Overview of *Candida auris* and Emerging Resistant Candida

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FDA Public Workshop

Development Considerations of Antifungal Drugs to Address Unmet Medical Need

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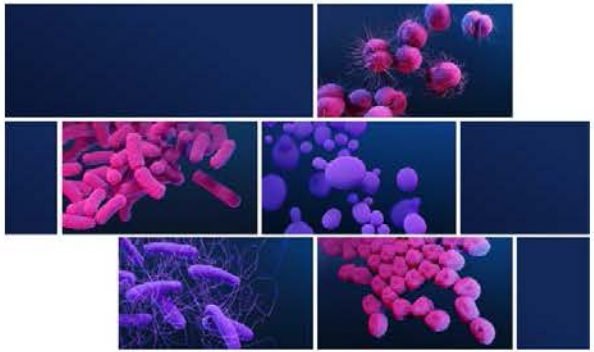
ANTIBIOTIC RESISTANCE THREATS
IN THE UNITED STATES

2019



Urgent Threats

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

CARBAPENEM-RESISTANT
ACINETOBACTER

CANDIDA AURIS

CLOSTRIDIOIDES DIFFICILE

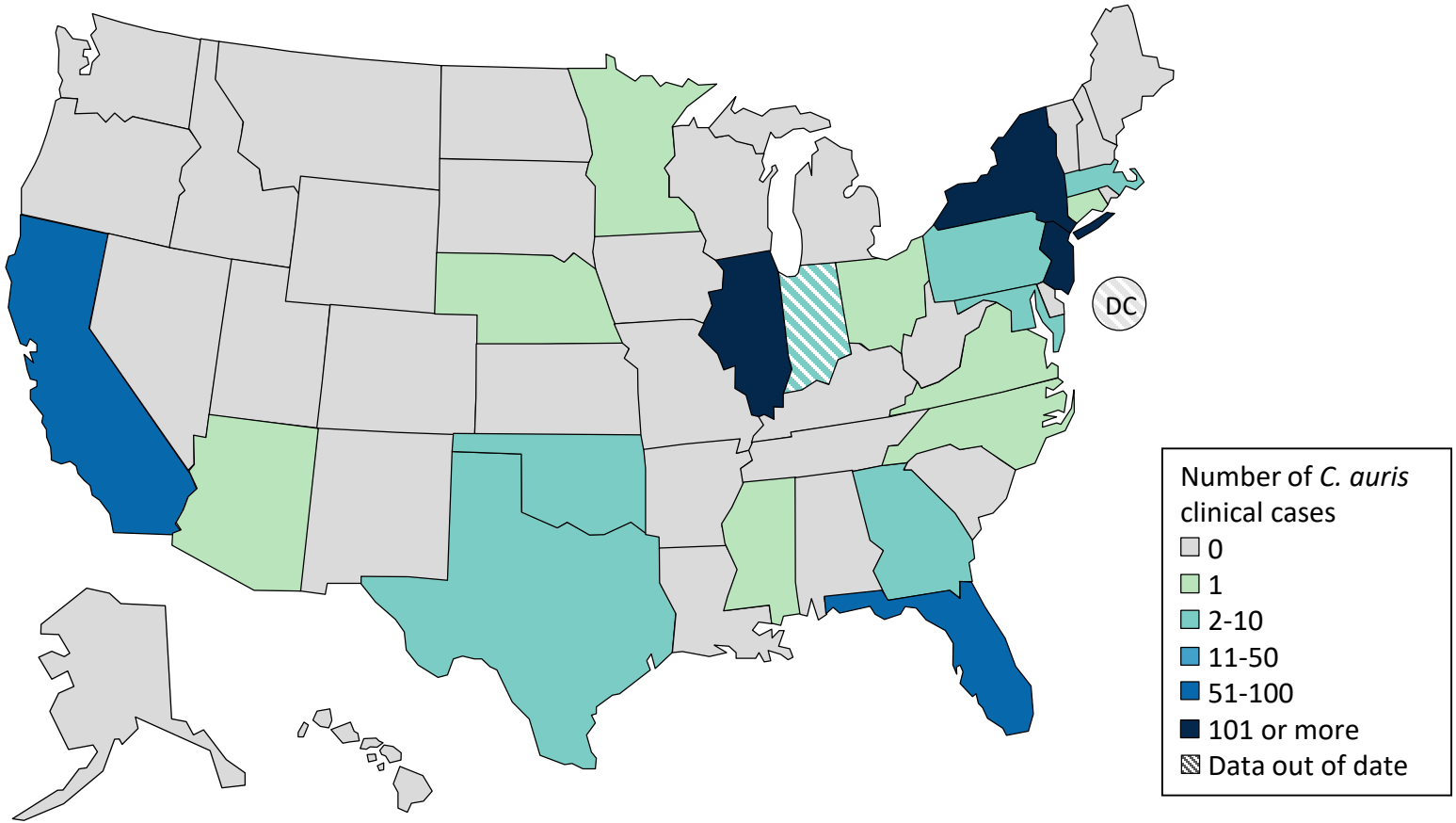
CARBAPENEM-RESISTANT
ENTEROBACTERIACEAE

DRUG-RESISTANT
NEISSERIA GONORRHOEAE

A paradigm shift for *Candida* infections
A yeast that acts like a bacteria!

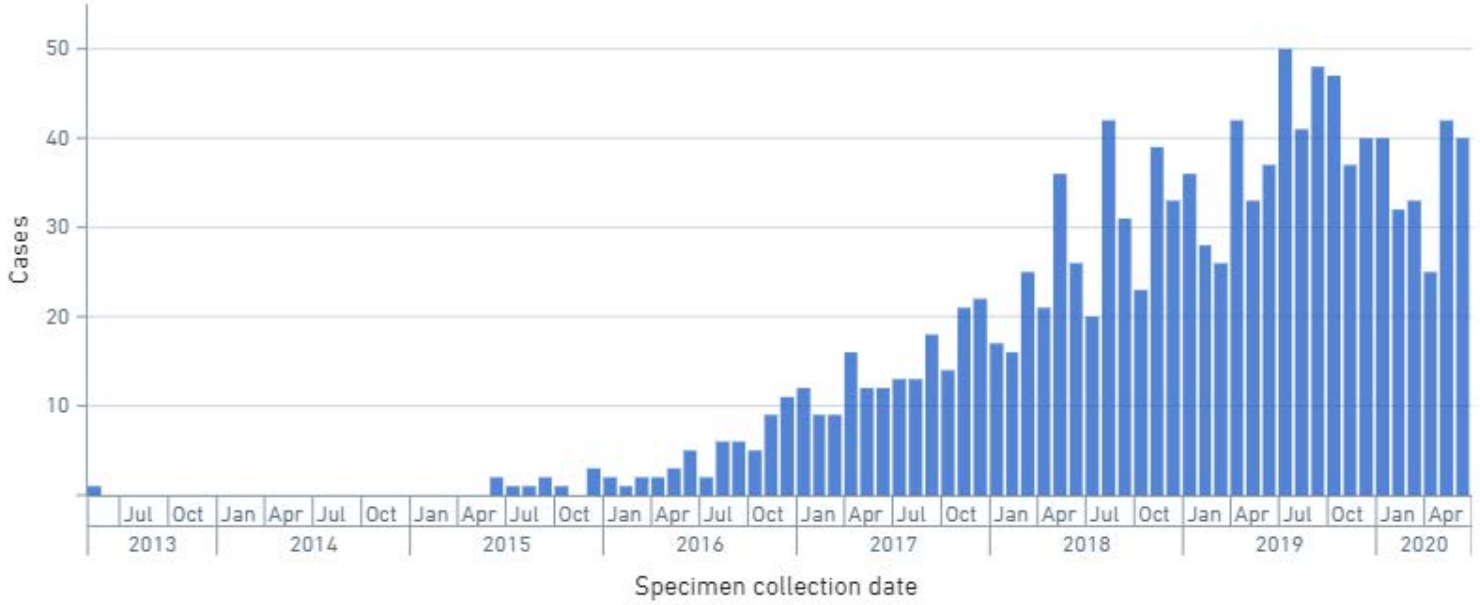
- Resistance is the norm
- Thrives on skin
- Contaminates patient rooms
- **CAN SPREAD IN HEALTHCARE SETTINGS**

C. auris clinical cases — United States, 2013–June 2020



C. auris clinical cases— United States, as of June 2020

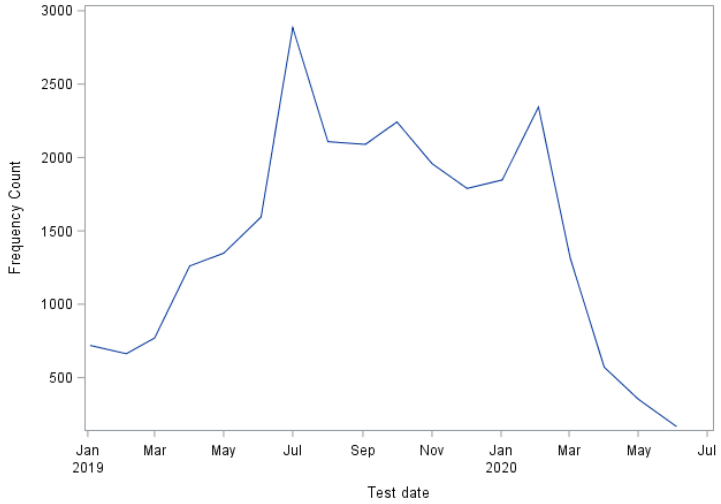
- Over 1200 clinical cases
- About 2400 screening cases



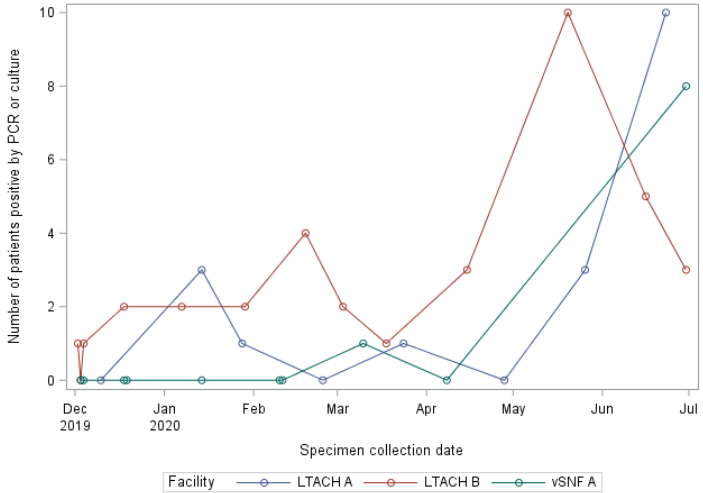
COVID-related challenges

- Decreased screening
- Reporting delays
- Changes in patient movement patterns
- Widespread empiric antimicrobial use

C. auris colonization swabs tested through AR Lab Network



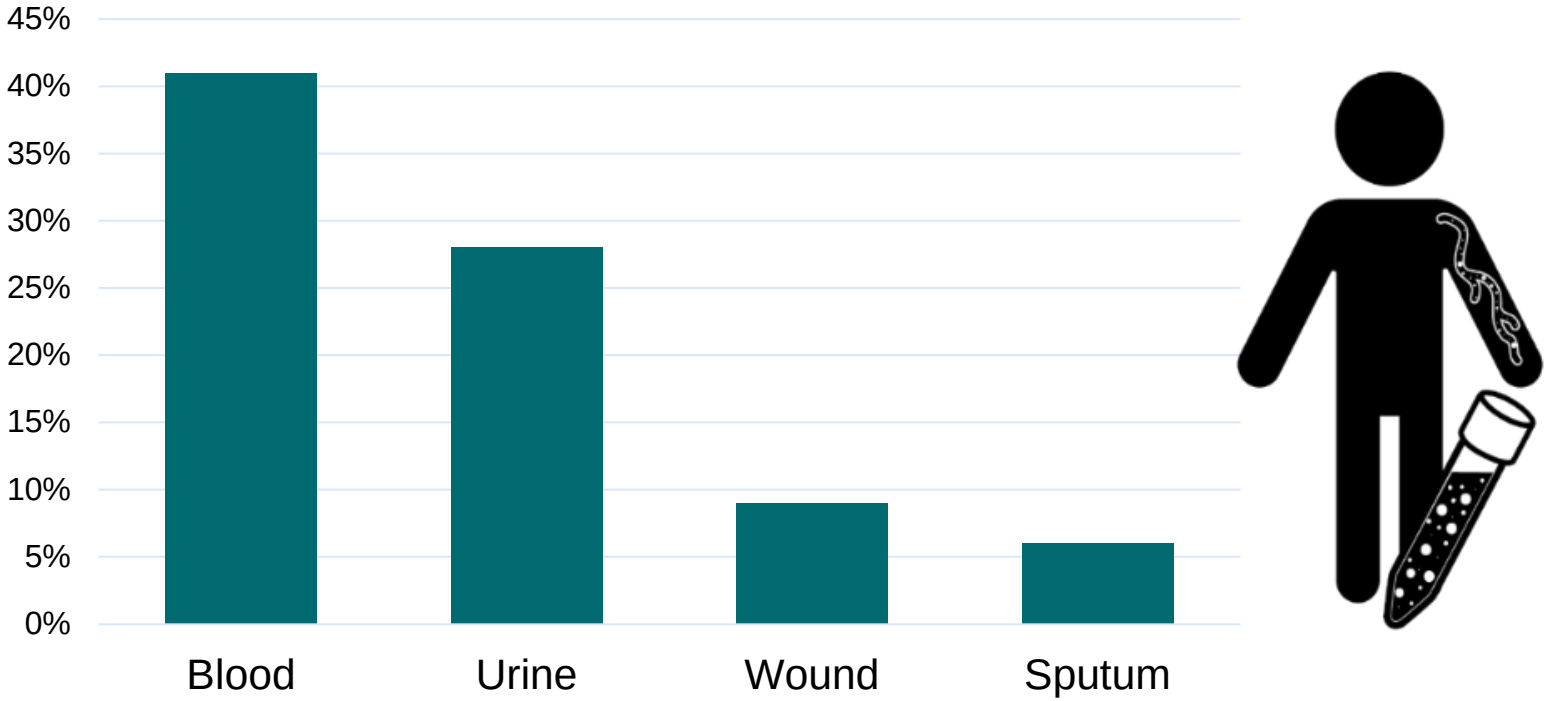
C. auris sharply increased in recent months in some long-term care facilities with COVID cases



Changing epidemiology?

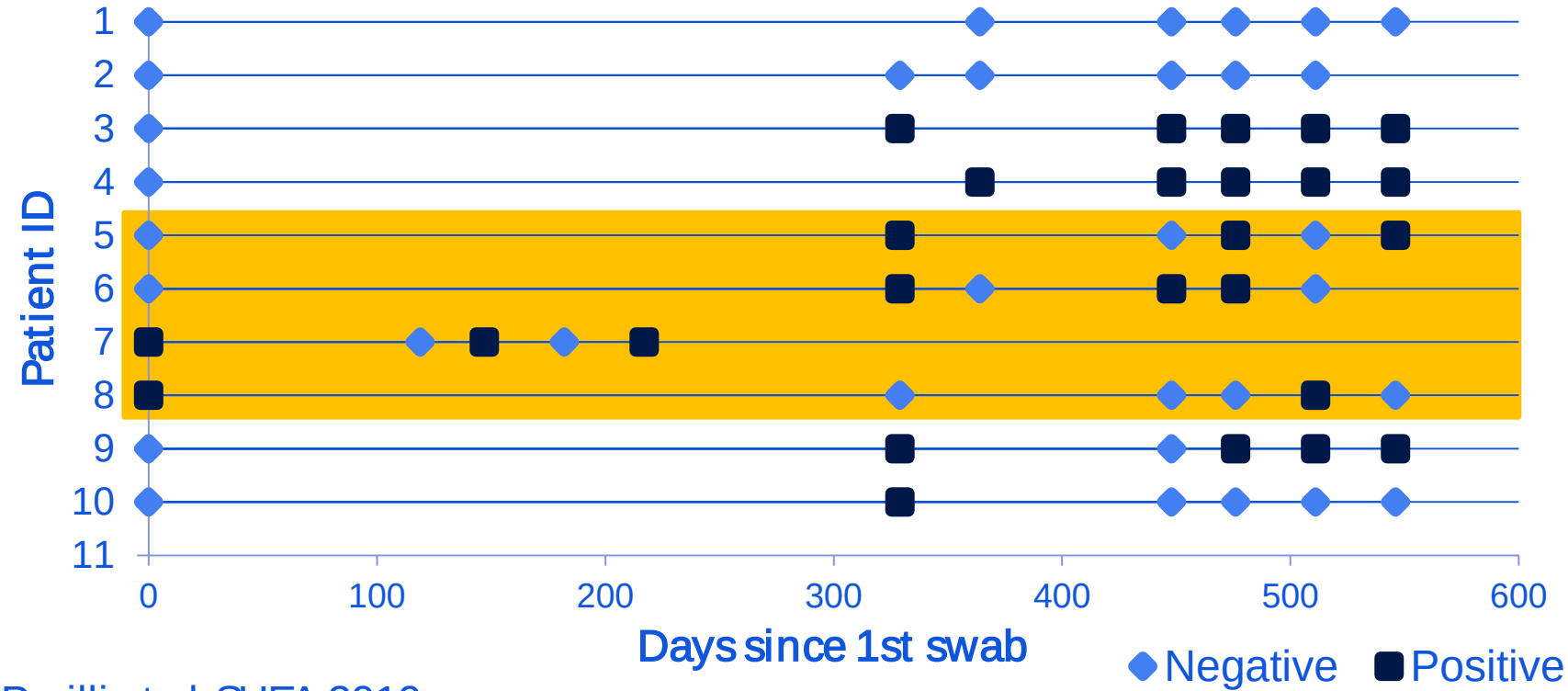
- Outbreaks happening in previously well-contained areas of the country
  - Southern California
  - Mid-Atlantic
- Cases identified without links to known cases or healthcare abroad
- Transmission seen in acute care hospitals and regular skilled nursing facilities
  - Though most transmission remains in LTACHs and skilled nursing facilities with ventilator care

Most common specimen sources of clinical cases*



* Cases may be included under multiple specimen sources

Long term Colonization

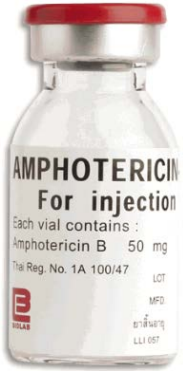


Pacilli et al, SHEA 2019

Resistance (n=1634 US isolates)

80%

Azoles



31%

Polyenes

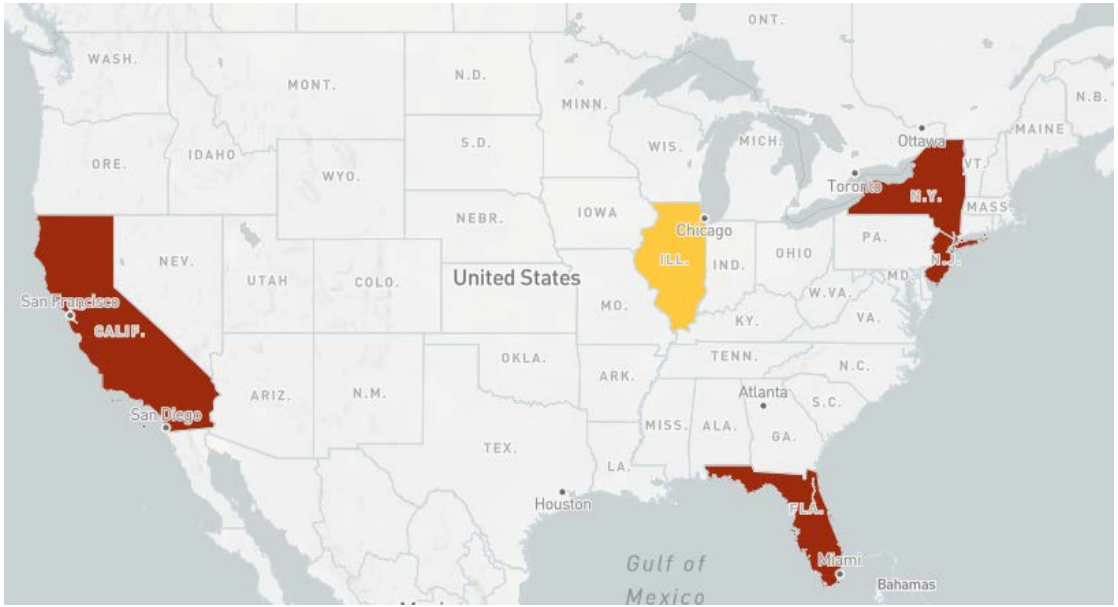
1%

Echinocandins

- 31% multidrug-resistant
- Pan-resistance found in 2 states, but still rare
- Major differences by clade

C. auris resistance varies geographically - Azole

- Azole resistance*
  - South Asian Clade
    - >99% in NY
    - >99% in NJ
  - African Clade
    - 99% in CA
    - 92% in FL
  - South American Clade
    - 7% in IL



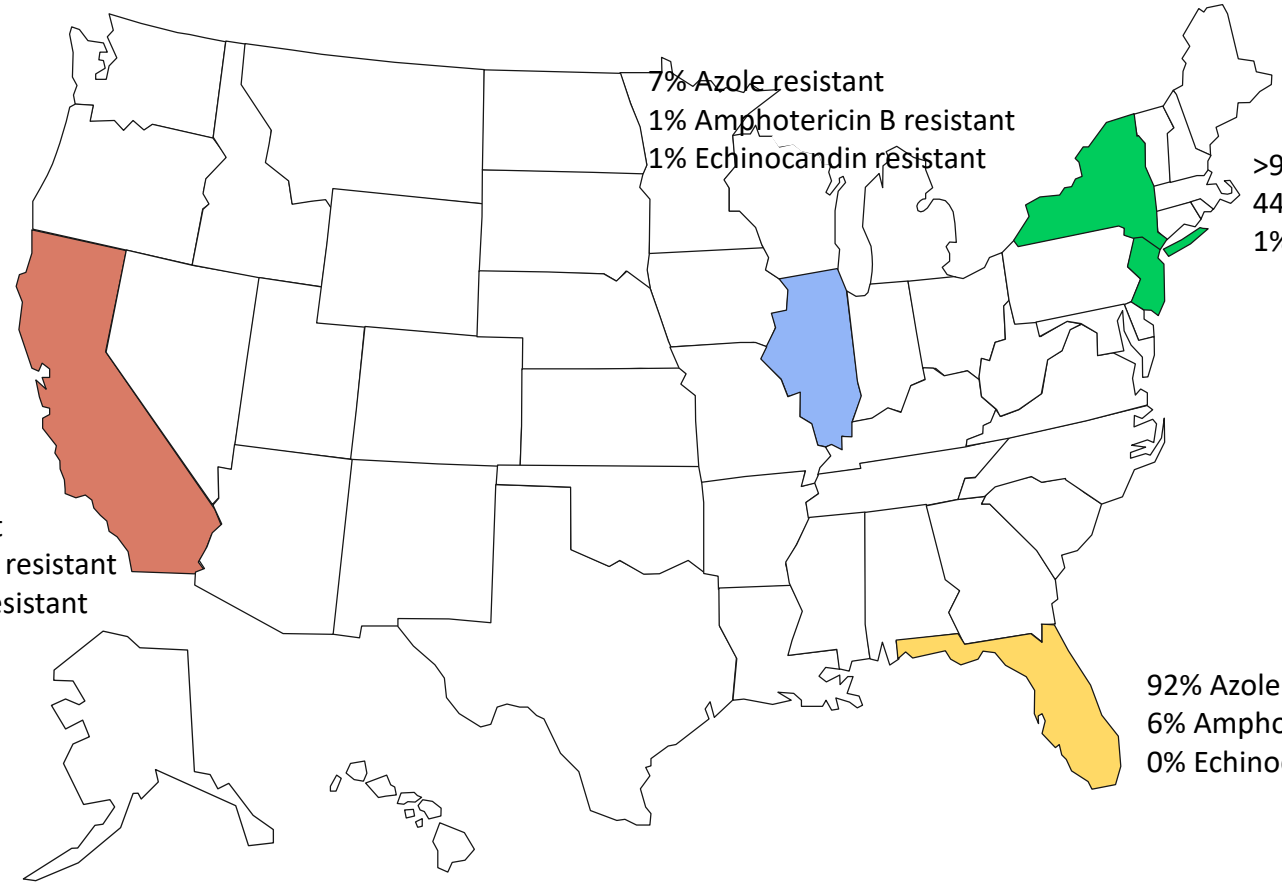
* Clades indicate the predominant clade in that state

C. auris resistance varies geographically – Amphotericin B

- Amphotericin B resistance*
  - South Asian Clade
    - 46% in NY
    - 32% in NJ
  - African Clade
    - 9% in CA
    - 6% in FL
  - South American Clade
    - 1% in IL

* Clades indicate the predominant clade in that state

Antifungal Resistance by Region



7% Azole resistant
1% Amphotericin B resistant
1% Echinocandin resistant

>99% Azole resistant
44% Amphotericin B resistant
1% Echinocandin resistant

99% Azole resistant
9% Amphotericin B resistant
3% Echinocandin resistant

92% Azole resistant
6% Amphotericin B resistant
0% Echinocandin resistant

Pan-resistant *C. auris*

- 4 unrelated cases reported with resistance to all 3 antifungal classes
  - 3 from New York
  - 1 from Maryland
- None had recent international travel or healthcare
- All were mechanically ventilated and had been in long-term care facilities
- All cases initially had *C. auris* sensitive to echinocandins, but developed resistance after treatment

Ostrowsky B, Greenko J, Adams E, et al. *Candida auris* Isolates Resistant to Three Classes of Antifungal Medications — New York, 2019. MMWR Morb Mortal Wkly Rep 2020;69:6–9.
DOI: http://dx.doi.org/10.15585/mmwr.mm6901a2external icon

Candida glabrata

- 12 years of surveillance, >2500 isolates
- 8.6% Fluconazole^{R}
- 3.2% Echinocandin^{R}
- Among Flu^{R} isolates, 10% also echino^{R}
- Among echino^{R} isolates, 25% also flu^{R}

Familiar *Candida* species:

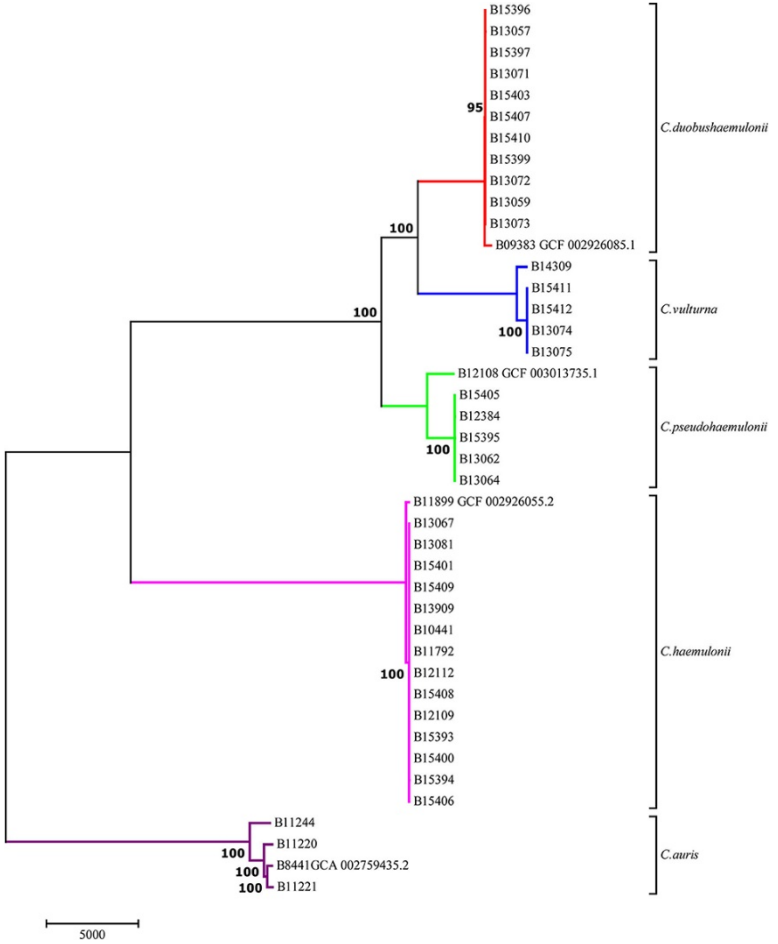
- *Candida parapsilosis* – fluconazole resistance in US approaching 10%
- *Candida guilliermondii* species complex – some very high fluconazole MICs in our surveillance

Emerging *Candida* species:

- *Candida haemulonii* - some fluconazole resistance
- *Candida duobushaemulonii* – some fluconazole resistance, high amp B resistance
- *Candida kefyr* – a few high fluconazole MICs

Related *C. haemulonii* species complex transmission

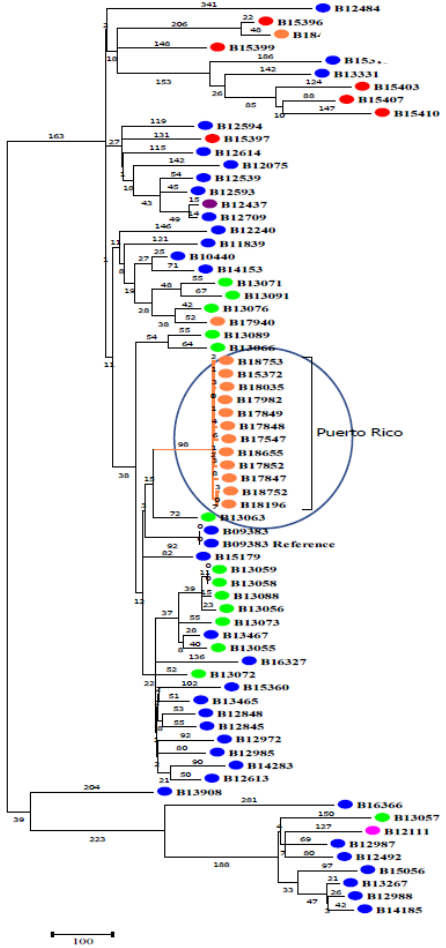
- Whole genome sequencing
- Detected transmission of *C. haemulonii* and *C. duobushaemulonii* in Panama



Gade, et al. Front. Genet., 10 June 2020. https://doi.org/10.3389/fgene.2020.00554

Related species *C. duobushaemulonii* outbreak in Puerto Rico detected

- Whole genome sequencing
  - 12 isolates from 11 patients <10 SNPs apart
  - 10 isolates from 1 facility
- Collected over a 1.5 years
- Blood & abscess specimens



Resources

- https://www.cdc.gov/fungal/candida-auris
  - Guidance
  - Fact sheets & FAQs
  - PCR and swabbing protocols
  - Sample screening script
  - Interfacility transfer form
- https://www.cdc.gov/drugresistance/laboratories.html
  - AR Lab Network contact info
  - AR Lab Network flyer

Acknowledgements

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For more information, contact CDC
1-800-CDC-INFO (232-4636)
TTY: 1-888-232-6348 www.cdc.gov