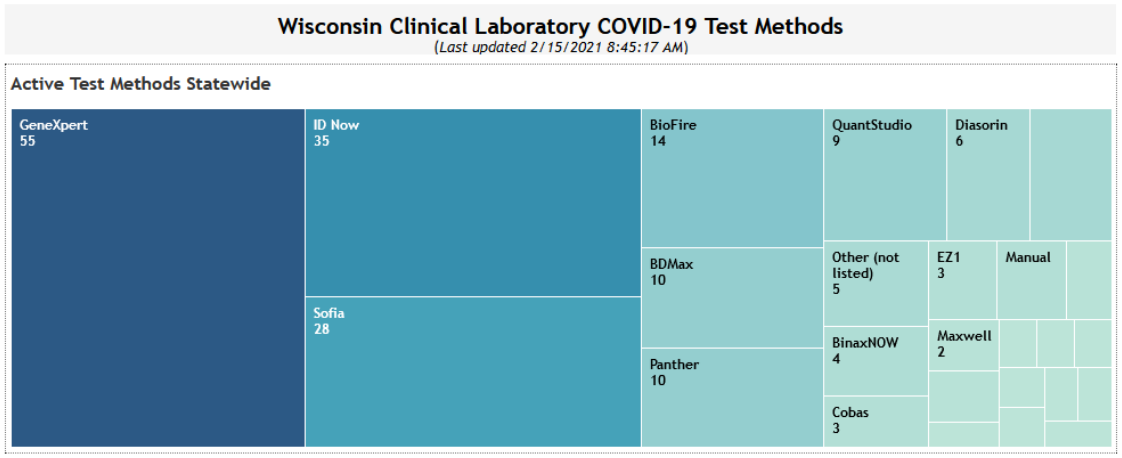



https://www.nytimes.com/interactive/2021/us/wisconsin-covid-cases.html






Feb 2021




Feb 2021

# Hurdles in Our Path

- We've seen supply shortages
- We've seen overfull hospitals
- We've seen demands for testing we couldn't provide
- We've been bombarded with rapidly changing information
- We've navigated demands from our hospitals and doctors
- We've battled against spreading mis-information
- We've managed changes to our own lives

## Purpose

- Learn from our successes and from our mistakes
- Share our experiences

- This has been profoundly life changing and emotional

- Take care with your words, let's build each other up today



## Diving Into the Unknown

**All Panelists:**

When you first heard about the declaration of the COVID-19 pandemic, what were your:

- First thoughts?
- First actions?

What partners did you connect with and why?

What resources did you refer to or utilize?

# Diving Into the Unknown

**Audience:**

When you first heard about the declaration of the COVID-19 pandemic, what were your:

- First thoughts?
- First actions?

What partners did you connect with and why?

What resources did you refer to or utilize?



# Break

# Clearing the Hurdles and Sprinting to the Finish Line





# Clearing the Hurdles and Sprinting to the Finish Line

**Laboratory Panelists:**

What were some of the obstacles that you had to hurdle early on in the pandemic to continue to provide routine laboratory testing?

# Clearing the Hurdles and Sprinting to the Finish Line

**Infection Prevention Panelist:**

What were some of the obstacles that you had to hurdle early on in the pandemic to continue to provide safe routine care?



# Clearing the Hurdles and Sprinting to the Finish Line

**State/Local Public Health Panelists:**

What were some of the obstacles that you had to hurdle early on during the COVID-19 pandemic?

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# Clearing the Hurdles and Sprinting to the Finish Line

**Audience:**

Were there other obstacles that haven't been mentioned yet that you had to hurdle to provide routine laboratory testing or care?



# Kahoot

Where do you work?

A. Laboratory
B. Infection prevention
C. Local public health
D. State public health

## Kahoot

If you work in the laboratory, which of the following most closely describes your workplace?

A. Clinic
B. Hospital ≤25 beds
C. Hospital >25 and ≤100 beds
D. Hospital >100 beds)



## Kahoot

Did you implement SARS-CoV-2 testing in your laboratory?

A. Yes
B. No

# Kahoot

Did you use, or are you still using a commercial reference laboratory for SARS-CoV-2 testing?

A. Yes we did, until we could bring on testing, but we are no longer doing so and are currently testing in-house.
B. Yes we did, and we are still using a reference lab for testing.
C. No, we are part of a healthcare system and all our testing is referred to one location within our healthcare system.
D. No, once commercial testing was available we've performed all testing in-house.



# Clearing the Hurdles and Sprinting to the Finish Line

**Laboratory panelists and audience:**

If you implemented SARS-CoV-2 testing, what strategy did you use to determine what assay(s) you would use?

Did you have to modify your testing strategy and why?

What type of screening testing did the laboratory perform (presurgical, employee) and how?

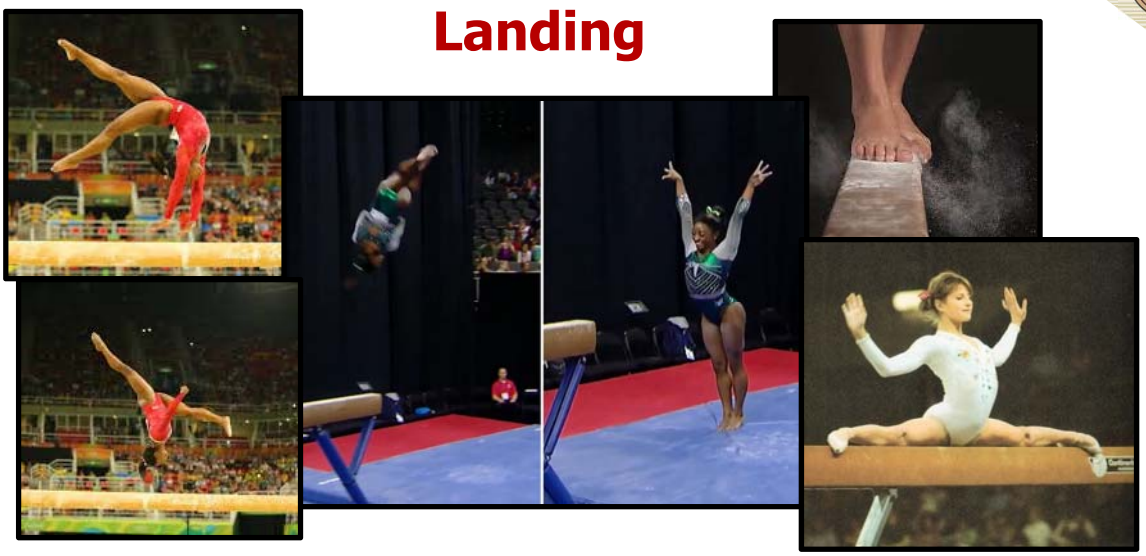
# Clearing the Hurdles and Sprinting to the Finish Line

**Panelists and Audience:**

Did the obstacles you had to hurdle change as the pandemic continued and if yes, how did they change?



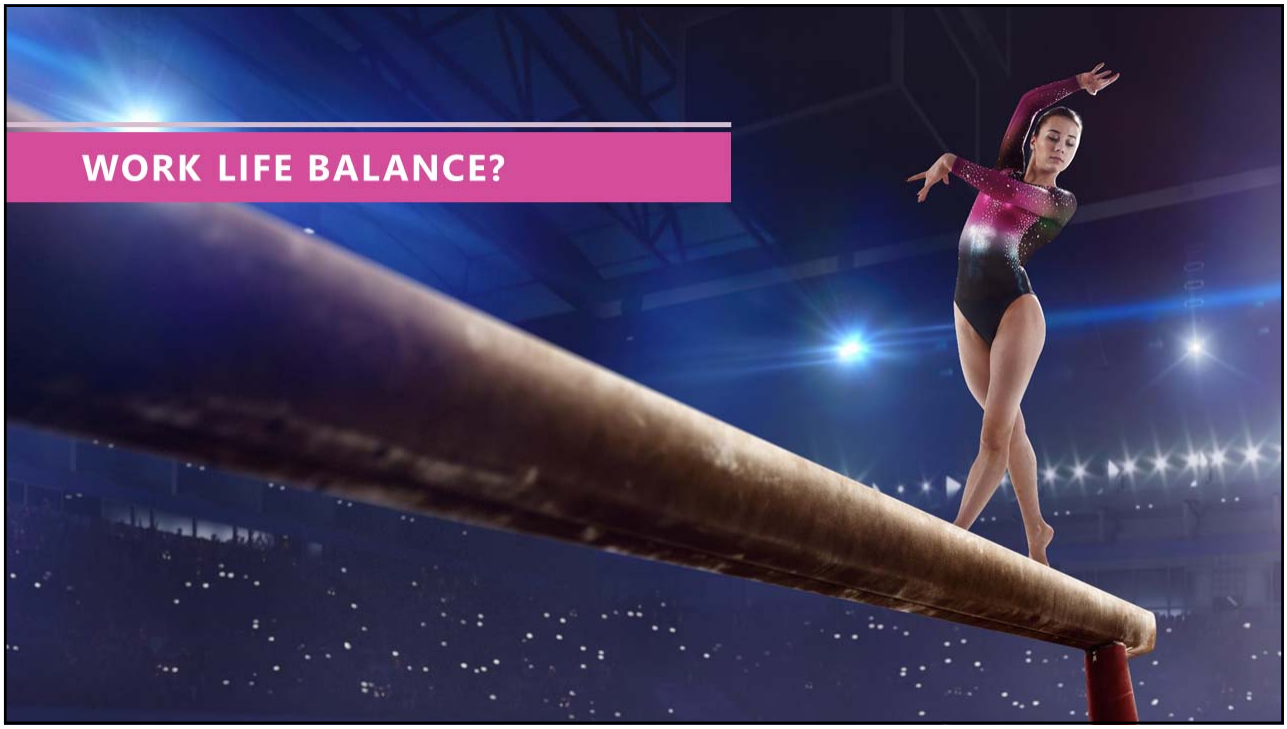
# Finding Balance and Sticking the Landing



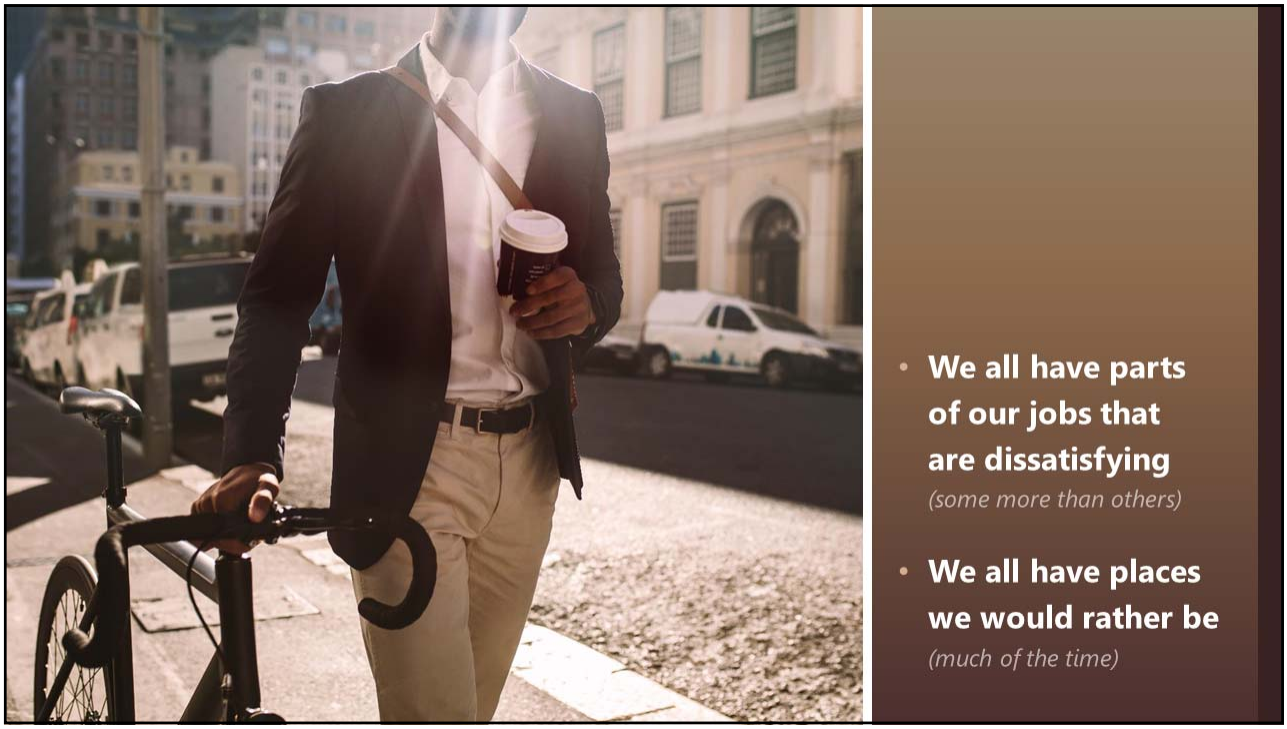

Lake Placid

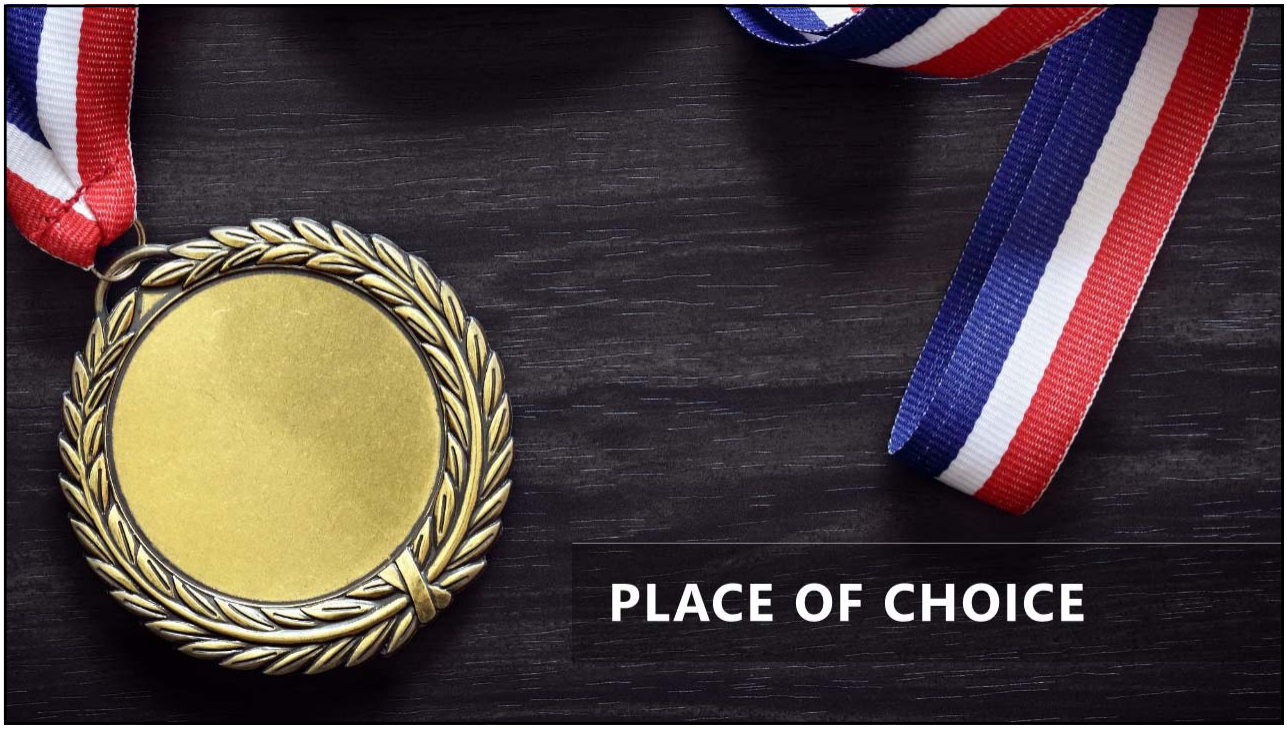

WORK LIFE BALANCE
Sticking the Landing
Bob Leschke, MD, CPCC

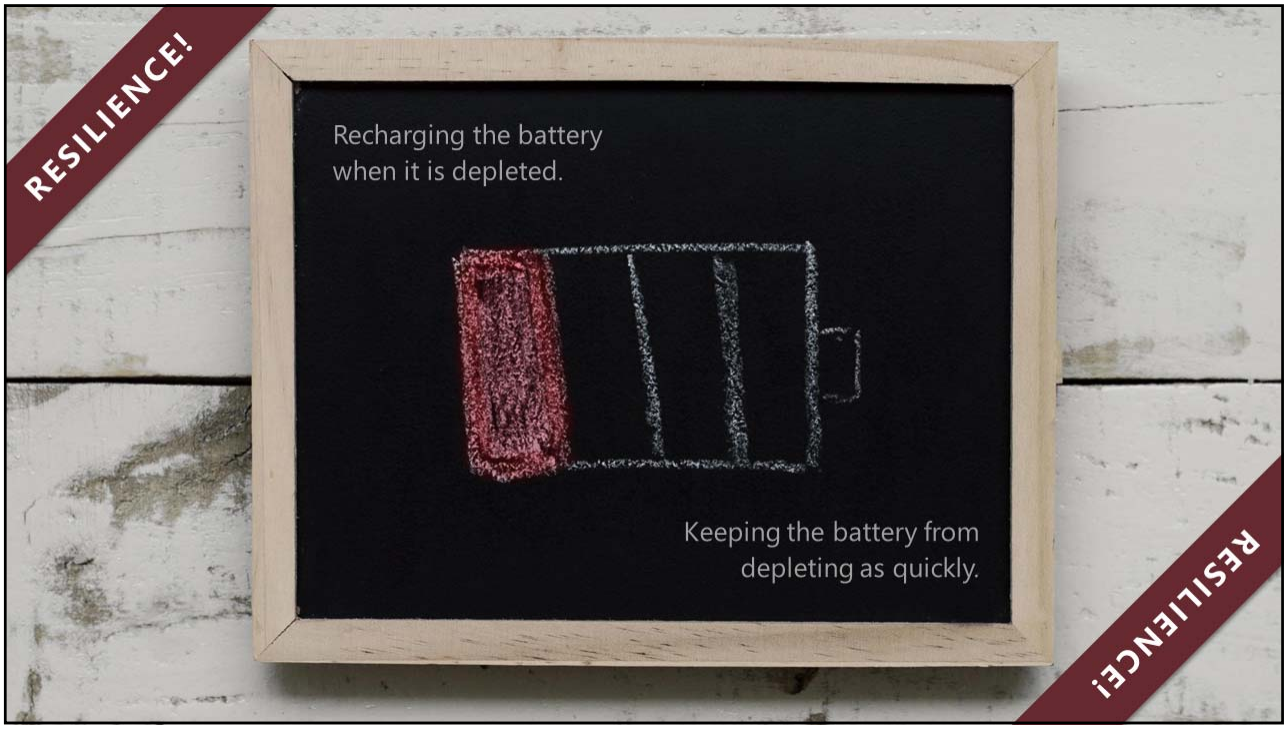

WORK LIFE BALANCE?

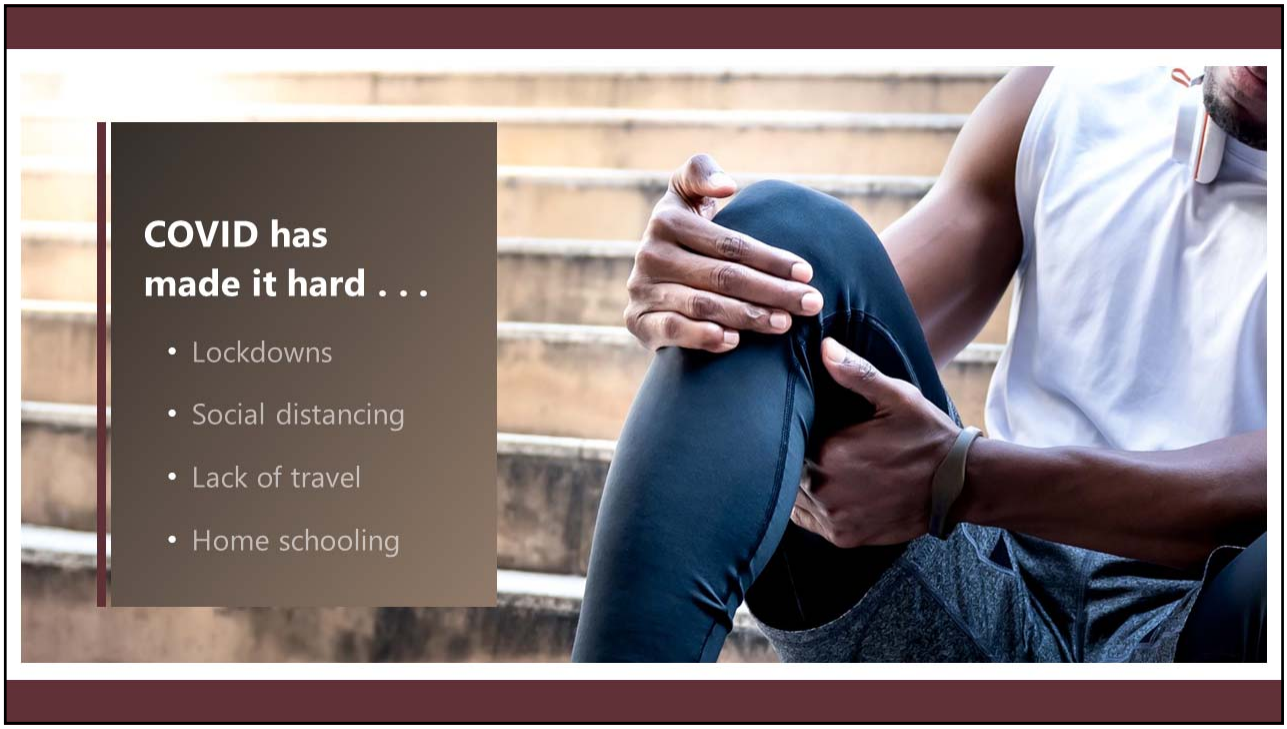

WORK LIFE BALANCE?

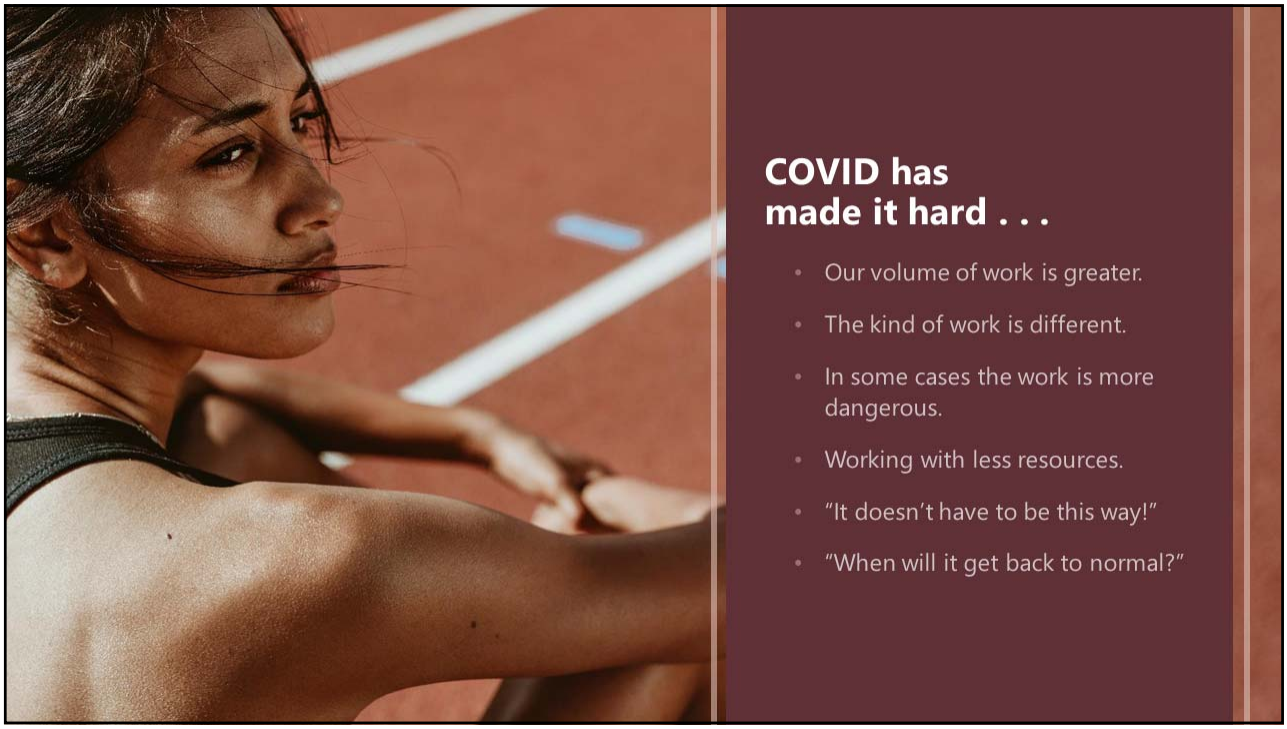

WORK LIFE BALANCE!


We all have parts of our jobs that are dissatisfying
(some more than others)
We all have places we would rather be
(much of the time)


PLACE OF CHOICE


RESILIENCE!
Recharging the battery
when it is depleted.
Keeping the battery from
depleting as quickly.
RESILIENCE!


COVID has made it hard . . .
• Lockdowns
• Social distancing
• Lack of travel
• Home schooling


COVID has made it hard . . .
• Our volume of work is greater.
• The kind of work is different.
• In some cases the work is more dangerous.
• Working with less resources.
• "It doesn't have to be this way!"
• "When will it get back to normal?"


## AGENCY

- The sense that we have some say in what happens and that our actions make a difference in the outcome.
- Focus on the places that you have some control and stop trying to control what you can't.


Agency
+ Plan
Hope


BOUNDARIES &
TRADE OFFS


What are you
willing to say
YES
to?

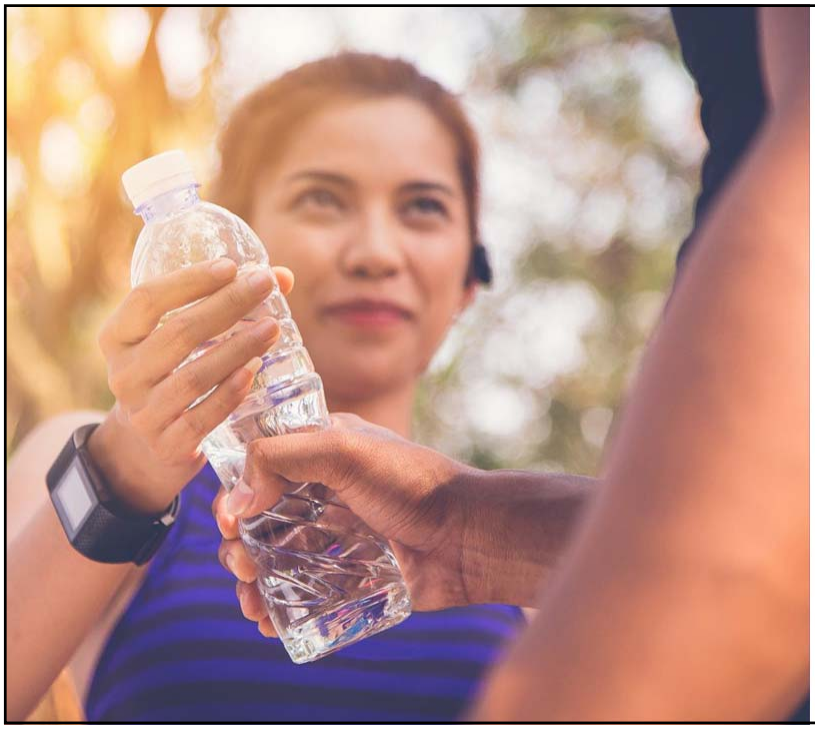

What are you
willing to say
NO
to?


WHAT WILL YOU
DO?
WHO WILL YOU
BE?


SELF COMPASSION

## Aware

- We must be willing to believe that we are hurting.
- We have our own special reasons why things are hard and we can share those reasons with others.



## Worthy

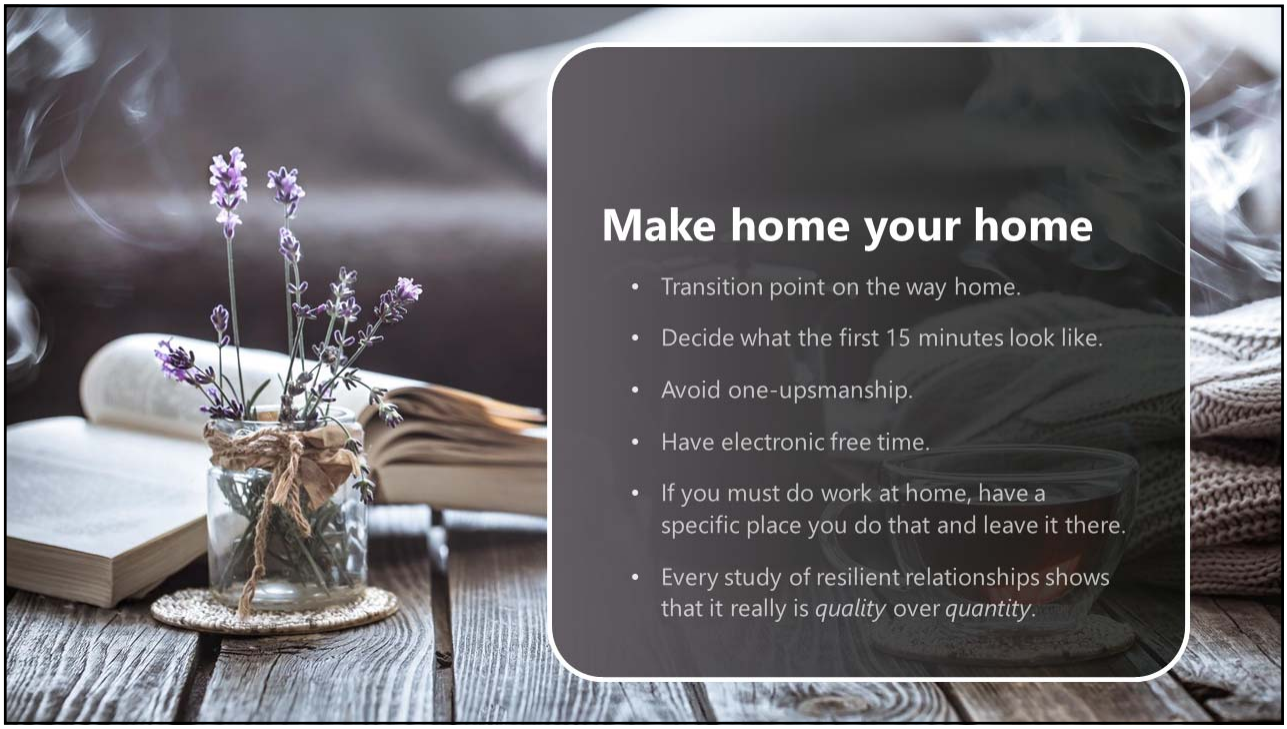
- We must believe that we are deserving of relief.
- "Everyone is hurting now so I can wait."

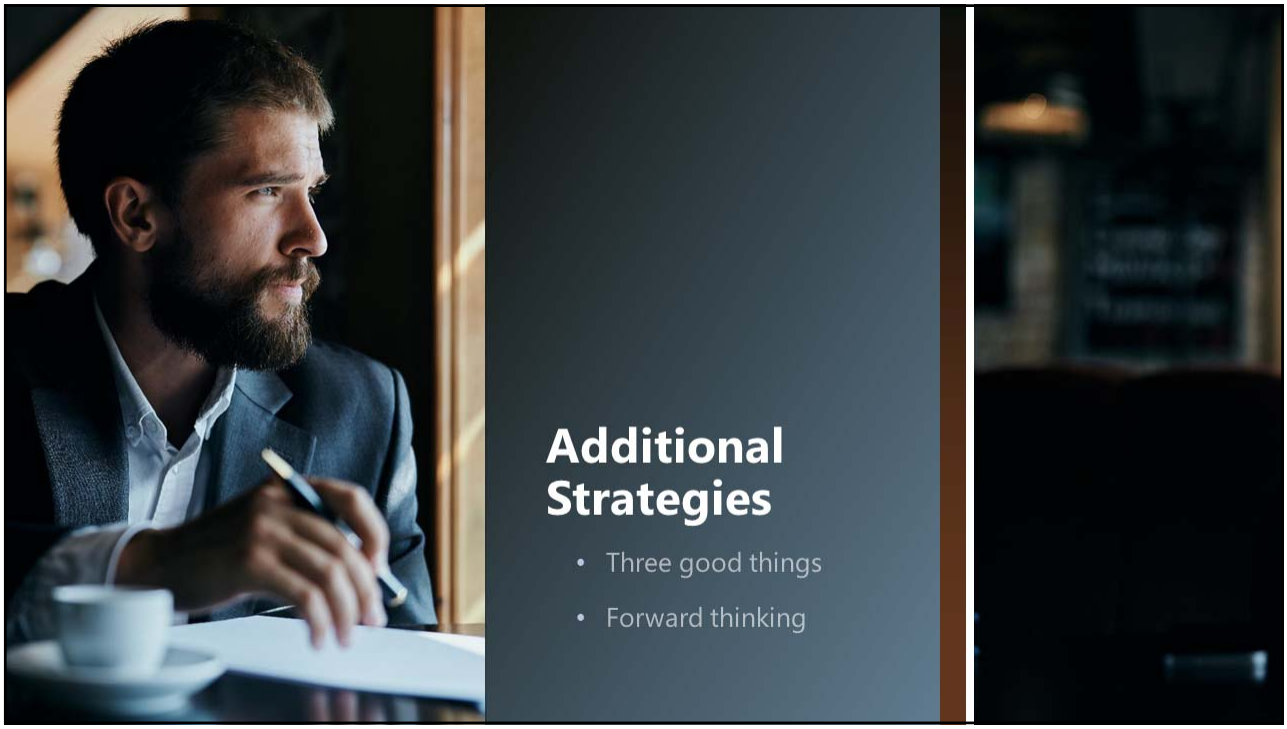

you cannot
pour from an
empty cup
Enough
We must believe that
care for ourselves
does not come at the
expense of others.


Selfish
• Put on your own mask
before you help others.
• Good kind of "selfish".


## At work strategies

- Three deep breaths
- Meditative hand washing
- Body checks
- Totems
- Step away from your environment


Make home your home
• Transition point on the way home.
• Decide what the first 15 minutes look like.
• Avoid one-upsmanship.
• Have electronic free time.
• If you must do work at home, have a specific place you do that and leave it there.
• Every study of resilient relationships shows that it really is *quality* over *quantity*.


Additional Strategies
• Three good things
• Forward thinking

## STICK THE LANDING!

Start where you are.

Use what you have.

Do what you can.


LESCHKE COACHING AND CONSULTING

# WORK LIFE BALANCE

## Sticking the Landing

**Bob Leschke, MD, CPCC**

http://leschkecoaching.com • leschkecoaching@gmail.com

# Building the Team and Passing the Baton




# Building the Team and Passing the Baton

**Panelists:**

Responding to the pandemic required teamwork. Describe how the process worked in your facility and who your team was comprised of.

Did the roles of the team members change and evolve over the course of the pandemic?

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# Building the Team and Passing the Baton

**Audience:**

Responding to the pandemic required teamwork. Describe how the process worked in your facility and who your team was comprised of.

Did the roles of the team members change and evolve over the course of the pandemic?



# Building the Team and Passing the Baton

**Laboratory Panelists:**

What were your initial goals for testing capacity and what is your test capacity now?

What impacted your test volume and capacity?

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# Building the Team and Passing the Baton

**Laboratory Audience:**

What were your initial goals for testing capacity and what is your test capacity now?

What impacted your test volume and capacity?



# Building the Team and Passing the Baton

**Panelists and Audience:**

Were you able to pass the baton successfully?

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# Victory Lap for the Gold Medal Laboratory Heroes




# Lunch – Back at 12:45 PM

# Riding the Waves and Rowing Together



# Riding the Waves and Rowing Together

**Laboratory Panelists:**

How do you feel about your laboratory's overall response to the COVID-19 pandemic?

**Audience:**

How do you feel about your laboratory's overall response to the COVID-19 pandemic?

How do you feel about the WCLN's overall response to the COVID-19 pandemic?

# Riding the Waves and Rowing Together

**Infection Prevention Panelist:**

How do you feel about your infection prevention overall response to the COVID-19 pandemic?

**Audience:**

How do you feel about your facilities infection prevention overall response to the COVID-19 pandemic?

How do you feel about infection preventions overall response to the COVID-19 pandemic?



# Riding the Waves and Rowing Together

**Public Health Panelists:**

How do you feel about your public health department's overall response to the COVID-19 pandemic?

**Audience:**

How do you feel about your local public health department's overall response to the COVID-19 pandemic?

How do you feel about the state public health department's overall response to the COVID-19 pandemic?

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# Riding the Waves and Rowing Together

## Laboratory Panelists and Audience:

What changes have you made in the laboratory as a result of the pandemic that you will keep moving forward?



# Riding the Waves and Rowing Together

## Infection Prevention Panelists and Audience:

What changes have you made in infection prevention as a result of the pandemic that you will keep moving forward?

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# Riding the Waves and Rowing Together

## Public Health Panelists and Audience:

What changes have you made in public health as a result of the pandemic that you will keep moving forward?



# Riding the Waves and Rowing Together

## All Panelists and Audience:

When the next pandemic occurs, what will you do that worked well with the COVID-19 pandemic and what will you do differently?

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## Rugby, Fencing, or Synchronized Swimming?





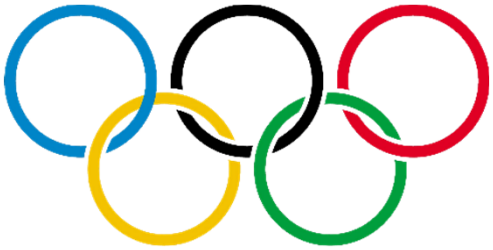


## Andrea Pitkus, PhD, MLS(ASCP)$^{CM}$
## Disclosures

- I am a paid employee of the University of Wisconsin-Madison and member of the Problem Concept Maps (ProMaps) team
- ProMaps is housed in the Department of Medicine in the School of Medicine and Public Health at UW-Madison

## Agenda

- What is a Patient Problem?
- ProMaps and the Problem Oriented View
- Laboratory Role and Value
- Clinical Decision Support LOINC Considerations
- Communications
- Questions?



## Objectives

- Discuss ways laboratory data can be utilized in aiding clinical decision making
- Improve Cross Disciplinary Communication

## What is a Patient Problem?

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## The Problem

- Office of the Coordinator for Health IT (ONC) defines a problem as “information about a condition, diagnosis, or other event, issue, situation or clinical concept that is documented.”
- An elevated cholesterol (result or finding) may warrant “lipidemia” be added to problem list
- It is mapped to International Classification of Diseases (ICD) or SNOMED CT codes in the electronic health record and LIS.

# Problems and The Problem List

- The problem list contains current and past (resolved) patient problems
- Why is this important?
- Physicians organize their work around patient problems. CMS requires ICD codes for billing.
- An HIV problem may warrant lab orders for HIV testing or CD4 levels for monitoring, diagnosing or treating the problem and medications such as Nucleotide Reverse Transcriptase Inhibitors or Antifungals

# The Problem: Clinician Burnout


Cognitive Overload

**Clinician Burnout**


The…..***split-attention effect***[1] occurs when clinicians must interact with multiple sources to acquire and synthesize information…..

In just three years, physician burnout increased from 45.5 percent to 54.4 percent, according to a paper authored by doctors at the University of California, Riverside School of Medicine.
American Journal of Medicine, August, 2018

Stanford's Chief Wellness Officer Aims To Prevent Physician Burnout
Washington Post, August 3, 2018

The Widespread Problem of Doctor Burnout
New York Times, August 23, 2012

[1]Harrry E, et. al., Cognitive Load and Its Implications for Health Care. *NEJM Catalyst*. Published 2018 March 14.

# The Solution: Problem Oriented View (POV)

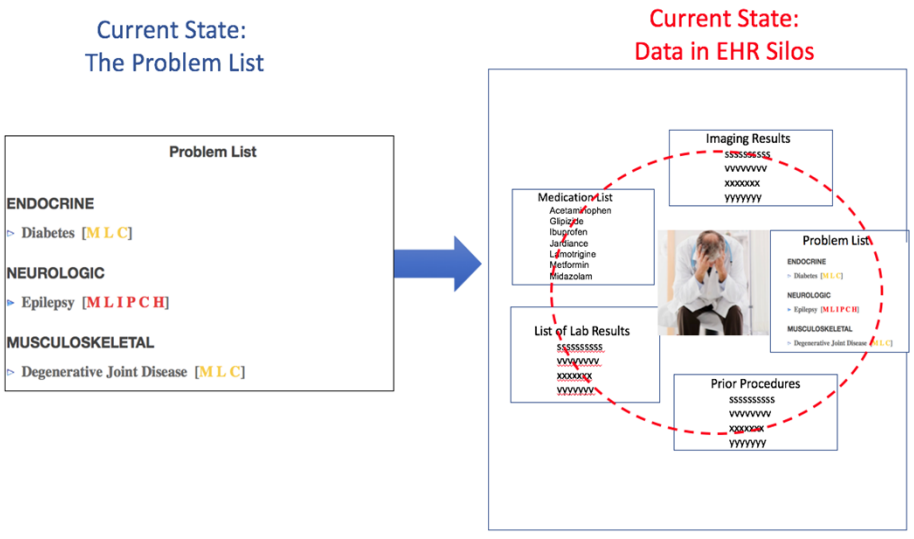
- Dr. Larry Weed fathered the Problem Oriented Medical Record (POML) which organizes relevant data for the patient's diagnoses

  Wright, A., Sittig, D. F., McGowan, J., Ash, J. S., & Weed, L. L. (2014). Bringing science to medicine: an interview with Larry Weed, inventor of the problem-oriented medical record. *Journal of the American Medical Informatics Association : JAMIA*, *21*(6), 964–968. https://doi.org/10.1136/amiajnl-2014-002776

- POV also reduces cognitive burden to find results amidst the data deluge clinicians face with EHRs today

  Buchanan J. Accelerating the Benefits of the Problem Oriented Medical Record. *Appl Clin Inform*. 2017;8(1):180-190. Published 2017 Feb 15.

# Problem Lists



# The Solution

Current State:
The Problem List

**Problem List**

**ENDOCRINE**

- Diabetes [M L C]

**NEUROLOGIC**

- Epilepsy [M L I P C H]

**MUSCULOSKELETAL**

- Degenerative Joint Disease [M L C]

Future State:
Problem Oriented View

**NEUROLOGIC**

- Epilepsy [M L I P C H]

Meds

| | | | | |
|---|---|---|---|---|
| lamOTRIGINE (LAMICTAL) 100MG tab | Take 2 tabs (200mg) in the AM & 1.5 tabs (150mg) in the PM. (Take crushed per G-Tube) | 105 tab | 6 ordered | 6/10/2015 |
| midazolam (VERSED) 2MG/ML syrup | Give 7ml per g-tube for seizures greater than 5 minutes. Limit once daily. | 100 mL | 3 ordered | 7/2/2015 |

Labs

| | | |
|---|---|---|
| LAMOTRIGINE | 4.8 | 1/11/2014 |

Imaging

| | |
|---|---|
| 9/12/2012 | MRI HEAD W & W/O CONTRAST |

Impression: 1. Findings compatible with bilateral Sturge-Weber syndrome with associated

Procedures

| | |
|---|---|
| 12/14/2012 | Routine EEG |

CLINICAL INTERPRETATION: This EEG recording is abnormal due to generalized slowing and disorganization.

Clinic Notes

| | | |
|---|---|---|
| 3/11/2015 | Epilepsy | Dr. Stanley |
| 9/23/2014 | Neurosurgery | Dr. Livingstone |

Hospitalizations

| | | |
|---|---|---|
| 7/31/2014 | Neurosurgery | Dr. Livingstone |
| 8/2/2013 | Neurology | Dr. Stanley |

[2]Buchanan J. Accelerating the Benefits of the Problem Oriented Medical Record. *Appl Clin Inform.* 2017;8(1):180-190. Published 2017 Feb 15.

Problem Oriented View[1,2]
An EHR that organizes relevant patient information for a disease in one window as described above reduces the consequences of split-attention effect.

# ProMaps and the Problem Oriented View

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# Selected Problem Statuses

Maps: Existing, Under Construction and Planned

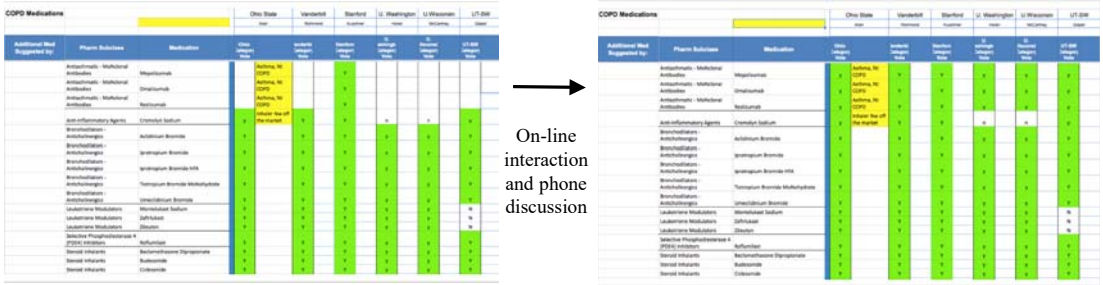
Listing by Specialty

| Specialty | Problem Name | Map Status |
|---|---|---|
| Allergy | Asthma | Planned |
| | Urticaria and Angioedema | Planned |
| Cardiology | Cardiac Arrhythmia | Released |
| | Cardiomyopathy | Fully Validated |
| | Coronary Artery Disease | Released |
| | Dyslipidemia | Released |
| | Heart Failure | Released |
| | Hypertension | Released |
| | Thromboembolic Disease | Reviewed by MD |
| | Valvular Heart Disease | Draft completed |
| Hematology | Anemia | Released |
| | Hemochromatosis | Planned |
| | Chronic Myeloid Leukemia | Planned |
| | Chronic Lymphocytic Leukemia | Planned |
| Infectious Disease | HIV and AIDS | Planned |
| | Lyme Disease | Planned |
| | Osteomyelitis | Planned |

www.problemlist.org

# Map Creation Process

- Modified Delphi Technique to achieve expert consensus via Google Sheets (lab ballot)
- Lab / LOINC expansion of different test results by a medical laboratory scientist
- Physician QA review / scope
- Build Files and Release Online



| | | | |
|---|---|---|---|
| Challenge Tests | Glucose 3 Hours Post 100g Glucose | 1530-5 | PCM Team Decision |
| Challenge Tests | Glucose 3 Hours Post 75g Glucose | 1533-9 | PCM Team Decision |
| Challenge Tests | Glucose 3 Hours Post Dose Glucose | 20437-0 | PCM Team Decision |
| Challenge Tests | Glucose 3 Hours Post Challenge | 18342-6 | PCM Team Decision |
| Challenge Tests | Glucose Baseline | 1547-9 | 83% |
| Challenge Tests | Glucose Pre Dose Insulin IV | 54257-1 | 83% |
| Clinical Category | Result Name | LOINC Code | |

Medications

Show 25 entries Search:

| Category | RxNorm Subclass | Medication | RxNorm Code | % Consensus Agreement |
|---|---|---|---|---|
| Anti-Diabetic Agents | Alpha-Glucosidase Inhibitors | Acarbose | 16681 | 100% |
| Anti-Diabetic Agents | Alpha-Glucosidase Inhibitors | miglitol | 30009 | 100% |
| Anti-Diabetic Agents | Biguanides | Metformin | 6809 | 100% |

## Enabling POV

SME and UW ProMaps team content development driven by clinical guidelines

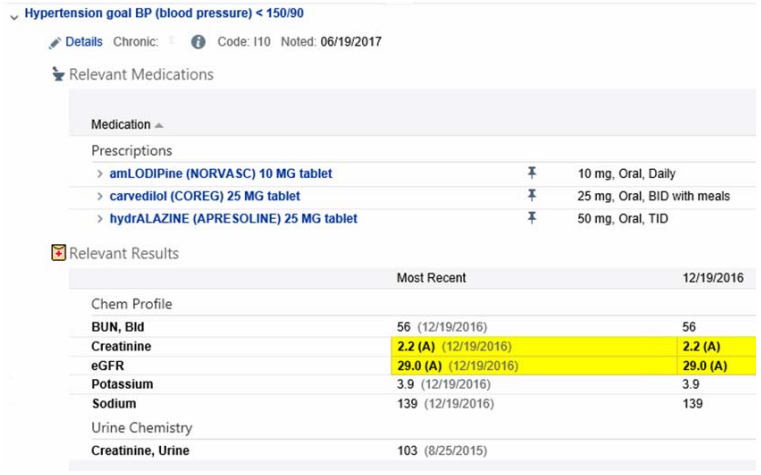
Available online at ProblemList.org

-Diabetes Problem-Meds and Labs (above) leverage LOINC codes for labs, RxNorm codes for meds, and SNOMED CT codes for problems

Freely available for global EHR and information system integration

# Problem Oriented View Study

- Epic simulation environment was used to display data in two Views:
  - The Problem Oriented View (POV)
  - The Traditional View (Epic standard)
- Participants asked to answer questions using the two Views
- 3 institutions, 51 participants (internal medicine residents)
- Cases test ability to extract data from EHR, not clinical knowledge
  - E.g., "John has hypothyroidism. When was his TSH last checked?"



# Study Hypotheses

- The Problem Oriented View will allow participants to complete their cases:

| More Quickly | More Accurately (Lower Error Rate) | With Greater User Satisfaction (SUS)[1] | With Less Cognitive Work (NASA-TLX)[2] |
|---|---|---|---|

1. SUS = System Usability Scale, from Brooke, J. (1986). "SUS: a "quick and dirty" usability scale". In P. W. Jordan, B. Thomas, B. A. Weerdmeester, & A. L. McClelland (eds.). Usability Evaluation in Industry. London: Taylor and Francis. https://www.usability.gov/how-to-and-tools/methods/system-usability-scale.html

2. NASA-TLX = NASA Task Load Index, from Hart, S. G. & Staveland, L. E. (1988) Development of NASA-TLX (Task Load Index): Results of empirical and theoretical research. In P. A. Hancock and N. Meshkati (Eds.) Human Mental Workload. Amsterdam: North Holland Press. https://humansystems.arc.nasa.gov/groups/TLX/

# Study Results

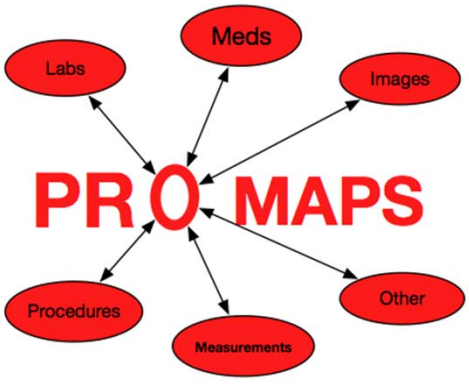
| More Quickly | | More Accurately (Lower Error Rate) | | With Greater User Satisfaction (SUS) | | With Less Cognitive Work (NASA-TLX) | |
|---|---|---|---|---|---|---|---|
| Traditional | POV | Traditional | POV | Traditional | POV | Traditional | POV |
| 196 sec | 172 sec | 7.4% | 3.3% | 41.8 | 58.0 | 0.96 | 0.72 |
| POV faster by 24 seconds | | POV reduces error rate by 55% | | POV more satisfying by 16.2 points<br>Scale 0 – 70, 70 best experience | | POV less cognitive work by 0.24 points<br>Scale 0.4 – 2.8, 2.8 most cognitive work | |
| **p = 0.03** | | **p = 0.003** | | **p < 0.0001** | | **p = 0.0003** | |

- N = 48 participants

Semanik MG, Kleinschmidt PC, Wright A, Willett DL, Dean SM, Saleh SN, Co Z, Sampene E, Buchanan JR. Impact of a problem-oriented view on clinical data retrieval. J Am Med Inform Assoc. 2021 Apr 23;28(5):899-906. doi: 10.1093/jamia/ocaa332. PMID: 33566093; PMCID: PMC8068438.

# The ProMaps Plan

- Current availability in Epic
- Continued development of most common problem maps with labs and meds
- Attain critical mass (~200+) maps, secure additional funding, have as public standard
- Adoption by more EHRs, for more use cases
- Adding radiology, procedures, etc. to maps
- Updates and maintenance of maps




**For More Information, contact:**

Dr. Joel Buchanan
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University of Wisconsin
jbuchanan@uwhealth.org

See More Information at https://problemlist.org

ProMaps slides courtesy of Dr. Joel Buchanan and Dr. Michael Semanik

## Laboratory Role and Value

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## The Laboratory Role and Value

- Clinical laboratory generates over 70% of EHR data utilized for clinical decision making!
- Reduce clinician cognitive burden and better aid clinical use of data like lab data by:
  - Clinical decision support (CDS) tools / aids
  - EHR usability/ redesign / facility customization
  - Policies for implementations

# Laboratory Data Usability 1

- To be computer processable/utilized in clinical decision support like ProMaps, laboratory data need to be:
  - 1. Electronic. Paper records just don't cut it!
  - 2. Discretely Modeled. PDF/Text Blob reports are human readable, but not very computer processable
    - Think Orders-Results-Values LIS Data Builds

# Laboratory Data Usability 2

- 3. Encoded with standard code systems like LOINC for lab orders and results and SNOMED CT for qualitative result values, organisms, specimen types, specimen sources, etc.
- 4. Messaged with proper HL7 message structure and interfaces connecting systems
- 5. Maintained. With test updates, coding updates, new message functionality, etc.

## Why?

- So computers can utilize lab data better
- PCM is dependent on LOINC codes from each performing laboratory driving their appearance in Problem Oriented View.
  - Uncoded or paper results won't appear
  - Important information could be missed from your laboratory
  - It's no longer enough to just report results, they need to be usable!

## Why?

- Huge physician complaint is unusable results → Adds to their burden
- Encoding and structuring lab data at point of origin reduces manual mapping that may be needed out of the laboratory, and allows data to flow to downstream systems reducing potential for errors to be introduced later (a patient safety and data quality issue)

## Clinical Decision Support LOINC Considerations

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# CDS LOINC Considerations

- PCM is example of Clinical Decision Support (CDS) Tool Using LOINC
- Understand Use Cases and ensure LOINC mapping usage is "Fit for Purpose"
  - Maps to LOINC and LOINC Map Quality / Appropriateness
  - LOINC Subsets (Clinical, Lab, Document Ontology, Radiology, etc.)
  - US versus International Use
  - LOINC Status / Use
  - Generic LOINCs / Context

# LOINC Mapping and Maintenance

- Clinical Decision Support Projects using LOINC (like ours) need to:
  - Ensure items are mapped to LOINC (or queries won't return results)
  - Ensure items are mapped appropriately to LOINC (or queries may return unintended results)
- Mappers make sure LOINC is updated within 90 days of each release
- Also vital for 21st Century Cures Act and Federal Interoperability Implementations
  - FHIR Apps, Information Blocking, etc.

# LOINC Considerations US vs Intl

- US vs International Usage
  - Units may or may not differ mmol/L
  - Rankings as rough indicator
  - Community Maps as rough indicator
  - Clinical Experience
  - All inform Usage. Feedback welcome
- Countries with own LOINC subsets
- Countries not using LOINC

| LOI... | Prope... | Ti... | Syste... | Scale | Meth... | LongName | ExU... | ExU... | Order... | Com... | Co... | Rank | SIR... |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 718-7 | MCnc | Pt | Bld | Qn | | Hemoglobin [Mass/volume] in Blood | g/dL | g/dL | Both | 216 | 24 | 2 | 2 |

## LOINC Statuses

- Deprecated, Discouraged or Trial
- We include Deprecated and Discouraged, even though Best Practice is not to map to them
- Our use case retrieves historic lab results which may be mapped to LOINCs now discouraged or deprecated

## Physician and Lab Perspectives

- Physician has “test” in mind
- Each laboratory has one or more “kinds of tests”
  - Different methods or specimens used in various settings (i.e. inpatient, outpatient, point of care)
  - Reference lab may not perform POCT, critical care testing (i.e. blood gases)
  - Orders, reflex tests with many results
- We present to physician different ways “test” can be performed.
- Most patients only have a few kinds of “tests”

## Generic LOINCs

- Generic LOINCs are non specific for specific method or analyte
  - Interpretations
    - Coagulation Biomarker Panel vs. Genetic Marker Results vs Pathology Report
- CDS Queries with generic LOINCs often need additional information in query to have appropriate context
  - If Coag CDS, want to include Coag genetic and biomarkers, but exclude pathology, other genetic and biomarkers, prenatal, electrophoresis interpretations, etc.

## Cultures and Reflex Tests

- Antimicrobial Sensitivity LOINCs used in context of organism(s) cultured, body site and other details
  - If Methicillin LOINC queried, are all organisms and specimens desired or only resistant values, or urine specimens, indicating urinary tract infections (UTIs)?
- For Reflex Testing, is the final result desired or all results in cascade?

Communications

Department of Medicine
UNIVERSITY OF WISCONSIN
SCHOOL OF MEDICINE AND PUBLIC HEALTH

# Getting Out of the Lab I

- Being the face of the laboratory
  - Volunteering for hospital/clinical committees
  - Picnic, cafeteria, coffee etc.
  - Projects with laboratory data
  - Clinical informatics projects
  - Education and Outreach programs

## Getting Out of the Lab II

- Connecting with clinical colleagues
  - What are their lab challenges?
  - How do they use laboratory data?
  - Differences in Outpatient vs Inpatient?
  - Patient population differences

## Lab Data Usability Issues

- Some LISes don't support sensitivity orders in OBR 4 (order) part of message so can't be sent to public health
- Micro and Transfusion lack of maps.
- How do you help physicians with usability of lab data.
- Perhaps radiology creat pjt to get more throughput and revenue.
- Most common physician problems?

## Your Trusted Lab Resource

- Make friends. You can be their trusted lab resource and they can be yours in nursing, radiology, nutrition, etc.
- Be seen as a peer health professional

## Questions and Answers

Thank you for your attention!

Contact Information:

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pitkus@wisc.edu

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UNIVERSITY OF WISCONSIN
SCHOOL OF MEDICINE AND PUBLIC HEALTH

# Break



## Highlighting the Gold Medal Winners

# Highlighting the Gold Medal Winners

## Review of WCLN Surveillance

**Allen Bateman, PhD, MPH, D(ABMM)**
Director, Communicable Disease Division
Wisconsin State Laboratory of Hygiene

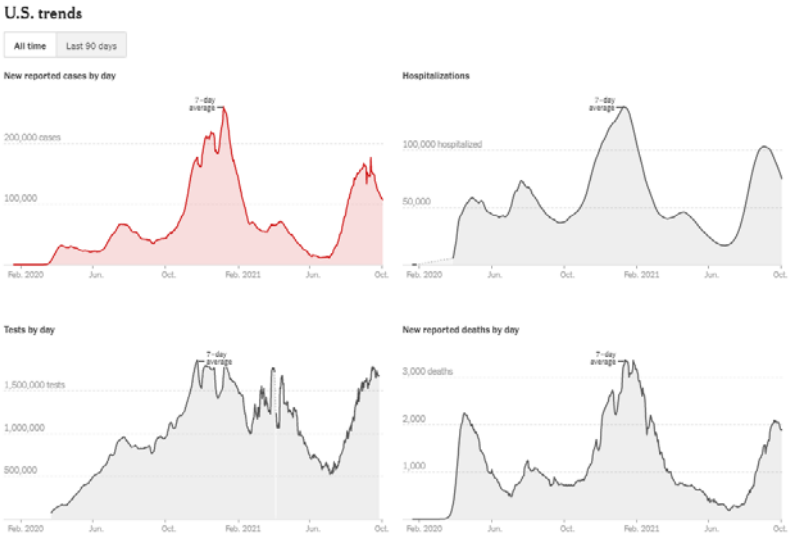
6 October 2021


Your participation in the Wisconsin surveillance system is **vital** to monitor infectious diseases of public health importance

# Outline

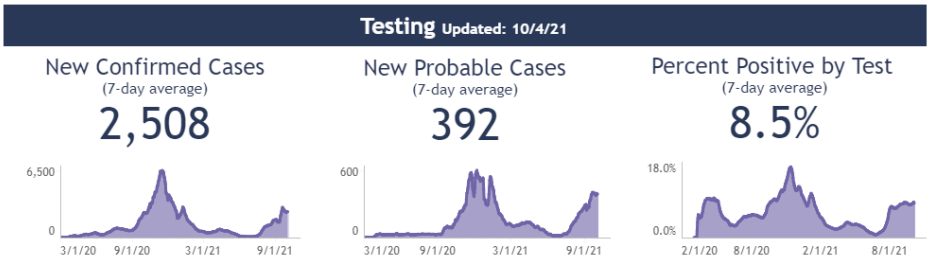
- SARS-CoV-2
- Impact of SARS-CoV-2
  - Specimen numbers at WSLH
  - TB
  - Enteric bacteria
  - Norovirus
  - Rabies
  - Other respiratory diseases
- WSLH surveillance tables

# SARS-CoV-2 Surveillance



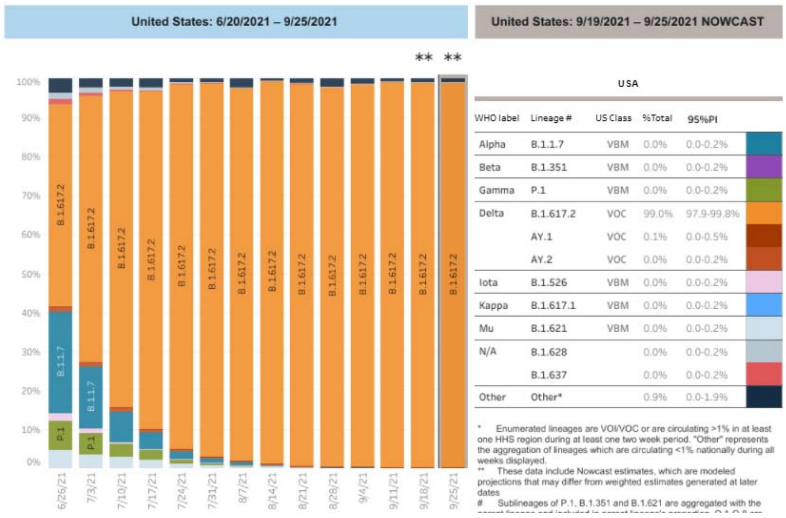

https://www.nytimes.com/interactive/2021/us/covid-cases.html

# SARS-CoV-2 Surveillance in Wisconsin




https://www.dhs.wisconsin.gov/covid-19/data.htm

# SARS-CoV-2 Genomic Surveillance



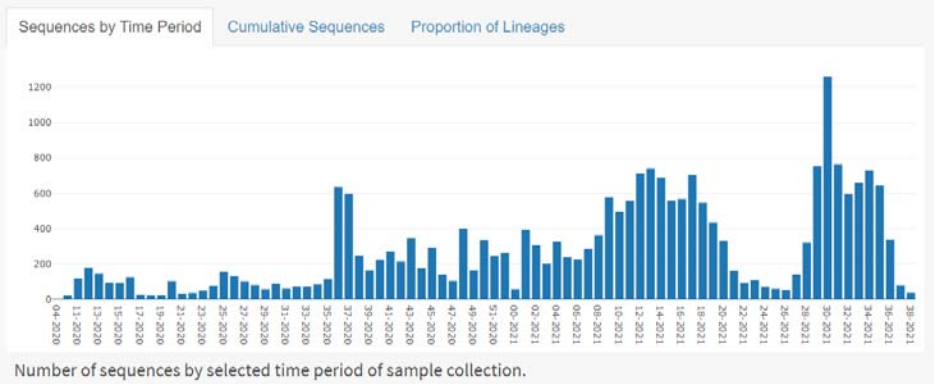

USA

| WHO label | Lineage # | US Class | %Total | 95%PI |
|---|---|---|---|---|
| Alpha | B.1.1.7 | VBM | 0.0% | 0.0-0.2% |
| Beta | B.1.351 | VBM | 0.0% | 0.0-0.2% |
| Gamma | P.1 | VBM | 0.0% | 0.0-0.2% |
| Delta | B.1.617.2 | VOC | 99.0% | 97.9-99.8% |
| | AY.1 | VOC | 0.1% | 0.0-0.5% |
| | AY.2 | VOC | 0.0% | 0.0-0.2% |
| Iota | B.1.526 | VBM | 0.0% | 0.0-0.2% |
| Kappa | B.1.617.1 | VBM | 0.0% | 0.0-0.2% |
| Mu | B.1.621 | VBM | 0.0% | 0.0-0.2% |
| N/A | B.1.628 | | 0.0% | 0.0-0.2% |
| | B.1.637 | | 0.0% | 0.0-0.2% |
| Other | Other* | | 0.9% | 0.0-1.9% |

* Enumerated lineages are VOI/VOC or are circulating >1% in at least one HHS region during at least one two week period. "Other" represents the aggregation of lineages which are circulating <1% nationally during all weeks displayed.
** These data include Nowcast estimates, which are modeled projections that may differ from weighted estimates generated at later dates
# Sublineages of P.1, B.1.351 and B.1.621 are aggregated with the

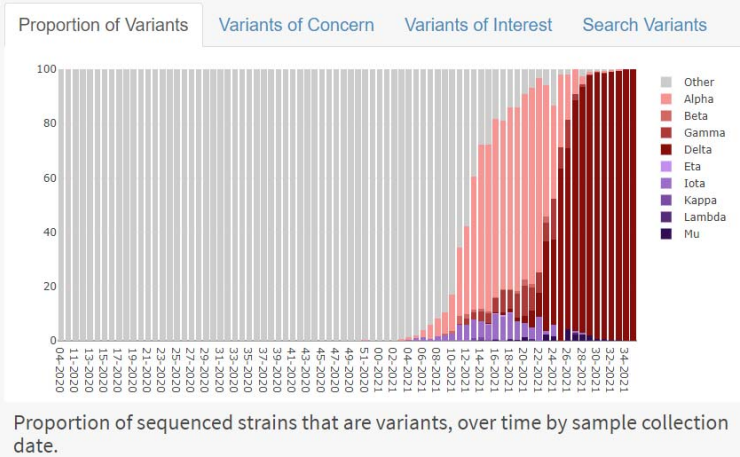
https://covid.cdc.gov/covid-data-tracker/#variant-proportions

# SARS-CoV-2 Genomic Surveillance in Wisconsin




https://dataportal.slh.wisc.edu/sc2dashboard#tab-2341-2

# SARS-CoV-2 Genomic Surveillance in Wisconsin




https://dataportal.slh.wisc.edu/sc2dashboard#tab-2341-2

# SARS-CoV-2 Whole-genome Sequencing Through the Pandemic

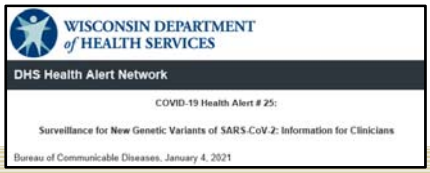
- December 2020: B.1.1.7 in the U.K.


https://www.npr.org/sections/goatsandsoda/2020/12/22/948961575/what-we-know-about-the-new-u-k-variant-of-coronavirus-and-what-we-need-to-find-o

# SARS-CoV-2 Whole-genome Sequencing Through the Pandemic

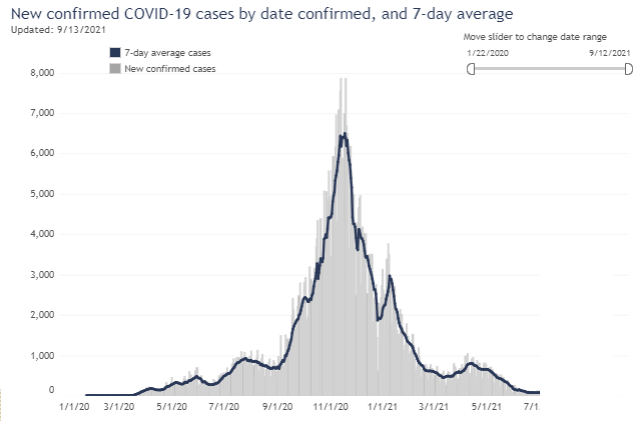
**SARS-CoV-2 WGS approach in Wisconsin**

- Participate in CDC's NS3 program
- Overall approach: general and targeted
  - General
    - WSLH sequencing all PCR positives from diagnostic testing at WSLH
    - Request positives from clinical labs statewide
      - Selected clinical labs initially; then broadened to all labs
  - Targeted
    - WI DHS Department of health criteria to enrich for variant identification sent to WSLH: positive samples from individuals with
      - International travel
      - Vaccine failure
      - Prolonged infections
      - Suspected re-infections



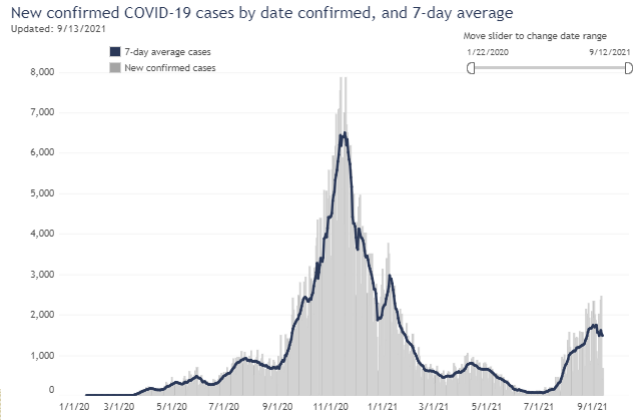
# SARS-CoV-2 Whole-genome Sequencing Through the Pandemic

- June/early July 2021: request all positives




# SARS-CoV-2 Whole-genome Sequencing Through the Pandemic

- August 2021: 10 per lab per week
- Now: 5 per lab per week



# SARS-CoV-2 Whole-genome Sequencing Through the Pandemic

- 4 other labs in Wisconsin also sequencing
  - City of Milwaukee Health Department Laboratory
  - Marshfield Clinic Research Institute
  - UW-Madison AIDS Vaccine Research Laboratory
  - Medical College of Wisconsin

# Thanks for your partnership in genomic surveillance!

Wisconsin State Laboratory of Hygiene
UNIVERSITY OF WISCONSIN-MADISON
2601 Agriculture Dr, Madison, WI 53702

Erin C. Rider, Ph.D., D(ABMM),MASCP(CM
Director of Clinical Laboratory Services
CSD Customer Service
Phone, 800-862-1013
FAX, 844-362-0233
Kits and Supplies: 800-862-1088

SARS-CoV-2 Ver. 1/2021

(Please type or print using black pen)

**Patient Information**
Name (Last, First):
Address:
City: State: Zip:
Account: 74200
Date of Birth: Gender: M F
Ethnicity: ☐ Hispanic/Latino ☐ Non-Hispanic
Race: ☐ Amer Indian ☐ Asian ☐ Black/African Amer ☐ Pacific Islander ☐ White Other
Clinician:
Your Patient ID Number:
Your Specimen ID Number:

**Date and Time Collected:**

**Specimen Type:**
☐ Nasopharynx Swab ☐ BAL
☐ Anterior Nares (Nasal) Swab ☐ Sputum
☐ Combined Throat/Nasopharynx Swab ☐ Other_____
☐ Throat Swab

**Test**
☐ VR01763 – **SARS-CoV-2 Sequencing** (must meet WDPH criteria OR be requested for surveillance)

**SARS-CoV-2 PCR** (check all that apply)
Pregnant: ☐ Yes ☐ No
Employed in a healthcare setting: ☐ Yes ☐ No
Has symptom related to COVID-19: ☐ Yes ☐ No
If symptomatic, date of onset:
Staff in a congregate care setting: ☐ Yes ☐ No
Resident in a congregate care setting: ☐ Yes ☐ No
Patient was hospitalized because of this condition: ☐ Yes ☐ No
If hospitalized, admitted to ICU: ☐ Yes ☐ No

**SARS-CoV-2 Sequencing**
- Only for previously PCR positive specimens
- Results are for surveillance only and will not be reported to submitters
- Optimal volume 1 mL

**Postmortem:** ☐ Yes

**Vaccination History (COVID):** Was patient vaccinated? ☐ Yes ☐ No ☐ Unknown
If Yes, date first vaccinated: / /

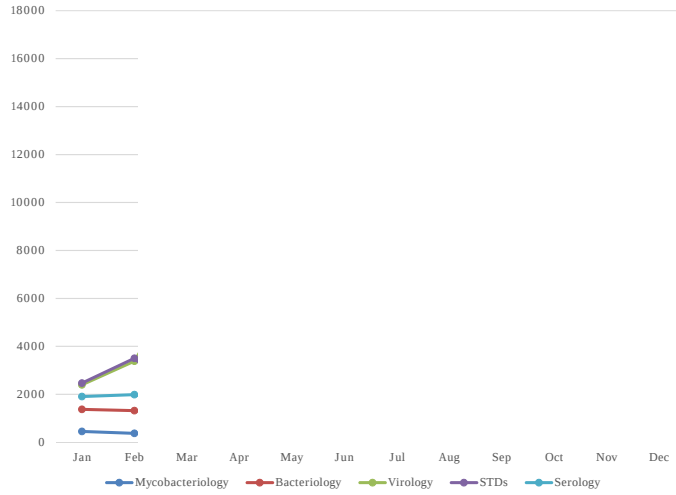
**International Travel History (Places and dates):**

**WISCONSIN STATE LABORATORY OF HYGIENE USE ONLY**
*2019 Novel Coronavirus Suspect [74]* | *COVID Sequencing [78]*

# Outline

- SARS-CoV-2
- Impact of SARS-CoV-2
  - Specimen numbers at WSLH
  - TB
  - Enteric bacteria
  - Rabies
  - Other respiratory diseases
- WSLH surveillance tables

# Specimen numbers at WSLH - 2020



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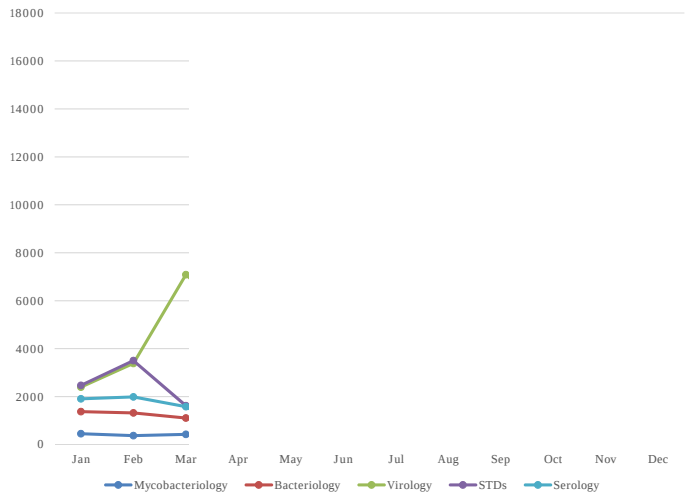


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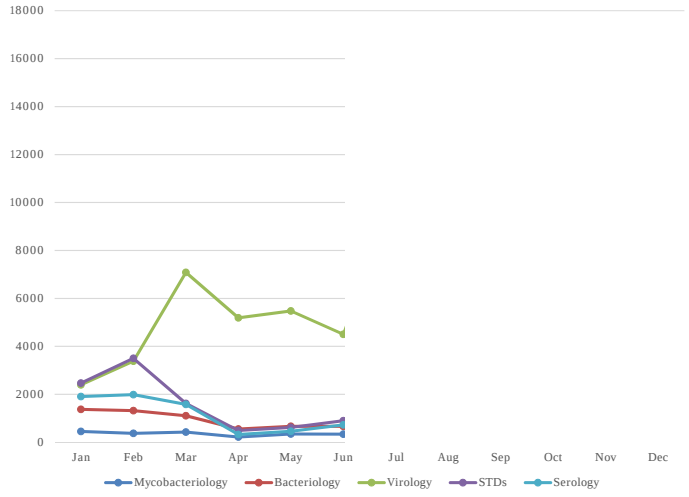

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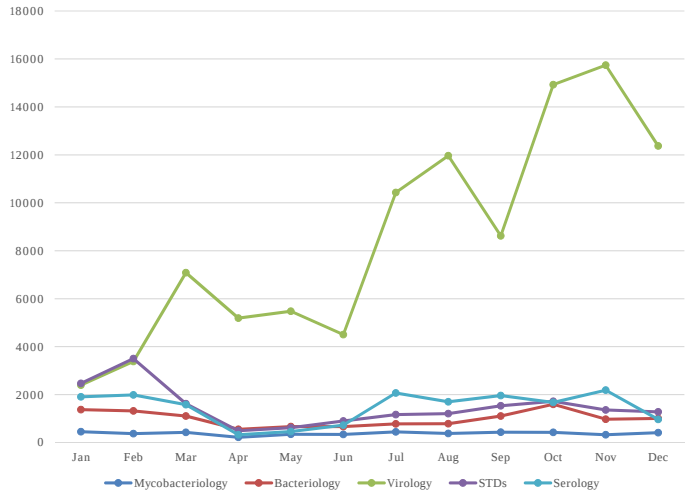
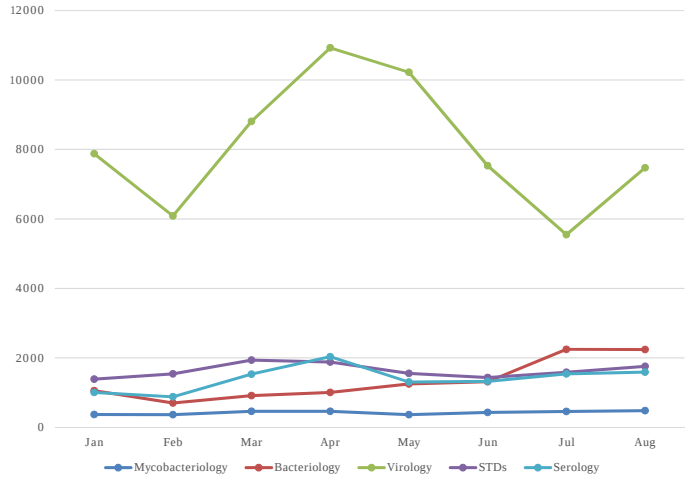
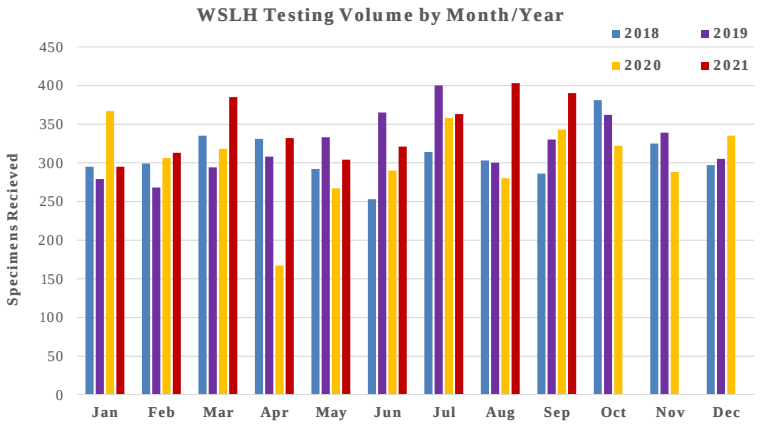



# Specimen numbers at WSLH - 2021



# Mycobacteriology Testing Volume




# TB Cases in Wisconsin, 2011-2021 (YTD)

| Year | No. | Rate* |
|---|---|---|
| 2011 | 70 | 1.2 |
| 2012 | 71 | 0.87 |
| 2013 | 50 | 0.87 |
| 2014 | 48 | 0.83 |
| 2015 | 69 | 1.2 |
| 2016 | 40 | 0.69 |
| 2017 | 49 | 0.84 |
| 2018 | 49 | 0.84 |
| 2019 | 51 | 0.87 |
| 2020 | 35 | 0.59 |
| 2021 (YTD) | 43 | 0.74 |

*People with TB per 100,000 (2.7 nationwide average)

# Enteric Bacteria

MMWR
Morbidity and Mortality Weekly Report

**Decreased Rates of Infection with Pathogens Transmitted Commonly Through Food During the COVID-19 Pandemic — Foodborne Diseases Active Surveillance Network, 10 U.S. Sites, 2017–2020**

https://www.cdc.gov/mmwr/volumes/70/wr/mm7038a4.htm?s_cid=mm7038a4_w

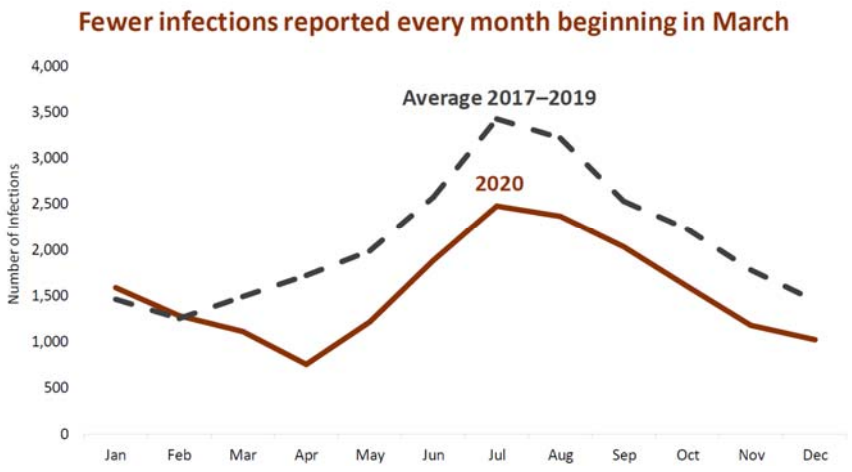
# Enteric Bacteria

National Center for Emerging and Zoonotic Infectious Diseases

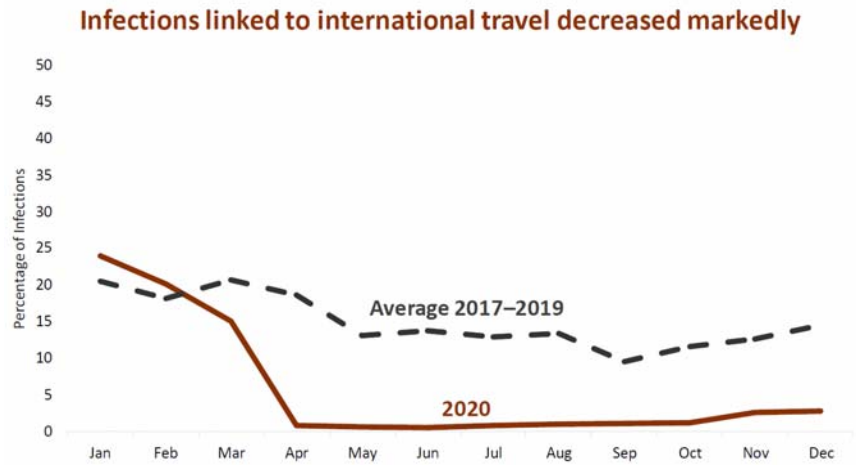
FoodNet
Foodborne Diseases Active Surveillance Network

**MMWR Report**
**Incidence Estimates for 2020**

# Enteric Bacteria

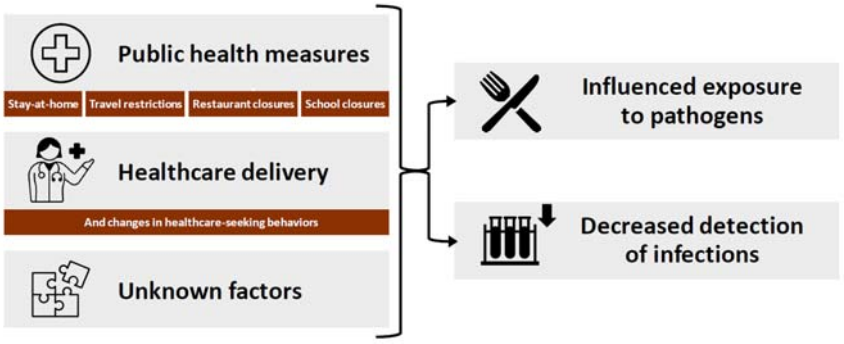



# Enteric Bacteria



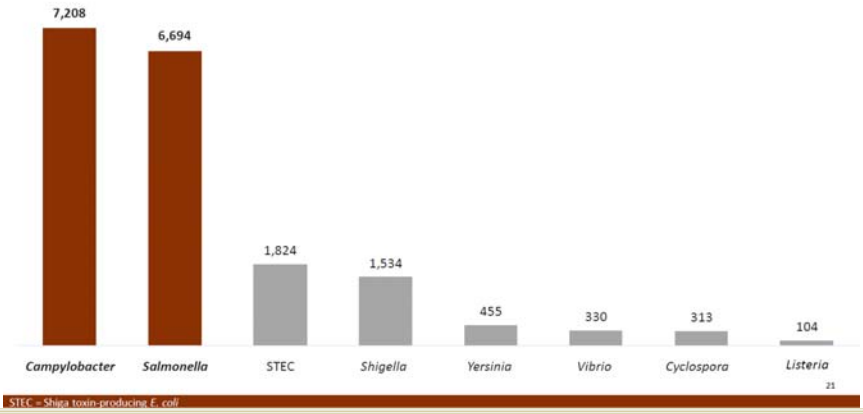
# Enteric Bacteria

**Factors related to the COVID-19 pandemic likely contributed to decreases in incidence of enteric infections**



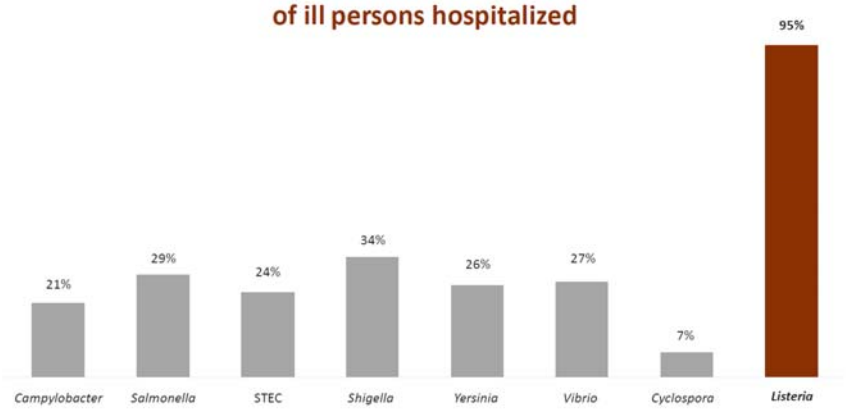

# Enteric Bacteria

**As usual, *Campylobacter* and *Salmonella* led in number of infections**



# Enteric Bacteria

As usual, *Listeria* had the largest percentage of ill persons hospitalized




# Enteric Bacteria

Incidence rates decreased for most pathogens

| Pathogen | 2020 Incidence Rate | Compared with 2017–2019 % Change | (95% CI) |
|---|---|---|---|
| *Campylobacter* | 14.4 | -23% | (-29% to -16%) |
| *Salmonella* | 13.3 | -22% | (-29% to -17%) |
| Shiga toxin-producing *E. coli* (STEC) | 3.6 | -37% | (-47% to -26%) |
| *Shigella* | 3.1 | -41% | (-54% to -23%) |
| *Yersinia* | 0.9 | -10% | (-29% to +14%) |
| *Vibrio* | 0.7 | -25% | (-39% to -8%) |
| *Listeria* | 0.2 | -27% | (-43% to -7%) |
| *Cyclospora* | 0.6 | -17% | (-50% to +37%) |

Purple shading shows statistically significant declines

# Enteric Bacteria

**Similar proportion of bacterial infections detected by CIDT only compared with previous 3 years**


# Enteric Bacteria

**Key Points**

**Incidence of infection**
Decreased for most pathogens

- ↓ *Campylobacter*, *Listeria*, STEC, *Salmonella*, *Shigella*, *Vibrio*
- → *Cyclospora*, *Yersinia*

**Incidence of *Salmonella* infection**
Decreased for some serotypes

- ↓ I 4,[5],12:i:-, Typhimurium, Enteritidis, Javiana
- → Newport, Infantis
- ↑ Hadar increased

**Laboratory factors**
Not responsible for decreased incidence

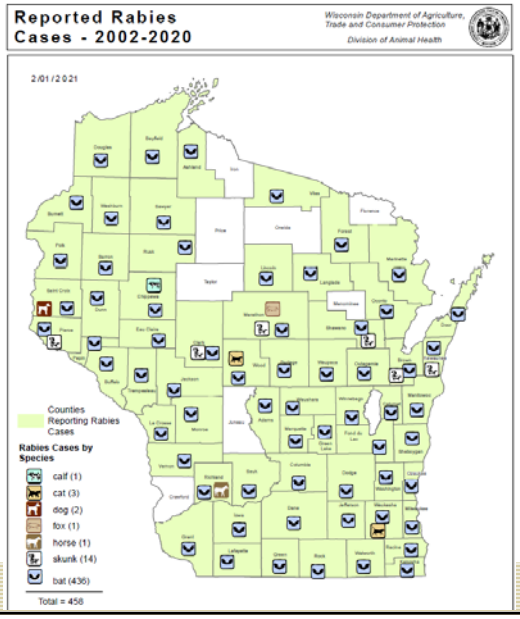
- → % of infections diagnosed by CIDTs was stable
- ↓ % of CIDT-positive specimens with reflex culture decreased for some pathogens

**COVID-19 pandemic**
Influenced exposure and detection

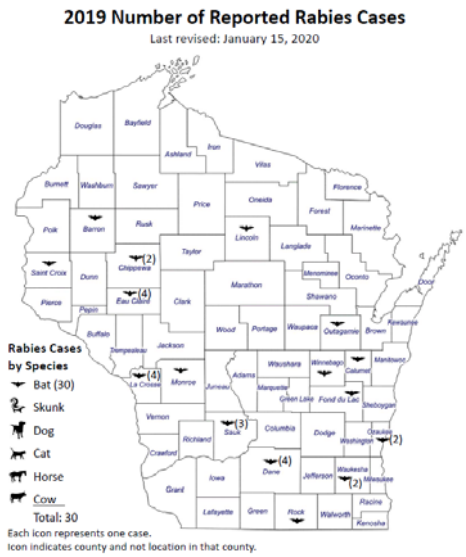
- Public health measures
- Changes in healthcare delivery
- Unknown factors

48

# Rabies




# Rabies



# Rabies

**2020 Wisconsin Reported Rabies Cases**

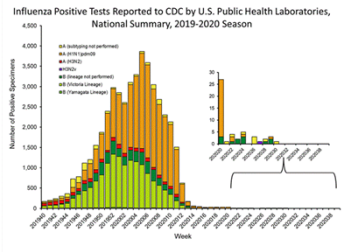
Last revised: April 15, 2021

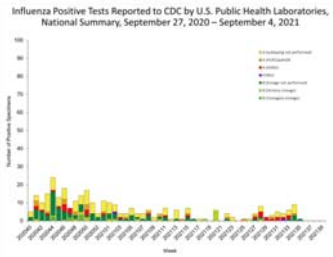

# Rabies

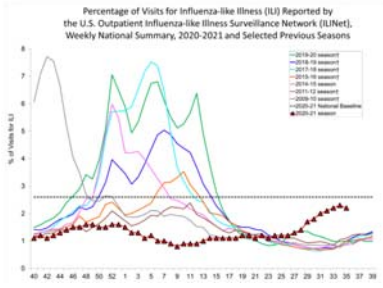
**2021 Wisconsin Reported Rabies Cases**

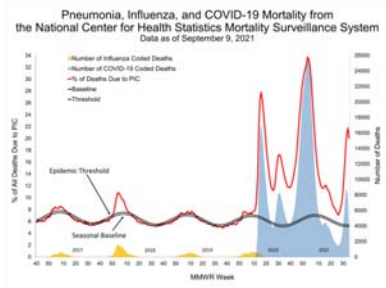
Last revised: September 27, 2021

## Other Respiratory Diseases: The 2020-21 Influenza (non-)Season



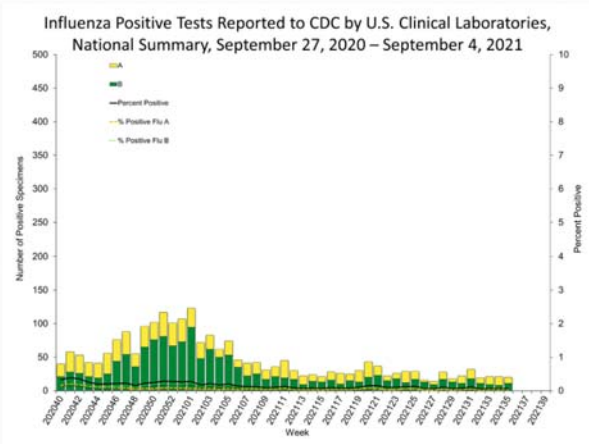




https://www.cdc.gov/flu/weekly/index.htm

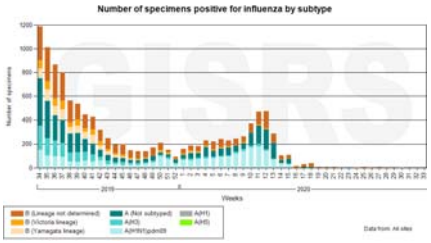
## Early in 2021-2022 season…



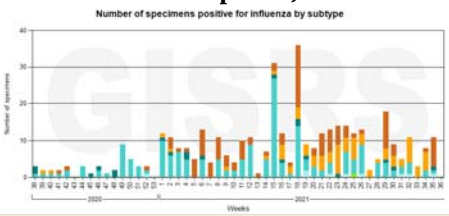

https://www.cdc.gov/flu/weekly/index.htm

WHO Global Influenza Surveillance and Response System (GISRS)

**Southern hemisphere, 2020**



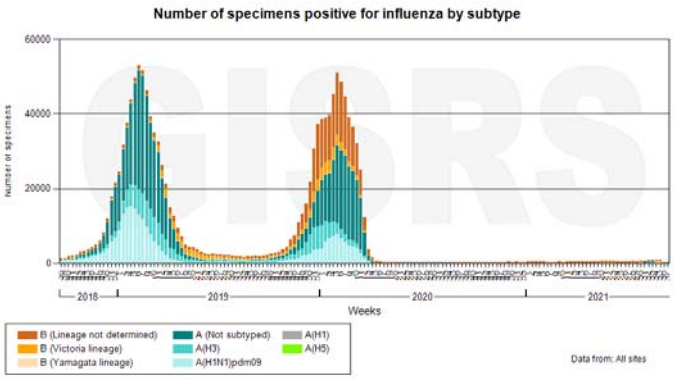

**Southern hemisphere, 2021**




https://apps.who.int/flumart/Default?ReportNo=5&Hemisphere=Southern

WHO Global Influenza Surveillance and Response System (GISRS)

Northern hemishere




SCIENTIFIC AMERICAN

PUBLIC HEALTH

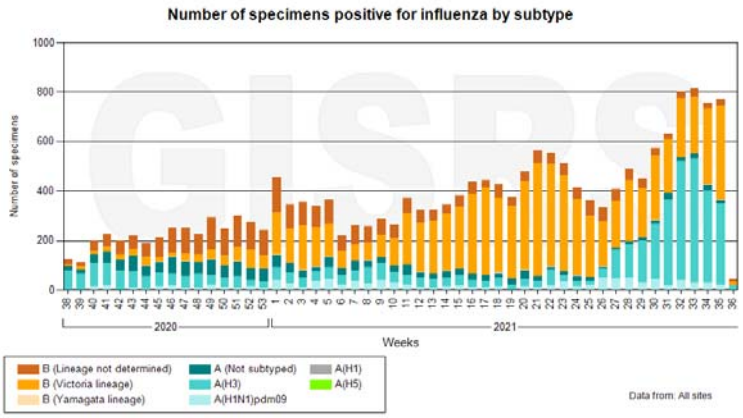
**Flu Has Disappeared for More Than a Year**

Mask wearing, social distancing and other steps to stop COVID-19 have also curtailed influenza

https://apps.who.int/flumart/Default?ReportNo=5&Hemisphere=Northern

WHO Global Influenza Surveillance and Response System (GISRS)

**Northern hemisphere, 2021**




https://apps.who.int/flumart/Default?ReportNo=5&Hemisphere=Northern

**Human seasonal influenza under COVID-19 and the potential consequences of influenza lineage elimination**

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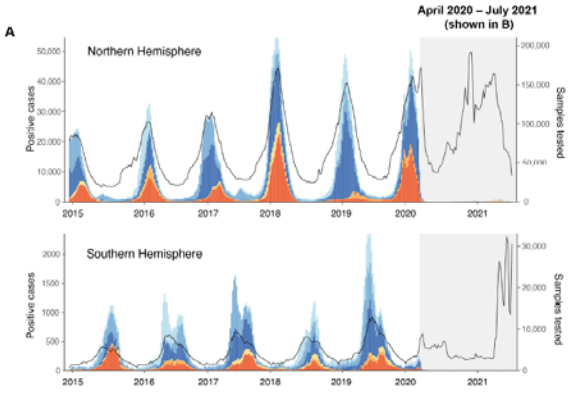
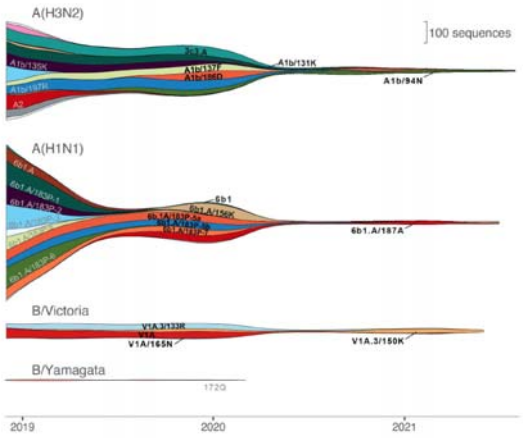


**Human seasonal influenza under COVID-19 and the potential consequences of influenza lineage elimination**

Vijaykrishna Dhanasekaran,[1,2*] Sheena Sullivan,[3] Kimberly M. Edwards,[1,2] Ruopeng Xie,[1,2] Arseniy Khvorov,[3] Sophie A. Valkenburg,[1,2] Benjamin J. Cowling,[1] Ian G. Barr[3]




# COMMENT

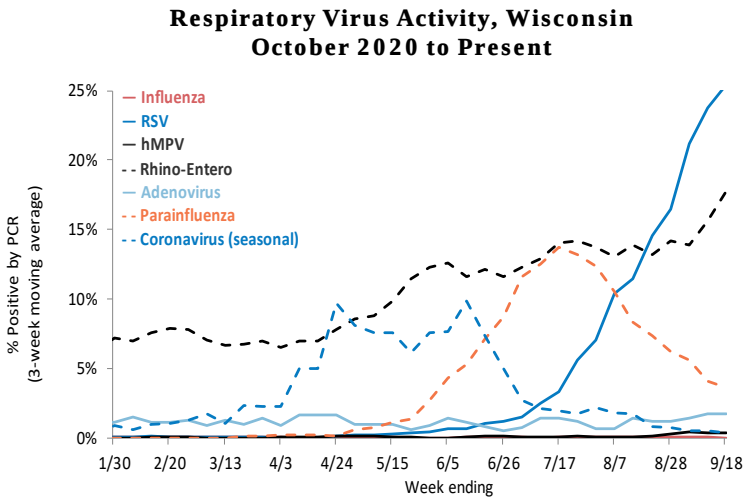
Check for updates

## Influenza lineage extinction during the COVID-19 pandemic?

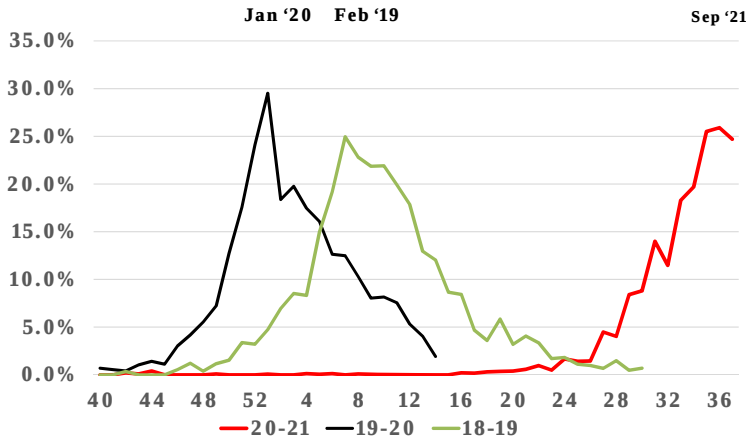
*Marios Koutsakos[1]✉, Adam K. Wheatley[1], Karen Laurie[2], Stephen J. Kent[1,3] and Steve Rockman[1,2]*

The SARS-CoV-2 pandemic has seen a notable global reduction in influenza cases of both influenza A and B viruses. In particular, the B/Yamagata lineage has not been isolated from April 2020 to August 2021, suggesting that this influenza lineage may have become extinct, which may provide opportunities for improving availability and effectiveness of influenza vaccines.

# Other Respiratory Diseases: RSV



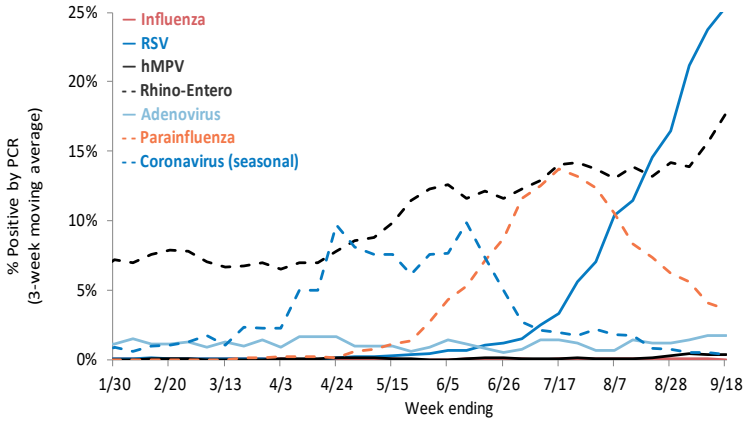

# Percent Positive RSV, 2019-2021



| RSV Positive Cases, PCR<br>July to Mid-September<br>2019-2021 | | |
|---|---|---|
| **2019** | **2020** | **2021** |
| **9** | **11** | **3771** |

# Other Respiratory Diseases

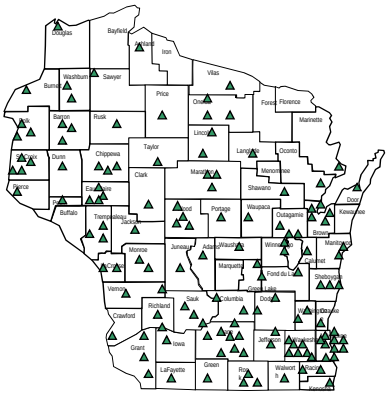
**Respiratory Virus Activity, Wisconsin**
**October 2020 to Present**



# Aggregate data from Wisconsin Clinical Laboratories

- All clinical labs in Wisconsin
- Weekly data: number of specimens tested, and number positive for each respiratory virus

- Advantage: large numbers (500-1000/week)

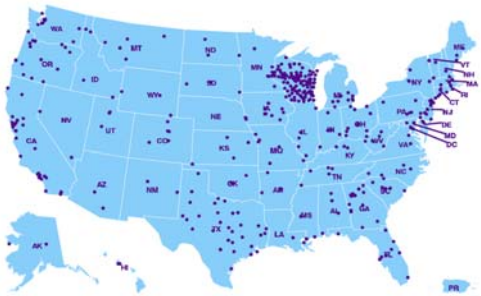


# Aggregate data from Wisconsin Clinical Laboratories

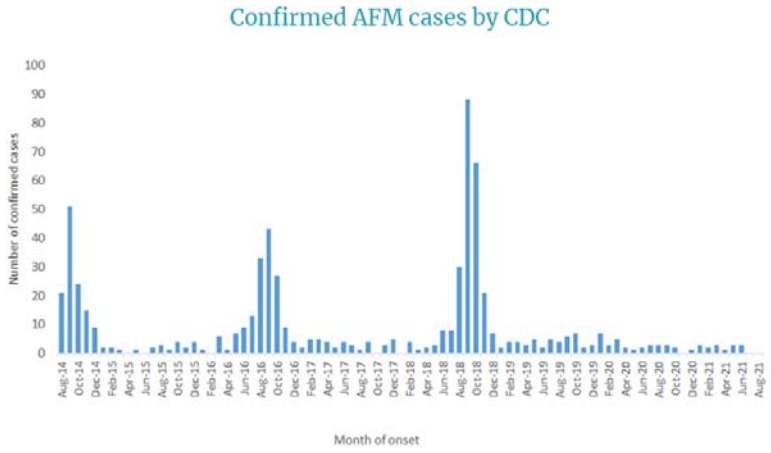
CDC Centers for Disease Control and Prevention
CDC 24/7: Saving Lives, Protecting People™

Map of Participating Labs

The National Respiratory and Enteric Virus Surveillance System (NREVSS)



# Acute Flaccid Myelitis (AFM)




https://www.cdc.gov/acute-flaccid-myelitis/cases-in-us.html

## Circulation of influenza, RSV, and SARS-CoV-2: an uncertain season ahead

"We could get RSV, influenza, and SARS-CoV-2 circulating at the same time, and we just do not know how that is going to play out"

*Lancet Respir Med* 2021

Published Online
August 6, 2021
https://doi.org/10.1016/S2213-2600(21)00364-7

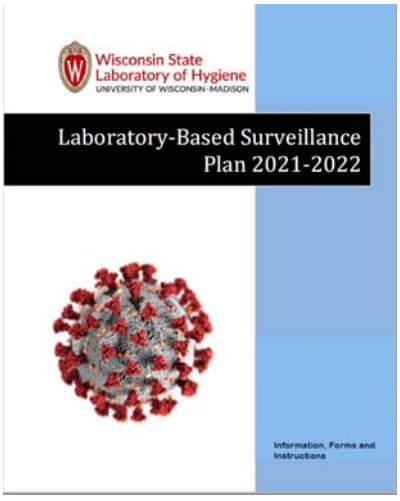
For the **Academy of Medical Sciences report** see https://acmedsci.ac.uk/file-download/4747802

# Outline

- SARS-CoV-2
- Impact of SARS-CoV-2
  - Specimen numbers at WSLH
  - TB
  - Enteric bacteria
  - Norovirus
  - Rabies
  - Other respiratory diseases
- WSLH surveillance tables

# Laboratory-based Surveillance Plan

- Detailed instructions
- Description of surveillance requests
- Web-based reporting instructions



Wisconsin State Laboratory of Hygiene

**Laboratory-based Surveillance Plans, Wisconsin, 2021-2022**

Table 1

| Respiratory Pathogen | Testing Data requested | Frequency to Report | Confirmatory testing available at WSLH |
|---|---|---|---|
| **Rapid Testing/Antigen Detection** | | | |
| **Influenza A/B** | Number detected and number tested | Weekly | **1. ALL** summer positives<br>2. During respiratory virus season, limited to first confirmed A or B positive at WSLH<br>3. Additionally, please send positive specimens from patients with:<br>1. International travel history<br>2. Swine exposure |
| **Rotavirus** | | | Send **one** positive/week |
| **SARS-CoV-2** | | | No (please contact WSLH for approval) |
| **RSV** | | | |
| **Strep A (rapid tests only)** | | | |
| ***PCR*** | | | |
| **Influenza A/B** | Number detected and number tested | Weekly | **ONLY** send the following specimens:<br>1. Unable to subtype (InfA Ct<35.0) if subtyping was attempted<br>2. One hospitalized patient per week<br>3. Patients with international travel history<br>4. Patients with swine exposure |
| **SARS-CoV-2 and Non-influenza respiratory pathogens (e.g. RSV)** | | | No |
| ***B. pertussis*** | | | |
| **Other viruses (e.g., VZV )** | | | |
| **Enterovirus*** | Number detected & number tested | Weekly | Yes* |

* Enterovirus typing may be performed on CSF specimens related to clusters of severe disease, acute flaccid myletis (AFM), paralysis, death or those requested by the Wisconsin Division of Public Health (WDPH).

| Pathogen | Testing Data to Report | Frequency to Report | Send specimens to WSLH |
|---|---|---|---|
| **Gastropathogens (PCR or other CIDT)** | | | |
| ***Aeromonas* species** | Number detected and number tested | Weekly | Isolates or stool for identification |
| ***Campylobacter* species** | | | Isolates or stool for identification; Antimicrobial susceptibility testing and molecular subtyping (WGS) will be performed as necessary |
| **Enterohemorrhagic/ Shiga Toxin-Producing *E. coli* (EHEC/STEC)** | | | Isolates, stool or enrichment broth for identification, serotyping and molecular subtyping (WGS) |
| ***Plesiomonas shigelloides*** | | | Isolates or stool for identification |
| ***Salmonella* species** | | | Isolates or stool for identification, antimicrobial susceptibility testing and molecular subtyping (WGS) |
| ***Shigella* species and *Enteroinvasive E.coli* (EIEC)** | | | Isolates or stool for identification and antimicrobial susceptibility testing; Molecular subtyping will be performed as deemed necessary |

| Pathogen | Testing Data to Report | Frequency | Send specimens to WSLH |
|---|---|---|---|
| **Gastropathogens (PCR or other CIDT)** | | | |
| ***Vibrio* Species** | Number detected and number tested | Weekly | Isolates or stool for identification and referral to CDC |
| ***Yersinia* species** | | | Isolates or stool for identification |
| ***Cryptosporidium* species** | | | Stool for identification* and genotyping |
| ***Cyclospora cayetanensis*** | | | Stool for molecular subtyping and/or referral to CDC |
| **Rotavirus** | | | One positive per week for molecular subtyping/genotyping |
| **Any other organism suspected of being in a cluster or outbreak of public health significance** | | | Consult with Wisconsin Division of Public Health Foodborne Disease Epidemiologists; isolates or stool for identification and molecular subtyping as applicable |
| ***Clostridioides difficile*** | | | **WSLH does not request submission of this organism at this time** |
| **Norovirus** | | | **WSLH does not request routine submission of this organism at this time unless specifically requested by the WDPH or WSLH** |

Wisconsin State Laboratory of Hygiene

**Laboratory-based Surveillance Plans, 2021-2022**

| Pathogen | Testing Data to Report | Frequency | Send specimens to WSLH |
|---|---|---|---|
| **Gastropathogens (PCR or other CIDT)** | | | |
| **Astrovirus** | Number detected and number tested | Weekly | **WSLH does not request submission of this organism at this time** |
| **Sapovirus** | | | **WSLH does not request submission of this organism at this time** |
| **Adenovirus F (40/41)** | | | **WSLH does not request submission of this organism at this time** |
| **Enteropathogenic, Enteroaggretative and Enterotoxigenic *E. coli* (EPEC, EAEC and ETEC)** | | | **WSLH does not request submission of these organisms at this time** |
| ***Giardia* species** | | | **WSLH does not request submission of this organism at this time** |
| ***Entamoeba histolytica*** | | | **WSLH does not request submission of this organism at this time unless specifically requested by the WDPH.** |

| Pathogen | Specimens Requested | Frequency | Confirmatory testing available at WSLH |
|---|---|---|---|
| **Antimicrobial Resistance (AR)** | | | |
| Pan-resistant organisms (R to all drugs tested in your laboratory) | AST results and any phenotypic or molecular targets detected submitted with isolate | As detected | Identification, antimicrobial susceptibility testing, AR-targeted PCR and referral to CDC as necessary |
| *Candida auris*, *C. haemulonii*, invasive *C. glabrata* and unusual* and hard to ID Candida | | | Identification, antimicrobial susceptibility testing and referral to CDC as necessary |
| *Enterobacteriaceae resistant* to carbapenems | | | Identification, antimicrobial susceptibility testing, carbapenemase screen, AR-targeted PCR and referral to CDC as necessary |
| *Staphylococcus aureus* (I or R to Vancomycin) | | | Identification, antimicrobial susceptibility testing and referral to CDC as necessary |
| *Enterococcus*** with elevated MIC's to Vancomycin (≥32 µg/ml), Daptomycin (≥8µg/ml), Linezolid (≥8µg/ml) | | | Identification, antimicrobial susceptibility testing and referral to CDC as necessary |
| *Pseudomonas aeruginosa* (Resistant to carbapenems other than ertapenem and non-susceptible to cefepime and/or ceftazadime) | | Up to 5 isolates per month | Identification, antimicrobial susceptibility testing, carbapenemase screen, AR-targeted PCR and referral to CDC as necessary |
| †*Acinetobacter baumanii* (Resistant to carbapenems) | | As detected | Identification, antimicrobial susceptibility testing, AR-targeted PCR and referral to CDC as necessary |
| *Aspergillus fumigatus* isolates from invasive infections | | | Isolates will be forwarded to the Maryland Department of Health for surveillance of azole resistance. |

| Pathogen | Frequency to Send | Send Specimens to WSLH for Characterization |
|---|---|---|
| **Invasive Bacteria (Blood, CSF or other sterile body site)** | | |
| *Haemophilus influenzae* | As detected | Isolates or CSF for identification and serotyping |
| *Listeria monocytogenes* | | Isolates for identification and molecular subtyping (WGS) |
| *Neisseria meningitidis* | | Isolates or CSF for identification, antimicrobial susceptibility testing and serogrouping |
| *Streptococcus pneumoniae* | | Isolates or CSF for identification, antimicrobial susceptibility testing and serotyping<br>*serotyping performed upon request on:<br>• CSF isolates<br>• Isolates non-susceptible to clinically relevant drugs<br>• Possible failure of therapy or vaccine or outbreak related isolates |
| **Any other organisms suspected of being in a cluster or outbreak of public health significance** | | Consult with Wisconsin Division of Public Health Epidemiologists; Isolates for identification and molecular subtyping |
| **Gram negative isolates from sterile body sites that are unidentifiable using commercial systems** | | Sequenced based and phenotypic identification will be performed |


Your participation in the Wisconsin surveillance system is **vital** to monitor for emerging novel strains with pandemic potential and other pathogens that impact community health.

## Medal for the Every Day Olympian

# Peter A. Shult Award

- The Peter A. Shult Award is being established in 2022 at the suggestion of the WCLN Laboratory Technical Advisory Group (LabTAG).
- The Peter A. Shult Award will be awarded annually by the WSLH to recognize an exceptional clinical laboratory professional.
- The award is named in honor of Dr. Shult's vision of and contributions to the development of the WCLN in 2003 and his active support in maintaining and strengthening the WCLN until his retirement in 2021.




# Peter A. Shult Award

**Attributes:**

- This award is for a laboratory professional at any stage of their career or educational degree attainment who is employed in a Wisconsin Clinical Laboratory Network (WCLN) member clinical laboratory.
- This individual actively participates in the WCLN
- This individual has made outstanding contributions to promoting the field of clinical laboratory science and/or has demonstrated exceptional clinical laboratory science service within their own facility, health system, or within the WCLN.

# Peter A. Shult Award

**Nominations:**

- Nomination forms and detailed instructions will be posted on our WCLN web page early in 2022.
- Reminders to nominate an individual will be included in Wisconsin Laboratory messaging.
- Completed nominations must be submitted by March 1, 2022 to be considered.
- LabTAG will review all nominations and determine the awardee.
- All nominees will be recognized and the award will be presented at the spring technical meeting in 2022.



# Thank You !

## Laboratory Technical Advisory Group

- **Tyler Tschanz** – Mayo Clinic Health System – Eau Claire Hospital, Eau Claire (Region 1)
- **Becky Brooks** – Ascension – St. Michael Hospital, Stevens Point (Region 2)
- **Tyler Radke** – Bellin Health, Green Bay (Region 3)
- **Jorn Bansberg**– Vernon Memorial Hospital, Viroqua (Region 4)
- **Heather Alvarez** – Columbus Community Hospital, Columbus (Region 5)
- **Katie Fuchs**- Ascension - St. Elizabeth Hospital, Appleton (Region 6)
- **Tim Block** - Froedtert - St. Joseph's Hospital, West Bend (Region 7)
- **Eric Beck**– ACL Laboratories, West Allis (At large member)
- **Erik Munson** – Marquette University, Milwaukee (At large member)
- **Raymond Podzorski** – St. Mary's Hospital, Madison (At large member)

# Thank You !

## 2021 WCLN Regional Meeting Speakers

- Erik Munson
- Alana Sterkel
- Robert Leschke
- Andrea Pitkus
- Allen Bateman

## 2021 WCLN Regional Meeting Panelists

- Anna Kocharian
- Jessie Phalen
- Anna Marciniak
- Nikki Mueller
- Heather Alvarez
- Tyler Tschanz
- Jorn Bansberg
- Eric Beck
- Tim Block
- Becky Brooks



# Thank You !

## 2021 WCLN Regional Meeting Technical Support Team

- Jim Hermanson
- Susan Schmidt
- Laura Louison

# Closing Ceremonies

**Thank you all of you in attendance today both in person and virtual!**

Your presence and participation today are what made this meeting a success. You are true gold medal Olympians!

**The Games Have Concluded**