# Antimicrobial Resistance Lab Network Updates 2021

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APHL-CDC Antimicrobial Resistance Fellow
Wisconsin State Laboratory of Hygiene

## Outline

- Introduction
- Submission Guidelines
- Summary of 2020 Data
  - Recent and noteworthy outbreaks
- Ongoing and Upcoming Surveillance Activities

VIRGINIA TECH

VIRGINIA TECH

# N-(3-oxododecanoyl)-L-homoserine lactone interactions in the breast tumor microenvironment: Implications for breast cancer viability and proliferation in vitro

Brittany N Balhouse [1 2], Logan Patterson [3 4], Eva M Schmelz [5], Daniel J Slade [3], Scott S Verbridge [1 2]

UNIVERSITY of VIRGINIA | SCHOOL of MEDICINE

UNIVERSITY of VIRGINIA | SCHOOL of MEDICINE

**Glucosylceramide production maintains colon integrity in response to Bacteroides fragilis toxin–induced colon epithelial cell signaling**

Logan Patterson [1], Jawara Allen [2], Isabella Posey [3], Jeremy Joseph Porter Shaw [1], Pedro Costa-Pinheiro [1], Susan J Walker [4], Alexis Gademsey [4], Xinqun Wu [2], Shaoguang Wu [2], Nicholas C Zachos [2], Todd E Fox [4], Cynthia L Sears [2], Mark Kester [4]

UNIVERSITY of VIRGINIA | SCHOOL of MEDICINE

Dr. Melinda Poulter, PhD, D(ABMM)

Director, Clinical Microbiology

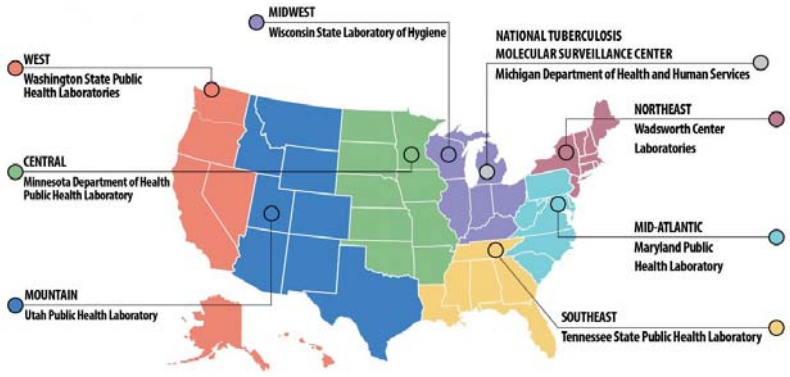
Dr. Amy Mathers, MD

Associate Director, Clinical Microbiology

Medical Director Antimicrobial Stewardship

https://www.reuters.com/investigates/special-report/health-coronavirus-hospital-test/

ARLABnetwork




https://www.cdc.gov/drugresistance/laboratories.html

# The AR Lab Network

- Core testing by all regional labs
  - Molecular testing to detect colonization of carbapenem-resistant *Enterobacteriaceae* (CRE)

https://www.cdc.gov/drugresistance/pdf/About-ARLN-Map-H.pdf

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  - Detection of new and emerging threats

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  - Fungal susceptibility of *Candida* species to identify emerging resistance

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  - Identification and colonization screening to detect and help prevent spread of *Candida auris*

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  - Perform expanded susceptibility testing to determine if new drugs or drug combinations will be effective to treat rare resistant pathogens

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  - Perform expanded susceptibility testing to determine if new drugs or drug combinations will be effective to treat rare resistant pathogens
  - Isolates may be used for the CDC and FDA AR Isolate Bank and WGS projects

https://www.cdc.gov/drugresistance/pdf/About-ARLN-Map-H.pdf

# The AR Lab Network

- Additional testing
  - Antimicrobial susceptibility and serotyping of multidrug-resistant *Streptococcus pneumoniae* (WI and MN)

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  - Test CRE and carbapenem-resistant *Pseudomonas aeruginosa* (CRPA) isolates for resistance mechanisms and antimicrobial susceptibility (AST)

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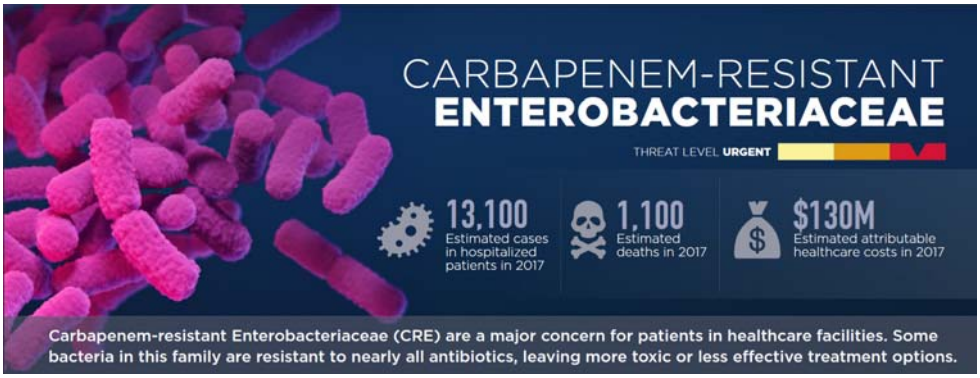
  - Antimicrobial susceptibility and serotyping of multidrug-resistant *Streptococcus pneumoniae* (WI and MN)
  - Test CRE and carbapenem-resistant *Pseudomonas aeruginosa* (CRPA) isolates for resistance mechanisms and antimicrobial susceptibility (AST)
    - Modified carbapenem inactivation method (mCIM), PCR, AST, and whole genome sequencing (WGS)

https://www.cdc.gov/drugresistance/pdf/About-ARLN-Map-H.pdf

# Carbapenem-resistant *Enterobacteriaceae* (CRE)




https://www.cdc.gov/drugresistance/pdf/threats-report/CRE-508.pdf

# Carbapenem-resistant *Enterobacteriaceae* (CRE)

- Carbapenem-resistant *Enterobacteriaceae* (CRE)
  - CRE can carry mobile genetic elements that are easily shared between bacteria
    - Approximately 30% of CRE carry a mobile genetic element that make carbapenem antibiotics ineffective
  - Patients who require devices (e.g., catheters) and patients taking long courses of antibiotics are the most at risk

| Organism | Isolates |
|---|---|
| *Enterobacter spp.* | 176 |
| *Klebsiella spp.* | 165 |
| *Escherichia coli* | 77 |
| *Citrobacter freundii* | 24 |
| *Proteus mirabilis* | 16 |
| *Raoultella ornithinolytica* | 13 |
| *Serratia marcescens* | 11 |
| *Providencia rettgeri* | 8 |
| *Morganella morganii* | 7 |
| *Hafnia alvei* | 3 |
| *Pseudomonas aeruginosa* | 4 |
| Misc. | 4 |
| *Citrobacter koseri* | 1 |
| *Providencia stuartii* | 1 |
| **Total** | **510** |

https://www.cdc.gov/drugresistance/pdf/threats-report/CRE-508.pdf

# AR surveillance and submission guidelines

- Carbapenem-resistant *Enterobacteriaceae* (CRE)
  - Resistant to any carbapenem

# AR surveillance and submission guidelines

- Carbapenem-resistant *Enterobacteriaceae* (CRE)
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  - Screen positive for a carbapenemase using a phenotypic testing method (mCIM, CarbaNP)

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  - Screen positive for a carbapenemase using a phenotypic testing method (mCIM, CarbaNP)
  - Test positive for a carbapenemase gene using molecular methods (KPC, NDM, VIM, IMP, OXA-48)

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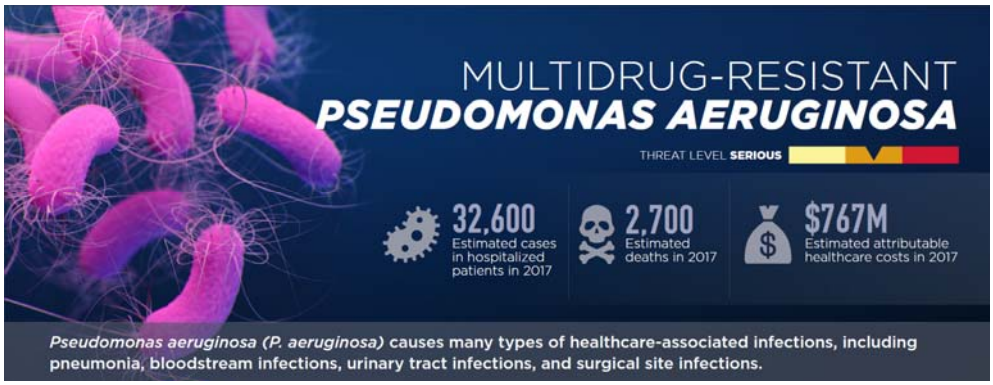
- Carbapenem-resistant *Enterobacteriaceae* (CRE)
  - Resistant to any carbapenem
  - Screen positive for a carbapenemase using a phenotypic testing method (mCIM, CarbaNP)
  - Test positive for a carbapenemase gene using molecular methods (KPC, NDM, VIM, IMP, OXA-48)
- Exceptions
  - *Proteus spp.*, *Providencia spp.*, and *Morganella morganii* that are resistant to Imipenem ONLY (susceptible to Meropenem or Doripenem)

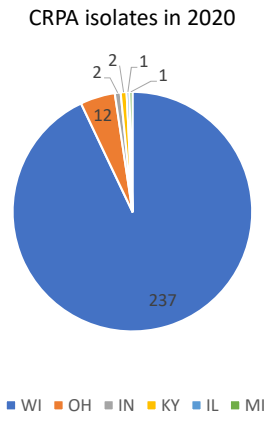
# Carbapenem-resistant *Pseudomonas aeruginosa* (CRPA)




https://www.cdc.gov/drugresistance/pdf/threats-report/pseudomonas-aeruginosa-508.pdf

# Carbapenem-resistant *Pseudomonas aeruginosa* (CRPA)

- Carbapenem-resistant *Pseudomonas aeruginosa* (CRPA)
  - *P. aeruginosa* infections usually occur in people in the hospital or with weakened immune systems
  - 2-3% of CRPA carry a mobile genetic element that makes a carbapenemase enzyme




https://www.cdc.gov/drugresistance/pdf/threats-report/pseudomonas-aeruginosa-508.pdf

# AR surveillance and submission guidelines

- Carbapenem-resistant *Pseudomonas aeruginosa* (CRPA)
  - Resistant to a carbapenem (Doripenem, Imipenem, or Meropenem) AND non-susceptible to Cefepime and/or Ceftazidime

# AR surveillance and submission guidelines

- Carbapenem-resistant *Pseudomonas aeruginosa* (CRPA)
  - Resistant to a carbapenem (Doripenem, Imipenem, or Meropenem) AND non-susceptible to Cefepime and/or Ceftazidime
- Exceptions
  - Isolates that are susceptible to Cefepime and/or Ceftazidime but are suspected of producing a carbapenemase may be accepted on a case-by-case basis

# AR surveillance and submission guidelines

- Carbapenem-resistant *Pseudomonas aeruginosa* (CRPA)
  - Resistant to a carbapenem (Doripenem, Imipenem, or Meropenem) AND non-susceptible to Cefepime and/or Ceftazidime
- Exceptions
  - Isolates that are susceptible to Cefepime and/or Ceftazidime but are suspected of producing a carbapenemase may be accepted on a case-by-case basis
  - Do not submit resistant *P. aeruginosa* isolates from cystic fibrosis patients

# Carbapenem-resistant *Acinetobacter baumannii* (CRAB)


https://www.cdc.gov/drugresistance/pdf/threats-report/acinetobacter-508.pdf

# Carbapenem-resistant *Acinetobacter baumannii* (CRAB)

- Carbapenem-resistant *Acinetobacter baumannii* (CRAB)
  - Cause pneumonia, wound, bloodstream, and urinary tract infections
    - Infections tend to occur in intensive care units (ICUs)
  - Carry mobile genetic elements that are easily shared between bacteria, further enhancing the spread of carbapenemase producing organisms
  - Some *Acinetobacter* are resistant to nearly all antibiotics
    - Very few new drugs are in development

https://www.cdc.gov/drugresistance/pdf/threats-report/acinetobacter-508.pdf

# Carbapenem-resistant *Acinetobacter baumannii* (CRAB)

- Carbapenem-resistant *Acinetobacter baumannii* (CRAB)
  - Often carry plasmid-encoded β-lactamases with carbapenemase activity (OXA-23, OXA-24/40, and OXA-58)
    - Denoted as OXA because of their ability to confer resistance to oxacillin
  - Presence of just one carbapenemase-hydrolyzing OXA enzyme may be enough for *A. baumannii* to become resistant to all carbapenems


Review › Clin Microbiol Rev. 2014 Apr;27(2):241-63. doi: 10.1128/CMR.00117-13.

OXA β-lactamases

Benjamin A Evans [1], Sebastian G B Amyes

Affiliations + expand

PMID: 24696435 PMCID: PMC3993105 DOI: 10.1128/CMR.00117-13

Free PMC article

https://pubmed.ncbi.nlm.nih.gov/24696435/

# AR surveillance and submission guidelines

- Carbapenem-resistant *Acinetobacter baumannii* (CRAB)
  - Isolates resistant to a carbapenem from Southeast Wisconsin
    - Jefferson, Kenosha, Milwaukee, Ozaukee, Racine, Walworth, Washington, and Waukesha counties

# AR surveillance and submission guidelines

- Carbapenem-resistant *Acinetobacter baumannii* (CRAB)
  - Isolates resistant to a carbapenem from Southeast Wisconsin
    - Jefferson, Kenosha, Milwaukee, Ozaukee, Racine, Walworth, Washington, and Waukesha counties
  - Pan-resistant isolates from facilities outside of Southeast Wisconsin, or isolates suspected of being part of an outbreak, please contact WSLH for guidance on submission (wiarln@slh.wisc.edu)

# *Candida auris*


https://www.cdc.gov/drugresistance/pdf/threats-report/candida-auris-508.pdf

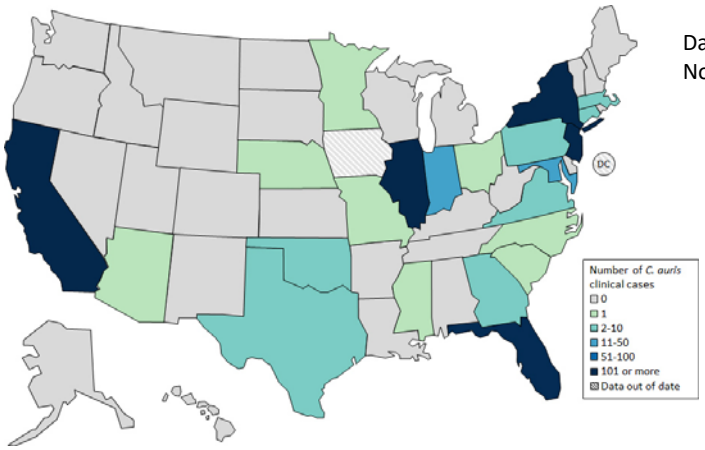
# *Candida auris*

- *Candida auris*
  - Can cause outbreaks in healthcare facilities
  - Often multidrug-resistant, with some strains resistant to all three available classes of antifungals
  - Can be carried on patient's skin without causing infection, allowing further spread
  - Some common healthcare disinfectants are less effective at eliminating it

| Organism | Isolates |
|---|---|
| *C. auris* | 260 |
| *C. parapsilosis* | 40 |
| *C. glabrata* | 9 |
| *C. lusitaniae* | 8 |
| *Candida species*, not *C. auris* | 7 |
| *S. cerevisiae* | 6 |
| *C. albicans* | 4 |
| *C. dubliniensis* | 3 |
| *C. fermentati* | 1 |
| *C. haemulonii* | 1 |
| *C. orthopsilosis* | 1 |
| *C. kefyr* | 1 |
| *C. neoformans* | 1 |
| *C. tropicalis* | 1 |
| **Total** | **343** |

https://www.cdc.gov/drugresistance/pdf/threats-report/candida-auris-508.pdf

# *C. auris* confirmed cases in the US




Data last updated
November 30, 2020

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

# AR surveillance and submission guidelines

- *Candida* species
  - *Candida auris,* or suspected *C. auris*

# AR surveillance and submission guidelines

- *Candida* species
  - *Candida auris,* or suspected *C. auris*
  - Invasive isolates of *Candida glabrata*

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- *Candida* species
  - *Candida auris,* or suspected *C. auris*
  - Invasive isolates of *Candida glabrata*
  - *Candida spp.* that are unable to be identified

# AR surveillance and submission guidelines

- *Candida* species
  - *Candida auris,* or suspected *C. auris*
  - Invasive isolates of *Candida glabrata*
  - *Candida spp.* that are unable to be identified
  - Unusual *Candida spp.*
    - Species other than *C. albicans, C. dublinensis, C. krusei, C. lusitaniae, C. parapsilosis,* or *C. tropicalis*

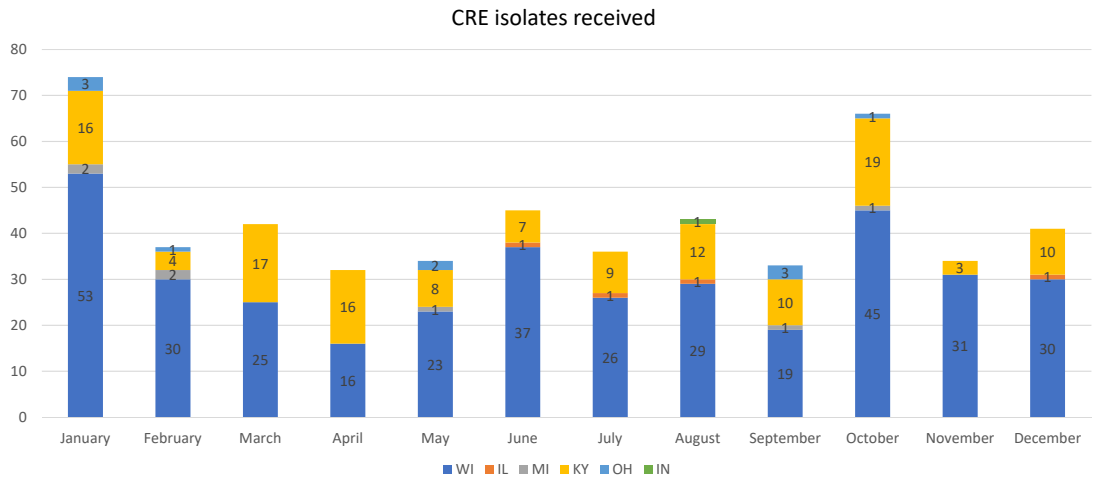
# AR surveillance and submission guidelines

- *Candida* species
  - *Candida auris,* or suspected *C. auris*
  - Invasive isolates of *Candida glabrata*
  - *Candida spp.* that are unable to be identified
  - Unusual *Candida spp.*
    - Species other than *C. albicans, C. dublinensis, C. krusei, C. lusitaniae, C. parapsilosis,* or *C. tropicalis*
  - *Candida spp.* resistant to two or more antifungal classes

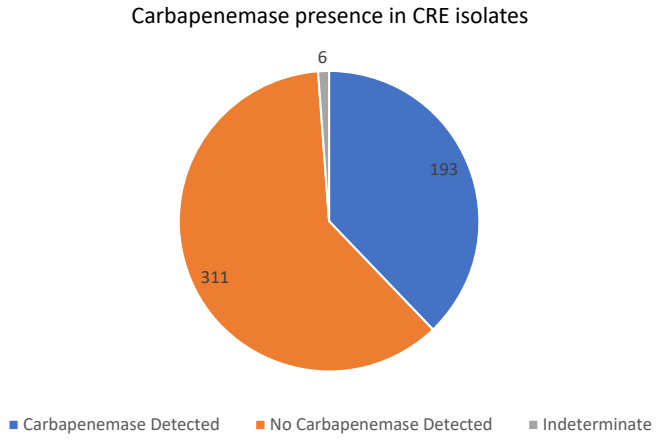
# Testing performed on submitted isolates

- CRE/CRPA
  - MALDI, modified carbapenem inactivation method (mCIM), AST, carbapenemase PCR (if mCIM+), and WGS

# 2020 CRE data



# 2020 CRE data

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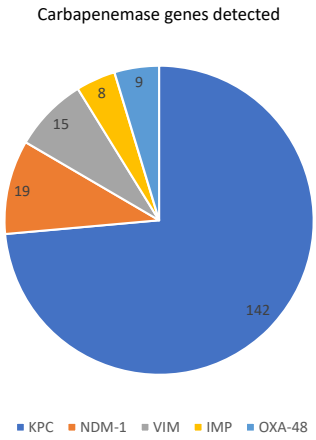

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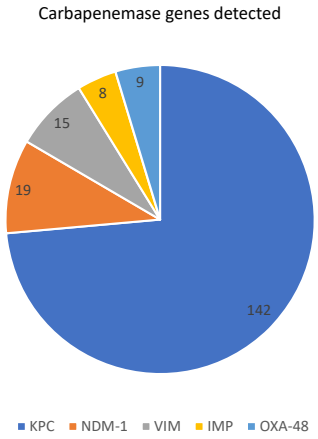
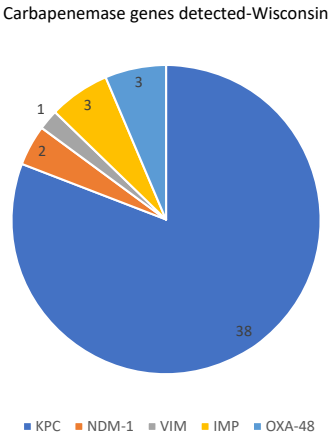
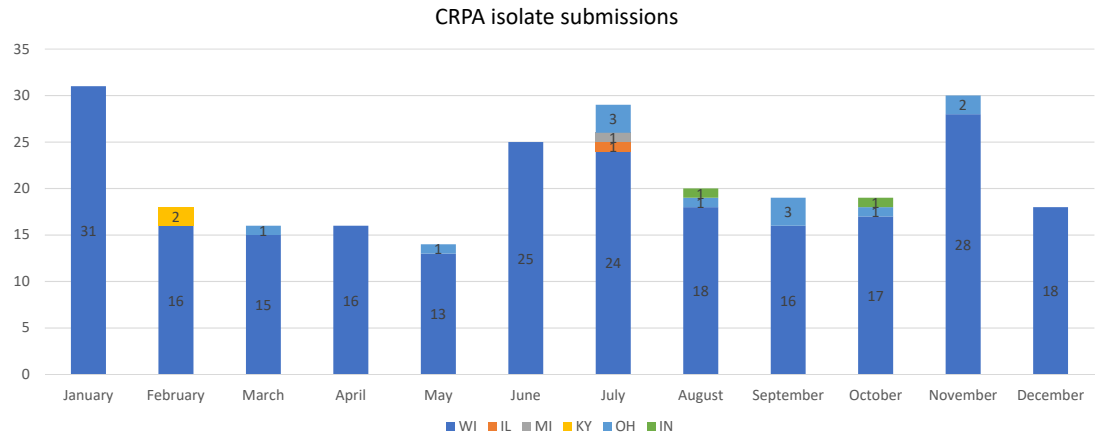



# 2020 CRE data

| Pan non-susceptible isolates | | | |
|---|---|---|---|
| **Month** | **State** | **Organism** | **Mechanism(s)** |
| January | OH | Klebsiella pneumoniae | KPC |
| January | MI | Klebsiella pneumoniae | NDM-1 |
| January | KY | Klebsiella pneumoniae | OXA-48 |
| February | OH | Klebsiella pneumoniae | KPC |
| March | KY | Klebsiella pneumoniae | OXA-48 |
| May | OH | Klebsiella pneumoniae | KPC |
| May | KY | Escherichia coli | NDM-1 |
| July | KY | Escherichia coli | NDM-1 and OXA-48 |
| July | IL | Klebsiella pneumoniae | KPC and NDM-1 |
| October | MI | Klebsiella pneumoniae | NDM-1 and OXA-48 |
| December | WI | Klebsiella pneumoniae | |

# 2020 CRPA data

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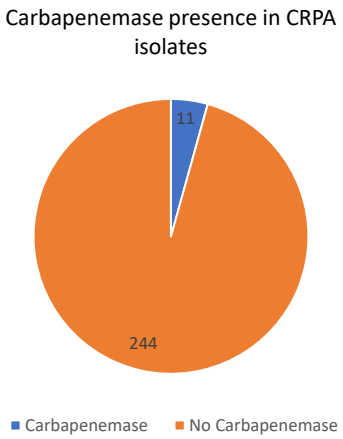

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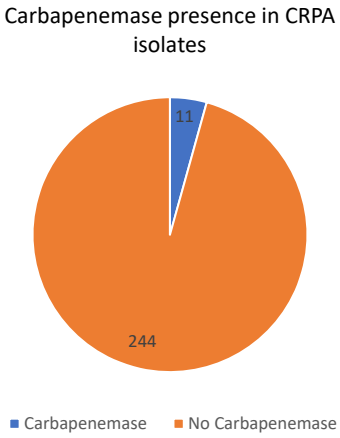
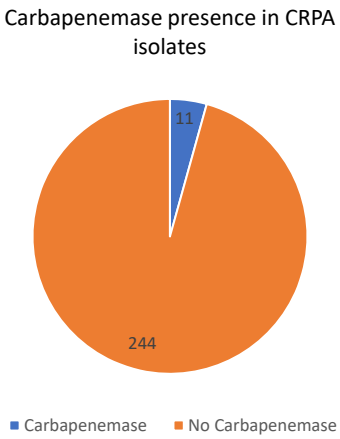



| Date | State | Mechanism |
|---|---|---|
| March | OH | VIM |
| May | OH | Potential novel |
| May | WI | Potential novel |
| July | OH | Potential novel |
| July | OH | Potential novel |
| July | OH | Potential novel |
| July | MI | Potential novel |
| October | OH | Potential novel |
| November | OH | Potential novel |
| December | WI | NDM-1 |
| December | WI | NDM-1 |

# 2020 CRPA data




| Date | State | Mechanism | Pan-NS? |
|---|---|---|---|
| March | OH | VIM | No |
| May | OH | Potential novel | No |
| May | WI | Potential novel | No |
| July | OH | Potential novel | No |
| July | OH | Potential novel | No |
| July | OH | Potential novel | No |
| July | MI | Potential novel | No |
| October | OH | Potential novel | No |
| November | OH | Potential novel | No |
| December | WI | NDM-1 | Yes |
| December | WI | NDM-1 | No |

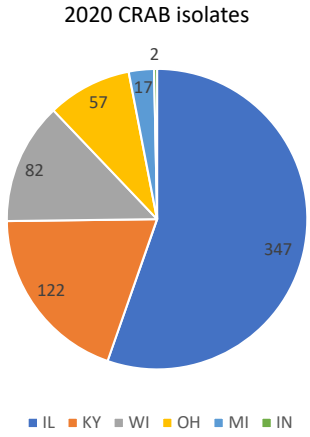
# 2020 CRPA data

| Date | State | Mechanism | Pan-NS? |
|---|---|---|---|
| May | WI | None detected | Yes |
| June | WI | None detected | Yes |
| July | WI | None detected | Yes |
| August | WI | None detected | Yes |
| August | OH | None detected | Yes |
| August | WI | None detected | Yes |
| December | WI | NDM-1 | Yes |

# Testing performed on submitted isolates

- CRE/CRPA
  - MALDI, modified carbapenem inactivation method (mCIM), AST, carbapenemase PCR (if mCIM+), and WGS
- CRAB
  - MALDI, AST, carbapenemase PCR, and WGS

# 2020 CRAB data

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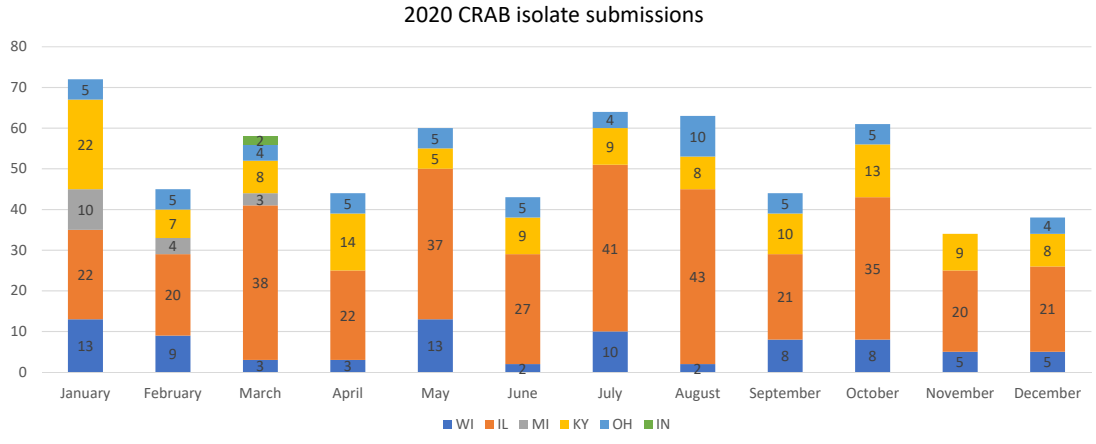

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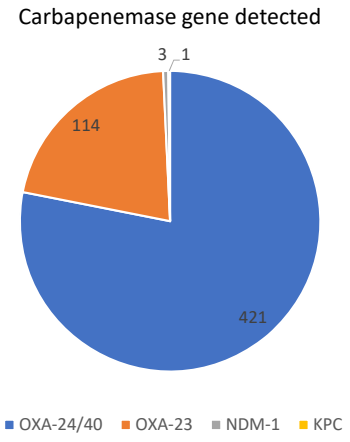


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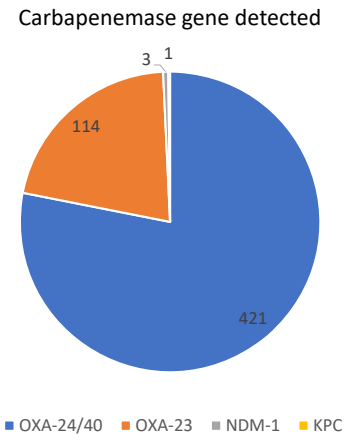
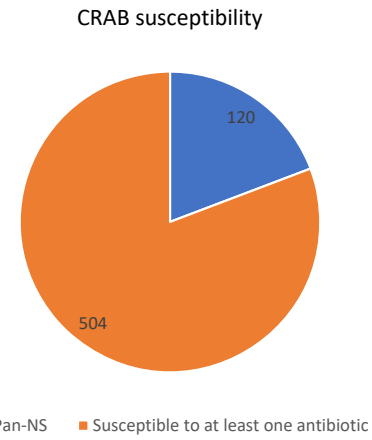


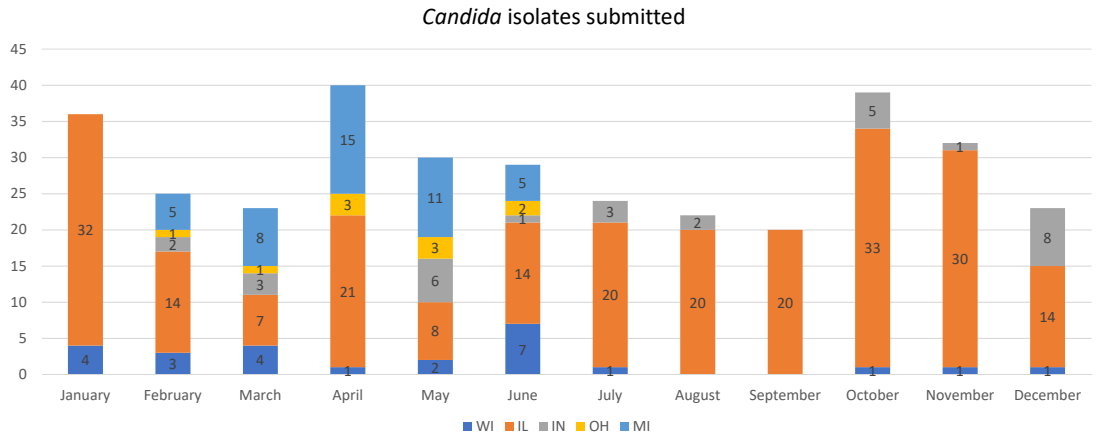
# 2020 CRAB data-Wisconsin

| Month | Isolates | Pan-NS? | OXA-24/40+ |
|---|---|---|---|
| January | 13 | 0 | 8 |
| February | 9 | 0 | 8 |
| March | 3 | 0 | 3 |
| April | 3 | 0 | 3 |
| May | 13 | 6 | 12 |
| June | 2 | 2 | 2 |
| July | 10 | 2 | 10 |
| August | 2 | 0 | 2 |
| September | 8 | 1 | 6 |
| October | 8 | 2 | 5 |
| November | 5 | 1 | 5 |
| December | 5 | 1 | 5 |
| **Total** | **81** | **15** | **69** |

# Testing performed on submitted isolates

- CRE/CRPA
  - MALDI, modified carbapenem inactivation method (mCIM), AST, carbapenemase PCR (if mCIM+), and WGS
- CRAB
  - MALDI, AST, carbapenemase PCR, and WGS
- *Candida spp.*
  - MALDI and AST

# 2020 *Candida* data




# The impact(s) of the COVID-19 pandemic

**COVID-19 Units Seeing Increasing Rates of Multi-Drug Resistant Organism Outbreaks**

Kansas Department of Health and Environment

December 21, 2020

RE: Possibility of increasing multidrug-resistant organisms (MDROs) amid the COVID-19 pandemic

https://www.communitycareks.org/wp-content/uploads/2020/12/12-21-20COVID-19andIncreaseMDRORisks.pdf

# COVID-19 and the spread of CRE

J Clin Med. 2020 Aug 25;9(9):2744. doi: 10.3390/jcm9092744.

**Antimicrobial Stewardship Program, COVID-19, and Infection Control: Spread of Carbapenem-Resistant Klebsiella Pneumoniae Colonization in ICU COVID-19 Patients. What Did Not Work?**

Beatrice Tiri [1], Emanuela Sensi [2], Viola Marsiliani [2], Mizar Cantarini [2], Giulia Priante [3], Carlo Vernelli [3], Lucia Assunta Martella [3], Monya Costantini [4], Alessandro Mariottini [5], Paolo Andreani [5], Paolo Bruzzone [6], Fabio Suadoni [7], Marsilio Francucci [8], Roberto Cirocchi [9], Stefano Cappanera [1]

Affiliations + expand

PMID: 32854334 PMCID: PMC7563368 DOI: 10.3390/jcm9092744

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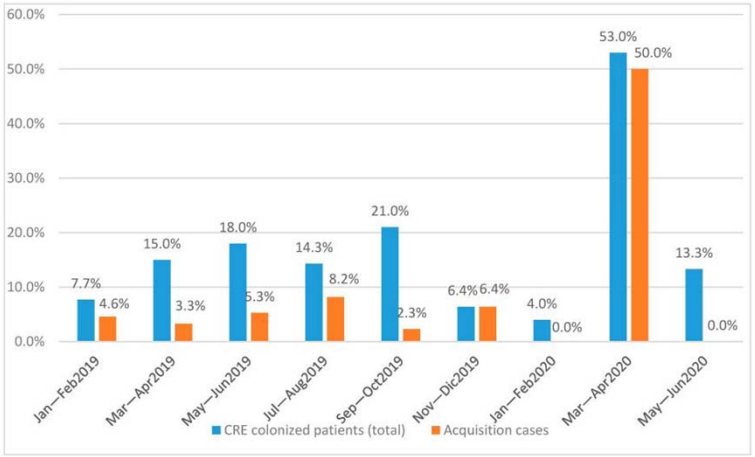
https://pubmed.ncbi.nlm.nih.gov/32854334/

# COVID-19 and the spread of CRE




Tiri *et al.*, 2020

https://pubmed.ncbi.nlm.nih.gov/32854334/

# COVID-19 and the spread of CRE

J Antimicrob Chemother. 2021 Jan 19;76(2):380-384. doi: 10.1093/jac/dkaa466.

## Carbapenemase-producing Enterobacterales causing secondary infections during the COVID-19 crisis at a New York City hospital

Angela Gomez-Simmonds [1], Medini K Annavajhala [1], Thomas H McConville [1], Donald E Dietz [1], Sherif M Shoucri [1], Justin C Laracy [1], Felix D Rozenberg [1], Brian Nelson [1], William G Greendyke [1], E Yoko Furuya [1], Susan Whittier [2], Anne-Catrin Uhlemann [1]

Affiliations + expand

PMID: 33202023 PMCID: PMC7717307 DOI: 10.1093/jac/dkaa466

Free PMC article

https://pubmed.ncbi.nlm.nih.gov/33202023/

# Importance of antimicrobial stewardship

Meta-Analysis > Clin Microbiol Infect. 2020 Dec;26(12):1622-1629.

doi: 10.1016/j.cmi.2020.07.016. Epub 2020 Jul 22.

## Bacterial co-infection and secondary infection in patients with COVID-19: a living rapid review and meta-analysis

Bradley J Langford [1], Miranda So [2], Sumit Raybardhan [3], Valerie Leung [4], Duncan Westwood [5], Derek R MacFadden [6], Jean-Paul R Soucy [7], Nick Daneman [8]

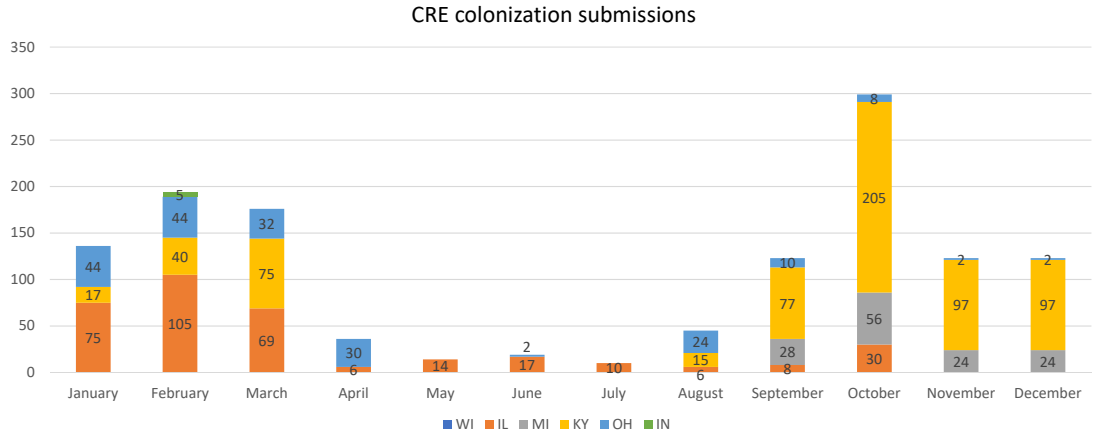
Affiliations + expand

PMID: 32711058 PMCID: PMC7832079 DOI: 10.1016/j.cmi.2020.07.016

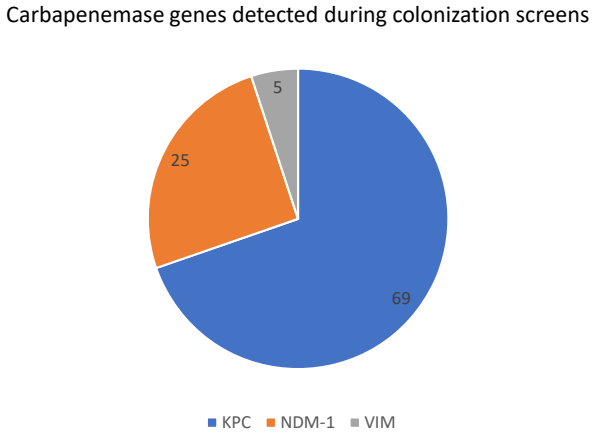
Free PMC article

https://pubmed.ncbi.nlm.nih.gov/32711058/

# 2020 CRE colonization data




# 2020 CRE colonization data



# COVID-19 and the impact on CRAB

Infection Prevention in Practice. 2021 Mar; 3(1): 100113. PMCID: PMC7794049
Published online 2021 Jan 9. doi: 10.1016/j.infpip.2021.100113

An outbreak of carbapenem-resistant *Acinetobacter baumannii* in a COVID-19 dedicated hospital

Tamar Gottesman,[a,b] Rina Fedorowsky,[a] Rebecca Yerushalmi,[c] Jonathan Lellouche,[d] and Amir Nutman[b,d,*]

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7794049/

# COVID-19 and the impact on CRAB

MMWR Morb Mortal Wkly Rep. 2020 Dec 4;69(48):1827-1831. doi: 10.15585/mmwr.mm6948e1.

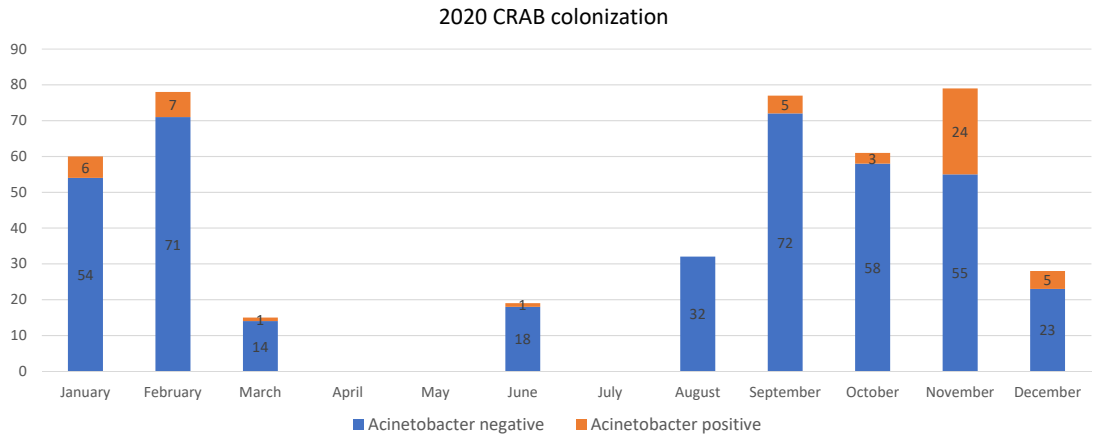
Increase in Hospital-Acquired Carbapenem-Resistant Acinetobacter baumannii Infection and Colonization in an Acute Care Hospital During a Surge in COVID-19 Admissions - New Jersey, February-July 2020

Stephen Perez, Gabriel K Innes, Maroya Spalding Walters, Jason Mehr, Jessica Arias, Rebecca Greeley, Debra Chew

PMID: 33270611 PMCID: PMC7714028 DOI: 10.15585/mmwr.mm6948e1
Free PMC article

https://pubmed.ncbi.nlm.nih.gov/33270611/

# 2020 CRAB colonization data




# The rise of *C. auris* during the COVID-19 pandemic

J Glob Antimicrob Resist. 2020 Sep;22:175-176. doi: 10.1016/j.jgar.2020.06.003. Epub 2020 Jun 12.

## The lurking scourge of multidrug resistant Candida auris in times of COVID-19 pandemic

Anuradha Chowdhary [1], Amit Sharma [2]

Affiliations + expand

PMID: 32535077 PMCID: PMC7289732 DOI: 10.1016/j.jgar.2020.06.003

Free PMC article

https://pubmed.ncbi.nlm.nih.gov/32535077/

# The rise of *C. auris* during the COVID-19 pandemic

Emerg Infect Dis. 2020 Nov;26(11):2694-2696. doi: 10.3201/eid2611.203504. Epub 2020 Aug 27.

**Multidrug-Resistant Candida auris Infections in Critically Ill Coronavirus Disease Patients, India, April-July 2020**

Anuradha Chowdhary, Bansidhar Tarai, Ashutosh Singh, Amit Sharma

PMID: 32852265 PMCID: PMC7588547 DOI: 10.3201/eid2611.203504
Free PMC article

https://pubmed.ncbi.nlm.nih.gov/32852265/

# The rise of *C. auris* during the COVID-19 pandemic

Clin Microbiol Infect. 2021 Jan 8;S1198-743X(20)30790-4. doi: 10.1016/j.cmi.2020.12.030. Online ahead of print.

**Outbreak of Candida auris infection in a COVID-19 hospital in Mexico**

Hiram Villanueva-Lozano [1], Rogelio de J Treviño-Rangel [1], Gloria M González [1], María Teresa Ramírez-Elizondo [2], Reynaldo Lara-Medrano [3], Mary Cruz Aleman-Bocanegra [3], Claudia E Guajardo-Lara [4], Natalia Gaona-Chávez [3], Fernando Castilleja-Leal [5], Guillermo Torre-Amione [5], Michel F Martínez-Reséndez [6]

Affiliations + expand

PMID: 33429028 PMCID: PMC7835657 DOI: 10.1016/j.cmi.2020.12.030
Free PMC article

https://pubmed.ncbi.nlm.nih.gov/33429028/

# The rise of *C. auris* during the COVID-19 pandemic

MMWR Morb Mortal Wkly Rep. 2021 Jan 15;70(2):56-57. doi: 10.15585/mmwr.mm7002e3.

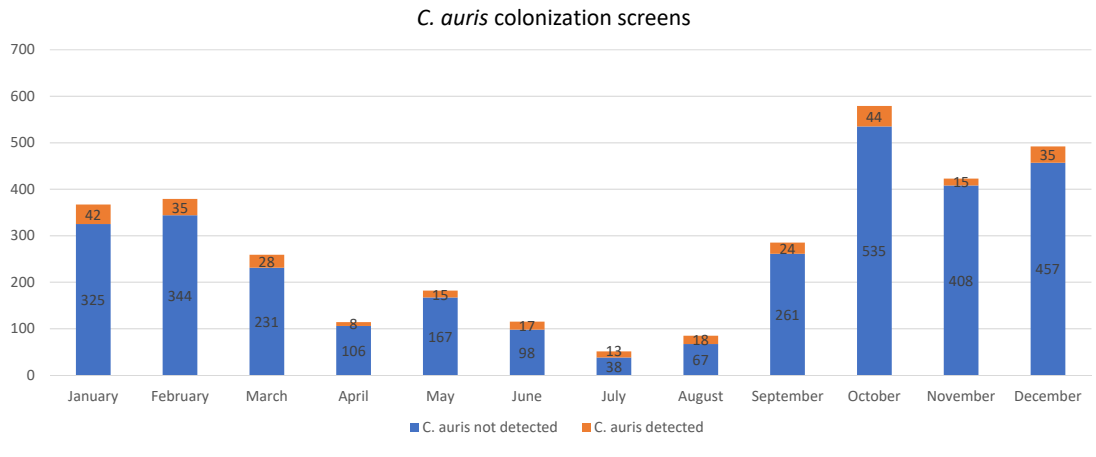
**Candida auris Outbreak in a COVID-19 Specialty Care Unit – Florida, July–August 2020**

Christopher Prestel, Erica Anderson, Kaitlin Forsberg, Meghan Lyman, Marie A de Perio, David Kuhar, Kendra Edwards, Maria Rivera, Alicia Shugart, Maroya Walters, Nychie Q Dotson

PMID: 33444298 PMCID: PMC7808709 DOI: 10.15585/mmwr.mm7002e3
Free PMC article

https://pubmed.ncbi.nlm.nih.gov/33444298/

# 2020 *Candida* colonization data



# The rise of *C. auris* during the COVID-19 pandemic

LAHAN
Los Angeles County Health Alert Network

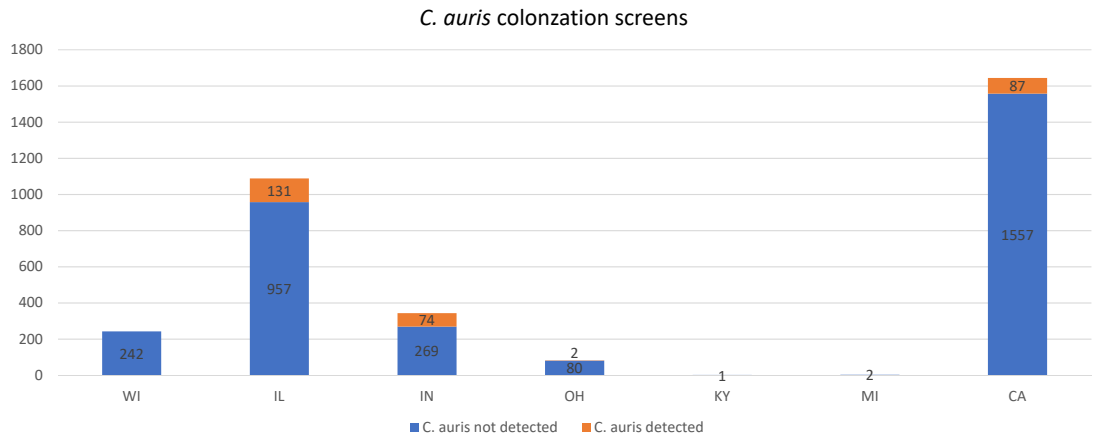
**CDPH Health Advisory:**
**Resurgence of *Candida auris* in Healthcare Facilities in the Setting of COVID-19**
**August 20, 2020**

*This message is intended for clinicians, infection preventionists, and laboratorians working in healthcare facilities. Please distribute as appropriate.*

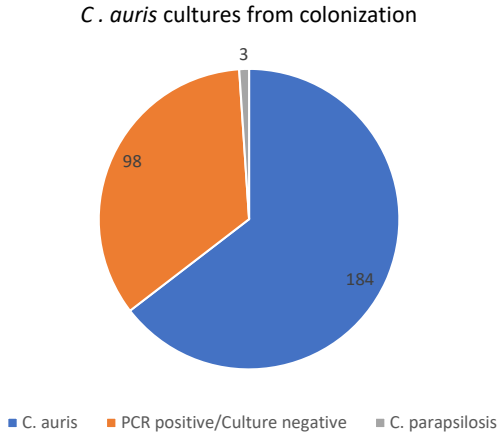
California Department of Public Health (CDPH) issued a health advisory on 8/19/20. The advisory, key messages, link to resources, and local health department reporting information can be found below.

http://publichealth.lacounty.gov/eprp/lahan/alerts/CAHANCauris082020.pdf

# 2020 *Candida* colonization data




# 2020 *Candida* colonization data




# Ongoing AR activities

- GN7F AST panel validation
- WGS progress
- Other AR activities

# GN7F AST panel validation

- GN7F panel will replace GNX2F AST panel
  - Key differences between the two panels

| New drugs on the GN7F panel | Drugs not included in the GN7F panel |
|---|---|
| Ampicillin | Cefotaxime |
| Ampicillin-Sulbactam | Colistin |
| Cefazolin | Doxycycline |
| Ceftazidime-Avibactam | Polymixin B |
| Ceftolozane-Tazobactam | Ticarcillin/Clavulanic Acid |
| Ceftriaxone | |
| Nitrofurantoin | |
| Tetracycline | |

# Whole genome sequencing

- Isolates being sequenced
  - Pan-nonsusceptible
  - Novel carbapenemase (mCIM+/PCR-)
  - Non-KPC carbapenemase in *Enterobacterales*
  - Carbapenemase in *Pseudomonas*
  - Non-OXA carbapenemase in *Acinetobacter*
  - Carbapenemase detected during colonization (excludes KPC)

# Other AR activities

- Drug resistant *Neisseria gonorrhoeae*
  - Testing handled by Utah Public Health Laboratory, Tennessee State Public Health Laboratory, and Washington State Public Health Laboratories


https://www.cdc.gov/drugresistance/pdf/threats-report/gonorrhea-508.pdf

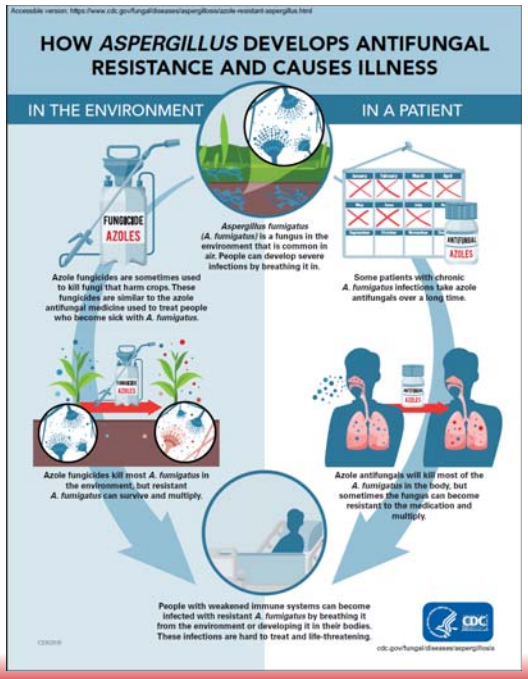
# Other AR activities

- *Clostridioides difficile*
  - Testing handled by Minnesota Department of Health Public Health Laboratory


https://www.cdc.gov/drugresistance/pdf/threats-report/clostridioides-difficile-508.pdf

# Other AR activities

- Azole-resistant *Aspergillus fumigatus*
  - Now on the CDC AR Watch List
  - Testing by the Maryland Public Health Laboratory and the Tennessee State Public Health Laboratory




# Acknowledgments

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  - Diane Podzorski
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  - Alana Sterkel
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Wisconsin State Laboratory of Hygiene
UNIVERSITY OF WISCONSIN-MADISON

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