



**TEXAS**  
Health and Human  
Services

**Texas Department of State  
Health Services**

# HAI-lights of the Field During the COVID-19 Pandemic

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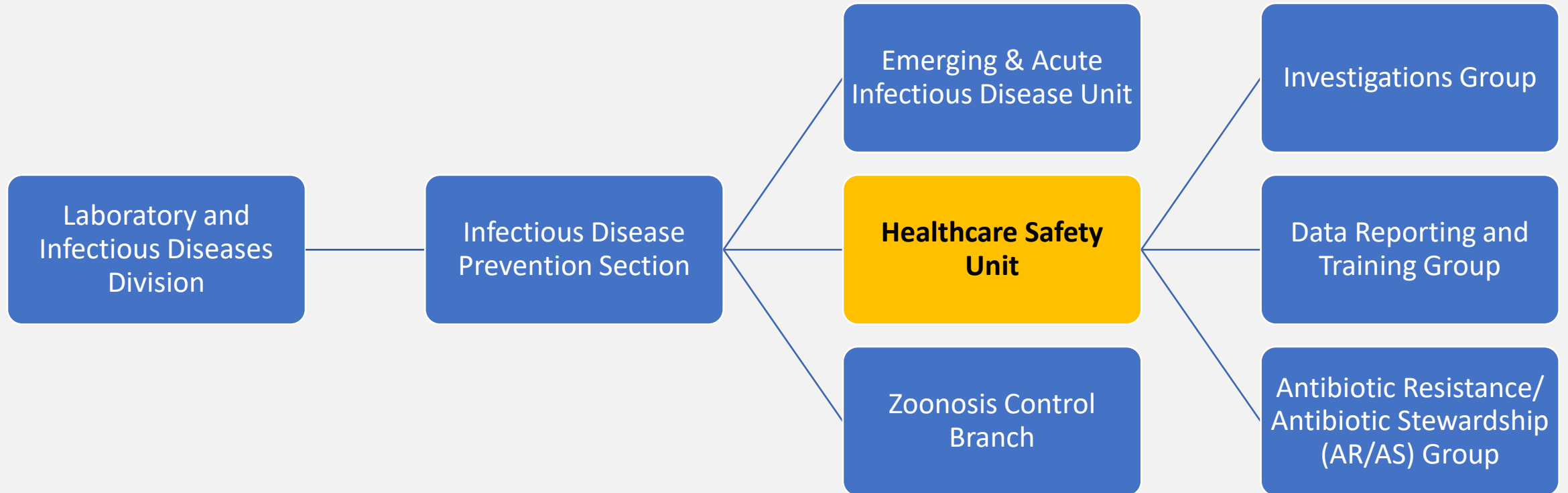


# Learning Objectives

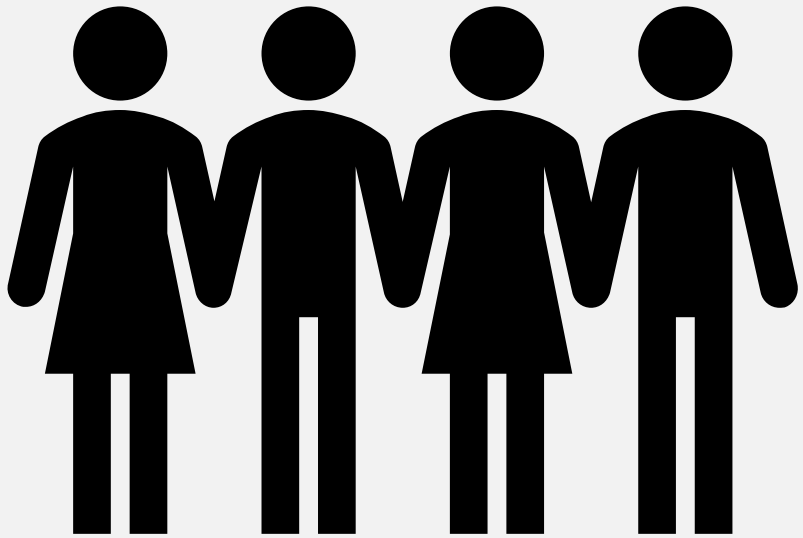
- Understand the initiatives of the Texas Healthcare Safety Unit to increase infection prevention and control (IPC) capacity and reduce HAIs in the state.
- Discuss the importance of promptly detecting antibiotic-resistant (AR) threats in healthcare facilities.
- Describe public health strategies to contain novel or targeted AR organisms.



# Organizational Structure



# Healthcare Safety Unit



## ***Mission***

Promoting safe and quality healthcare through awareness, education, transparency, monitoring and response.

## ***Vision***

Helping to achieve safe, quality healthcare that improves the well-being of everyone in Texas.

# HCS Investigations Group

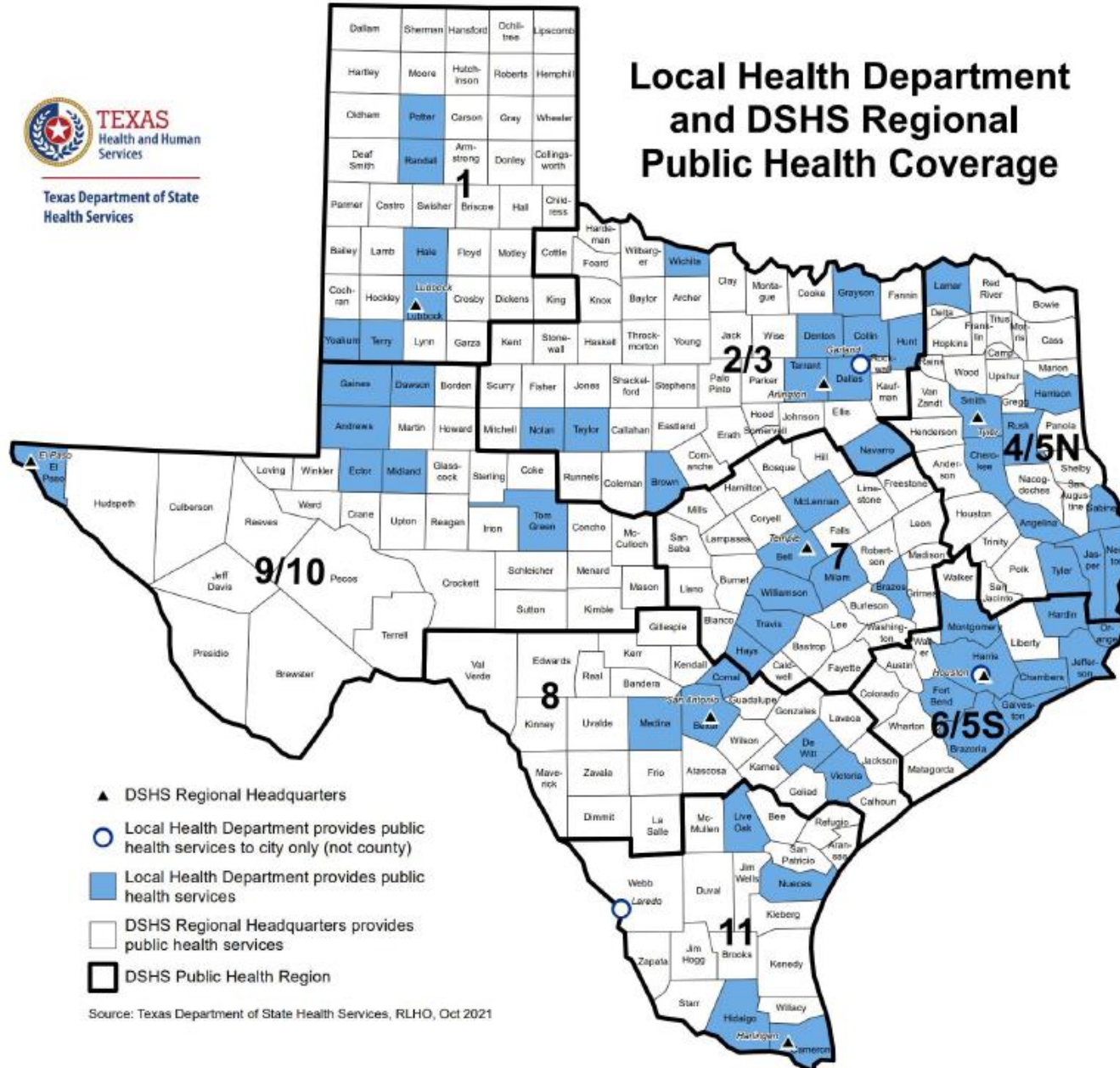
[ICAR@dshs.texas.gov](mailto:ICAR@dshs.texas.gov)



# Texas Healthcare Associated Infections (HAI) Epidemiologists



## Local Health Department and DSHS Regional Public Health Coverage



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# HAI Epidemiologists: Primary Roles

Healthcare infection prevention and control (IPC) expert

Respond to investigations and outbreaks related to healthcare facilities

Conduct infection control assessments in healthcare facilities

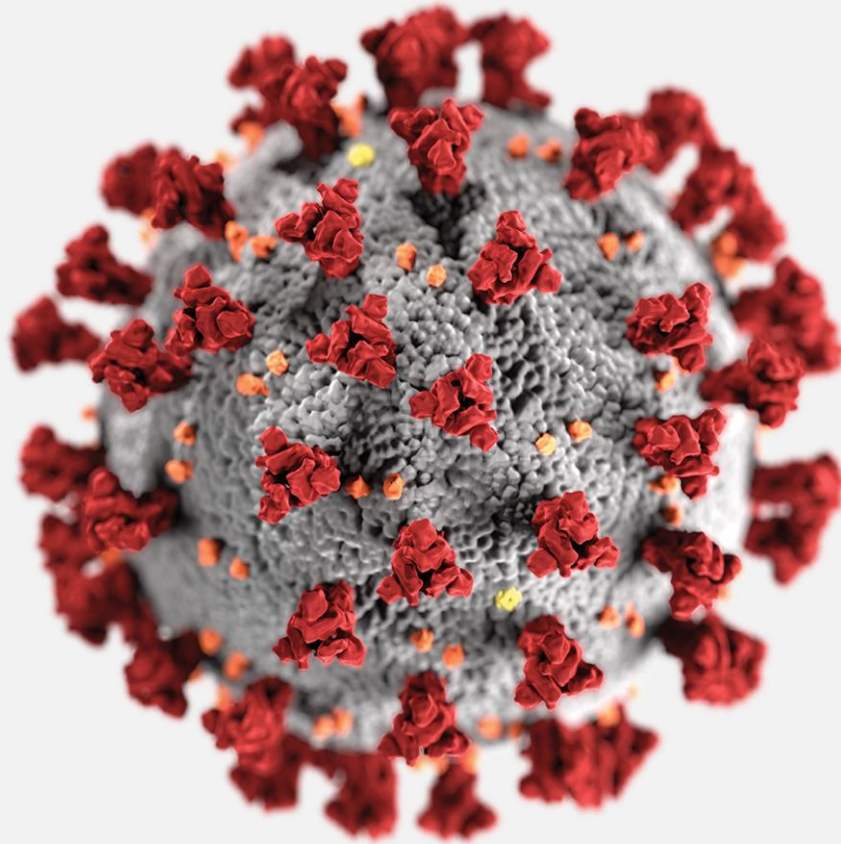
Provide support for outbreak investigations to LHDs and healthcare facilities

Collaborate with stakeholders in IPC activities





# COVID-19 Healthcare Response



- Responded to over 1,500 outbreaks in healthcare settings, mostly in long-term care facilities.
- Conducted over 1,196 infection control assessments.
- Created and provided over 44 infection control education to internal and external stakeholders.



# AR/AS Group

[MDROTexas@dshs.texas.gov](mailto:MDROTexas@dshs.texas.gov)



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# Texas Notifiable Conditions - 2022

**Report all Confirmed and Suspected cases**

**24/7 Number for Immediately Reportable – 1-800-705-8868**

Access List Online



Contact Information



Unless noted by\*, report to your local or regional health department using number above or find contact information at <http://www.dshs.texas.gov/idcu/investigation/conditions/contacts/>

A – L	When to Report	L – Y	When to Report
*Acquired immune deficiency syndrome (AIDS) <sup>1</sup>	Within 1 week	Legionellosis <sup>2</sup>	Within 1 week
Amebic meningitis and encephalitis <sup>2</sup>	Within 1 week	Leishmaniasis <sup>2</sup>	Within 1 week
Anaplasmosis <sup>2</sup>	Within 1 week	Listeriosis <sup>2,3</sup>	Within 1 week
<b>Anthrax<sup>2,3,25</sup></b>	<b>Call Immediately</b>	Lyme disease <sup>2</sup>	Within 1 week
Arboviral infections <sup>2,4,5</sup>	Within 1 week	Malaria <sup>2</sup>	Within 1 week
*Asbestosis <sup>6</sup>	Within 1 week	<b>Measles (rubeola)<sup>2</sup></b>	<b>Call Immediately</b>
Ascariasis <sup>2</sup>	Within 1 week	<b>Meningococcal infection, invasive (<i>Neisseria meningitidis</i>)<sup>2,3</sup></b>	<b>Call Immediately</b>
Babesiosis <sup>2,5</sup>	Within 1 week	Mumps <sup>2</sup>	<b>Within 1 work day</b>
<b>Botulism (adult and infant)<sup>2,3,7,25</sup></b>	<b>Call Immediately<sup>7</sup></b>	Paragonimiasis <sup>2</sup>	Within 1 week
<b>Brucellosis<sup>2,3,25</sup></b>	<b>Within 1 work day</b>	Pertussis <sup>2</sup>	<b>Within 1 work day</b>
Campylobacteriosis <sup>2</sup>	Within 1 week	*Pesticide poisoning, acute occupational <sup>8</sup>	Within 1 week
*Cancer <sup>9</sup>	See rules <sup>9</sup>	<b>Plague (<i>Yersinia pestis</i>)<sup>2,3,25</sup></b>	<b>Call Immediately</b>
<b><i>Candida auris</i><sup>2,3,10</sup></b>	<b>Within 1 work day</b>	<b>Poliomyelitis, acute paralytic<sup>2</sup></b>	<b>Call Immediately</b>
<b>Carbapenem-resistant <i>Enterobacteriales</i> (CRE)<sup>2,11</sup></b>	<b>Within 1 work day</b>	Poliovirus infection, non-paralytic <sup>2</sup>	<b>Within 1 work day</b>

In addition to specified reportable conditions, **any outbreak, exotic disease, or unusual group expression of disease that may be of public health concern should be reported by the most expeditious means available. This includes any case of a select agent<sup>25</sup>**

See select agent list at <https://www.selectagents.gov/selectagentsandtoxinslist.html>



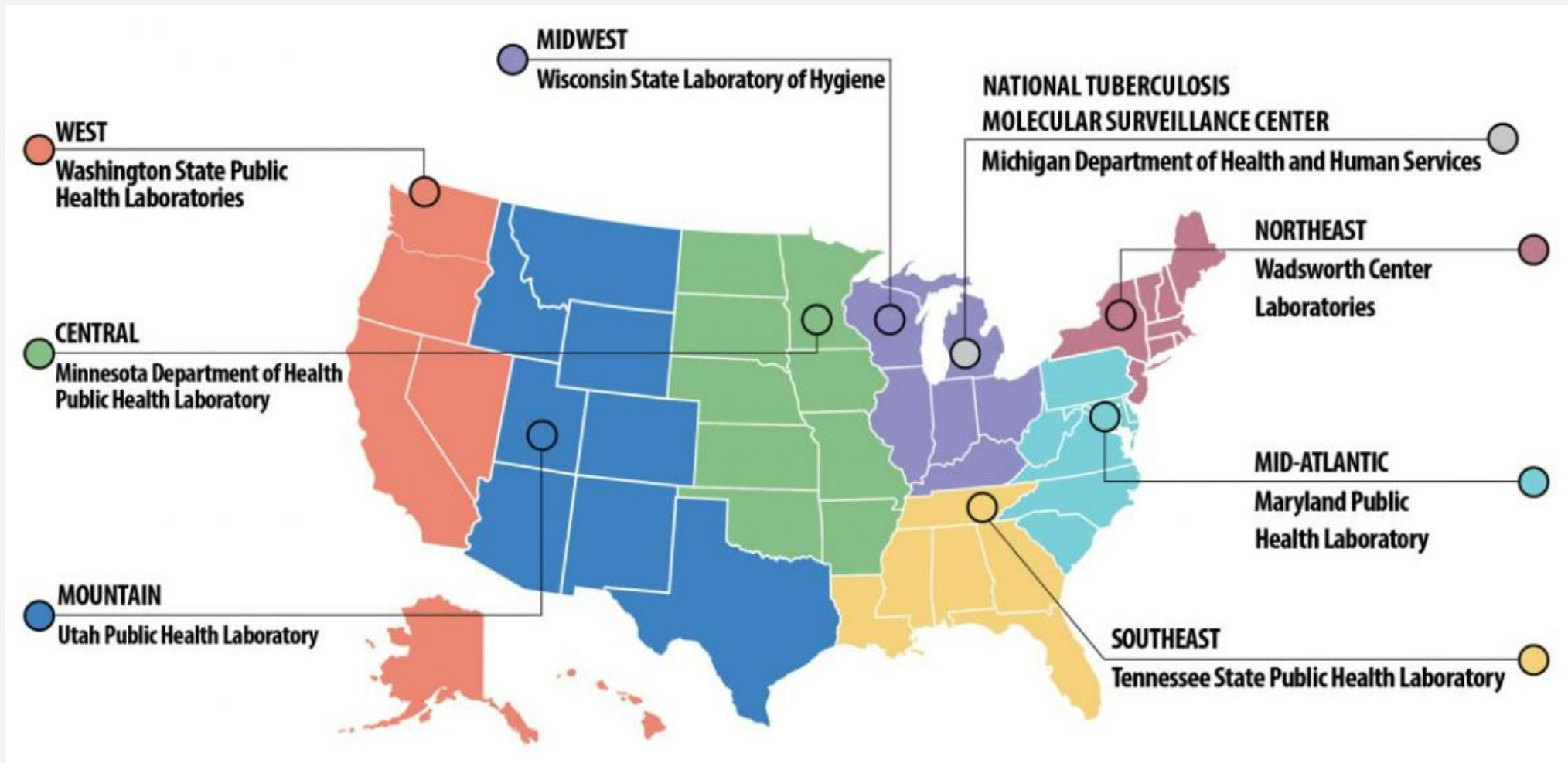
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# Texas Notifiable MDROs

- **Carbapenem-resistant *Enterobacterales***
  - *Escherichia coli*
  - *Klebsiella pneumoniae*
  - *Klebsiella oxytoca*
  - Production of carbapenemase (i.e. KPC, NDM, VIM, IMP)
- ***C. auris*: *Candida auris***
- **VISA**: Vancomycin-Intermediate *Staphylococcus aureus*
- **VRSA**: Vancomycin-Resistant *Staphylococcus aureus*



# CDC Antibiotic Resistance Laboratory Network (AR Lab Network)



# Antibiotic Stewardship Program

**Mission:** *Provide direction for the development of a collaborative statewide program that empowers healthcare providers and the public with evidence-based information, education, and tools necessary to use antimicrobials judiciously and limit the emergence and spread of resistance in Texas.*

## Antimicrobial Stewardship Regional Advisory Committees

- Meetings will be set during the 2022 calendar year.

## Each committee will consist of:

- Physicians
- Directors of Nursing or (equivalent consultants with long-term care facilities)
- Public health officials knowledgeable about antibiotic stewardship
- Other interested parties

## For more information:

- Webpage: <https://www.dshs.state.tx.us/IDCU/Antimicrobial/Antimicrobial-Stewardship.aspx>
- Email: [AntibioticStewardship@dshs.texas.gov](mailto:AntibioticStewardship@dshs.texas.gov)

# Carbapenem-Resistant *Acinetobacter baumannii* Outbreaks in Acute Care Hospital COVID-19 Intensive Care Units in South Texas, 2020



# Carbapenem resistant *Acinetobacter baumannii* (CRAB) Outbreaks

- 5 CRAB Outbreaks in Acute Care Hospital (ACH) COVID-19 intensive care units in Public Health Region 11

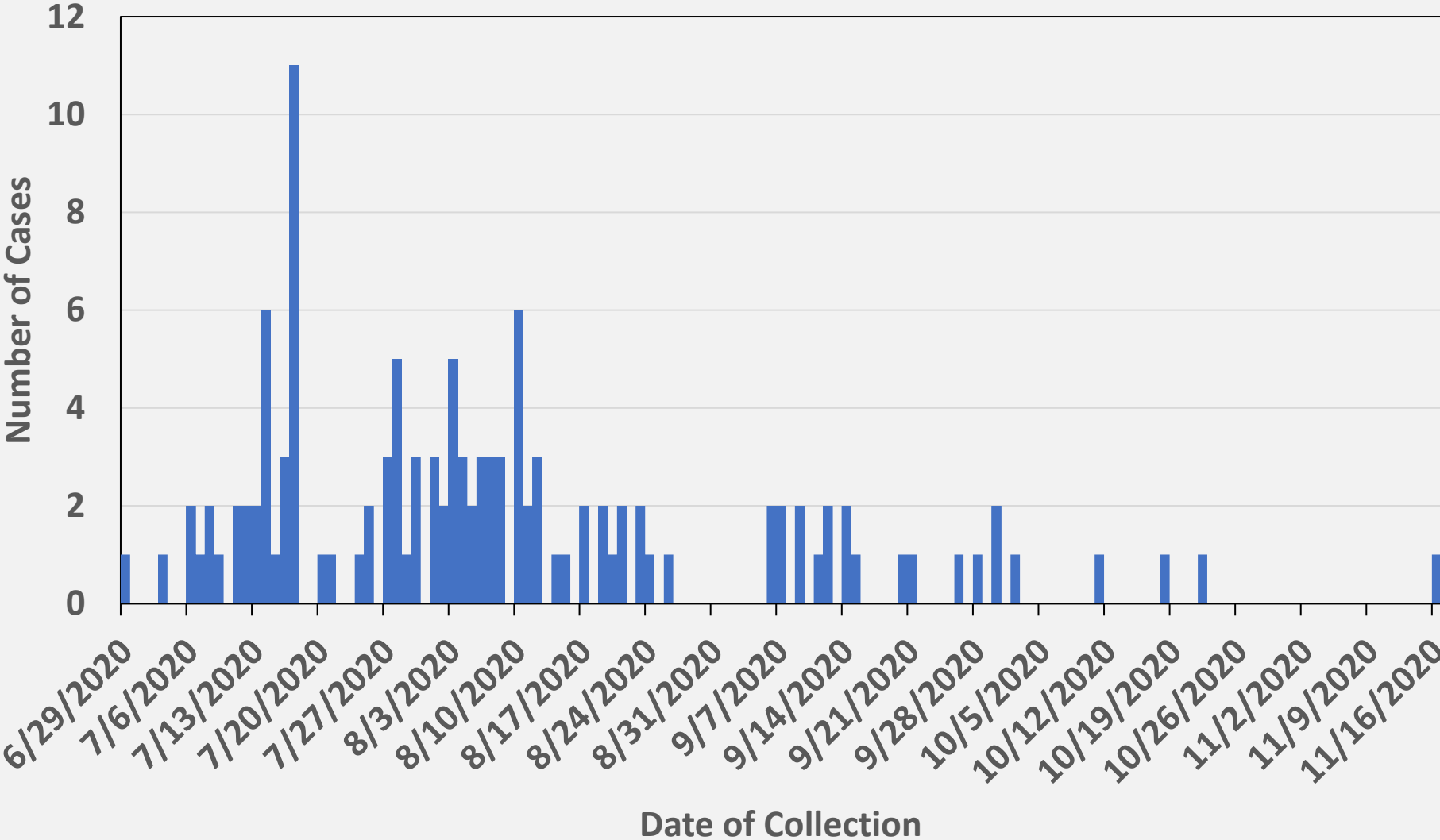
## Case Count:

- 123 patients (80% mortality)
- Clinical Testing June 2020 to November 2020
- Whole Genome Sequencing
  - 85 isolates from 61 patients across all ACHs tested
- Colonization Screening
  - 132 axilla/groin samples tested from 100 patients Oct – Nov 2020
  - 807 additional axilla/groin samples tested in house testing Nov – Feb 2021

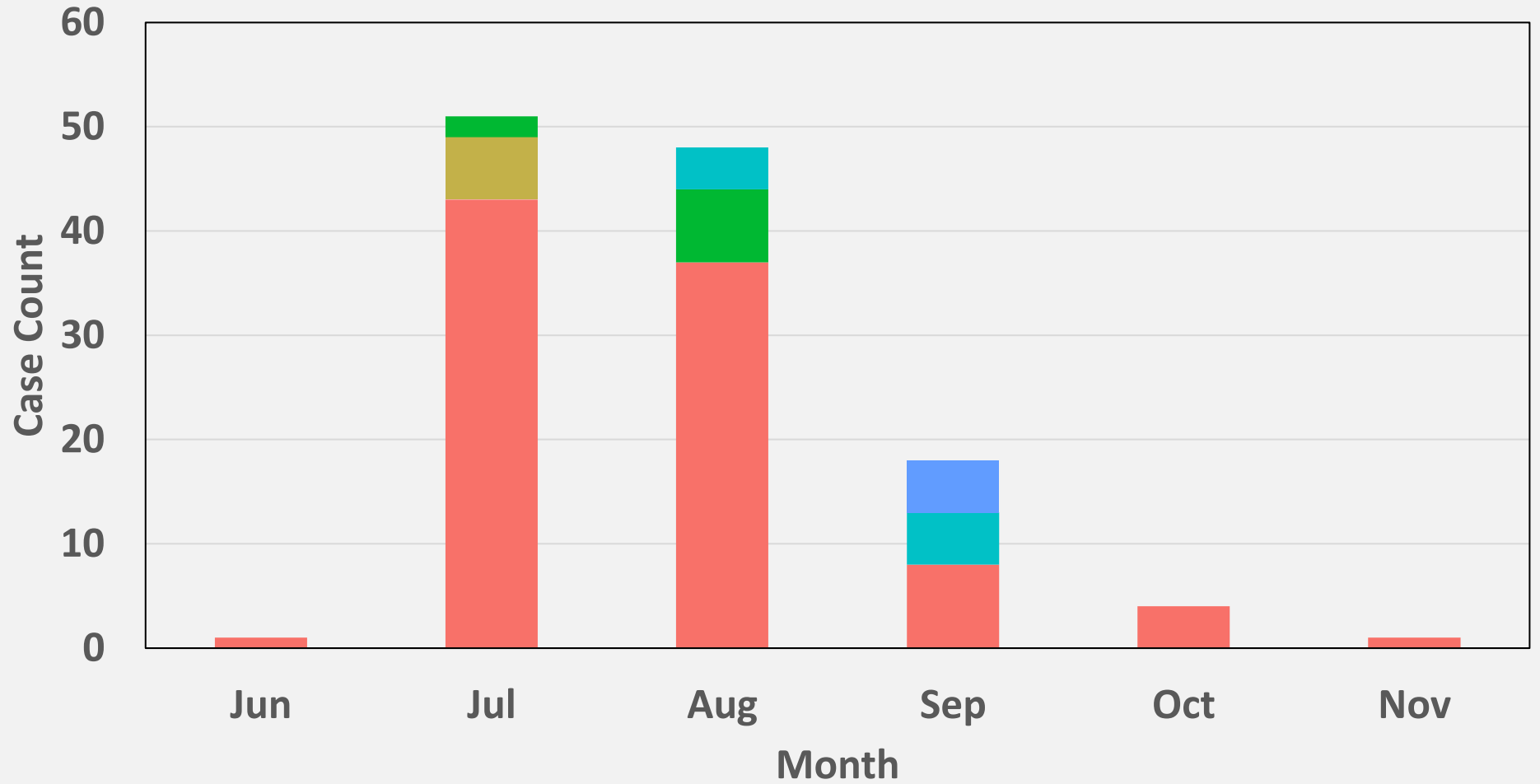




### CRAB in ACH COVID-19 ICUs in PHR 11, 2020



## CRAB in ACH COVID-19 ICUs in PHR 11 by Facility



Facility A   Facility B   Facility C   Facility D   Facility E



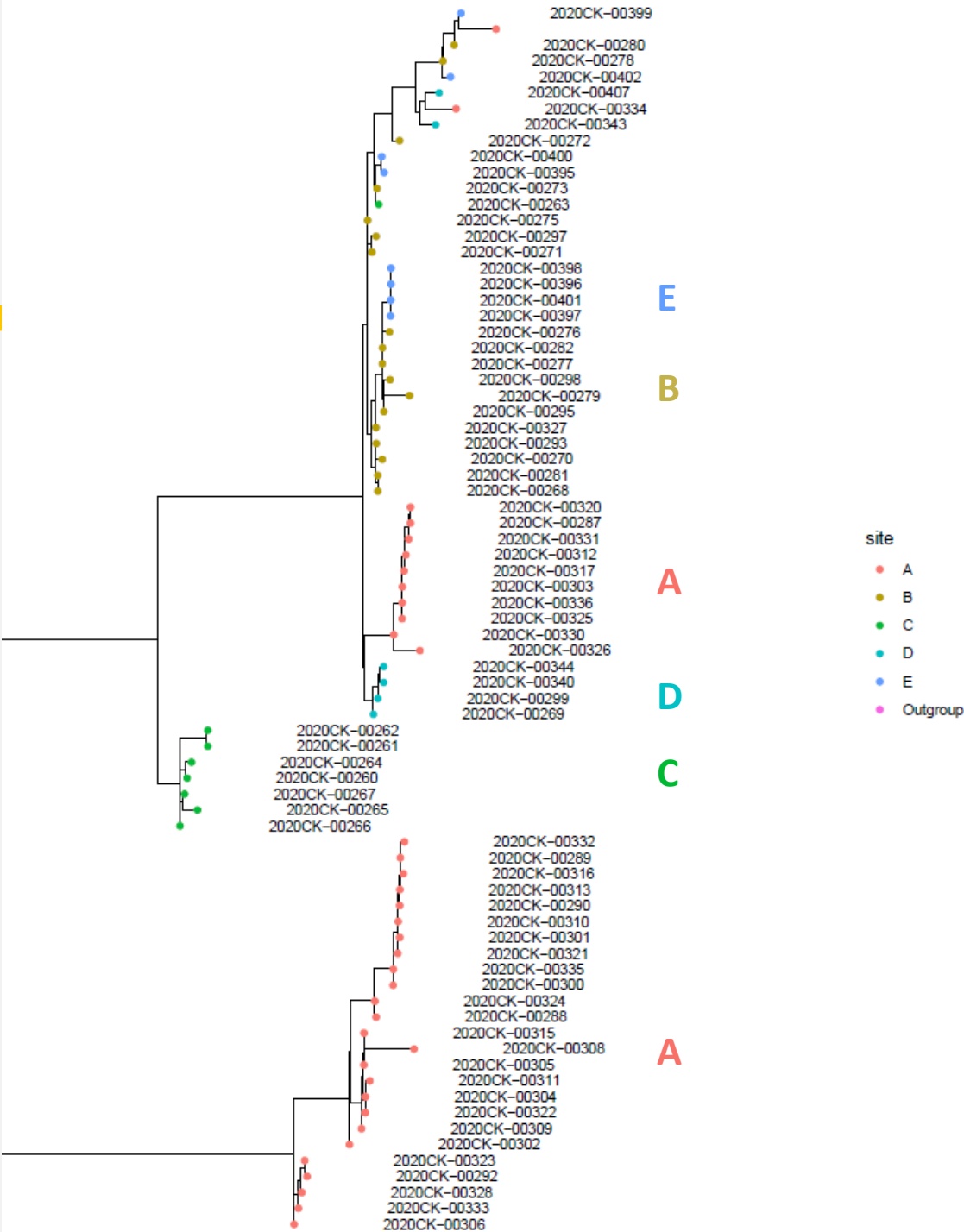
# Whole Genome Sequencing (WGS)

Site A ACH: Two clades of resistant CRAB strains

Findings suggest CRAB transmission was intra-facility (within) and not interfacility (between)



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# DSHS, LHD, and CDC Response

## Aggressive Containment Response Effort

- Infection Control Assessment and Response (ICAR)
- Coordinated ARLN WGS and Colonization Screening
- Local Health Department (LHDs) managing epi line list data
- APIC Chapter meetings
- Communicating Transmission Based Precaution to other healthcare facilities and alerting previous transferring healthcare facilities within the past 30 days.
- Increase in MDRO surveillance
  - (CRE *Klebsiella pneumoniae* and *Klebsiella aerogenes*)



# Infection Control Findings

- Cross-contamination, self-contamination, improper storage of personal protective equipment (PPE)
- A need to improve observational audits and validation processes of hand hygiene and PPE donning/doffing
- A need to return to conventional PPE strategies from contingency/crisis strategies when not in a PPE shortage
- A need to re-educate staff leaders to champion infection control for new and existing staff.



# NDM, OXA-72, and OXA-58 Oh my!

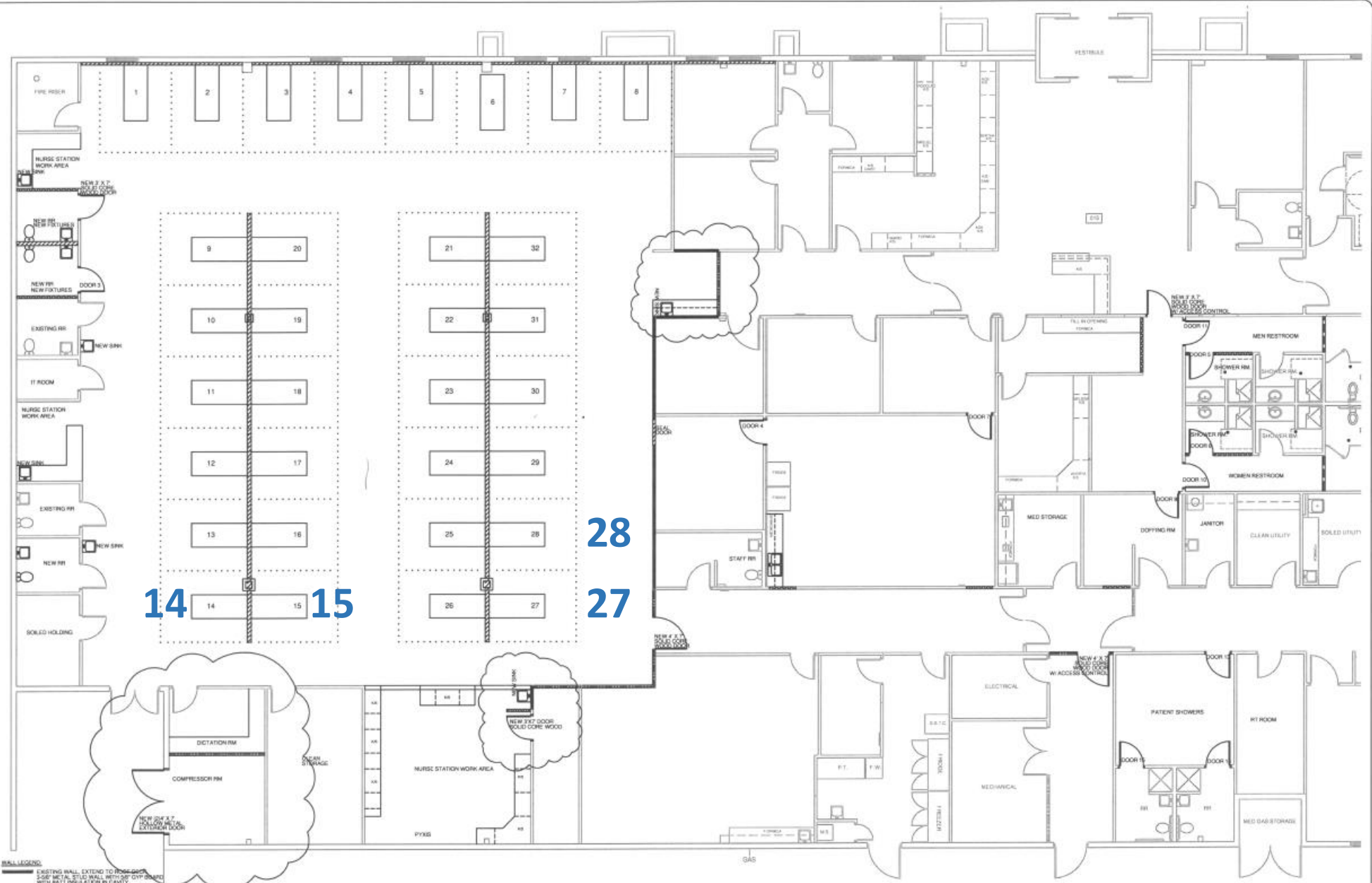
- DSHS is notified by CDC/ARLN of novel plasmid mediated resistance gene tet(X)
- 15 CRAB patients with tet(x) gene in ACH COVID-19 ICU
  - Resistance mechanisms of NDM, OXA-72, and OXA-58
  - Specimen collection dates August 2021 to October 2021
  - 13 with unknown travel outside US within past 6 months
  - 1 from Honduras through Mexico to US, 1 from Mexico
- Follow up ICAR conducted to reassess



# HAI Transmission

Patient	Room #	Admission Date	Collection Date	Expired Date
A	ER (7/21) ICU (7/22) 565 (7/28)	7/21/2021	8/2/2021	8/9/2021
B	ER (7/27) 566 (7/28)	7/27/2021	8/9/2021	8/14/2021
C	564 (8/2) ICU 15 (8/20) ICU 28 (9/3)	8/2/2021	9/1/2021	9/4/2021
D	ER (8/23) ICU 14 (8/28) ICU 27 (9/3) ICU 22 (9/5)	8/23/2021	9/1/2021	9/17/2021
E	574 (8/4) 562 (8/8)	8/4/2021	8/9/2021	8/17/2021





P 411

- WALL LEGEND:**
- EXISTING WALL, EXTEND TO ROOF/CEILING  
5/8" METAL STUD WALL WITH 5/8" GYP BOARD WITH BATT INSULATION IN CAVITY.
  - NEW WALL, FROM FLOOR TO ROOF DECK  
5/8" METAL STUD WALL WITH 5/8" GYP BOARD WITH BATT INSULATION IN CAVITY.
  - NEW WALL, FROM FLOOR TO CEILING  
6" METAL STUD WALL WITH 5/8" GYP BOARD WITH BATT INSULATION IN CAVITY.
  - NEW WALL, FROM FLOOR TO CEILING  
5/8" METAL STUD WALL WITH 5/8" GYP BOARD WITH BATT INSULATION IN CAVITY.
  - NEW WALL, FROM FLOOR TO CEILING  
5/8" METAL STUD WALL WITH 5/8" GYP BOARD OR DRY-BUILD.
  - - - - - CURTAINS BY EHR

- GENERAL NOTES:**
1. CLOSE UP EAST SIDE WINDOWS FOR MED GABIES.
  2. FIELD VERIFY STEEL COLUMN LOCATIONS. NEW WALLS WILL FOLLOW STEEL COLUMN LAYOUT.
  3. HEADWALLS FOR BDRS 6, 13, 14, 15, 18, 22, 26, 27 & 31 TO WORK AROUND STEEL COLUMNS.
  - 4.



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# Carbapenem Resistant *Pseudomonas aeruginosa*

and the role of environmental cultures



# Research shows...

- *P. aeruginosa* has been found on mattresses<sup>1,2</sup>, and sink sites<sup>3-6</sup>
- *P. aeruginosa* has been detected several years after resolution of outbreak<sup>4</sup>
  - Important to have clear maintenance protocols for water systems, including drainage components
- Value in repeat sampling of multiple sites, across multiple days<sup>5</sup>
- WGS can show relation in environmental and patient isolates<sup>6</sup>

# To culture or not to culture

...That is sometimes the question



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# Environmental Techniques

- Have a plan for positive cultures
- Select surfaces in varying patient proximity
- Repeat sites across multiple days
  - ex. 2 samples for each site on days 1-7 and day 14 or at discharge
- Premoistened swab
- Entire swab head in contact with sample area
  - Rolling the swab horizontally, vertically, diagonally



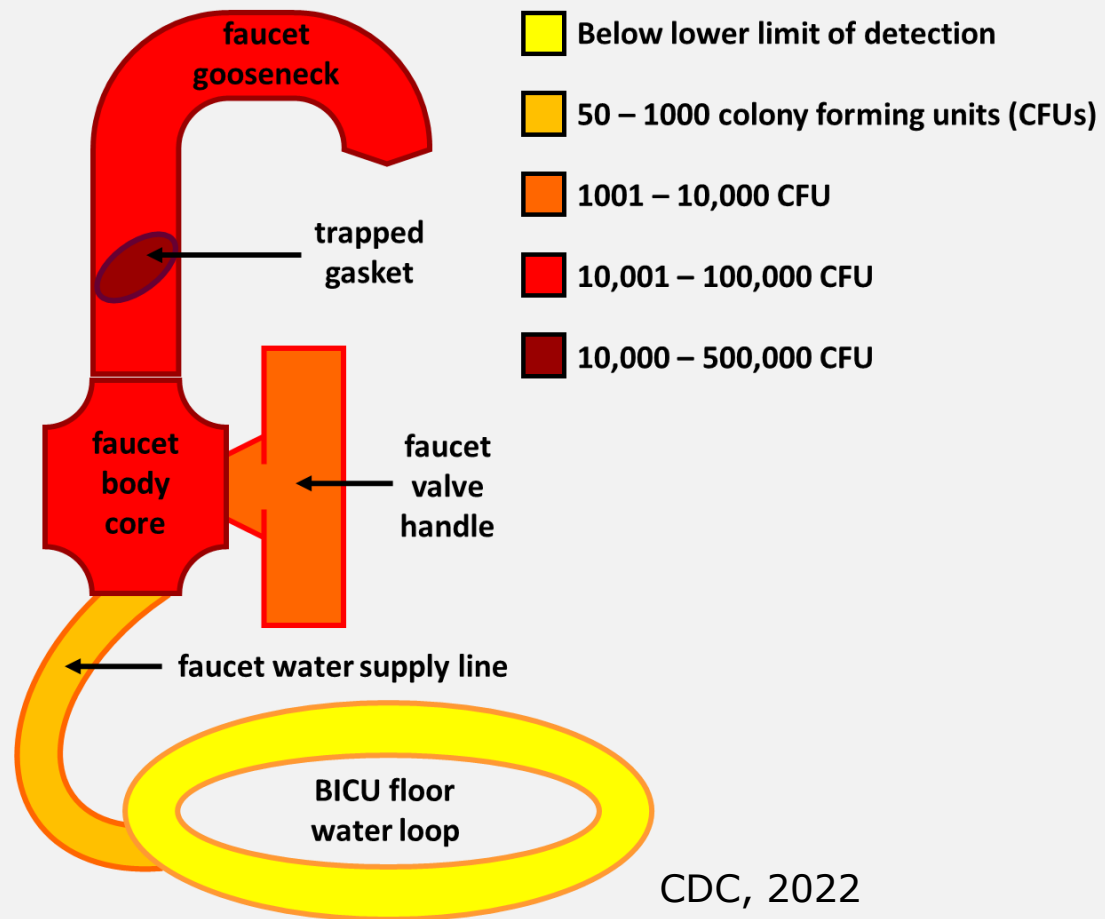
# Example Table

## Sampling locations

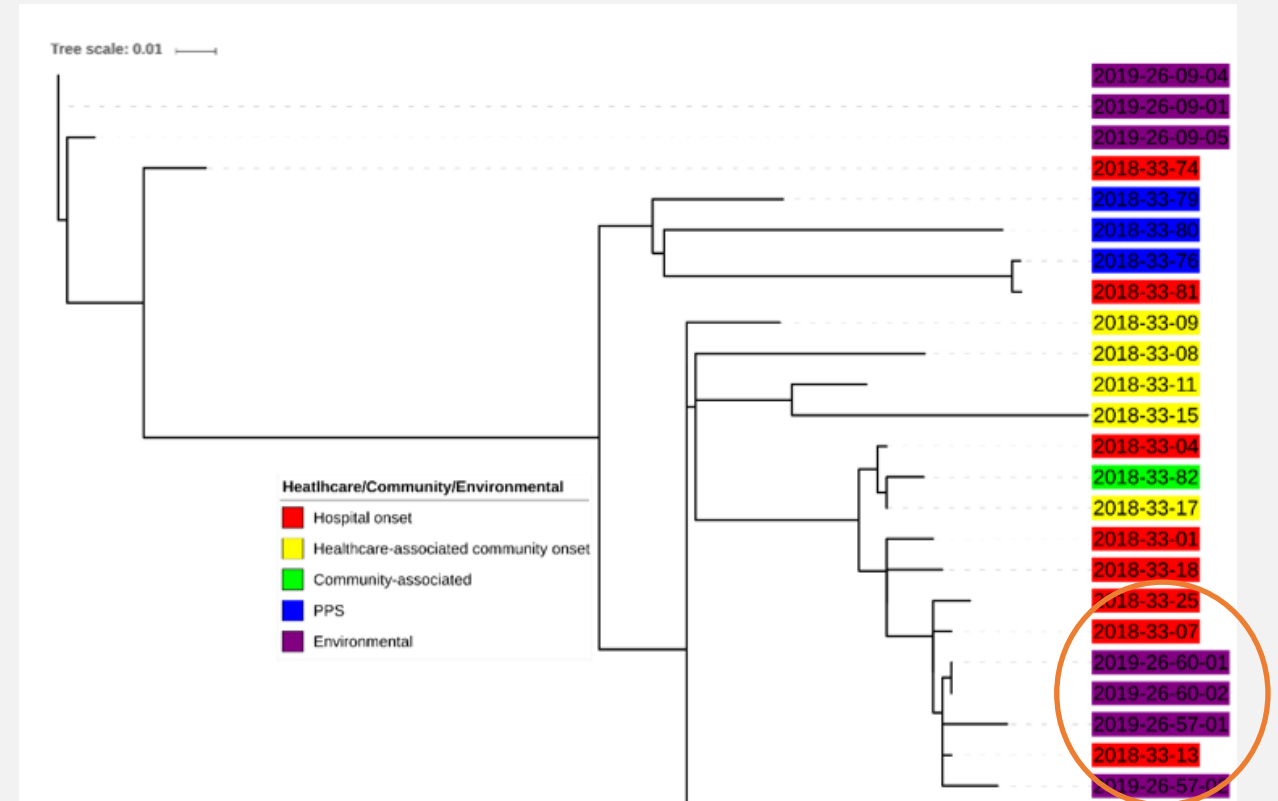
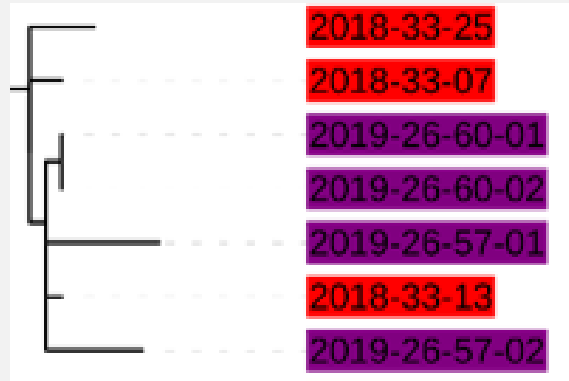


Sampling site	Swab	Day*	Date	Time
Sink X faucet <u>Pre</u> -flush	Swab 1			
	Swab 2			
Sink X faucet <u>Post</u> -flush	Swab 1			
	Swab 2			
Sink X drain <u>Pre</u> -flush	Swab 1			
	Swab 2			
Sink X drain <u>Post</u> -flush	Swab 1			
	Swab 2			
Sink X aerator <u>Pre</u> -flush	Swab 1			
	Swab 2			
Sink X aerator <u>Post</u> -flush	Swab 1			
	Swab 2			
Ice machine opening	Swab 1			
	Swab 2			
Mattress	Swab 1			
	Swab 2			
Bedside table	Swab 1			
	Swab 2			
Bed rail	Swab 1			
	Swab 2			

# *Pseudomonas aeruginosa* Bioburden



# Whole Genome Sequencing



# Problems are Opportunities!

- Daily cleaning of 'high risk' areas
- Flush taps regularly
- Point of use filters
- Educate personnel about sink hygiene and HAI risk
- Offset sink faucets from the drain
- Last resort: replace sink and plumbing
- New to the field: drain disinfectants



## Fluorescent dye on the sieve illustrates the extent of splatter



# References

1. Fujita K, Lilly HA, Kidson A, Ayliffe GA. Gentamicin-resistant *Pseudomonas aeruginosa* infection from mattresses in a burns unit. *Br Med J (Clin Res Ed)*. 1981 Jul 18;283(6285):219-20. doi: 10.1136/bmj.283.6285.219. PMID: 6789973; PMCID: PMC1506656.
2. Grubb DJ, Watson KC. *Pseudomonas* septicemia from plastic mattresses [letter]. *Lancet* 1982;1:518.
3. Pirzadian J, Hartevelde SP, Ramdutt SN, van Wamel WJB, Klaassen CHW, Vos MC, Severin JA. Novel use of culturomics to identify the microbiota in hospital sink drains with and without persistent VIM-positive *Pseudomonas aeruginosa*. *Sci Rep*. 2020 Oct 13;10(1):17052. doi: 10.1038/s41598-020-73650-8. PMID: 33051501; PMCID: PMC7554030.
4. Bédard E, Laferrière C, Charron D, Lalancette C, Renaud C, Desmarais N, Déziel E, Prévost M. Post-Outbreak Investigation of *Pseudomonas aeruginosa* Faucet Contamination by Quantitative Polymerase Chain Reaction and Environmental Factors Affecting Positivity. *Infect Control Hosp Epidemiol*. 2015 Nov;36(11):1337-43. doi: 10.1017/ice.2015.168. Epub 2015 Jul 20. PMID: 26190556.
5. Sbarra AN, Harris AD, Johnson JK, Madger LS, O'Hara LM, Jackson SS, Thom KA. Guidance on Frequency and Location of Environmental Sampling for *Acinetobacter baumannii*. *Infect Control Hosp Epidemiol*. 2018 Mar;39(3):339-342. doi: 10.1017/ice.2017.319. Epub 2018 Jan 30. PMID: 29378673; PMCID: PMC6342278.
6. Parcell BJ, Oravcova K, Pinheiro M, Holden MTG, Phillips G, Turton JF, Gillespie SH. *Pseudomonas aeruginosa* intensive care unit outbreak: winnowing of transmissions with molecular and genomic typing. *J Hosp Infect*. 2018 Mar;98(3):282-288. doi: 10.1016/j.jhin.2017.12.005. Epub 2017 Dec 8. PMID: 29229490; PMCID: PMC5840502.
7. Palmore T. Transmission of resistant organisms from hospital drains. Presentation. October 30, 2019

# Thank you!

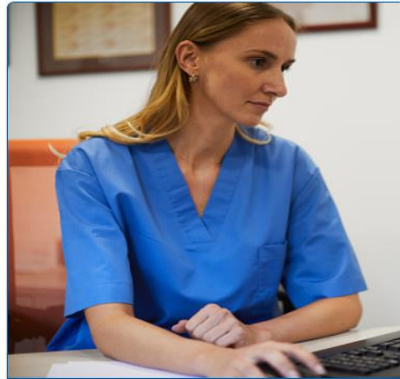
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- Rachael Singer, PhD, MSPH, a-IPC

# HCS Data Reporting and Training Group

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# Project Firstline



Watch Project Firstline Videos

Learn about infection control by watching Project Firstline videos.



Lead an Infection Control Training

Use our facilitator toolkit to lead trainings on your team's schedule, even if you're not an infection control expert.



Access Multimedia Resources

Access shareable images, web buttons, posters, and print materials.



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<https://www.cdc.gov/infectioncontrol/projectfirstline/>

# Project Firstline

## New Videos on Recognizing Infection Risks



Texas Department of State  
Health Services

<https://www.cdc.gov/infectioncontrol/projectfirstline/healthcare.html>

# Project Firstline

## Facilitator Training Toolkits

### Recognizing Risk Using Reservoirs Training Toolkit



**Session 1:**  
What Does it Mean to Recognize A Risk?

[Session Plan: Recognizing Risk](#) [PDF - 18 Pages]

[Slide Set: Recognizing Risk](#) [PPT - 22 Slides]

[Participant Booklet: Recognizing Risk](#) [PDF - 4 Pages]

**Session 2:**  
How Germs Make People Sick

[Session Plan: How Germs Make People Sick](#) [PDF - 21 Pages]

[Slide Set: How Germs Make People Sick](#) [PPT - 25 Slides]

[Participant Booklet: How Germs Make People Sick](#) [PDF - 4 Pages]

**Session 3:**  
Recognizing Risk Using Reservoirs: A Review

[Session Plan: Recognizing Risk Review](#) [PDF - 20 Pages]

[Slide Set: Recognizing Risk Review](#) [PPT - 22 Slides]

[Participant Booklet: Recognizing Risk Review](#) [PDF - 4 Pages]

### Introduction to Reservoirs: Where Germs Live Training Toolkit



**Session 1:**  
Body Reservoirs

[Session Plan: Body Reservoirs](#) [PDF - 24 Pages]

[Slide Set: Body Reservoirs](#) [PPT - 21 Slides]

[Participant Booklet: Body Reservoirs](#) [PDF - 8 Pages]

**Session 2:**  
Healthcare Environment Reservoirs

[Session Plan: Environment Reservoirs](#) [PDF - 21 Pages]

[Slide Set: Environment Reservoirs](#) [PPT - 20 Slides]

[Participant Booklet: Environment Reservoirs](#) [PDF - 8 Pages]

**Session 3:**  
Body and Healthcare Environment Reservoirs: Synthesis

[Session Plan: Reservoirs Synthesis](#) [PDF - 15 Pages]

[Slide Set: Reservoirs Synthesis](#) [PPT - 16 Slides]

[Participant Booklet: Reservoirs Synthesis](#) [PDF - 5 Pages]



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# Infection Control Education

## Healthcare Safety Newsletter

Healthcare Safety Unit  
Texas Department of State Health Services  
[Healthcare Safety | Home \(texas.gov\)](https://www.dshs.state.tx.us/IDCU/health/Healthcare-Safety-Training.aspx)

<https://www.dshs.state.tx.us/IDCU/health/Healthcare-Safety-Training.aspx>

### Past Trainings

#### **Part I: Basics in Infection Prevention and Control for LHD Epidemiologists**

[October 19th, 2021](#)

[October 21st, 2021](#)

#### **TSICP Infection Control Essentials**

[February 10th-11th, 2022](#)

#### **TSICP CIC Exam Prep Course**

[March 10th-11th, 2022](#)

#### **Part 2: Conducting an Infection Control Assessment (ICAR) in a Healthcare Setting**

[February 24, 2022](#)

[April 5, 2022](#)

### Upcoming Trainings

**Part 3 in IPC Series**



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# Texas Healthcare Safety Network 2.0

## TxHSN 2.0

- New ICAR data collection and management functionality
- All public health departments can conduct ICARs electronically
- Self-assessments for facilities
- Communication, scheduling, follow-up, and reports completed within the system
- If interested in piloting, please email: [HAITexas@dshs.texas.gov](mailto:HAITexas@dshs.texas.gov)

### Remote ICAR - Mini-LTC Covid - Scheduled

Start ICAR

Print ICAR

Cancel ICAR

Delete ICAR

Summary

Facility Information

Actions

ICAR Status **Scheduled**

#### Facility Contact Information

Name **Paula Lemon**  
Phone Number (111) 111-1111 ext: 2222  
Email Address [paula.williams2@dshs.texas.gov](mailto:paula.williams2@dshs.texas.gov)

#### ICAR Details

Date and Time **2022-01-14 01:00:00 PM**  
Type of ICAR Remote  
Outbreak **✓**  
BBP exposure **X**  
COVID-19 **X**  
Proactive **X**  
Ever Participated in ICAR **✓**

#### Investigator

Investigator Name **Fire, Star (Region - PHR 6/5S)**

**Coming  
Soon!**

ARLN Associated **X**  
Reported breach/survey/complaint **X**  
Contaminated Medical Device **X**  
HAI or MDRO **X**  
Contacted Local Health Department **✓**

# HAI Data Validation Activities

HAIs required to be reported by hospitals in Texas:

- Central Line-Associated Bloodstream Infections (CLABSIs)
- Catheter-Associated Urinary Tract Infections (CAUTIs)
- Surgical Site Infections (SSIs) following Colon & Abd Hysterectomy
- *Clostridioides difficile* Infections (CDI) Lab ID events
- *Methicillin Resistant Staphylococcus aureus* (MRSA) Bacteremia Lab ID events

Facilities report HAIs through the CDC's National Healthcare Safety Network (NHSN).

The Data Reporting and Training Group conducts audits to ensure that the data is accurate.

Audits are non-regulatory.

One LHD representative is invited to participate in audits within their jurisdiction.



# Highlights of National Conferences



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# Council of State and Territorial Epidemiologists (CSTE) National Conference 2021

- Partnerships between CDC, HAI/AR programs and healthcare facilities were crucial in the COVID-19 pandemic response.
- The pandemic established stronger collaborative relationships across different agencies and significantly increased funding for HAI/AR programs and activities.
- There is no centralized database on drug diversion in healthcare settings.  
CSTE drug diversion toolkit (2019):  
[https://cdn.ymaws.com/www.cste.org/resource/resmgr/pdfs/pdfs2/Drug\\_Diversion\\_Toolkit\\_LiveL.pdf](https://cdn.ymaws.com/www.cste.org/resource/resmgr/pdfs/pdfs2/Drug_Diversion_Toolkit_LiveL.pdf)
- CDC is very interested in ensuring that equity, diversity, and inclusion efforts address multiple levels of our HAI/AR work.



# Society for Healthcare Epidemiology of America (SHEA) National Conference 2022

- A new antimicrobial, Ridinilazole, is being developed for *C.difficile* infections.
- 2020 had the largest fecal microbiota transplantation (FMT) study in children: 81% success rate after 1<sup>st</sup> treatment; 87% after 2nd treatment.
- CDC will review Droplet Precautions recommendations this year.
- A study found that a combination of MERV 8 + MERV 16 filters provide protection against virus transmission through the HVAC systems and could be a cost-conscious alternative to HEPA filters.
- 37.9-70.5% US Laboratories are using obsolete AST breakpoints; New College of American Pathologists (CAP) has developed a new checklist item that requires all clinical laboratories to update their systems and AST processes to use current breakpoints by Jan. 1, 2024.



# Infection Prevention is Teamwork



***“The strength of the team is each individual member.  
The strength of each member is the team.”***

*Phil Jackson*



Texas Department of State  
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# Questions?

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# Thank you!



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