Finding *Candida auris* in California Clinical Laboratories: Strategies That Work for Us!

Webinar - May 19, 2022

California Department of Public Health (CDPH)
Los Angeles County Department of Public Health (LACDPH)

Moderator:
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Microbiologist, Public Health Laboratory
Los Angeles County Department of Public Health

Housekeeping

Please note:

- You will be muted throughout the program
- Type your questions in “Chat” or “Q&A” panels
  - You can access these panels by hovering your mouse over the bottom of your monitor screen and several icons will appear.
  - Click on the Chat or Q&A icons to type in your questions and comments.
- Questions will be answered at the end of the program as time permits
  - Any unanswered questions will be answered after the program
  - All Q&As will be sent to participants within 2 weeks
- A copy of the slides and recording and additional resource list of the presentation will be available on the CDPH website shortly (link to be sent with Q&As)
- Unfortunately, no CE will be available

Finding *Candida auris* in California Clinical Laboratories: Strategies That Work for Us!

Public Health

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Finding *Candida auris* in California Clinical Laboratories: Strategies That Work for Us!

Objectives

At the conclusion of this webinar, you will be able to:

1. Understand the scope of the *C. auris* problem in California.
2. Outline various strategies for passive surveillance (identification of yeast form all specimen sources, including nonsterile sites to rule out *C. auris*).
3. Summarize various strategies for active surveillance (colonization screening swabs) in-house or as send-outs.

Four fellow microbiologists from various settings will describe *C. auris* strategies that are working for them!

Finding *Candida auris* in California Clinical Laboratories: Strategies That Work for Us!

Objectives

At the conclusion of this webinar

1. Understand

3

What might work for you???

Four fellow microbiologists from various settings will describe *C. auris* strategies that are working for them!

Candida auris in California

May 19, 2022

Presented via Webinar
Finding *Candida auris* in Clinical Laboratories:
Strategies that Work for Us!

Tisha Mitsunaga, DrPH
Healthcare-Associated Infections (HAI) Program
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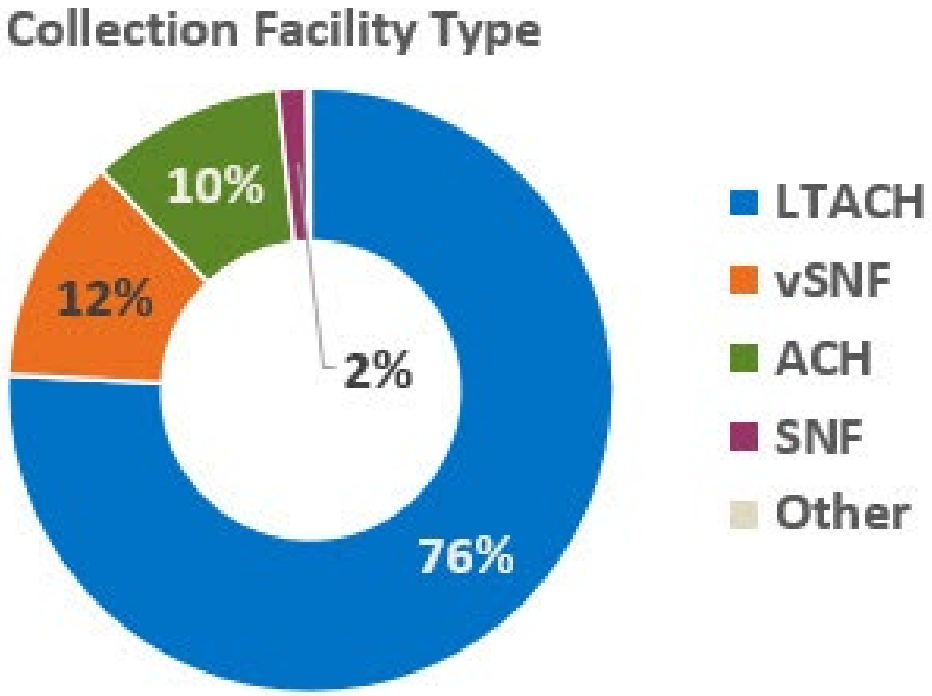
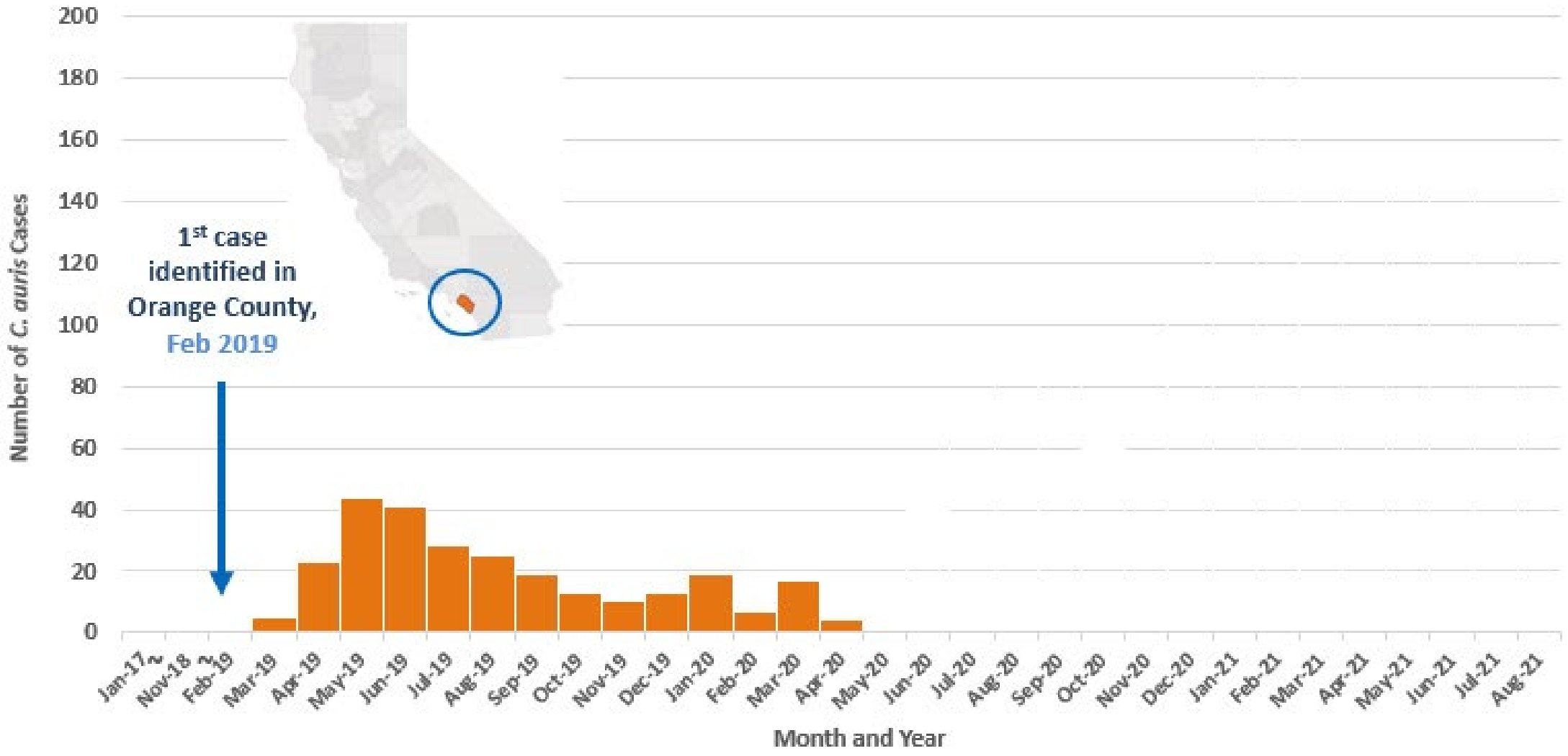
Candida auris

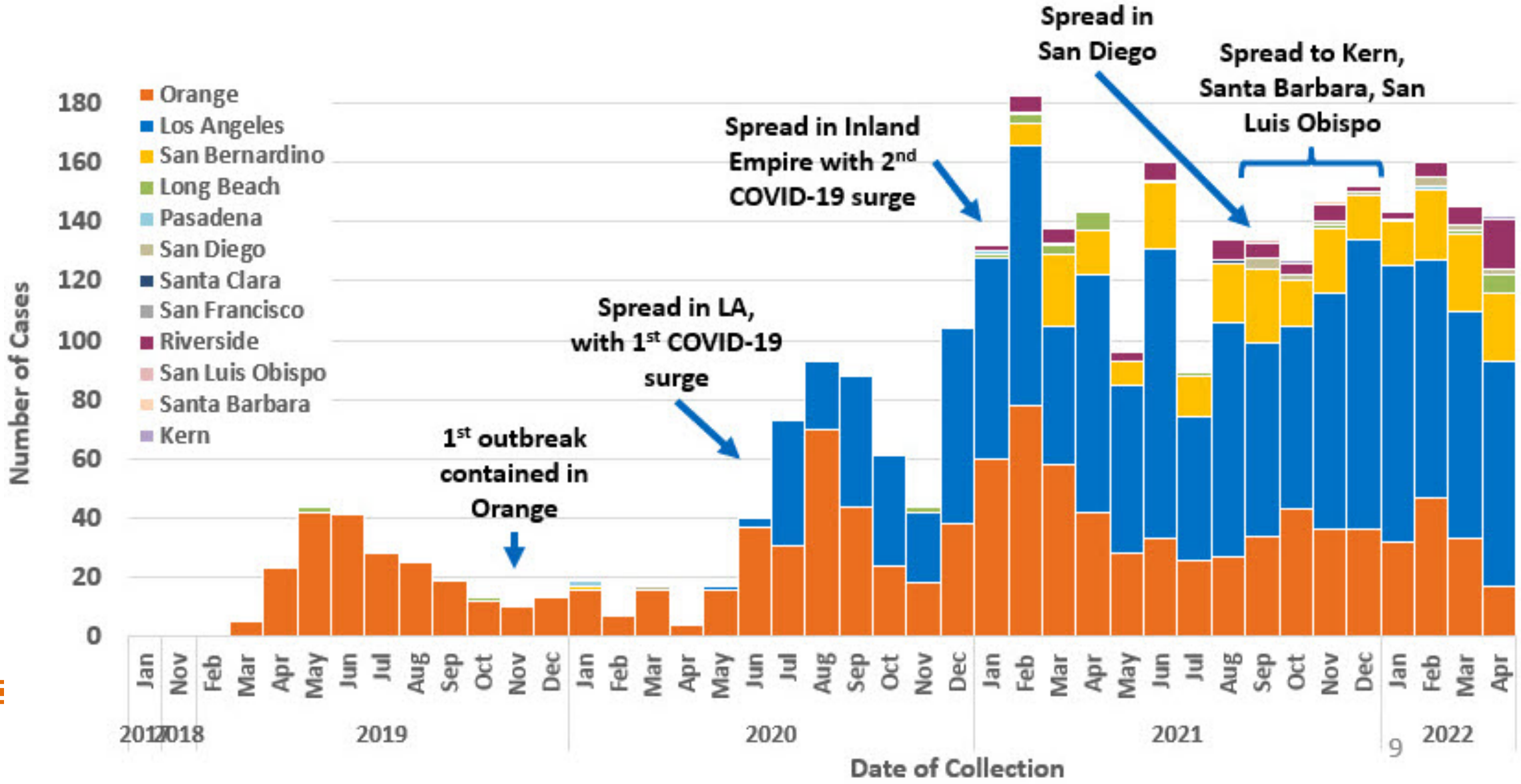
- Multidrug-resistant yeast
  - Few treatment options
- Can cause serious, invasive infections with **30-60% mortality**
- *C. auris* is very "sticky" in the healthcare environment
  - Cleaning and disinfection requires agents effective against *C. auris* (List P)
- Has caused **large regional outbreaks** in healthcare facilities



C. auris Cases in CA through April 2020 (N=271)

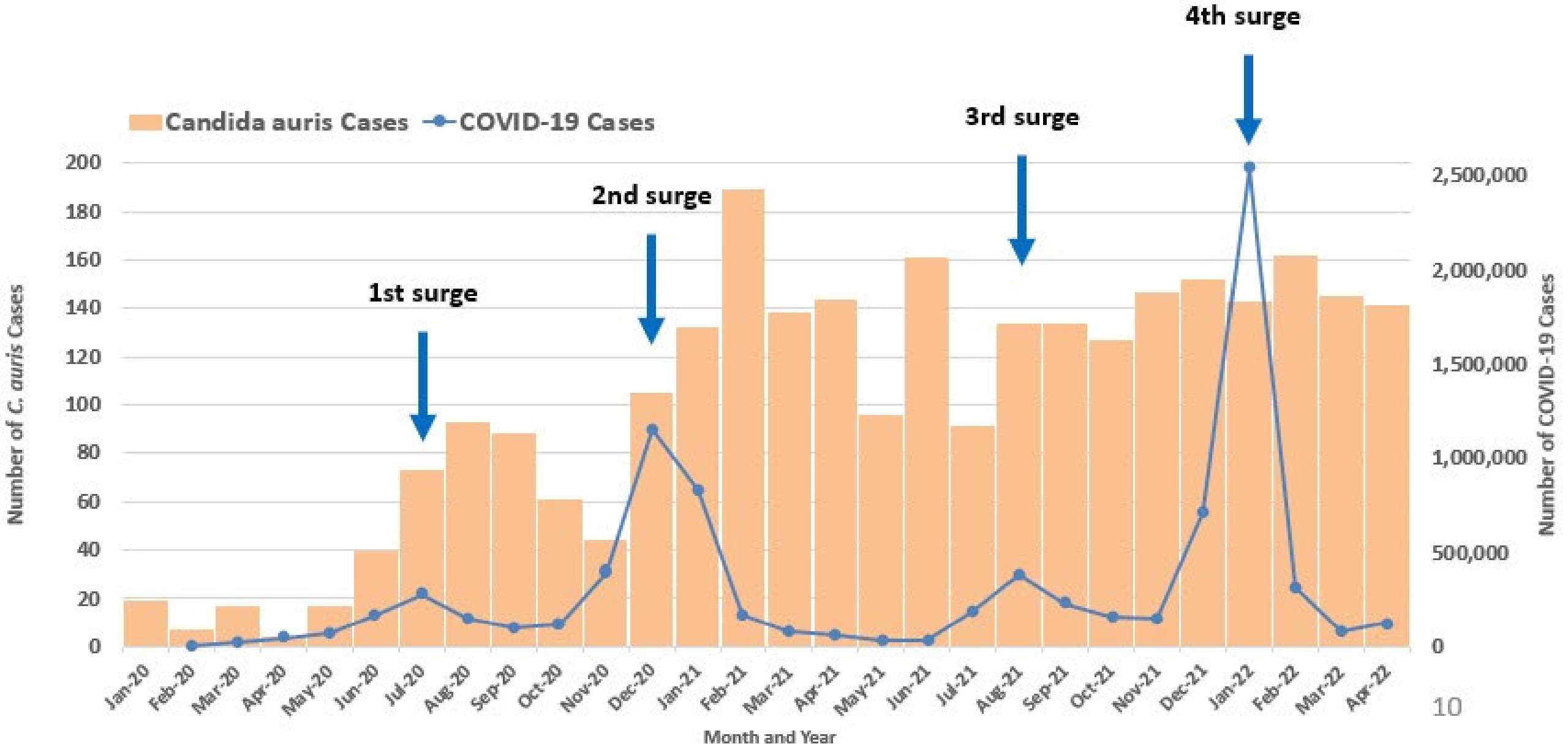


C. auris Cases Reported by Local Health Jurisdiction through April 2022 (n=3026)

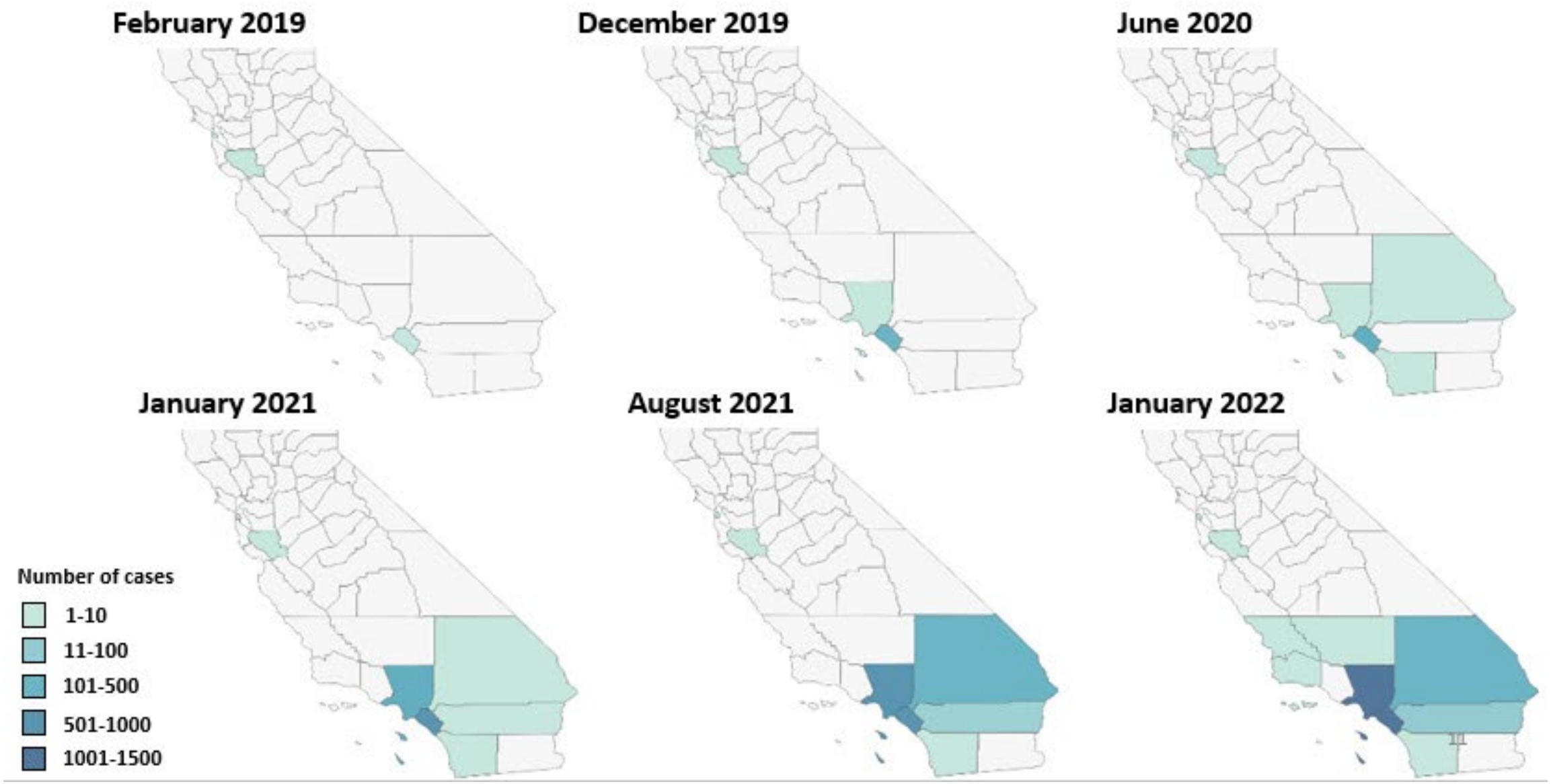


California Department of PublicHealth

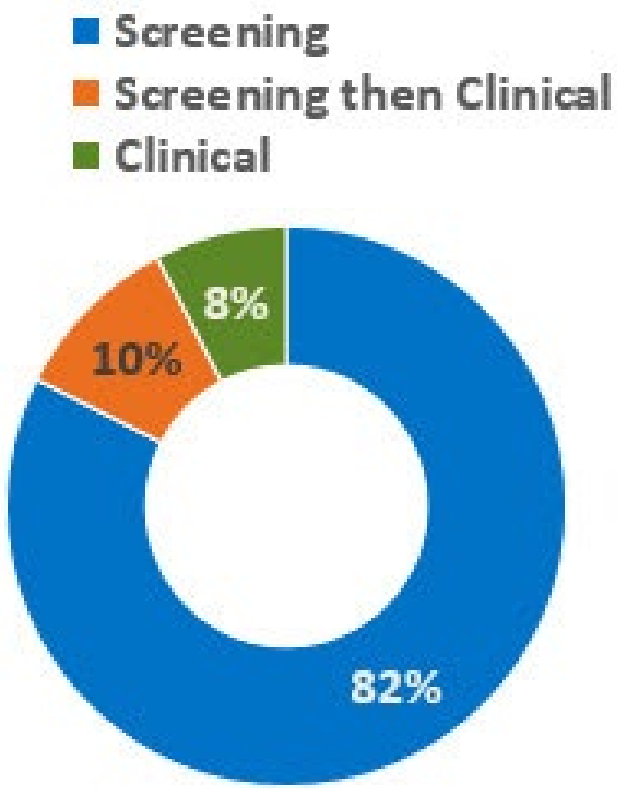
C. auris and COVID-19 Cases through April 2022



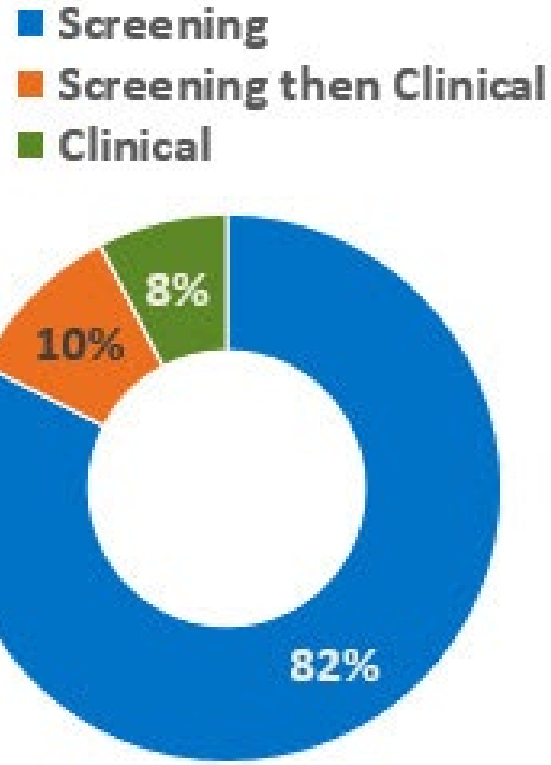
C. auris Cases, February 2019 through January 2022

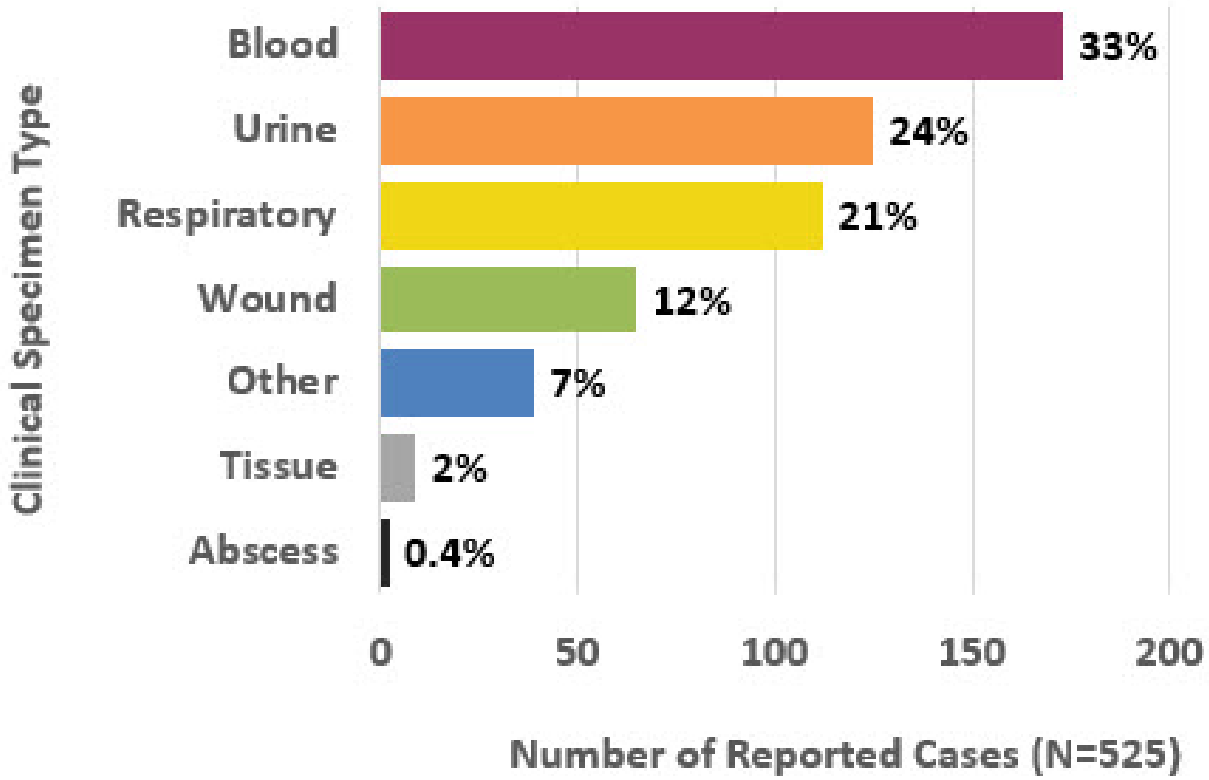


C. auris Cases by Case, Clinical Specimen Type through April 2022



C. auris Cases by Case, Clinical Specimen Type through April 2022





Early Detection and Containment Can Prevent Further Spread of *C. auris*

- Epidemiological investigation
- Onsite infection prevention and control assessments and education
- Targeted colonization testing for high-risk patients and patient contacts
- Enhanced clinical isolate testing by laboratories serving high-risk patients

Laboratory Testing is Essential to *C. auris* Detection and Containment

Testing Type	Response	Prevention and Mitigation
Colonization testing – point prevalence surveys (PPS)	At outbreak facilities, every 2 weeks until 2 consecutive negatives	• At high-risk facilities, every 3-6 months • At facilities with ongoing transmission, every 1-3 months

Colonization testing – admission screening	At facilities receiving patients from outbreak facilities	• At high-risk facilities
		• At all facilities, patients
		  • from any LTACH
		  • from SNF vent unit in jurisdictions with known *C. auris* transmission (all SoCal)
		  • with other known *C. auris* risk factors (www.cdph.ca.gov/Programs/CHCQ/HAI/Pages/Candida-auris.aspx)

Clinical isolate testing	At outbreak facilities, identify species of all *Candida* isolates	• At high-risk facilities, identify species of all *Candida* isolates • At all facilities, identify species of all *Candida* isolates from sterile site specimens; consider for non-sterile site specimens.

Reporting *Candida auris*

- Currently, reportable to public health as “Occurrence of Any Unusual Disease” or “Outbreaks of Any Disease” under Title 17
- Planning to make “*Candida auris*” lab- and provider-reportable with next Title 17 updates
  - Laboratory submission requirements for sterile site specimens
- In preparation, new *Candida auris* condition now available in CalREDIE for electronic laboratory and provider reporting

Questions?

For more information,

Email: HAIProgram@cdph.ca.gov
Or visit our CDPH *C. auris* webpage
(cdph.ca.gov/Programs/CHCQ/HAI/Pages/Candida-auris.aspx)

The Fungus Among Us: C. auris in LA County

5/19/22

Sandeep Bhaurla, MPH, CIC
AR Epidemiologist
Healthcare Outreach Unit
Acute Communicable Disease Control Program
Los Angeles County Department of Public Health

LACDPH *C. auris* Surveillance plan

- Table 3 of the **Mitigating the Spread of *C. auris* in Los Angeles County** (PDF) (publichealth.lacounty.gov/acd/docs/MitigatingSpreadofC.aurisLAC.pdf)

- Required to:
  - Report all confirmed *C. auris* within 1 working day (include AST results, if available)
  - Screen all persons who are epidemiologically-linked to newly identified *C. auris* cases (i.e., as part of a unit-wide point prevalence survey (PPS))

- Recommended to:
  - Identify yeast to the species level from non-sterile sites to r/o *C. auris*
  - Screen (surveillance swabs) all admissions from high-risk healthcare facilities and/or all high-risk patient populations[1]

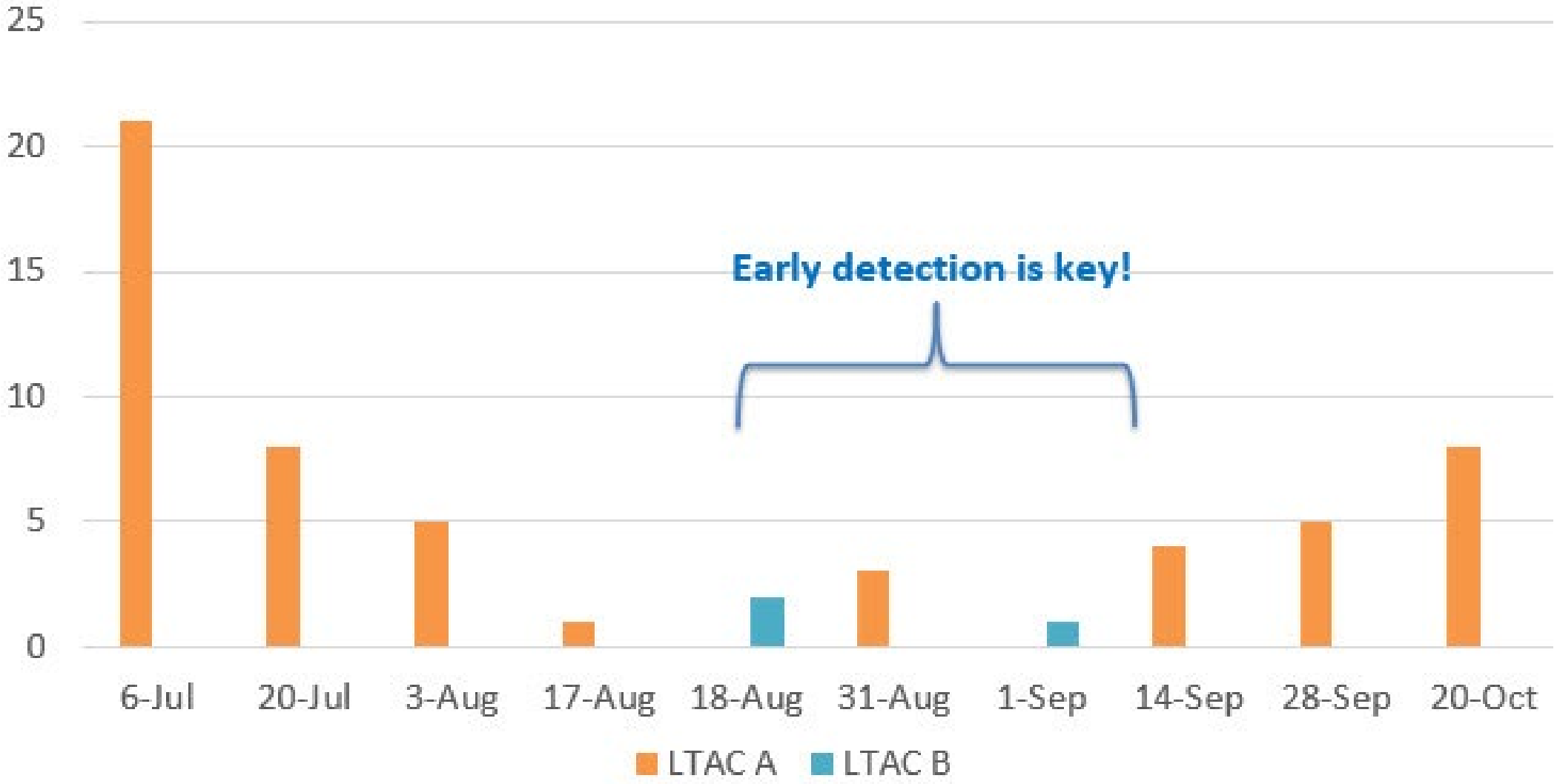
[1]CDPH Health Advisory, Feb 2022 (PDF) (publichealth.lacounty.gov/acd/docs/CAHAN_Cauris_Surveillance020122.pdf)

What is active vs passive surveillance?

- Passive surveillance:
  - Most common type of surveillance activity
  - Based on laboratories reporting new *C. auris*-positive persons as identified from clinical specimens (i.e., collected as part of routine clinical care)

- Active surveillance:
  - Mostly used for case finding or during outbreak investigations
  - Based on providers taking proactive steps to identify persons who may be positive for *C. auris* (collecting a screening swab to assess for *C. auris* colonization)

Why active surveillance for *C. auris* is important: A story of two LTACHs



Why passive surveillance is important: A story of *C. auris* in SoCal

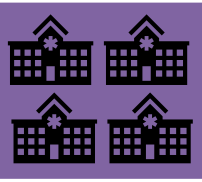
Lab starts identifying yeast to species level for isolates from routine urine cultures

Person tests positive for *C. auris* in the urine

Facility-wide PPS identifies many positives

PPS in connected HCFs identifies more cases

Preventative PPS & IC visits done in LA County HCFs



Questions?

Email us anytime at **hai@ph.lacounty.gov**

Or visit our **LA County Public Health *C. auris* website**

(publichealth.lacounty.gov/acd/Diseases/CandidaAuris.htm)

Health Outreach Unit website

(publichealth.lacounty.gov/acd/HOU.htm)

Candida auris Testing at Southern California Kaiser Permanente

Tam T. Van, PhD, D(ABMM)

Technical Director, Microbiology

Kaiser Permanente, Southern California Permanente Medical Group

Candida auris from Routine Cultures

- No active “rule out” protocol for *C. auris* from routine cultures due to high volume
- Isolated *C. auris* from blood and urine cultures (based on current workflow)
- MALDI-TOF (Vitek MS) for identification
- Susceptibility testing automatically performed for *Candida* from sterile sites (Sensititre)
  - Testing for other sites performed upon provider’s request

- Challenge with processing culture
  - Blood, CSF, sterile body fluid
  - Non-sterile sites (e.g., urine, respiratory, wound)

Workflow for Samples from Non-sterile Sites

- Respiratory culture (~400 samples/month)
  - Pure culture
  - Any amount of round yeast, no “feet” morphology, rule out *Cryptococcus* species (MALDI-TOF)
- Urine culture (~20K-25K/month)
  - Pure or growth of < 3 organisms
  - For ≥ 3 organisms, may be reported as flora, if not predominant
- Urine (invasively collected)
  - Full workup for suprapubic, cystoscopy, kidney (small volume)

Workflow for Samples from Non-sterile Sites

- Non-Sterile Culture (~1500/month)
  - Identify yeast if pure, moderate/heavy growth
  - Descriptive ID of yeast if pure, light growth
  - If ≥ 2 organisms, and not predominant – considered mixed flora
  - Eye: identify yeast regardless of growth quantity

Screening for *Candida auris* Colonization

- Laboratory-developed PCR assay since mid-May 2021
- Specimen type: bilateral axilla/groin composite (Eswab)
- Positive results are reported to public health immediately via electronic reporting
- Samples/isolates sent to public health, if requested
- Recommended testing criteria but no restriction on ordering

C. auris Colonization Testing Criteria

- Criteria for testing (public health recommendations)
  - Epi-linked to *C. auris* positive patients
    - Roommates, shared bathroom, same unit/room (24 hours)
  - Overnight stay in a healthcare facility in a county with transmission or multiple cases of *C. auris* in the past 12 months
  - Colonized with carbapenemase-producing organisms
  - Admitted from long-term acute care hospital or skilled nursing home
  - Admitted from a facility with transmission of *C. auris*

Notification for *C. auris* Positive

- Notification of positive *C. auris* either from screening (or routine culture)
  - Called notification to:
    - Ordering provider
    - On-call Infection Preventionist
  - Email communication to:
    - Technical and Physician Directors of Microbiology
    - Regional Director and Physician Director of Infection Prevention and Control

- Approximately 200 *C. auris* PCR performed per month
- Since May 2021, performed about 1800 PCR with ~1.9% positivity

Challenges

- Lack of commercially available test
  - Difficulties/challenges: resources, regulatory requirements
- Capital for molecular methods
  - Engage Regional Infection Prevention and Control to support initiative
- Staffing
  - Limited testing to day shift only

Providence

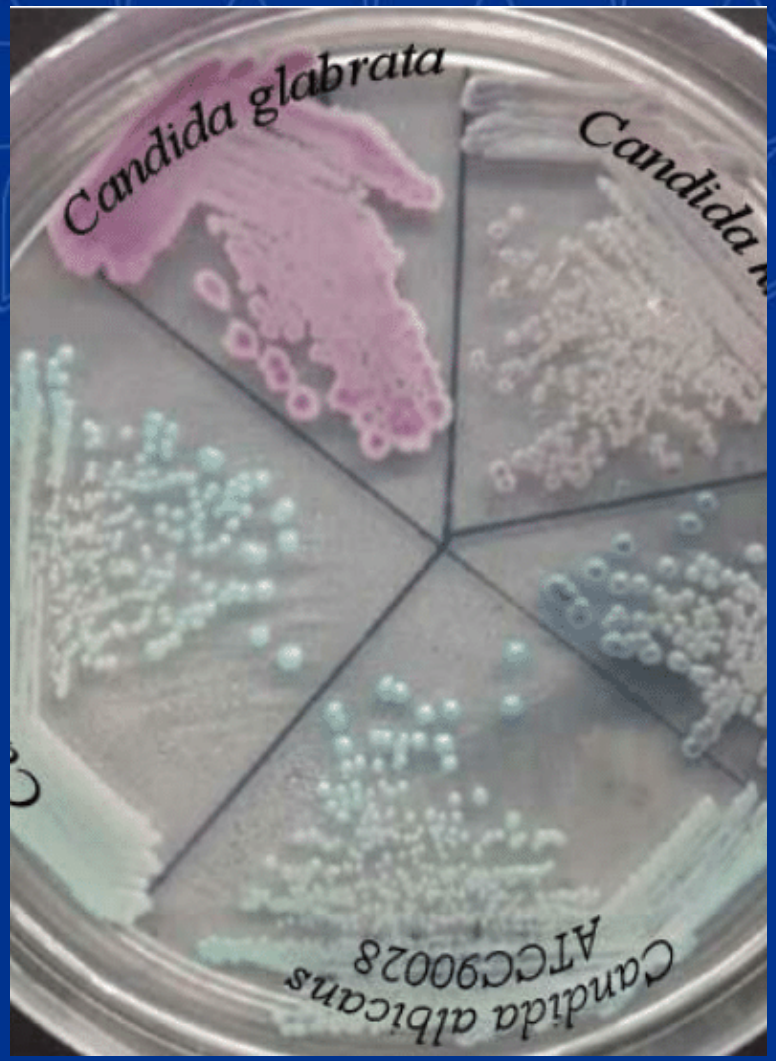
Candida auris Testing at Providence Saint Joseph Medical Center

Marc Bernaldez
Microbiology/Molecular Microbiology Manager
Providence Saint Joseph Medical Center (PSJMC)
Los Angeles Service Area Core Microbiology Department

Rule-out *C. auris* in cultures

ALL Cultures (Respiratory, Wounds, Urines, etc.) get a rule-out

- SOP changes to rule-out non-feathering yeast for *C. auris*
- Method of ID:
  - Bruker MALDI-TOF MS or VITEK 2 YST ID (no ID's or during PM and maintenance).
  - Media plate: BD ChromID
- Before *C. auris*, only report "yeast" if pure or heavy/predominant.
- Since we now ID, we report out yeast IDs
  - If yeast is in low amounts and not *C. auris*, we would still not report and consider as normal flora, in the case of respiratory cultures
  - Non-feathering Yeast, not *C. auris* reported as "Yeast"
  - We bill for a Yeast ID (EPIC CYST manually entered)
  - Protocols for fungal cultures did not change and rule-out same as above



Susceptibility Testing & Notification

Susceptibility testing for yeast cultures

- Sterile sites: automatic reflex
- Non-sterile sites: request from MD

Established *C. auris* as a “critical value”

- Notify results to both providers and infection prevention
- *C. auris* swabs come at night, floors would be notified first. IP usually would be reported the following business day.

Candida auris Surveillance PCR

- NAAT, performed at PSJMC (BD MAX, BioGX reagents)
  - Turnaround time from receipt in lab to result: 8 hours
  - Laboratory open 24/7, 365
  - Axilla/Groin collection using Eswab
  - Reported via Epic (LIS)
- Validation study was lengthy, but doable
  - Utilized CDC AR Isolate Bank *Candida auris* panel (requires deep freezer)
- Needed to implement testing per Infection Prevention
- Each hospital has its own criteria for testing or still in early adaptation on order sets
- Cost is high but essential…we have identified a few positives from different hospitals

Culture tips:

- There may be delays in reporting certain cultures when you're doing a "rule-out". Comments can include:
  - "Culture in progress"
  - "Mixed organisms isolated, identifications to follow"
  - "Yeast isolated, identification to follow"
- No BD MAX? HardyCHROM Candida + auris available (requires UV light)

PCR tips:

- Controls for each run on BD MAX: positive, negative, pooled negative patients

Reimbursement tips:

- Patients for surveillance are usually from Nursing Homes, SNFs, and inpatients…these get lumped up by DRG, or other types of reimbursements

References

MIC.63252, MIC.63256, MIC.63318, MIC.63322, MIC.63328, MIC.64760, MIC.64770, MIC.64968, MIC.64975, MIC.65200, MIC.65230, MIC.65240, MIC.65250, MIC.65260, MIC.65270, MIC.65300, MIC.65340, MIC.65500, MIC.66200

- CLSI. Molecular Diagnostic Methods for Infectious Diseases. 3rd ed. CLSI report MM03. Wayne, PA: Clinical and Laboratory Standards Institute; 2015.
- Molecular Microbiology: Diagnostic Principles and Practice, 3rd Edition, Edited by David H. Persing et al. 2016 ASM Press, Washington, DC
- BioGX. *Candida auris* Open System Reagents for the BD MAX™. Rev 01-05.12.2020. Amsterdam, The Netherlands; 2020.

Thank you!

Any Questions?

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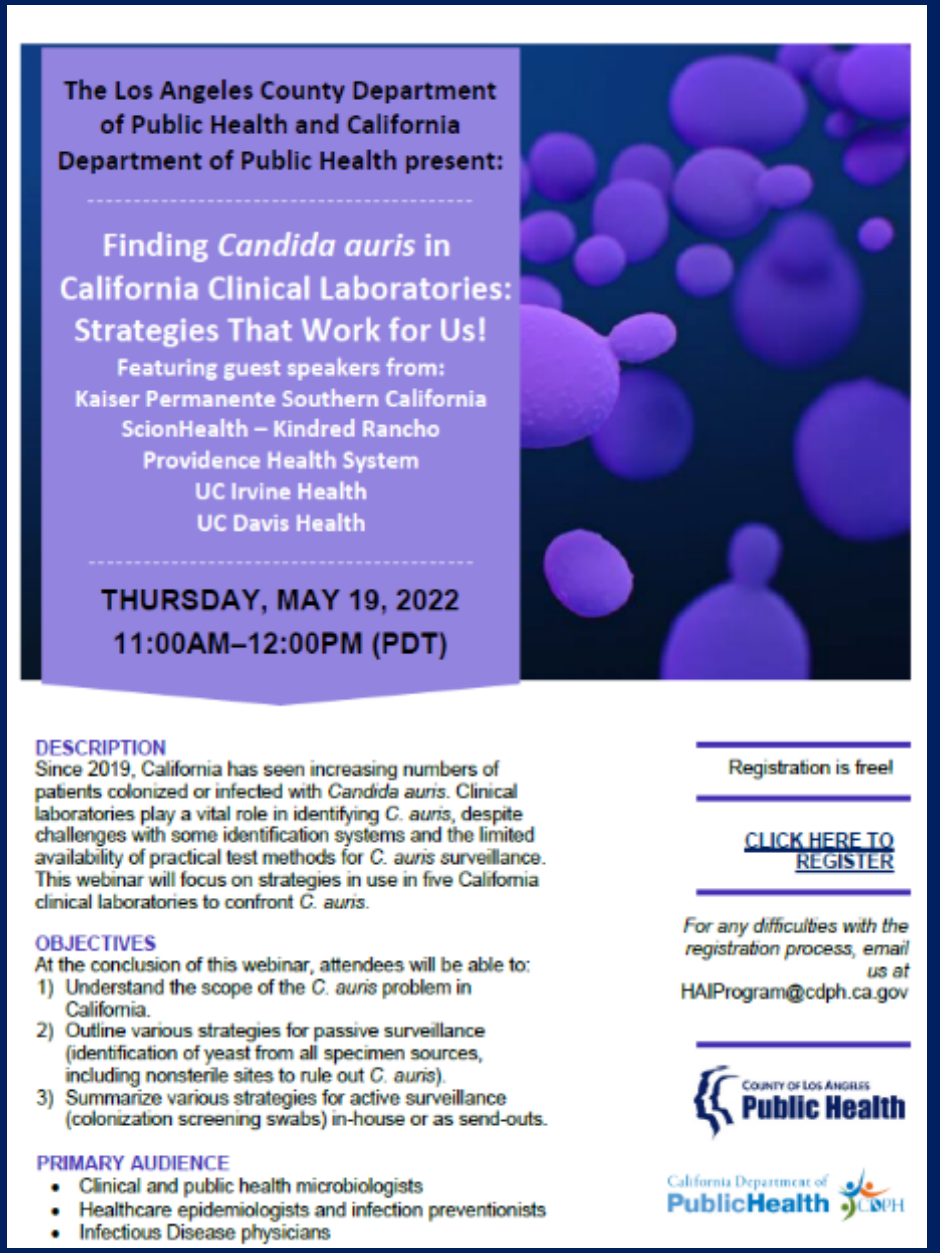
Finding *Candida auris* in California Clinical Laboratories: Strategies That Work for Us!

Gigi Lehman, CLS
Specialist, Mycology

UCI Health



Question # 1:

Which yeast isolates from nonsterile sites are ruled out as C. auris? (assume sterile site isolates get species ID; protocol for ID of yeast from nonsterile fungal vs bacterial cultures)?

Fungal Cultures, Non-Sterile Site

Any yeast from cultures other than respiratory cultures

Bacterial Cultures, Non–Sterile Sites

Workup performed based on established protocol - determined for each specimen type, predominance, and quantity.

Special Request by Epidemiology / Infection Prevention (EIP) as "Rule out *C. auris*"

Workup / Identify all yeast Isolates

Question # 2:

What methods are used to identify C. auris from diagnostic specimens?

Methods Used to Identify *C. auris*

LIS Order: Fungal Culture, Rule Out *Candida auris* (Ordered by EIP)

Specimen: Axilla/groin, Nares swabs

Media: Blood Agar
BHI with Gentamicin Chloramphenicol
Chromagar Candida Medium

Incubation: 37°C for 10 days

Colony Morphotypes: White, Pink, White w/ Pink center

Methods Used to Identify *C. auris*

Primary method: MALDI-TOF (ID)

Back-up method: API20C AUX (rule out)

If not identified: Send out to OCDH-PHL

UCI Follows the CDC Algorithm to Identify *C. auris* (PDF)

(www.cdc.gov/fungal/candida-auris/pdf/Testing-algorithm_by-Method_508.pdf)

National Center for Emerging and Zoonotic Infectious Diseases

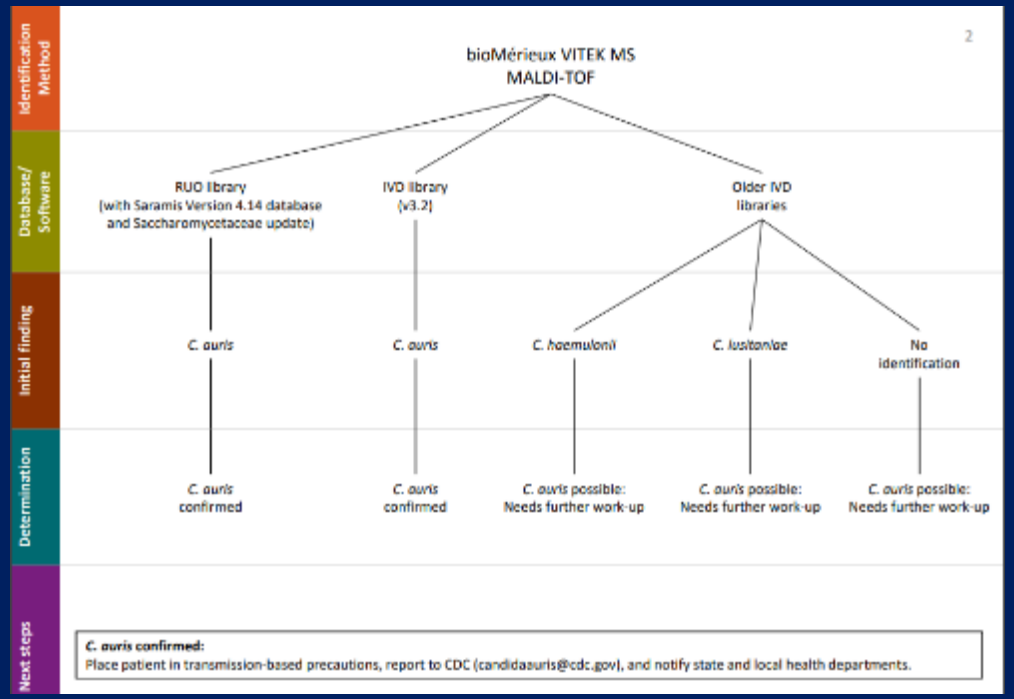
Algorithm to identify *Candida auris* based on phenotypic laboratory method and initial species identification

PURPOSE

Candida auris is a multidrug-resistant yeast that has been found in multiple countries, including the United States. *C. auris* can cause invasive infections, be passed from person to person, and persist in the environment. Its severity, communicability, and drug resistance makes correctly identifying *C. auris* crucial to treating patients and preventing infections. However, this is challenging because traditional phenotypic methods frequently misidentify *C. auris*. This algorithm details the steps needed to determine the correct *Candida* spp. based on the tests and equipment available in your lab.

TABLE OF CONTENTS – ALGORITHMS BY METHOD

Please note that these algorithms are based on our current knowledge about misidentification of C. auris and may change as we learn new information.



Question # 3:

When are antifungal susceptibility tests performed on C. auris?

Antifungal Susceptibility performed on:

- Blood and sterile body sites
- Surgical specimens
- If requested by EIP

Question # 4:

How are results reported to providers (including infection preventionists) (e.g., phone/text; routine reports; nonsterile sites for rule out…is "yeast, not C. auris reported"? etc.)?

Reporting *C. auris*

If requested as R/O *C. auris:*

Negative Culture: *"No Candida auris Isolated"*

Positive Culture: *"4+ Candida auris"*

***C. auris* are reported to physician by phone**

"Phoned results and readback confirmed to: [Name], [Date] at [Time] by [Tech Initials]."

***C. auris* is flagged in LIS**

Line listing is generated for EIP for significant results which includes *C. auris*

Question # 5

How are colonization screening swabs handled? (e.g., in house or send out)

Question # 6

If in house, what method is used for colonization screening swabs?

Reporting *C. auris*

UCI Patients

- In-house testing
- By special request by EIP
- Screening performed by culture method

Non- UCI Patients

- Not Tested in UCI - Sent to reference lab

Question # 7:

What criteria are used for sending isolates to your local public health laboratory?

Criteria for Sending Isolates to Local Public Health Lab

Sent to Local Public Health Lab

C. auris isolates recovered from clinical specimens

NOT sent to Local Public Health Lab

C. auris isolates from screening cultures ordered by EIP that are from known positive patients from outside facilities (SNFs).

Question # 8:

What challenges/barriers were encountered with setting up this testing (including any cost issues) – how/why they overcame?

Challenges Encountered Setting Up *C. auris* Testing

Last Year, 2021

- Lack of commercially available screening media
- Lack of guidance and evolving requirements

This Year, 2022

- Main Challenge – Implementing molecular testing
- Most assays are LDTs requiring extensive validation
- The validation is complete for swabs and blood culture detection of *C. auris* and live on 6/1/2022.

Question # 9: Any Final Tips..

Work with your Epidemiology - Infection Prevention team:

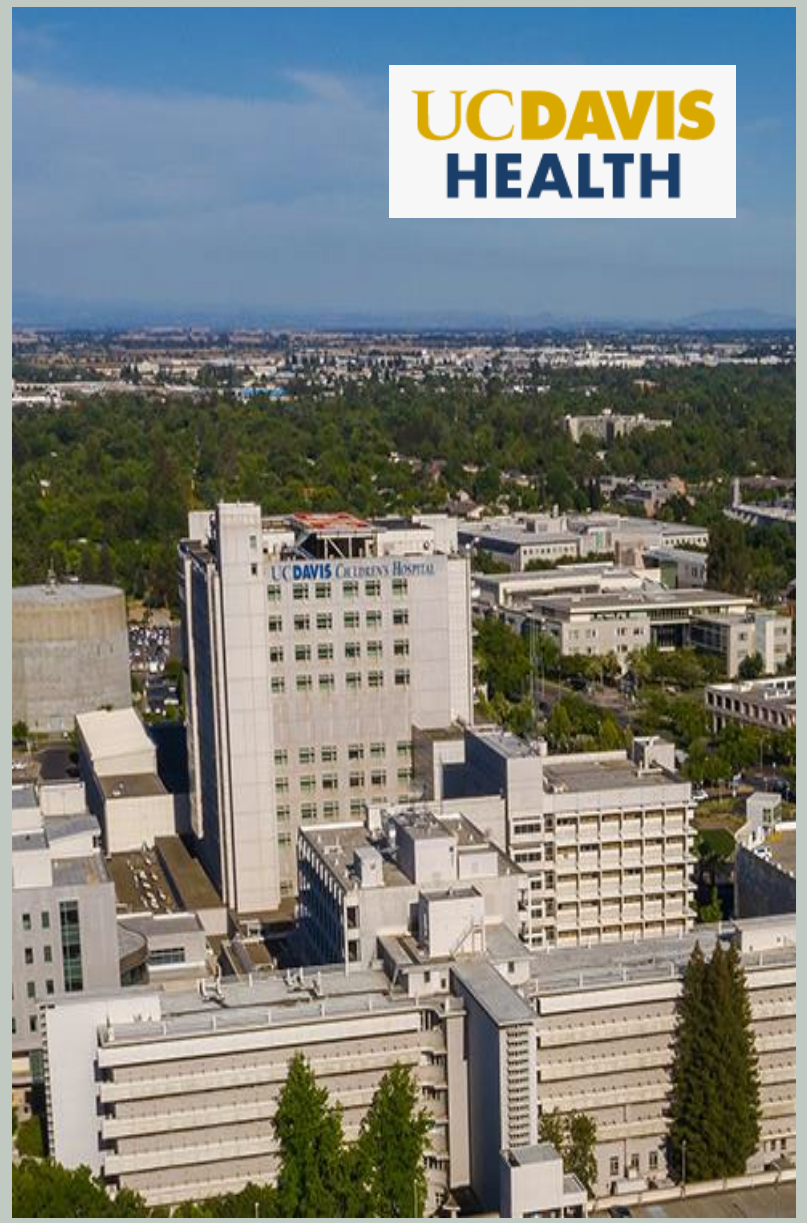
- Determine your facility needs
- Consider your patient population in-patients, out-patients, and referral patients
- Differential Chromogenic agar is now available (Hardy Diagnostics). Our initial studies showed good results (ASM Poster 2022)
- Communicate, communicate, communicate…

Thank you!!

UCI Microbiology Team

Candida auris

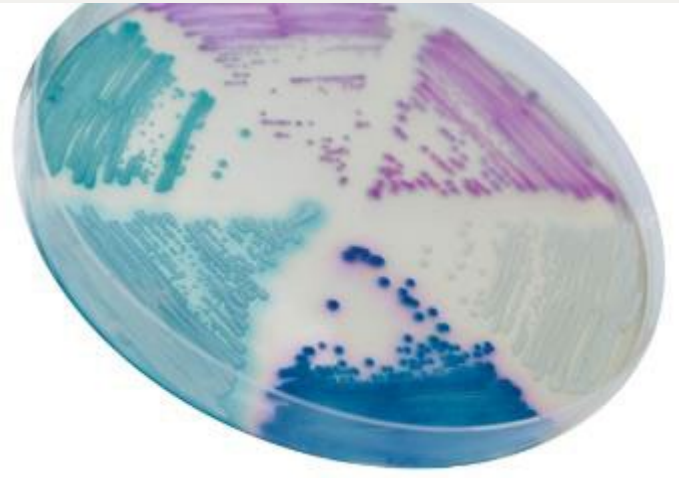
- Testing at UC Davis Health



Amy Kingsley, CLS, MLS (ASCP)^{CM}

UC Davis Pathology & Laboratory Medicine

C. auris Identification and rule-out



CHROMagar Candida Plus
(www.chromagar.com/en/product/chromagar-candida-plus/)

Non-sterile sites*

- **Wounds**
- **Lesions**
- **Skin**
- **Ear, Nose**
- **Urine**

* *C. auris* is not pursued in heavily mixed cultures

Identification Method

Bruker MALDI-TOF

- Isolated colonies of suspected yeast on bacterial or yeast culture media

MALDI-TOF microflex Biotyper
(www.medicalexpo.com/)

Patient Reports

Culture Reports

- Species name including *Candida auris* if identified
- Yeast, not Cryptococcus (respiratory source)
- Yeast, not further identified (non-sterile source)

Candida auris Surveillance Test

- *Candida auris* detected
- *Candida auris* not detected

Infection Prevention (IP) Notification

- If *C. auris* is detected in the surveillance test or reported in culture, an infection marker is applied in the patient chart for IP notification

Antifungal Susceptibility Testing

Sensititre™ YeastOne™ YO9 AST Plate
(www.thermofisher.com/order/catalog/product/YO9)

Sensititre™ YeastOne™ YO9 AST Plate

- *Candida albicans*
- *Candida glabrata* complex
- *Candida parapsilosis* complex
- *Candida dubliniensis*
- *Candida tropicalis*
- *Clavispora lusitaniae*
- *Pichia kudriavzevii*
- *Candida auris* – **not validated. Sent to University of Texas for antifungal testing.**
  - Amphotericin B
  - Micafungin

Candida auris Surveillance Test

Test population – colonization screening:

- Patients from Skilled Nursing Facilities (SNF)
- Patients from Long Term Acute Care Hospitals (LTACH)
- Point prevalence surveillance

Specimen collection:

- BD ESwab™
- Bilateral axilla and groin

Test Method

Real-time PCR

- BD MAX™
- BioGX *Candida auris* primers and probes
- BD MAX DNA Extraction Cartridge

BD MAX™ system
(www.bd.com/en-us/products-and-solutions/products/product-families/bd-max-system)

Establishing the *C. auris* Test

Validation

- Lab Developed Test
  - Obtained isolates from CDC AR Isolate Bank
  - Contrived positive and negative samples tested
  - Sensitivity, Specificity, Accuracy, Cross-reactivity, Comparison
  - LoD challenges

Test build & ordering

- Develop orderable test and prompt physicians to place order
- BPA (best practice alert) – physician guidance to order the test

Thank you!

Contact Information for Presenters Slide and Recording Access

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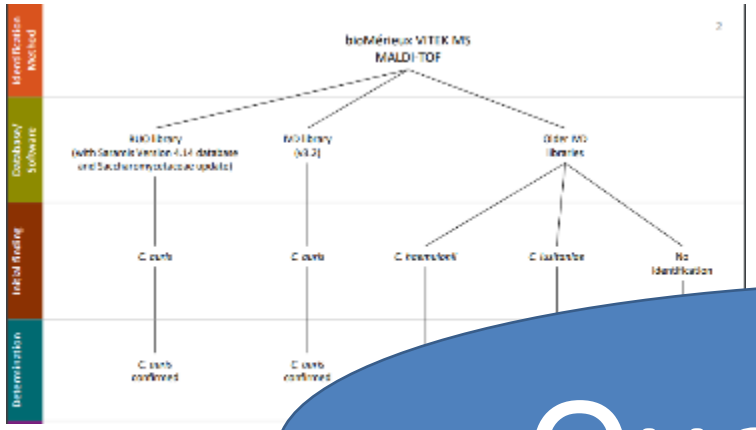
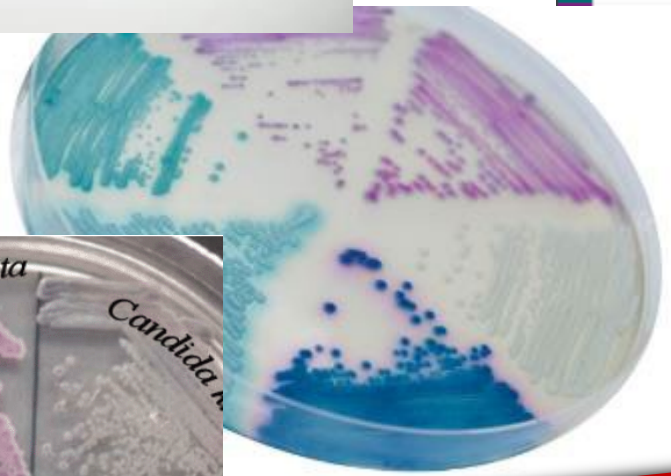
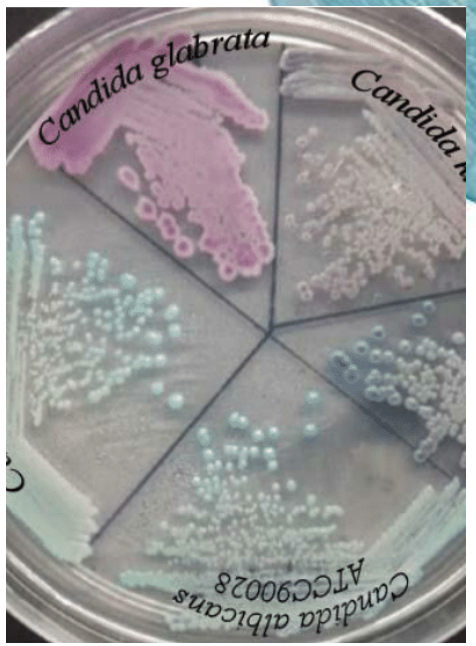
Will send email to you within 2 weeks with link to:

- copy of slides and recording
- Q&As
- additional resource list

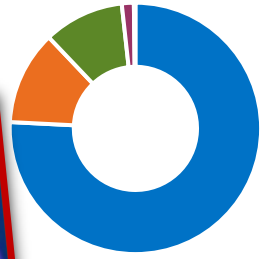


Questions???





Collection Facility Type



Thank you!

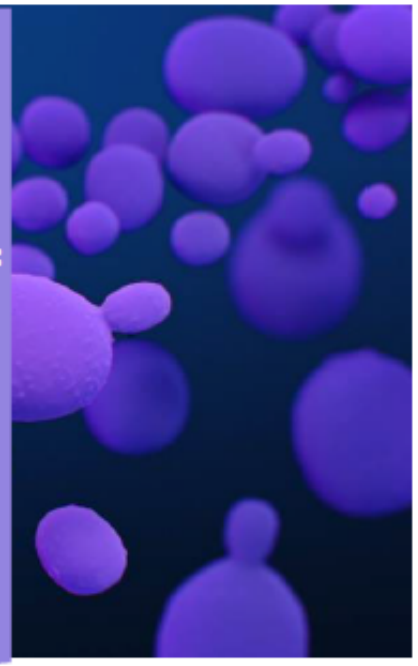
Special thanks to our presenters

The Los Angeles County Department of Public Health and California Department of Public Health present:

Finding *Candida auris* in California Clinical Laboratories: Strategies That Work for Us!

Featuring guest speakers from:
Kaiser Permanente Southern California
ScionHealth – Kindred Rancho
Providence Health System
UC Irvine Health
UC Davis Health

THURSDAY, MAY 19, 2022
11:00AM–12:00PM (PDT)



DESCRIPTION
Since 2019, California has seen increasing numbers of patients colonized or infected with *Candida auris*. Clinical laboratories play a vital role in identifying *C. auris*, despite challenges with some identification systems and the limited availability of practical test methods for *C. auris* surveillance. This webinar will focus on strategies in use in five California clinical laboratories to confront *C. auris*.

OBJECTIVES
At the conclusion of this webinar, attendees will be able to:
1) Understand the scope of the *C. auris* problem in California.
2) Outline various strategies for passive surveillance (identification of yeast from all specimen sources, including nonsterile sites to rule out *C. auris*).
3) Summarize various strategies for active surveillance (colonization screening swabs) in-house or as send-outs.

PRIMARY AUDIENCE
- Clinical and public health microbiologists
- Healthcare epidemiologists and infection preventionists
- Infectious Disease physicians

Registration is free!

CLICK HERE TO REGISTER

For any difficulties with the registration process, email us at
HAIProgram@cdph.ca.gov

County of Los Angeles Public Health

California Department of PublicHealth CDPH