EMERGING INFECTIOUS DISEASES, AN UPDATE: COVID-19, MPOX & *CANDIDA AURIS*

David J. Weber, MD, MPH, FIDSA, FSHEA, FRSM (London)
Sanders Distinguished Professor of Medicine, Pediatrics and Epidemiology
Associate Chief Medical Officer
Medical Director, Hospital Epidemiology
University of North Carolina, Chapel Hill, NC

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Disclosures: Consultancy; Pfizer, Merck, Sanofi, PDI, BD, Germitec, Wellair
All drugs/vaccines issues discussed consistent with FDA approvals or authorizations

CANDIDA AURIS

EPIDEMIOLOGY

TRANSMISSION

INFECTION PREVENTION ISSUES AND MITIGATION

THERAPY

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WHO LIST OF PRIORITY DISEASES, 2015
CDC BACTERIA AND FUNGI LISTED IN 2019 AR THREAT REPORT

- Arenaviral hemorrhagic fevers (including Lassa Fever)
- Crimean Congo Hemorrhagic Fever (CCHF)
- Filoviral diseases (including Ebola and Marburg)
- Middle East Respiratory Syndrome Coronavirus (MERS-CoV)
- Other highly pathogenic coronaviral diseases (such as Severe Acute Respiratory Syndrome, (SARS)
- Nipah and related henipaviral diseases
- Rift Valley Fever (RVF)
- Severe Fever with Thrombocytopenia Syndrome (SFTS)
- Zika

- Urgent Threats: Carabpenem-resistant *Acinetobacter,* *Candida auris*, *Clostridioides difficile*, CRE, Drug resistant N. *gonorrhoeae*
- Serious Threats*:* Drug resistant *Campylobacter*, drug resistant *Candid*a, ESBL producing *Enterobacterales*, VRE, MDR-*P. aeruginosa*, drug resistant *Salmonella*, drug resistant *Salmonella* serotype Typhi, drug resistant *Shigella*, MRSA, drug resistant *S. pneumoniae*, drug resistant *M. tuberculosis*
- Concerning Threats: Erythromycin resistant Group A *Streptococcus*, Clindamycin resistant Group B *streptococcus*
- Watch List: Azole resistant *Aspergillus fumigatus*, drug resistant *Mycoplasma genitalium*, drug resistant *Bordetella pertussis*

https://www.cdc.gov/drugresistance/biggest-threats.html

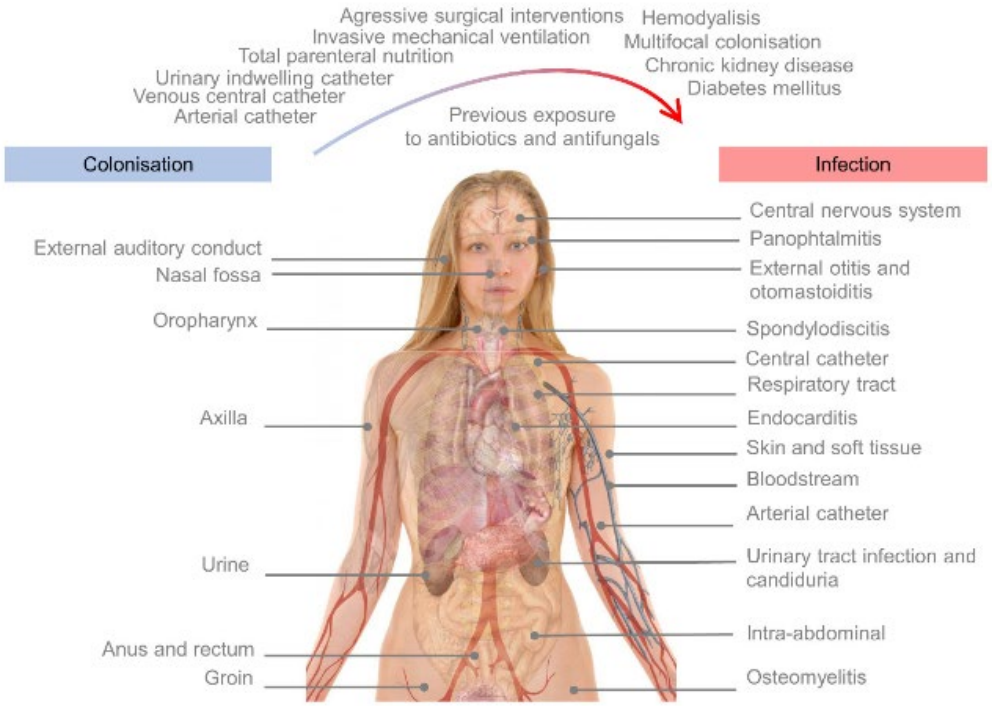
CANDIDA AURIS: AN OVERVIEW, CDC

- *Candida auris* is an emerging fungus that presents a serious global health threat for the following reasons:
  - *C. auris* is spreading geographically and increasing in incidence.
  - *C. auris* may colonize patients for months to years (no method of decolonization). Infection (usually candidemia) has a high mortality (~60%).
  - It is often multidrug-resistant (e.g., echinocandins, triazoles, polyenes {amphotericin B}). Some strains are resistant to all three available classes of antifungals.
  - It is difficult to identify with standard laboratory methods, and it can be misidentified in labs without specific technology. Misidentification may lead to inappropriate management.
  - It has caused multiple outbreaks in healthcare settings. For this reason, it is important to quickly identify *C. auris* in a hospitalized patient so that healthcare facilities can take special precautions to stop its spread.
- May 11, 2021: Updated Tracking *C. auris* to include historical and current U.S. interactive maps and downloadable datasets
- July 19, 2021: Environmental Protection Agency (EPA) has created List P, a list of EPA-registered disinfectants effective against *C. auris*
- Current needs: (1) rapid diagnostics; (2) new drugs; (3) decolonization methods; (4) registered, easy to use and effective disinfectants; (5) other tools or protocols for treatment and prevention

https://www.cdc.gov/fungal/candida-auris/index.html
https://www.cdc.gov/fungal/candida-auris/researchers-and-industry-professionals.html

CANDIDA AURIS: EPIDEMIOLOGY

- First isolated in 2009 from ear discharge of a female patient in Japan; now reported in >45 countries worldwide
- Healthcare-associated outbreaks common
- Mortality ~65%-70%
- Primarily infects the usual spectrum of compromised individuals including those with uncontrolled diabetes mellitus, chronic renal diseases, neutropenia, and those on immunosuppressive therapy, broad-spectrum antimicrobials, and those with indwelling medical devices, or at extremes of age.
- Causes an array of human diseases ranging from fungemias, surgical/nonsurgical wound infections, urinary tract infections, meningitis, myocarditis, skin abscesses, and bone infections.



Bandara N, Smaranayake L. Med Mycology 2022;60:myac008; Lone S, Ahmad A 2019;62:620-637; Garcia-Bustos V, et al. Microgoranisms 2021;9:2177

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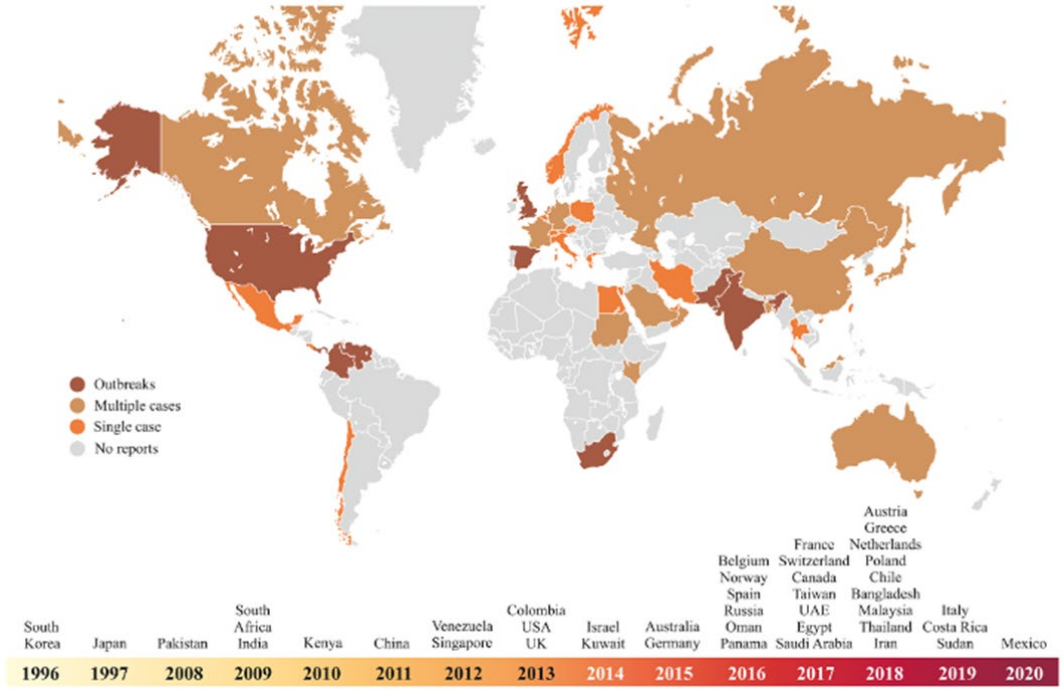
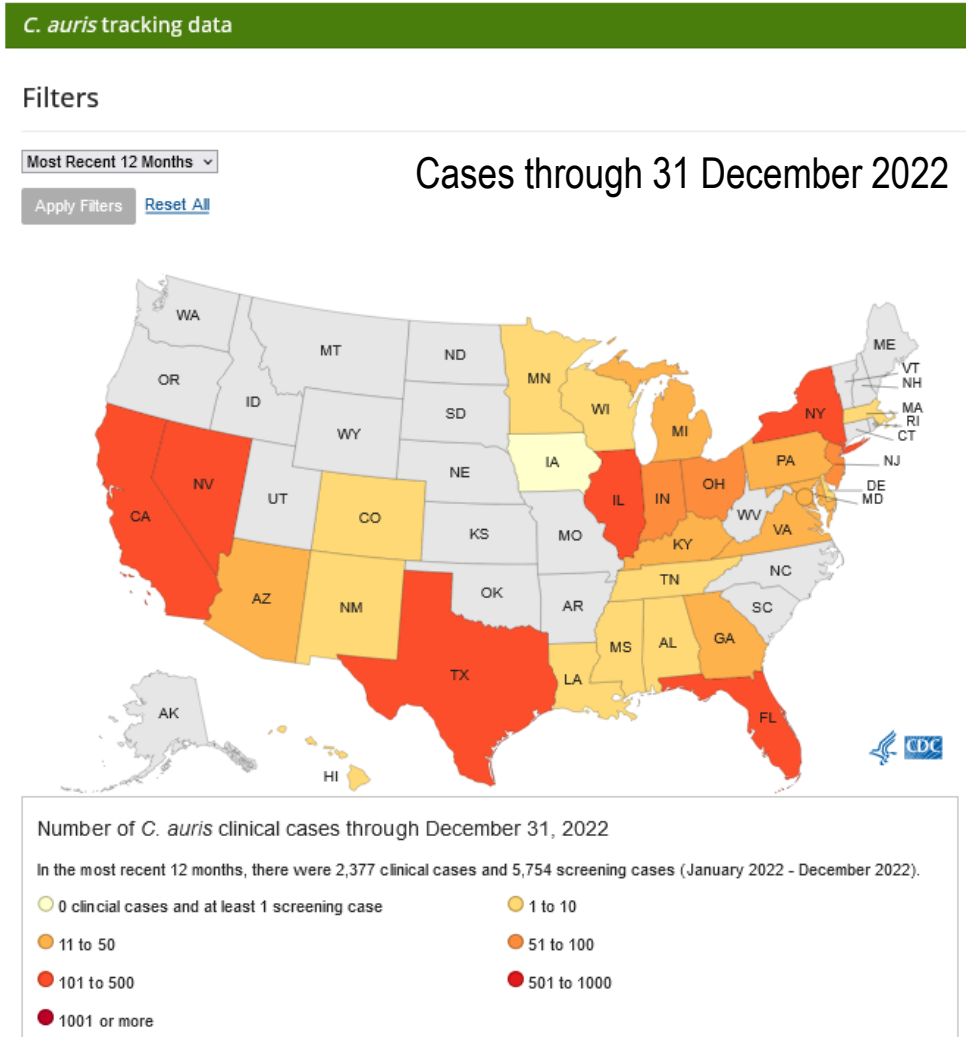
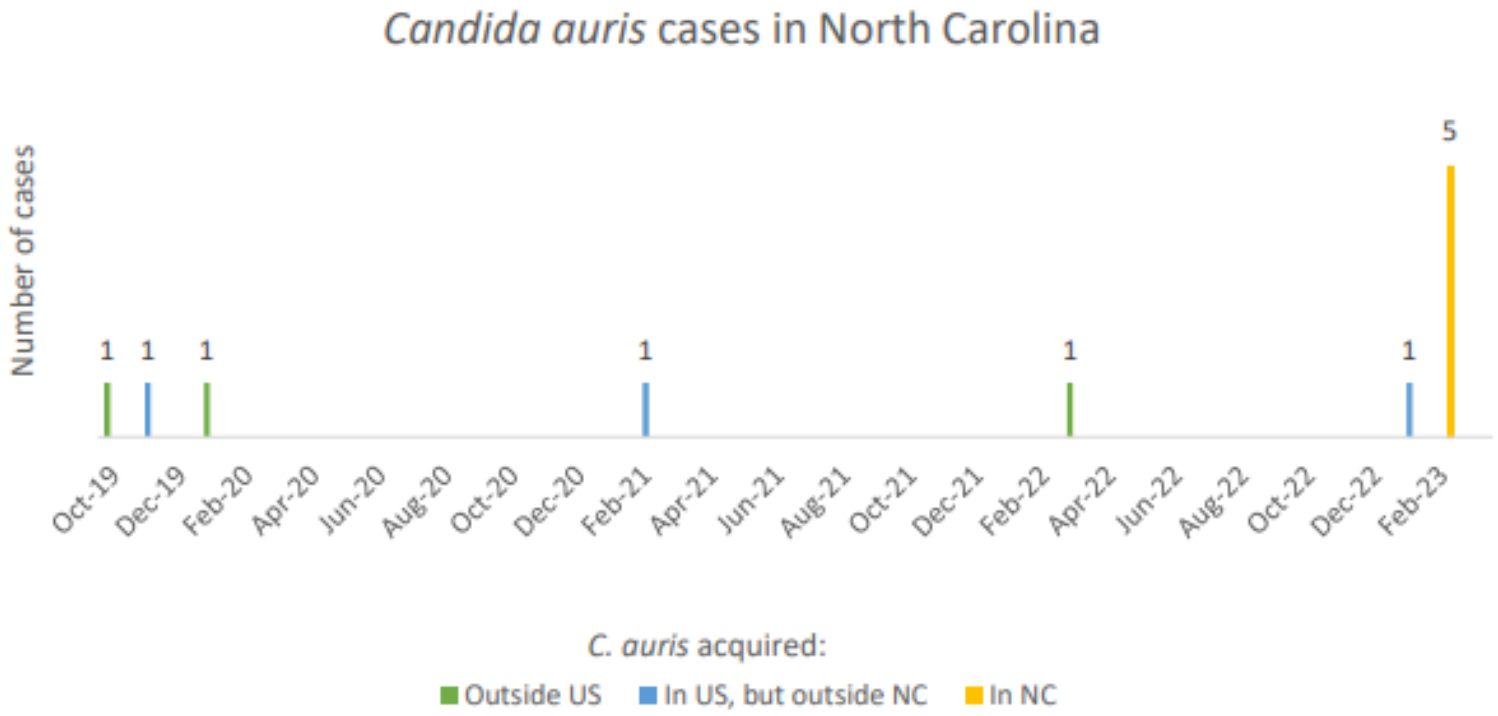
C. auris SURVEILLANCE, WORLDWIDE & US (CDC)



Chakravbarti A, Sood P. J Med Microbiol 2021;70:001318



CANDIDA AURIS, NC



30 March, 2023

Prior to February 2023, six *C. auris* cases had been reported in NC, all in patients who had acquired the organism in another state or country. Since February 2023, there have been five *C. auris* cases identified in NC residents who had no prior diagnosis or known exposure outside the state. Three of these cases were identified through screening in response to a known exposure, while two of the cases have no identified links to other reported cases. All cases occurred in individuals with serious comorbid health conditions and/or a history of prolonged hospitalization. No deaths have occurred.

Updated C auris provider memo_033023_Final.pdf

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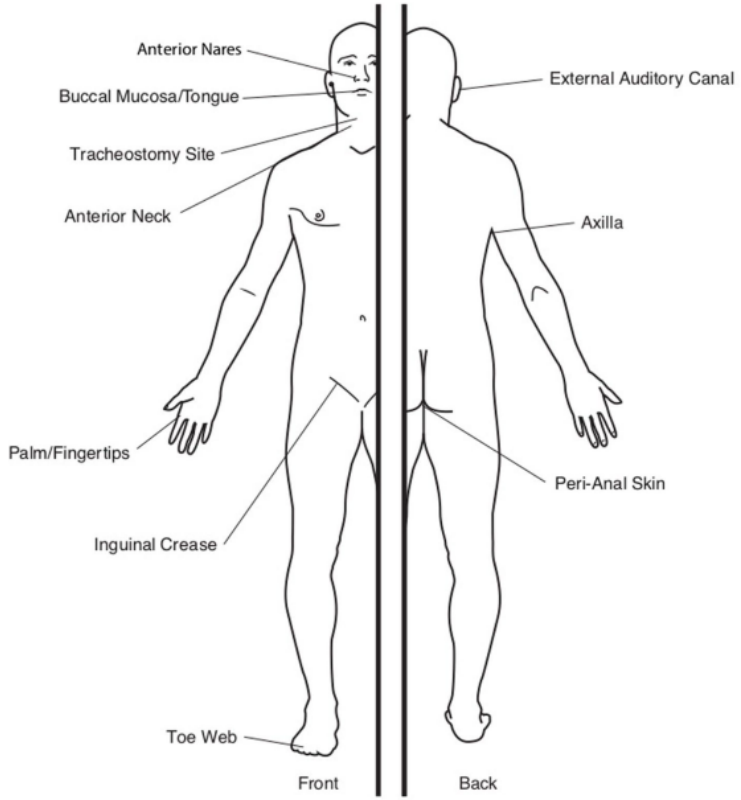
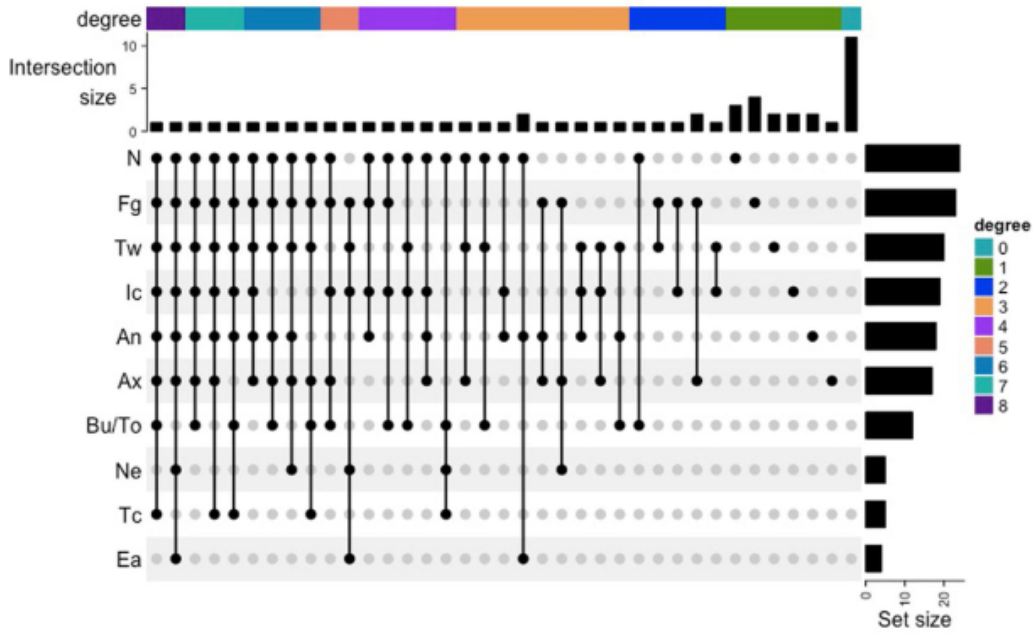
CANDIDA AURIS: COLONIZATION SITES

Extended Data



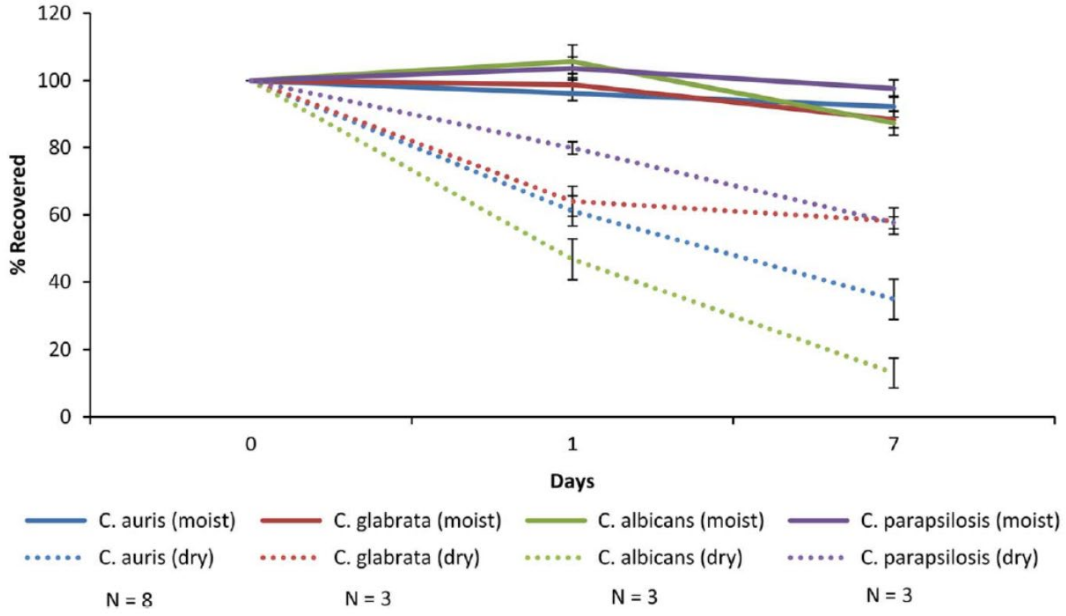
Extended Data Fig. 1 |. Map of sample sites.
We surveyed 10 body sites per subject, including the anterior nares (N), tracheostomy site (Tc), anterior neck (Ne), palms/fingertips (Fg), buccal mucosa/tongue (Bu/To), inguinal crease (Ic), axilla (Ax), toe web (Tw), external auditory canal (Ea), and peri-anal skin (An).

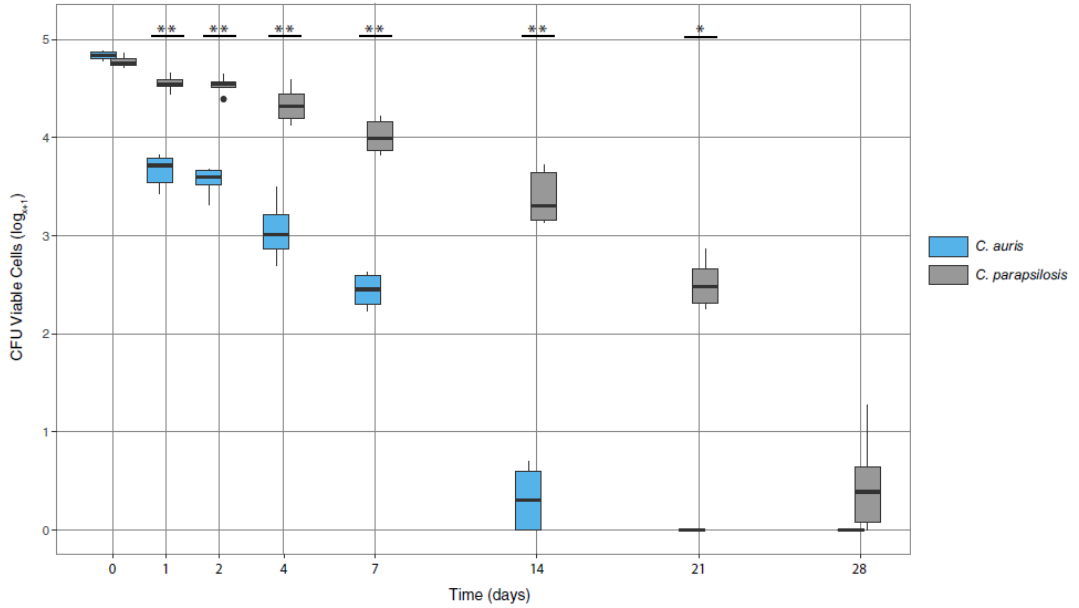


Extended Data Fig. 2 |. Patterns of body site colonization visualized with UpSetR.
Colors map to degree, a measure of the number of co-colonized sizes. A total of 36 distinct co-colonization patterns were observed, each arranged from the left to the right as a function of decreasing degree. The intersection size is the number of subjects whose body-site colonization matches the points connecting sites for each of the 36 unique co-colonization patterns. For example, the nares (N) and fingertips/palm (Fg) are more frequently mono-colonized than any of the other sites while the buccal mucosa/tongue (Bu/To), neck (Ne), tracheostomy site (Tc), and external auditory canal (Ea) are never mono-colonized. Most patients have a distinct pattern of co-colonization with the most frequent pattern being singular colonization of the nares (N) or fingertips/palm (Fg). The set size corresponds to the frequency of colonization for each site for the first time point.

Proctor DM, et al. Nat Med 2021:27:1401-1409

ENVIRONMENTAL SURVIVAL OF *CANDIDA AURIS*





Piedrahita C, et al. ICHE 2017;38:1107-1109

Welsh RM, et al. J Clin Microbiol 2017;55:2996-3005

First hospital outbreak of the globally emerging *Candida auris* in a European hospital

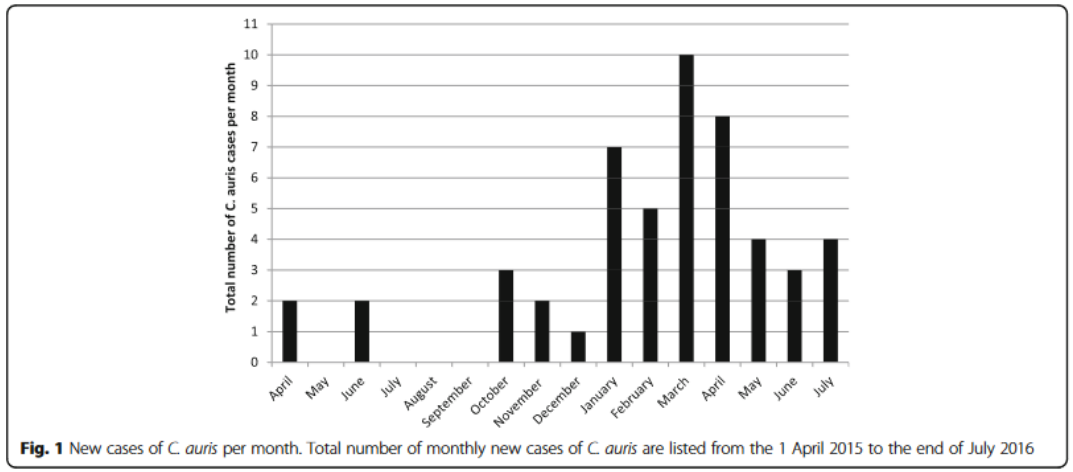


Fig. 1 New cases of *C. auris* per month. Total number of monthly new cases of *C. auris* are listed from the 1 April 2015 to the end of July 2016

CDC

- The risk of *C. auris* infection to otherwise healthy people, including healthcare personnel, is very low.
- At this time, HCP do not need to be tested for *C. auris* unless they are identified as a possible source of transmission to patients

https://www.cdc.gov/fungal/candida-auris/c-auris-health-qa.html

- As healthcare workers (HCW) have been implemented in the transmission of other Candida species in the past we have undertaken an extensive staff screening program involving doctors, nurses, physiotherapists, catering and cleaning staff, dieticians, a Chaplin and ward administrators. Staff hands (agar impression plates), nose, axilla, groin and throat swabs were analyzed for the presence of *Candida*. Only one out of 258 HCW screened were found to have a *C. auris* positive nose swab (all other samples were negative). This nurse had been caring for a heavily C. auris colonized patient. After a five day decolonization protocol with chlorhexidine washes, nasal ointment and oral nystatin medication (as described below) repeat microbiology samples were negative suggesting transient carriage only

Schelenz S, et al. Antimicrob Resistant Infect Control 2016;5:35

DIAGNOSIS AND TREATMENT: OVERVIEW

- Sites for screening cultures = axilla and groin
  - Screening recommended in healthcare facilities is index patient and if not isolated, screen patients in close proximity
  - Patients hospitalized abroad of ≥1 day within past 12 months
- *C. auris* grows on bacterial media (chocolate and blood); *C. auris* grows on most fungal media (Sabouraud dextrose agar preferred), with the exception of mycobiotic agar (inhibited by cycloheximide)
- Fungitell assay, which looks for β-D-Glucan in serum, has a lower sensitivity for *C. auris* candidemia than other *Candida* species in limited studies(43-60%)
- Isolates of *C. auris* can be readily identified by MALDI-TOF but may be misidentified by Vitek 2 YST, API 20C, API ID 32C, BD Phoenix yeast identification system, MicroScan, and RapID yeast Plus
- Antifungal Susceptibility Testing
  - There are currently no established *C. auris* specific breakpoints
  - CDC has suggested MIC breakpoints based on previous data and interpretations from other related *Candida* spp.
  - Caspofungin may display an “Eagle effect,” which may lead to false resistance interpretations, especially if other echinocandins are not tested
- Echinocandin = drug of choice (but resistance possible)

Novel Therapeutic Approaches to Invasive Candidiasis

Scenarios	Indications	Rezafungin	Ibrexafungerp	Fosmanogepix
Multiple resistance	*FKS*-mutant *C. glabrata* and *C. auris*	X	O	O
Need of prolonged therapy and project of hospital discharge	Complicated IC	O	O	O
Uncontrolled source of infection	Intra-abdominal candidiasis	O	O	O
Sanctuary sites of infection	CNS or eye infection	X	X	O

Figure 1 Potential place of novel antifungal agents for the treatment of IC.
Abbreviations: *FKS*, genes encoding the (1,3)-beta-D-glucan synthase; CNS, central nervous system; O (green), good candidate; X (red), not an option.

Ibrexafungerp now FDA approved for vulvovaginal candidiasis

Table 2 Advantages and Limitations of Novel Antifungal Drugs for IC

Antifungal Drug	Advantages	Limitations
Rezafungin	Fungicidal Prolonged half-life (once weekly administration)	Intravenous only Lack of penetration in CNS and eye Not appropriate for short-course or initial empirical therapy (potential risk of resistance because of prolonged effect)
Ibrexafungerp	Fungicidal Oral mode of administration Compared to echinocandins, extended spectrum against a majority of echinocandin-resistant *Candida* isolates	Oral bioavailability may be affected in some patients (e.g., proton pump inhibitors, gastro-intestinal disorders) Lack of penetration in CNS and eye
Fosmanogepix	Oral and intravenous mode of administration Efficient against most azole and echinocandin resistant *Candida* isolates Acceptable penetration in CNS and eye	Fungistatic effect Poor or limited efficacy against some *Candida* spp. (*C. krusei, C. kefyr*)

Abbreviation: CNS, central nervous system.

Lamoth F
Infection and Drug Resistance
2023;16:1087-1097

Key interventions recommended (or to be considered) by select governmental agencies to prevent transmission of *Candida auris*

Agency (country/ region)	Active surveillance population	Hand hygiene	Isolation	Transmission-based precautions	Environmental disinfection	Additional special measures	Reference
Centers for Disease Control and Prevention (USA)	Contacts of newly identified case patients. Patients with an overnight stay in a healthcare facility outside of the USA in the previous year	Alcohol-based hand rub, or soap and water if hands are visibly soiled	Single room or cohorting with another patient with *C. auris*	Standard and contact precautions, for the duration of colonization, perhaps indefinitely	Use a disinfectant active against *Clostridioides difficile* spores	Minimize the number of care providers	[91]
Public Health England (UK)	Patients admitted from affected hospitals within the UK or from hospitals in countries reporting outbreaks. Close contacts in intensive care settings or contacts of patients prior to implementation of isolation procedures	Soap and water followed by alcohol-based hand rub	Single room or cohorting for colonized or infected patients or pending screening from high-risk areas	Contact precautions	Post-discharge terminal cleaning with sodium hypochlorite disinfectant, with or without no-touch disinfection	Single-use medical equipment; chlorhexidine skin washes for critically ill patients, mouth gargle with chlorhexidine, and topical nystatin and terbinafine at key sites	[92]
European Centre for Disease Prevention and Control (Europe)	Patients recently admitted or transferred from hospitals with detected *C. auris* case. Close contact patients	–	Single room or cohorting	Contact precautions	Post-discharge terminal cleaning with chlorine-based disinfectants, hydrogen peroxide or other disinfectants with fungicidal activity	Staff cohorting. Single-use equipment or cohorting of equipment among cases	[61•]
Centre for Opportunistic, Tropical and Hospital Infections (South Africa)	Routine screening on admission not recommended	Soap and water followed by alcohol-based hand rub	Single room or cohorting	Standard and contact precautions	Environmental cleaning with a chlorine-based disinfectant and consider hydrogen peroxide vapor for no-touch disinfection after terminal cleaning	Off-unit procedures should be scheduled for last case of the day, followed by thorough cleaning	[93]

Synder GM Wright SB. Curr Infectiious Dis Report 2019;21:19

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Infection Prevention and Control for *Candida auris*

- Hand Hygiene: HCP should follow standard hand hygiene practices. Alcohol-based hand sanitizer (ABHS) is the preferred hand hygiene method for *C. auris* when hands are not visibly soiled. If hands are visibly soiled, wash with soap and water.
- Transmission Based Precautions: Private room with bathroom, contact isolation (gloves & gown)
  - Duration of precautions: Patients often remain colonized with *C. auris* for many months, perhaps indefinitely, even after an acute infection (if present) has been treated and resolves. Continue precautions for entire duration of stay.
  - CDC does not recommend routine reassessments for *C. auris* colonization. At this time, no specific intervention is known to reduce or eliminate *C. auris* colonization.
- Disinfection: *C. auris* can persist on surfaces in healthcare environments for days to months.
  - Perform thorough routine (at least daily) and terminal cleaning and disinfection of patients' rooms and other areas where patients receive care (e.g., radiology, physical therapy) using an appropriate disinfectant. Clean and disinfect shared or reusable equipment (e.g., ventilators, physical therapy equipment) after each use. Label cleaned and disinfected equipment as such and store it away from dirty equipment. Data indicate that products solely dependent on quaternary ammonia compounds (QACs) are NOT effective. Use an EPA–registered hospital-grade disinfectant effective against *C. auris* (List P). Consider a "no touch" method (e.g., UV-C) as a supplement to standard disinfection (run at *C. difficile* cycle time).
- Other: 1) Educate HCP about appropriate precautions; 2) Ensure adequate supplies are available; 3) Monitor compliance with HH & disinfection (provide feedback); 4) Ensure proper signage on door; 5) Flag the patient's record; 6) Consider patient screening and lab surveillance.

https://www.cdc.gov/fungal/candida-auris/c-auris-infection-control.html

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UNC Medical Center strategy for control:

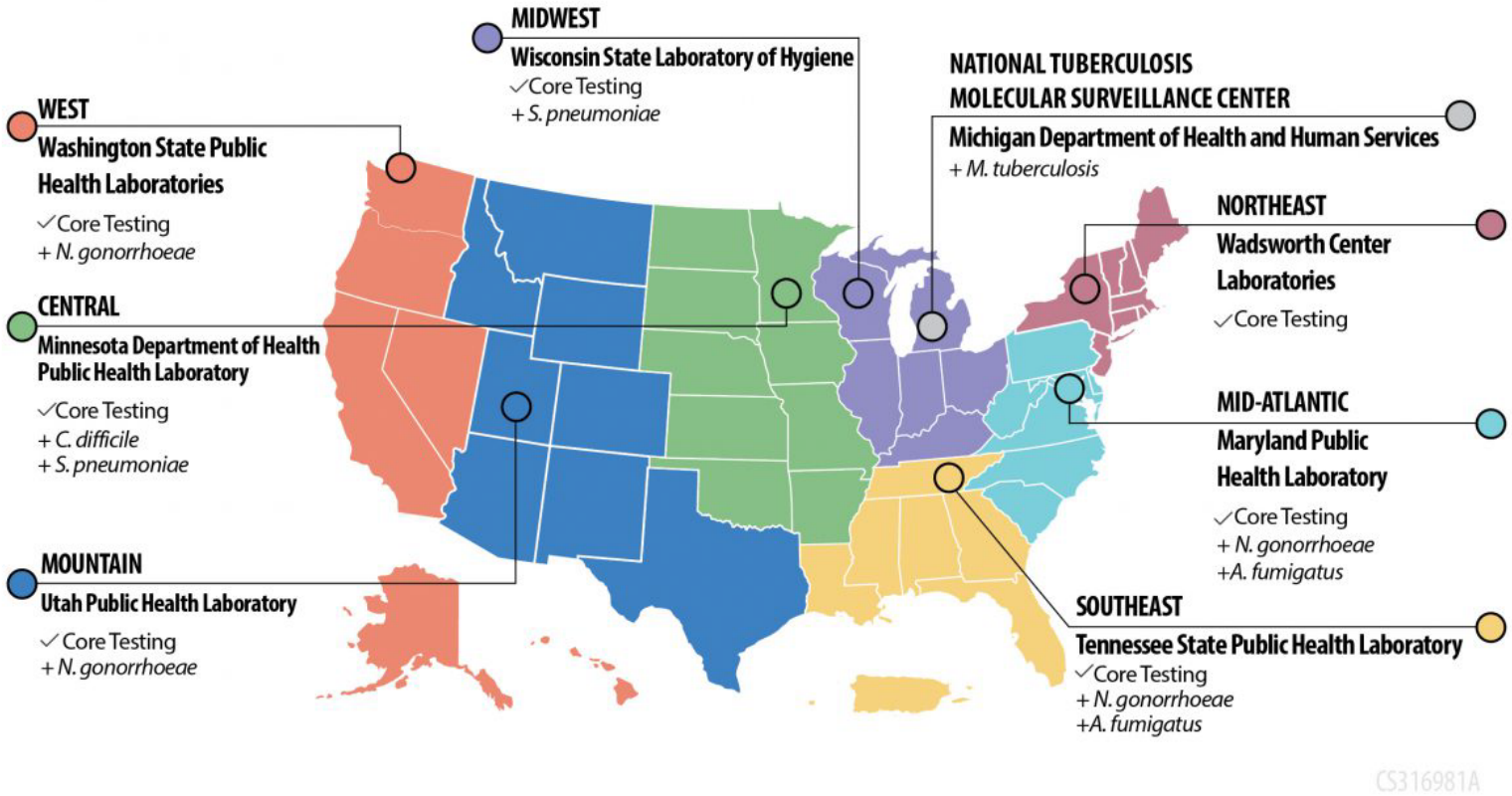
- Patient's chart flagged before arrival to UNC Medical Center.
- Service lines caring for the patient have been communicated with directly.
- Infection Prevention has partnered with nursing staff, environmental services, patient transport, ICU transport, house supervisors, patient logistics center and ancillary areas the patient may visit.
- Patient placed on Enteric Precautions to ensure proper room cleaning daily with bleach and bleach + UV upon discharge.
- Alcohol based hand rubs are effective.
- Microbiology lab has been notified and has developed algorithm for identification.

PUBLIC HEALTH SCREENING FOR *C. AURIS*

- CDC recommendations – Consider screening patients who are at high risk for *C. auris* including:
  - Close healthcare contacts of patients with newly identified *C. auris* infection or colonization.
  - Patients who have had an overnight stay in a healthcare facility outside the US in the previous one year, especially if in a country with documented *C. auris* cases. Strongly consider screening when patients have had such inpatient healthcare exposures outside the US and have infection or colonization with CRE. *C. auris* co-colonization has been observed regularly.
  - Screen roommates at healthcare facilities, including nursing homes, where the index patient resided in the previous month. Ideally, identify and screen roommates of the index patient even if they were discharged from the facility. Consider also screening patients who require higher levels of care (e.g., mechanical ventilation) and who overlapped on the ward or unit with the index patient for 3 or more days, as these patients are also at substantial risk for colonization
  - Screen for *C. auris* colonization using a composite swab of the patient's bilateral axilla and groin. Although patients have been colonized with *C. auris* in the nose, mouth, external ear canals, urine, wounds, and rectum, these sites are usually less sensitive for colonization screening.
- NC DHHS, 2/24/23
  - Screen any inpatient who have had an overnight stay in a healthcare facility outside the U.S. in the past 12mo for *C. auris*.

https://www.cdc.gov/fungal/candida-auris/c-auris-screening.html

C. auris Surveillance



https://www.cdc.gov/drugresistance/ar-lab-networks/domestic/testing-details.html

COVID-19

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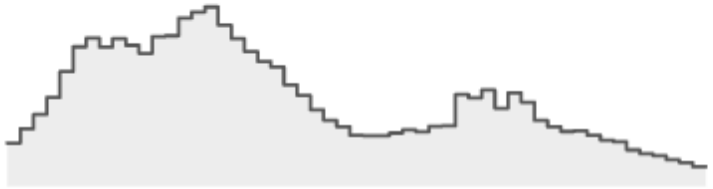
COVID-19: CASES, TEST POSITIVITY, DEATHS, US

Weekly cases

April 6 to 12 | 14-day change

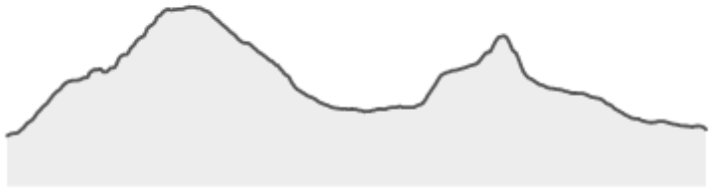
101,145 | −26%



Test positivity rate

Avg. on April 17 | 14-day change

5.9% | −7%



Weekly deaths

April 6 to 12 | 14-day change

1,327 | −13%

Primary series vaccination rate

69% Total population

94% Ages 65 and up

About this data

Bivalent booster rate

17% Total population

43% Ages 65 and up

A bivalent booster is recommended for adults and most children if it has been at least two months since their last dose.

https://www.nytimes.com/interactive/2023/us/covid-cases.html

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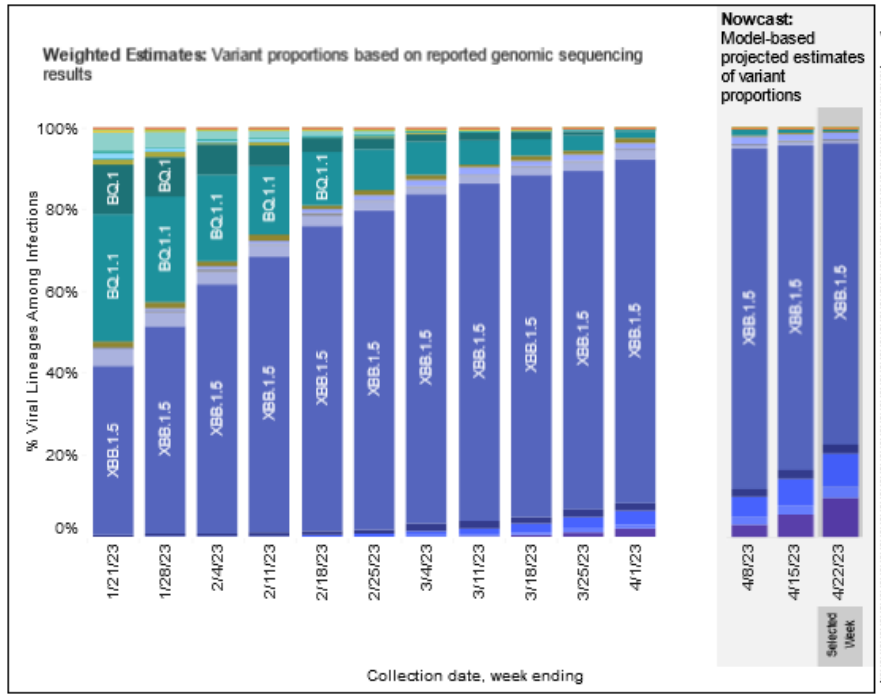
COVID-19 VARIANTS, US

Weighted and Nowcast Estimates in United States for Weeks of 1/15/2023 – 4/22/2023

Hover over (or tap in mobile) any lineage of interest to see the amount of uncertainty in that lineage's estimate.



Nowcast Estimates in United States for 4/16/2023 – 4/22/2023

USA

WHO label	Lineage #	US Class	%Total	95%PI
Omicron	XBB.1.5	VOC	73.6%	69.6-77.3%
	XBB.1.16	VOC	9.6%	6.7-13.6%
	XBB.1.9.1	VOC	7.9%	6.1-10.1%
	XBB.1.9.2	VOC	2.9%	2.1-4.0%
	XBB.1.5.1	VOC	2.2%	1.7-2.8%
	FD.2	VOC	1.6%	0.7-3.2%
	XBB	VOC	1.0%	0.6-1.8%
	BQ.1.1	VOC	0.7%	0.4-1.1%
	CH.1.1	VOC	0.4%	0.2-0.5%
	BQ.1	VOC	0.1%	0.0-0.1%
	BN.1	VOC	0.0%	0.0-0.0%
	BA.5	VOC	0.0%	0.0-0.0%
	BA.2.75	VOC	0.0%	0.0-0.0%
	BA.2	VOC	0.0%	0.0-0.0%
	BF.7	VOC	0.0%	0.0-0.0%
	BA.2.75.2	VOC	0.0%	0.0-0.0%
	BA.5.2.6	VOC	0.0%	0.0-0.0%
	BF.11	VOC	0.0%	0.0-0.0%
	BA.4.6	VOC	0.0%	0.0-0.0%
Other	Other*		0.1%	0.0-0.1%

* Enumerated lineages are US VOC and lineages circulating above 1% nationally in at least one week period. "Other" represents the aggregation of lineages which are circulating <1% nationall during all weeks displayed.

BA.1, BA.3 and their sublineages (except BA.1.1 and its sublineages) are aggregated with B.1.1.529. Except BA.2.12.1, BA.2.75, XBB and their sublineages, BA.2 sublineages are aggregatec with BA.2. Except BA.2.75.2, CH.1.1 and BN.1, BA.2.75 sublineages are aggregated with BA.2.75. Except BA.4.6, sublineages of BA.4 are aggregated to BA.4. Except BF.7, BF.11, BA.5.2.6, BQ.1 and BQ.1.1, sublineages of BA.5 are aggregated to BA.5. Except the lineages shown and their sublineages, sublineages of XBB are aggregated to XBB. Except XBB.1.5.1 and FD.2, sublineages c XBB.1.5 are aggregated to XBB.1.5. For all the other lineages listed, their sublineages are aggregated to the listed parental lineages respectively. Previously, XBB.1.9.2 and XBB.1.16 were aggregated to XBB; FD.2 was aggregated to XBB.1.5. Lineages BA.2.75.2, XBB, XBB.1.5, XBB.1.5.1, FD.2, XBB.1.9.1, XBB.1.9.2, XBB.1.16, BN.1, BA.4.6, BF.7, BF.11, BA.5.2.6 and BQ.1.1 contain the spike substitution R346T.

https://covid.cdc.gov/covid-data-tracker/#variant-proportions

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OMICRON XBB.1.16 IN CHILDREN, INDIA

India: Study describes key clinical characteristics of SARS-CoV-2 infected children, visiting an outdoor department of a pediatric hospital in a north Indian city. Preliminary findings show a higher involvement of young infants than older children and mild respiratory illness predominates other presentations. One interesting finding was the presence of itchy, non-purulent conjunctivitis with mucoid discharge and stickiness of eyelids in 42.8% of positive infants. None of the children required hospitalization. All recovered with symptomatic treatment.

Clinical features	0-59 months (n=22)	>60 months (n=3)
Fever	22 (100%)	3 (100%)
High fever (>102°F)	2 (9.1%)	00
Rhinorrhea	17 (72.3%)	1 (33.3%)
Conjunctival involvement	09 (40.9%)	00
Throat pain	00	1 (33.3%)
Cough	13 (59.1%)	2 (66.7%)
Crepitations/rhonchi on auscultation	10 (45.5%)	00
Loose stools	4 (18.2%)	00
Vomiting	6 (27.3%)	1 (33.3%)
Pain in abdomen/colic	6 (27.3%)	00
Fine rash	2 (9.1%)	00
Muscle pains and body aches	0	2 (66.7%)
Headache	0	2 (66.7%)

Table II. Clinical Characteristics of young and older children with COVID-19 Illness

Vashishtha VM, et al.
https://www.medrxiv.org/content/10.1101/2023.04.18.23288715v1.full.pdfhttps://www.medrxiv.org/content/10.1101/2023.04.18.23288715v1.full.pdf

OMICRON XBB.1.16 IN CHILDREN, INDIA

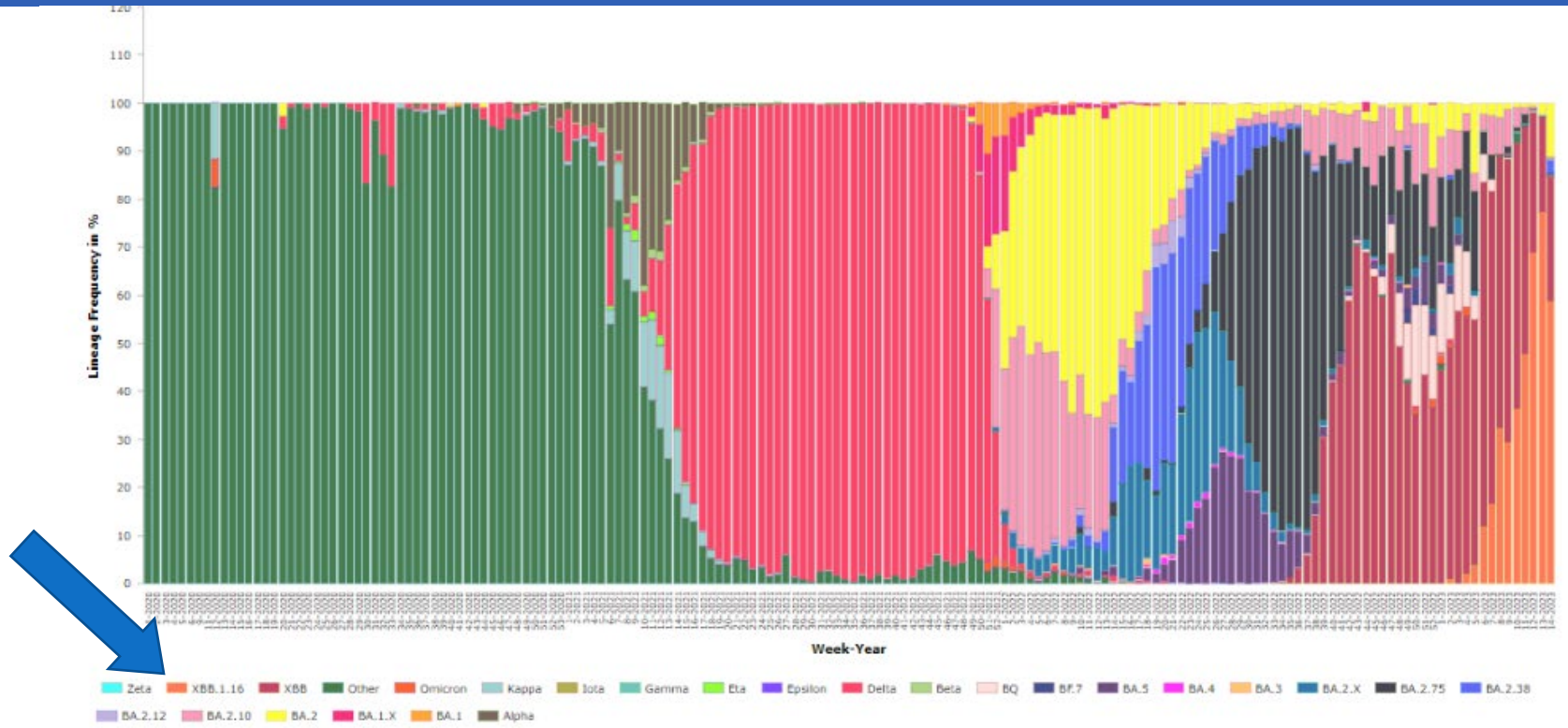

Figure 1. Various lineages of Severe Acute Respiratory Syndrome Corona Virus-2 (SARS-CoV2) at different time point in India (Source: INSACOG)

Vashishtha VM, et al.
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Virological characteristics of the SARS-CoV-2 Omicron XBB.1.16 variant

At the end of March 2023, XBB.1.16, a SARS-CoV-2 omicron XBB subvariant, emerged and was detected in various countries. Compared to XBB.1.5, XBB.1.16 has two substitutions in the S protein: E180V is in the N-terminal domain, and T478R in the receptor-binding domain (RBD). We first show that XBB.1.16 had an effective reproductive number (Re) that was 1.27- and 1.17-fold higher than the parental XBB.1 and XBB.1.5, respectively, suggesting that XBB.1.16 will spread worldwide in the near future. In fact, the WHO classified XBB.1.16 as a variant under monitoring on March 30, 2023. Neutralization assays demonstrated the robust resistance of XBB.1.16 to breakthrough infection sera of BA.2 (18-fold versus B.1.1) and BA.5 (37-fold versus B.1.1). We then used six clinically-available monoclonal antibodies and showed that only sotrovimab exhibits antiviral activity against XBB subvariants, including XBB.1.16. Our results suggest that, similar to XBB.1 and XBB.1.5, XBB.1.16 is robustly resistant to a variety of anti-SARS-CoV-2 antibodies. Our multiscale investigations suggest that XBB.1.16 that XBB.1.16 has a greater growth advantage in the human population compared to XBB.1 and XBB.1.5, while the ability of XBB.1.16 to exhibit profound immune evasion is comparable to XBB.1 and XBB.1.5. The increased fitness of XBB.1.16 may be due to (1) different antigenicity than XBB.1.5; and/or (2) the mutations in the non-S viral protein(s) that may contribute to increased viral growth efficiency

Yamasoba D, et al. https://www.biorxiv.org/content/10.1101/2023.04.06.535883v3.full.pdf

MPOX

TRANSMISSION

EPIDEMIOLOGY

VACCINE EFFECTIVENESS AND COVERAGE

TREATMENT

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Mpox in Young Woman with No Epidemiologic Risk Factors, Massachusetts, USA

We describe a case of mpox characterized by a circularly distributed facial rash but no identified risk factors. Fomite transmission of mpox virus from contaminated linen at a massage spa was suspected. Clinicians should consider mpox in patients with consistent clinical syndromes, even in the absence of epidemiologic risk factors.

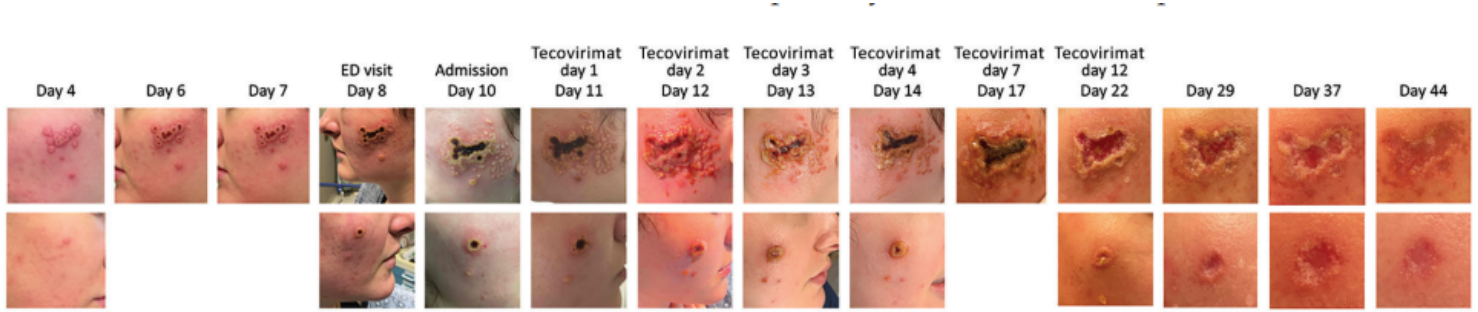

Figure. Progression of facial rash during mpox in a young woman in the absence of epidemiologic risk factors, Massachusetts, USA. Days since rash onset or beginning tecovirimat therapy are indicated. The rash began with pruritic erythematous macules on the bilateral infraorbital and malar areas, lower cutaneous lip, and chin and, by day 4, had progressed to vesicles followed by pustules on day 6 (top row, left cheek; bottom row, right cheek). On day 8 after rash onset, the patient had multiple confluent ulcers; macerated rolled borders were observed on the left cheek, and a single, large, deep-seated ulcer that had raised borders and a central hemorrhagic crust was observed on the right cheek. Satellite blisters and papules were present at early stages of ulcer development. The patient was started on tecovirimat on day 11 after rash onset, after which her lesions continued to evolve and had eventual loss of central eschar but persistent exudative, macerated borders by day 12 of tecovirimat therapy (day 22 after rash onset). Smaller lesions were treated with mupirocin ointment and dressed with loose gauze coverings. Toward the end of her 14-day treatment course (day 22), the escharotic ulcers developed granulated tissue. Ulcers had abundant granulated tissue and no central eschar and had begun to reepithelialize ≈2 weeks after completion of therapy (day 37).

Siedner MJ, et al
EID 2023;29:846

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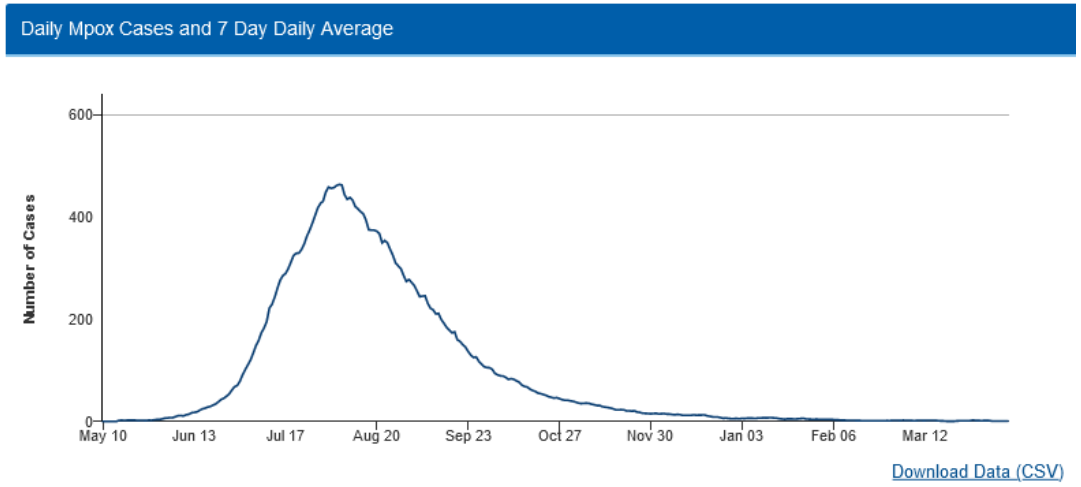
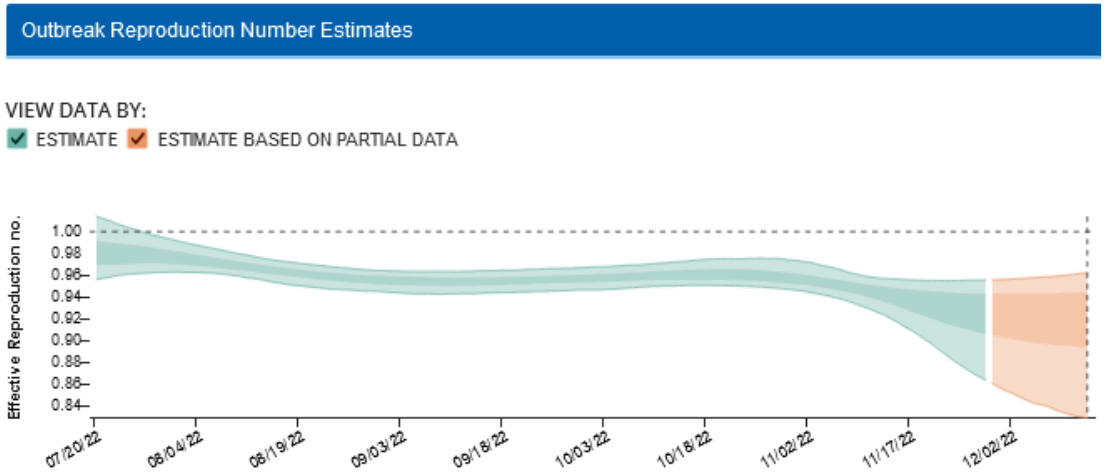
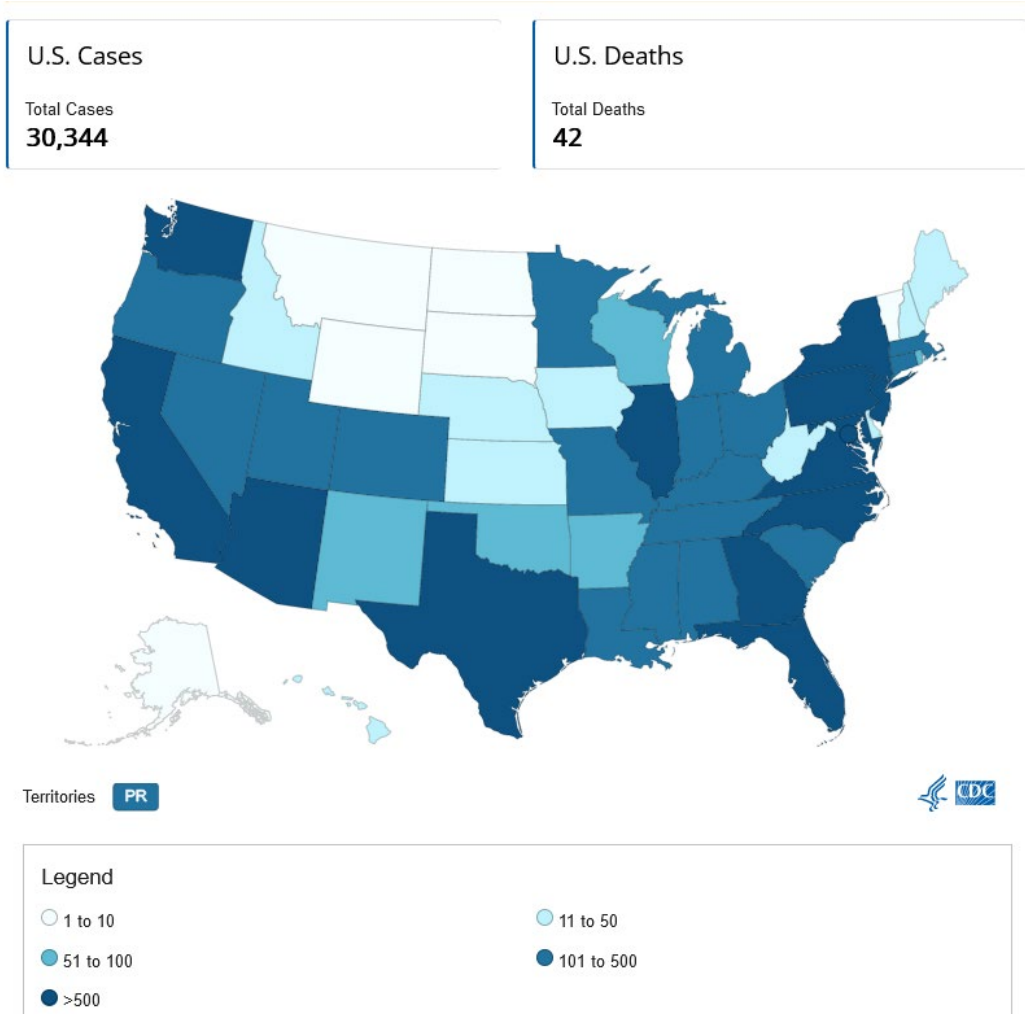
CDC, US MAP AND CASE COUNT, 12 APRIL 2023







https://www.cdc.gov/poxvirus/mpox/response/2022/us-map.html

Risk Assessment of Mpox Resurgence and Vaccination Considerations

Summary: The 2022 mpox outbreak in the US has receded to very low levels. However, most jurisdictions in the US may be at risk of resurgence or new mpox outbreaks without continued efforts to vaccinate people at risk, based on new modeling analyses. The chance of an outbreak and its predicted size will likely increase over time without continued efforts to vaccinate people at highest risk of mpox exposure.

Background: The 2022 mpox outbreak in the US has slowed to about one case per day, down from a peak of about 460 cases per day on average in early August 2022.The outbreak has likely slowed because of a combination of vaccination, infection-induced immunity, and temporary changes in sexual behavior.

https://www.cdc.gov/poxvirus/mpox/response/2022/risk-assessment-of-resurgence.html

Assessment: If mpox reintroduction occurs and no additional vaccination or sexual behavior adaptations occur, the risk of a resurgent mpox outbreak is greater than 35% in most jurisdictions in the US. Resurgent outbreaks in these communities could be as large or larger than the 2022 outbreak. This is because immunity is relatively low in populations who are highly affected, including sexually active MSMs in these jurisdictions. In jurisdictions where immunity is higher in these populations, the risk is anticipated to be low over the next year, although a renewed outbreak could occur. These jurisdictions include most jurisdictions that had large mpox outbreaks in 2022, such as CA, DC, IL, and NY.

The chance of a new outbreak and its predicted size will grow over time as new, never-vaccinated or never-infected people become sexually active, reducing overall population immunity. In jurisdictions with high levels of vaccination coverage (>75%), and therefore population immunity, the risk of a renewed mpox outbreak is 5%–12% each year over the next five years if mpox reintroduction occurs. Outbreaks could average only <15% of the 2022 outbreak size, even in the absence of additional vaccination or sexual behavior adaptations after an outbreak emerges. In jurisdictions with low levels of vaccination coverage (<35%) with at least one dose, which includes most U.S. jurisdictions, resurgent outbreaks are more likely (>35% risk of occurring given reintroduction). Outbreaks could be as large or larger than the 2022 outbreak if no additional vaccination or sexual behavior adaptations take place.