Indiana Department of Health

TARGETED MDROS IN INDIANA

CALEB COX

SENIOR MDRO EPIDEMIOLOGIST

04/15/2025

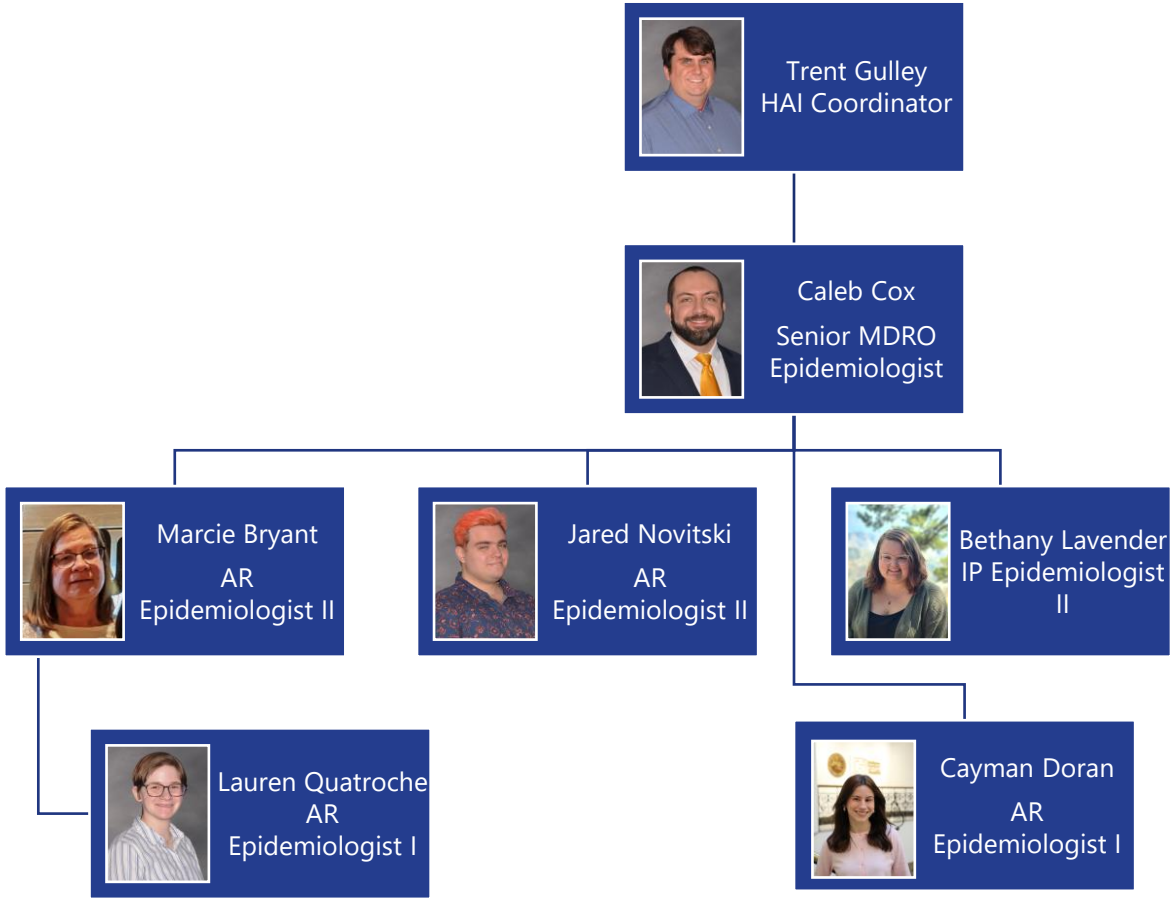
OUR MISSION:

To promote, protect, and improve the health and safety of all Hoosiers.

OUR VISION:

Every Hoosier reaches optimal health regardless of where they live, learn, work, or play.

Antimicrobial Resistance Team



Indiana Department of Health

Communicable Disease Rule

Announcement: In March 2023, the Indiana Department of Health (IDOH) announced changes to Indiana's Communicable Disease (CD) Rule (410 IAC), including streamlined timeframes for reporting and updates to reportable diseases. Indiana Code Title 16 (Health 16-41-2-1) was amended in 2019. This amendment allows the IDOH to publish and update the list of reportable communicable diseases and control measures on the IDOH website. External documents have been created to house this information, which will allow for updates and changes to be made more easily in the future.

Communicable disease reporting changes went into effect April 1.

Key Updates

- The reporting timeframes have been streamlined to two options: immediately and within one working day. The number of immediately reportable diseases has decreased.
- The reportable disease list has been removed from the Indiana Communicable Disease (CD) Rule. Separate documents have been created for the reportable disease list for providers as well as a reportable result/pathogen list for laboratories. By listing this information in external documents, rather than within the rule, it will be easier to make changes and keep the information updated. Additionally, these documents will be more easily accessible and convenient for health care providers, hospitals, medical laboratories, and local health departments.

The following documents cover the changes in greater detail:

1. Indiana Reportable Disease List for Healthcare Providers and Hospitals
2. Indiana Reportable Result/Pathogen List for Laboratories
3. Summary of Reporting Changes Document
4. Frequently Asked Questions Document
5. Local Health Department Webcast Slides

Access the communicable disease reporting resources here!

Indiana Department of Health

2025 Indiana Reportable Disease List for Healthcare Providers and Hospitals

410 IAC 1-2,5-75 & 76

Indiana Department of Health

REPORT IMMEDIATELY ON SUSPICION

Anthrax
Botulism
Cholera (*Vibrio cholerae* O1, O139, or toxigenic)
Diphtheria
Eastern equine encephalitis virus (EEEV) disease
Hemolytic uremic syndrome (HUS), post-diarrheal
Hepatitis, viral, Type B, pregnant woman (acute and chronic) or perinatally exposed infant
Influenza A, Novel
Measles (Rubeola)
Melioidosis (*Burkholderia pseudomallei*)
Meningococcal disease, invasive
Middle East respiratory syndrome coronavirus (MERS-CoV)
Plague
Poliomyelitis
Rabies, human
Rubella (German Measles)
Rubella congenital syndrome
SARS-associated coronavirus (SARS-CoV)
Smallpox (Variola infection)
Tularemia
Viral hemorrhagic fever, filoviruses
- Ebola virus
- Marburg virus

Viral hemorrhagic fever, other
- Crimean-Congo hemorrhagic fever virus
- Guanarito virus
- Junin virus
- Lassa virus
- Lujo virus
- Machupo virus
- Sabia virus

TO REPORT:

- Immediately Reportable: complete steps 1-2
- Within One Working Day: complete step 2

Step 1: Call **317-233-7125**
317-233-1325 (After hours)

Step 2:

- NBS users: Report conditions via Morbidity Report in **NBS**
- Non-NBS users: Report with **this** form

REPORT WITHIN ONE WORKING DAY

Acquired Immunodeficiency Syndrome (AIDS)
Acute Flaccid Myelitis (AFM)
Anaplasmosis
Animal bite or exposure
Arboviral disease or infection, domestic:
- California serogroup viruses,
- Jamestown Canyon virus,
- La Crosse virus,
- Powassan virus,
- St. Louis encephalitis virus,
- West Nile virus,
- Western equine encephalitis virus

Arboviral disease or infection, imported:
- Chikungunya virus,
- Dengue virus,
- Japanese encephalitis,
- Oropouche virus,
- Yellow fever,
- Zika virus

Babesiosis
Brucellosis
Campylobacteriosis
Candida auris
Carbapenemase-Producing Organisms (CPO)
Chancroid
Chlamydia trachomatis, genital infection
Lymphogranuloma venerum
Coccidioidomycosis
COVID-19-associated deaths (all ages)
Cronobacter infection, invasive, infants (younger than 1 year of age)
Cryptosporidiosis
Cyclosporiasis
Ehrlichiosis
Escherichia coli (E. coli) infection (Shiga toxin-producing *E. coli* (STEC) including, but not limited to, *E. coli* O157 and other serogroups)
Giardiasis
Gonorrhea
Disseminated gonococcal infection
Haemophilus influenzae, invasive disease, (including antimicrobial susceptibility testing)
Hansen's disease (leprosy)
Hantavirus infection (pulmonary and non-pulmonary), including, but not limited to: Sin Nombre virus, Seoul virus
Hepatitis, viral, Type A
Hepatitis, viral, Type B (acute and chronic)
Hepatitis, viral, Type C (acute and chronic)
Hepatitis, viral, Type C, pregnant woman (acute or chronic) or perinatally exposed infant
Hepatitis, viral, Type Delta
Hepatitis, viral, Type E
Hepatitis, viral, unspecified
Histoplasmosis
HIV infection
HIV infection, pregnant woman or perinatally exposed infant
Influenza-associated deaths (all ages)
Latent tuberculosis infection (LTBI)
Legionellosis
Leptospirosis
Listeriosis
Lyme disease
Malaria
Mpox (formerly known as Monkeypox)
Multisystem Inflammatory Syndrome in adults (MIS-A)
Multisystem Inflammatory Syndrome in children (MIS-C)
Mumps
Pandrug-resistant Organisms
Pertussis (whooping cough)
Psittacosis
Q Fever
Rabies, postexposure prophylaxis administration
Salmonellosis, non-typhoidal
Shigellosis
Spotted fever rickettsiosis, including Rocky Mountain Spotted fever
Streptococcus pneumoniae, invasive disease (including antimicrobial susceptibility testing)
Streptococcus, Group A, invasive disease
Syphilis
Tetanus
Toxic shock syndrome (streptococcal or staphylococcal)
Trichinellosis
Tuberculosis disease, reportable upon suspicion
Typhoid and paratyphoid fever, cases and carriers
Vancomycin-resistant *Staphylococcus aureus* (VRSA) *and* Vancomycin-intermediate *Staphylococcus aureus* (VISA)
Varicella (chickenpox)
Vibriosis (non-cholera *Vibrio* infection)
Yersiniosis, non-*pestis*

1/1/25

2025 Indiana Reportable Disease List for Healthcare Providers and Hospitals

410 IAC 1-2,5-75 & 76

Indiana Department of Health

IMMEDIATELY REPORTABLE OUTBREAKS

1. Any disease required to be reported as listed above
2. Newborns with diarrhea in hospitals or other institutions
3. Foodborne or waterborne diseases in addition to those specified above
4. Streptococcal illnesses
5. Conjunctivitis
6. Impetigo
7. Clusters or suspected outbreaks of any disease associated with hospitals and healthcare facilities
8. Influenza-like illness
9. Viral meningitis
10. Unusual occurrence of disease
11. Any disease (e.g. anthrax, plague, tularemia, Brucella species, smallpox, or botulism) or chemical illness considered a bioterrorism threat, importation, or laboratory release

OTHER REPORTABLE NON-COMMUNICABLE CONDITIONS AND DISEASES

- Report all blood lead results (capillary and venous) in children and adults within one week (410 IAC 29-3-1)
- Report confirmed cases of cancer occurring in residents diagnosed or treated in Indiana to the state cancer registry (410 IAC 21-1-2)

1/1/25

Reporting – Within One Working Day

How to report:

- Option 1: create morbidity report in NBS
  - attach all documents to morbidity report
- Option 2: fax all documents to IDOH
  - secure fax number: 317-234-2812

Documents to include when reporting:

- history and physical
- all relevant lab reports
- antimicrobial susceptibility testing (AST) report
- Confidential Report of Communicable Diseases (if faxing)

Acronyms

- CRE – Carbapenem-resistant *Enterobacterales*
- CP-CRE – Carbapenemase-producing - carbapenem resistant *Enterobacterales*
- CRPA – Carbapenem-resistant *Pseudomonas aeruginosa*
- CRAB – Carbapenem-resistant *Acinetobacter baumannii*
- CPO – Carbapenemase-producing organism
- MDRO – Multidrug-resistant organism
- CDC- Centers for Disease Control and Prevention
- NBS- National Electronic Disease Surveillance System (NEDSS) base system

Carbapenemase Producing Organisms

- Carbapenemase-producing *Enterobacterales, Pseudomonas aeruginosa*, and *Acinetobacter baumannii* from any site OR
- Isolates of *Enterobacterales, Pseudomonas aeruginosa*, and *Acinetobacter baumannii* that are resistant to carbapenems but have not been tested for Carbapenemase production

Condition Name in NBS:

- **Carbapenemase-Producing Organisms (CPO), Clinical**
- **Carbapenemase-Producing Organisms (CPO), Screening**

Reporting Timeframe:

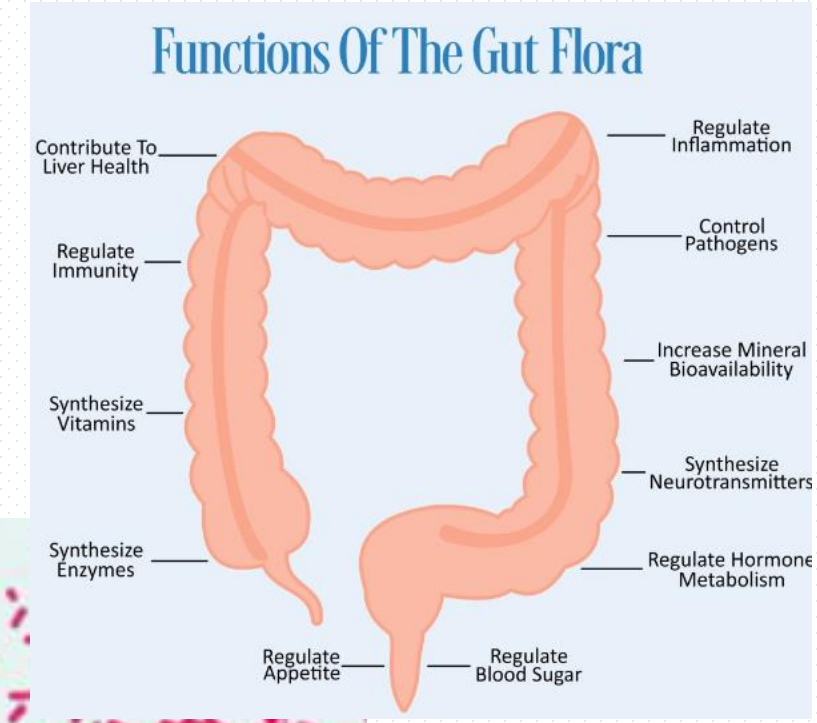
- **Within One Working Day**

Indiana Department of Health

Enterobacterales

Enterobacterales

- A category of bacteria that live in the GI tract of humans
- These bacteria are all gram-negative rods
- Examples
  - *E. coli*
  - *Klebsiella* sp.
  - *Enterobacter* sp.
  - *Serratia* sp.
  - *Proteus* sp.
  - *Citrobacter* sp.
  - etc.



CRE

Definition: Any *Enterobacterales* that are not susceptible (i.e. intermediate or resistant) to a carbapenem antibiotic

- *Enterobacterales* can be resistant to carbapenems through several resistance mechanisms
- Carbapenemase production is currently the most concerning

Indiana Department of Health

Image source: https://www.cdc.gov/hai/organisms/cre/cre-patients.html

CRPA

- *Pseudomonas* is commonly found in the soil and water.
- *Pseudomonas aeruginosa* can cause infections in the blood, lungs, or other parts of the body after surgery.
- Can colonize a patient without causing infections.
- Can be intrinsically resistant to Ertapenem

Indiana Department of Health

Image source: https://www.cdc.gov/hai/organisms/pseudomonas.html

CRAB

- *Acinetobacter* is commonly found in soil and water.
- *Acinetobacter baumanii* can cause infections in the blood, urinary tract, lungs, and in wounds.
- Can colonize a patient without causing infections.

Indiana Department of Health

Image source: https://www.cdc.gov/hai/organisms/acinetobacter.html

CPO

Screening definition:

- Organisms cultured **specifically for screening** from any body site that are found to produce a carbapenemase enzyme

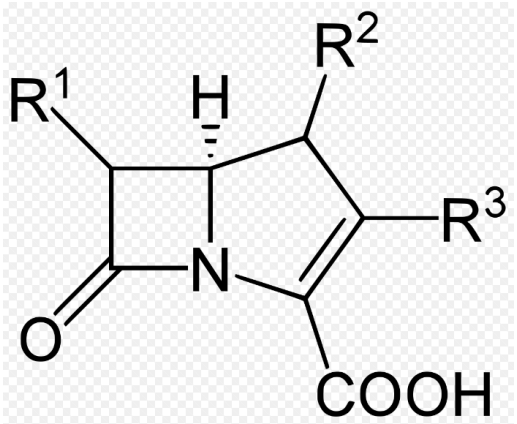
Clinical definition:

- Organisms cultured **during routine care** from any body site that are found to produce a carbapenemase enzyme

Carbapenem vs carbapenemase

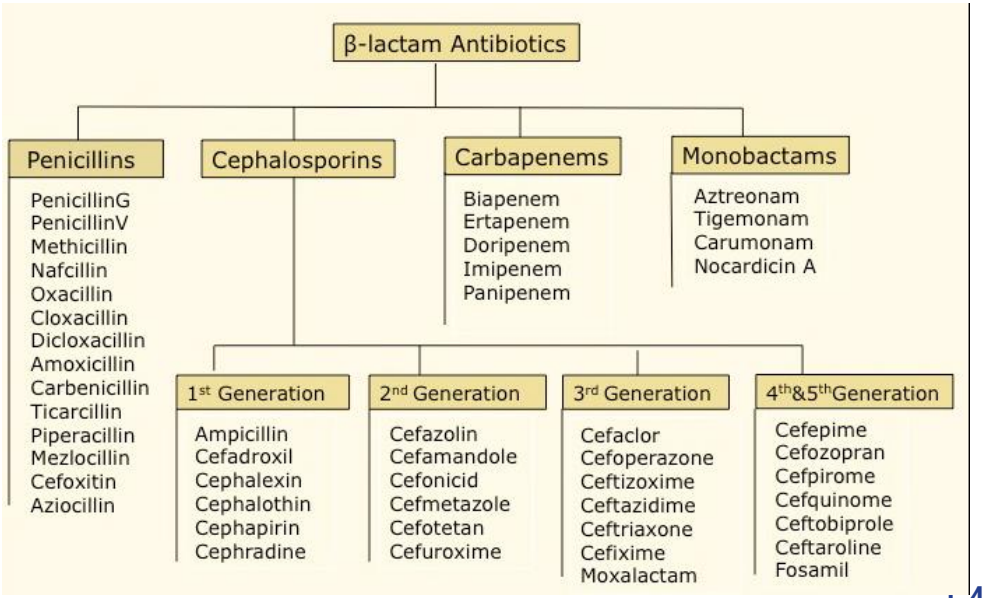
Carbapenem

- Class of broad-spectrum antibiotics
- Treatment is typically reserved for severe or highly resistant infections only
- Includes
  - Meropenem
  - Ertapenem
  - Doripenem
  - Imipenem



Carbapenemase

- An enzyme that can break down carbapenems (and all beta-lactams)
- Includes: KPC, VIM, OXA-48, IMP, NDM



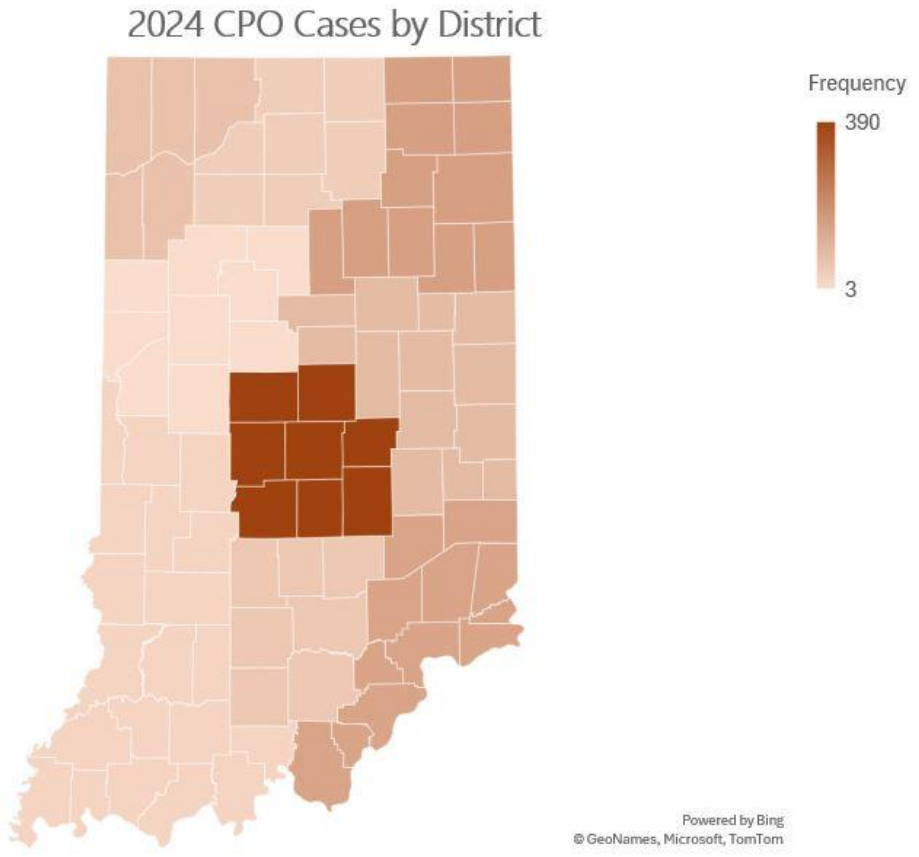
Carbapenamase Producing Organisms (CPO) Data

2023: 405

- Clinical: 328 (81.0%)
- Screening: 77 (19.0%)

2024: 440

- Clinical: 399 (90.7%)
- Screening: 41 (9.3%)



Indiana Department of Health

Indiana 2024 CPO Cases

Organism:

- *Klebsiella spp.: 105*
- *E. coli: 46*
- *Enterobacter spp*: 23
- Other: 77
- *Acinetobacter spp*: 170
- *Pseudomonas spp*: 8

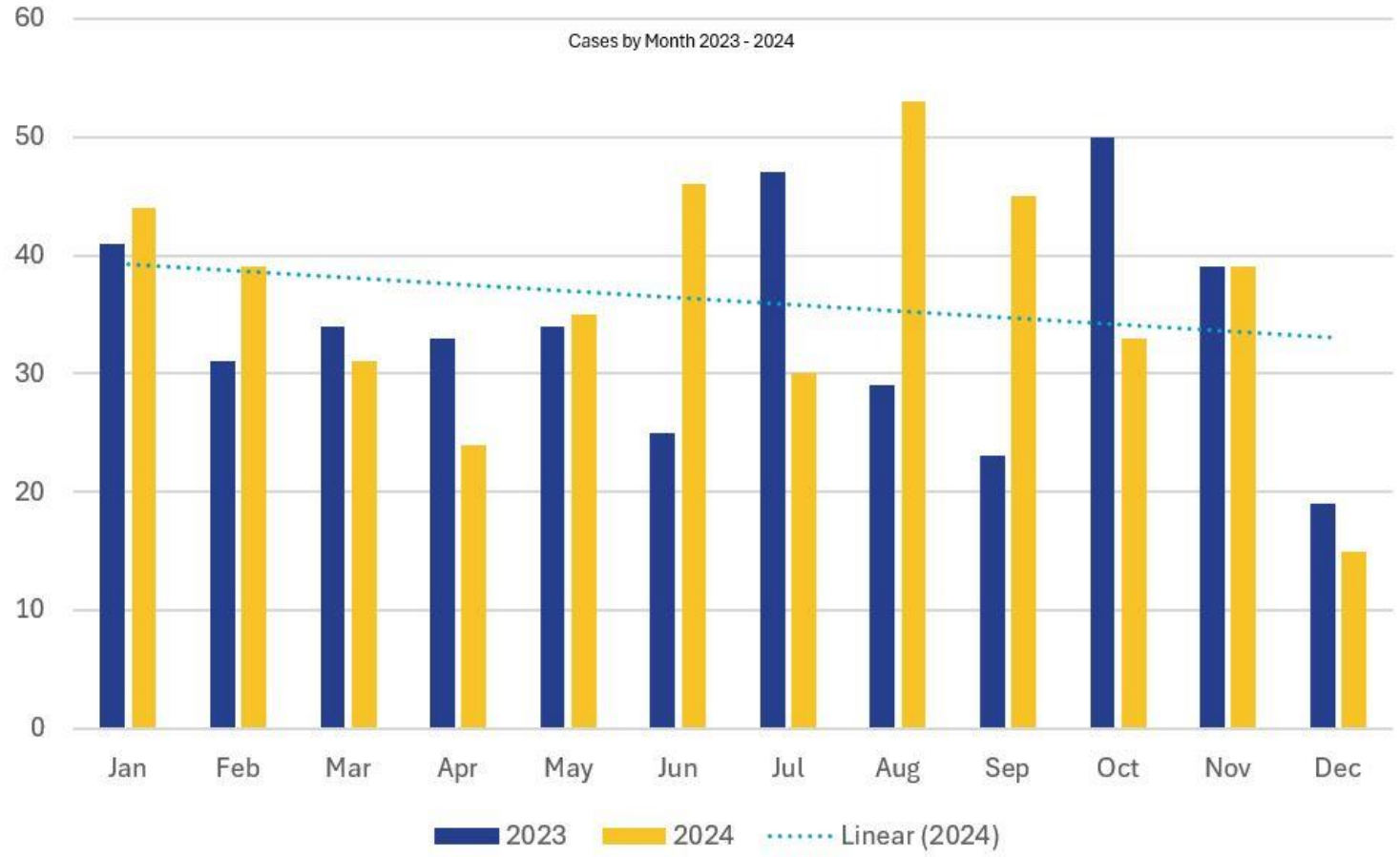
Mechanism:

- KPC: 163
- VIM: 30
- NDM: 37
- IMP: 7
- OXA-48: 16

Acinetobacter only

- OXA-23: 58
- OXA-24/40: 109
- OXA-58: 0

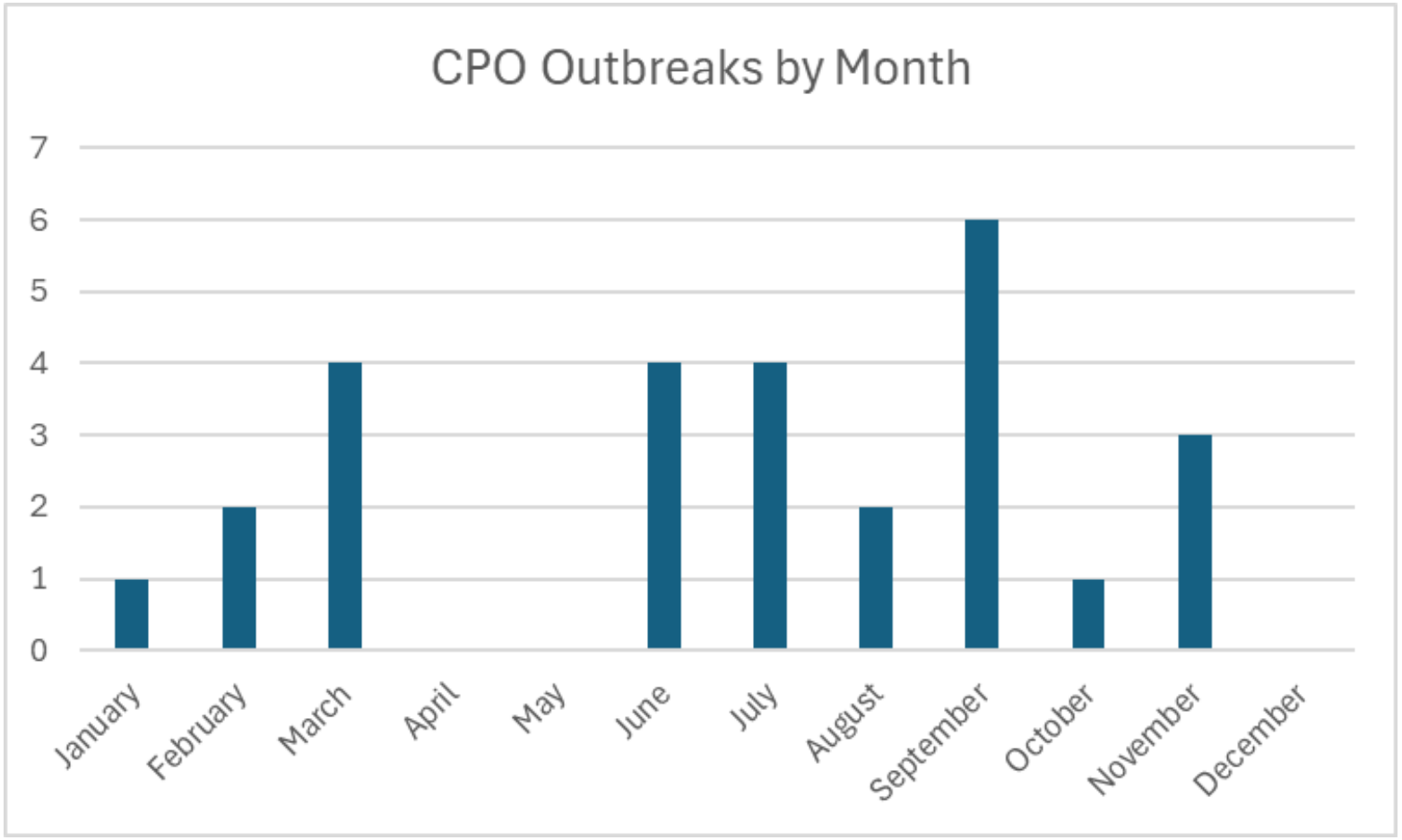
Carbapenamase Producing Organisms (CPO) Trends



Indiana Department of Health

CPO Outbreaks

- Total Outbreaks: 28
  - CRAB OXA-24/40: 12
  - CRAB OXA-23: 5
  - *E. coli* NDM: 2
  - *K. pnuemoniae* KPC: 2
  - CP-CRPA mCIM+/PCR Neg: 1
  - MRSA: 1
  - Multiple MDROs: 1
  - Multiple CP-CRE KPC: 1
  - *S. marcescens* KPC: 1
  - No MDROs: 1



Indiana Department of Health

Candida auris (C. auris)

- *Candida auris* clinical isolates representing both invasive (e.g., blood and CSF) and non-invasive sources (e.g., urine, wound, and respiratory tract), OR
- Colonized cases diagnosed via a skin or axilla/groin swab used to screen for *C. auris*,

Condition Name in NBS:

- **Candida auris, clinical**
- **Candida auris, colonized**

Reporting Timeframe:

- **Within One Working Day**

Background

- *Candida auris* (*C. auris*) is an emerging multidrug-resistant yeast that can cause invasive infections associated with high mortality.
- *C. auris* can persist on surfaces and medical equipment, spread between patients, and lead to outbreaks in healthcare settings.
- Approximately 40% of the U.S. clinical cases have been bloodstream infections; the rest involved non-sterile sites such as urine, respiratory tract, and wounds.
- *C. auris* can colonize the skin, nares, and other body sites. Patients can be colonized with *C. auris* for long periods of time, even after successful treatment of infection.
- Although patients colonized with *C. auris* in non-sterile sites may not need medical treatment, they can be a source of transmission to other individuals.

*Source CORHA Candida auris https://www.corha.org/wp-content/uploads/2021/08/Candida-auris-Recommendations-for-Healthcare-Outbreak-Response.pdf

Background

- Risk of infection or colonization with *C. auris* is greatest among people:
  - With extensive healthcare exposures, especially in long-term care facilities providing ventilator care
  - Infected or colonized with another multidrug-resistant organism, especially carbapenemase-producing organisms (CPOs)
  - With invasive medical devices such as central venous catheters and with tracheostomy, or gastrostomy tubes

Indiana Department of Health

*Source CORHA Candida auris https://www.corha.org/wp-content/uploads/2021/08/Candida-auris-Recommendations-for-Healthcare-Outbreak-Response.pdf

C. auris clades

- Clade - A group of biological taxa (such as species) that includes all descendants of one common ancestor
- Originally referred to by their geographic origins.
  - South Asian (Clade I)
  - East Asian (Clade II)
  - African (Clade III)
  - South American (Clade IV)
- Clade V isolates from Iran
- Novel Clade VI isolated in Bangladesh, first published June 2024

Clades, Indiana, and whole genome sequencing (WGS)

- WGS is needed to determine to which clade a *C. auris* isolate belongs
- Due to lack of testing capacity, WGS for *C. auris* previously took many months
  - Had to be done by special request to the CDC
- The Wisconsin State Laboratory of Hygiene (WSLH) now has the capability to sequence and analyze *C. auris* isolates. Routine testing includes:
  - The first isolate that initially diagnoses a patient with *C. auris*
  - All isolates that exhibit echinocandin resistance
  - Any isolates upon special request

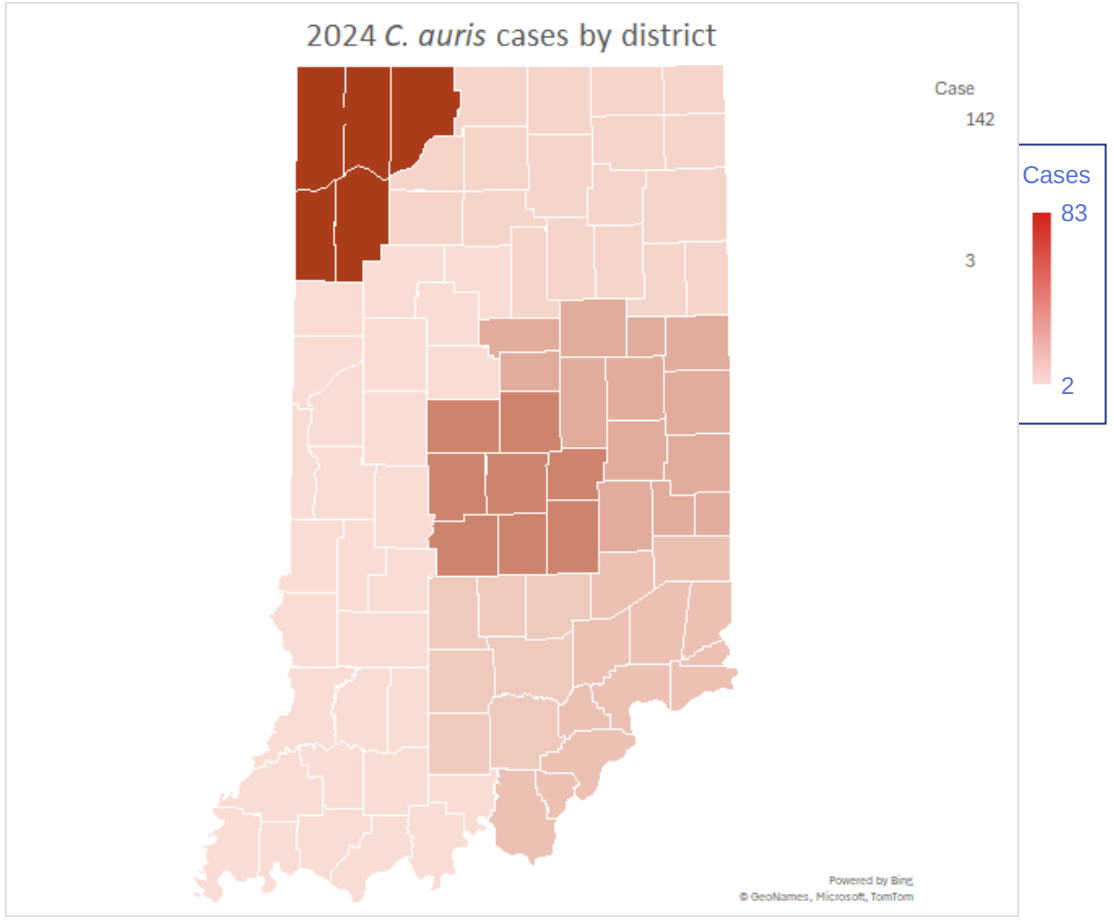
Candida auris (*C. auris*) Data

2023: 279

- Clinical: 105 (37.6%)
- Screening: 174 (62.3%)

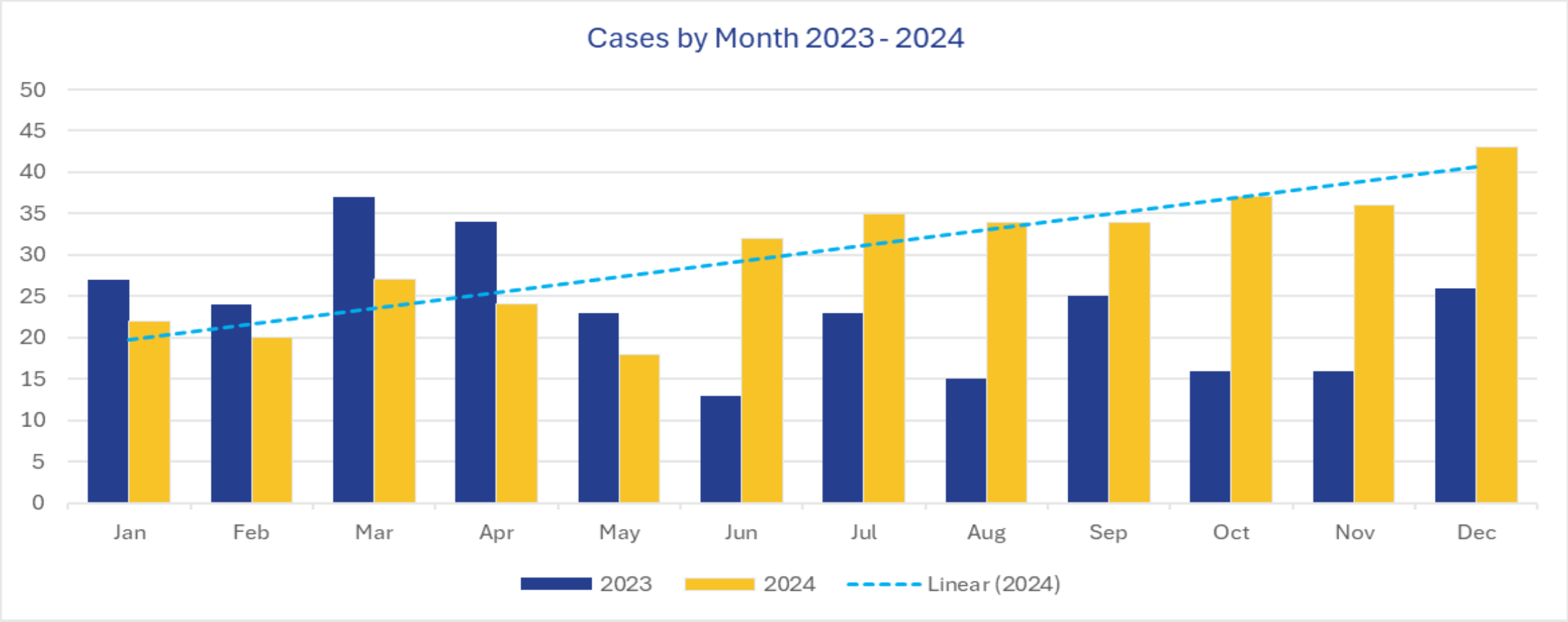
2024: 362

- Clinical: 166 (45.8%)
- Screening: 196 (54.1%)



Indiana Department of Health

Candida auris (*C. auris*) Trends

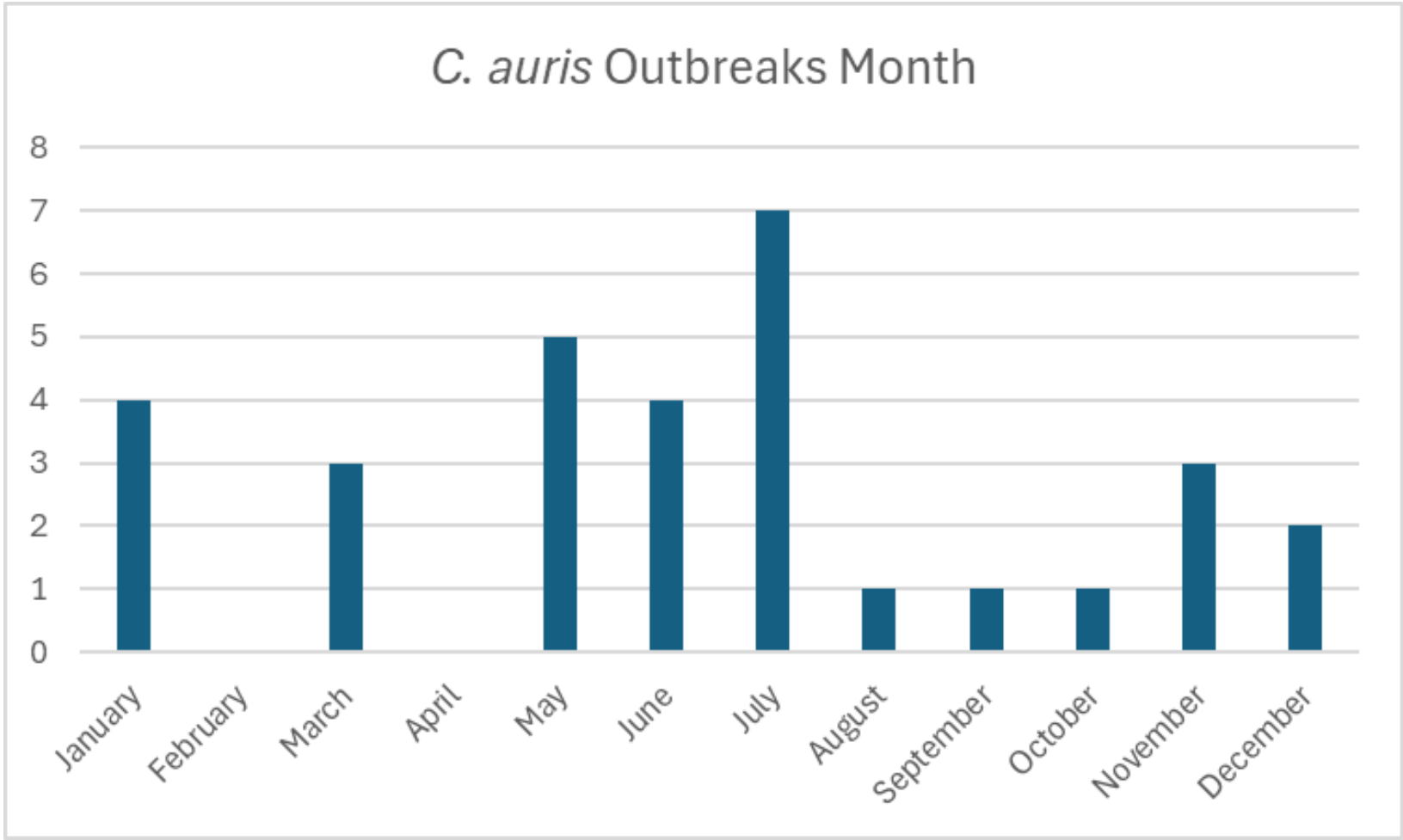


Indiana Department of Health

Candida auris Outbreaks

Total: 32

- Two responses due to echinocandin resistance
- One response due to organ donor involvement



Indiana Department of Health

United States *C. auris* Antifungal Resistance

Amphotericin B	echinocandins	Fluconazole
30 %	2 %	90 %

Please note that a finding of an elevated minimum inhibitory concentration (MIC) for an antifungal drug should not necessarily preclude its use. This is especially true if the use of other antifungal drugs for the patient has been ineffective.

Based on these MIC breakpoints, many isolates are resistant to multiple classes of drugs. Some U.S. *C. auris* isolates have been found to be resistant to all three classes of antifungal drugs. CDC has received reports of pan-resistance found in other countries as well.

*Source https://www.cdc.gov/candida-auris/hcp/laboratories/antifungal-susceptibility-testing.html

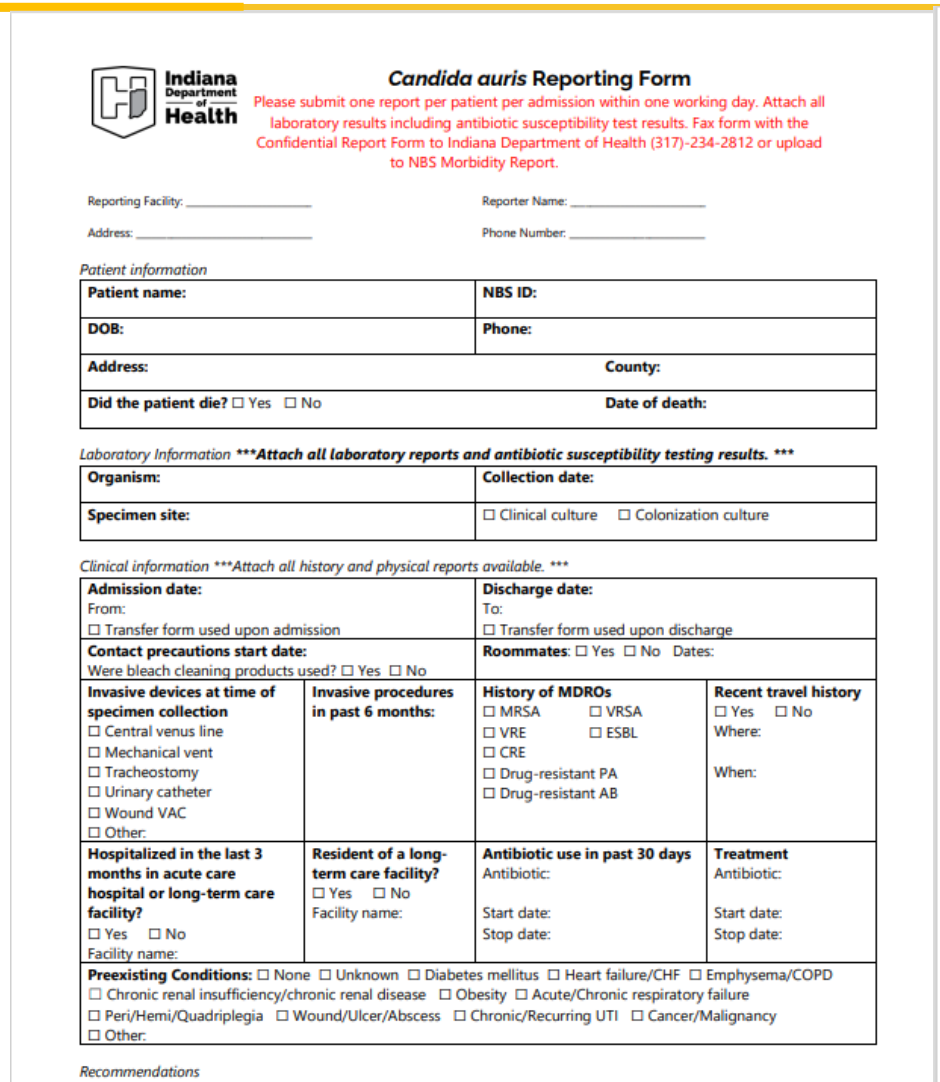
*For treatment information go to: https://www.cdc.gov/candida-auris/hcp/clinical-care/index.html

Indiana *C. auris* Antifungal Resistance thru 2023

YEAR Breakpoint	Micafungin ≥4	Anidulafungin ≥4	Caspofungin ≥2	Fluconazole ≥32	Amphotericin B MIC≥2 ETEST ≥1.5
2020 N=34	0	0	0	74.47 %	0
2021 N=77	0	0	0	71.0 %	0
2022 N-145	0.69 %	0.69 %	0.7 %	70.83 %	2.78 %
2023 N=180	0.56 %	0.56 %	0.68 %	83.33 %	7.78 %

For surveillance purposes only

C. auris reporting form



Indiana Department of Health

Candida auris Reporting Form

Please submit one report per patient per admission within one working day. Attach all laboratory results including antibiotic susceptibility test results. Fax form with the Confidential Report Form to Indiana Department of Health (317)-234-2812 or upload to NBS Morbidity Report.

Reporting Facility: _____ Reporter Name: _____

Address: _____ Phone Number: _____

Patient information

Patient name:	**NBS ID:**
DOB:	**Phone:**
Address:	**County:**
Did the patient die? ☐ Yes ☐ No	**Date of death:**

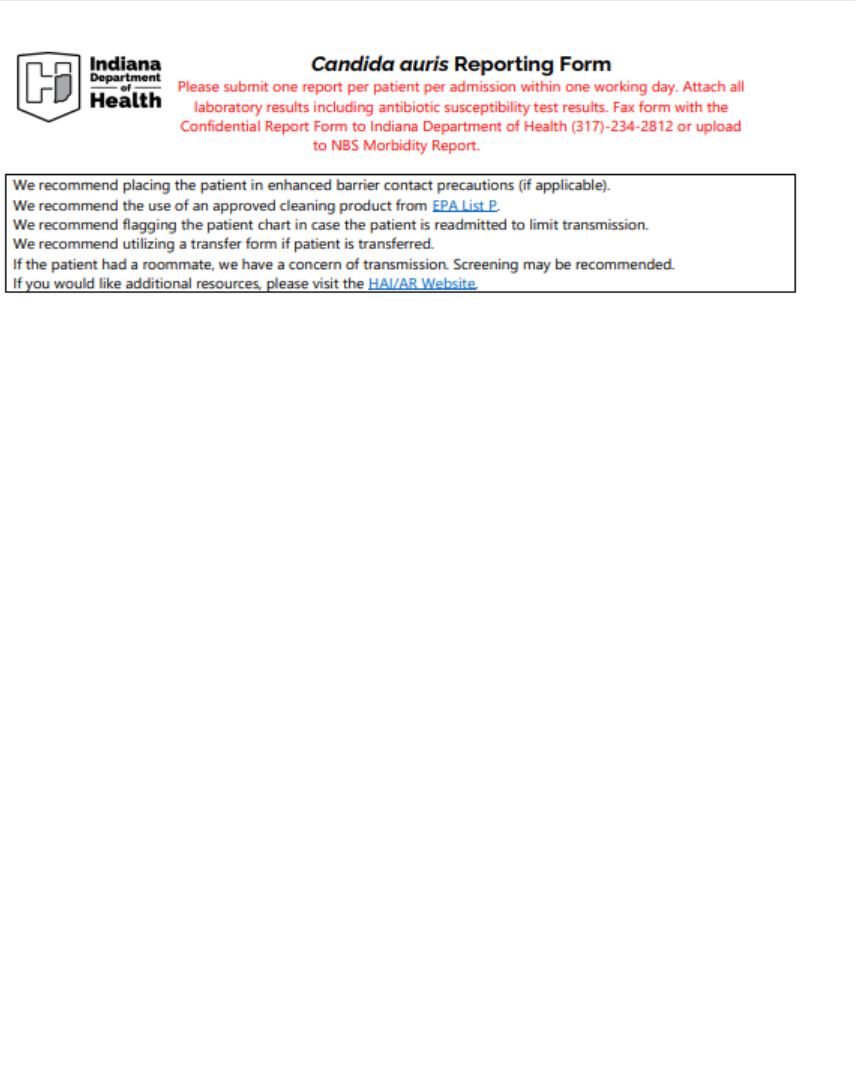
Laboratory Information ******Attach all laboratory reports and antibiotic susceptibility testing results.******

Organism:	**Collection date:**
Specimen site:	☐ Clinical culture ☐ Colonization culture

*Clinical information ***Attach all history and physical reports available. ****

Admission date: From: ☐ Transfer form used upon admission		**Discharge date:** To: ☐ Transfer form used upon discharge	
Contact precautions start date: Were bleach cleaning products used? ☐ Yes ☐ No		**Roommates**: ☐ Yes ☐ No Dates:	
Invasive devices at time of specimen collection ☐ Central venus line ☐ Mechanical vent ☐ Tracheostomy ☐ Urinary catheter ☐ Wound VAC ☐ Other:	**Invasive procedures in past 6 months:**	**History of MDROs** ☐ MRSA ☐ VRSA ☐ VRE ☐ ESBL ☐ CRE ☐ Drug-resistant PA ☐ Drug-resistant AB	**Recent travel history** ☐ Yes ☐ No Where: When:
Hospitalized in the last 3 months in acute care hospital or long-term care facility? ☐ Yes ☐ No Facility name:	**Resident of a long-term care facility?** ☐ Yes ☐ No Facility name:	**Antibiotic use in past 30 days** Antibiotic: Start date: Stop date:	**Treatment** Antibiotic: Start date: Stop date:
Preexisting Conditions: ☐ None ☐ Unknown ☐ Diabetes mellitus ☐ Heart failure/CHF ☐ Emphysema/COPD ☐ Chronic renal insufficiency/chronic renal disease ☐ Obesity ☐ Acute/Chronic respiratory failure ☐ Peri/Hemi/Quadriplegia ☐ Wound/Ulcer/Abscess ☐ Chronic/Recurring UTI ☐ Cancer/Malignancy ☐ Other:			

Recommendations



Indiana Department of Health

Candida auris Reporting Form

Please submit one report per patient per admission within one working day. Attach all laboratory results including antibiotic susceptibility test results. Fax form with the Confidential Report Form to Indiana Department of Health (317)-234-2812 or upload to NBS Morbidity Report.

We recommend placing the patient in enhanced barrier contact precautions (if applicable).
We recommend the use of an approved cleaning product from EPA List P.
We recommend flagging the patient chart in case the patient is readmitted to limit transmission.
We recommend utilizing a transfer form if patient is transferred.
If the patient had a roommate, we have a concern of transmission. Screening may be recommended.
If you would like additional resources, please visit the HAI/AR Website.

Indiana Department of Health

Pandrug-Resistant Organisms

- Pandrug-resistant Organisms
- Any isolates that shows intermediate or resistant to all antimicrobials tested

Condition Name in NBS:

- **Pandrug-resistant Organisms**

Reporting Timeframe:

- **Within One Working Day**

Indiana Department of Health

VISA/VRSA

Vancomycin-resistant *Staphylococcus aureus* (VRSA) and Vancomycin-intermediate *Staphylococcus aureus* (VISA) from any site

- Vancomycin Resistant: MIC ≥ 16
- Vancomycin Intermediate: MIC 4-8

Condition Name in NBS:

- **VRSA**
- ***S. aureus*, vancomycin intermediate susc (VISA)**

Reporting Timeframe:

- **Within One Working Day**

VISA, VRSA, and Pan-Drug Resistant Organisms

- VISA: All time- 3 Confirmed Cases
- VRSA: All time- 0 Confirmed Cases
- Pan-drug Resistant: 2023-12 confirmed cases. 2024- 9 confirmed cases

Infection Control Assessment and Response (ICAR)

- What if multiple individuals who test positive for an MDRO were at the same facility?
  - Confirmation that all individuals were at the facility would occur
- IDOH would work with the facility and suggest an onsite visit
  - A team from IDOH would meet with stakeholders at the facility
  - An ICAR tool would be completed by the infection prevention team at IDOH
  - Usually takes two to three hours:
    - Roundtable discussion with leadership, facility infection preventionist (IP), and housekeeping manager
    - Involves walking through the facility and observing staff performing their routine work where the cases reside

ICAR tool and IP scope

"ICAR tools are used to systematically assess a healthcare facility's infection prevention and control (IPC) practices and guide quality improvement activities (e.g., by addressing identified gaps)."- CDC

We use the Infection Control Assessment and Response (ICAR) tools to work with facilities across the state of Indiana to enhance infection prevention practices and improve outcomes for patients, staff, and residents

- Long-term Cares and Assisted Livings
- Long-term Care Acute Hospitals (LTACHs)
- Acute Care Hospitals (ACH)
- Department of Corrections (DOC)/Prisons' infirmaries
- Dental facilities
- Dialysis facilities

Indiana Department of Health

ICARs are non-punitive!

Outbreak ICAR: Targeted MDRO

Targeted MDRO Outbreak in a healthcare setting is identified.

- *C. auris* outbreak- two or more *Candida auris* cases with an epidemiological link.
- CPO outbreak- two or more CPOs of the same organism and mechanism occur in a 4-week period in patients who are epidemiologically linked or determined to be genetically related by laboratory testing.

IDOH offers an ICAR

- Assessment is educational.
  - Discussion with facility infection prevention personnel.
  - Review of facility policy and procedure.
  - Direct observations.

Benefits of an ICAR

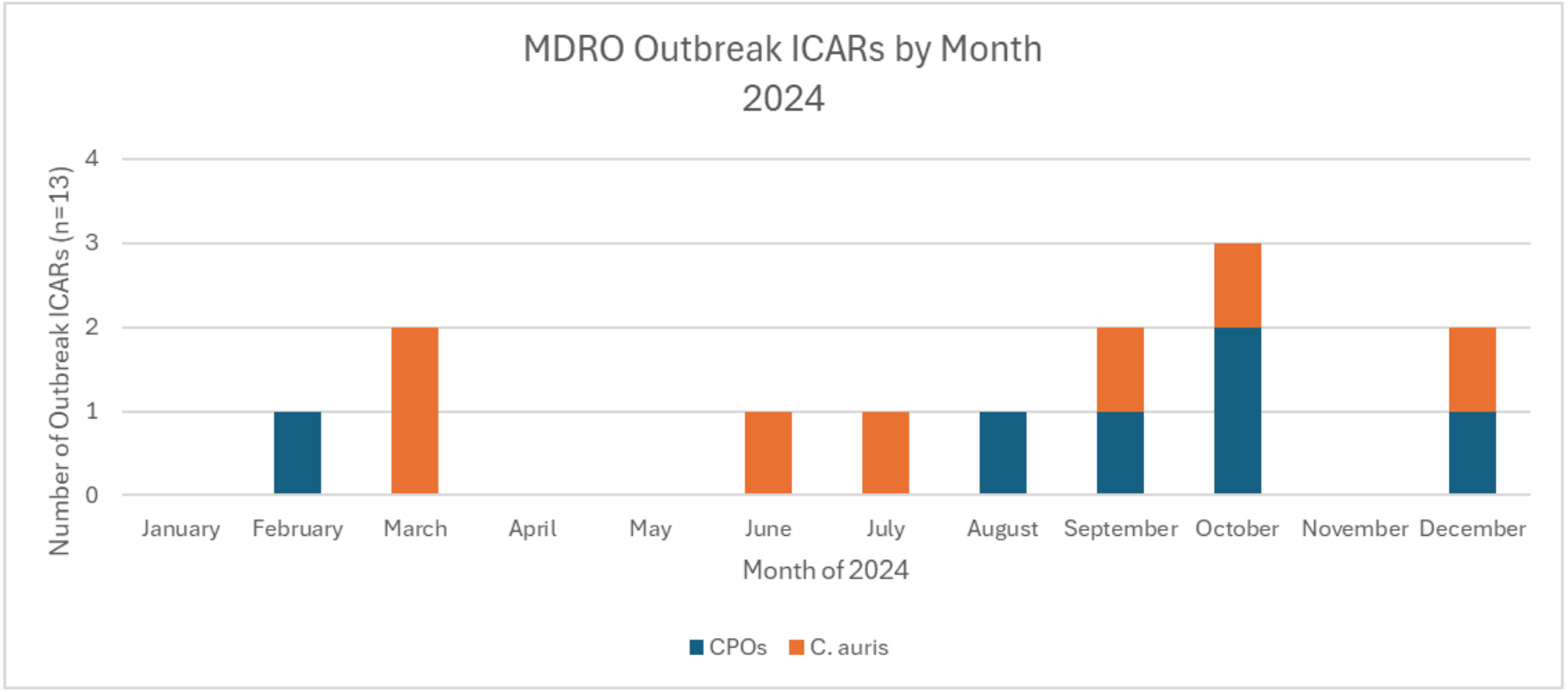
- Potential identification of gaps in infection prevention practices that should be corrected
- Performance of the ICAR is collaborative and in no way punitive
- Increased awareness by:
  - Staff regarding the target organism
  - Staff regarding IP practices
  - Leadership regarding need for resources

The point prevalence survey (PPS)

- A key tool for public health
- Per CDC recommendations:
  - Should be used if evidence of transmission in a facility
  - Every patient on a given unit or floor where transmission is suspected should be screened
- IDOH facilitates supplies through our AR (antimicrobial resistance) lab network reference facility

ICARs in 2024

- Total: 13
- CPO: 6 outbreak ICARs
- *C. auris*: 7 outbreak ICARs



Indiana Department of Health

Questions?

Caleb Cox, MPH

Senior MDRO Epidemiologist

calcox@health.in.gov