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Candida auris*, an Emerging Fungal Pathogen – 2021 Update*

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Since its discovery in 2009, *Candida auris* has emerged as a global concern. Although *C. auris* has not been yet detected in this state, the Washington State Department of Health (DOH) is actively conducting surveillance and providing education to healthcare and local health partners on how to prepare for, and prevent spread of, *C. auris*. As of January 1, 2022, *C. auris* is mandated to be reported to public health and isolates submitted to the Washington Public Health Laboratories (PHL). A new *C. auris* reporting and investigation guideline and educational materials are available on the DOH notifiable conditions webpage. This publication reproduces sections from a previous epiTRENDS in 2019 and provides relevant new information.

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Background

C. auris is the first fungal pathogen to be declared a public health threat. Reasons for concern include the organism's resistance to multiple antifungal drugs, misidentification by laboratories, ability to asymptomatically colonize skin, persistence on fomites, easy transmission in healthcare settings, and ability to cause severe disease with a high mortality rate. These factors represent an alarming paradigm shift for *Candida* infections.

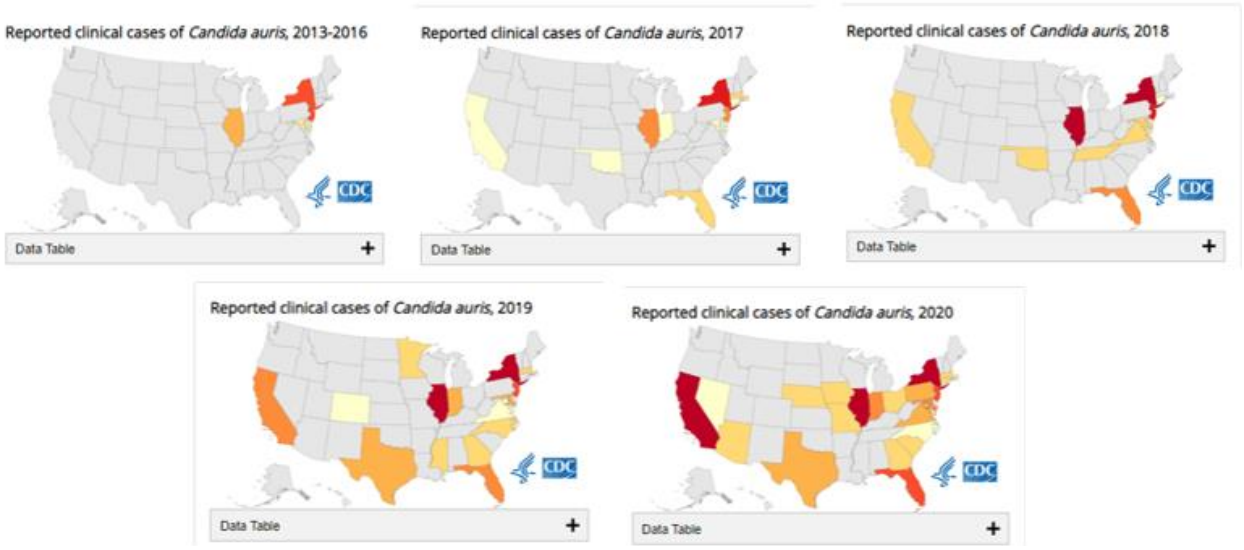
In 2009, a novel ascomycetous yeast was isolated from the ear canal of 70-year old woman in Japan. The mysterious, new species was named *Candida auris*. Retrospective analysis of thousands of historical *Candida* isolates collected from four continents only yielded two previously misidentified *C. auris* isolates. The apparent absence of historical isolates indicates recent emergence, as opposed to *C. auris* being newly identifiable by improving laboratory technology.

Within the next few years, *C. auris* was identified as the cause of outbreaks in other parts of Asia, Europe (2013) and Africa (2015); limited reliable laboratory identification of *C. auris* has likely led to underreporting of cases globally (Figure 1). In 2016 the Centers for Disease Control and Prevention (CDC) identified the first known case in the US from a previously misidentified isolate collected in 2013. In 2018, *C. auris* was made nationally notifiable.

Figure 1. Countries from which *Candida auris* cases have been reported as of February 15, 2021.

As of December 31, 2020, there have been 1,747 confirmed clinical cases in 26 states and Washington, D.C. Ninety-five percent of cases have occurred in five states, New York (41%), Illinois (26%), New Jersey (14%), California (8%), and Florida (7%). From May 1, 2020 to April 30, 2021, 806 clinical cases and 2,193 colonization cases have been reported. Both clinical and colonization cases can spread *C.auris* within healthcare settings.

Figure 2. Reported clinical cases of *C. auris* by state of collection, 2013-2020 (data from CDC).



United States response to C. auris

The Antibiotic Resistance Laboratory Network

In 2015, President Obama implemented the National Action Plan for Combating Antibiotic-Resistant Bacteria. Main goals of the Plan are to slow the emergence of resistance, strengthen surveillance, and improve capacity for prevention. Through the National Action plan, the Antibiotic Resistance Laboratory Network (AR Lab Network) was established in 2016. The AR

Lab Network allows public health laboratories (PHL) to increase lab capacity and infrastructure for antibiotic resistant pathogens, allowing public health to rapidly detect and respond to antibiotic-resistant threats. The AR Lab Network established 7 regional laboratories, which are funded to conduct advanced testing for their region. WA PHL was selected as the West regional lab and serves Washington, Oregon, California, Nevada, Hawaii, Alaska, and Guam. The AR Lab Network has built up national testing capacity for *C. auris*, through colonization screening and isolate testing and improved capacity for public health to rapidly respond to *C. auris* outbreaks.

Identification Issues

As a result of the rapid emergence of *C. auris* and its close relatedness to other *Candida* species, *C. auris* is difficult to identify with traditional diagnostic techniques. *C. auris* can only be reliably identified with Matrix Assisted Laser Desorption/Ionization Time of Flight Spectroscopy (MALDI-TOF-MS), sequencing, and Polymerase Chain Reaction (PCR) assays. Access to these advanced laboratory techniques represents a major barrier for rapid identification both nationally and globally, likely leading to underreporting of clinical cases.

Clinical labs should be aware of the species commonly misidentified species by common *Candida* identification methods and forward suspect isolates to PHL for confirmatory testing (table below). Please contact ARLN@doh.wa.gov for more information.

Identification Method	Organism *C. auris* can be misidentified as
Vitek 2 YST*	*Candida haemulonii* *Candida duobushaemulonii*
API 20C	*Rhodotorula glutinis* (characteristic red color not present) *Candida sake*
API ID 32C	*Candida intermedia* *Candida sake* *Saccharomyces kluyveri*
BD Phoenix yeast identification system	*Candida haemulonii* *Candida catenulata*
MicroScan	*Candida famata* *Candida guilliermondii*** *Candida lusitaniae*** *Candida parapsilosis***
RapID Yeast Plus	*Candida parapsilosis***

Resistance

According to *Antibiotic Resistance Threats in the United States 2019,* 90% of *C. auris* isolates are resistant to at least one antifungal and 30% of isolates are resistant to at least two. Pan-resistant strains have been reported in the US. Treatment options for fungal infections are limited, making resistance a major concern. The lack of treatment options contributes to the high mortality rate.

Risk Factors and Prevention

C. auris is more common with critical illness, indwelling medical devices, long-term acute care hospitals and skilled nursing facilities with ventilated patients, and treatment or prophylaxis with broad-spectrum antimicrobials. Overnight healthcare in areas with ongoing *C. auris* transmission (international and US settings) is also a risk factor for colonization and/or infection.

Bloodstream infection is the most common type of infection caused by *C. auris*, but other types of infection, such as urogenital, respiratory, and wound, have been reported. Symptoms of invasive infection with *C. auris* are clinically indistinguishable from other invasive infections. Lab testing is required for diagnosis. Mortality varies significantly between geographic regions and patient populations, but in the United States mortality ranges from 30% to 60%. The overall attributable mortality rate is difficult to discern because of patient comorbidities.

To prevent the spread of *C. auris*, it is vital for healthcare facilities to be aware of risk factors for acquisition, to have a robust infection prevention program, and to rapidly implement infection control precautions when a resistant organism such as *C. auris* is suspected. Hand hygiene, standard and transmission-based precautions, appropriate use of personal protective equipment, proper environmental cleaning, and reprocessing of shared equipment are all critical elements for preventing spread. Close healthcare contacts of newly identified patients with *C. auris* infection or colonization should be screened for acquisition. Point prevalence studies of entire unit or facilities may be appropriate if there is suspicion or confirmed transmission of *C. auris*. Admission screening should be considered for patients who had an overnight stay in a healthcare facility in an area with ongoing *C. auris* transmission in the previous 12 months (see figure 2 above for affected areas). Screening for *C. auris* should also be considered in patients with non-KPC carbapenemases. PHL performs this screening free of charge.

DOH is preparing for the detection of *C. auris* in Washington. *C. auris* has been reported in British Columbia and in California. Additionally, our healthcare facilities accept patients from across the world, including countries and states with ongoing transmission. Through education of healthcare facilities and local health partners, increased surveillance of *Candida* and implementation of admission screenings, WA DOH hopes to appropriately prepare partners. Labs that wish to become a *Candida* sentinel lab, and facilities that wish to implement admission screening of patients for *C. auris* should contact the DOH HAI Program at hai@doh.wa.gov.

Resources

DOH background:
https://www.doh.wa.gov/ForPublicHealthandHealthcareProviders/NotifiableConditions/Candidaauris

CDC general information: https://www.cdc.gov/fungal/candida-auris/index.html

Antibiotic Resistance Threats in the United States 2019:
https://www.cdc.gov/drugresistance/pdf/threats-report/2019-ar-threats-report-508.pdf