Candida auris (*C. auris*) in California: Strategy for Prevention and Response

APIC Sierra Chapter

March 17, 2023

Healthcare-Associated Infections (HAI) Program
Center for Health Care Quality
California Department of Public Health

California Department of PublicHealth

Agenda

1. Review *C. auris* background
2. Summarize *C. auris* epidemiology in California
3. Describe *C. auris* prevention and response activities
4. Walk through an example scenario

C. auris Background

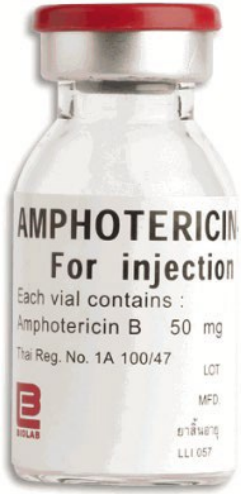
Why are we concerned about *Candida auris?*

Highly drug-resistant

C. auris Resistance in Orange County Isolates, Feb–Oct 2019

100%

Fluconazole



7%

Amphotericin B

0%

Echinocandins

First-line treatment

Since 2021, we have identified

- 3 echinocandin-resistant cases
- **First pan-resistant case in October 2022**

Karmarkar et al., 2021

Increasing pan- and echinocandin resistance

- ~2% of isolates resistant to echinocandins (first-line treatment)
- Two clusters of pan- or echinocandin-resistant strains (in DC and TX)

The New York Times

Outbreaks of Untreatable, Drug-Resistant Fungus Spread in 2 Cities

For the first time, the C.D.C. identified several cases of Candida auris that were resistant to all drugs, in two health facilities in Texas and a long-term care center in Washington, D.C.

Notes from the Field

Transmission of Pan-Resistant and Echinocandin-Resistant *Candida auris* in Health Care Facilities — Texas and the District of Columbia, January–April 2021

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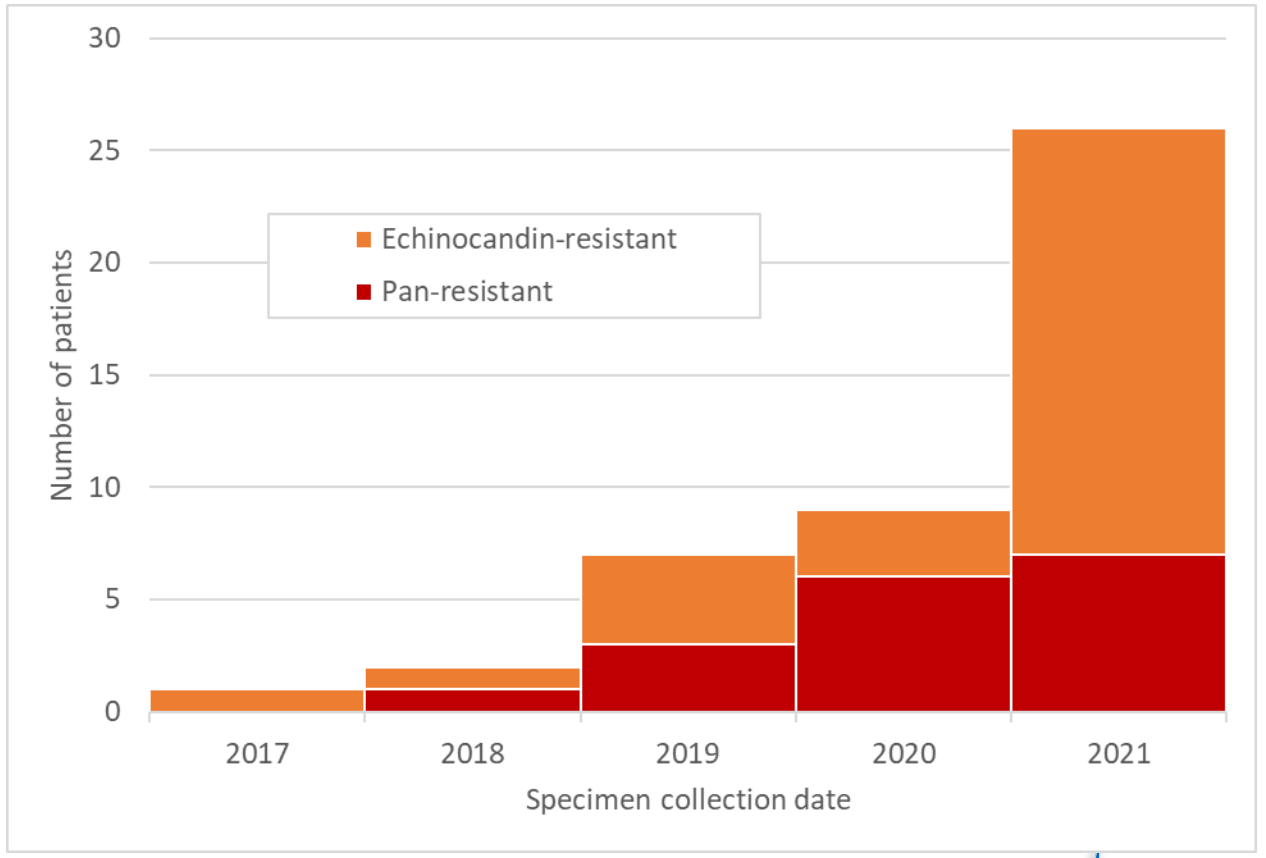
www.cdc.gov/mmwr/volumes/70/wr/mm7029a2.htm



CSTE HAI subcommittee, Jan 2023

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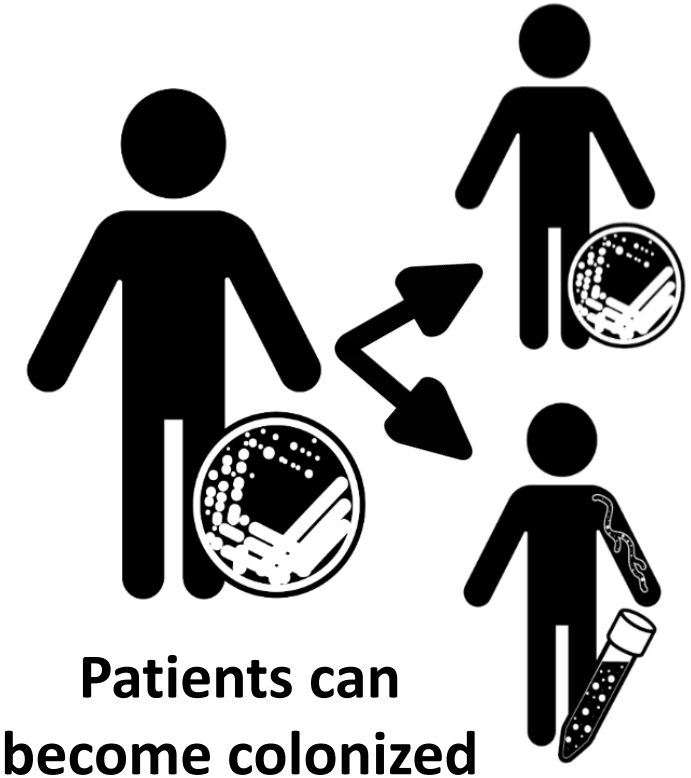
Why are we concerned about *Candida auris?*

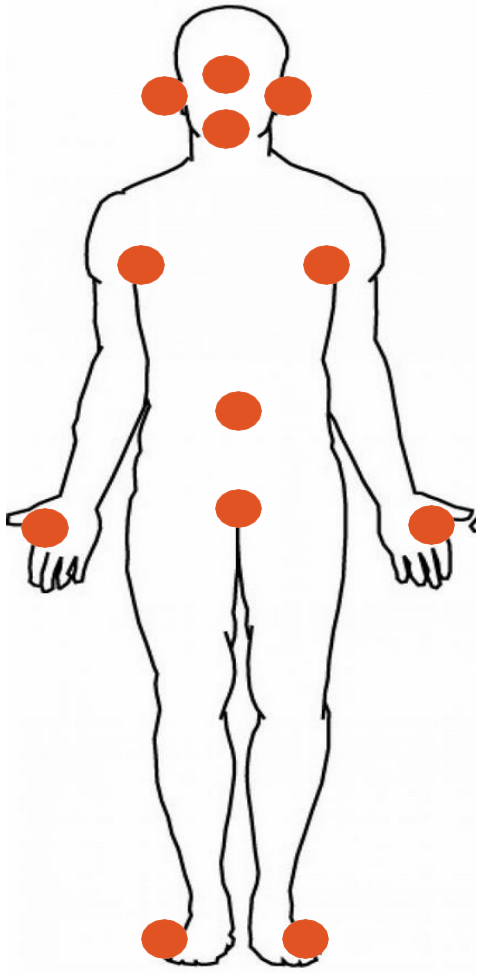
Highly drug-resistant



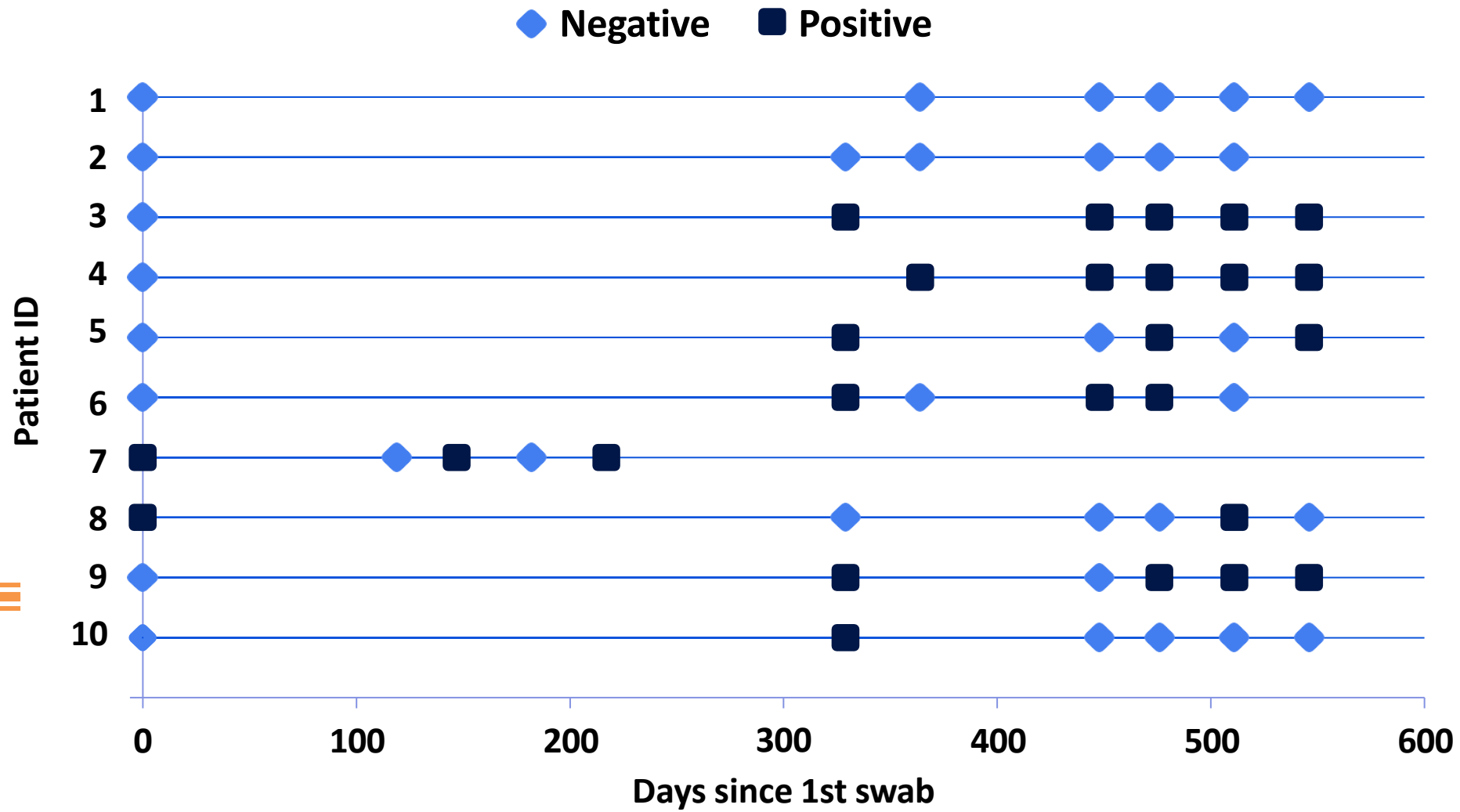
Patients can become colonized and develop invasive infections

C. auris Colonization

- *Candida auris* can colonize the **skin** and other body sites
  - Axilla
  - Inguinal
  - Nares
  - Hands
  - Toes
  - Other skin sites
- Screening recommendation = composite axilla/groin swabs

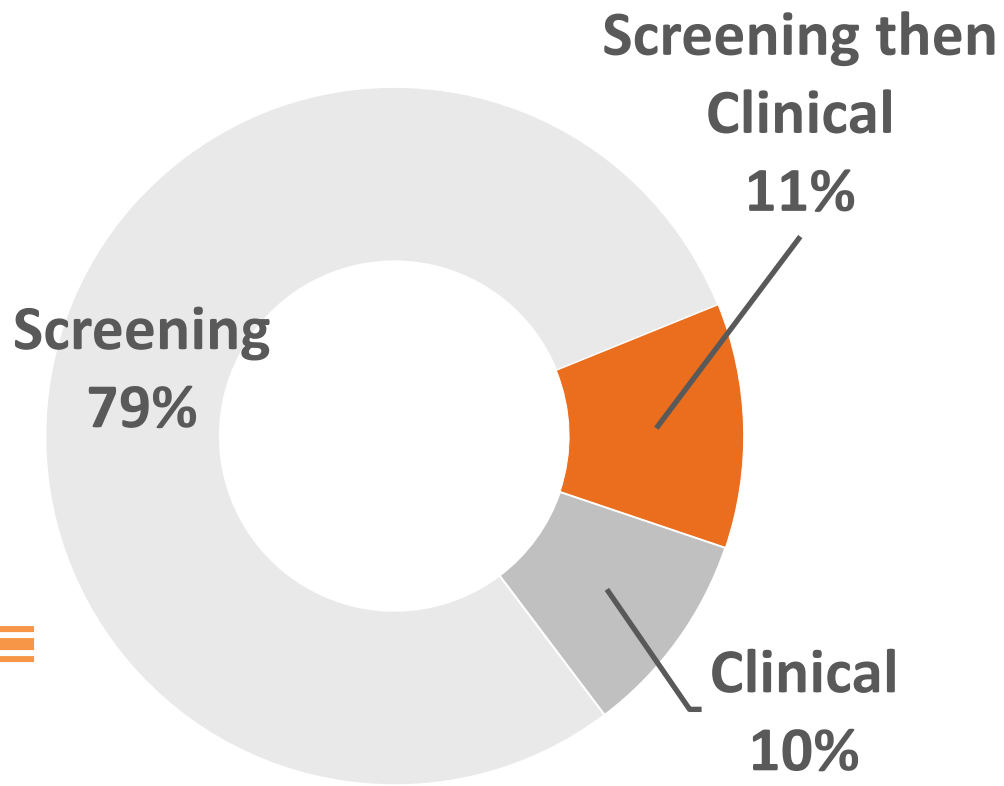


C. auris Colonization can be Long-term



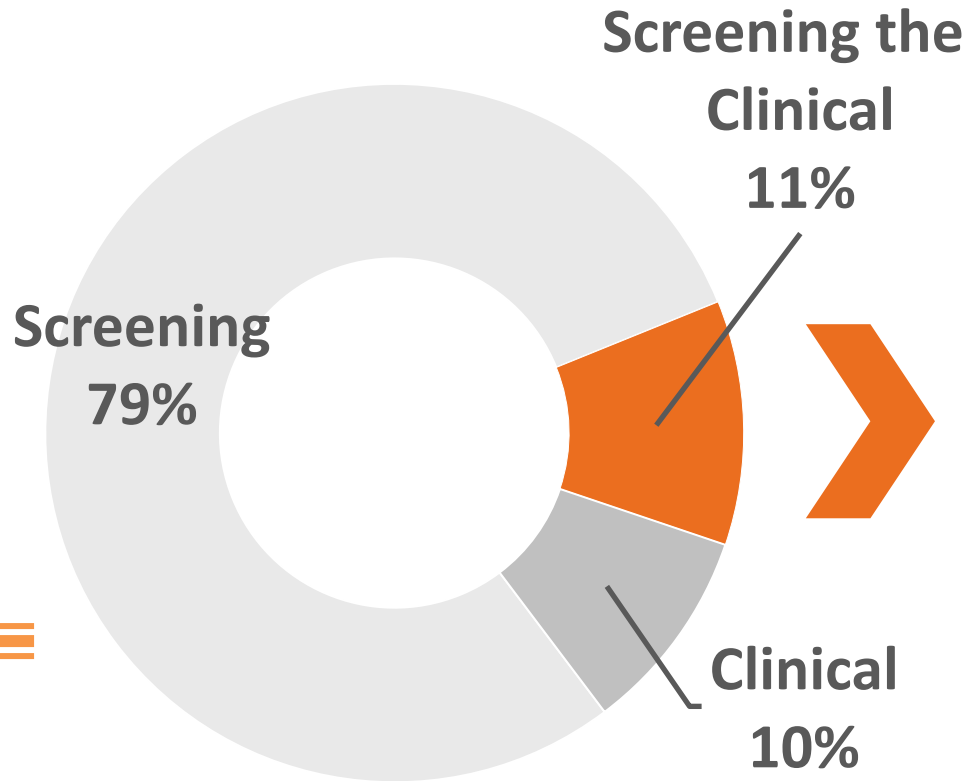
Pacilli et al, SHEA 2019

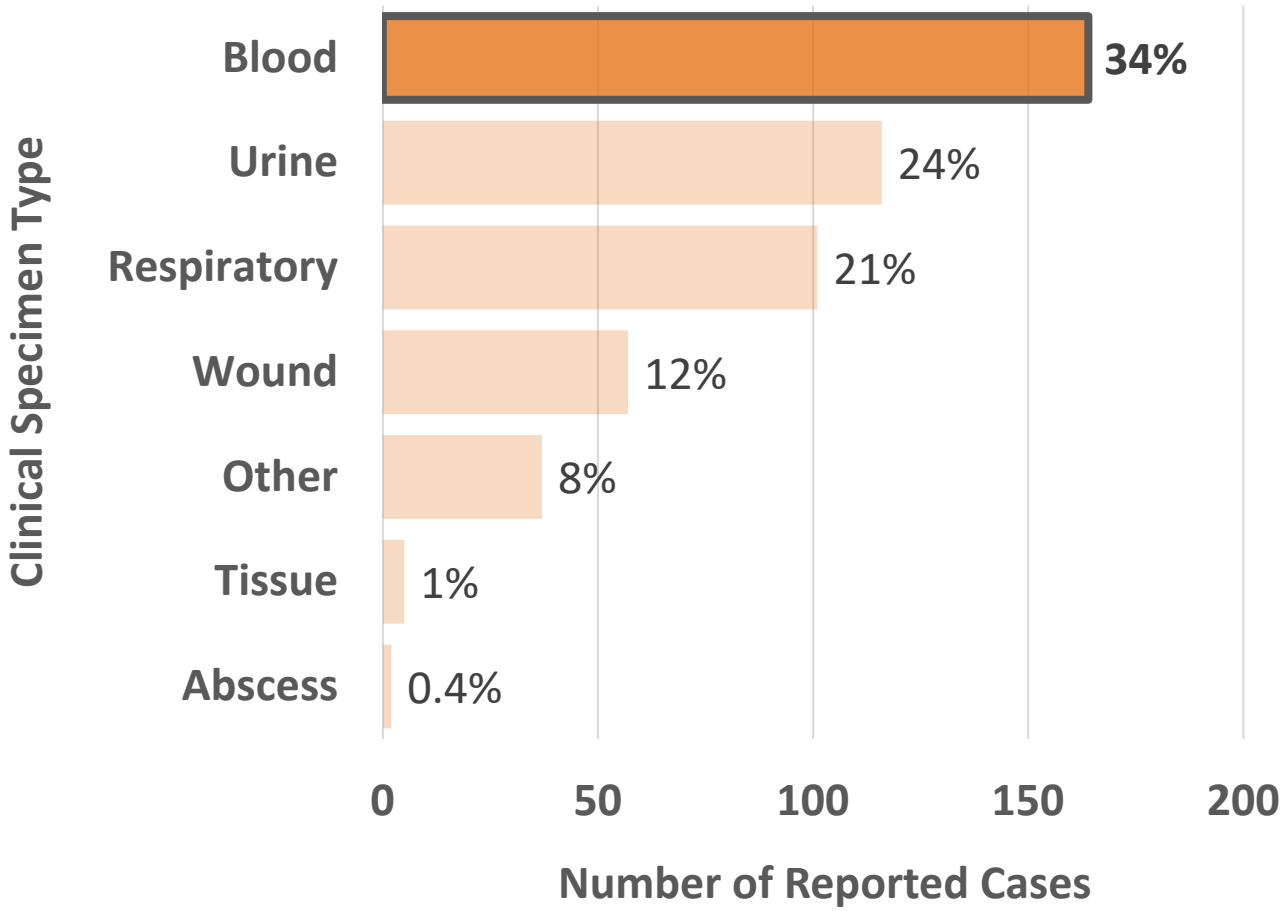
11% of screening (colonization) cases have clinical specimens



C. auris cases reported to CDPH through January 2023

11% of screening (colonization) cases have clinical specimens; of those, 34% are in blood



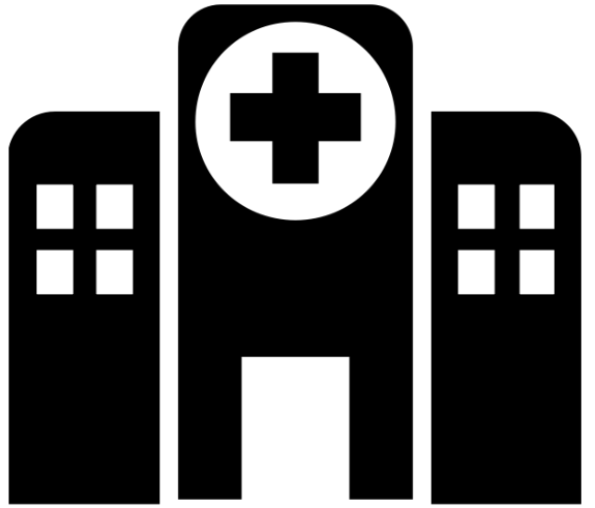


C. auris cases reported to CDPH through January 2023

Why are we concerned about *Candida auris?*

Highly drug-resistant

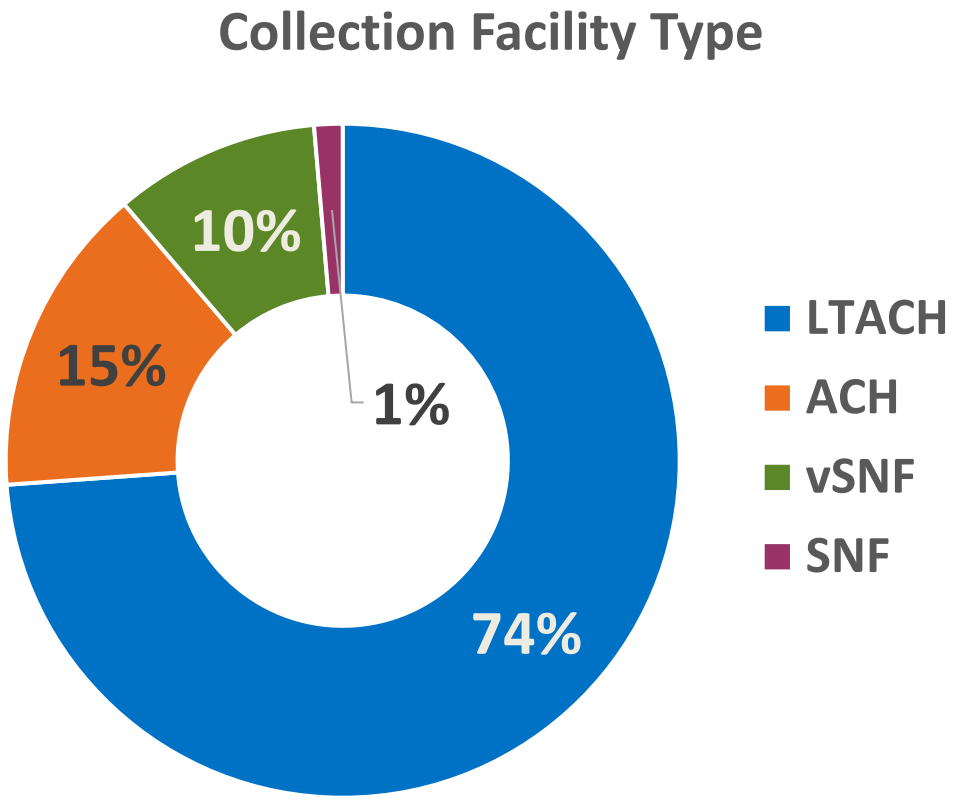
Patients can become colonized and develop invasive infections



Spreads in healthcare settings

California Department of PublicHealth

C. auris Collection Facility Type and Risk Factors



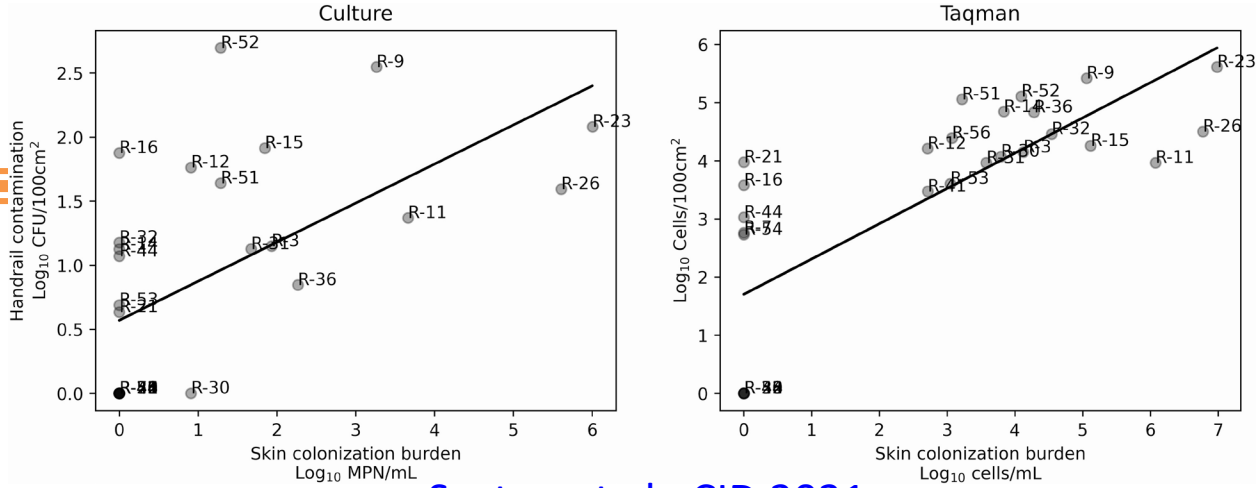
- **Prolonged admission** in healthcare settings, particularly high-acuity long-term care facilities (LTACH, vSNF) or hospital units (e.g., intensive care, burn or step-down units)
- Presence of **indwelling devices**
- **Broad-spectrum antibiotic and antifungal use**

C. auris cases reported to CDPH through January 2023
ACH=acute care hospital; LTACH=long-term ACH; SNF=skilled nursing facility; vSNF=ventilator-equipped SNF)

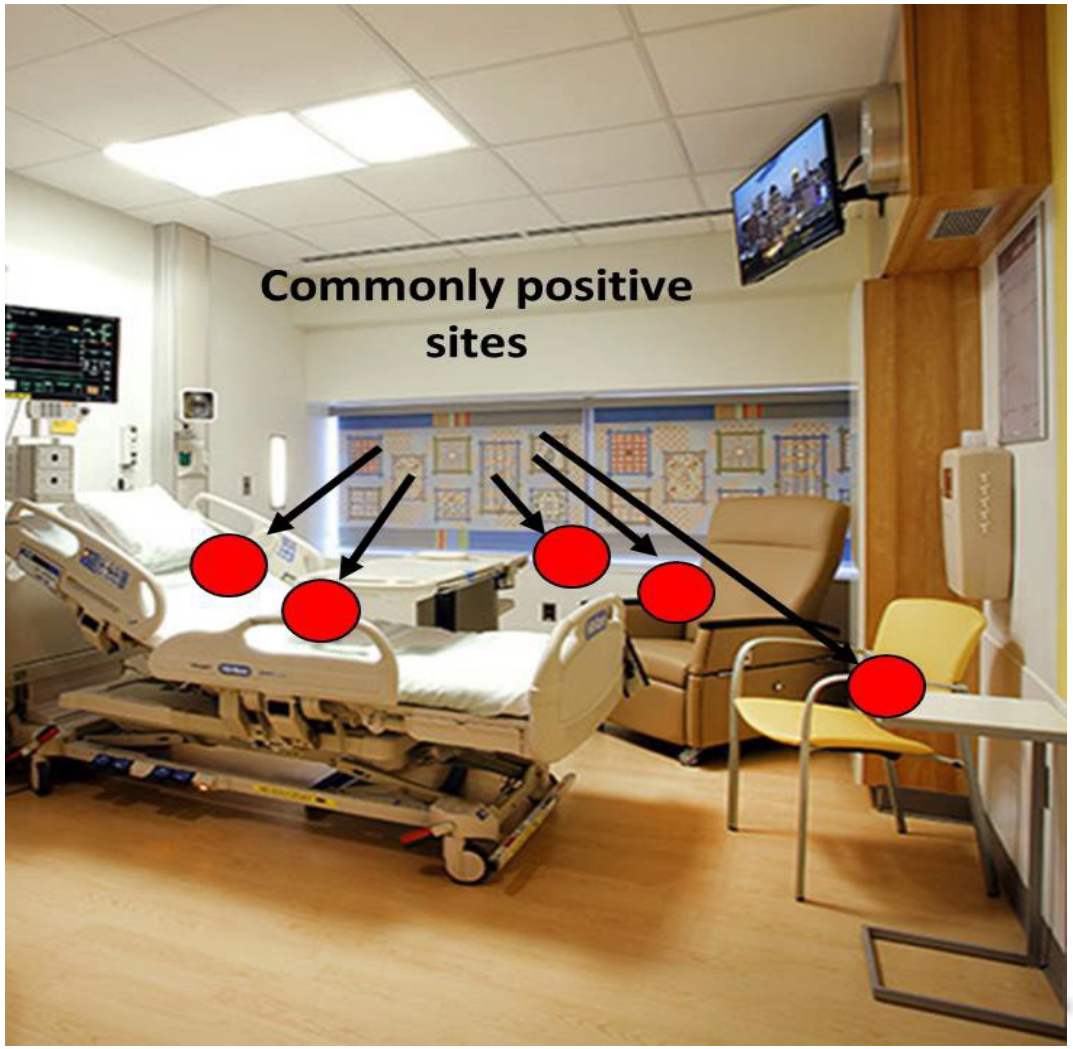
C. auris is persistent in the healthcare environment

- Need **List P, K** agent with claims against *C. auris* ("Quats" don't work)

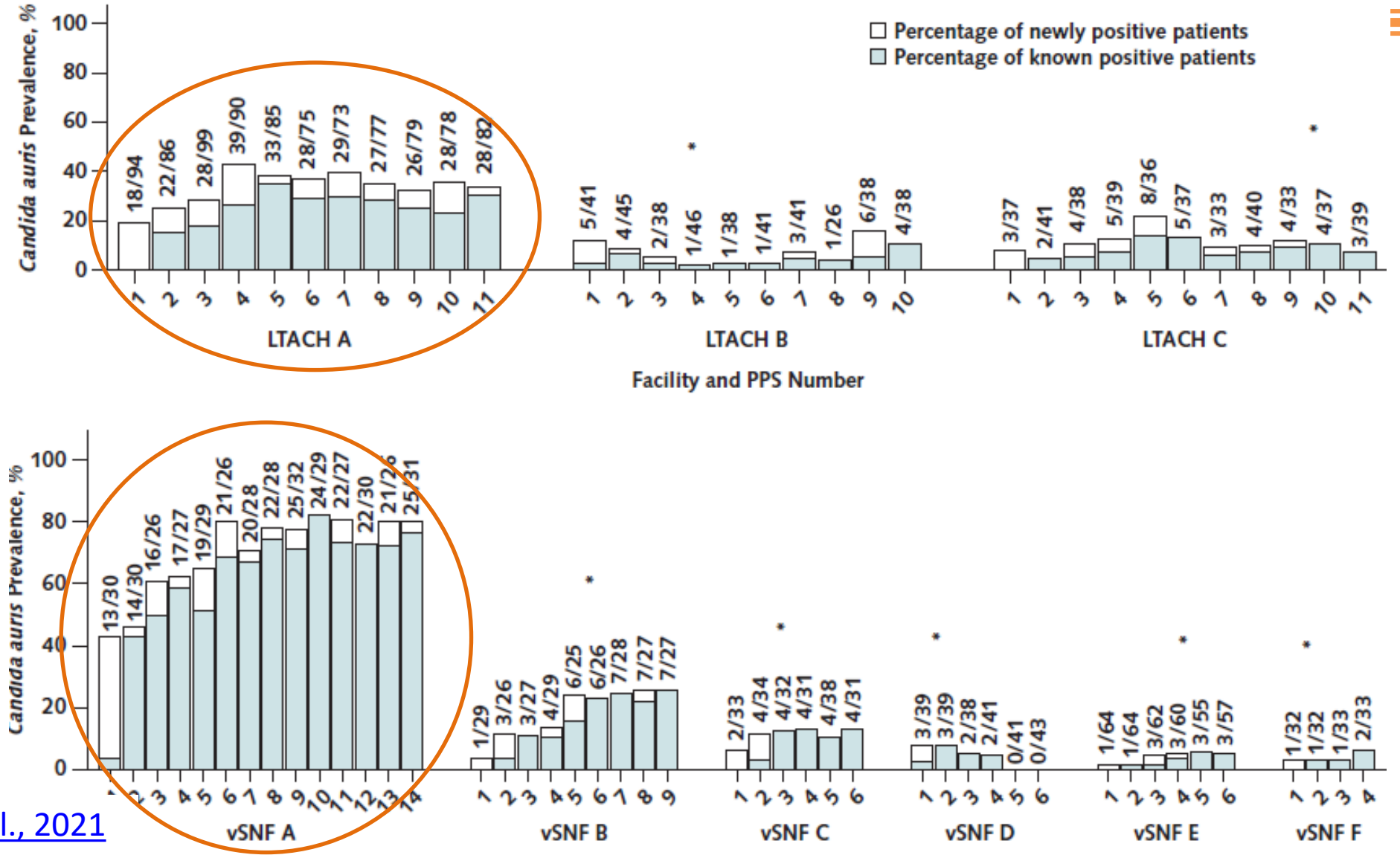
- Higher colonization burden (x axis) associated with greater environmental contamination (y axis)



Sexton et al., CID 2021



Once *C. auris* is in a facility, it can spread rapidly

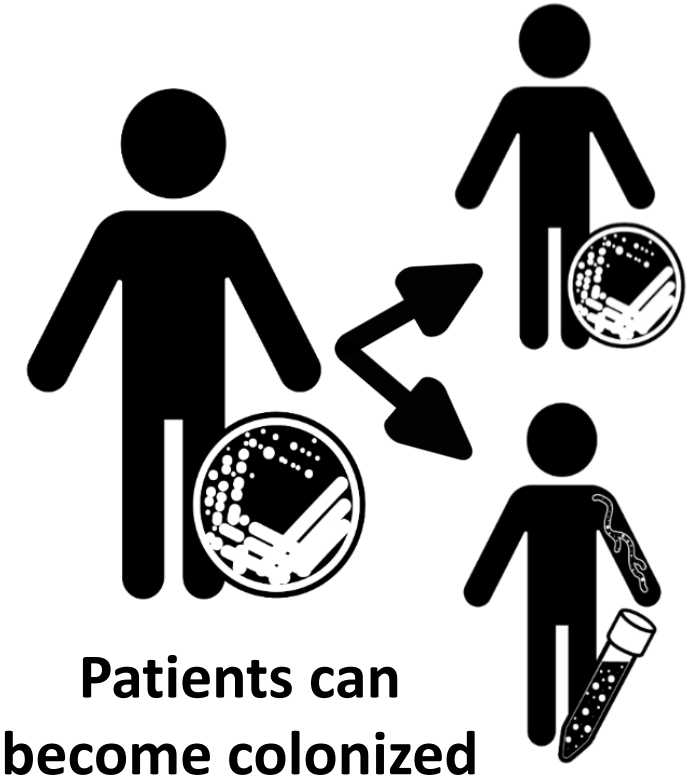


[Karmarkar et al., 2021]

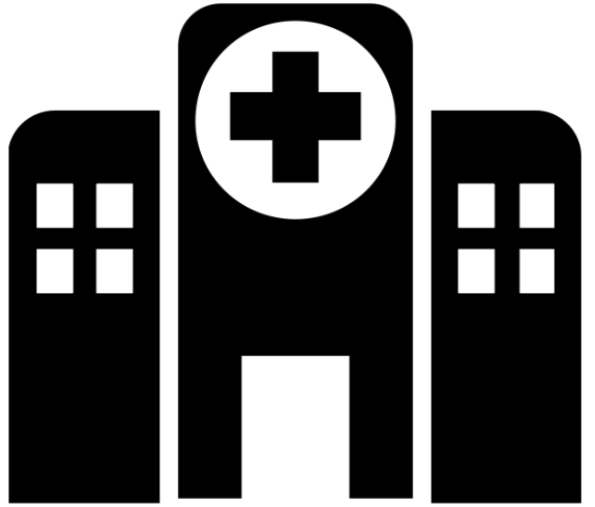
Why are we concerned about *Candida auris?*

All the makings of a fungal superbug!

Highly drug-resistant



Patients can become colonized and develop invasive infections



Spreads in healthcare settings

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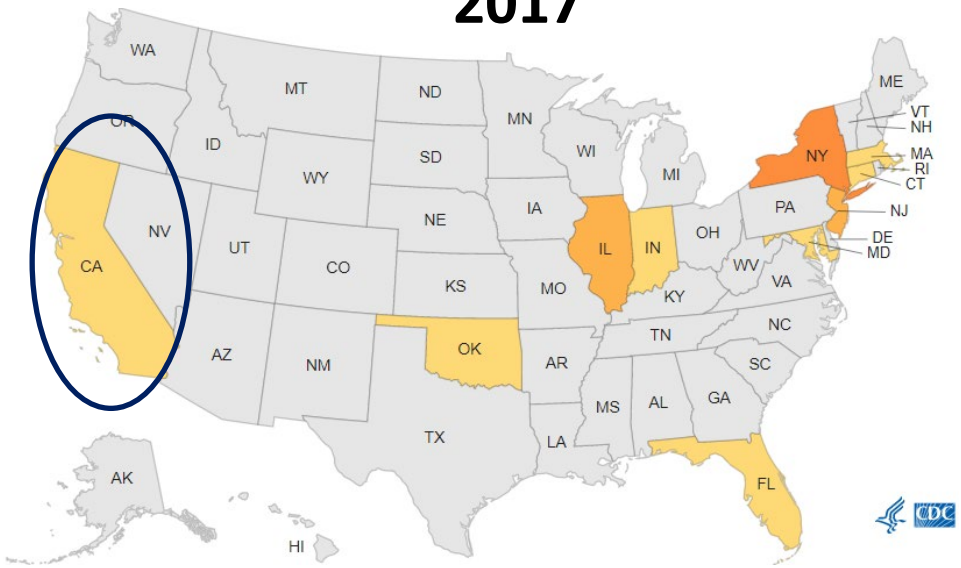
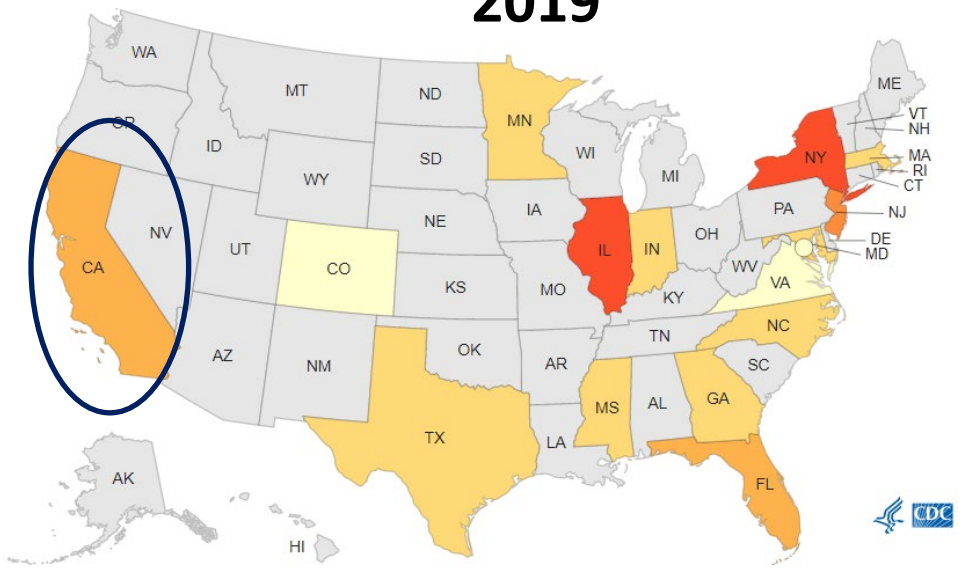
C. auris Epidemiology in California

C. auris Clinical Cases in California and the U.S., 2017–2022

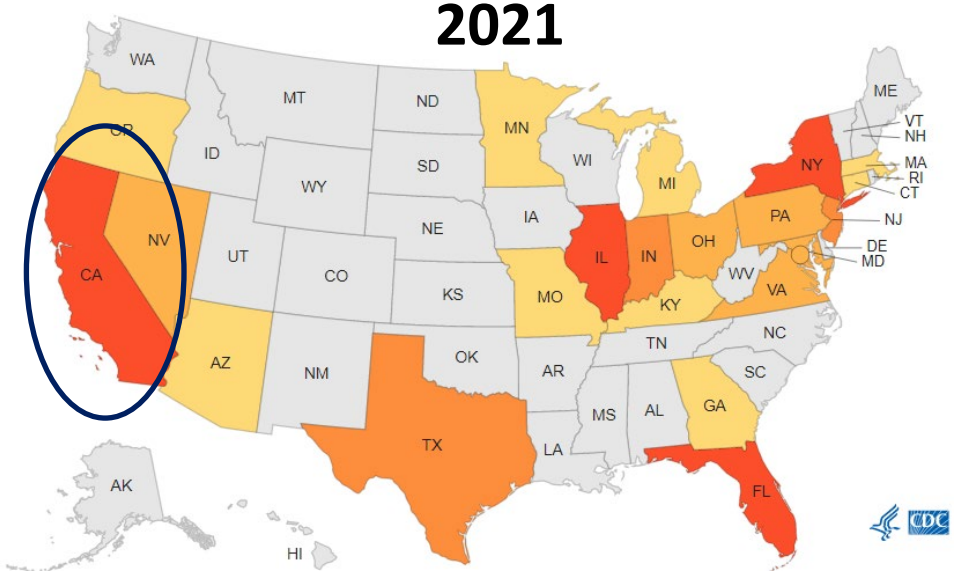
2017



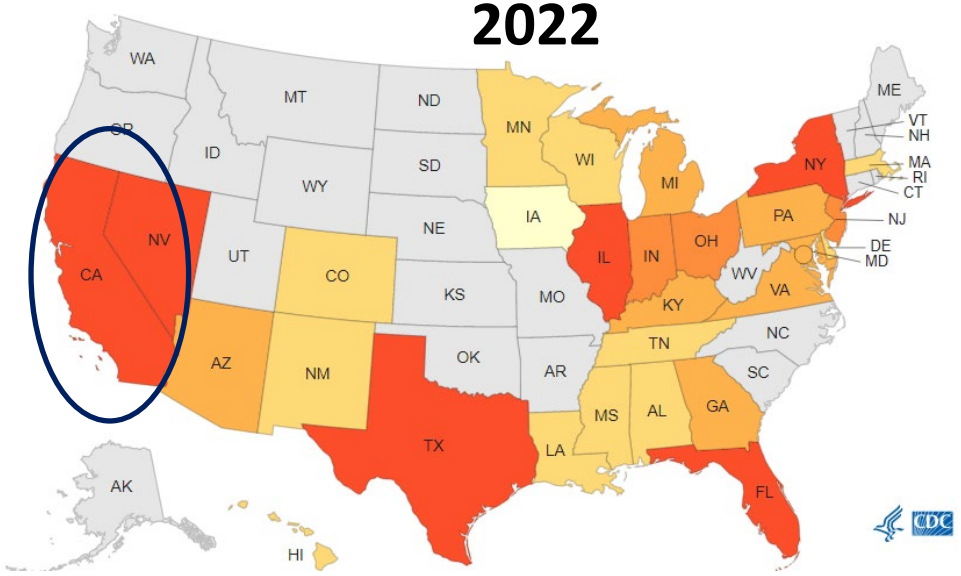
2019



2021



2022



- 0 clinical but 1+ screening cases
- 1 to 10
- 11 to 50
- 51 to 100
- 101 to 500

[CDC Tracking *C. auris*]

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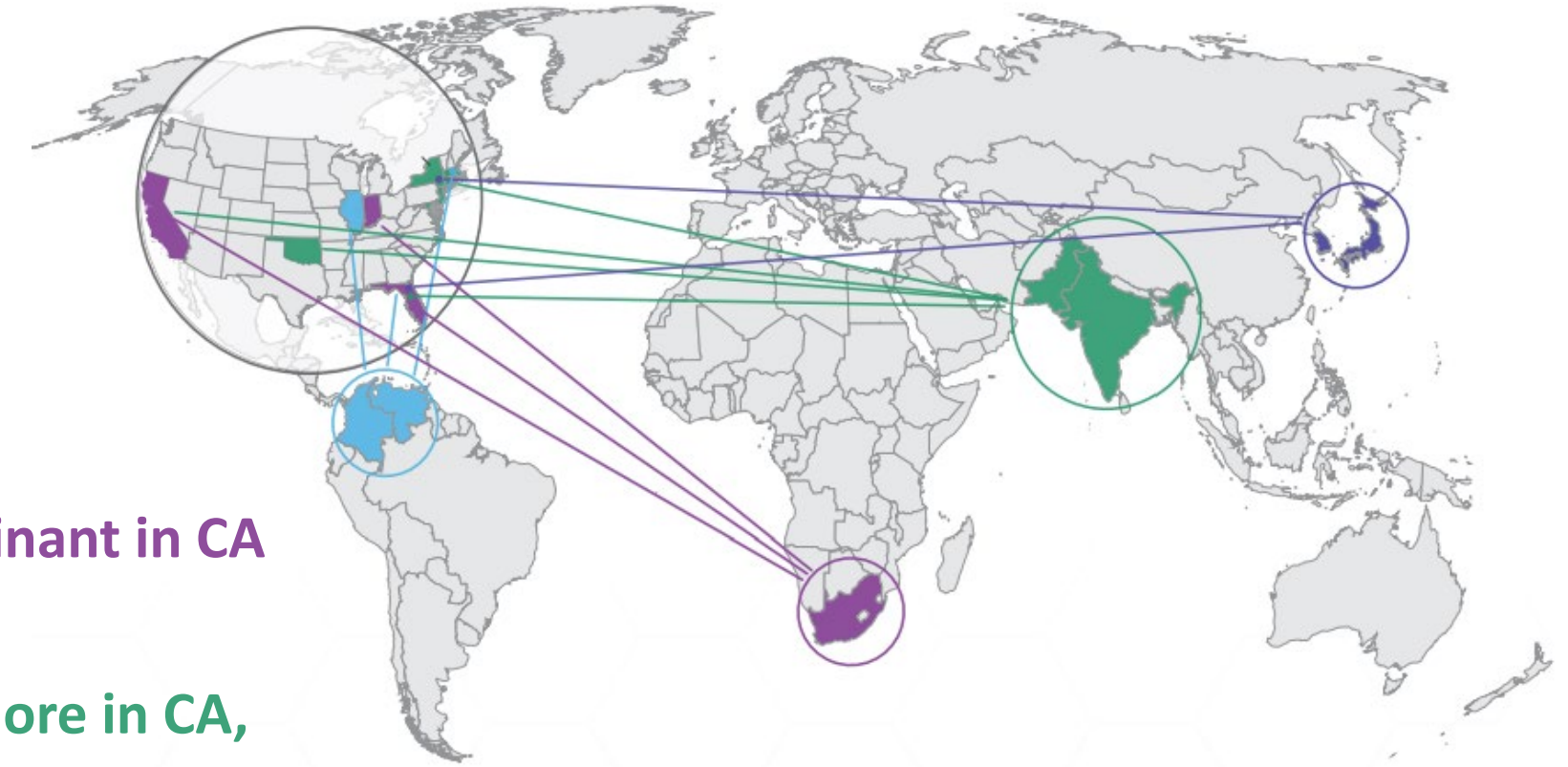
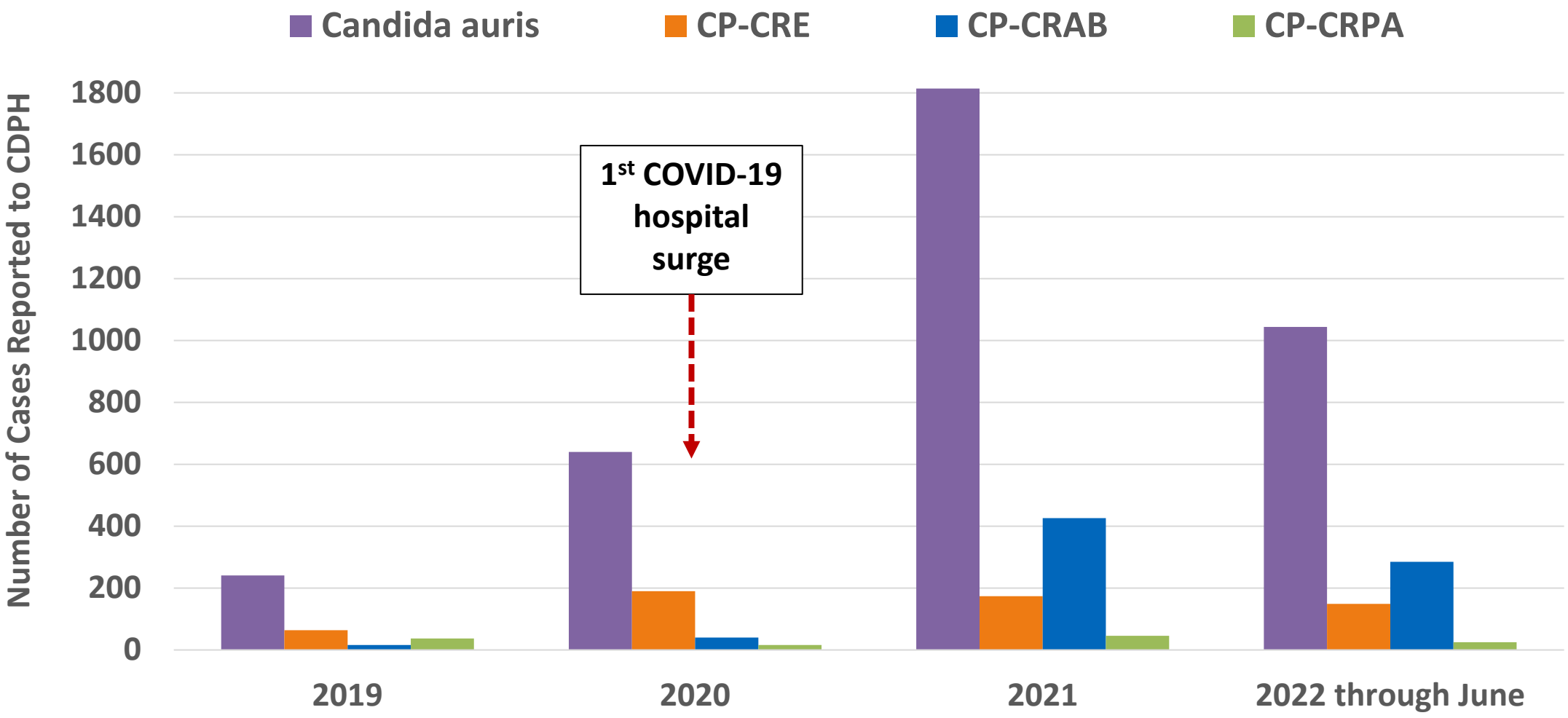
Candida auris
Clades in California



- **Clade III (South Africa) predominant in CA**
- **Clade I (South Asia) detected more in CA, present in NV, CT, FL, MD, NY, NJ, OK**
- **Clade II (East Asia) in FL, NY**
- **Clade IV (South America) in FL, IL, MA**
- Clade V (Iran) newly identified

CDC 2019 AR Threats in US (dx.doi.org/10.15620/cdc:82532)

Between 2020 and 2021, *C. auris* cases* increased 3-fold



CP=carbapenemase-producing; carbapenem-resistant Enterobacterales (CRE), *Acinetobacter baumannii* (CRAB), *Pseudomonas aeruginosa* (CRPA)
**C. auris* numbers include both screening and clinical cases.

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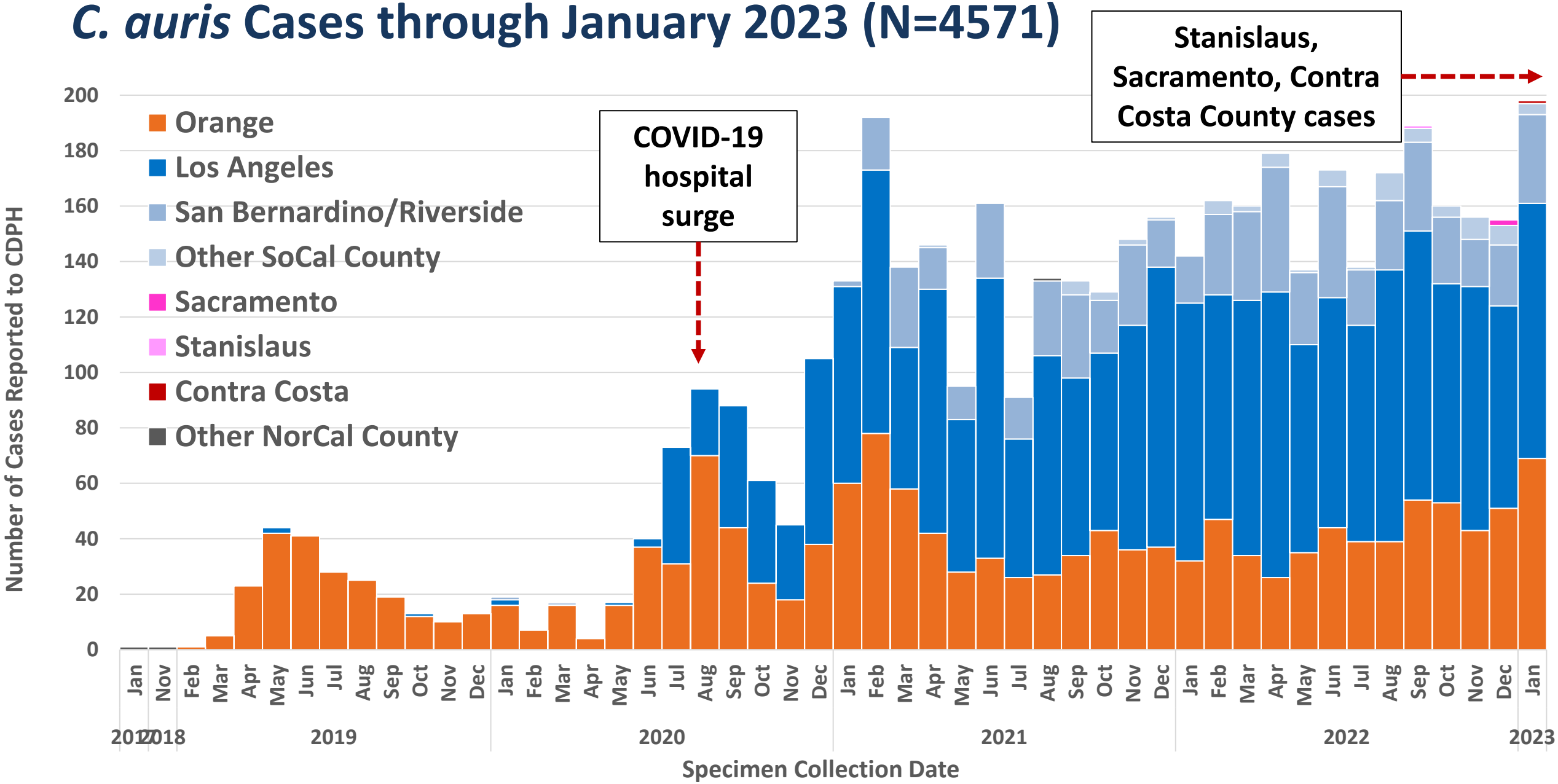
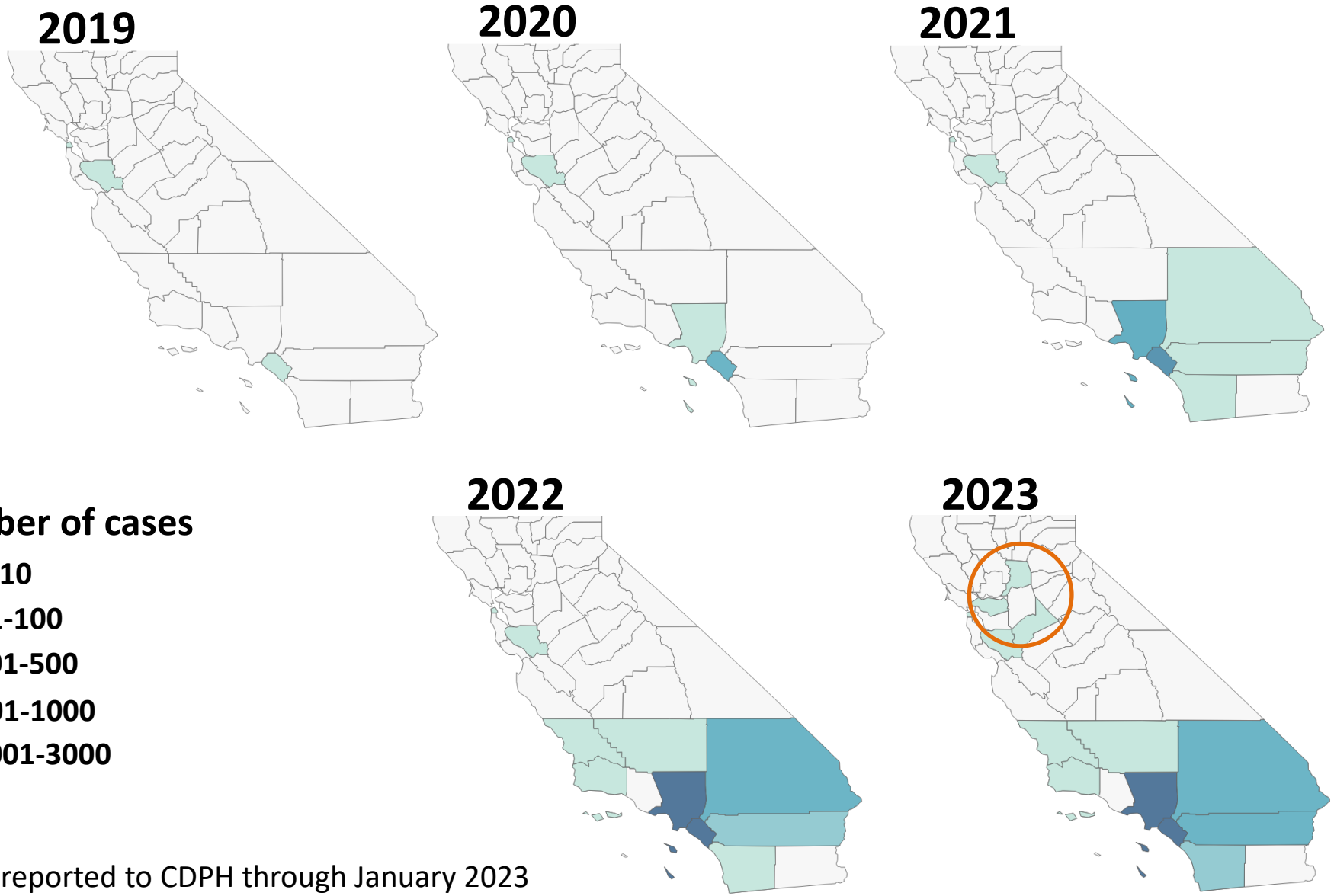
C. auris Cases through January 2023 (N=4571)



Candida auris Spread in California, 2019–2023



C. auris cases reported to CDPH through January 2023

California Department of PublicHealth

Facilities Reporting *C. auris* and Carbapenemase-producing Organism (CPO) Cases, Jan 2019–Sep 2022

Case/Facility Type	ACH	LTACH	vSNF	SNF
C. auris	91	16	38	32
CPO	148	13	32	19
C. auris or CPO	200	21	61	47
Total facilities in CA (2022)	383	23	~130	~1200

California *C. auris*-related CAHAN Health Advisories

- **Aug 2020**: Resurgence of *C. auris* in the setting of COVID-19
- **Mar 2021**: Active surveillance of *C. auris* in healthcare facilities
- **Feb 2022**: *C. auris* in acute care hospitals and outside of Orange and Los Angeles counties
- **Sep 2022**: *C. auris* in Nevada healthcare facilities
- **Feb 2023**: Emergence of *C. auris* in healthcare facilities in Northern California

CAHAN HAI/AR Health Advisories (www.cdph.ca.gov/Programs/CHCQ/HAI/Pages/CAHAN.aspx)

Candida auris Prevention and Response Strategy

A phased approach based on local epidemiology

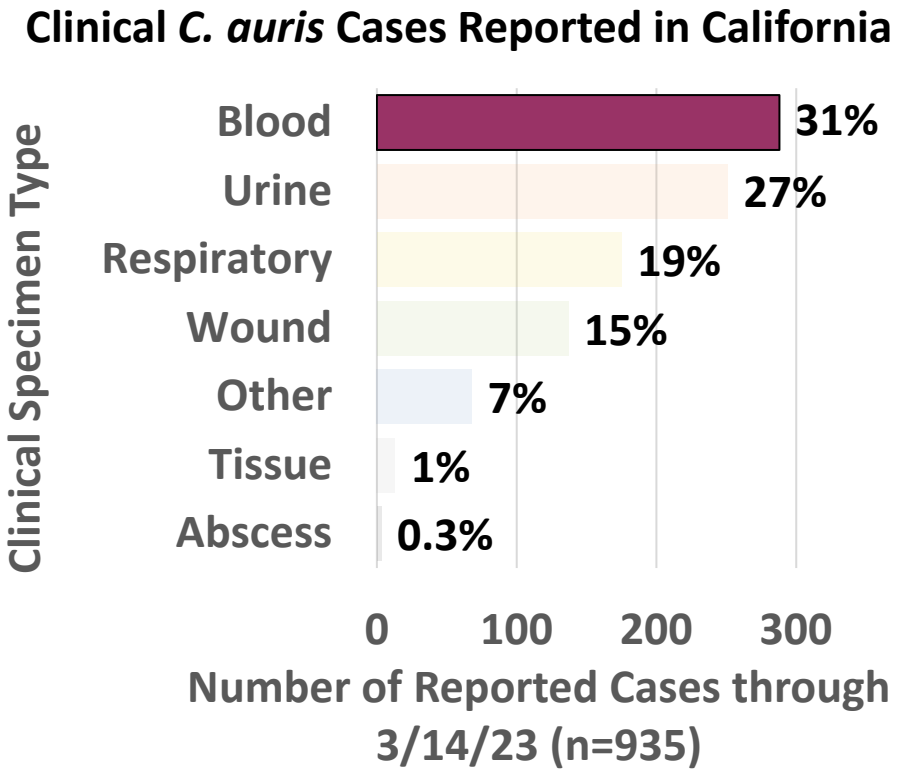
- **Phase 1 (naïve): prevention in all facilities**
  - Build strong foundation for lab surveillance, core infection prevention and control (IPC) practices, antimicrobial stewardship, and interfacility communication
  - Public health-led
- **Phase 2 (new cases): early detection and aggressive response in affected facilities**
  - Investigate, reinforce core IPC practices, conduct screening and onsite IPC assessments, ensure communication
  - Public health-led
- **Phases 3 and 4 (endemic): mitigation and maintenance to prevent further spread**
  - Focus on strengthening all prevention activities
  - Facility-led

See CDPH Regional *C. auris* Prevention and Response Strategy (PDF) (www.cdph.ca.gov/Programs/CHCQ/HAI/CDPH%20Document%20Library/Cauris_Phases.pdf)

Candida auris Laboratory Surveillance

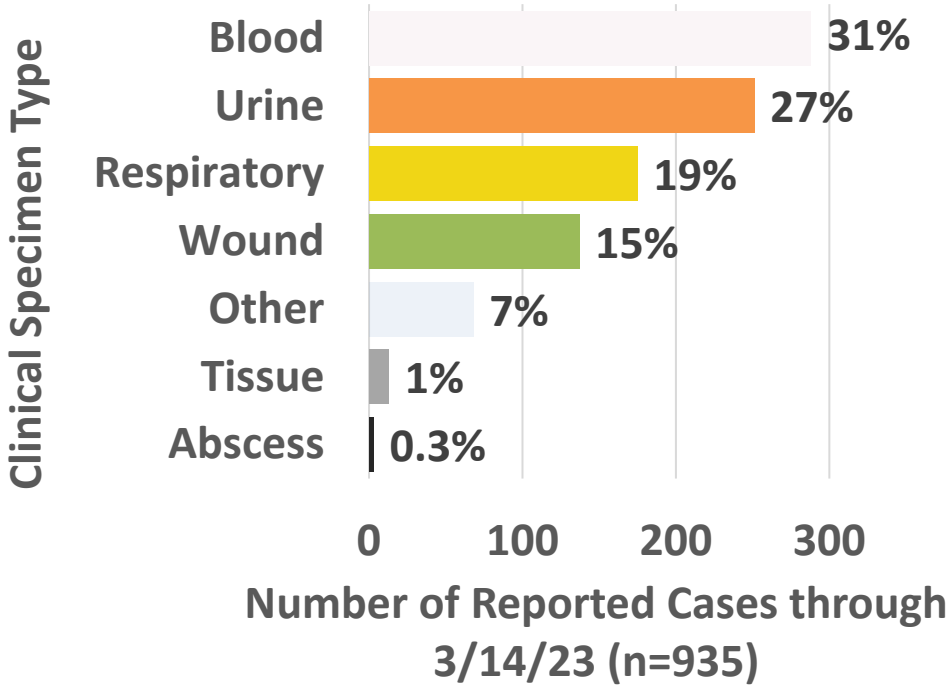
Lab Surveillance: *Candida* Species Identification in Sterile Sites

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



Lab Surveillance: When *Candida* Species Identification Matters

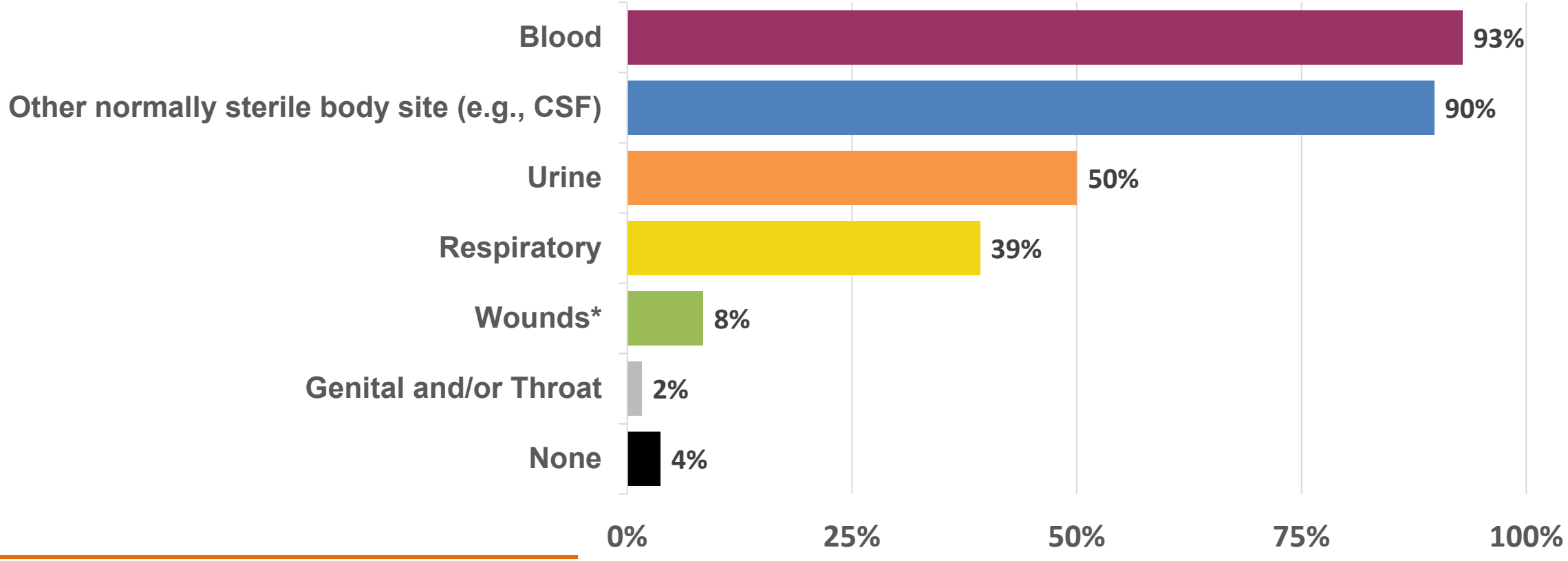
- Identify *Candida* isolates from non-sterile sites to the species level:
  - For high-risk patients
    - Coming from LTACH, vSNF vent unit, or known outbreak facility
    - With healthcare exposure abroad
  - For mono-microbial yeast growth in urine



LTACH=long-term acute care hospital, vSNF=ventilator-equipped skilled nursing facility
CDPH *C. auris* Webpage (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 (PDF) (www.cdc.gov/nhsn/forms/57.103_pshospsurv_blank.pdf)

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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

Screening Recommendations

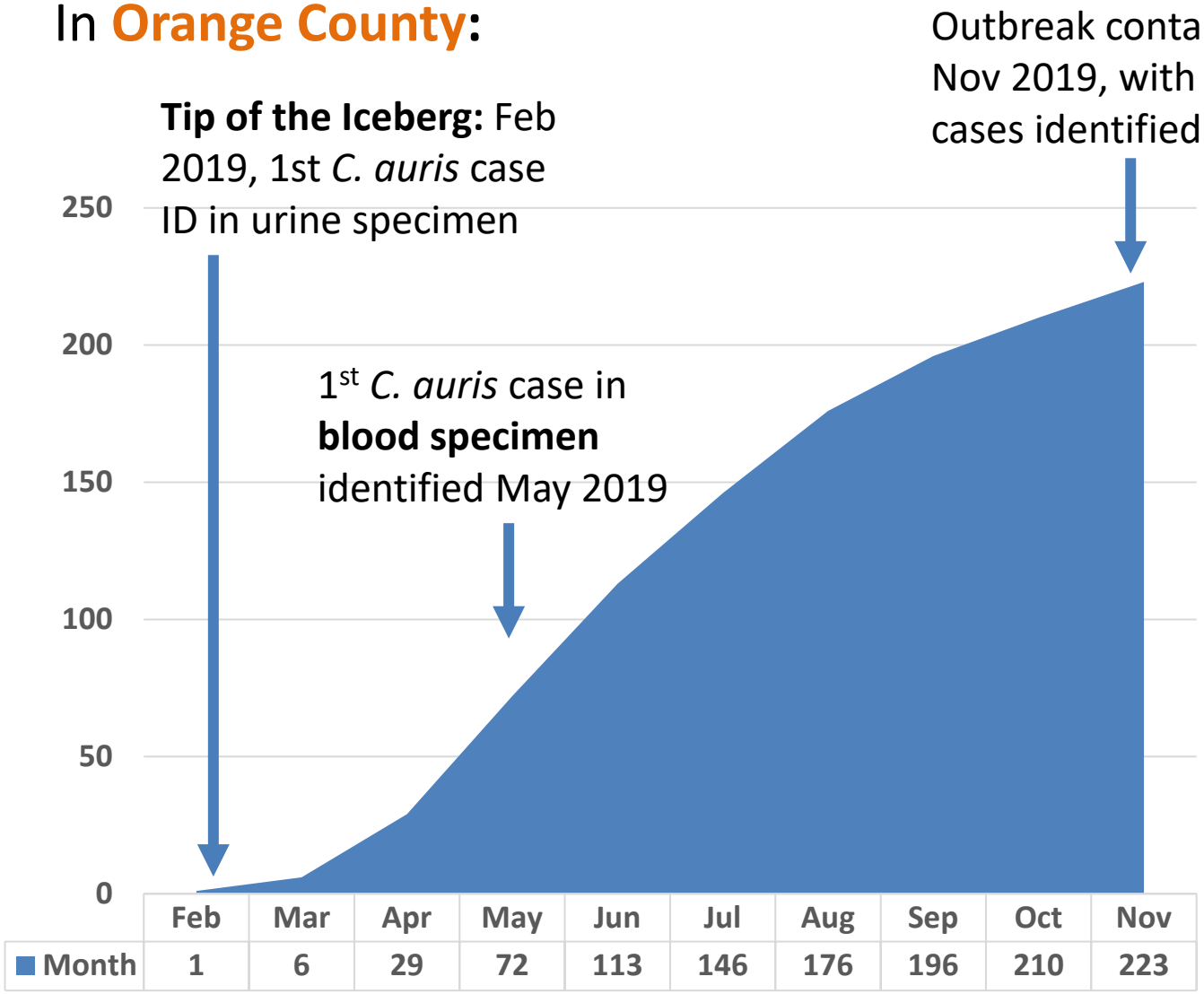
Screen (and place on empiric Contact Precautions) patients transferring from:

1. any LTACH or vSNF ventilator unit regardless of geographic location;
2. any facility with known *C. auris* transmission; and
3. any ACH (plus any LTACH or vSNF vent unit) in Nevada state.

- At **LTACH**, screen patients on admission, conduct routine point prevalence surveys (PPS)
- In **vSNF vent units**, conduct routine PPS; consider admission screening
- Consider screening patients with other known risk factors (e.g., healthcare abroad)
- If *C. auris* identified on admission, notify transferring facility and local health department of patient's status

Why Laboratory Surveillance Matters

In Orange County:



In Sacramento County:

- 1st case identified in urine
- 2nd case identified through screening

In Contra Costa County:

- 1st case identified through routine admission screening of high-risk patient
- Early detection resulted in 0 transmission in admitting facility

Core infection prevention and control (IPC) measures are effective for preventing spread of many pathogens

	C. auris	Other MDRO (e.g., CRE, CRAB)	*C. diff*	SARS-CoV-2
Good hand hygiene – ABHS preferred	X	X	Soap & water	X
Contact Precautions, single room if possible	X	X	X	+ respirator, eye protection
Thorough environmental cleaning and disinfection	Use List P/List K agent – facility-wide in LTACH, unit-wide in SNF subacute, ACH ICU, burn, SDU	X	Use List K agent	Use List N agent (List P/K agent OK)
Routine adherence monitoring	X	X	X	X
Cohorting of patients and healthcare personnel	X	X	X	X

HAI Program IPs can conduct onsite IPC assessments as needed

*Including *Clostridioides difficile (C. diff);* ABHS=alcohol-based hand sanitizer; *C. auris=Candida auris;* CRE=carbapenem-resistant Enterobacterales; CRAB=carbapenem-resistant *Acinetobacter baumannii*

Antimicrobial Stewardship (AS)

Limit unnecessary use of antimicrobial agents

- Ensure appropriate use of broad-spectrum antimicrobials (e.g., carbapenems)
- Antifungal treatment not recommended for *C. auris* isolated from noninvasive sites without evidence of infection
- Provide indication and duration for antimicrobial prescriptions when discharging patients (to SNF)

- Participate in CDPH AS Program Honor Roll, LTACH Collaborative, MDRO Prevention Collaborative

CDPH AS Resources

Communication

Key to preventing interfacility transmission!

- Actively seek MDRO status of all admissions
- Flag medical record for future admissions
- Inform receiving facility of patient MDRO status and IPC recommendations
- Reach out to high-volume transfer facilities (hospital-SNF), share IP expertise
- Educate patients and family
- Use interfacility transfer form

HEALTHCARE FACILITY TRANSFER FORM

Use this form for all transfers to an admitting healthcare facility.

Affix patient labels here.

Patient Name (Last, First):

Date of Birth: | MRN: | Transfer Date:

Receiving Facility Name:

Contact Name: Contact Phone:

Sending Facility Name:

Contact Name: Contact Phone:

PRECAUTIONS

Patient currently on precautions? ☐ **Yes** ☐ **No**

If yes, check all that apply: ☐ Airborne ☐ Contact ☐ Droplet ☐ Enhanced Standard*

Personal protective equipment (PPE) to consider at receiving facility*:

☐ Gloves ☐ Gown ☐ Mask ☐ N95/PAPR ☐ Eye Protection

Long-term care facilities may implement Enhanced Standard precautions for patients with MDRO or risk factors for transmission, i.e., gown and glove use for high-contact care activities (https://www.cdph.ca.gov/Programs/CHCQ/LCP/CDPH%20Document%20Library/AFL-19-22.pdf); such patients may be on Contact precautions in acute care settings.

ORGANISMS (Include copy of **lab results** with organism ID and antimicrobial susceptibilities.)

Patient has multidrug-resistant organism (MDRO) or other lab results requiring precautions?

☐ **Yes** (record organism(s), specimen source, collection date) ☐ **No**

☐ **Exposed to MDRO/other** (record organism(s) and last date(s) of exposure if known)

Organism	Carbapenemase (if applicable)**	Source	Date
☐ *Candida auris* (***C. auris***)			
☐ *Clostridiodes difficile* (***C. diff***)			
☐ *Acinetobacter*, multidrug-resistant (e.g., **CRAB****)			
☐ Carbapenem-resistant Enterobacterales (**CRE****)			
☐ *Pseudomonas aeruginosa*, multidrug-resistant (e.g., **CRPA****)			
☐ Extended-spectrum beta-lactamase (**ESBL**)-producer			
☐ Methicillin-resistant *Staphylococcus aureus* (**MRSA**)			
☐ Vancomycin-resistant *Enterococcus* (**VRE**)			
☐ No organism identified (e.g., molecular screening test**)			
☐ **Other, specify**: (e.g., SARS-CoV-2 (COVID-19), lice, scabies, disseminated shingles (*Herpes zoster*), norovirus, influenza, tuberculosis)			

**Note specific carbapenemase(s) (e.g., NDM, KPC, OXA-23) if known

[Interfacility Transfer Communications Guide](www.cdph.ca.gov/Programs/CHCQ/HAI/Pages/InterfacilityCommunication.aspx)
(www.cdph.ca.gov/Programs/CHCQ/HAI/Pages/InterfacilityCommunication.aspx)

California Department of PublicHealth

C. auris Tabletop Exercise

Setting

- **You are an infection preventionist at ACH A**
- Your county has not yet identified *C. auris*

Hospital reports *Candida auris*

On Monday January 23rd, you are notified by your lab of a **positive *C. auris* result**, from a urine specimen collected Monday January 16 from Patient A, currently admitted to ACH A.

Does this result need to be reported?

- What are the reporting requirements for *Candida auris*?
  1. **Healthcare providers and laboratories** should report *C. auris* cases. Labs must report via electronic laboratory reporting (ELR) to CalREDIE
  2. Healthcare providers can use the *C. auris* case report form via CalREDIE to report additional facility and epidemiological information for a case

Does the lab need to submit the isolate to public health?

- What else does the lab need to do with the result?
  1. **Labs must** submit all *C. auris* isolates from **sterile site specimens** (e.g., blood) to a public health lab within 10 working days
  2. **If requested** by public health, labs must attempt to obtain a fungal culture isolate from a specimen site (sterile or non-sterile) for submission as soon as available to the public lab for the local health jurisdiction where the patient resides

Questions from Public Health

- The hospital reports the case to local public health. Your public health partner has the following questions for you:
  1. What are the patient's admission and discharge dates, and what unit(s) is/was the patient admitted on?
  2. Where is the patient now?
  3. Have they been on Contact Precautions?
  4. Did they have roommates or shared bathroom-mates?
  5. What is known about their medical and travel history?
  6. Does the facility use a disinfectant with claims for *C. auris*?
  7. Has the facility identified non-*albicans Candida* in other patient isolates?

Patient History: Patient A

He is a 72-year-old male with no known history of international travel.

He was admitted to the ICU at ACH A Dec 6 2022-Jan 16 2023 from home. He was in the same room and had no roommates, but was not on Contact Precautions. He was admitted to the step-down unit Jan 16 where he had a roommate until Jan 20; he is still admitted to the same room in the SDU, and was placed on Contact Precautions on Jan 23.

ACH A uses a List P agent in the ICU, but not the SDU.

Initial Recommendations?

What initial recommendations will public health have about the patient and the facilities, based on this information?

Initial Recommendations for ACH A?

What initial recommendations will public health have for ACH A, based on this information?

- ✓ Place the patient on Contact Precautions and in a single room
- ✓ Ensure use of a List P/K agent for daily and terminal cleaning and disinfection in the ICU and SDU, possibly facility-wide
- ✓ Provide a line list of healthcare contacts for possible screening, including roommates and patients overlapping with the index currently admitted to ACH A or discharged to another healthcare facility
- ✓ Offer a consultative onsite IPC assessment
- ✓ Communicate the patient's *C. auris* status to any receiving facility

Facility Details – ACH A

You are not aware of any other patients with recent cultures positive for non-*albicans Candida*.

- The hospital has 12 beds and 10 patients currently in the ICU. There are 20 patients in the SDU.
- 10 patients who overlapped with the index are currently still admitted to the other units in the hospital
- 10 patients who overlapped with the index were discharged to other healthcare facilities
- You provide public health with a line list
- You schedule an onsite IPC assessment with public health

What screening is recommended?

- Who should be screened as a result of the *C. auris* case?
- What type of screening is recommended?

What screening is recommended?

- Who should be screened as a result of the *C. auris* case?

✓ We recommend *C. auris* colonization testing of close healthcare contacts including those:

- ✓ who shared a bathroom and roommates
- ✓ who require high levels of care (e.g., ventilator-dependent) and overlapped on the same ward or unit as the index
- ✓ with shared primary HCP, or exposed to the same device
- ✓ residing on unit(s) where transmission is suspected (point prevalence survey (PPS))

What screening is recommended?

- What type of screening is recommended?
  - ✓PCR testing is preferred over culture-based for quicker turnaround time (24-48 hours versus ~7-14 days)
  - ✓AR Lab Network offers colonization testing at no cost through public health
  - ✓Facility may use their own testing resources

What screening is recommended?

- Public health recommends screening all patients:
  - currently admitted to the ICU and SDU (PPS)
    - If positive, continue every 2 weeks until 2 consecutive negative PPS
  - currently admitted to other units in the facility if they overlapped with the index
    - If positive, consider expanding screening to additional healthcare contacts or units
  - overlapping with the index and currently at a healthcare facility, and their roommate(s)
    - If positive, expand screening to hallway, unit, or facility

Precautions

- What level of Precautions would you recommend for the index patient? And for other healthcare contacts?

Precautions

- What level of Precautions would you recommend for the index patient? And for other healthcare contacts?

✓ **Contact Precautions for index patient** and private room with private bathroom

✓ **Empiric Contact Precautions** for exposed roommates and healthcare contacts at ACH A and those discharged to facilities until screening results

✓ **Enhanced Standard Precautions** possible for exposed healthcare contacts discharged to SNF (risk-based approach to use of gowns and gloves during high contact activities) in the absence of known transmission

CDPH ESP Website (ca.gov)

Environmental Cleaning and Disinfection

- Do we need to do anything special for cleaning and disinfection?

Environmental Cleaning and Disinfection

- Do we need to do anything special for cleaning and disinfection?

✓ Yes, *C. auris* can persist on surfaces in healthcare environments

- *C. auris* has been recovered from glucometers, temperature probes, mobile ultrasounds, pulse-oximeters, blood pressure cuffs, and stethoscopes, in addition to bedrails, doorknobs, window sills, and other high-touch surfaces
- *C. auris* has been detected on bedrails of *C. auris* negative patients who recently moved into rooms previously occupied by colonized patients

Sexton et al., CID 2021

Environmental Cleaning and Disinfection

- Do we need to do anything special for cleaning and disinfection?

✓ Use a List P or List K (*C. diff*) agent in high-acuity units (e.g., ICU, SDU, burn) or facility-wide
✓ Perform thorough daily and terminal cleaning and disinfection of patients' rooms and other areas where patients receive care (e.g., radiology, physical therapy); consider double terminal cleans
✓ Clean and disinfect shared or reusable equipment after each use
✓ Label cleaned and disinfected equipment and store it away from dirty equipment
✓ Train HCP on who cleans what, types of agents, and contact time

HAI Program Onsite IPC Assessment

- What can you expect during an HAI Program onsite IPC assessment?

✓ **Non-regulatory**, consultative, extra set of eyes
✓ Standardized assessment
✓ Observations with adherence monitoring tools, focus on affected units (ICU, SDU) and environmental cleaning and disinfection
✓ Education
✓ Follow-up recommendations

Resources

- CDPH *C. auris* Webpage (www.cdph.ca.gov/Programs/CHCQ/HAI/Pages/Candida-auris.aspx)
- CDPH *C. auris* Screening Decision Tree (PDF) (www.cdph.ca.gov/Programs/CHCQ/HAI/CDPH%20Document%20Library/Tier2_Pathogen_Screening_Decision_Tree_Oct2020.pdf)
- *C. auris* Reporting FAQ (PDF) (www.cdph.ca.gov/Programs/CHCQ/HAI/CDPH Document Library/CaurisReportingFAQ.pdf)
- CDPH *C. auris* Webpage (www.cdph.ca.gov/Programs/CHCQ/HAI/Pages/Candida-auris.aspx)
- CDPH MDL Fungal Identification Submission Requirements (www.cdph.ca.gov/Programs/CID/DCDC/Pages/TestOrderFungalIDYeastMALDI.aspx)
- CalREDIE Communicable Disease Control Forms (*C. auris*-specific form forthcoming) (www.cdph.ca.gov/Programs/PSB/Pages/CommunicableDiseaseControl.aspx)
- CDPH Regional *C. auris* Prevention and Response Strategy (PDF) (www.cdph.ca.gov/Programs/CHCQ/HAI/CDPH%20Document%20Library/Cauris_Phases.pdf)
- Targeted Surveillance Program for non-*albicans Candida* Isolates (PDF) (www.cdph.ca.gov/Programs/CHCQ/HAI/CDPH%20Document%20Library/CDPH_ARLN_TargetedSurveillanceDescription_052521.pdf)
- List of laboratories with *C .auris* Testing Capacity (PDF) (publichealth.lacounty.gov/acd/docs/List_C.aurisLabs.pdf)
- EPA-approved List P Agents (www.epa.gov/pesticide-registration/list-p-antimicrobial-products-registered-epa-claims-against-candida-auris)

Supporting Literature

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- C. auris Recommendations for Outbreak Response. CORHA. https://www.corha.org/wp-content/uploads/2021/08/Candida-auris-Recommendations-for-Healthcare-Outbreak-Response.pdf
- The Importance of Ventilator Skilled Nursing Facilities (vSNFs) in the Regional Epidemiology of Carbapenemase-Producing Organisms (CPOs). Poster: https://pdfs.semanticscholar.org/9016/884753452a66c8e072a0b97f42950aef4726.pdf
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Thank you!

Questions?

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