

# *Candida auris* Reporting, Surveillance, and Laboratory Testing

November 9<sup>th</sup>, 2022

Presented by Webinar

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West Region Antimicrobial  
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## Objectives

- Review the epidemiology of *Candida auris* (*C. auris*) in California
- Introduce *C. auris* reporting and isolate submission requirements
- Describe *C. auris* testing available through CDPH Microbial Diseases Laboratory (MDL) and West Region Antimicrobial Resistance (AR) Lab Network
- Present resources and guidance for preventing and responding to *C. auris* cases



*Candida auris*

## *Candida auris*



- *Candida* species resistant to multiple classes of antifungals
  - Invasive infections associated with 30 to 72% mortality\*
  - Recent report of 2 simultaneous and independent clusters of near pan-resistant *C. auris*\*\*
- Very difficult to limit spread and eliminate from patient environment
  - Cleaning and disinfection requires agents effective against *C. auris* (List P or List K)
  - Recent study found contaminated beds and handrails for 3 residents who did NOT test positive for *C. auris*.
    - All 3 residents were in rooms recently vacated by a *C. auris* positive resident\*\*\*
- Patients can remain colonized for many months, with no “clearance” recommendations

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\*Cortegiani, Andrea, et al. Journal of intensive care. 2018 Oct 29;6:69. [doi:10.1186/s40560-018-0342-4](https://doi.org/10.1186/s40560-018-0342-4)

\*\*Lyman M, et al. MMWR Morb Mortal Wkly Rep. 2021 Jul 23;70(29):1022-1023. [doi: 10.15585/mmwr.mm7029a2](https://doi.org/10.15585/mmwr.mm7029a2).

\*\*\*Sexton D, et al. Clin Infect Dis. 2021 Oct 1; 73(7): 1142–1148. [doi: 10.1093/cid/ciab327](https://doi.org/10.1093/cid/ciab327)

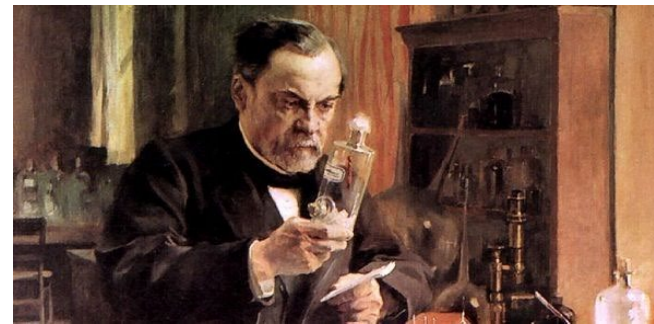
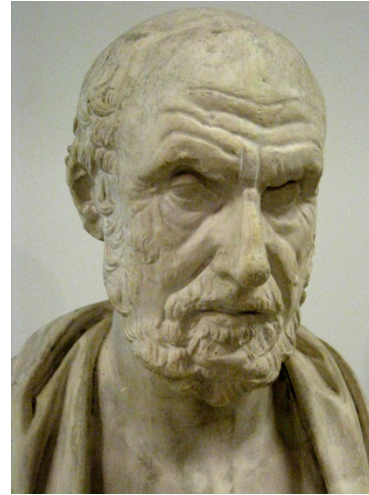
## POLL: What year was *Candida auris* first discovered?

1. 400 BCE

2. 1729

3. 1917

4. 2009



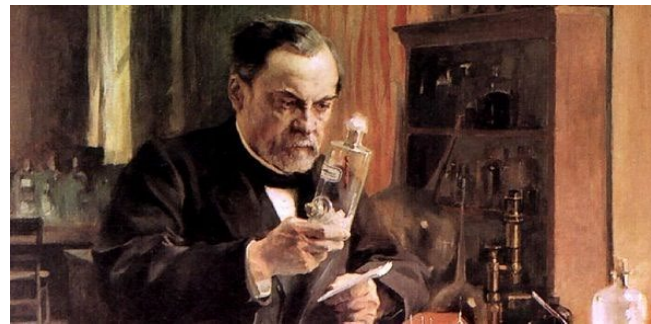
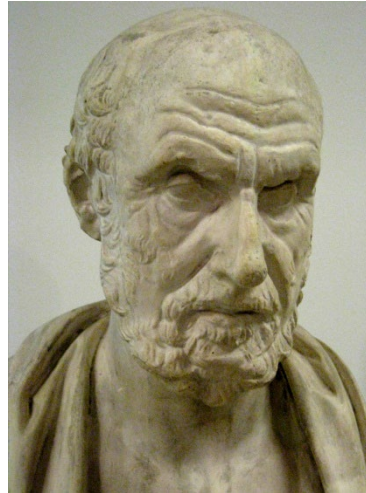
## POLL: What year was *Candida auris* first discovered?

1. 400 BCE (*C. albicans*)

2. 1729 (*Aspergillus*)

3. 1917 (*C. glabrata*)

4. 2009 (*C. auris*)



## POLL: Using whole genome sequencing, epidemiologists estimate *C. auris* emerged from which region?

1. East Asia
2. South America
3. South Africa
4. South Asia
5. All of the Above



# POLL: Using whole genome sequencing, epidemiologists estimate *C. auris* emerged from which region?

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## *C. auris* is a Major Threat to Public Health

- WHO recently released a [fungal pathogen priority report](http://www.who.int/publications/i/item/9789240060241) (www.who.int/publications/i/item/9789240060241), designating *C. auris* a critical priority for global public health
- CDC's [2019 Antibiotic Resistance Threat Report](http://www.cdc.gov/drugresistance/biggest-threats.html) (www.cdc.gov/drugresistance/biggest-threats.html) also listed *C. auris* as an urgent, top tier, threat to patient safety in the United States

### Urgent Threats

These germs are public health threats that require urgent and aggressive action:



CARBAPENEM-RESISTANT  
**ACINETOBACTER**



**CANDIDA AURIS**



**CLOSTRIDIODES DIFFICILE**

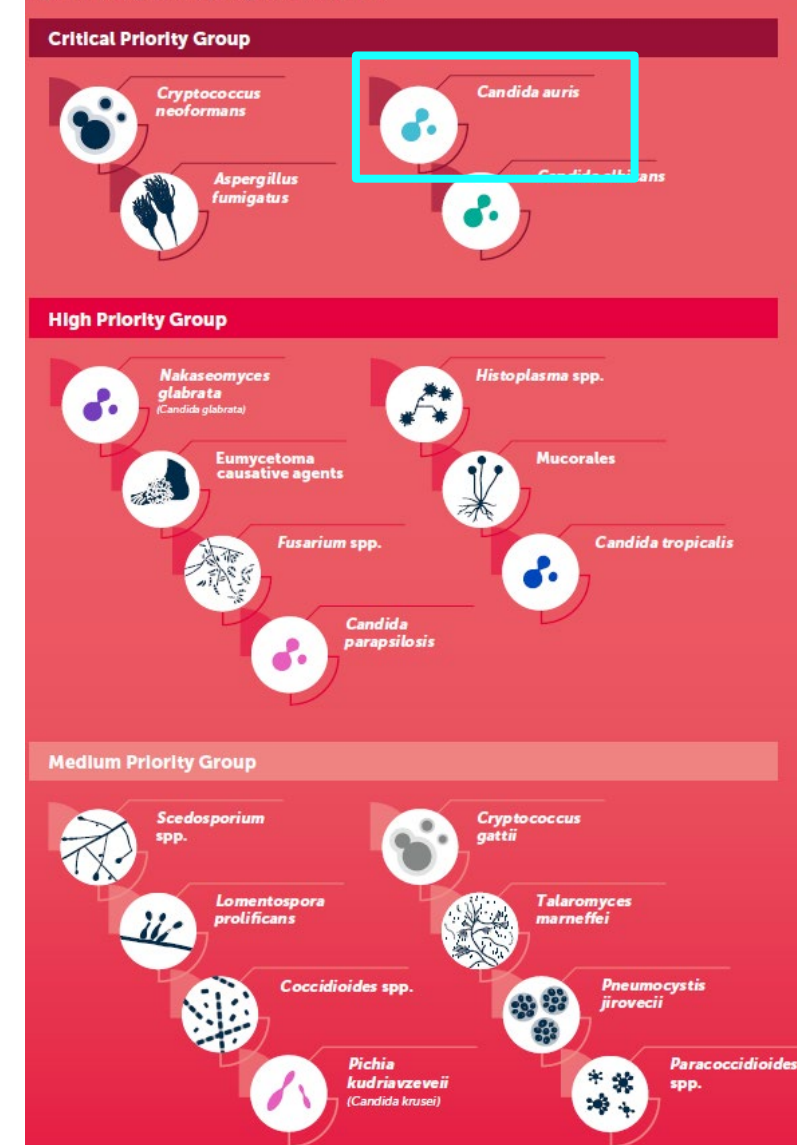


CARBAPENEM-RESISTANT  
**ENTEROBACTERIACEAE**



DRUG-RESISTANT  
**NEISSERIA GONORRHOEAE**

Fig. 1. WHO fungal priority pathogens list (WHO FPPL)



## *C. auris* is a Major Threat to Public Health

- CDC's 2022 Special Report, [COVID-19 U.S. Impact on Antimicrobial Resistance](https://www.cdc.gov/drugresistance/pdf/covid19-impact-report-508.pdf) (PDF) ([www.cdc.gov/drugresistance/pdf/covid19-impact-report-508.pdf](https://www.cdc.gov/drugresistance/pdf/covid19-impact-report-508.pdf)) showed a 60% increase in *C. auris* from 2019-2020

*C. auris* clinical cases have steadily increased since 2015 and significantly increased in 2020. The increase in 2020 could be a result of staffing and supply shortages, an increased number of sicker patients, and changes in infection prevention and control practices (e.g., re-use or extended use of gowns and gloves).



COVID-19: U.S. Impact on Antimicrobial Resistance, Special Report 2022

## Diagnostics

### Yeast Identification in California Hospitals, 2021

- Laboratory testing for *Candida auris*
  - Culture-based
    - Most common type of yeast ID in clinical labs\*
    - Yeast misidentification is rare but labs should be aware of [possibility for misclassification](#)  
([www.cdc.gov/fungal/candida-auris/identification.html](http://www.cdc.gov/fungal/candida-auris/identification.html))

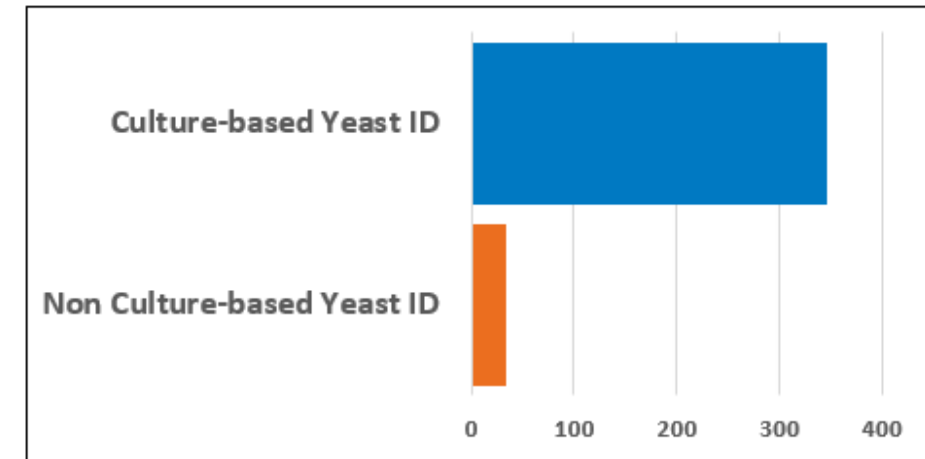
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\* 347/380 (91%) of hospitals use a lab that performs culture-based yeast identification (including MALDI-TOF)  
Source: [NHSN Annual Survey, 2021](#) (PDF) ([www.cdc.gov/nhsn/forms/57.103\\_pshospurv\\_blank.pdf](http://www.cdc.gov/nhsn/forms/57.103_pshospurv_blank.pdf))

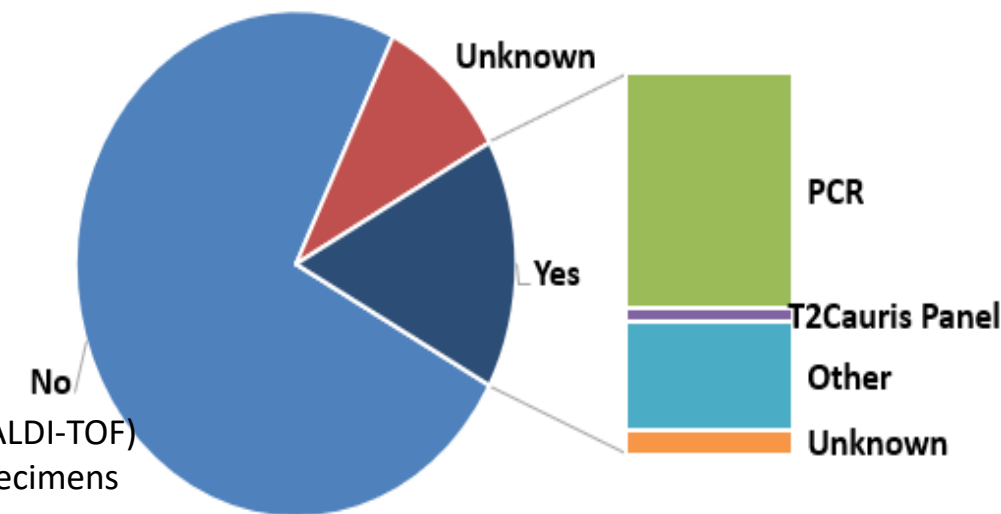
# Diagnostics

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  - Culture-independent diagnostic tests (CIDT)
    - Minority of labs use CIDT to identify *C. auris* from clinical specimens\*\*
    - Preferred for screening specimens (e.g., axilla/groin, skin, nares swabs)

Yeast Identification in California Hospitals, 2021



Yeast Identification in California Hospitals, 2021



\* 347/380 (91%) of hospitals use a lab that performs culture-based yeast identification (including MALDI-TOF)

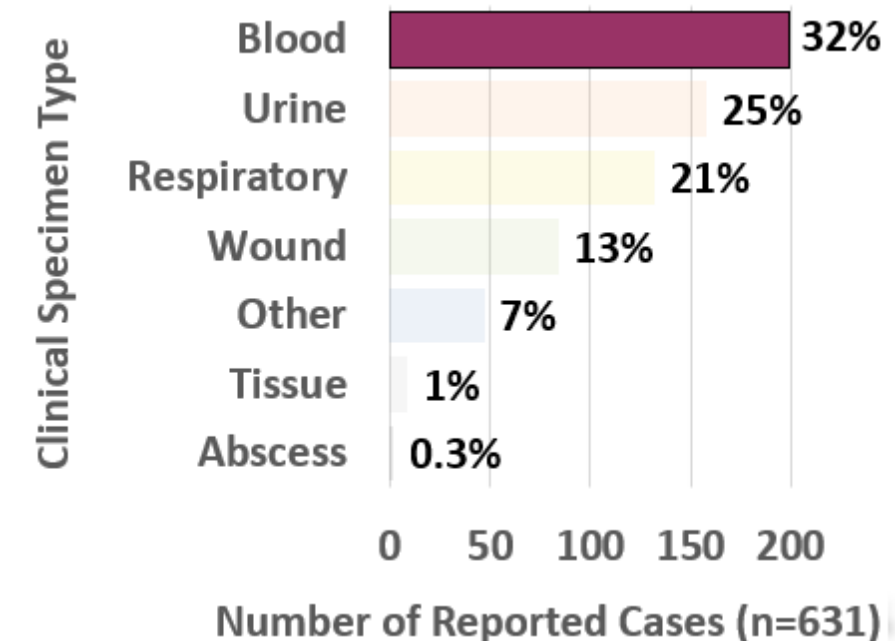
\*\*60/380 (17%) of hospitals report using a lab that performs CIDT to identify *C. auris* from clinical specimens

Source: [NHSN Annual Survey, 2021](https://www.cdc.gov/nhsn/forms/57.103_pshospssurv_blank.pdf) (PDF) (www.cdc.gov/nhsn/forms/57.103\_pshospssurv\_blank.pdf)

## *Candida* Species Identification in Sterile Sites

- CDC recommends identifying all *Candida* isolates from normally **sterile sites** to the species level
  - Likely indicate invasive infection requiring treatment

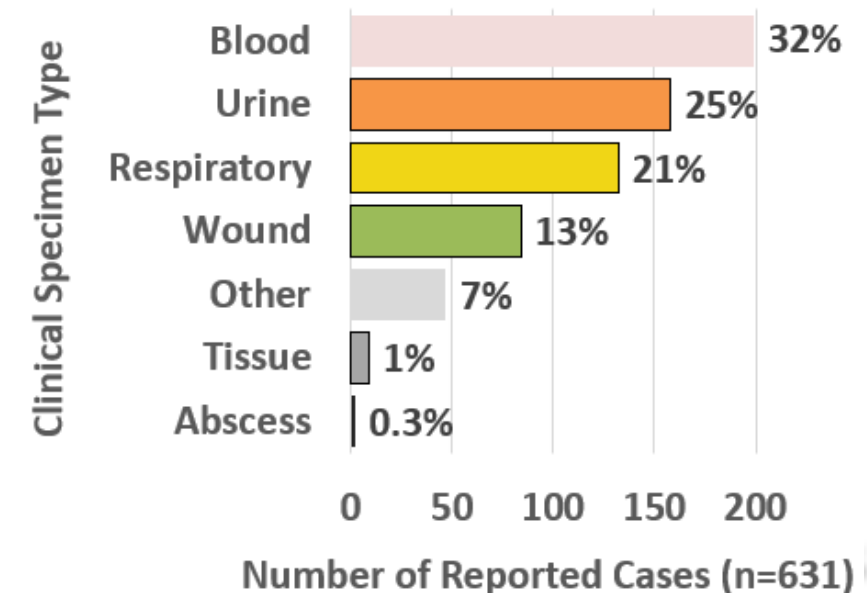
Clinical *C. auris* Cases Reported in California



## Candida Species Identification in Non-sterile Sites

- Identify *Candida* isolates from **non-sterile sites** to the species level:
  - when clinically indicated for patient care
  - for additional case detection (prospective surveillance)
  - for patients at high risk for *C. auris* acquisition
    - LTACH patients or vSNF residents
    - from known *C. auris* outbreak facilities
    - close healthcare contacts
    - colonized or infected with a CPO
    - had overnight healthcare exposure outside the US in the past year

Clinical *C. auris* Cases Reported in California

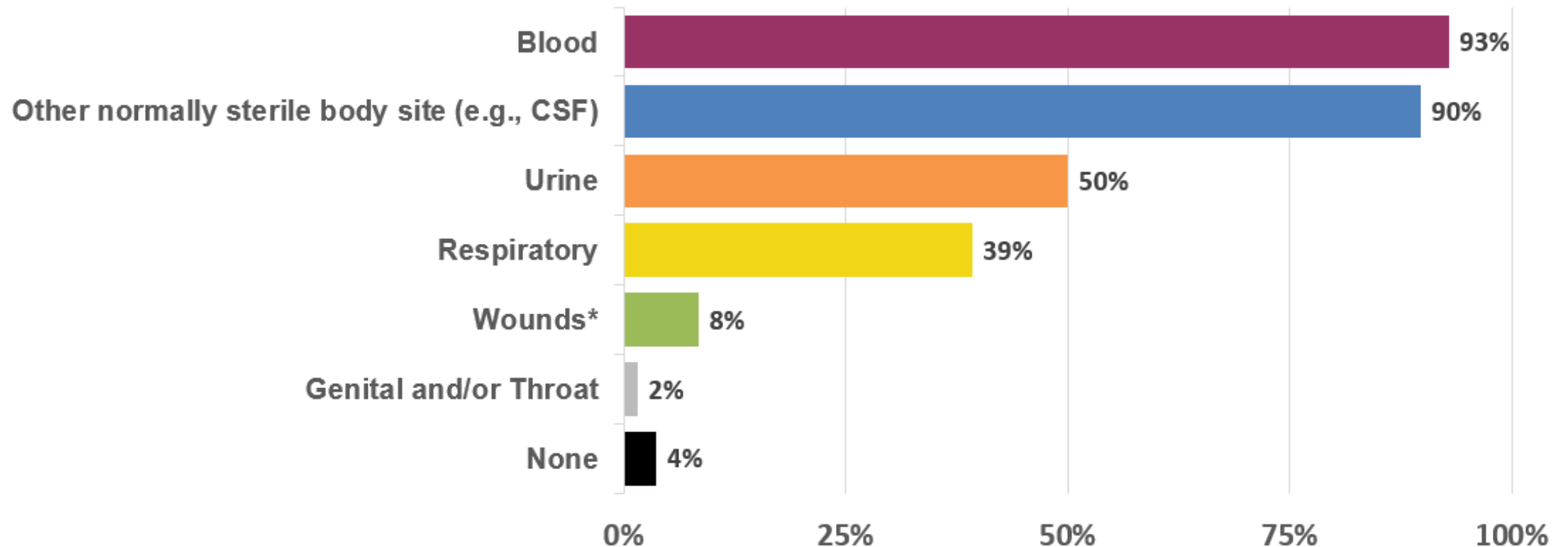


LTACH=long-term acute care hospital, vSNF=ventilator-equipped skilled nursing facility,  
CPO=carbapenemase-producing organism

[CDPH C. auris Webpage](http://www.cdph.ca.gov/Programs/CHCQ/HAI/Pages/Candida-auris.aspx) (www.cdph.ca.gov/Programs/CHCQ/HAI/Pages/Candida-auris.aspx)

# *Candida* Species Identification by Specimen Source, NHSN 2021

***Candida* identified from which body site are usually identified to the species level?**



\* Respondents indicate they identify *Candida* isolates to the species level only for specific wound specimens

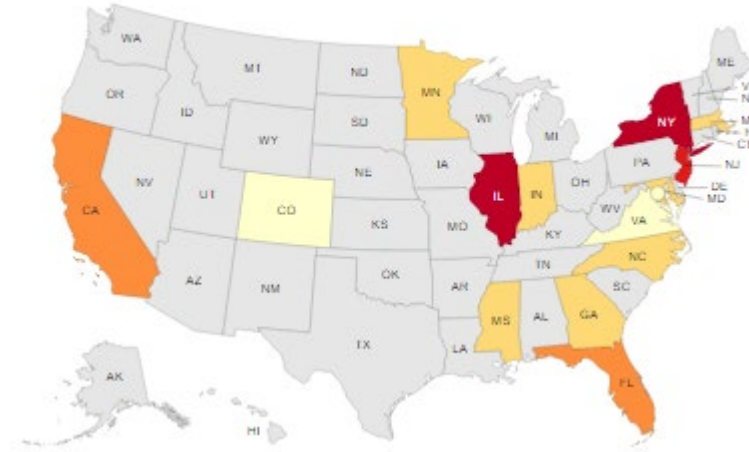
Source: [NHSN Annual Survey, 2021](https://www.cdc.gov/nhsn/forms/57.103_pshospurv_blank.pdf) (PDF) ([www.cdc.gov/nhsn/forms/57.103\\_pshospurv\\_blank.pdf](https://www.cdc.gov/nhsn/forms/57.103_pshospurv_blank.pdf))

# C. auris in the United States

REPORTED CLINICAL CASES OF *CANDIDA AURIS*, 2017



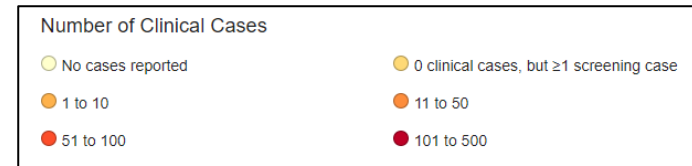
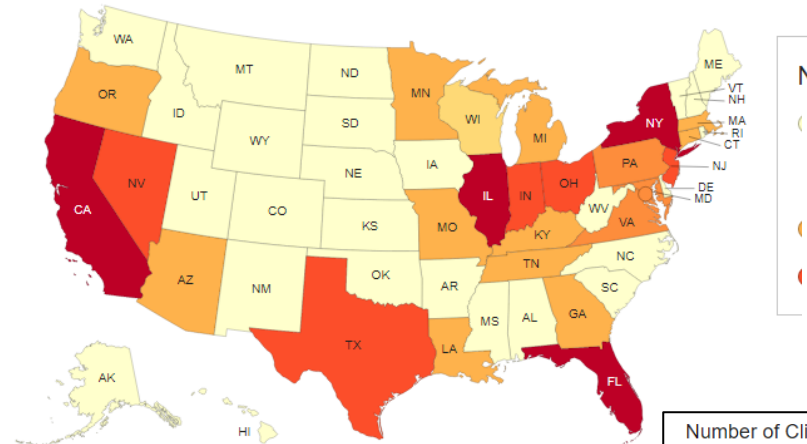
REPORTED CLINICAL CASES OF *CANDIDA AURIS*, 2019



REPORTED CLINICAL CASES OF *CANDIDA AURIS*, 2021



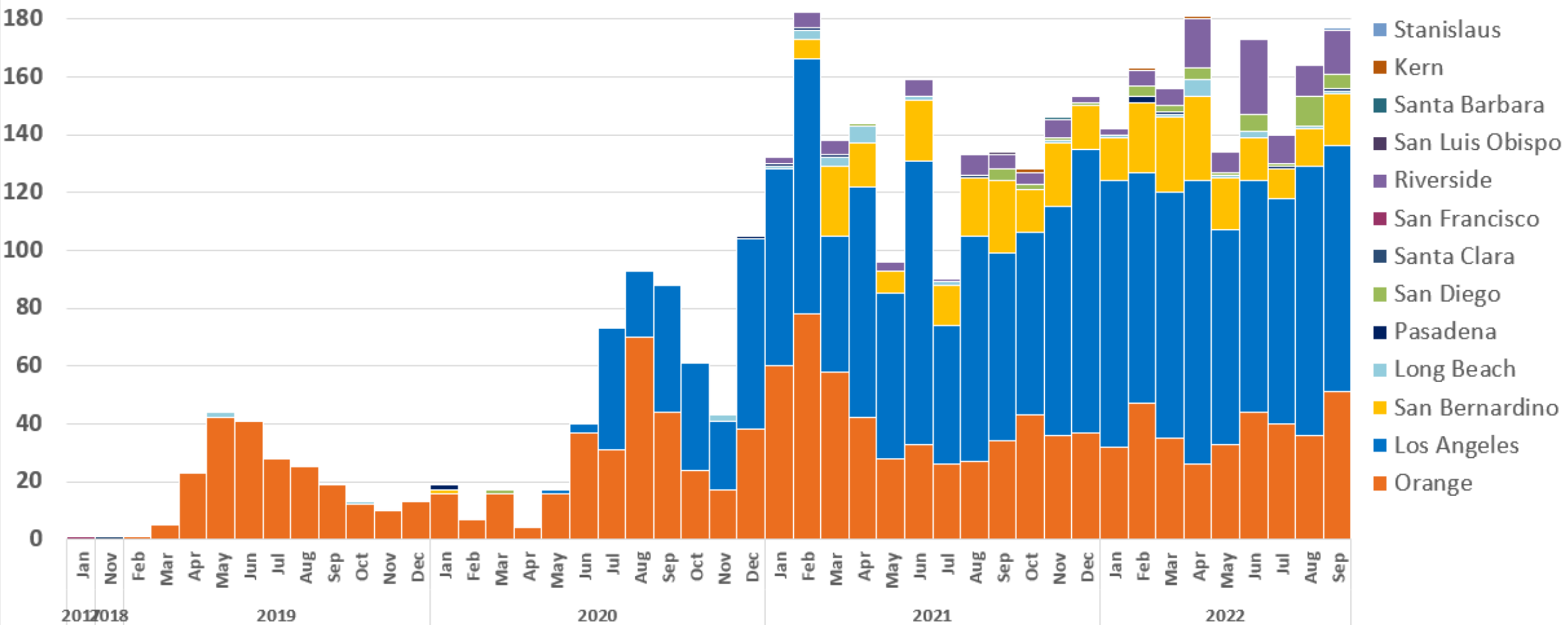
Reported clinical cases of *Candida auris*, June 1, 2021-May 31, 2022



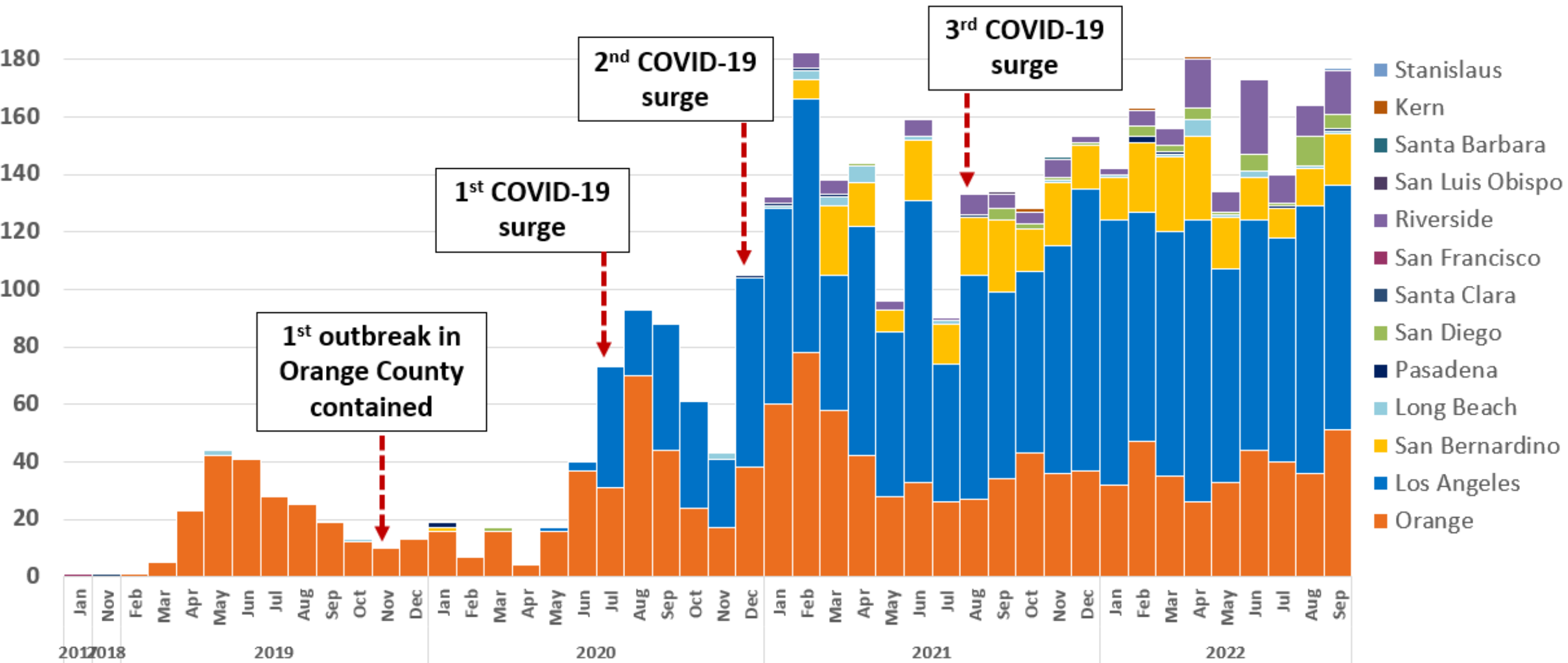
Source: [CDC Tracking Candida auris](http://www.cdc.gov/fungal/candida-auris/tracking-c-auris.html) (www.cdc.gov/fungal/candida-auris/tracking-c-auris.html)



# C. auris Cases Reported in California through September 2022 (N=3863)



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# HEALTHCARE-ASSOCIATED INFECTIONS PROGRAM

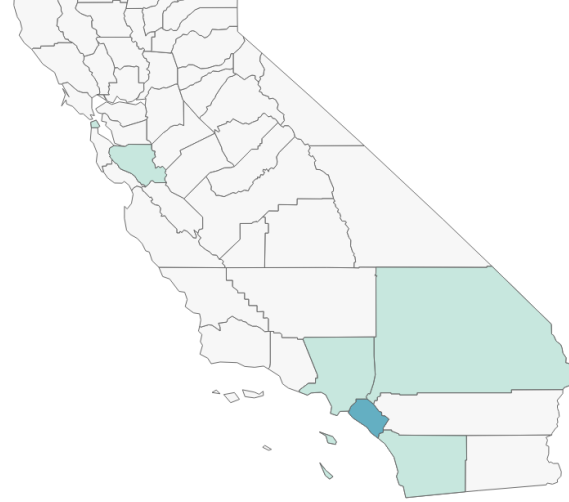
## February, 2019



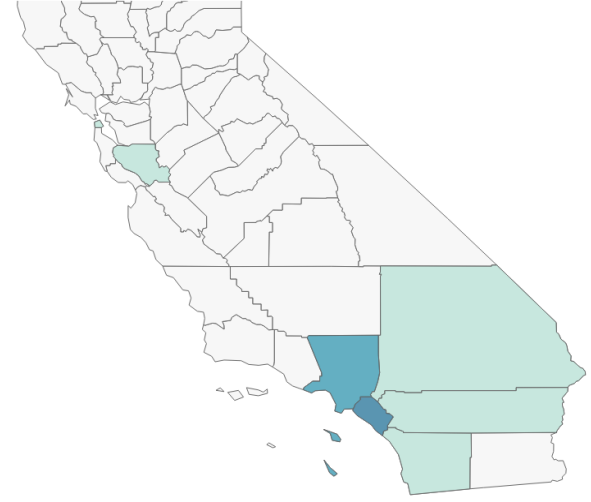
## December, 2019



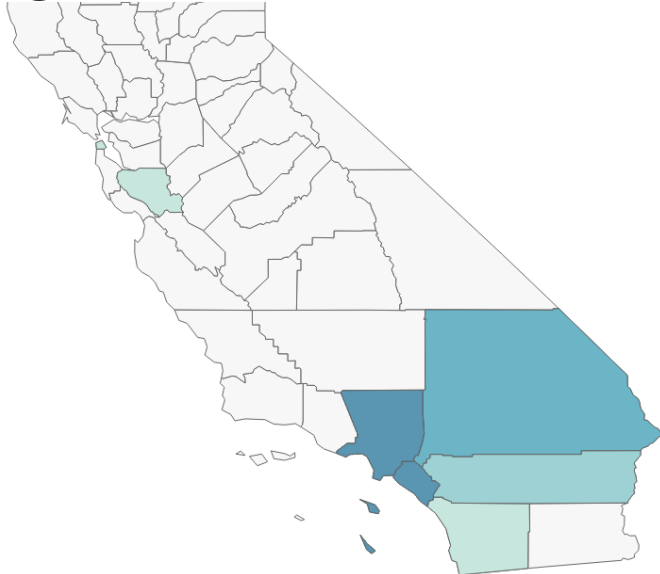
## June, 2020



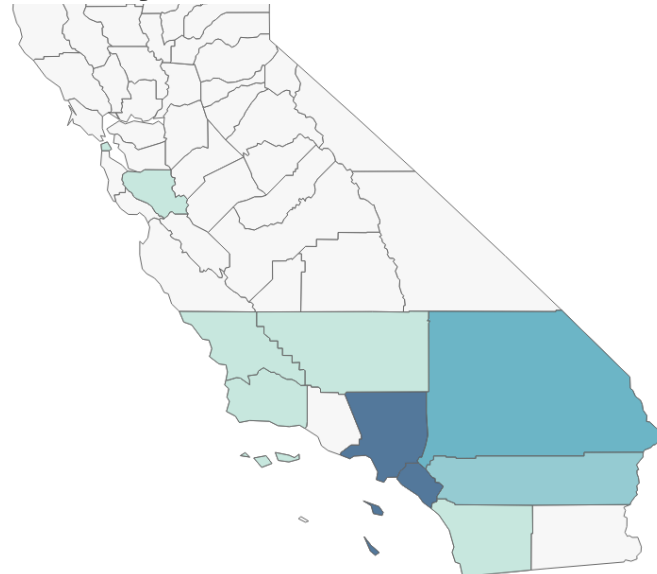
## January, 2021



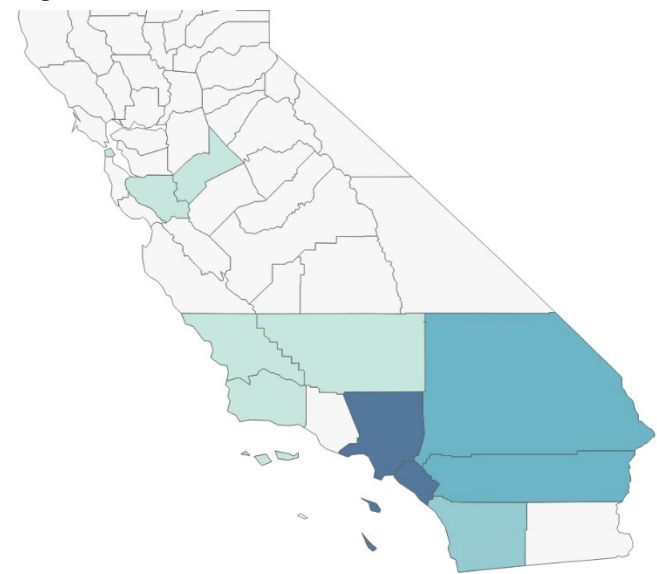
## August, 2021



## January, 2022



## September, 2022



### Number of cases

- 1-10
- 11-100
- 101-500
- 501-1000
- 1001-2000

*C. auris* Reporting

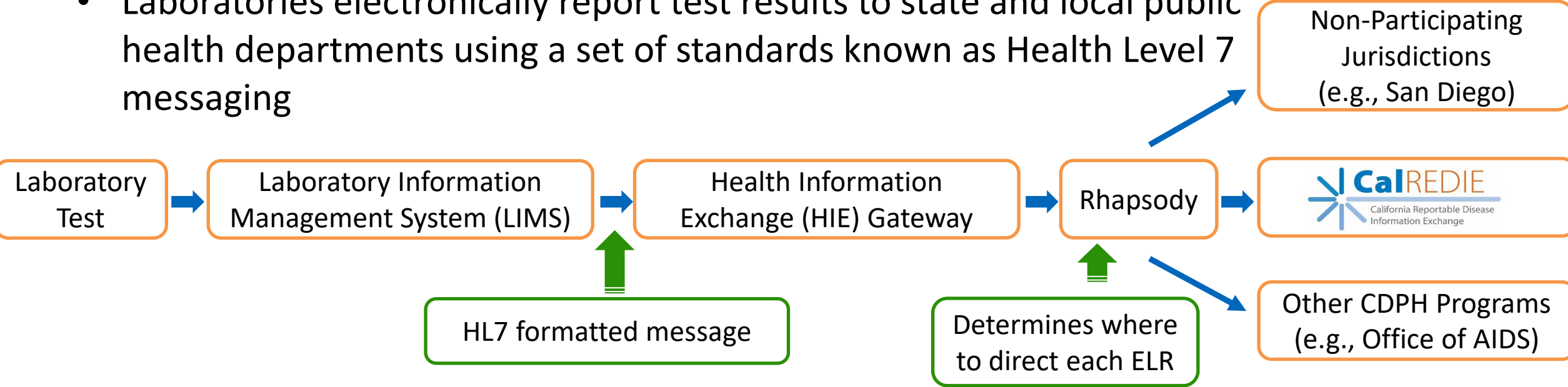


## Reporting *Candida auris*

- **Laboratories electronically report:**
  - Detection of *C. auris* in a specimen using either culture or a validated culture-independent test (e.g., nucleic acid amplification test [NAAT])
- **Providers submit reports to their local health department (LHD):**
  - Patient, facility, and epidemiological risk factors
- **Laboratory submission requirement**
  - Isolates from sterile site specimens (e.g., blood) within 10 working days, batching OK
  - No requirement to obtain fungal culture if not available; LHD may request other isolates, and more timely

# Electronic Lab Reporting

- Laboratories electronically report test results to state and local public health departments using a set of standards known as Health Level 7 messaging



- ELR use SNOMED and LOINC codes to standardize messages
  - ELRs must include clear information on specimen source, genus & species
  - CDPH encourages reporting test type and antifungal susceptibility results
  - [CDPH ELR Guidance](http://www.cdph.ca.gov/Programs/CID/DCDC/Pages/CalREDIE-ELR.aspx) (www.cdph.ca.gov/Programs/CID/DCDC/Pages/CalREDIE-ELR.aspx ) lists commonly used SNOMED and LOINC codes



## *Candida auris* Provider Report Form



- Standardized case report form for providers to complete
  - Data elements align with CalREDIE forms
    - Demographic and laboratory data
  - Case investigation details
- The provider report form is most important when a case is newly identified in a region or facility
  - Less urgent for cases in a facility with multiple previous positives (e.g., patient identified on Round 2 of a point prevalence survey)

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  - Less urgent for cases in a facility with multiple previous positives (e.g., patient identified on Round 2 of a point prevalence survey) → **Local Health Departments can decide when a complete provider report form is required**



# Provider Report Form and Investigation

- Provider report form contains key information to inform a case or outbreak investigation, including:
  - Patient demographics
    - New California legal requirements to collect race/ethnicity data\*
  - Admission source and status
  - Discharge date and disposition
  - Laboratory information (can confirm ELR)
  - Potential exposures or risk factors
    - Healthcare outside the US
    - Admission from a facility experiencing an outbreak

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\* [Assembly Bill 532](http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201520160AB532) (leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill\_id=201520160AB532)

# Candida auris Provider Reporting: Demographic Information

<b>CANDIDA AURIS CASE REPORT FORM</b>			
Please note, reporters in Los Angeles County should use the form available on the LACDPH <a href="#">website</a>			
<b>PATIENT INFORMATION</b>			
<b>Last Name, First Name</b>	<b>MI</b>	<b>Date of Birth</b>	<b>Age:</b> <input type="checkbox"/> Years <input type="checkbox"/> Month <input type="checkbox"/> Days
<b>Address (Number, Street)</b>	<b>State</b>	<b>Zip Code</b>	<b>County of Residence</b>
<b>Current Gender Identity</b> <input type="checkbox"/> Male <input type="checkbox"/> Female <input type="checkbox"/> Genderqueer or non-binary <input type="checkbox"/> Identity not listed (specify): _____		<b>Sex Assigned at Birth</b> <input type="checkbox"/> Male <input type="checkbox"/> Female <input type="checkbox"/> Declined to answer <input type="checkbox"/> Unknown	
<b>Patient Ethnicity</b> <input type="checkbox"/> Hispanic/Latino <input type="checkbox"/> Non-Hispanic/Non-Latino <input type="checkbox"/> Unknown			
<b>Patient Race</b> <input type="checkbox"/> African-American/Black <input type="checkbox"/> American Indian/Alaska Native <input type="checkbox"/> Asian (check all that apply) <input type="checkbox"/> Asian Indian <input type="checkbox"/> Hmong <input type="checkbox"/> Thai <input type="checkbox"/> Cambodian <input type="checkbox"/> Japanese <input type="checkbox"/> Vietnamese <input type="checkbox"/> Chinese <input type="checkbox"/> Korean <input type="checkbox"/> Filipino <input type="checkbox"/> Laotian <input type="checkbox"/> Other (specify): _____ <input type="checkbox"/> Pacific Islander (check all that apply) <input type="checkbox"/> Native Hawaiian <input type="checkbox"/> Samoan <input type="checkbox"/> Guamanian <input type="checkbox"/> Other (specify): _____ <input type="checkbox"/> White <input type="checkbox"/> Other (specify): _____ <input type="checkbox"/> Unknown			
<b>Pregnant?</b> <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Unknown      If yes, estimated delivery date: _____			

Los Angeles County healthcare facilities should use the LACDPH form

# Candida auris Provider Reporting: Facility and Laboratory Information

## FACILITY INFORMATION

<b>Reporting Provider Name</b>		<b>Reporting Facility Name</b>		<b>Facility Type</b>		<input type="radio"/> Emergency Department <input type="radio"/> Acute Care Hospital <input type="radio"/> Ventilator-equipped SNF (vSNF)	
				<input type="radio"/> Outpatient Clinic <input type="radio"/> Skilled Nursing Facility (SNF) <input type="radio"/> Long-Term Acute Care Hospital (LTACH) <input type="radio"/> Other (please specify): _____			
<b>Address (Number, Street)</b>				<b>Suite/Unit No.</b>	<b>City</b>	<b>State</b>	<b>Zip</b>
<b>Admit Date</b>	<b>Admission Source (If Date of Collection within 7 days after admission)</b>				<b>Currently Admitted?</b>	<b>Death/Discharge Date</b>	
	<input type="radio"/> Home <input type="radio"/> Hospital <input type="radio"/> LTACH <input type="radio"/> SNF <input type="radio"/> vSNF <input type="radio"/> Other (please specify): _____ <input type="radio"/> Unknown      Facility Name: _____ Out-of-State Facility? <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Unknown      If yes, state: _____				<input type="radio"/> Yes <input type="radio"/> Discharged <input type="radio"/> Died <input type="radio"/> Unknown		
<b>If discharged to another facility, please provide facility name</b>				<b>If discharged home, was there a home health referral?</b>			
				<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Unknown      If yes, name of agency: _____			
<b>Submitted by</b>	<b>Telephone Number</b>	<b>Fax Number</b>	<b>Date Submitted</b>	<b>Reported To</b>			

## LABORATORY INFORMATION

<b>Date of Collection</b>	<b>Date of Final Result</b>	<b>Specimen Source (If Multiple Positive Specimens, Select Source with Earliest Collection Date)</b>					
		<input type="radio"/> Abscess <input type="radio"/> Blood <input type="radio"/> Respiratory <input type="radio"/> Tissue <input type="radio"/> Wound <input type="radio"/> Urine <input type="radio"/> Unknown <input type="radio"/> Axilla/Groin swab <input type="radio"/> Nares swab <input type="radio"/> Other (please specify): _____					
Isolates from sterile sites (e.g., blood, CSF) are required to be submitted to the local public health laboratory for additional testing. Please see <a href="#">CDPH Lab Reportable Diseases</a> (PDF) for more information. If available, please attach a copy of the laboratory report to this case report form.							

# Candida auris Provider Reporting: Epidemiological Information

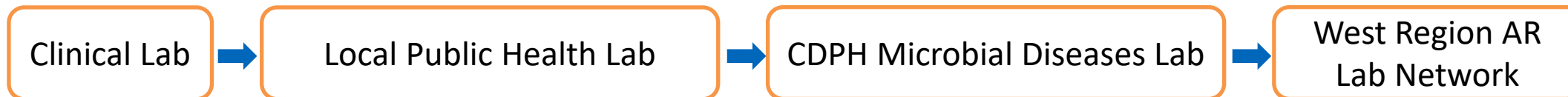
## EPIDEMIOLOGICAL INFORMATION

<p><i>Has the patient had an overnight stay in a healthcare facility outside the US within the past 12 months?</i> <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Unknown</p> <p>If yes, name of country, facility (if known), and approximate dates: _____</p>	
<p><i>Does the patient have a history of an infection or colonization with a carbapenemase-producing organism (e.g., NDM-E.coli):?</i></p> <p><input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Unknown    If yes, carbapenemase type and organism: _____</p>	
<p><i>If the patient screened positive for colonization (e.g., axilla/groin swab), why was the patient initially tested (check all that apply)?</i></p> <p><input type="checkbox"/> Coming from facility with outbreak      <input type="checkbox"/> Potential exposure to a known case (e.g., point prevalence survey)      <input type="checkbox"/> Unknown</p> <p><input type="checkbox"/> International healthcare/travel exposure      <input type="checkbox"/> Colonized with a carbapenemase-producing organism      <input type="checkbox"/> Other (specify): _____</p>	

- Three key questions
  - Healthcare outside the United States
  - Co-colonized with a CPO
  - Reason for screening (i.e., why was this patient tested?)

## *Candida auris* Isolate Submission

- Isolates identified from sterile site specimens represent:
  - Clinically-significant infections
  - ~8% of specimens overall in California
- **Purpose of submission**
  - Organism ID **confirmation**
  - **Antifungal susceptibility** testing and monitoring of resistance patterns
    - West Region AR Lab Network performs comprehensive AFST
  - Possible whole genome sequencing to inform **outbreak investigation, response and management**





# *C. auris* Testing at CDPH MDL



# *C. auris* Confirmation Testing

- Test methodology:
  - Identification of yeast species by MALDI-TOF mass spectrometry
  - Turn around time is 2-3 days
  - Currently available at MDL
- Accepting pure culture on solid media in tube or flask with tightened screw cap that is taped
  - Isolates should be incubated at 25-30°C
  - Isolates can be shipped at ambient temperature
  - Please plan your shipping accordingly to avoid attempted delivery over the weekend or on holidays
  - Submission requirements and points of contact can be found via [CDPH MDL](http://www.cdph.ca.gov/Programs/CID/DCDC/Pages/TestOrderFungalIDYeastMALDI.aspx)  
([www.cdph.ca.gov/Programs/CID/DCDC/Pages/TestOrderFungalIDYeastMALDI.aspx](http://www.cdph.ca.gov/Programs/CID/DCDC/Pages/TestOrderFungalIDYeastMALDI.aspx))

# C. auris Confirmation Testing

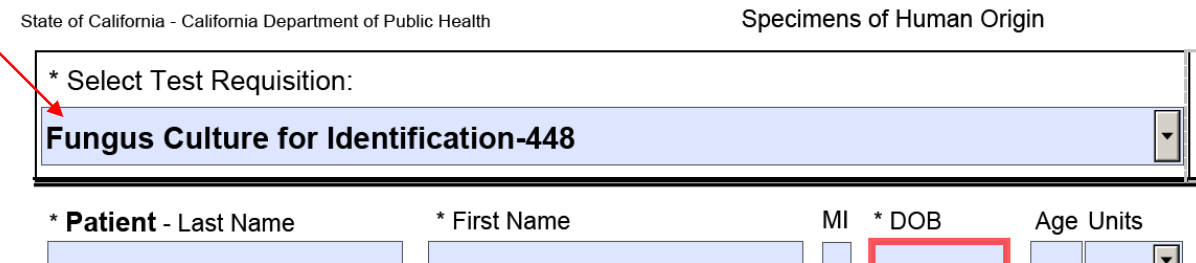
- Pre-approval is not required for isolate submission
- Form 448 must be completed and accompany each specimen
  - For specific instructions, reference the Form 448 [Electronic Submittal Form Instructions](http://www.cdph.ca.gov/Programs/CID/DCDC/Pages/MDL-eform-448-Instructions.aspx) (www.cdph.ca.gov/Programs/CID/DCDC/Pages/MDL-eform-448-Instructions.aspx)
  - Save **MDL General Electronic Submission Form (PDF)** from [MDL Submission Forms page](http://www.cdph.ca.gov/Programs/CID/DCDC/Pages/MDLSubmissionInstructionsandForms.aspx) (www.cdph.ca.gov/Programs/CID/DCDC/Pages/MDLSubmissionInstructionsandForms.aspx)
  - Open with Adobe Acrobat and select **Fungus Culture for Identification-448** in drop down for “Select Test Requisition” at the top of the page
  - Fill out remaining patient/accession information (for more guidance, see [General Specimen Submission Page 1 Instructions](http://www.cdph.ca.gov/Programs/CID/DCDC/General_Specimen_Submission_P1_Instructions.aspx) (www.cdph.ca.gov/Programs/CID/DCDC/General\_Specimen\_Submission\_P1\_Instructions.aspx))
  - Send with specimens following Category B shipping requirements

State of California - California Department of Public Health Specimens of Human Origin

\* Select Test Requisition:  
**Fungus Culture for Identification-448**

\* Patient - Last Name      \* First Name      MI      \* DOB      Age Units





# NEW - *C. auris* Colonization Screening

- Test methodology:
  - Real-time PCR for detection of *Candida auris* from patient skin swab specimens using BD-MAX
  - Culture-based testing will be performed on PCR-positives and indeterminate swabs
  - Turn around time is 2-3 days for PCR testing, and 7-14 days for culture screening
  - Go live at MDL at the end of Nov 2022
  - Cultures isolated from the patient specimens may be sent out for AFST or WGS at Regional APHL lab upon request
- Accepting axilla/groin skin swabs collected using BD ESwab
  - ESwab collection kits must be stored at 4-25°C
  - Specimens collected with ESwabs must be shipped with cold packs
  - ESwab specimen stability is 9 days from collection
  - Swab kits will be available on request, more info on kits to come!

# NEW - *C. auris* Colonization Screening

- Pre-approval is required for submission; please contact CDPH's HAI Program before submitting specimens ([HAIProgram@cdph.ca.gov](mailto:HAIProgram@cdph.ca.gov))
- Form 449 must be completed and accompany each specimen
  - Save **MDL General Electronic Submission Form (PDF)** from [MDL Submission Forms page](#) ([www.cdph.ca.gov/Programs/CID/DCDC/Pages/MDLSubmissionInstructionsandForms.aspx](http://www.cdph.ca.gov/Programs/CID/DCDC/Pages/MDLSubmissionInstructionsandForms.aspx))
  - Open with Adobe Acrobat and select **Candida auris Colonization Screening-449** in drop down for "Select Test Requisition" at the top of the page
  - Fill out remaining patient/accession information (for more guidance, see [General Specimen Submission Page 1 Instructions](#) ([www.cdph.ca.gov/Programs/CID/DCDC/Pages/General\\_Specimen\\_Submission\\_P1\\_Instructions.aspx](http://www.cdph.ca.gov/Programs/CID/DCDC/Pages/General_Specimen_Submission_P1_Instructions.aspx)))
  - Send with specimens following Category B shipping requirements

State of California - California Department of Public Health      Specimens of Human Origin

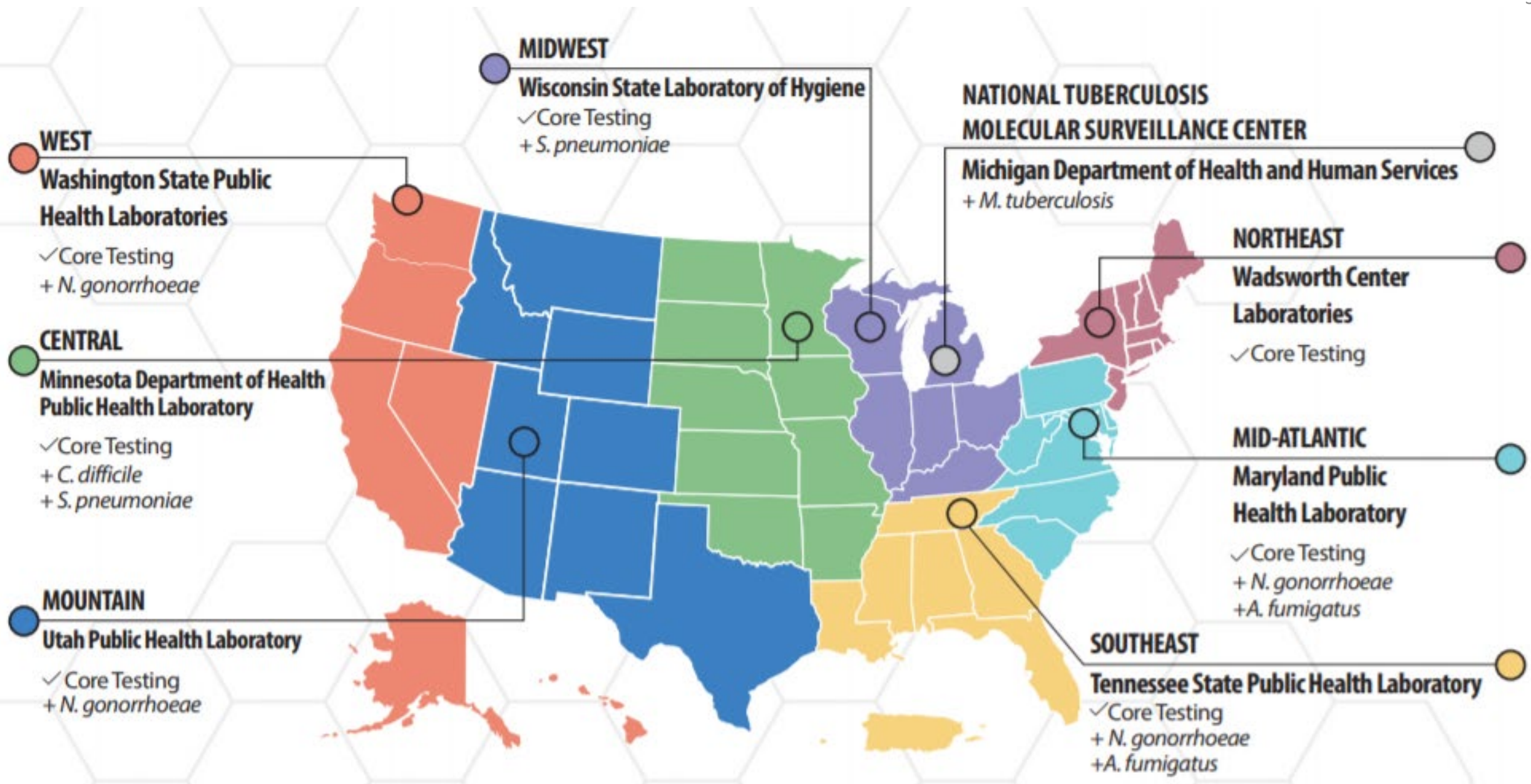
\* Select Test Requisition:  
**Candida auris Colonization Screening-449**

\* Patient - Last Name      \* First Name      MI      \* DOB      Age Units



# *C. auris* Testing at West Regional AR Lab Network





# Antibiotic Resistance Laboratory Network (ARLN) Test Menu

Use the searchable menu below for:

- Specimen collection and shipping instructions
- Specimen submission forms
- Pre-approval requirements
- Testing methodologies and frequencies
- Turnaround times and contact information



[About ARLN](#)

To ensure that specimens meet laboratory acceptance criteria, please review all appropriate content prior to specimen submission.

<a href="#">Name</a> <sup>A</sup>	<a href="#">Updated</a>
+ <i>Candida auris</i> screening <i>Candida</i> , Fungal, AFST	1/30/2020
+ <i>Candida</i> species Identification and Fungal Susceptibility Testing <i>Candida</i> , Fungal, AFST	1/24/2020
+ Carbapenem-resistant <i>Acinetobacter</i> CR- <i>Acinetobacter</i> , CRAB, CR-AB	1/24/2020



## [ARLN Lab Test Menu](#)

([www.doh.wa.gov/ForPublicHealthandHealthcareProviders/PublicHealthLaboratories/ARLNLabTestMenu#heading21701](http://www.doh.wa.gov/ForPublicHealthandHealthcareProviders/PublicHealthLaboratories/ARLNLabTestMenu#heading21701))



# C.auris screening

- All screening must be coordinated through state and/or local public health and requires pre-approval by the AR Lab Network West Regional Lab

<i>Candida auris</i> colonization screening	
Testing available	<ul style="list-style-type: none"> <li>• PCR (CDC assay)</li> <li>• Culture (isolate recovery)</li> </ul>
TAT	2-3 business days
Source	Axilla/groin bilateral composite
Swab	ESwab Liquid Amies Elution swab (flocked tip)
Expiration after collection	9 days
Shipping conditions	Cold



## *Candida* Isolate Testing

- Please work with state and/or local public health to determine the appropriate submission pathway
- Upon request, supplies (slants, Category B shippers) can be provided
- All non-*albicans* *Candida* species accepted
- **Identification Method:** MALDI-TOF
- **AFST:** Broth microdilution (RPMI plates)
  - Amphotericin B
  - Anidulafungin
  - Caspofungin
  - Fluconazole
  - Isavuconazole
  - Itraconazole
  - Micafungin
  - Posaconazole
  - Voriconazole
- *C.auris* WGS will be available soon, currently eligible isolates will be sequenced by CDC

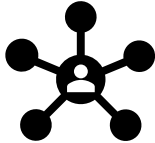


# Regional *C. auris* Prevention and Response Strategy



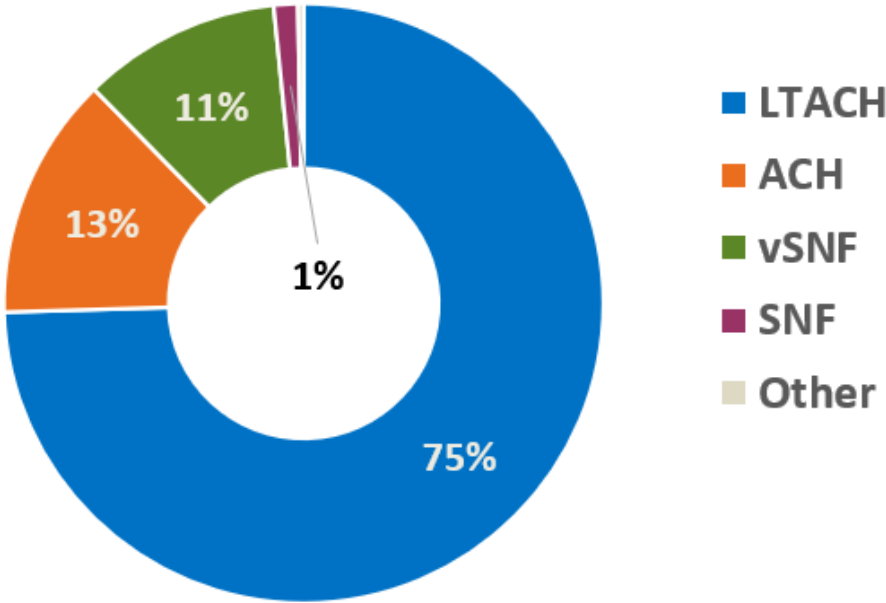


# Preventing *C. auris* Emergence and Spread



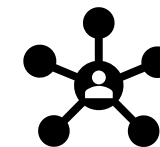
- Target facilities with patients at highest risk of *C. auris* acquisition (LTACH, vSNF\*)

86% of *C. auris* Cases Reported in  
 LTACH and vSNF



\*Long-term acute care hospitals (LTACH), ventilator-equipped skilled nursing facilities (vSNF) in jurisdictions adjacent to or with patient sharing networks with outbreak jurisdictions

## Preventing *C. auris* Emergence and Spread

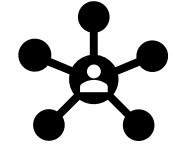


- **In LTACH and vSNF\*, carry out proactive:**
  - baseline and follow-up point prevalence surveys and admission screening
  - onsite infection prevention and control assessments
  - species identification of all *Candida* isolates
  - use of List P or List K agent for daily and terminal cleaning and disinfection

\*Long-term acute care hospitals (LTACH), ventilator-equipped skilled nursing facilities (vSNF) in jurisdictions adjacent to or with patient sharing networks with outbreak jurisdictions

[CDPH Regional \*C. auris\* Prevention and Response Strategy](http://www.cdph.ca.gov/Programs/CHCQ/HAI/CDPH%20Document%20Library/Cauris_Phases.pdf) (PDF) (www.cdph.ca.gov/Programs/CHCQ/HAI/CDPH%20Document%20Library/Cauris\_Phases.pdf)

# Preventing *C. auris* Emergence and Spread



- **In LTACH and vSNF\*, carry out proactive:**
  - baseline and follow-up point prevalence surveys and admission screening
  - onsite infection prevention and control assessments
  - species identification of all *Candida* isolates
  - use of List P or List K agent for daily and terminal cleaning and disinfection
- **In all facilities:**
  - Prioritize *Candida* species identification for patients with risk factors
  - Promote antimicrobial stewardship
  - In SNF, implement Enhanced Standard Precautions
  - Ensure interfacility transfer communication

\*Long-term acute care hospitals (LTACH), ventilator-equipped skilled nursing facilities (vSNF) in jurisdictions adjacent to or with patient sharing networks with outbreak jurisdictions

[CDPH Regional \*C. auris\* Prevention and Response Strategy](http://www.cdph.ca.gov/Programs/CHCQ/HAI/CDPH%20Document%20Library/Cauris_Phases.pdf) (PDF) (www.cdph.ca.gov/Programs/CHCQ/HAI/CDPH%20Document%20Library/Cauris\_Phases.pdf)

## Summary

- *C. auris* is an urgent public health threat and is now reportable in California
    - Electronic lab reporting
    - Provider reporting
    - Sterile site isolate submission
  - Laboratory testing is available at local public health labs, CDPH MDL, and the West Region AR Lab Network
    - Colonization screening
    - Species identification
    - Antifungal susceptibility testing
    - Whole genome sequencing
- 
-

## Goals of Surveillance, Reporting, and Isolate Submission

- Enable early detection of *C. auris* in a region or facility
- Facilitate timely investigation and response
- Publish annual summary data and report to CDC
- Monitor antifungal resistance trends and emergence of new strains
- Support coordination between healthcare facilities, clinical laboratories, and public health departments to prevent and slow the spread of *C. auris*

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# Recent and Upcoming Carbapenemase-producing Organism and *C. auris* Presentations

- **September 29<sup>th</sup>:** Carbapenemase-producing Organisms: Guidance for Reporting and Containment webinar [slides](#) (PDF) ([www.cdph.ca.gov/Programs/CHCQ/HAI/CDPH%20Document%20Library/CPO\\_ReportingAndPreventionWebinar\\_092922.pdf](http://www.cdph.ca.gov/Programs/CHCQ/HAI/CDPH%20Document%20Library/CPO_ReportingAndPreventionWebinar_092922.pdf)) and [recording](#) ([youtu.be/dm4I2ooSA4M?t=79](https://youtu.be/dm4I2ooSA4M?t=79))
- **October 19<sup>th</sup>:** CalREDIE Local Users Call [slides](#) ([calrediehelp.powerappsportals.us/luc-slides-2022.10.19.pdf#msdyntrid=9Iq3h92dGIjqJTf8wMIAFnXfaZB5qNtQCgwTpGCnjO4](https://calrediehelp.powerappsportals.us/luc-slides-2022.10.19.pdf#msdyntrid=9Iq3h92dGIjqJTf8wMIAFnXfaZB5qNtQCgwTpGCnjO4)) and [recording](#) ([urldefense.com/v3/\\_\\_https://cdph-ca-gov.zoom.us/rec/share/RLtzKRUYanMjuc3DMSOA\\_PYVvIH1JPqBvMeL-tNhX\\_Fl\\_lvd7uCwaNNLhUZsVZe7.ae0MjNpnSWRuGkkZ?startTime=1666194904000\\_\\_;!!AvL6XA!zUXWqks0cG7udJtLOy\\_bPzz54QaMA50np3PajED7vpDce\\_WBJJ3A2BiocfeoQNi4ntoSBdyfX7O-FmddPxn8lpeG9KheZJakRtU\\$](https://urldefense.com/v3/__https://cdph-ca-gov.zoom.us/rec/share/RLtzKRUYanMjuc3DMSOA_PYVvIH1JPqBvMeL-tNhX_Fl_lvd7uCwaNNLhUZsVZe7.ae0MjNpnSWRuGkkZ?startTime=1666194904000__;!!AvL6XA!zUXWqks0cG7udJtLOy_bPzz54QaMA50np3PajED7vpDce_WBJJ3A2BiocfeoQNi4ntoSBdyfX7O-FmddPxn8lpeG9KheZJakRtU$)) (passcode required)
- **October 27<sup>th</sup>:** Carbapenemase-producing Organisms: Carbapenemase Testing Strategies webinar [slides](#) (PDF) ([www.cdph.ca.gov/Programs/CHCQ/HAI/CDPH Document Library/CPO\\_webinar\\_102722.pdf](http://www.cdph.ca.gov/Programs/CHCQ/HAI/CDPH%20Document%20Library/CPO_webinar_102722.pdf)) and [recording](#) ([youtu.be/I6LPBB9EQ8c](https://youtu.be/I6LPBB9EQ8c))
- **December TBD:** Carbapenemase-producing Organisms: Carbapenemase Testing to Inform Clinical Treatment Decisions webinar

# Resources

- [CDPH Antimicrobial Resistance \(AR\) Resources Webpage](http://www.cdph.ca.gov/Programs/CHCQ/HAI/Pages/AntimicrobialResistanceLandingPage.aspx)  
(www.cdph.ca.gov/Programs/CHCQ/HAI/Pages/AntimicrobialResistanceLandingPage.aspx)
  - [CDPH CPO and \*C. auris\* Screening Decision Tree](http://www.cdph.ca.gov/Programs/CHCQ/HAI/CDPH%20Document%20Library/Tier2_Pathogen_Screening_Decision_Tree_Oct2020.pdf) (PDF)  
(www.cdph.ca.gov/Programs/CHCQ/HAI/CDPH%20Document%20Library/Tier2\_Pathogen\_Screening\_Decision\_Tree\_Oct2020.pdf)
  - [C. auris Reporting FAQ](http://www.cdph.ca.gov/Programs/CHCQ/HAI/CDPH%20Document%20Library/CaurisReportingFAQ.pdf) (PDF)  
(www.cdph.ca.gov/Programs/CHCQ/HAI/CDPH Document Library/CaurisReportingFAQ.pdf)
  - [CDPH C. auris Webpage](http://www.cdph.ca.gov/Programs/CHCQ/HAI/Pages/Candida-auris.aspx)  
(www.cdph.ca.gov/Programs/CHCQ/HAI/Pages/Candida-auris.aspx)
  - [MDL Submission Instructions and Forms](http://www.cdph.ca.gov/Programs/CID/DCDC/Pages/MDLSubmissionInstructionsandForms.aspx)  
(www.cdph.ca.gov/Programs/CID/DCDC/Pages/MDLSubmissionInstructionsandForms.aspx)
  - [CDPH MDL Fungal Identification Submission Requirements](http://www.cdph.ca.gov/Programs/CID/DCDC/Pages/TestOrderFungalIDYeastMALDI.aspx)  
(www.cdph.ca.gov/Programs/CID/DCDC/Pages/TestOrderFungalIDYeastMALDI.aspx)
  - [CalREDIE Communicable Disease Control Forms](http://www.cdph.ca.gov/Programs/PSB/Pages/CommunicableDiseaseControl.aspx) (*C. auris*-specific form forthcoming)  
(www.cdph.ca.gov/Programs/PSB/Pages/CommunicableDiseaseControl.aspx)
- 
-



# Acknowledgements

- CDPH Microbial Diseases Laboratory:
  - Varvara Kozyreva
  - Matt Sylvester
  - Katelyn Chen
- CDPH HAI Program:
  - Diana Holden
  - Tisha Mitsunaga
  - Erin Epon
- West Regional Antimicrobial Resistance Lab Network

**Thank you!**

**Questions?**

For more information,  
contact

[HAIProgram@cdph.ca.gov](mailto:HAIProgram@cdph.ca.gov)

**Additional Slides**

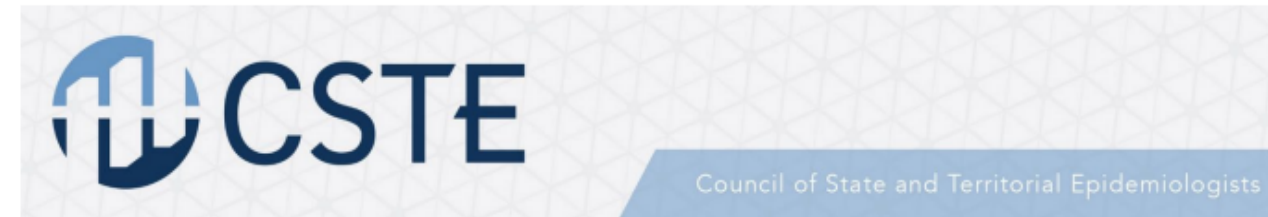


## Potential for *Candida auris* misidentification

- Some commonly used phenotypic yeast identification systems can misidentify *Candida auris*. For more information, clinical laboratories can consult [CDC Identification of \*Candida auris\*](http://www.cdc.gov/fungal/candida-auris/identification.html) (www.cdc.gov/fungal/candida-auris/identification.html), which includes a table summarizing the common misidentifications stratified by phenotypic method, and detailed [algorithms for when to suspect \*Candida auris\* based on laboratory method and initial species identification](#) (PDF) (www.cdc.gov/fungal/candida-auris/pdf/Testing-algorithm\_by-Method\_508.pdf).
- As more manufacturers have updated their libraries and software to include *Candida auris*, the potential for mischaracterization has become less of a cause for concern. However, laboratorians and public health departments should remain aware of these issues and refer to CDC guidance as yeast identification methods continue to change.

# CSTE Nationally Notifiable Condition Update

- [Council of State and Territorial Epidemiologists \*C. auris\* Position Statement \(PDF\)](http://www.cste.org/resource/resmgr/ps/ps2022/2022_Submission_Cauris_For_W.pdf)  
([www.cste.org/resource/resmgr/ps/ps2022/2022\\_Submission\\_Cauris\\_For\\_W.pdf](http://www.cste.org/resource/resmgr/ps/ps2022/2022_Submission_Cauris_For_W.pdf))



**Submission Date:** 3/24/22

**Committee:** Infectious Disease

**Proposed Title:** Update to the Standardized Case Definition and National Notification for *Candida auris*

Check this box if this position statement is an update to an existing standardized surveillance case definition and include the most recent position statement number here: 18-ID-05.

**Synopsis:** This position statement updates the *Candida auris* case definition by removing presumptive laboratory criteria and probable and suspect case classifications and by recommending *C. auris* screening cases be made nationally notifiable. Updates include new information on transmissibility and case counts.

## **I. Statement of the Problem**

*Candida auris* is an emerging multidrug-resistant yeast that can colonize the skin and cause invasive infections. It can spread readily between patients in healthcare facilities, causing numerous outbreaks that have been difficult to control. Containment of *C. auris* spread largely depends on timely detection and implementation of appropriate infection prevention and control measures (1).

Individuals colonized on their skin can be identified through screening tests; they can shed into the environment, thereby presenting similar transmission risks and requiring the same infection control precautions as individuals with *C. auris* identified in clinical specimens. Screening detects outbreaks earlier than relying solely on passive surveillance through clinical specimens; in several large outbreaks, over 90% of incident cases were identified through screening tests (2, 3). Currently, however, only cases identified through clinical specimens are nationally notifiable. Incomplete reporting of cases could lead to delayed identification and outbreak response and prevent jurisdictions from understanding the full burden of *C. auris* needed to guide public health action.

# Targeted Surveillance

- Public health laboratory surveillance was crucial for identifying outbreaks of CPOs and *C. auris* across California
- AR Lab Network surveillance for *Candida* and CRAB isolates
  - Testing services and supplies can be provided at no cost to the submitting healthcare facility or lab
  - More information available on the [CDPH website](http://www.cdph.ca.gov/Programs/CHCQ/HAI/CDPH%20Document%20Library/CDPH_ARLN_TargetedSurveillanceDescription_052521.pdf) (PDF)  
(www.cdph.ca.gov/Programs/CHCQ/HAI/CDPH%20Document%20Library/CDPH\_ARLN\_TargetedSurveillanceDescription\_052521.pdf)

Organism	Testing Services
<i>Non-albicans Candida</i>	<ol style="list-style-type: none"> <li>1. Species confirmation</li> <li>2. Antifungal susceptibility testing</li> </ol>
Carbapenem-resistant <i>Acinetobacter baumannii</i> (CRAB)	<ol style="list-style-type: none"> <li>1. Species confirmation</li> <li>2. Carbapenemase testing</li> <li>3. Antimicrobial susceptibility testing</li> </ol>



## Additional ELR Guidance for *C. auris* Reporting

- Use the most specific SNOMED and LOINC codes for all ELR messages.
  - For LOINC codes, send the Long Common Name to accompany the LOINC code in messaging.
  - If using a LOINC code that is non-specific (e.g., 98394-0, Candida sp in Isolate by MS.MALDI-TOF), indicate the genus and species associated with the result, as well as the specimen source.
  - Use LOINC codes that indicate yeast rather than bacterial identification methods (e.g., 601-5, Fungus identified in Blood by Culture rather than 600-7, Bacteria identified in Blood by Culture).
  - If specimen source and genus and species are indicated in the comments, please ensure that these results are also indicated in an OBX segment using the appropriate LOINC or SNOMED code.

# Example SNOMED and LOINC Codes relevant to *C. auris* Reporting

- [SNOMED lookup](http://browser.ihtsdotools.org/) (browser.ihtsdotools.org/)
- [LOINC term lookup](http://search.loinc.org/) (search.loinc.org/)

LOINC Code	LOINC Name (Long Common Name)	SNOMED Code	SNOMED Name
94419-9	Candida auris [Presence] in Isolate by MS.MALDI-TOF	260373001 260415000	Detected Not Detected
90002-7	Candida auris [Presence] in Specimen by Organism specific culture		
96302-5	Candida auris DNA [Presence] by NAA with non-probe detection in Positive blood culture		
92791-3	Candida auris DNA [Presence] by NAA with probe detection in Positive blood culture		
91081-0	Candida sp DNA [Presence] in Specimen by NAA with probe detection*	10828004 260385009	Positive Negative
87620-1	Candida auris ITS2 gene [Presence] in Specimen by NAA with probe detection		
95766-2	Candida auris DNA [Presence] in Blood by NAA with non-probe detection		
95765-4	Candida auris DNA [Presence] in Specimen by NAA with non-probe detection		
95764-7	Candida auris DNA [Presence] in Urine by NAA with non-probe detection		

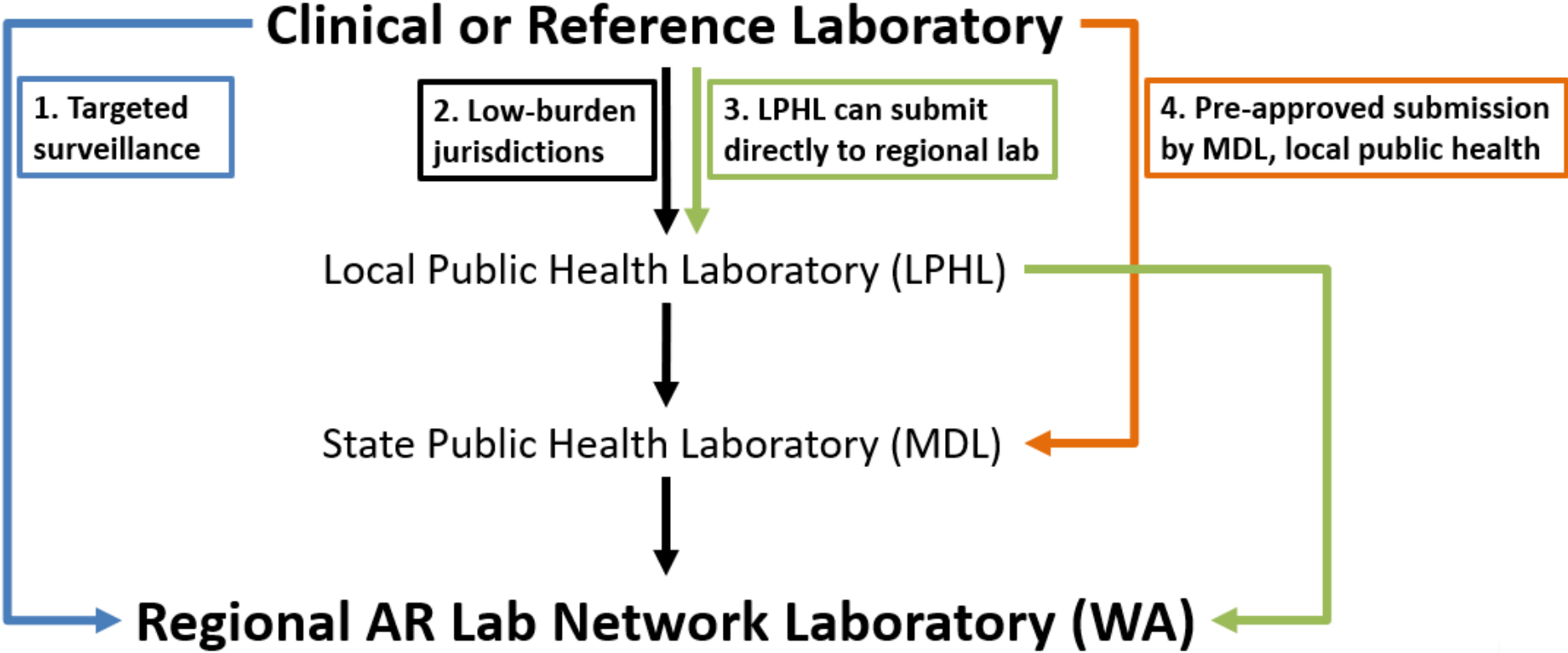


# Summary of Title 17 Changes for HAI-related Conditions

Summary of Changes to 22CCR2500-2505	
Type of Change	Description
Addition to 2500 (j)	<ul style="list-style-type: none"> <li>Added <i>Candida auris</i>, colonization or infection, to be reported within one working day of identification (+)</li> </ul>
Addition to 2505 (e) (2)	<ul style="list-style-type: none"> <li>Added <i>Candida auris</i>, colonization or infection</li> <li>Added Carbapenemase-producing organism, colonization or infection</li> </ul>
Remove from 2505 (e)	<ul style="list-style-type: none"> <li>Removed Carbapenem-resistant Enterobacteriaceae (Carbapenemase-producing)(CP-CRE)</li> </ul>
Requirement added to 2505	<ul style="list-style-type: none"> <li>Added requirement to send sterile site isolates for <i>Candida auris</i> [within 10 working days]</li> </ul>



# C. auris Isolate Submission Pathways



Local health departments decide how clinical labs in their jurisdiction should submit

