

# Emerging Issues in Healthcare-Associated Infections: California Update for 2023

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Center for Health Care Quality  
California Department of Public Health



**I have no financial interests or relationships to disclose.**

## Outline

- Describe the epidemiology of *Candida auris* in California
- Discuss new developments in wastewater surveillance of *Candida auris* in California
- Review recent examples of healthcare-associated infections related to infection control breaches

# Candida auris is in the news

**The Washington Post**  
Democracy Dies in Darkness

## Deadly fungal infection rapidly spreading in U.S. health facilities

## HEALTHCARE-ASSOCIATED INFECTIONS PROGRAM

**The New York Times**

## Deadly Fungus Spread Rapidly During the Pandemic, C.D.C. Says

Candida auris, a drug-resistant fungus that health officials hoped to contain is now in more than half the 50 states, according to a new research paper.

# the ONION® The Yeast They Could Do

## Potentially deadly 'superbug' fungus is spreading faster in the US

By Harry Baker last updated 6 days ago

A new study shows that the anti-drug resistance and number of cases of the infectious fungus *Candida auris* increased between 2019 and 2021.

[Infectious Disease](#) > [General Infectious Disease](#)

## Cases of Deadly Fungus Tripled in Past Few Years, CDC Says

— The agency has rated *Candida auris* as an urgent antimicrobial-resistant threat

by Ingrid Hein, Staff Writer, MedPage Today March 20, 2023

## BuzzFeed News

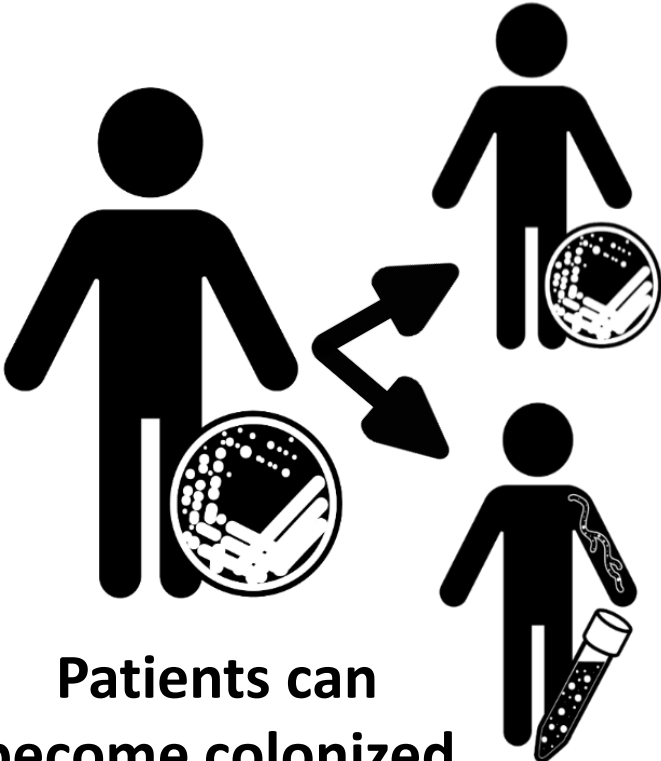
## What Experts Say About Candida Auris, The New “Urgent Threat” To Human Health

Candida auris is a type of yeast that can spread from person to person and is resistant to antifungal treatments. The CDC calls it an “urgent threat.”

# What makes *Candida auris* a public health priority?



Emerging fungal pathogen that is highly drug-resistant



Patients can become colonized and develop invasive infections



Spreads in healthcare settings



# DRUG-RESISTANT **CANDIDA AURIS**

THREAT LEVEL **URGENT**



**323**  
Clinical cases  
in 2018



**90%** Isolates resistant to at least **one** antifungal  
**30%** Isolates resistant to at least **two** antifungals

*Candida auris* (*C. auris*) is an emerging multidrug-resistant yeast (a type of fungus). It can cause severe infections and spreads easily between hospitalized patients and nursing home residents.

### WHAT YOU NEED TO KNOW

- *C. auris*, first identified in 2009 in Asia, has quickly become a cause of severe infections around the world.
- *C. auris* is a concerning drug-resistant fungus:
  - Often multidrug-resistant, with some strains (types) resistant to all three available classes of antifungals
  - Can cause outbreaks in healthcare facilities
  - Some common healthcare disinfectants are less effective at eliminating it
  - Can be carried on patients' skin without causing infection, allowing spread to others

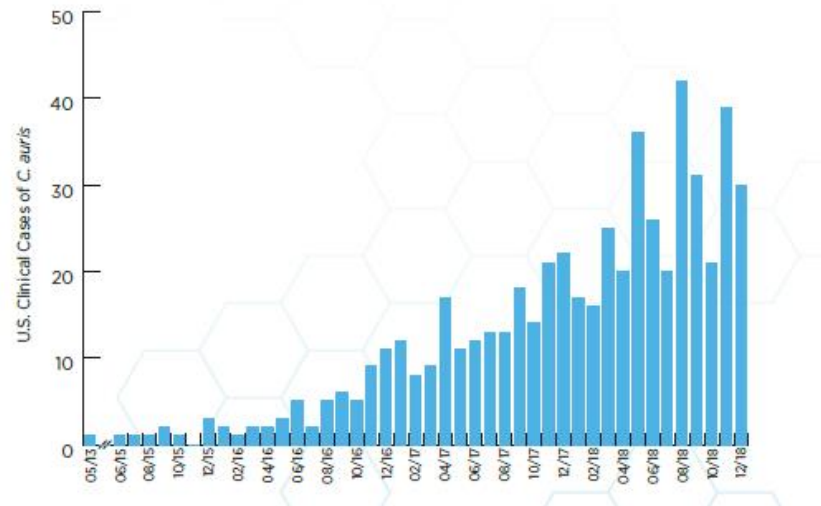
Data represents U.S. cases only. Isolates are pure samples of a germ.



U.S. Department of Health and Human Services  
Centers for Disease Control and Prevention

### CASES OVER TIME

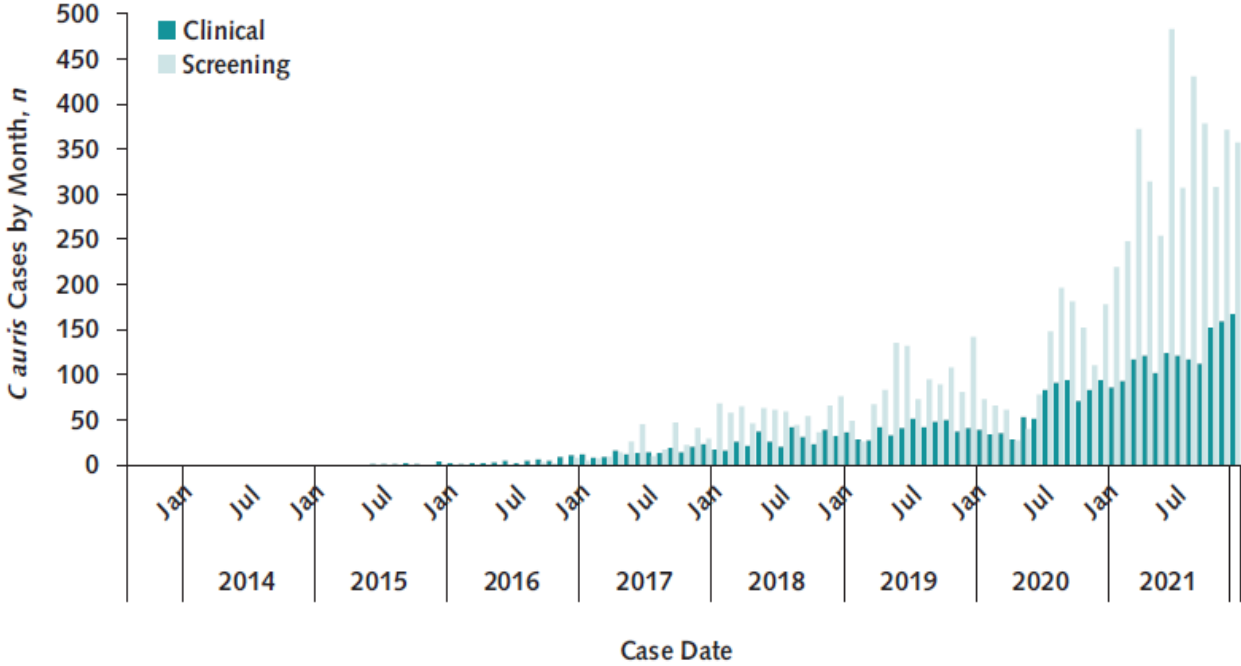
*C. auris* began spreading in the United States in 2015. Reported cases increased 318% in 2018 when compared to the average number of cases reported in 2015 to 2017.



# Epidemiology of *Candida auris*

# There has been a rapid increase in cases in the US

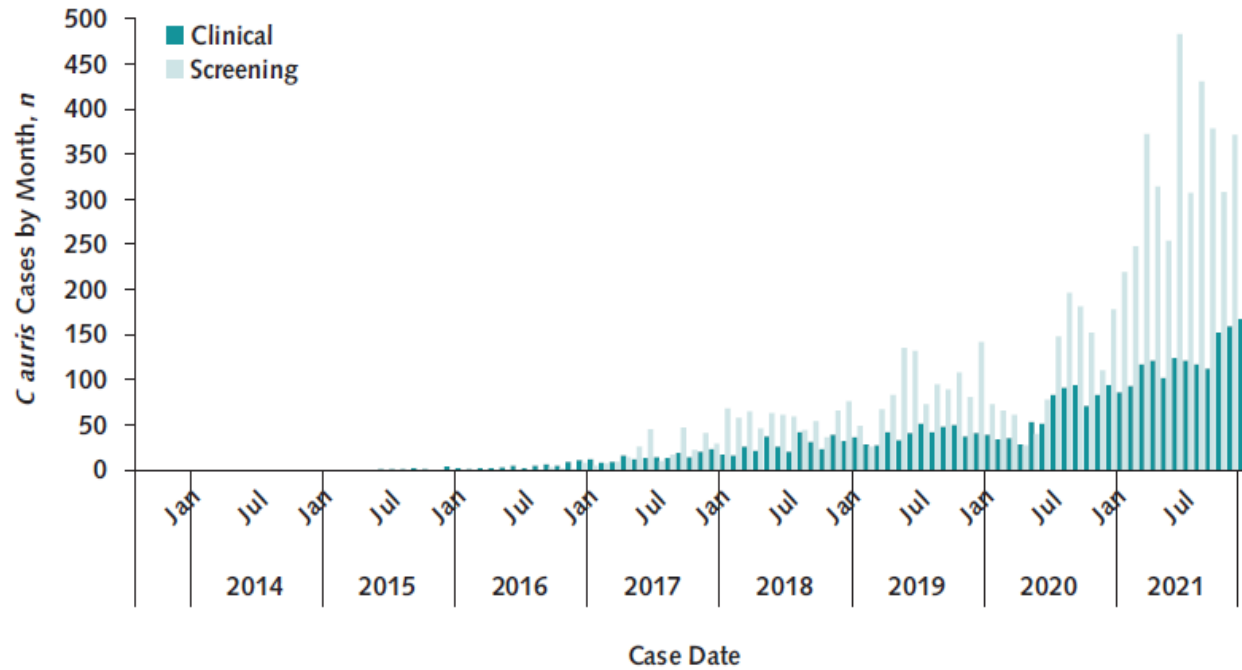
Number of clinical and screening cases reported to CDC, 2013–2021



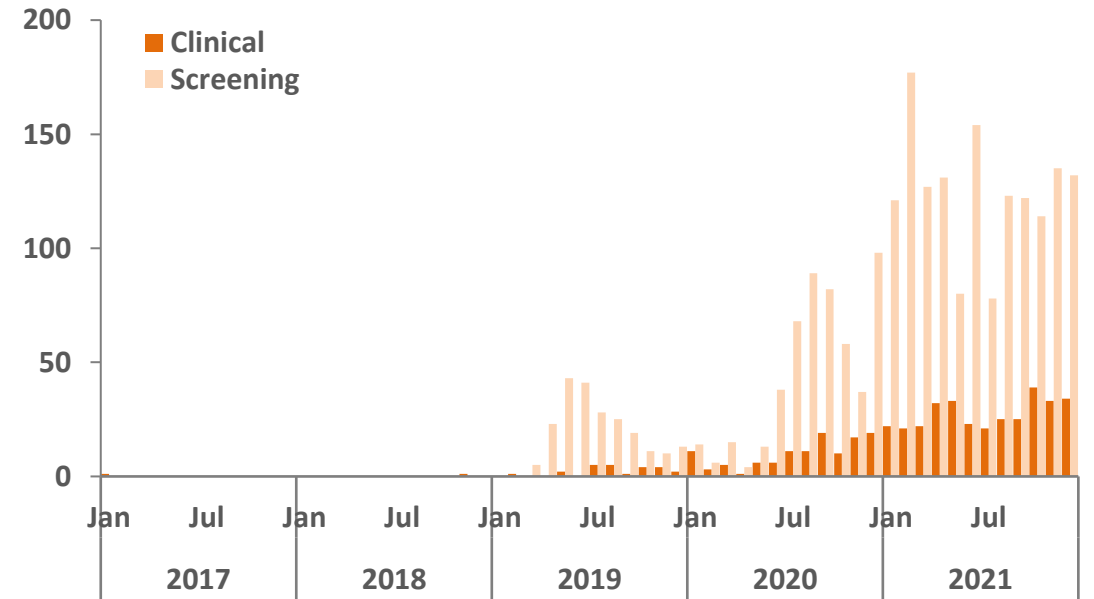


# There has been a rapid increase in cases in the US and CA

Number of clinical and screening cases reported to CDC, 2013–2021

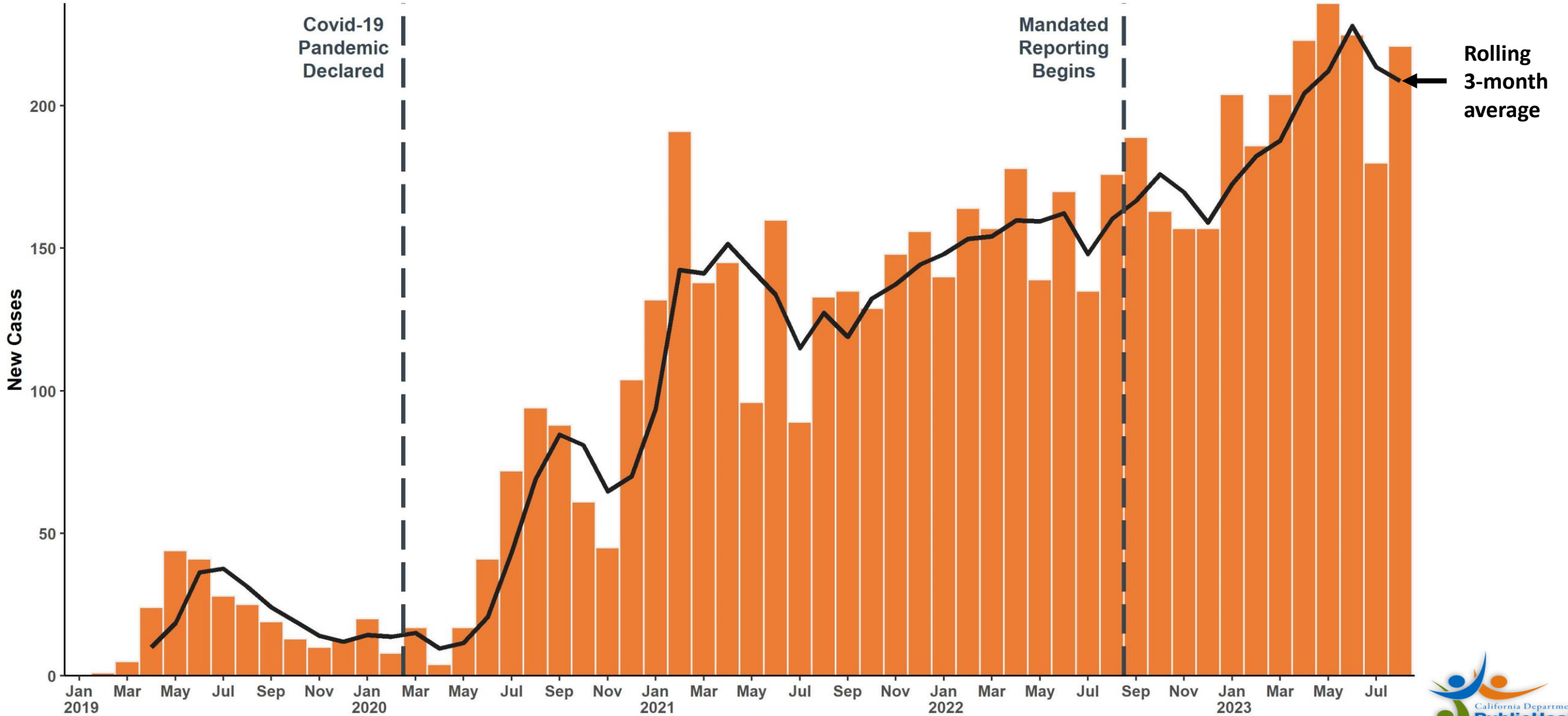


Number of clinical and screening cases reported to CDPH, 2017–2021



# HEALTHCARE-ASSOCIATED INFECTIONS PROGRAM

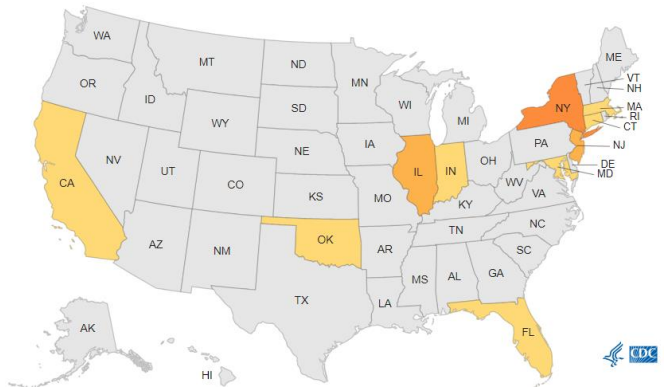
## Patients with *C. auris* in California Healthcare Facilities Rolling 3 Month Average



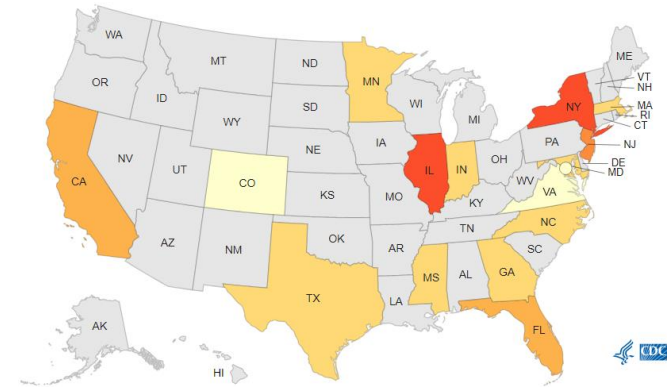
Preliminary data reported to CDPH through 10/13/23



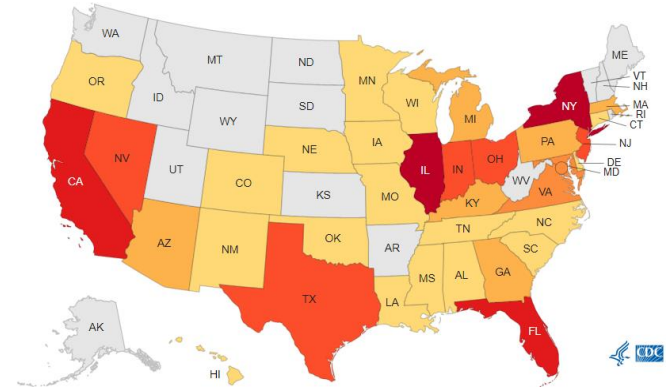
# C. auris has spread across the country



2017

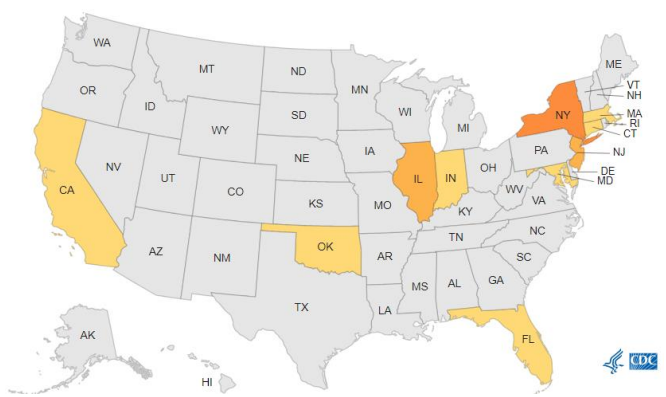


2019

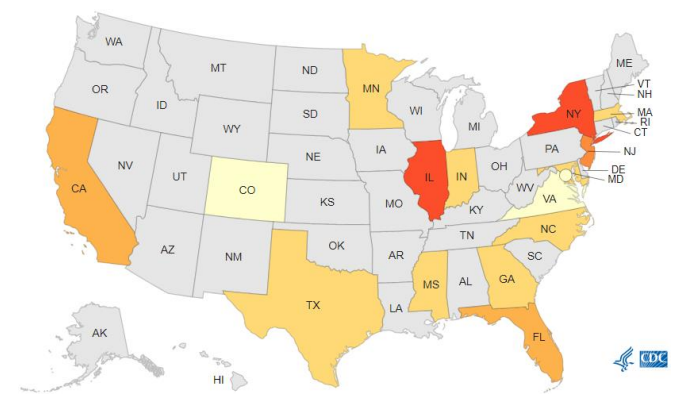


2022

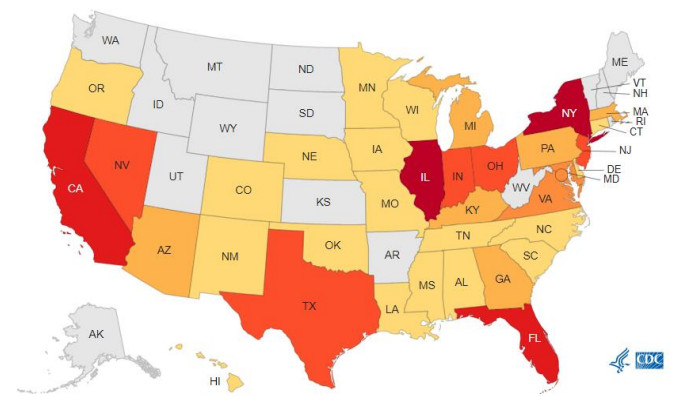
# C. auris has spread across the country and California



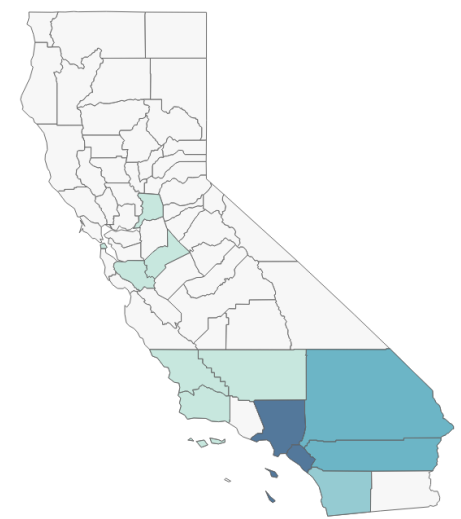
2017



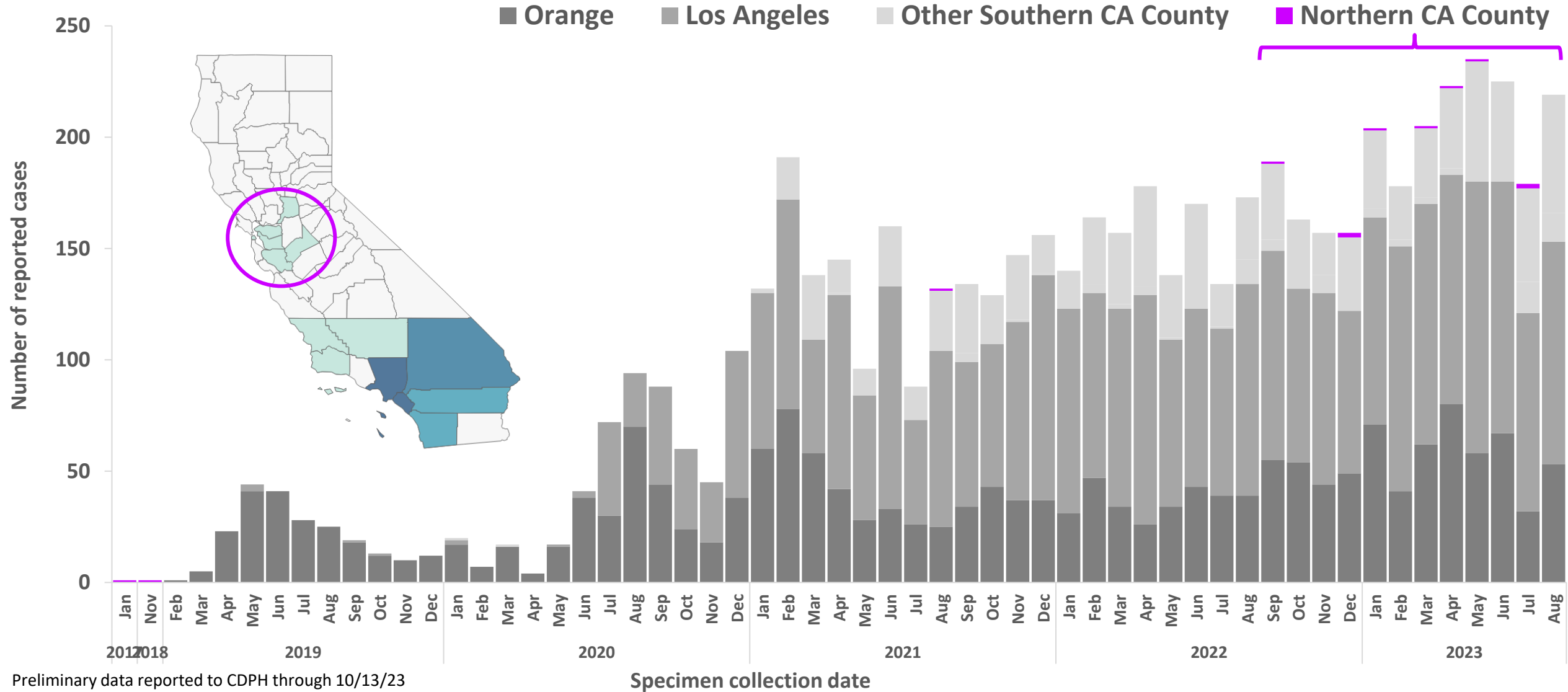
2019



2022

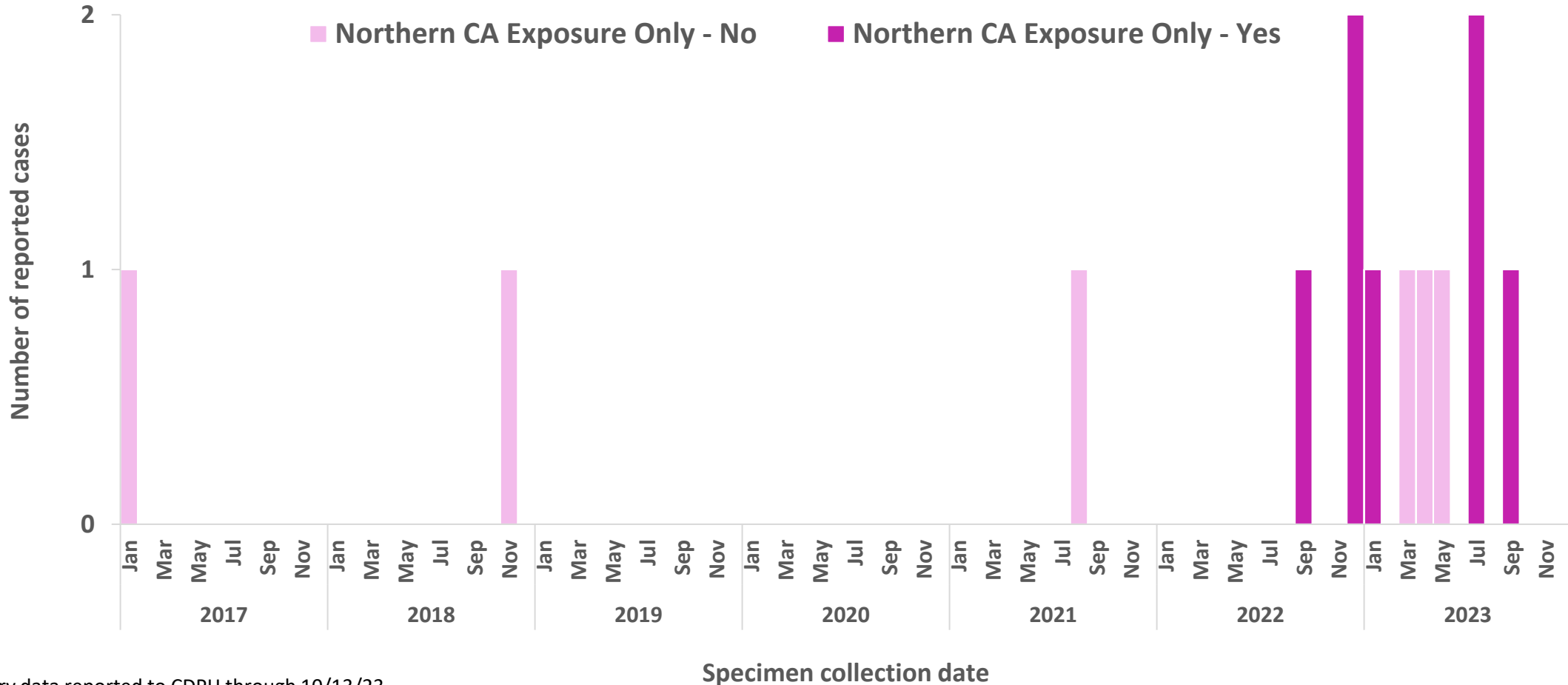


# Since 2022, cases have increasingly been detected in Northern CA



Preliminary data reported to CDPH through 10/13/23

# 7 of 10 Northern CA cases since Sep 2022 had no outside exposure



Preliminary data reported to CDPH through 10/13/23



Health Advisory: Emergence of *Candida auris* in Healthcare Facilities in Northern California  
February 2023

California Department of Public Health (CDPH) and local public health partners are alerting healthcare providers of the emergence of epidemiologically-linked *Candida auris* (*C. auris*) cases associated with acute care hospital (ACH), skilled nursing facility (SNF), and outpatient settings in Sacramento and Stanislaus counties since September 2022. Additionally, at the end of January 2023, CDPH was alerted to a case in Contra Costa county associated with an ACH and long-term care setting. These were the first reported *C. auris* cases in each county, and the patients had no known exposures in healthcare facilities outside of Northern California. These findings suggest there is more transmission in the region than has been identified to date. We continue to see *C. auris* transmission in Southern California. Patients and residents who have had prolonged admission in healthcare settings, particularly high-acuity care settings including long-term acute care hospitals (LTACH), ventilator-equipped SNF (vSNF), high-acuity ACH units (e.g., intensive care units (ICU) and step-down units (SDU)), are at highest risk of *C. auris* and other multidrug-resistant organism (MDRO) colonization and infection.

To proactively prevent further spread of *C. auris* in California, the CDPH Healthcare-Associated Infections (HAI) Program recommends healthcare facilities implement the following updated infection prevention and control (IPC) and containment strategies. A previous recommendation to screen patients from vSNF ventilator units in jurisdictions with known *C. auris* transmission has been expanded to include screening patients from vSNF ventilator units regardless of geographic location. Recommendations for proactive screening in high-risk facilities are also added.

Active Surveillance

- Assess *C. auris* status for all patients and residents upon admission, by reviewing medical records and following up with the transferring facility as necessary.
- Conduct screening through colonization testing for persons at highest risk for *C. auris*, whose status is unknown.
  - Screen 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 (in addition to any LTACH or vSNF ventilator unit) in Nevada state.
  - At LTACHs, screen patients on admission, and conduct routine point prevalence surveys (PPS) per public health guidance.\*
  - In vSNF ventilator units, conduct routine PPS per public health guidance.\*

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

## Emergence of *C. auris* in N. CA

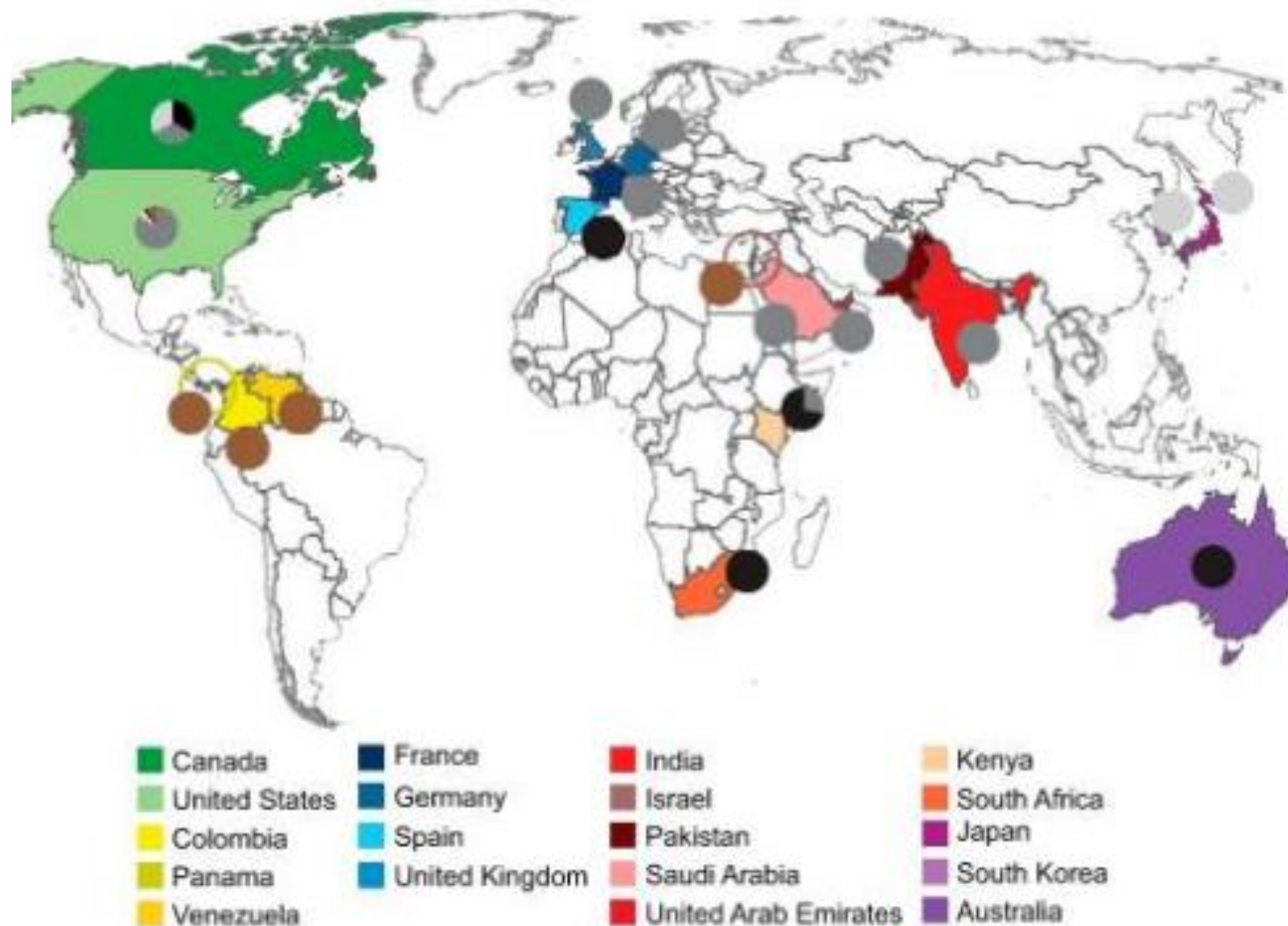
- Since Sept 2022, several cases identified by an LTACH in Bay Area that started admission screening that month

→ More widespread transmission in the region likely

## *Candida auris* clades: global distribution, 2004-2018

- Clade I (South Asia)
  - most widespread, common in US
- Clade II (East Asia)
  - rarest and most genetically diverse, associated with ear infections
- Clade III (South Africa)
  - most common in CA
- Clade IV (South America)

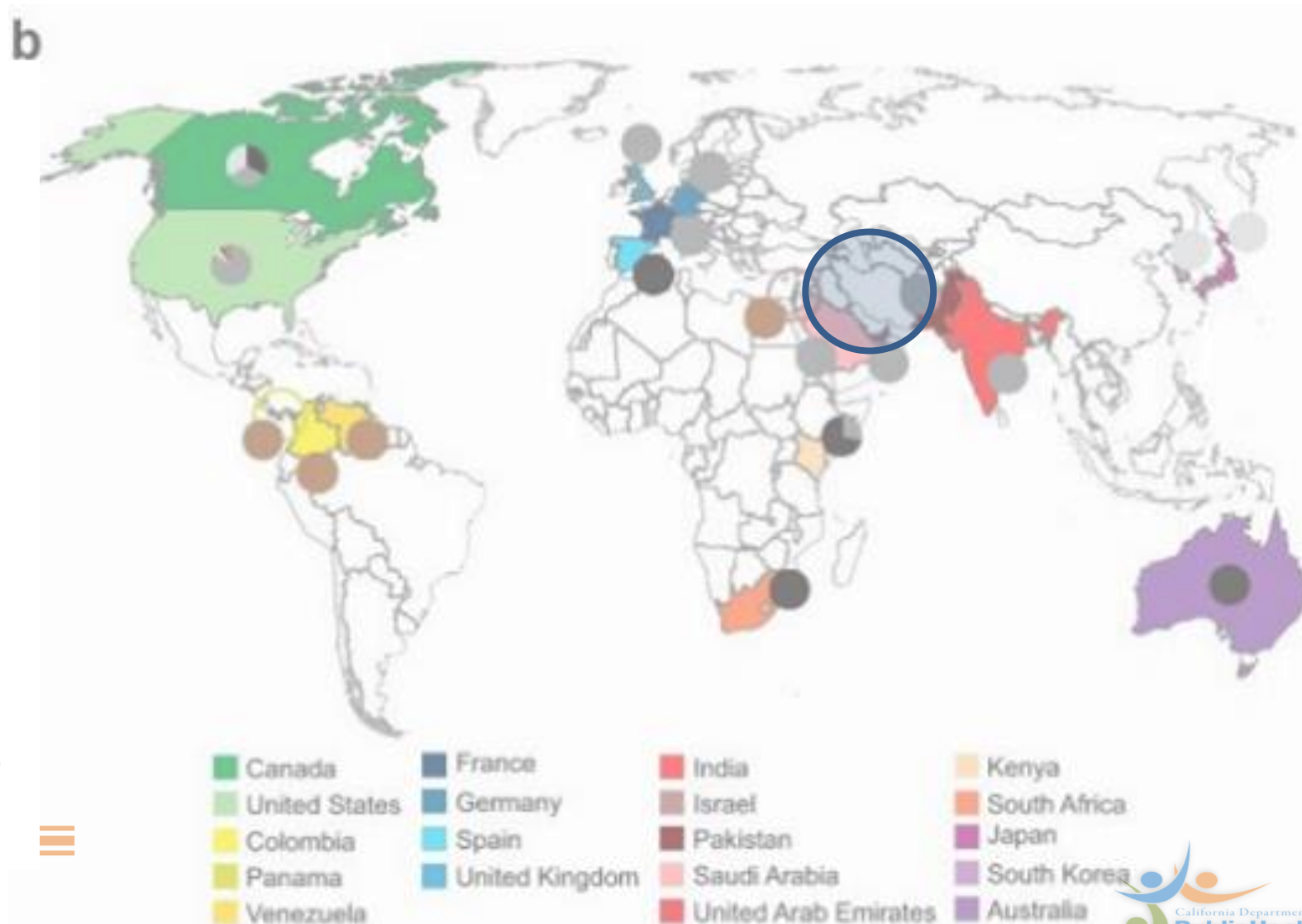
b





## *Candida auris* clades: clade V, 2018-2021

- Clade I (South Asia)
- Clade II (East Asia)
- Clade III (South Africa)
- Clade IV (South America)
- **Clade V (Iran)**
  - newly reported in 2018
  - present outside of Iran
  - shares characteristics with clade II (ear infections, susceptible, no outbreaks)

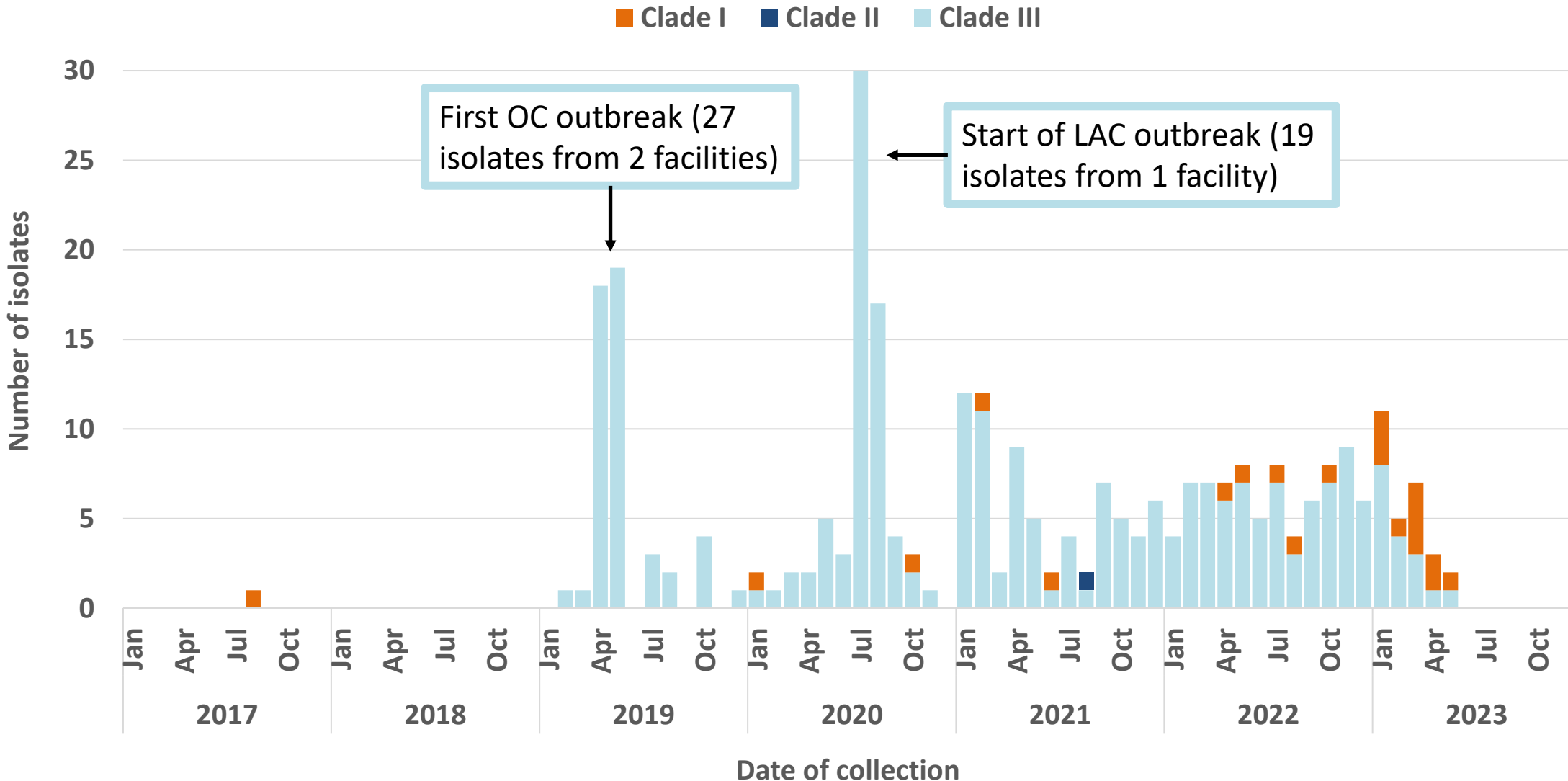


## CA isolates sequenced by CDC and Orange County public health labs, 2017–May 2023

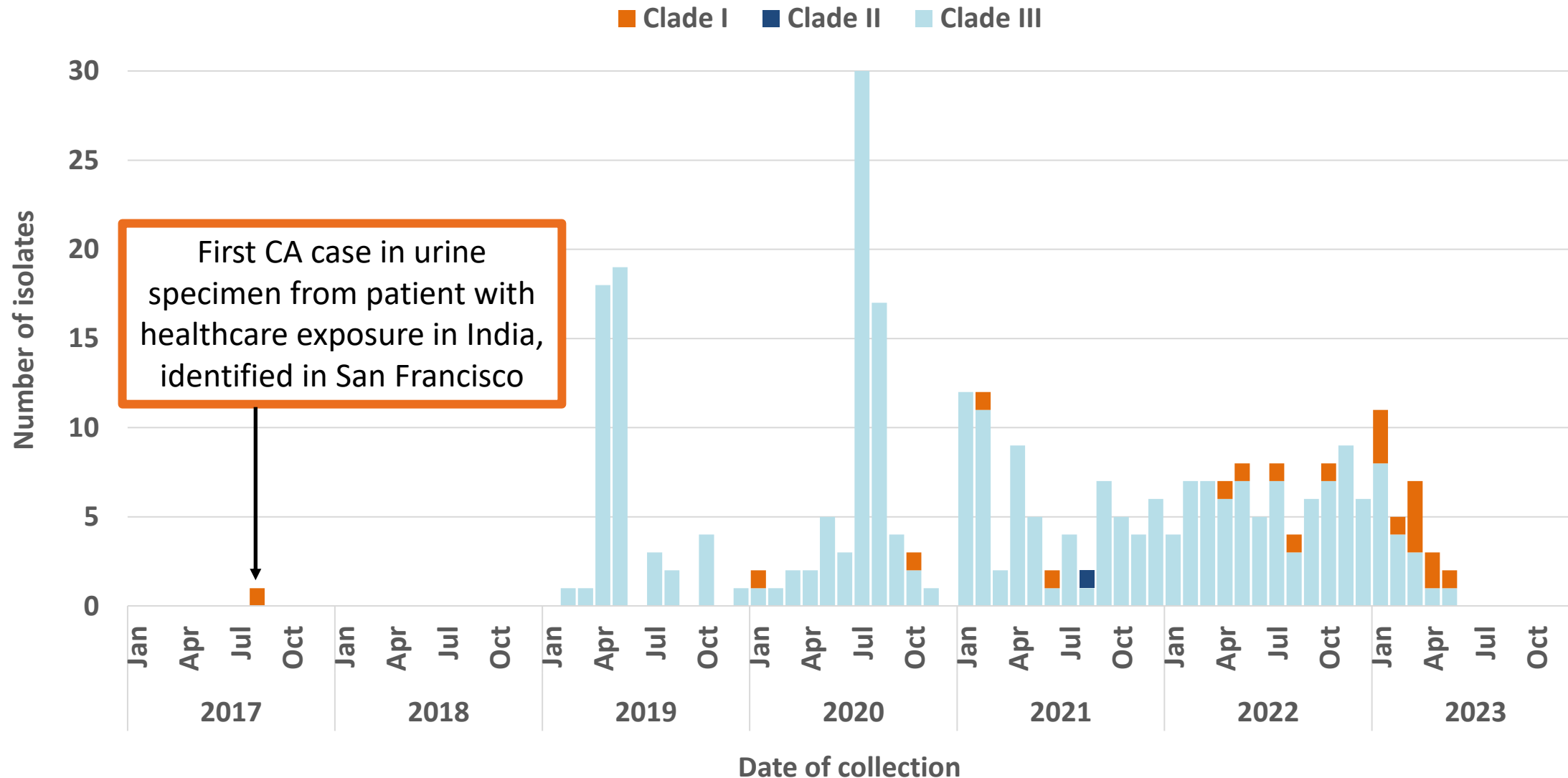
County	Total sequenced	Clade I	Clade II	Clade III
Los Angeles	35	0	0	35
Orange	246	19	0	229
Riverside	2	0	0	2
San Bernardino	5	1	0	4
San Diego	6	0	0	6
San Francisco	1	1	0	0
Santa Clara	1	0	1	0
<b>Total</b>	<b>297*</b>	<b>21</b>	<b>1</b>	<b>275</b>

\*Orange County Public Health Laboratory (OCPHL) sequenced 145 isolates and CDC sequenced 178, including 9 isolates sequenced by both labs; 17 isolates were excluded for patients with additional isolates from the same clade

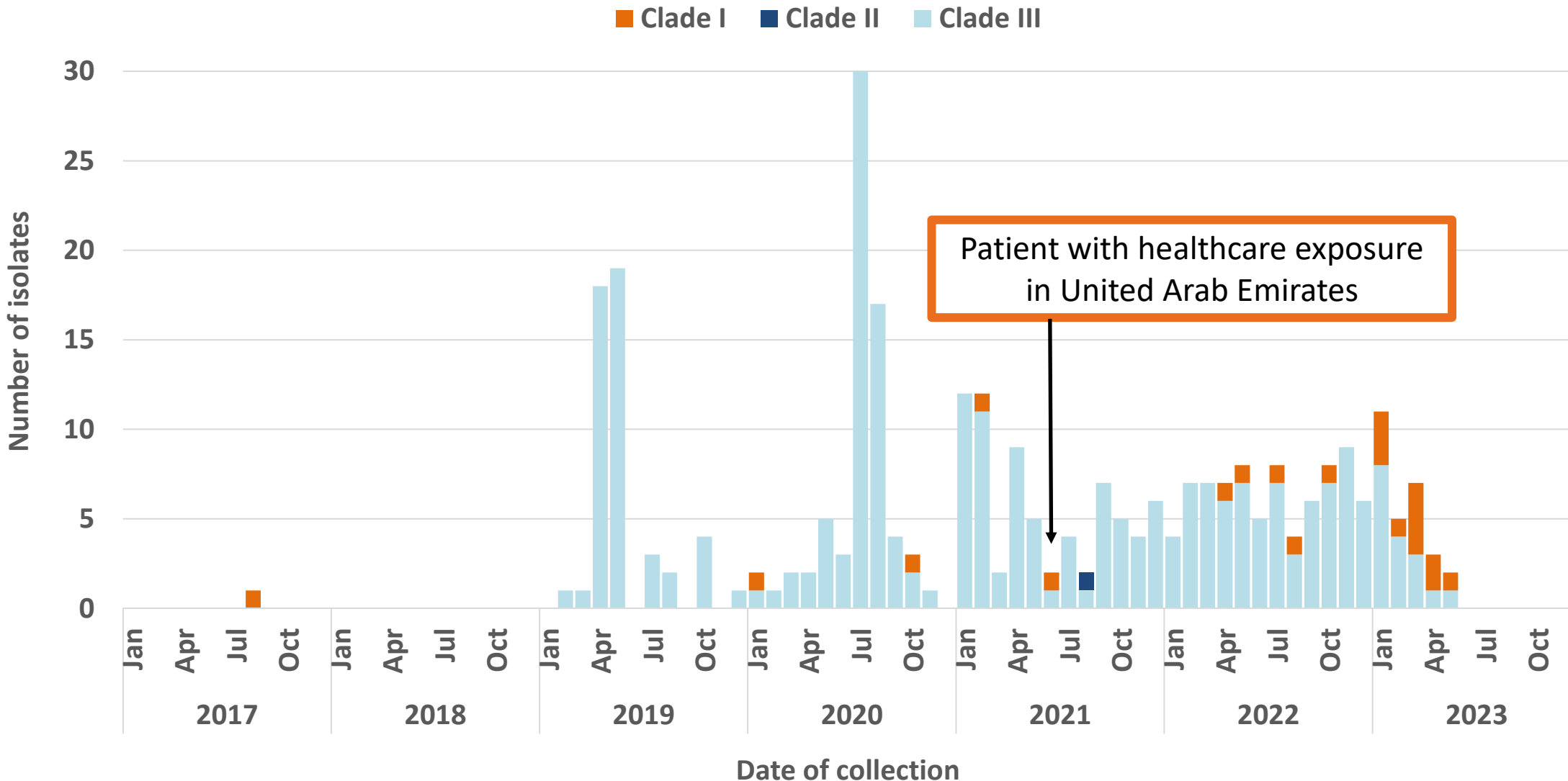
# Majority of Sequenced Isolates are from Clade III



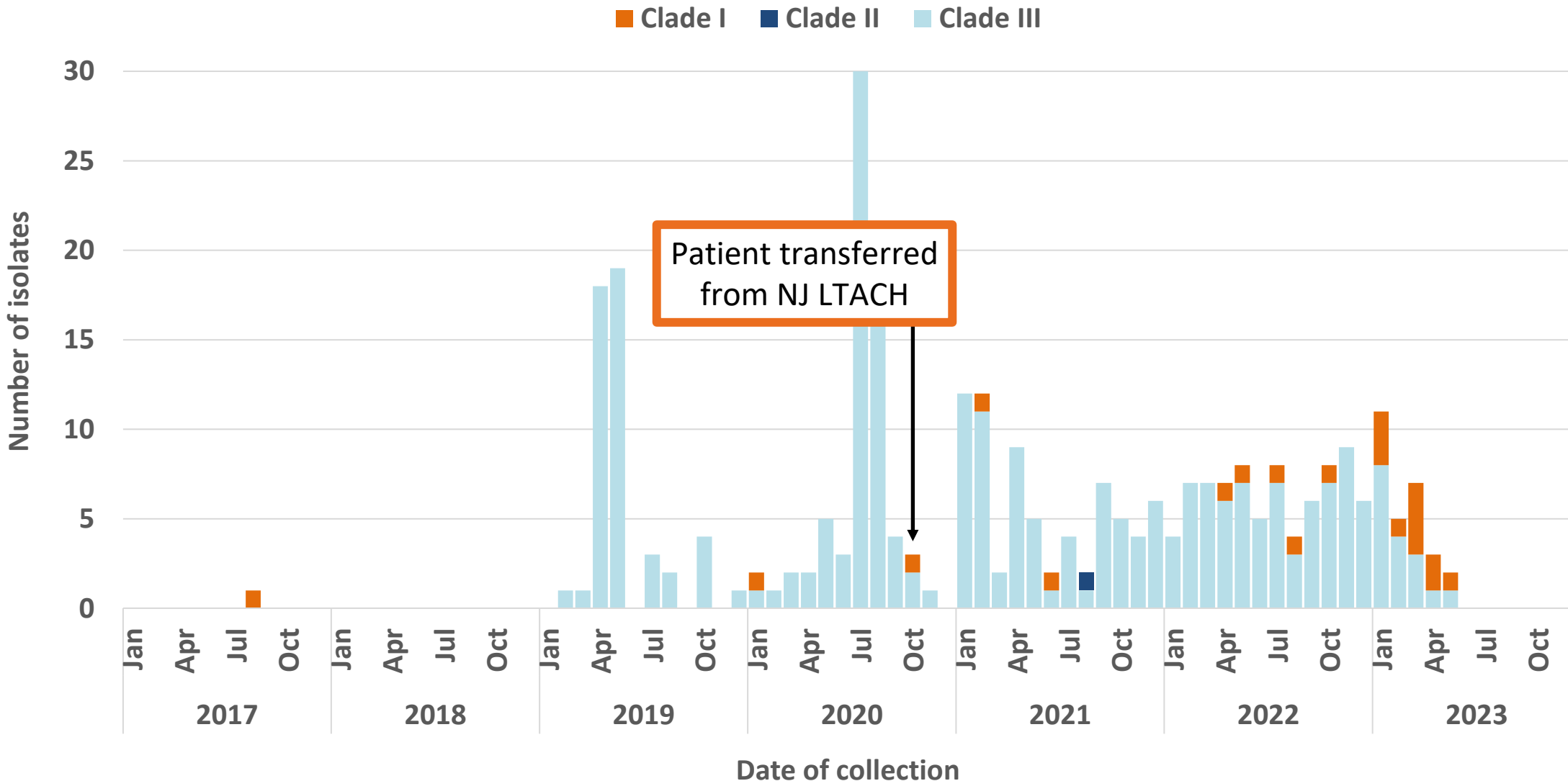
# Clade I isolates identified in patients with healthcare outside CA



# Clade I isolates identified in patients with healthcare outside CA

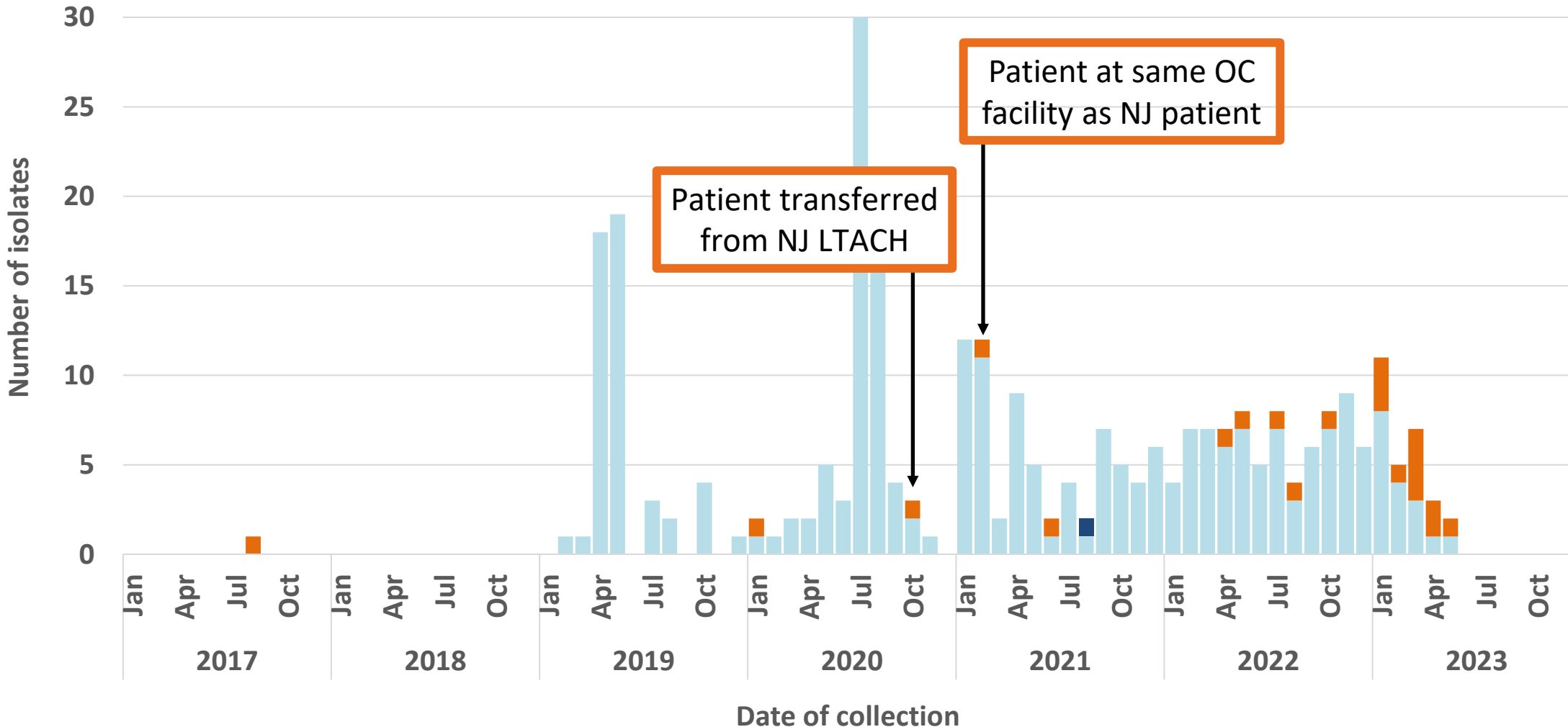


# Clade I isolates identified in patients with healthcare outside CA

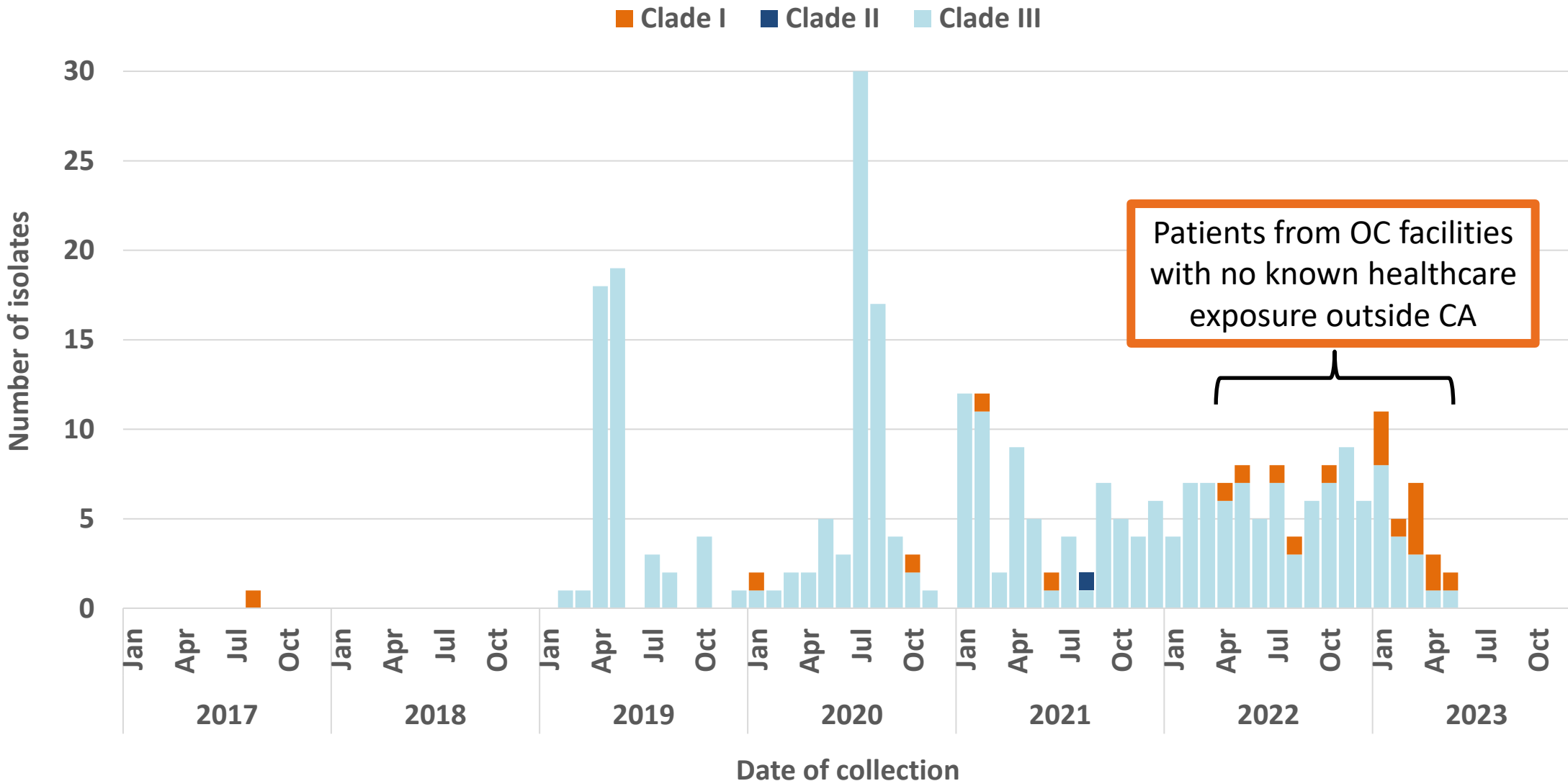


# Clade I identified in patient with no healthcare outside CA

■ Clade I ■ Clade II ■ Clade III

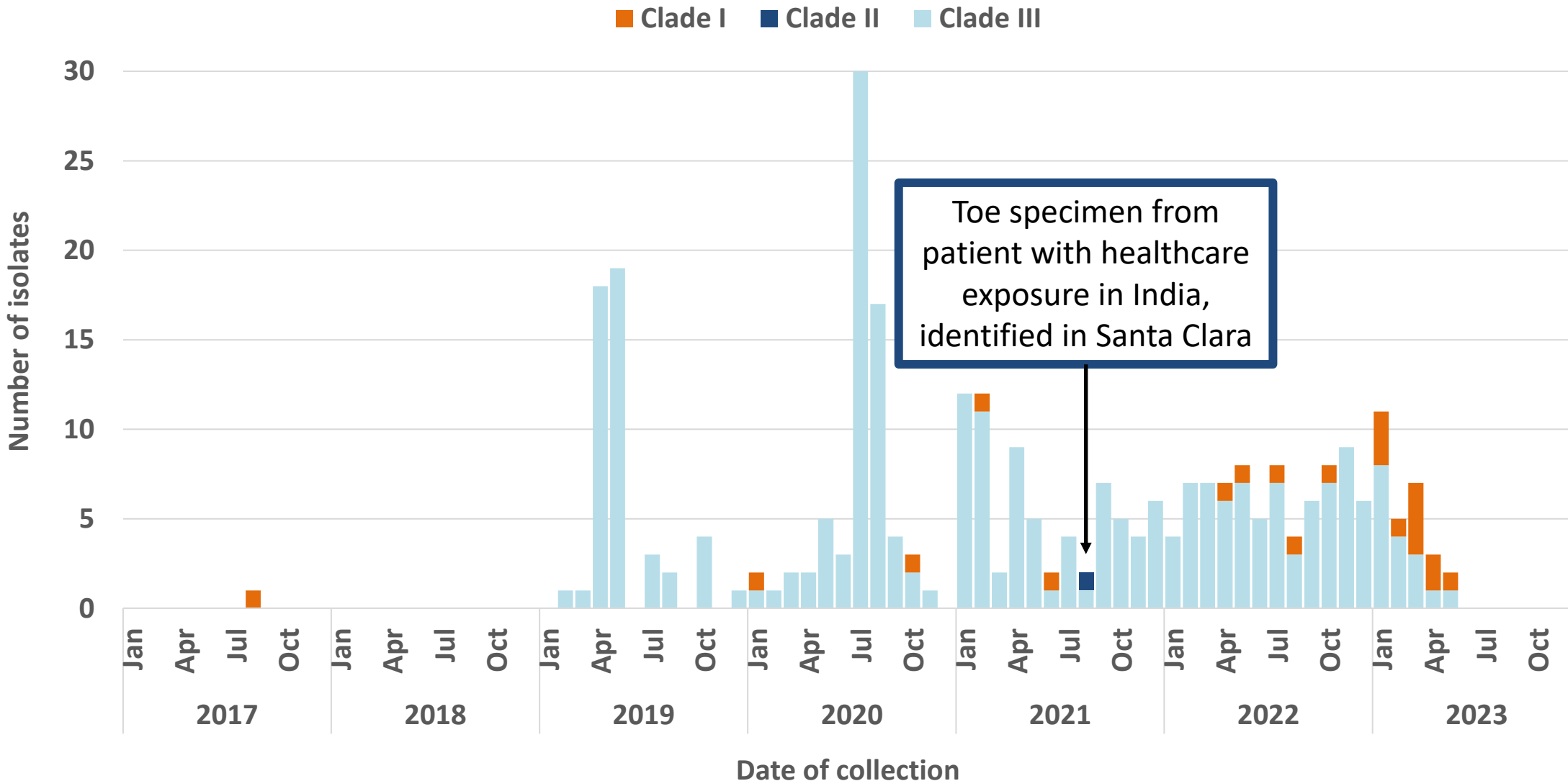


# Clade I identified in patients with no healthcare outside CA





# Isolates from clade II are still rarely identified in CA





# Antifungal resistance

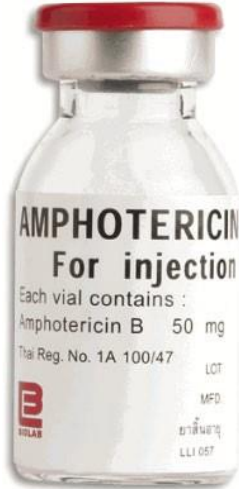


# *Candida auris* antifungal resistance in the US

First-line treatment



**Fluconazole**  
**86%**



**Amphotericin B**  
**20%**



**Echinocandins**  
**1%**

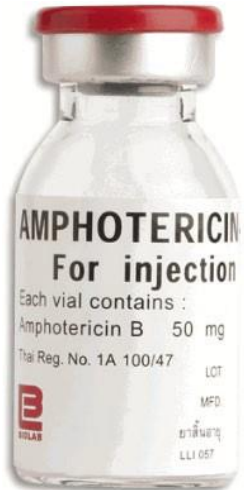
**United States**

Source: US-subset of isolates submitted to CDC [AR Lab Network](#), 2017–2022

In **CA**, almost all isolates are fluconazole-resistant;  
very few are amphotericin B- or echinocandin-resistant



Fluconazole



Amphotericin B



Echinocandins



United States

86%

21%

1%

California

99%

2%

<1%

Source: US-subset of isolates submitted to CDC [AR Lab Network](#), 2017–2022;  
CA-subset of CA isolates submitted to [WA regional AR Lab Network lab](#), 2018–July 2023 (n=1199)

Percentages are followed by number of isolates in parentheses.

## Antifungal resistance differs by clade

Clade ( <i>n</i> )	Frequency (%) of antifungal drug resistance in isolates ( <i>n</i> )					
	Susceptible	Fluconazole resistant	Amphotericin B resistant	Micafungin resistant	MDR <sup>a</sup>	XDR <sup>b</sup>
Clade I (118 <sup>c</sup> )	3 (4)	97 (114)	47 (54)	6 (7)	45 (53)	3 (4)
Clade II (7)	86 (6)	14 (1)	0 (0)	0 (0)	0 (0)	0 (0)
Clade III (51)	2 (1)	98 (50)	0 (0)	8 (4)	8 (4)	0 (0)
Clade IV (120)	31 (37)	59 (71)	11 (13)	9 (11)	10 (12)	0 (0)
Total (296)	16 (48)	80 (236)	23 (67)	7 (22)	23 (69)	1 (4)

<sup>a</sup>MDR, multidrug resistance to two major antifungal classes.

<sup>b</sup>XDR, extensive drug resistance to three major antifungal classes.

<sup>c</sup>Complete AFST data for 8 of the 126 clade I isolates were missing.

## Antifungal resistance differs by clade

Clade ( <i>n</i> )	Frequency (%) of antifungal drug resistance in isolates ( <i>n</i> )					
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Total (296)	16 (48)	80 (236)	23 (67)	7 (22)	23 (69)	1 (4)
<b>Clade V (5)</b>	<b>60 (4)</b>	<b>40 (2)</b>	<b>0 (0)</b>	<b>0 (0)</b>	<b>0 (0)</b>	<b>0 (0)</b>

## *Candida auris* antifungal resistant case reports in the US

- 3 patients in NY had isolates initially sensitive to echinocandins
  - Resistance to 3 classes of antifungal medications detected after receipt of antifungal medications
- Two clusters in DC and TX of pan- or echinocandin- resistant strains
  - No patients with pan- or echinocandin-resistant isolates received echinocandins before collection
  - Suggesting transmission of resistant strains may have occurred in U.S.

# Recent echinocandin-resistant *Candida auris* cases in California

- Since 2021, in California, we have identified:
  - 4 echinocandin-resistant cases
  - California's first case resistant to all three antifungal classes (identified in Oct 2022)
- Antifungal susceptibility testing should be done for all *Candida auris* isolates



# Patient and Facility Characteristics



# Candida auris is a reportable disease (Title 17 CCR)\*

- **Candida auris is reportable by:**
  - Providers to local health department
  - Labs via electronic lab reporting
- **Laboratory submission requirement**
  - Labs must submit all *C. auris* isolates from sterile site specimens (e.g., blood) to a public health laboratory within 10 working days

**CANDIDA AURIS CASE REPORT FORM**

Please note, reporters in Los Angeles County should use the form available on the LACDPH [website](#)

**PATIENT INFORMATION**

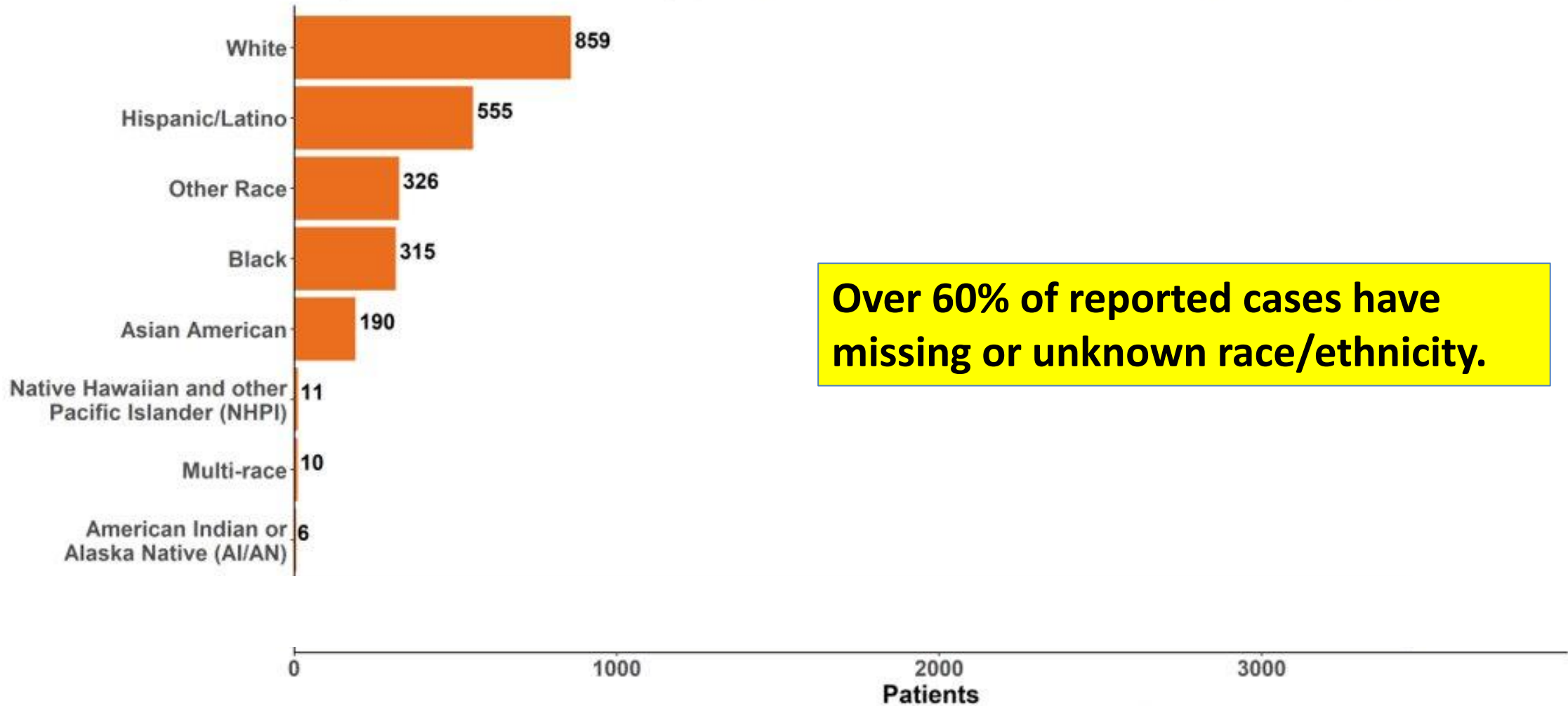
<b>Last Name, First Name</b>		<b>MI</b>	<b>Date of Birth</b>	<b>Age:</b> <input type="checkbox"/> Years <input type="checkbox"/> Month <input type="checkbox"/> Days
<b>Address (Number, Street)</b>		<b>State</b>	<b>Zip Code</b>	<b>County of Residence</b>
<b>Current Gender Identity</b> <input type="checkbox"/> Male <input type="checkbox"/> Female <input type="checkbox"/> Genderqueer or non-binary <input type="checkbox"/> Identity not listed (specify): _____			<input type="checkbox"/> Trans male/transman <input type="checkbox"/> Trans female/transwoman <input type="checkbox"/> Declined to answer	
<b>Patient Ethnicity</b> <input type="checkbox"/> Hispanic/Latino <input type="checkbox"/> Non-Hispanic/Non-Latino <input type="checkbox"/> Unknown			<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 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: _____				

\*Reportable as of September 2022



## *Candida auris* surveillance data definitions

- We collect whether reported cases are clinical cases or screening cases
  - Clinical cases: *C. auris*-positive specimens (such as blood or urine) that are collected as part of routine clinical care
  - Screening cases: *C. auris*-positive skin swabs that are collected during colonization screening

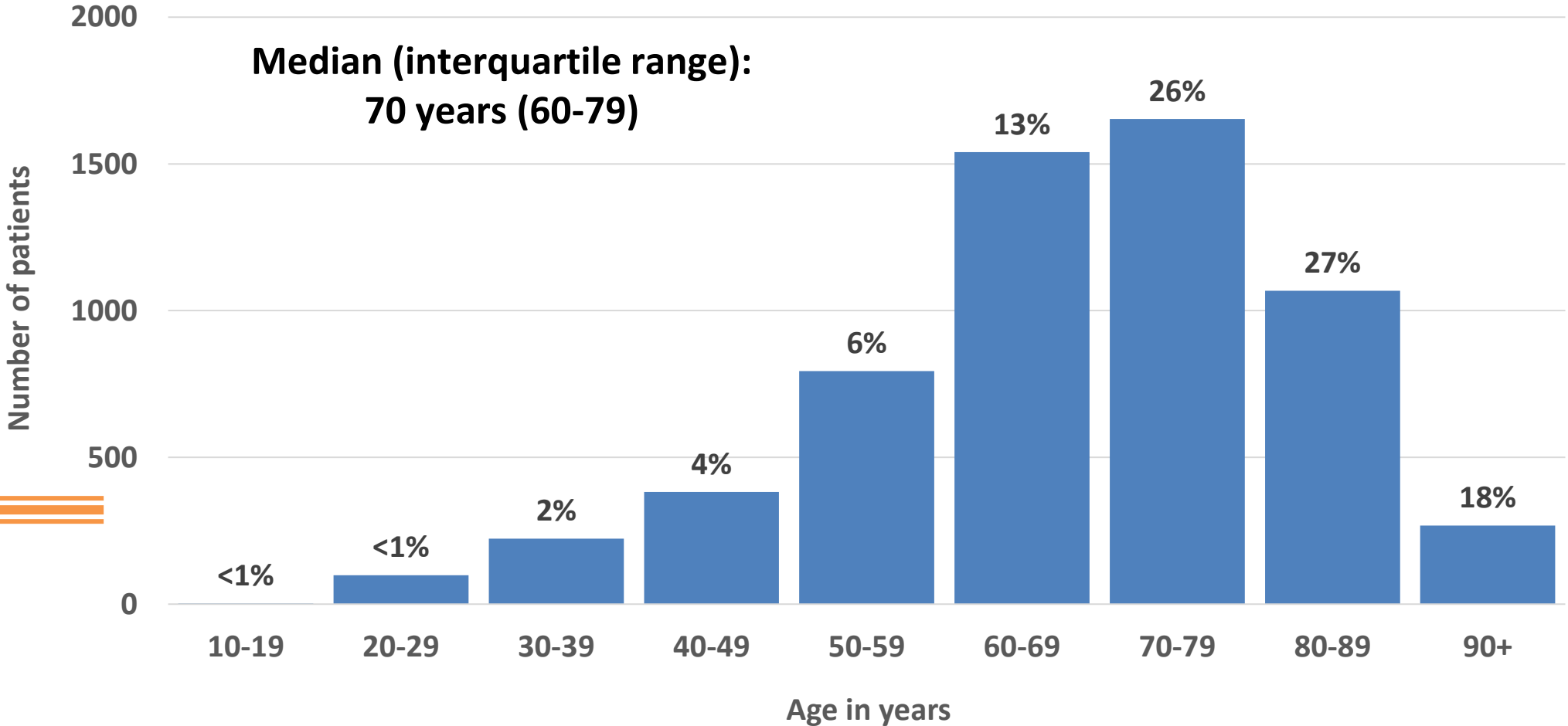
Reported Race/Ethnicity of California Patients with *Candida auris*, 2017-Present

Over 60% of reported cases have missing or unknown race/ethnicity.

Data are preliminary and include patients identified through July 2023

N=5731 patients

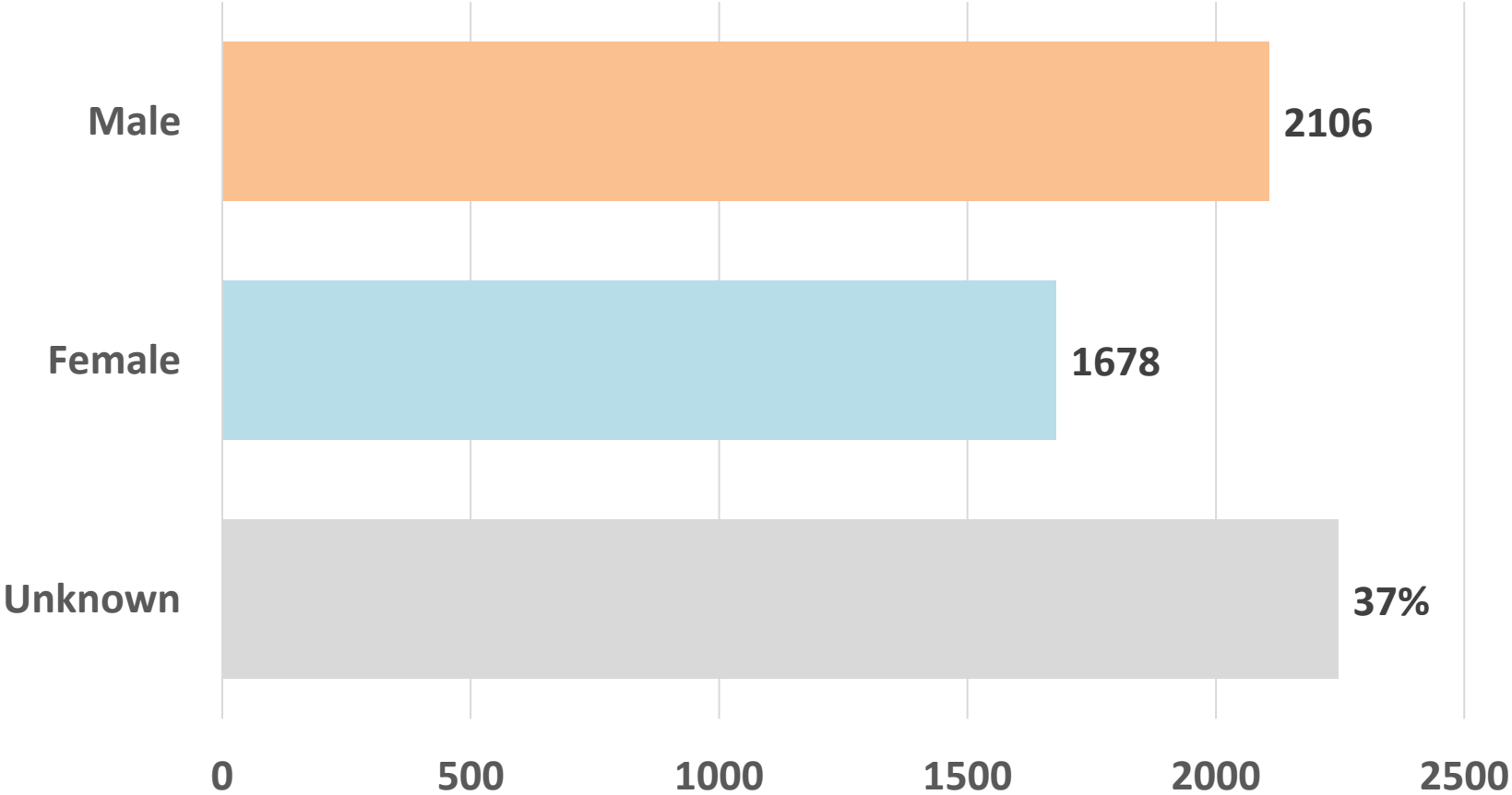
# California patient age at initial date of collection of *C. auris*



Preliminary data reported to CDPH through 10/13/23



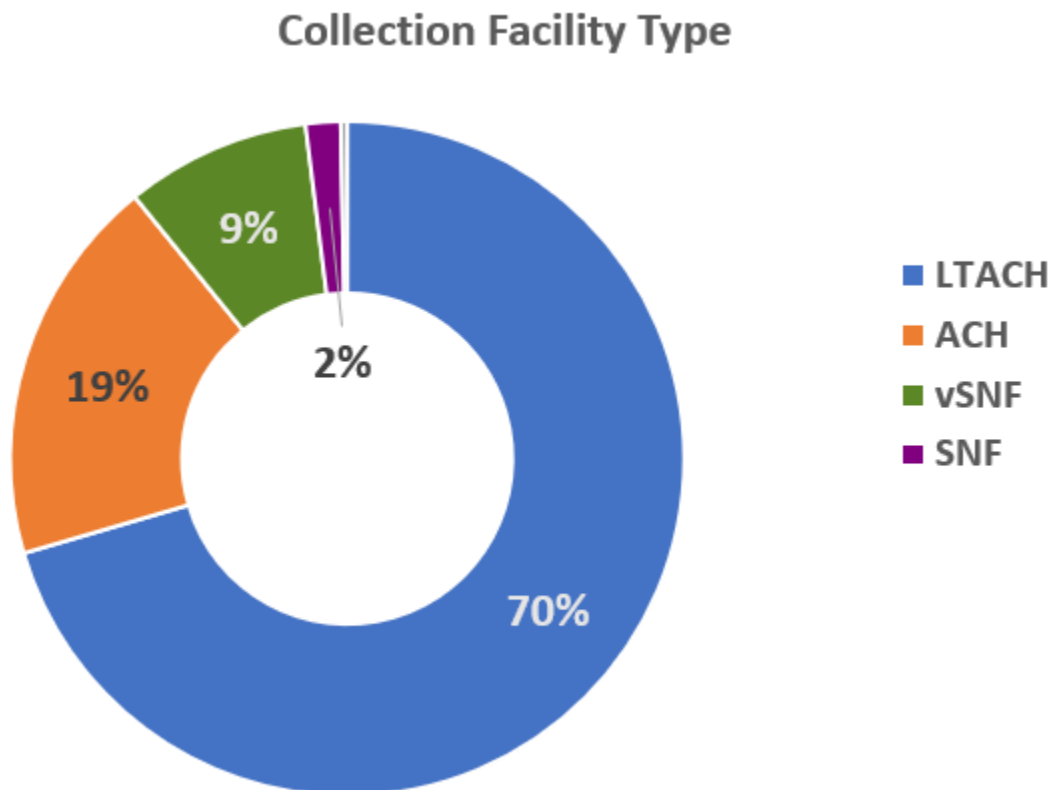
# Gender of *C. auris* reports in California



Preliminary data reported to CDPH through 10/13/23



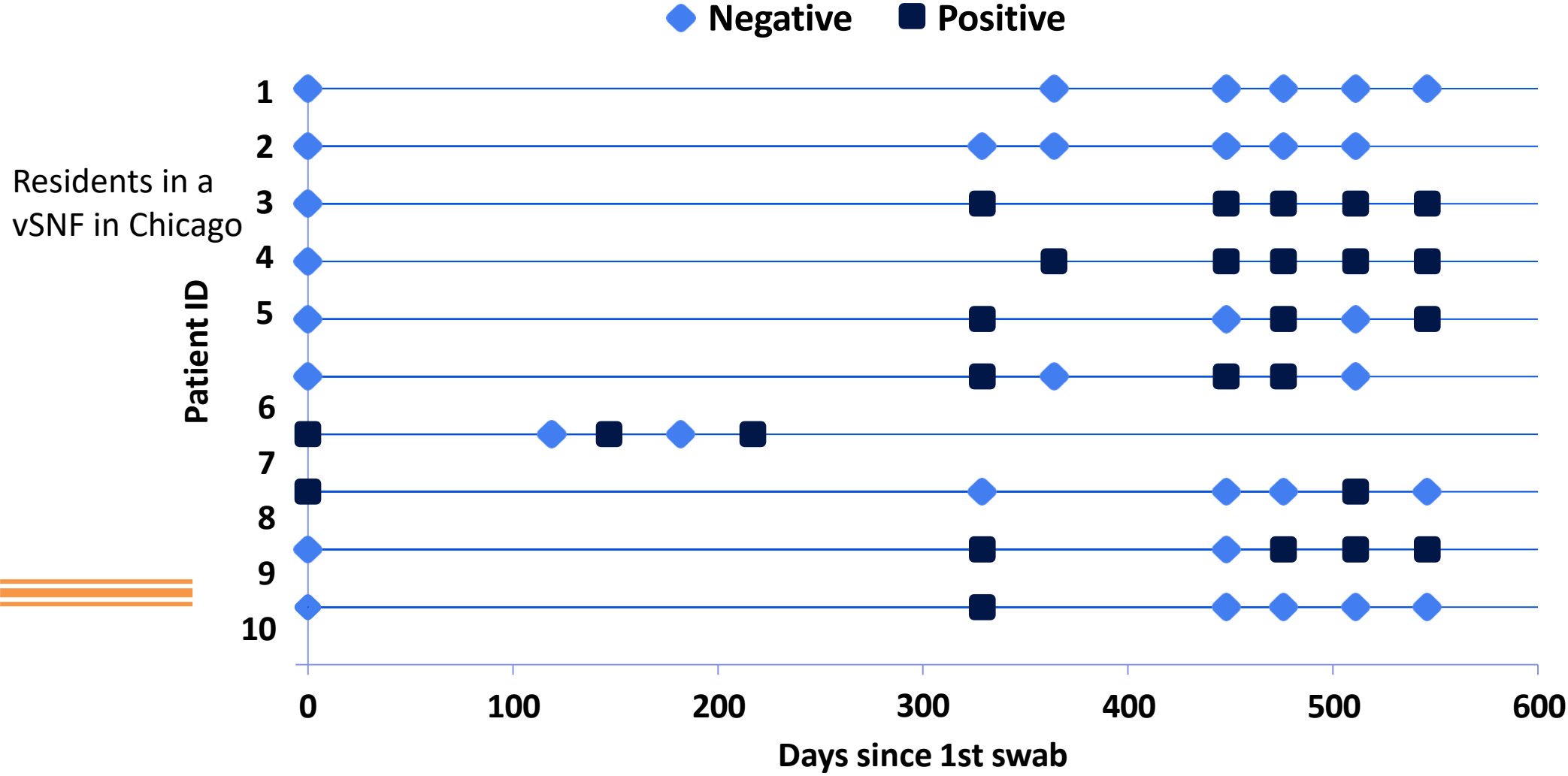
## C. auris Collection Facility Type



## Risk Factors in CA

- Prolonged admission in healthcare settings, particularly high-acuity long-term care facilities, such as **long-term acute care hospitals (LTACH)** and **ventilator-equipped skilled nursing facilities (vSNF)**
- Presence of **indwelling devices**
- **Broad-spectrum antibiotic and antifungal use**
- Other risk factors for *C. auris* similar to those for other types of *Candida*, e.g., underlying med conditions, recent abdominal surgery

# Candida auris colonization can be prolonged

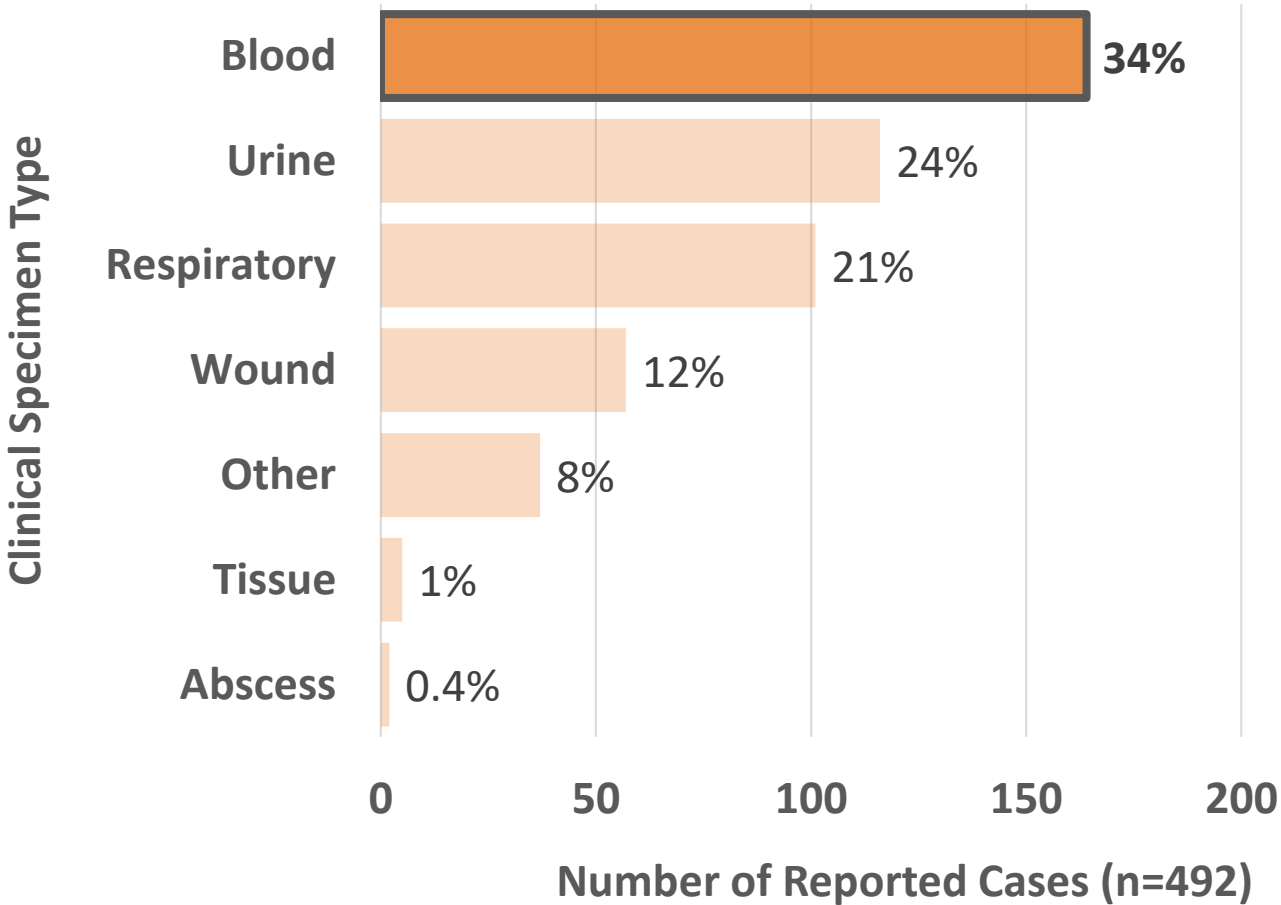
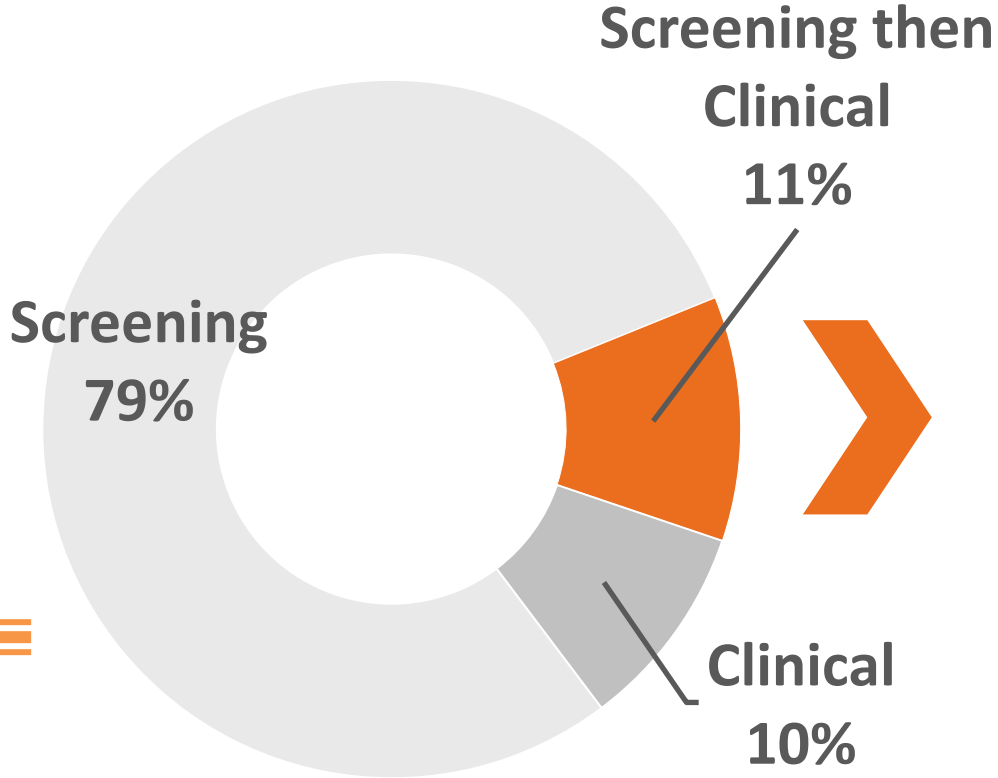


Residents in a vSNF in Chicago





In California, **11%** of screening (colonization) cases go on to have clinical specimens; of those, **34%** are in blood



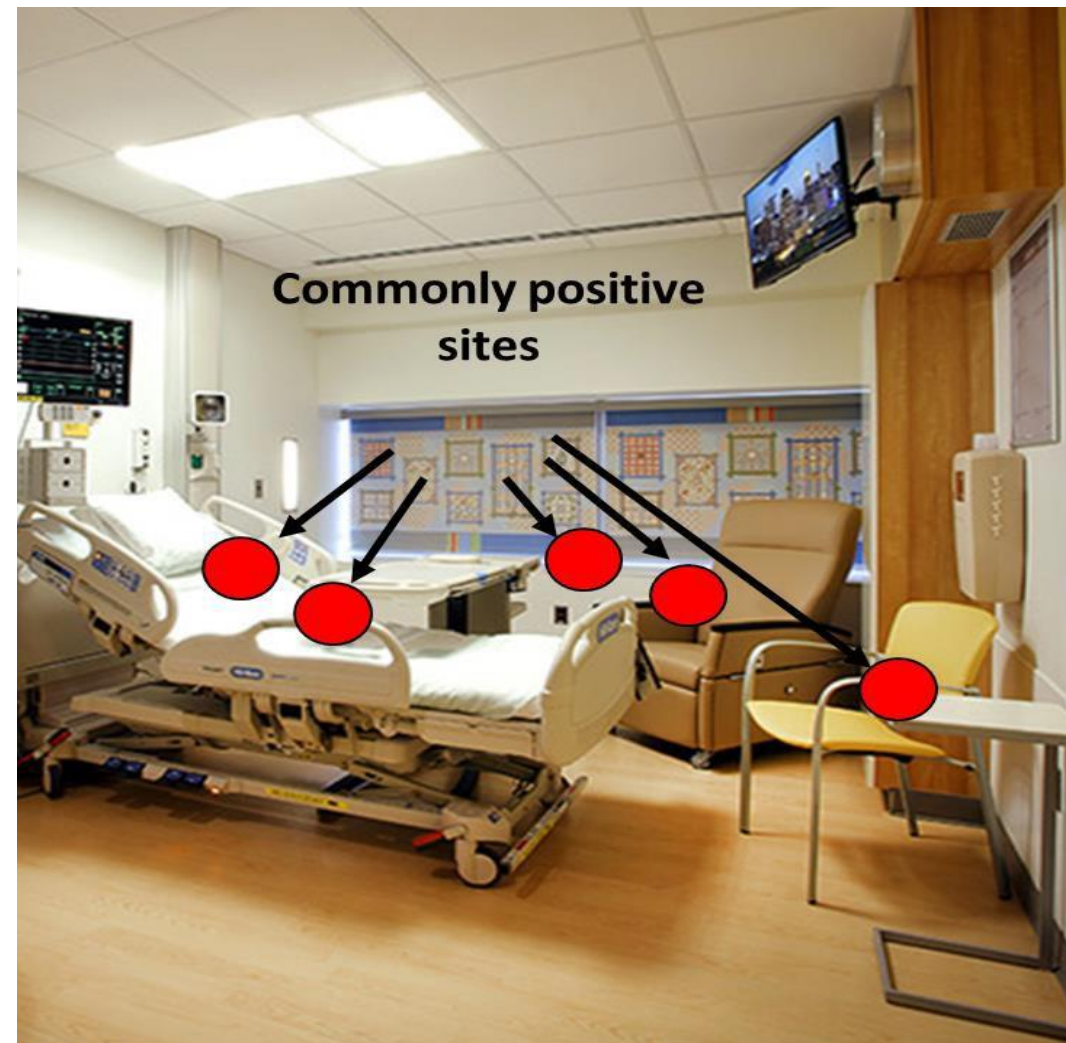
CDPH unpublished case data through Jan 2023

## Mortality in California Patients (preliminary analysis)

- Preliminary analysis matching case data with vital records in California
- Of more than 4000 patients identified with *C. auris* 2018-2022, 46% were known to have died within 365 days of their first identification with *C. auris* (2018-2022)
- A quarter of patients who developed a *Candida auris* bloodstream infection died within 30 days
- 30% of patients who screened positive and never had a clinical specimen with *Candida auris* died within 90 days

## *C. auris* is persistent in the healthcare environment

- *C. auris* can persist for weeks
- Environmental sampling for *C. auris*: patient rooms, hallways outside the rooms, beds, chairs, windowsills, countertops, trolleys, EKG leads, BP monitoring cuffs, ventilators, etc.
- One study conducted in a vSNF detected it on all bedrails occupied by colonized residents, and on bedrails of 2 residents not colonized (in rooms previously occupied by residents with *C. auris* 1-2 mos earlier)
- Need **List P, K** agent with claims against *C. auris* for environmental cleaning



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**What's new?**

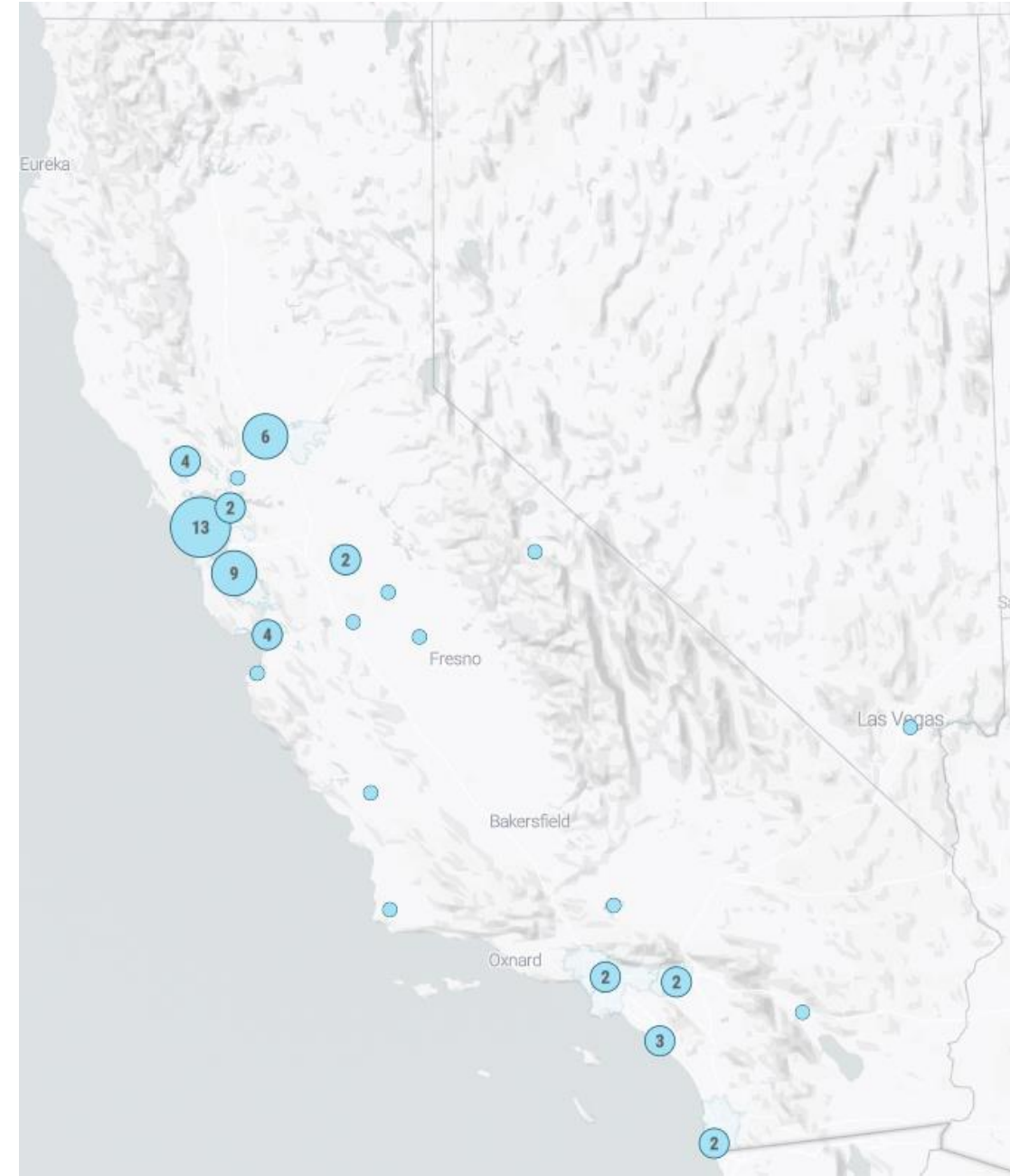
***Candida auris* Wastewater Surveillance**

# Wastewater surveillance in public health

- Long history of wastewater surveillance of pathogens spread by fecal-oral transmission, e.g., polio, cholera
- COVID-19 pandemic saw the wider adoption of wastewater monitoring as an added component of infectious disease surveillance
- Recent use for influenza virus, mpox
- *Very* recent addition of *Candida auris*

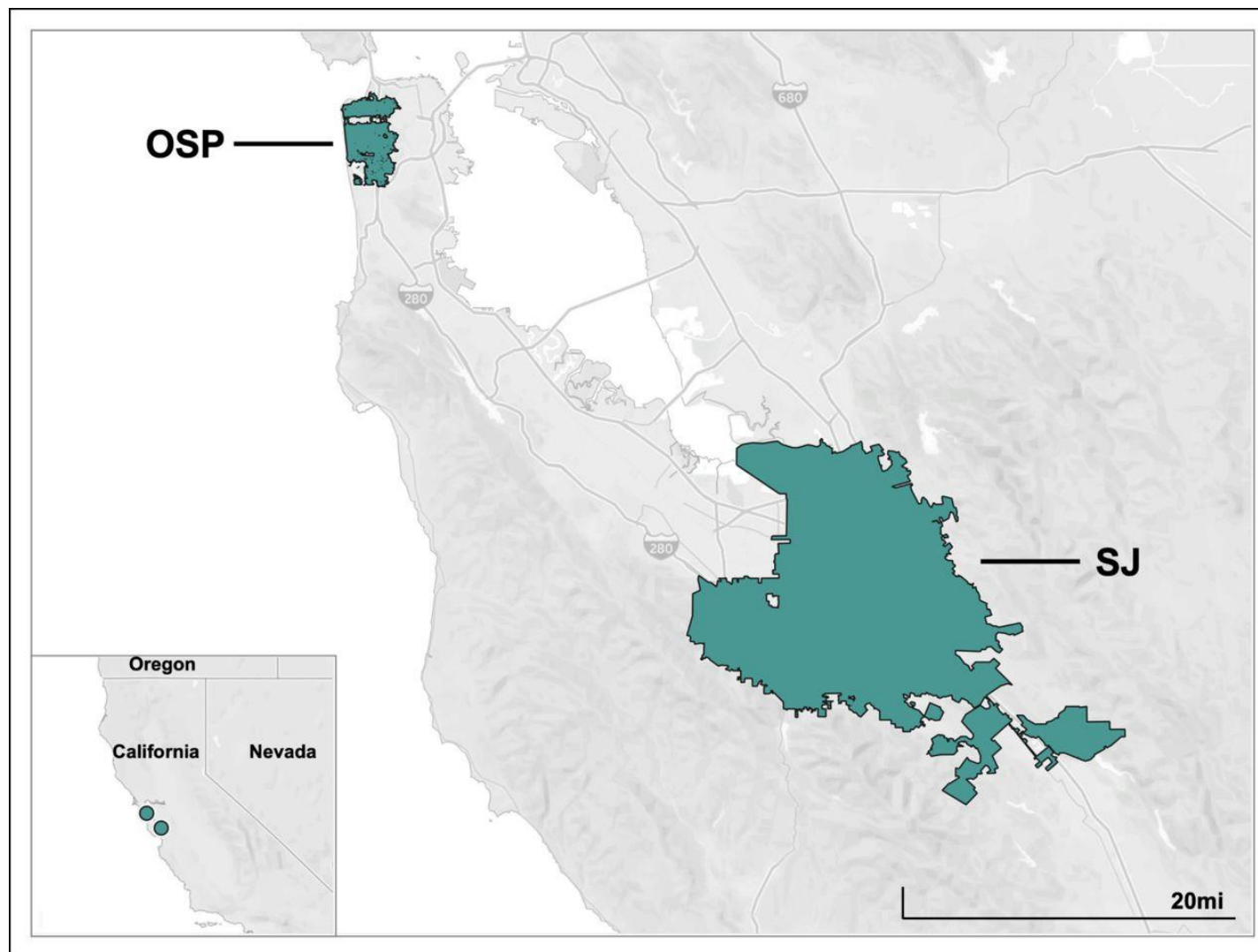
## *C. auris* wastewater surveillance in CA

- Researchers from Emory and Stanford recently added *C. auris* to their list of gene targets in wastewater sites across the US
- 59 sites as of September 25, 2023
- Monitor for presence of *C. auris* in wastewater and work to understand potential use for public health



## *Candida auris* in wastewater: retrospective study

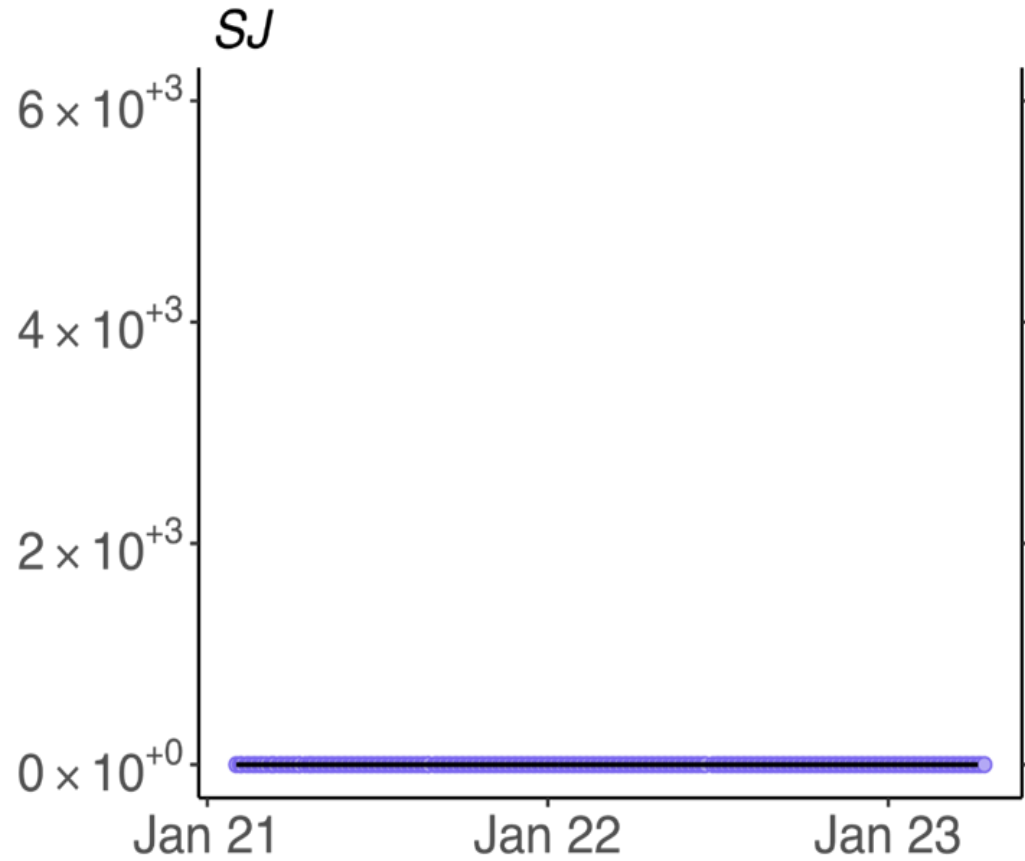
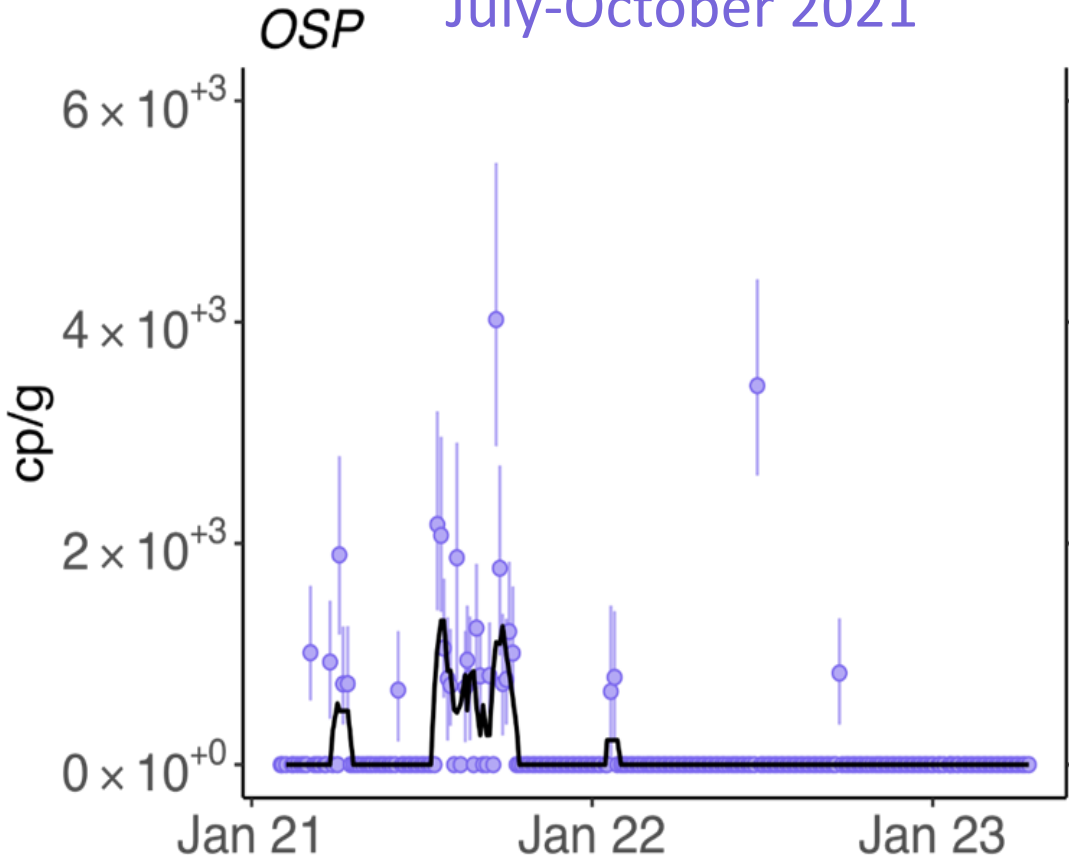
- Study period
  - 2/1/21–4/14/23
  - 2 samples per week
- 2 low burden sewersheds
  - Oceanside, San Francisco
  - San Jose
- Included other targets



# C. auris in wastewater: retrospective study results

San Francisco: multiple hits clustered around July-October 2021

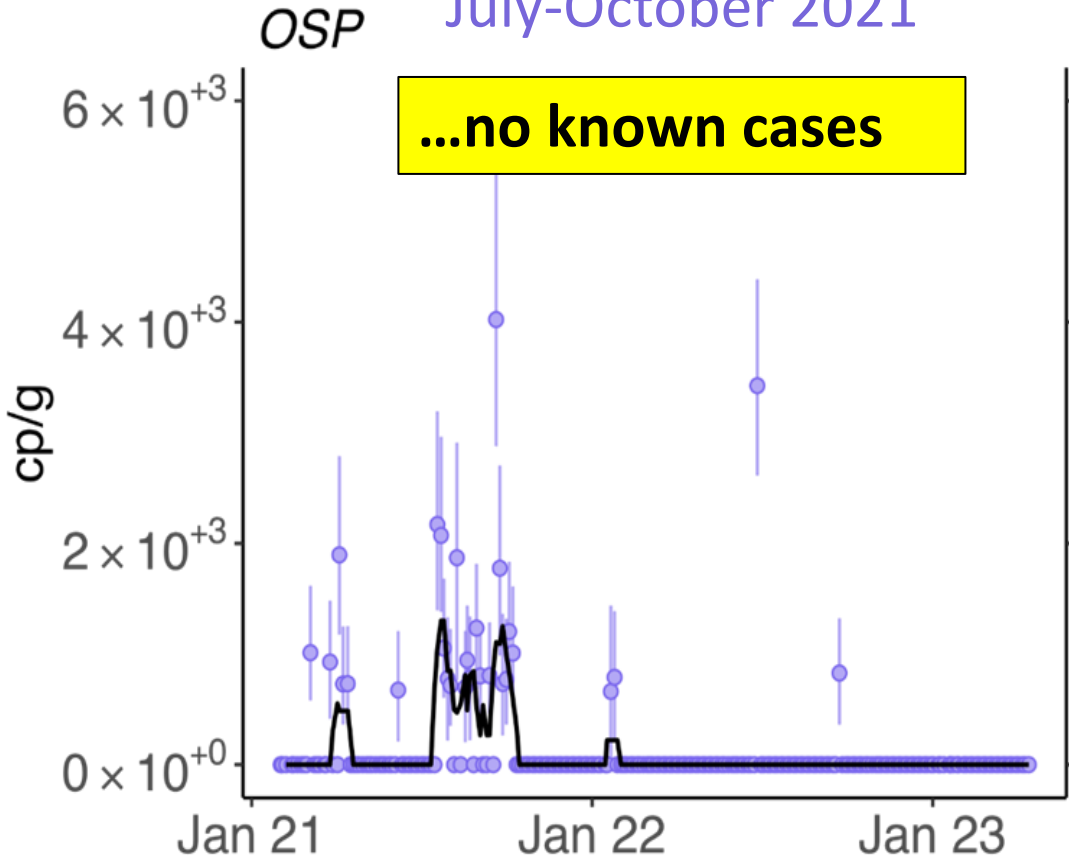
San Jose: no hits during study period





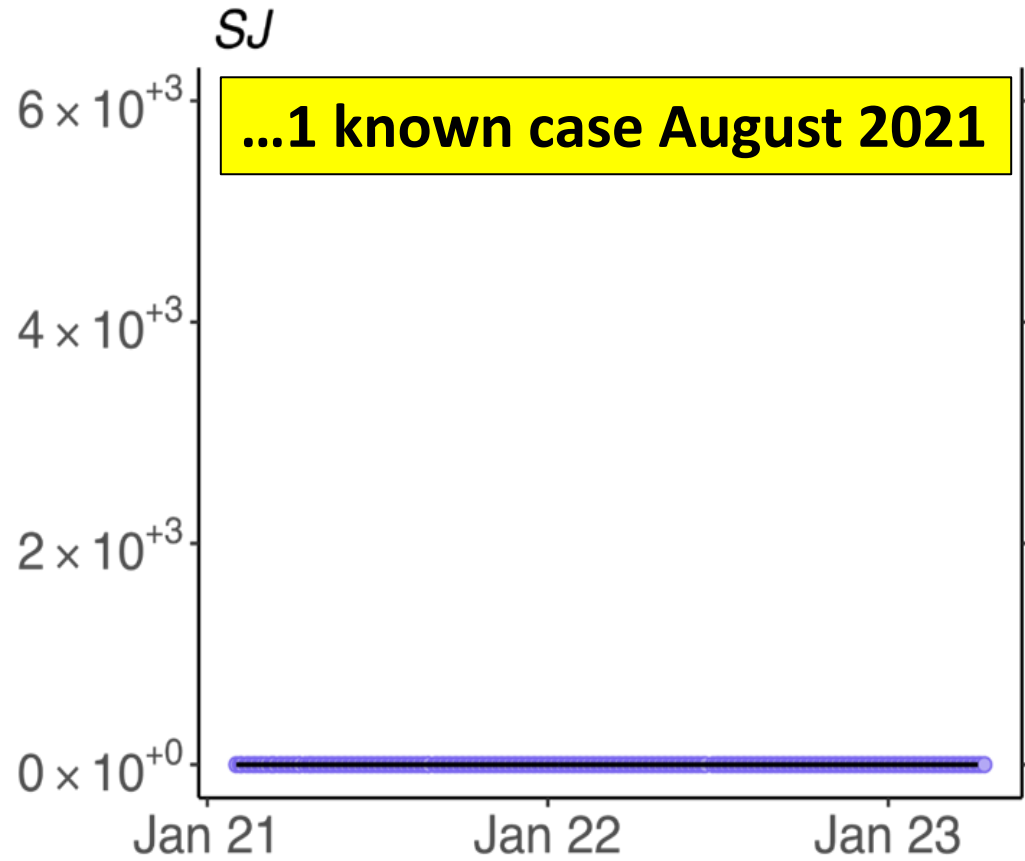
# *C. auris* in wastewater: retrospective study results and cases

San Francisco: multiple hits clustered around July-October 2021



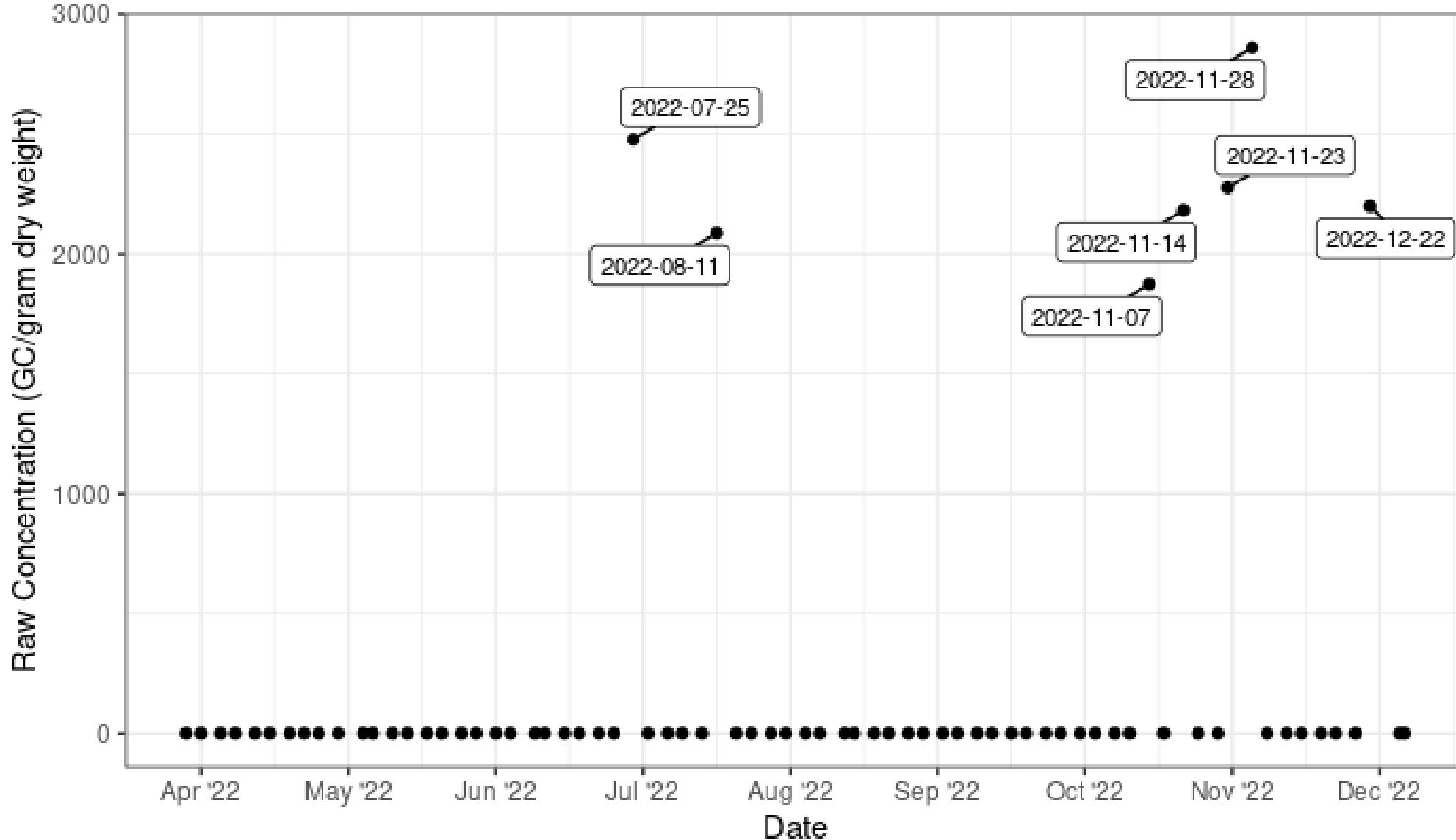
*C. auris*

San Jose: no hits during study period



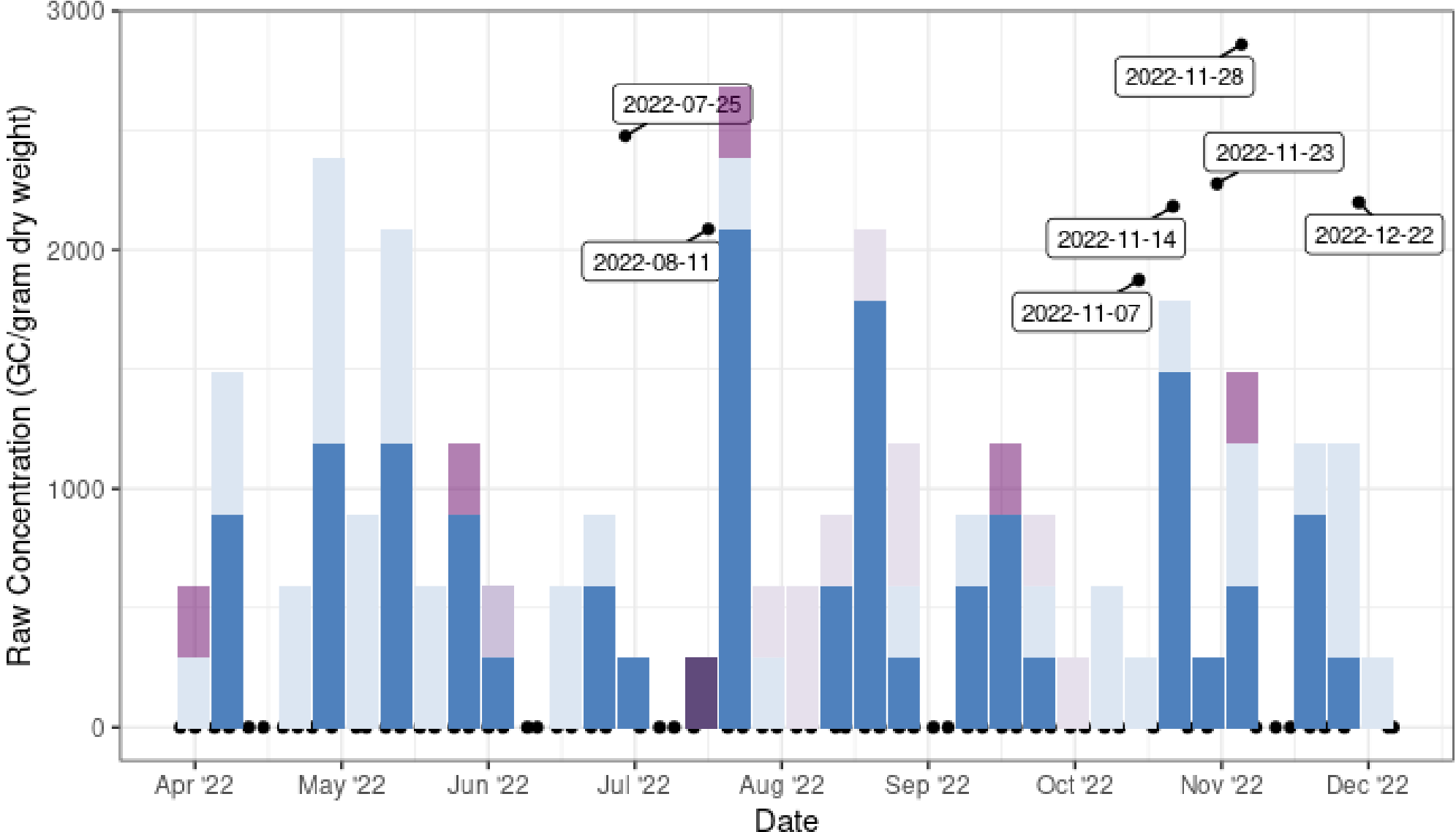
# Retrospective sampling in Ontario (known higher burden sewershed), 4/25-12/29/22

Ontario C. auris Concentrations (Retrospective samples)



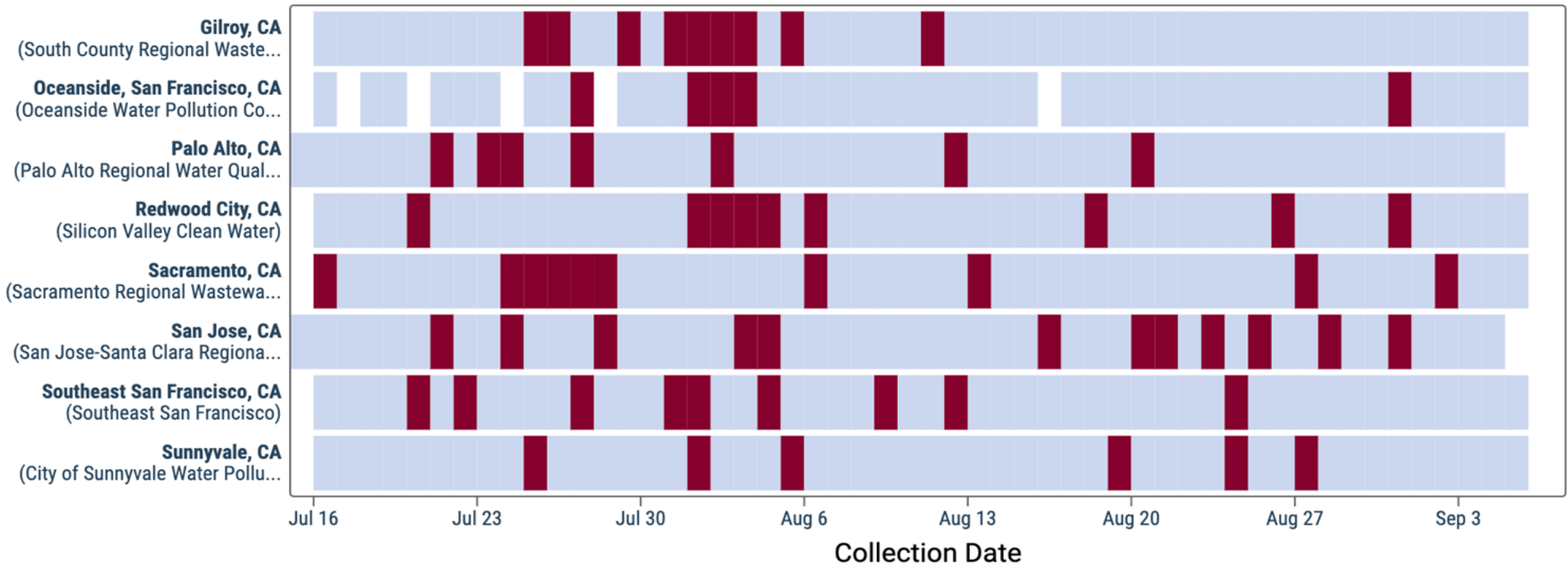
# No clear correlation with cases reported to CDPH during same period

Ontario C. auris Concentrations (Retrospective samples)



# Prospective surveillance in 8 pilot sewersheds 7/10/23-9/5/23: all sites had detections

## Candida auris: SCAN Sites



Level: ■ Not detected ■ Detected

[WastewaterSCAN dashboard \(data.wastewaterscan.org/\)](https://data.wastewaterscan.org/)

# 2 cases identified in Northern CA during the same period

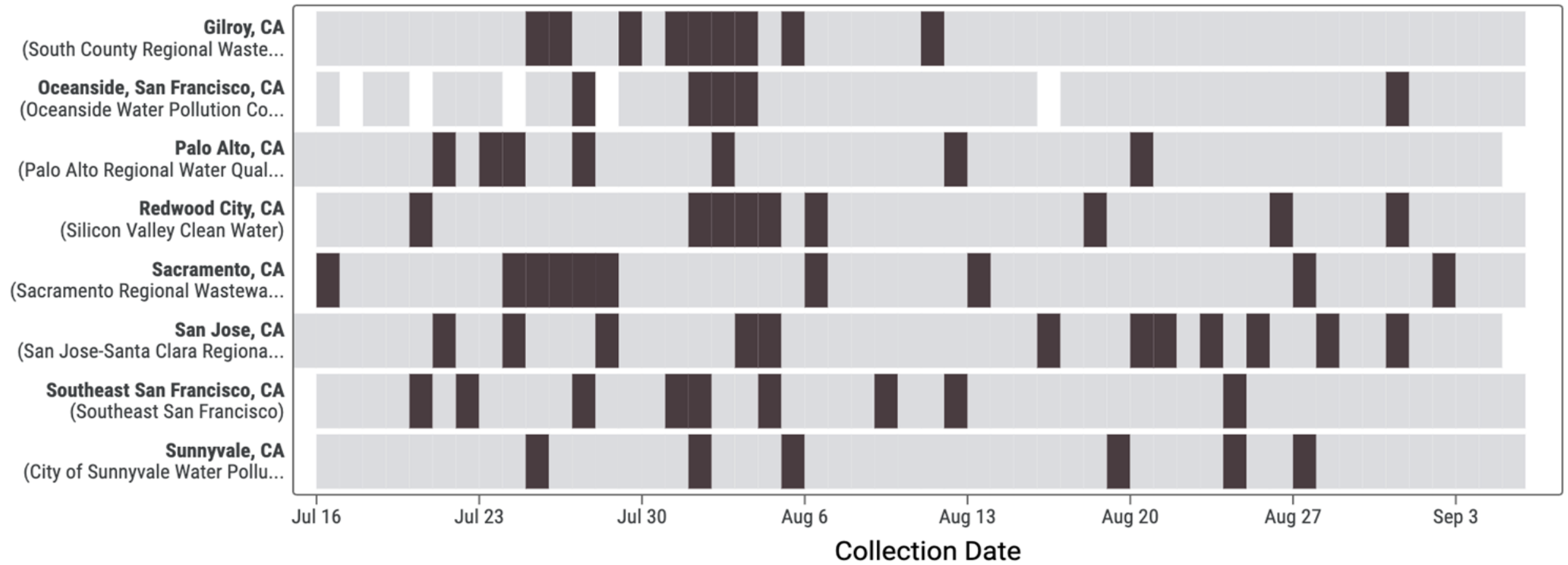
7/18/23



7/31/23



Candida auris: SCAN Sites



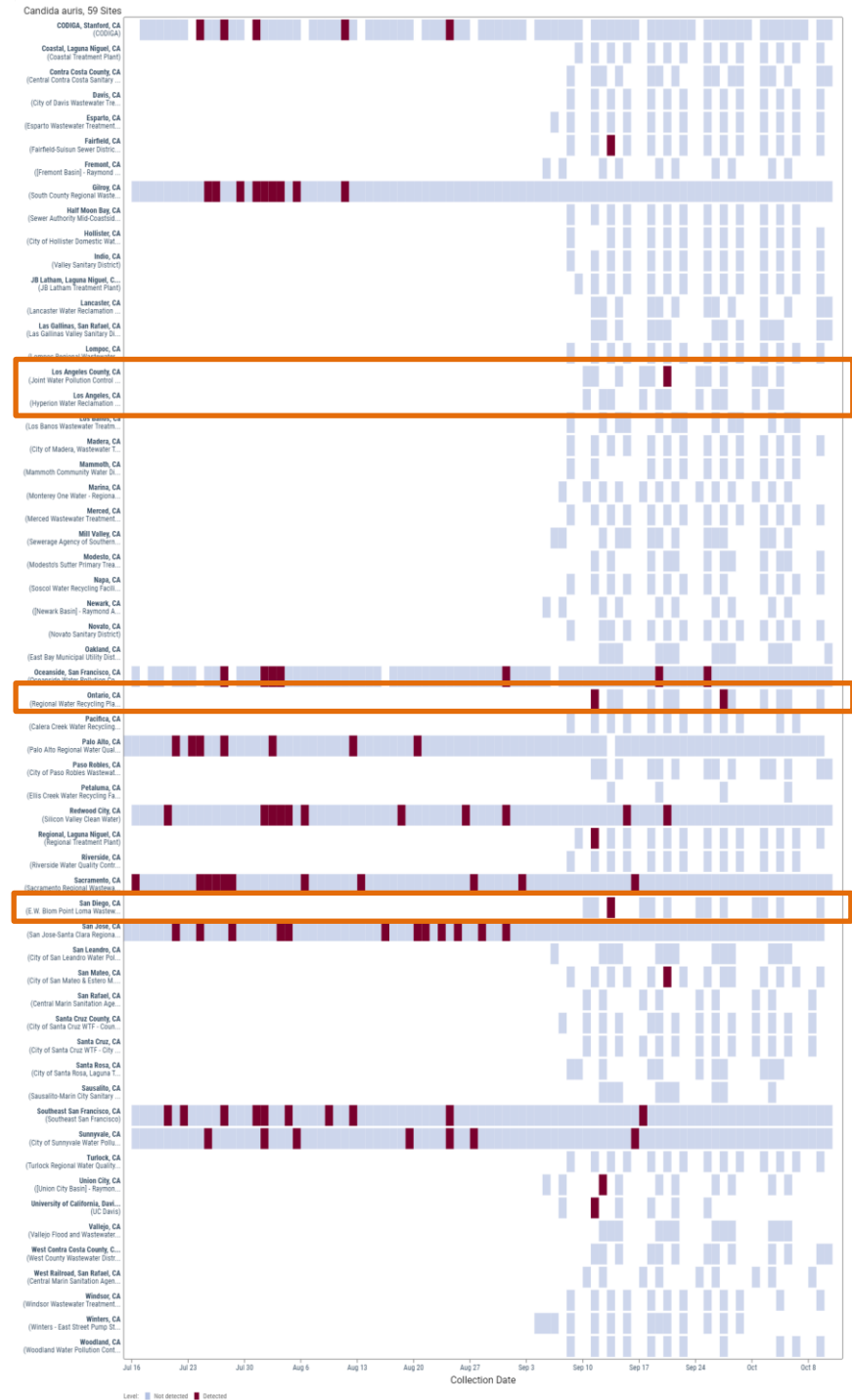
Level:  Not detected  Detected

Since the larger rollout began, sites in known high-burden jurisdictions have had few detections

LA County

Ontario

San Diego



## Correlation between wastewater findings and human cases is unclear

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- *C. auris* colonization is prolonged, and patterns of shedding into wastewater are not well-defined
  - *C. auris* does not have an acute infectious phase unlike other high-incidence pathogens (e.g., SARS-CoV-2)
  - CDPH is currently partnering with an academic institution to analyze wastewater and case data
  - Currently, wastewater surveillance might be more effective at identifying the presence rather than the magnitude of *C. auris* in a region
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## Recommendations for when *C. auris* is detected in wastewater

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- In no- or low-burden jurisdictions → **strengthen testing in healthcare facilities**
    - **Identify species of *Candida*** isolated from non-sterile site specimens
    - Implement **admission screening** for patients most at risk of *C. auris* acquisition and transmission
    - Conduct preventive **point prevalence surveys (PPS)** in long-term acute care hospitals (LTACHs) and ventilator-equipped skilled nursing facilities (vSNFs)
- 
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## *C. auris* wastewater surveillance: CDPH HAI website

- *C. auris* case counts updated monthly
  - Dashboard coming soon
- Wastewater surveillance FAQ document for general public
  - Link to WastewaterSCAN dashboard

### HEALTHCARE-ASSOCIATED INFECTIONS (HAI) PROGRAM

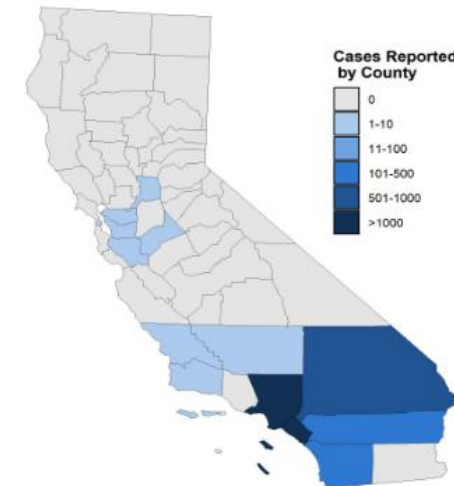
#### *Candida auris*

*Candida auris* (*C. auris*) is a multidrug-resistant yeast that can spread in healthcare settings via person-to-person transmission or contact with contaminated surfaces. *C. auris* can cause serious, hard-to-treat infections.

#### *C. auris* Case Counts

Since September 2022, healthcare providers and laboratories are required to report cases of *C. auris* colonization and infection to public health per California state regulations (PDF).

*Candida auris* Cases by County through July 2023, N= 5,805



Counties with ≥1 Reported Case	Cases through July 2023
Alameda	<11
Contra Costa	<11
Kern	<11
Los Angeles	2,898
Orange	1,951
Riverside	279
Sacramento	<11
San Bernardino	557
San Diego	101
San Francisco	<11
San Luis Obispo	<11
Santa Barbara	<11
Santa Clara	<11
Stanislaus	<11
<b>Total</b>	<b>5,805</b>

**Case Count Notes:** Data are cumulative from January 2017 through the end of the most recent month with complete reporting data. Each case represents a unique patient with *C. auris*, and is attributed to the county of the healthcare facility that first identified the patient. A patient identified upon admission at a healthcare facility may be attributed to the county of the facility from which the patient transferred. Case counts are updated on a monthly basis and counties with one to ten cases are shown as "<11."

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

CDPH *C. auris* wastewater FAQs

([https://www.cdph.ca.gov/Programs/CHCQ/HAI/CDPH%20Document%20Library/Cauris\\_Wastewater\\_FAQ.pdf](https://www.cdph.ca.gov/Programs/CHCQ/HAI/CDPH%20Document%20Library/Cauris_Wastewater_FAQ.pdf))



# *Candida auris* Prevention Strategy



## CDPH phased approach for prevention and response to *C. auris* based on local epidemiology

- **Phase 1 (naïve – not yet detected a case): prevention in all facilities**
  - Build strong foundation for lab surveillance, core infection prevention and control (IPC) practices, antimicrobial stewardship, and interfacility communication
- **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
- **Phases 3 and 4 (endemic): mitigation and maintenance to prevent further spread**
  - Focus on strengthening all prevention activities, especially preventing adverse clinical outcomes



## CDPH Recommendations for *Candida auris* Admission Screening

- LTACHs: screen patients on admission, and conduct routine point prevalence surveys (PPS) per public health guidance.
  - Multiple Bay Area LTACHs have initiated admission screening
- Acute Care Hospitals: CDPH recommends screening 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 (in addition to any LTACH or vSNF ventilator unit) in Nevada state.
- In ACHs and LTACHs, place any patient with *C. auris* on Contact Precautions, and if possible, in a single room
- Do not rescreen patients previously identified with *C. auris*; they can remain colonized indefinitely

LTACH: long term acute care hospital

ACH: acute care hospital

vSNF: ventilator-equipped skilled nursing facility



## Key points – *Candida auris*

- *Candida auris* is an emerging fungal pathogen that is:
  - increasingly identified in Northern California
  - multidrug-resistant
  - associated with healthcare outbreaks
- Providers should be aware of the changing epidemiology, risk factors, and reporting requirements

**Case Studies that Illustrate Breaches in Core Infection Control Practices**



# Case Study 1:

## Healthcare-Associated MSSA Outbreak 2023

- Clinician learns of 3 patients hospitalized with MSSA bacteremia and/or SSTI following sacroiliac joint injections for pain at an outpatient surgery center
  - The 3 patients developed symptoms within a 7-day period

# Investigation begins

- 3 patients had SI injections performed under fluoroscopy
  - 2 patients' injections were on the same day
  - One patient's injection was 7 days later
- Clinical team was the same for the 3 patients
- One patient died 7 days after the procedure
- No other recent similar clinical cases identified
- MSSA isolates sent to public health for whole genome sequencing



# Initial investigation reveals

- Single-dose vials of one product had been used for multiple patients

**SINGLE-DOSE  
OR  
MULTI-DOSE?**



# Injection Safety Practices: Single-Dose Vials

- Vials that are labeled as single-dose or single-use should be used for only a single patient as part of a single case, procedure, injection.
- Multiple reported outbreaks have resulted from healthcare personnel using single-dose or single-use vials for multiple patients.



**Invasive *Staphylococcus aureus* Infections Associated with Pain Injections and Reuse of Single-Dose Vials — Arizona and Delaware, 2012**

[https://www.cdc.gov/injectionsafety/providers/provider\\_faqs\\_singlevials.html](https://www.cdc.gov/injectionsafety/providers/provider_faqs_singlevials.html)

<https://www.cdc.gov/mmwr/preview/mmwrhtml/mm6127a1.htm>



# On-site infection control assessment by CDPH infection preventionists

- One healthcare worker wore bracelets and had a skin condition that affected their ability to perform hand hygiene
- This person provided care to all 3 patients

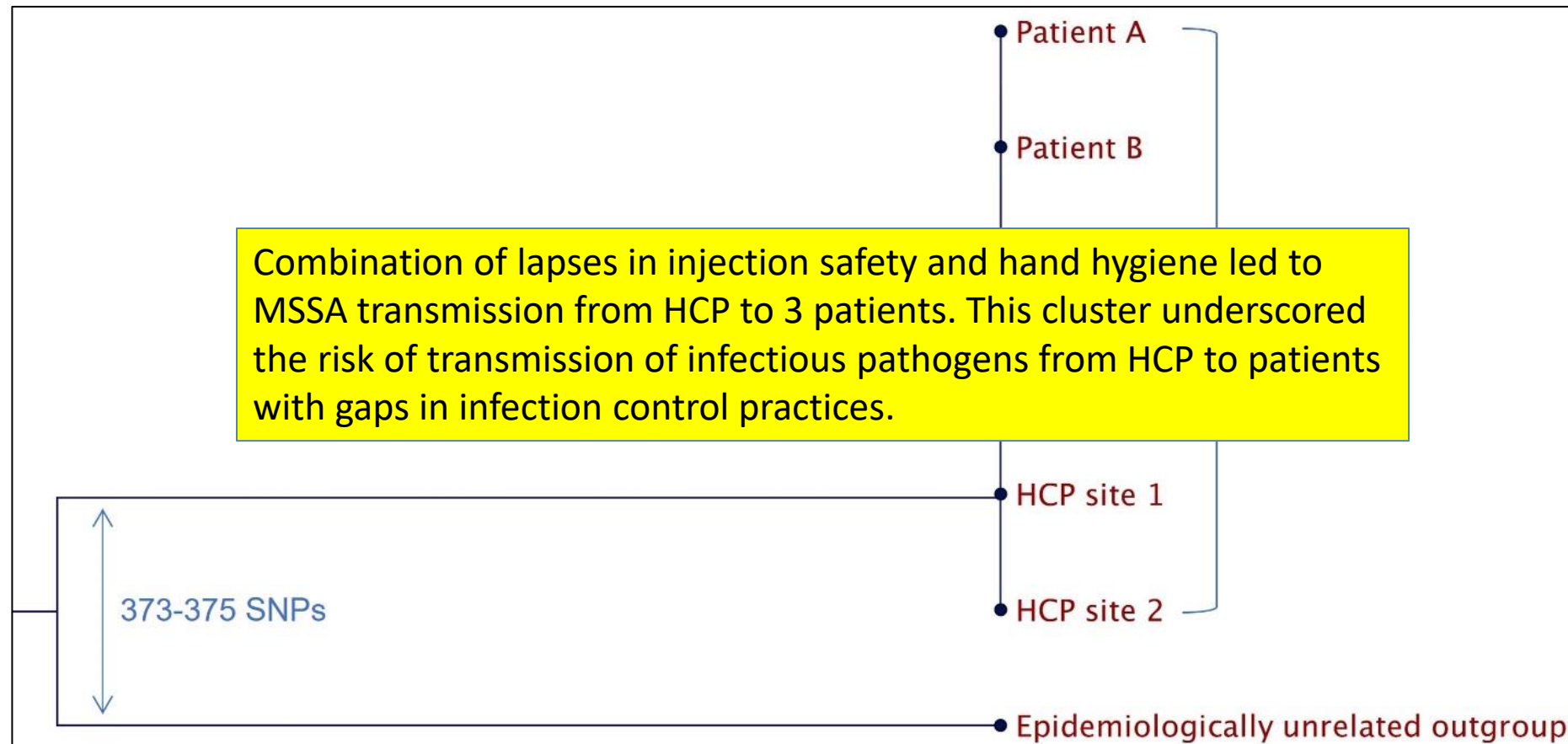
# Injection Safety Practices: Hand Hygiene and Aseptic Technique for Preparation & Administration of Injected Medications

- Hand hygiene should be performed prior to medication preparation and administration of injected medications
- Medications should be drawn up into syringes in a designated clean medication area
  - Area must **not** be adjacent to areas where potentially contaminated items are placed

In this case study, the individual's inability to perform proper hand hygiene should have been brought to the attention of supervisor or lead and addressed. Bracelets should not have been worn.



# The healthcare worker's MSSA isolates were highly related to the patients' isolates (0-2 SNPs)



# Case Study 2: Healthcare-Associated HCV Outbreak Associated with Alternative Medical Therapy

- Acute HCV was diagnosed in an asymptomatic frequent blood donor
  - No traditional risk factors for HCV infection
  - Recent injection procedure as part of prolotherapy (prolotherapy is an injection-based alternative medical therapy that has been used for chronic musculoskeletal pain)

## Case Study 2: Healthcare-Associated HCV Outbreak, cont.

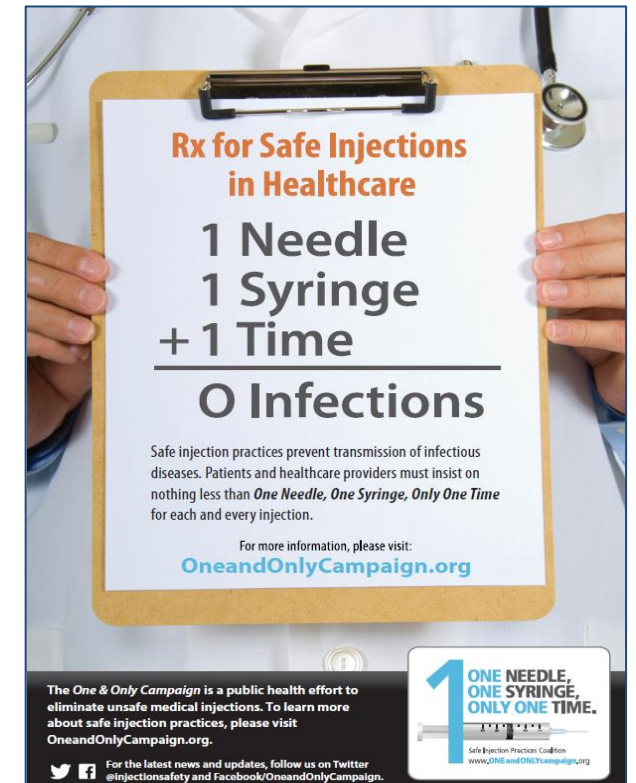
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- Public health investigation revealed:
  - Physician was changing needle but reusing same syringe for multiple patients
  - Use of single-dose vials for multiple patients
  - Poor hand hygiene and inconsistent glove use
  - 6 additional patients with no prior HCV diagnosis were identified, 4 of whom had injection procedures performed at clinic on same day as index patient
- Clinic was closed when poor infection control practices persisted
- Patients were notified of their potential exposure to bloodborne pathogens

# This case study demonstrated breaches in the following infection control practices:

- Reusing syringe for multiple patients
- Use of single-dose vials for multiple patients
- Poor hand hygiene



<https://www.cdc.gov/mmwr/volumes/65/wr/mm6521a4.htm>  
[CDC One and Only Campaign](http://www.oneandonlycampaign.org) (<http://www.oneandonlycampaign.org>)



# Hepatitis B and C Outbreaks Associated with Unsafe Infection Practices

- CDC aware of 62 healthcare-associated outbreaks of hepatitis B and C in non-hospital settings in U.S., 2008-2019
  - An underestimate
- Outbreaks due to injection safety breaches
  - Reuse of syringes
  - Use of single-dose vials for more than one patient
  - Infection control lapses during assisted monitoring of blood glucose
  - Drug diversion by HCP/employees
  - Other

<https://www.cdc.gov/hepatitis/outbreaks/healthcarehepoutbreaktable.htm>

Site accessed 8.13.23

# “Red Flags” for Suspecting Healthcare Acquisition of HBV or HCV

- Sentinel events, such as seroconversion in dialysis patient or frequent blood donor
- Patient age  $\geq 50$  with acute HBV/HCV and no traditional risk factors
- Setting types where prior hepatitis outbreaks have occurred, e.g.:
  - Outpatient settings where frequent injections or infusions are administered
  - Settings that provide assistance with multiple patients for blood glucose monitoring
- Facility/clinic associated with prior case of acute HBV/HCV
- Previous report or complaint about unsafe injection practice

## Case Study 3: Bacterial Meningitis

- Onset of fever, headache, stiff neck in patient who had epidural placed one day prior at ambulatory surgical center
- CSF Gram stain: Gram negative diplococci
- Reported to health department as suspect *Neisseria meningitidis* case
- CSF culture: *Neisseria subflava*
  - part of normal flora of human oral cavity and respiratory tract
- Public health investigation: clinician routinely does not wear a mask when performing procedure

# Wear Facemask for Epidural Procedures

- HCP should wear a facemask when inserting a catheter or injecting material into the epidural or subdural space
  - Myelogram
  - Epidural or spinal anesthesia



**CDC CLINICAL REMINDER**

### Spinal Injection Procedures Performed without a Facemask Pose Risk for Bacterial Meningitis

**Summary:**

The Centers for Disease Control and Prevention (CDC) is concerned about the occurrence of bacterial meningitis among patients undergoing spinal injection procedures that require injection of material or insertion of a catheter into epidural or subdural spaces (e.g., myelogram, administration of spinal or epidural anesthesia, or intrathecal chemotherapy). Outbreaks of bacterial meningitis following these spinal injection procedures continue to be identified among patients whose procedures were performed by a healthcare provider who did not wear a facemask (e.g., may be labeled as surgical, medical procedure, or isolation mask),<sup>1</sup> with the most recent occurrence in October 2010 (CDC unpublished data). This notice serves as a reminder that facemasks should always be worn by healthcare providers when performing these spinal injection procedures.<sup>2</sup>

**Background:**

CDC has investigated multiple outbreaks of bacterial meningitis among patients undergoing spinal injection procedures. Recent outbreaks have occurred among patients in acute care hospitals who received spinal anesthesia or epidural anesthesia, and also among patients at an outpatient imaging facility who underwent myelography.

In each of these outbreak investigations, nearly all spinal injection procedures that resulted in infection were performed by a common healthcare provider who did not wear a facemask. The strain of bacteria isolated from the cerebrospinal fluid of these patients was identical to the strain recovered from the oral flora of the healthcare provider who performed the spinal injection procedure. These findings illustrate the risk of bacterial meningitis associated with droplet transmission of the oral flora from healthcare providers to patients during spinal injection procedures.

National Center for Emerging and Zoonotic Infectious Diseases  
Division of Healthcare Quality Promotion



<https://www.cdc.gov/injectionsafety/spinalinjection-meningitis.html>

[https://www.cdc.gov/injectionsafety/pdf/Clinical\\_Reminder\\_Spinal-Infection\\_Meningitis.pdf](https://www.cdc.gov/injectionsafety/pdf/Clinical_Reminder_Spinal-Infection_Meningitis.pdf)

# What are the requirements for reporting of outbreaks or unusual occurrences?

- **Title 17 California Code of Regulations** requires healthcare provider reporting to the local health department of:
  - Outbreaks of any disease
  - Occurrence of any unusual disease
  - All other reportable conditions

*Additional requirements for reporting outbreaks and unusual occurrences to CDPH's local Licensing & Certification District Office apply to all licensed healthcare facilities (including hospitals and skilled nursing facilities) per **Title 22 California Code of Regulations.***

<https://www.cdph.ca.gov/Programs/CID/DCDC/CDPH%20Document%20Library/ReportableDiseases.pdf>  
<https://www.cdph.ca.gov/Programs/CHCQ/LCP/Pages/AFL-23-08.aspx>

# What are Examples of Reportable HAI Incidents in Healthcare Facilities?

- Single case of postpartum or post-surgical or facility outbreak of **healthcare-associated invasive group A strep**
- **Outbreak** or increased incidence of any infectious agent, device- or procedure-associated infections, for example:
  - Increase in cases of patients with cultures positive for *Burkholderia* in an ICU, or
  - A case of post-operative or post-procedure extrapulmonary nontuberculous mycobacteria infection
- Infections suspected to be associated with **contaminated** medication, transfused blood products, or other distributed medical product

# What are Examples of Reportable HAI Incidents in Healthcare Facilities?

- Single case of colonization or infection with a **multidrug resistant organism** if never previously or only rarely encountered in a facility, such as *Candida auris* or a specific carbapenemase-producing organism
- Outbreak or increased incidence of any multidrug resistant organism, such as **MRSA in a neonatal intensive care unit**
- Single case of presumptive **healthcare-associated Legionnaires' disease**
- **Facility outbreak** of COVID-19, influenza, pneumonia, other respiratory viral pathogen (e.g., RSV) or gastroenteritis
- **Foodborne** infectious disease outbreak
- This list is not all-inclusive of everything reportable to public health

<https://www.cdph.ca.gov/Programs/CHCQ/LCP/Pages/AFL-23-08.aspx>

# Important Updates on Outbreak of Fungal Meningitis in U.S. Patients Who Underwent Surgical Procedures under Epidural Anesthesia in Matamoros, Mexico

[Print](#)



Distributed via the CDC Health Alert Network

June 01, 2023, 5:30 PM ET

CDCHAN-00492

- 12 deaths to date
- Many others treated for fungal meningitis
- Cases identified and reported after travel and procedure in Mexico
- Clinician detection



# Travelers' Health

- US residents may seek medical care in another country that costs less or is provided in the traveler's culture or language.
- Clinicians should maintain awareness for infectious complications or antimicrobial resistant organisms in returning travelers who sought medical care abroad.

<https://wwwnc.cdc.gov/travel/page/medical-tourism>

## Medical Tourism: Travel to Another Country for Medical Care

Traveling to another country to get medical care can be risky. Learn about the risks and how to minimize them.



## Traveling Internationally for Medical Care

Each year, millions of US residents travel to another country for medical care which is called medical tourism. Medical tourists from the United States most commonly travel to Mexico and Canada, and to several other countries in Central America, South America, and the Caribbean.

The reasons people may seek medical care in another country include:

- Cost: To get a treatment or procedure that may be cheaper in another country
- Culture: To receive care from a clinician who shares the traveler's culture and language
- Unavailable or unapproved procedures: To get a procedure or therapy that is not available or approved in the United States

**The Washington Post**  
*Democracy Dies in Darkness*

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# Second deadly TB outbreak linked to tainted bone grafts

The same type of bone repair product was linked to tuberculosis outbreak in 2021

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<https://www.washingtonpost.com/health/2023/08/04/tb-outbreak-tuberculosis-bone-graft/>

# Healthcare-Associated Infections (HAIs)

CDC > Healthcare-associated Infections (HAI) > Outbreak and Patient Notifications

## Tuberculosis (TB) Disease Associated with Suspected Contaminated Viable Bone Matrix Material Used in Surgical and Dental Procedures

Reported by clinician diagnosing TB in patient who had no traditional risk factors and recent surgery with bone allograft

### At-A-Glance:

People who received product from implicated lot: 36

Facility Type: Hospitals and Dental Offices

States: 7

Deaths: 2

<https://www.cdc.gov/hai/outbreaks/TB-bone-allograft.html>

# Key Points – Infection Prevention and Control Practices and Clinical Reporting

- ID doctors may be consulted on possible healthcare-associated infections or ‘red flag’ cases for healthcare-associated bloodborne pathogen transmission.
- Maintain a low threshold to report infections that may be healthcare-associated to public health for investigation.

**Thank you!**

**Questions?**

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

Website:

[www.cdph.ca.gov/Programs/CHCQ/HAI/Pages/HAIProgramHome.aspx](http://www.cdph.ca.gov/Programs/CHCQ/HAI/Pages/HAIProgramHome.aspx)