



**IDPH**  
ILLINOIS DEPARTMENT OF PUBLIC HEALTH

# **The XDRO Registry and CRE burden in Illinois**

Angela Tang, MPH  
CRE Project Director/Epidemiologist  
Hektoen Institute

# Disclosure

- I have no actual or potential conflict of interest in relation to this program or presentation.

# Why are we talking about CRE and the XDRO registry at the AMS summit?



## CARBAPENEM-RESISTANT ENTEROBACTERIACEAE



**9,000**

DRUG-RESISTANT INFECTIONS PER YEAR



**600**

DEATHS

CARBAPENEM-RESISTANT *KLEBSIELLA* SPP.

**7,900**



**1,400**

CARBAPENEM-RESISTANT *E. COLI*

THREAT LEVEL

**URGENT**



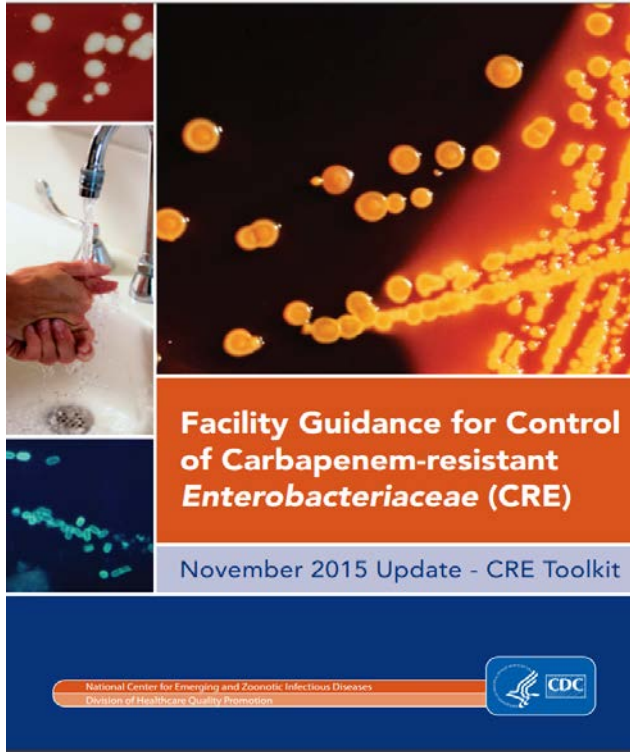
This bacteria is an immediate public health threat that requires urgent and aggressive action.



**CRE HAVE BECOME RESISTANT TO ALL OR NEARLY ALL AVAILABLE ANTIBIOTICS**



# CRE Prevention Strategies



1. Hand Hygiene
2. Contact Precautions
3. Healthcare Personnel Education
4. Device use
5. Laboratory notification
6. Inter-facility communication
- 7. Antimicrobial stewardship**
8. Environmental Cleaning

“Multiple antimicrobial classes have been shown to be a risk for CRE colonization and/or infection.”

# Potential to reduce MDRO incidence

Recent systematic review and meta-analysis found that ASPs reduced incidence of:

- MDR Gram-negative bacteria (**51%**)
- ESBL Gram-negative bacteria (**48%**)
- MRSA (**37%**)
- CDI (**32%**)

# Mandatory CRE Reporting in Illinois

**Start Date:** November 1, 2013

---

**Required Reporters:**

acute care hospitals

long-term acute care hospitals

long-term care facilities

laboratories

---

**How to report:** Extensively Drug-Resistant  
Organism (XDRO) Registry

---

**When to report:** Within 7 days of test confirmation

# XDRO registry, 2013

## 1. Mandatory CRE reporting

All Illinois Facilities



**XDRO  
registry**

Query

XDRO status



Facility A

## 2. Information exchange

# CRE reported to XDRO registry, 2014-15

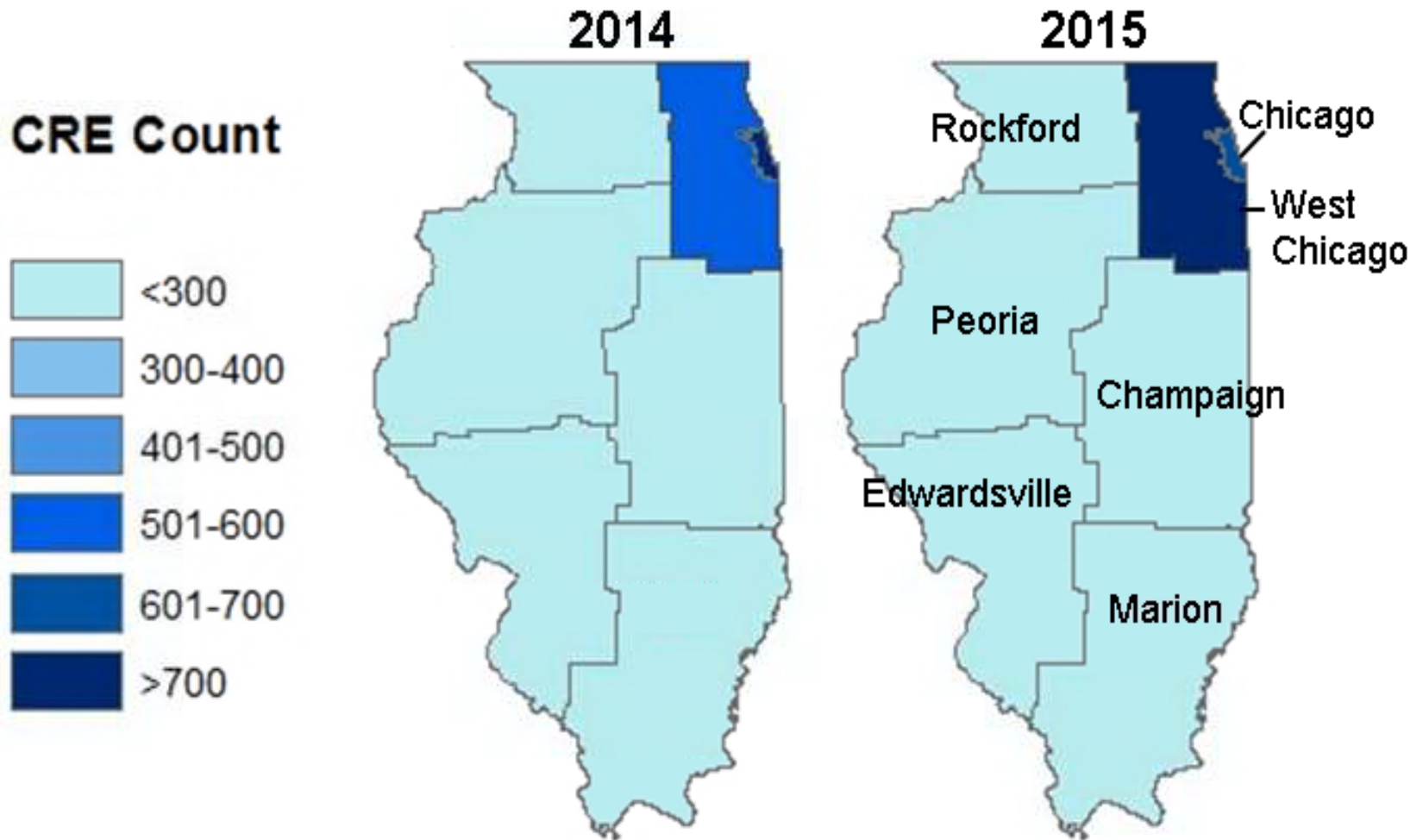
	n	(%)
<b>Organism<sup>1</sup></b>		
<i>K. pneumoniae</i>	2567	(84)
<i>E. coli</i>	180	(6)
<i>Enterobacter</i> spp.	170	(6)
Other	142	(4)
<b>Mechanism of Resistance<sup>2</sup></b>		
KPC	636	(90)
NDM	29	(4)
OXA-48-like	6	(<1)
IMP	1	(<1)

<sup>1</sup>Out of 3059 reports

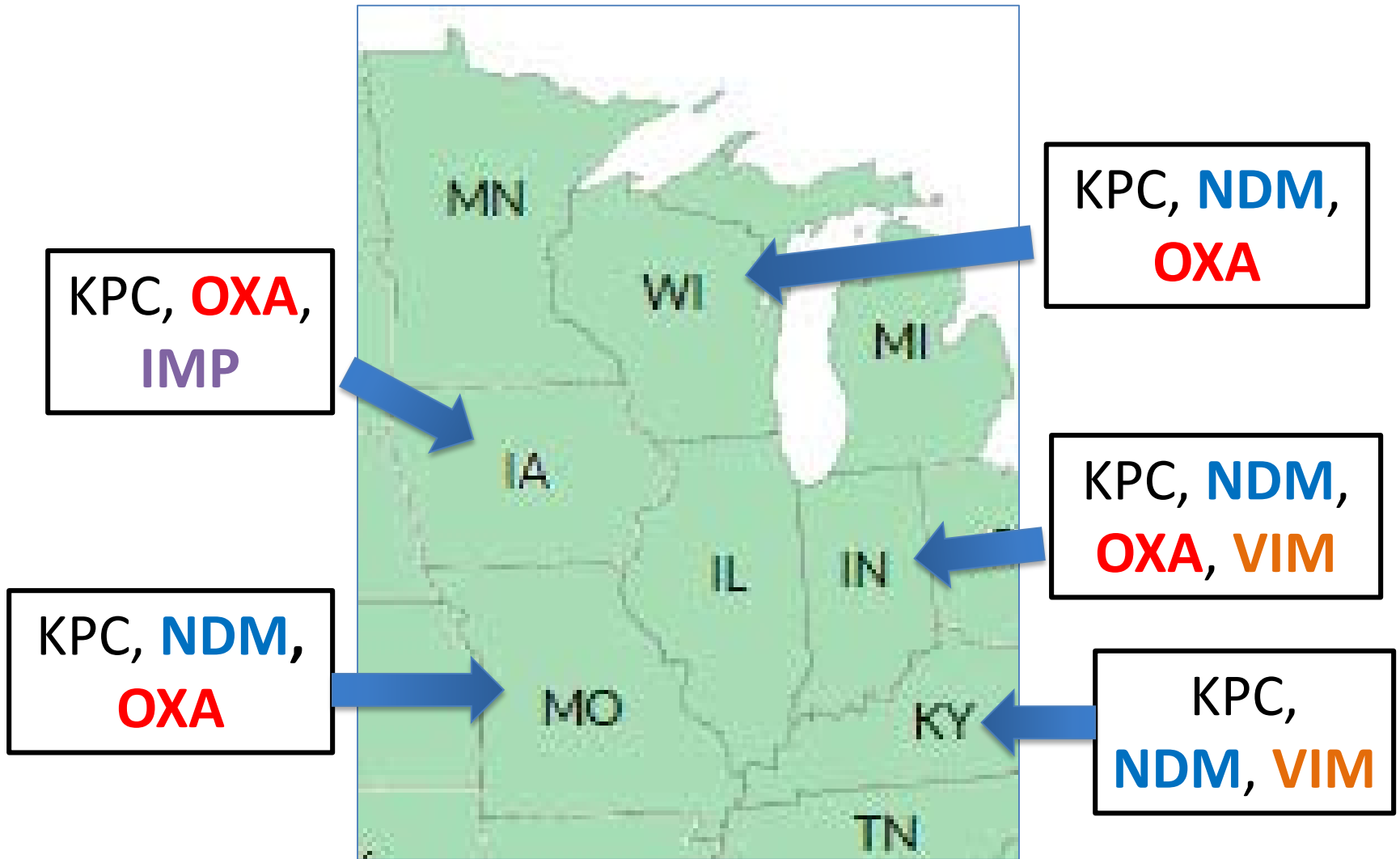
<sup>2</sup>Out of 709 isolates with molecular testing



# CRE by IDPH Region, 2014-15



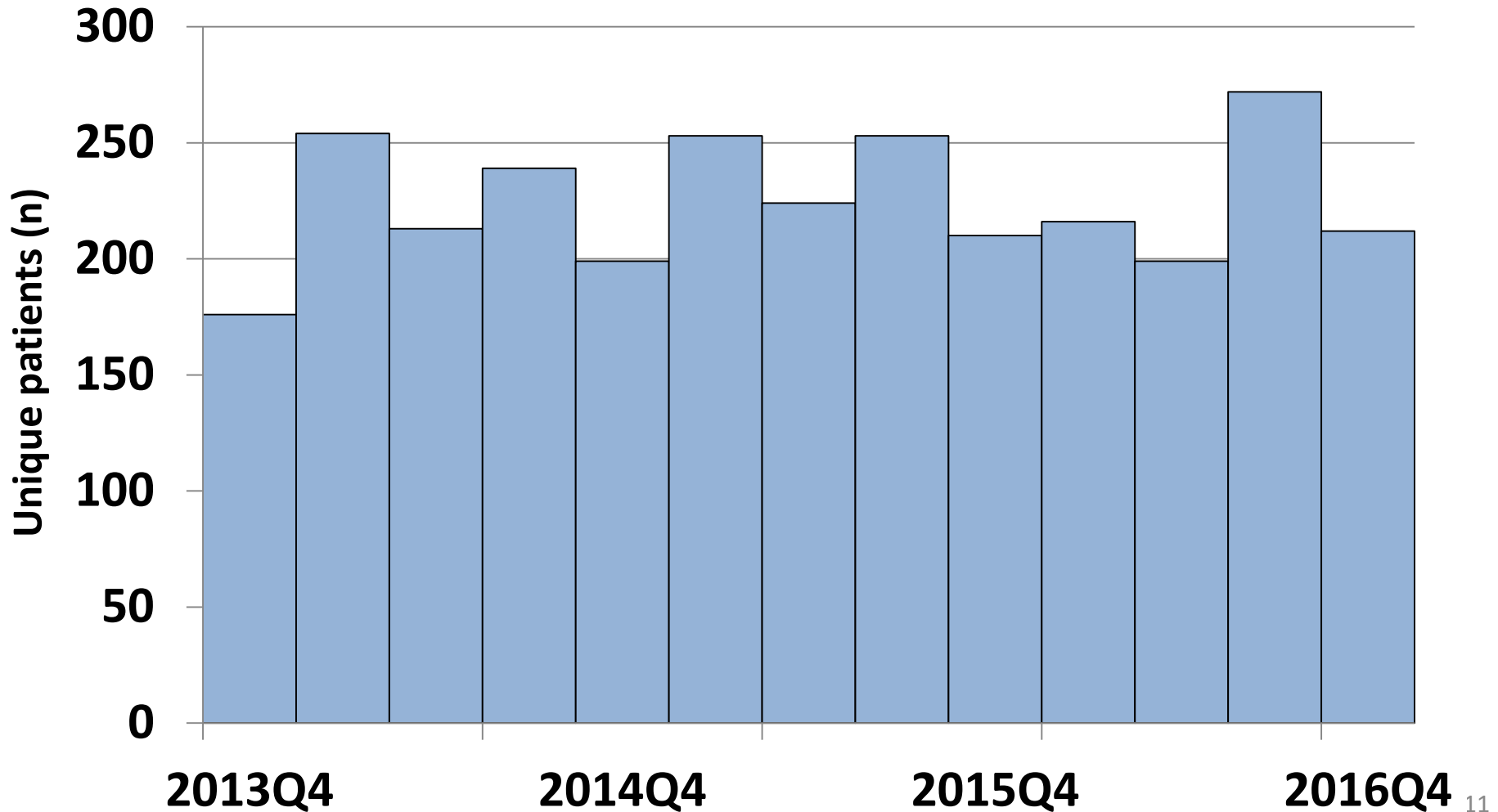
# CRE in states bordering IL



Data reported to CDC as of 1/6/17

<https://www.cdc.gov/hai/organisms/cre/trackingcre.html>

# Unique patients reported to the XDRO registry, by quarter of earliest CRE clinical culture, 11/2013 – 12/2016 (N=2920)



# Adding emerging organisms

## 1. Mandatory CRE reporting

All Illinois Facilities

## 2. Emerging pathogens

IDPH

**XDRO  
registry**

Query

XDRO status

Facility A

## 3. Information exchange

# *Candida auris*

Clinical Alert to U.S. Healthcare Facilities - June 2016

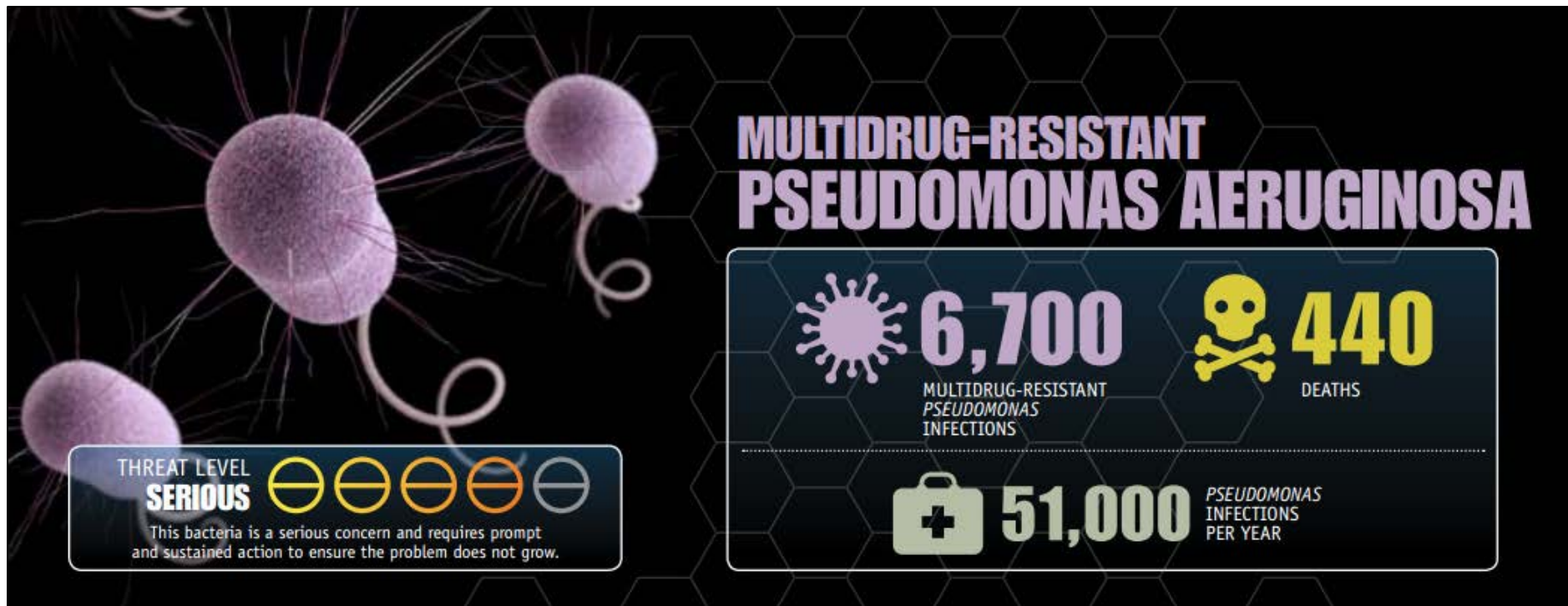
---

Global Emergence of Invasive Infections Caused by the Multidrug-Resistant Yeast *Candida auris*

**Summary:** The Centers for Disease Control and Prevention (CDC) has received reports from international healthcare facilities that *Candida auris*, an emerging multidrug-resistant (MDR) yeast, is causing invasive healthcare-associated infections with high mortality.

- Emerging multidrug-resistant yeast
- Potential to cause outbreaks in healthcare settings
- Difficult to detect with conventional lab methods

# Carbapenemase-producing *Pseudomonas aeruginosa*



- VIM–PA outbreak detected in Chicago area
- KPC and IMP later identified (very rare)
- Currently only PA with carbapenemase identified are being entered by IDPH

# Inter-facility communication

## 1. Mandatory CRE reporting

All Illinois Facilities

## 2. *C. auris*, CP-PA

IDPH

**XDRO  
registry**

ADT Feed/  
Manual query

XDRO  
status

Facility A

## 3. Information exchange

# Manual searches

**Submit Report**

**Search Registry**



**Facility Submission History**

**Facility Alert History**

**XDRO Dashboard**




# Need last name and DOB to conduct query

**XDRO registry** Sample Hospital [change facility](#)

ANGELA TANG [Home](#) [Citations](#) [Help](#) [Go Back](#) [Logout](#)

## Search Patient

\* Last name       \* Date of birth  /  /       First name

[Query](#) 

### Search Instructions

#### a. Available fields

Last name (required), first name (optional), DOB (required).

#### b. Search algorithm

- i. If you enter all 3 fields, then attempt to match (exact; case insensitive) on all 3 fields.
- ii. If no match returns on 3 fields, then attempt to match (exact; case insensitive) on last name and DOB (ignore first name completely).

#### c. Results display

- i. In general, you will see the search results for exactly how you entered the information. If there are no exact matches for last name and dob, you will see a NULL result.

# Patient Match



Sample Hospital [change facility](#)

ANGELA TANG

[Home](#) [Citations](#) [Help](#) [Go Back](#) [Logout](#)

## Search Patient

\* Last name

\* Date of birth

 /  / 

First name

Query

Showing results for bird, DOB 3/4/2000 (FIRST NAME IGNORED):

Name	Date of Birth	SSN	Organism	Culture Date	Last Transaction	Facility
Bird, Tweety	03/04/2000		<i>Klebsiella pneumoniae</i>	01/01/2017	submitted,05/31/2017	Sample Hospital..

Disclaimer: A match on name and date of birth only may not be 100% accurate. We recommend that you verify XDRO status with the patient or by contacting the facility that entered the result.

Note: As of January 2017, the Illinois Department of Public Health is entering *Candida auris* cases into the XDRO registry; such patients can be identified through the above search query. Patients with *C. auris* should be placed on standard and contact precautions and, when possible, in single rooms. More information is available on CDC's [Questions and Answers](#) and [Interim Recommendations](#) pages.

As of April 2017, IDPH is entering carbapenemase-producing *Pseudomonas aeruginosa* cases into the XDRO registry. More information is available on [CDC's website](#).

## XDRO Report - Sample Hospital

### Patient information

**Patient name:** Bird, Tweety**MRN:** 1234567**Admission date:** 12/31/2016**Date of birth:** 03/04/2000**SSN (last 4):****Gender:** male**Race:** Other**Ethnicity:** Not Hispanic or Latino**Address:** 12345 Main St, Anycity, Cass, IL 60000

### XDRO culture information

**Organism:** *Klebsiella pneumoniae***Culture date:** 01/01/2017**XDRO criterion:** Molecular test**Specimen source:** Urine**Mechanism of resistance:** KPC**Comments:**[Submitted by Vicky Gao, 05/31/2017, Sample Hospital](#)[Go Back](#)[Edit](#)[Delete](#)[Print](#)

# XDRO Auto Alerts



- **Inpatient Admission Feed:** Every 15-30 min
- **Pager/SMS texts (optional feature):**
  - Real-time alerts from 8 am-8 pm;
  - Off-hours alerts queued until 8 am next day

# Sample XDRO alert email

**Subject:** Alert notification from XDRO registry (AID 123)

The XDRO registry has identified that a patient recently admitted to <hospital name> may carry an organism that is highly resistant to antibiotics. Please log in to the XDRO registry ([dph.partner.illinois.gov](http://dph.partner.illinois.gov)) for details.

# Sample alert text message



# Log in to the registry to view alerts

**XDRO**  
registry

Sample Hospital [change facility](#)

Test User1

[Home](#) [Help](#) [Go Back](#) [Logout](#)

Submit Report

Search Registry

Facility Submission History

**Facility Alert History** ←

XDRO Dashboard

# Facility Alert Page

## Sample Hospital Alert

Please click [here](#) to confirm your alert contact information and facility

First name

Last name

Date of birth

 /  / 

Search

Alerts Tracking

Acknowledge	AID	Name	Date of Birth	Organism	Matching	▼Alert Date
By A.T. 06/01/2016 09:23	323	Submission, Test	01/02/1934	Klebsiella pneumoniae	Full Match	05/23/2016
By R.L. 04/09/2015 15:47	3	E, Ds	11/11/1982	Enterobacter aerogenes	Partial Match	03/21/2014
<input type="button" value="Acknowledge"/>	2	Bug, Super	01/01/1914	Klebsiella pneumoniae	Full Match	03/20/2014

Disclaimer: A match on name and date of birth only may not be 100% accurate. We recommend that you verify XDRO status with the patient or by contacting the facility that entered the result.

Note: Full match: There was a complete match on first name, last name, and date of birth.

Partial match: There was a match on last name and date of birth; the first name was matched only on the first initial.

As of January 2017, the Illinois Department of Public Health is entering Candida auris cases into the XDRO registry; such patients can be identified through the above search query. Patients with C. auris should be placed on standard and contact precautions and, when possible, in single rooms. More information is available on CDC's [Questions and Answers](#) and [Interim Recommendations](#) pages.



# Tracking Alert Outcomes



Sample Hospital [change facility](#)

ANGELA TANG

[Home](#) [Citations](#) [Help](#) [Go Back](#) [Logout](#)

## Sample Hospital Alert Tracking

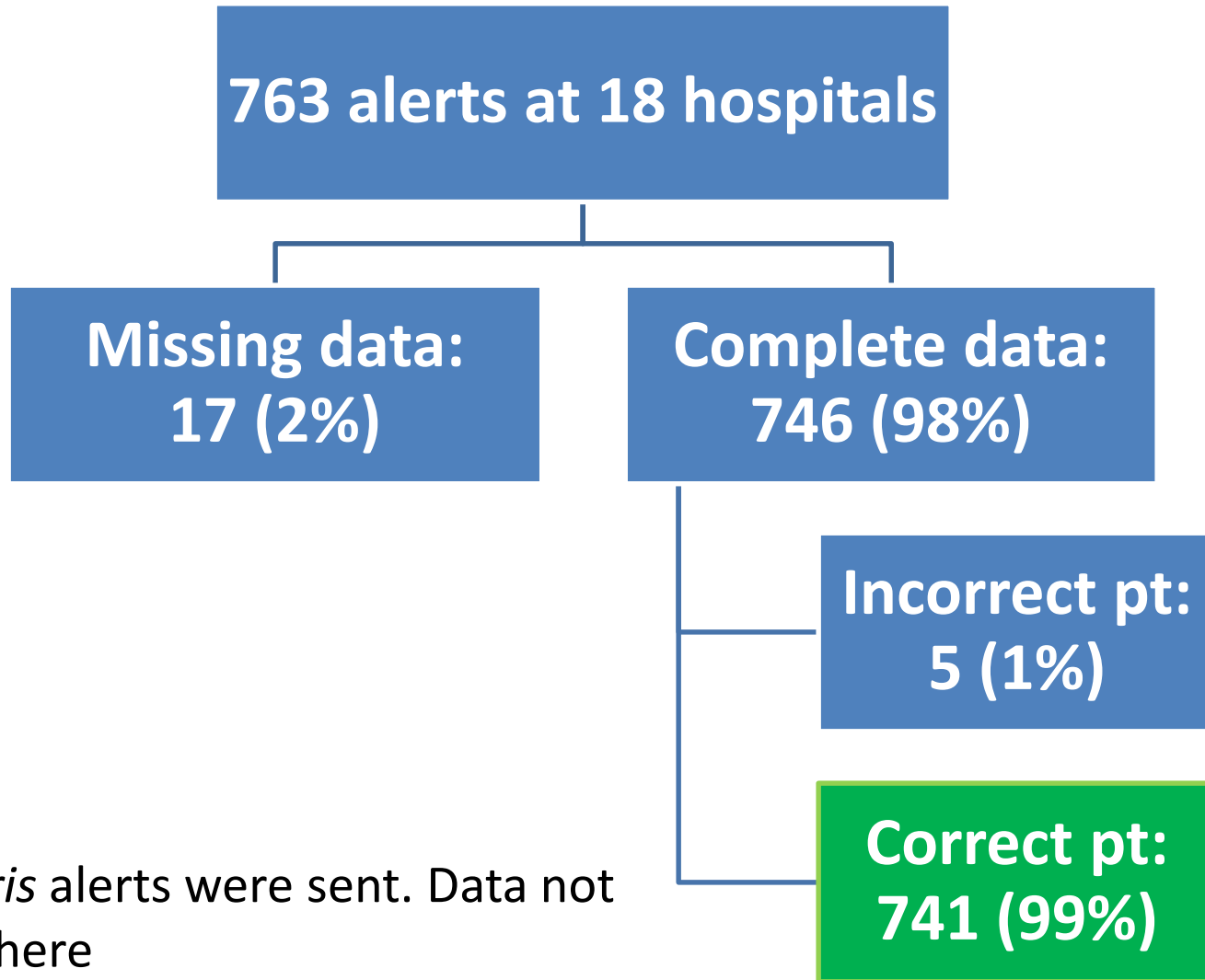
**AID** 
**Last name** 
**Date of birth**  /  /

[Alert History](#)

Action	AID	Patient	Alert Date	Not Inpatient	Correct Patient? <sup>a</sup>	Known CRE? <sup>b</sup>	Previous positive at our facility? <sup>c</sup>	Communicated by other facility? <sup>c</sup>	Already on contact precautions? <sup>d</sup>
<input type="button" value="Save"/>	323	T.S.	05/23/2016	<input type="checkbox"/>	<input type="text" value="select:"/>	<input type="text" value="select:"/>	<input type="text" value="select:"/>	<input type="text" value="select:"/>	<input type="text" value="select:"/>
<input type="button" value="Edit"/>	3	D.E.	03/21/2014	<input checked="" type="checkbox"/>	—	—	—	—	—
<input type="button" value="Edit"/>	2	S.B.	03/20/2014	<input type="checkbox"/>	Yes	Yes	Unknown	Yes	Yes

- a. Sometimes a name and date of birth do not match up to the correct patient, especially if there is a partial match (using date of birth, last name, first initial). Occasionally, you may need to confirm the identity of the patient using additional information (for example, home address).
- b. Prior to receiving the CRE alert, did you know that the patient was CRE colonized?
- c. If the patient is already a "known CRE", how did you find out? (Answer only if "Known CRE?"= Yes)
- d. At the time you acknowledged (viewed) the alert, was the patient already on contact precautions?

# CRE Alert Outcomes, 1/7/15 – 5/28/17

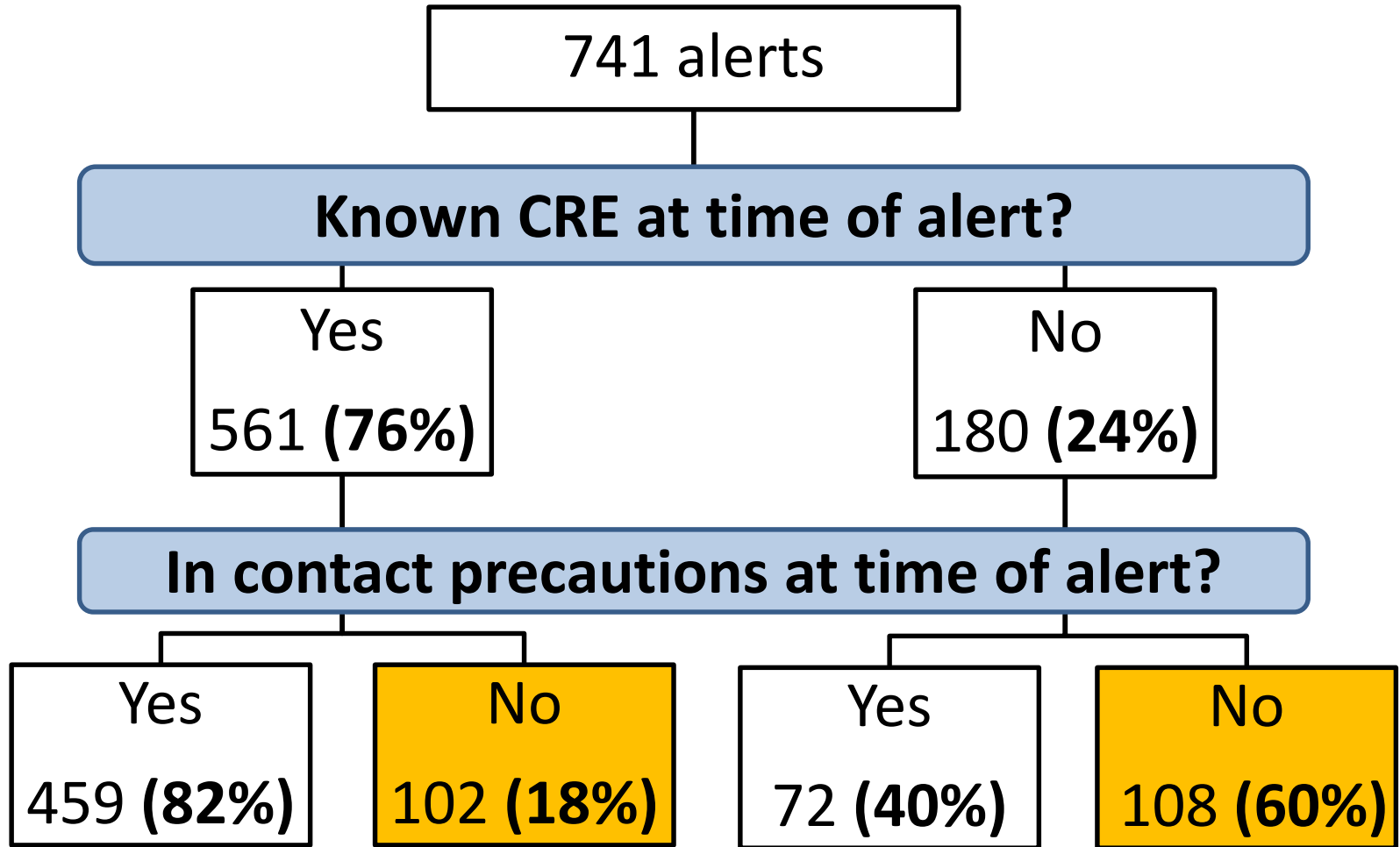


## Notes:

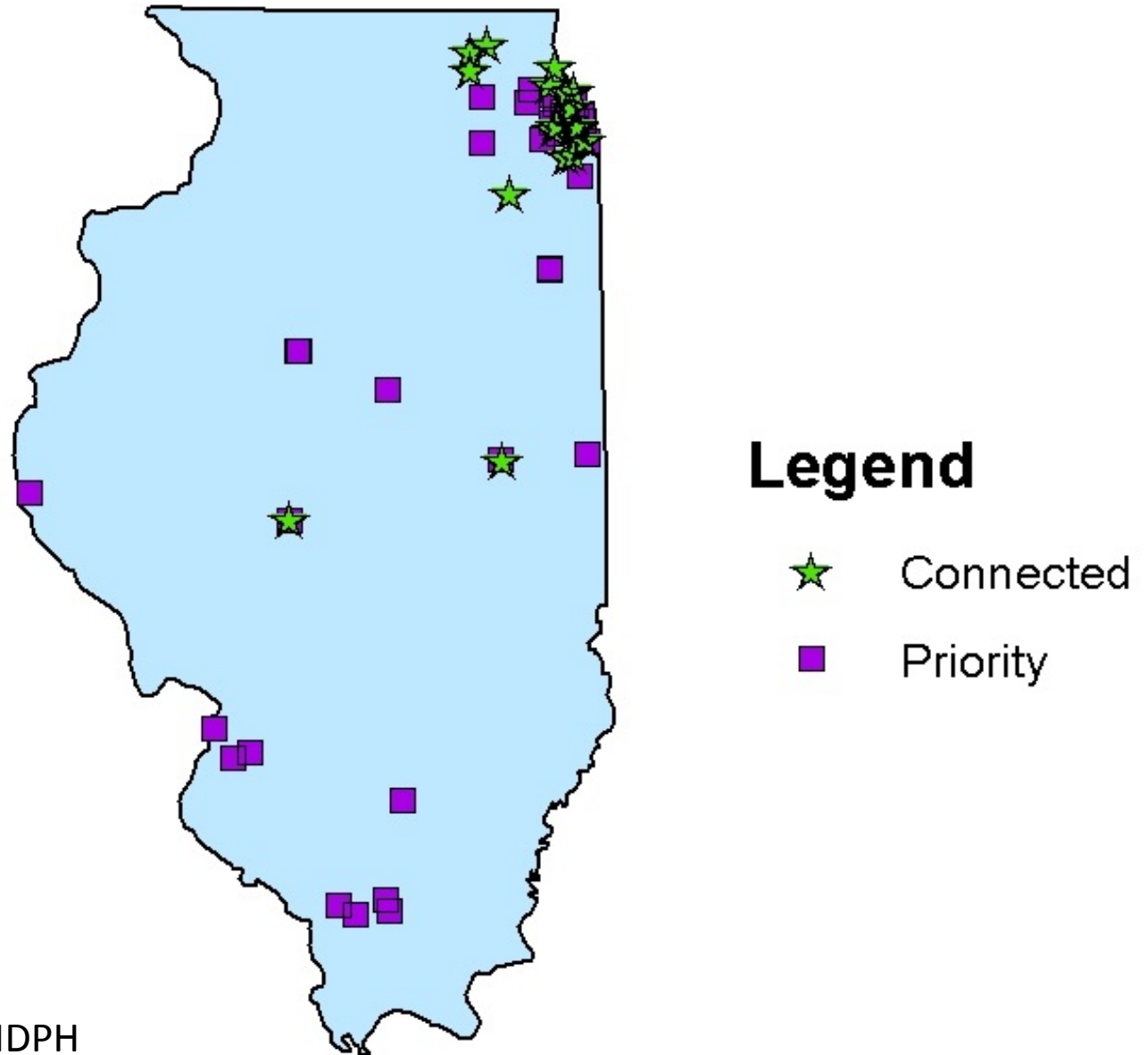
- 2 *C. auris* alerts were sent. Data not shown here
- 1 hospital has not received an alert yet

# Alert Outcomes:

## All correct inpatient CRE alerts, 1/7/15 – 5/28/17

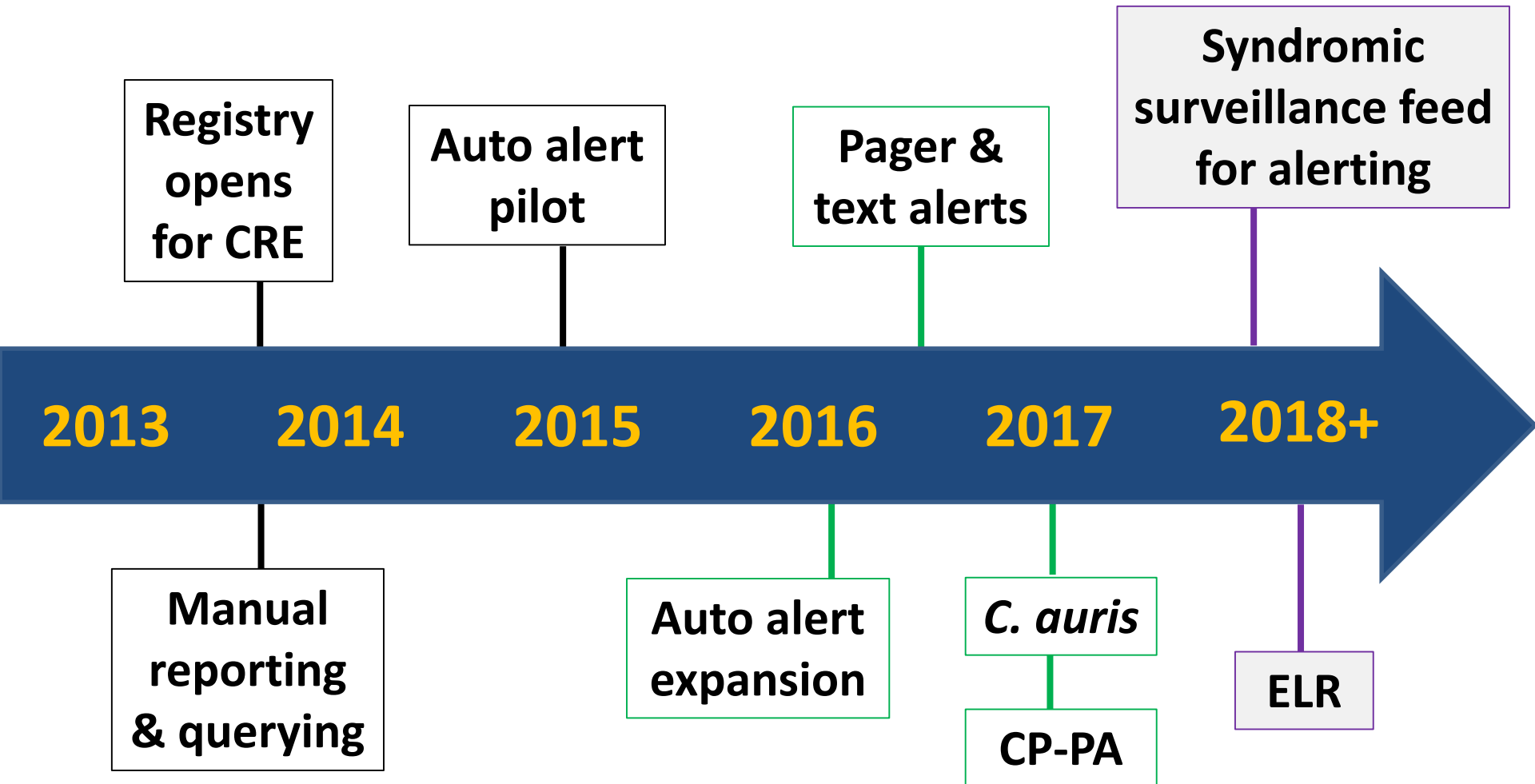


# XDR0 auto alert progress (statewide)



Credit: Emily Augustini, IDPH

# XDRO registry developments



CP-PA= Carbapenemase-producing *Pseudomonas aeruginosa*;  
ELR= Electronic Laboratory Reporting



# CRE Testing at IDPH – **New in 2017!**

- 1) Unusual resistance mechanism
- 2) Suspected outbreak

Report to XDRO registry

Contact LHD for authorization

# Select CRE Prevention Strategies

Strategy	Illinois Initiative
Hand Hygiene	Project PROTECT
Contact Precautions	Project PROTECT
Healthcare Personnel Education	CRE Campaign
Laboratory Detection	IDPH Lab Testing
Inter-facility communication	XDRO registry
<b>Antimicrobial stewardship</b>	<b>AMS Summit, PDSB Campaign, Facility ASPs</b>



# Acknowledgments

## IDPH

- Erica Runningdeer
- Chinyere Alu
- Stacey Hoferka
- Emily Augustini

## CDC Epicenter

- Bill Trick
- Mike Lin
- Vicky Gao
- Shawn Xiang
- Helen Zhang
- George Markovski

## BD/MedMined

- Vikas Gupta
- Autumn Langford

## MRAIA

## IL Hospital IPs

For more information:

[www.xdro.org](http://www.xdro.org)

[DPH.XDROregistry@illinois.gov](mailto:DPH.XDROregistry@illinois.gov)