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Why Worry?

Superbugs in NYS: Multidrug-Resistant Organisms of Concern

October 26, 2018

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Healthcare Epidemiology & Infection Control Program
New York State Department of Health

Disclosures

Speaker has no disclosures to report.

Objectives

- Multidrug-Resistant Bacteria of Concern
- Multidrug-Resistant Fungus of Concern
  - *C. auris* epidemiology in New York State
    - Patient characteristics
    - Environmental findings
    - Laboratory Findings
- ***Why Worry?***

CDC's New Antibiotic Resistance Laboratory Network

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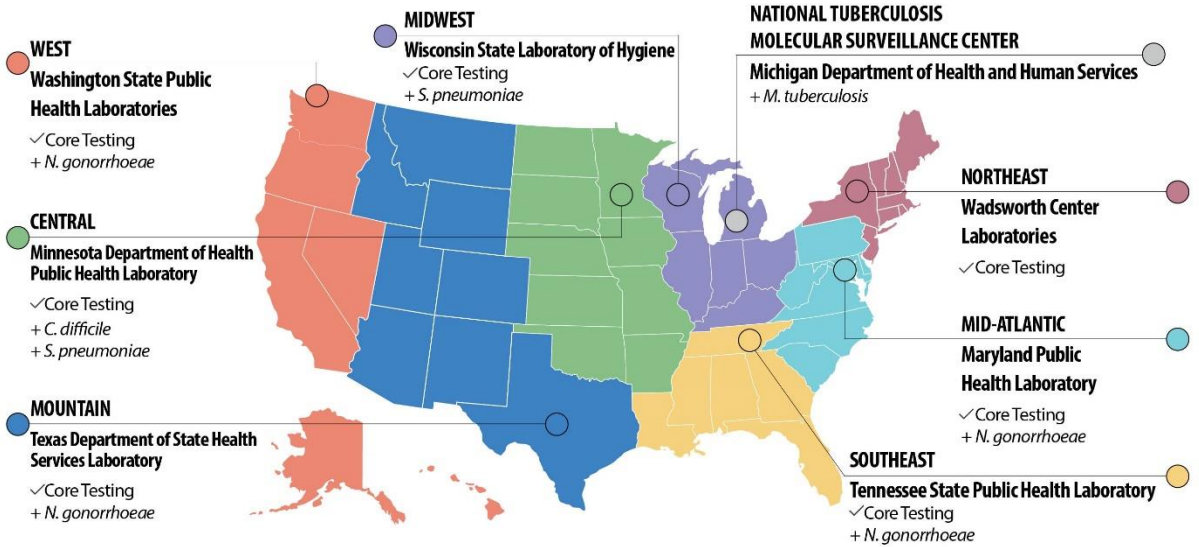
Lab Capacity Supported by the AR Solutions Initiative: Regional Labs

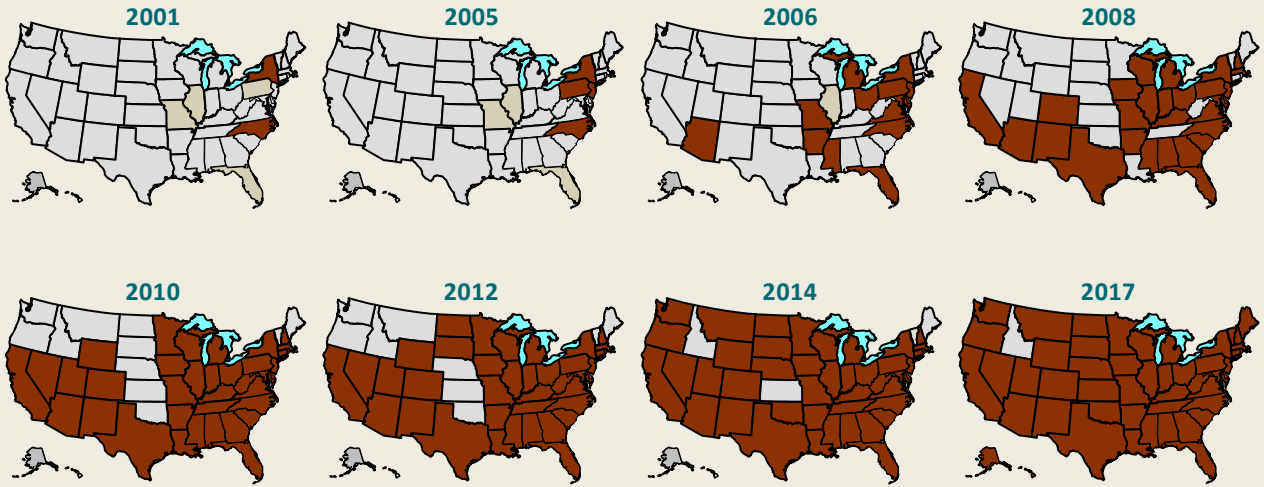
Healthcare Labs	State/Local Labs	Regional Labs	CDC



Bacteria: *Why Worry?*

Rapid Spread of CP-CRE in the United States

KPC-CRE found in the US spread from 2 states in 2001 to 49 states, DC, and PR in 16 years

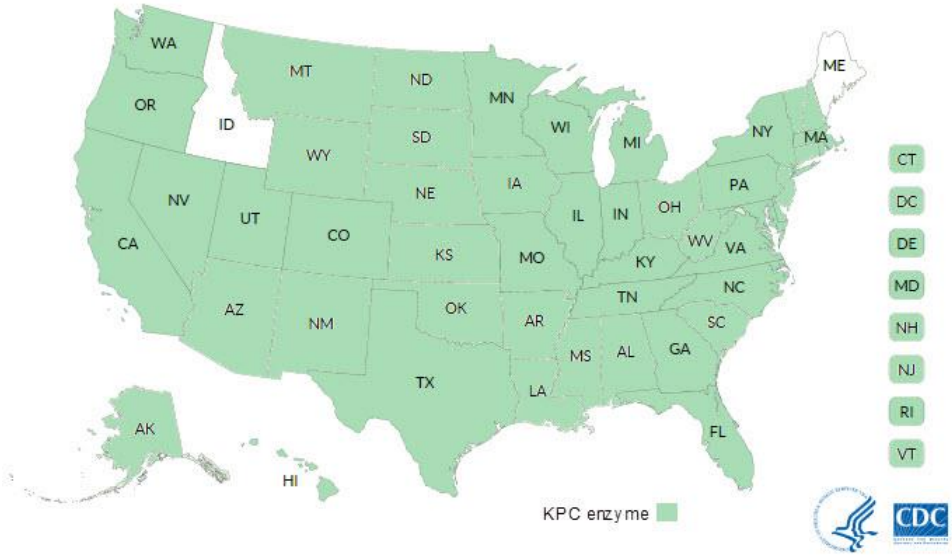


States with *Klebsiella pneumoniae* carbapenemase (KPC)-producing Carbapenem-resistant Enterobacteriaceae (CRE) confirmed by CDC

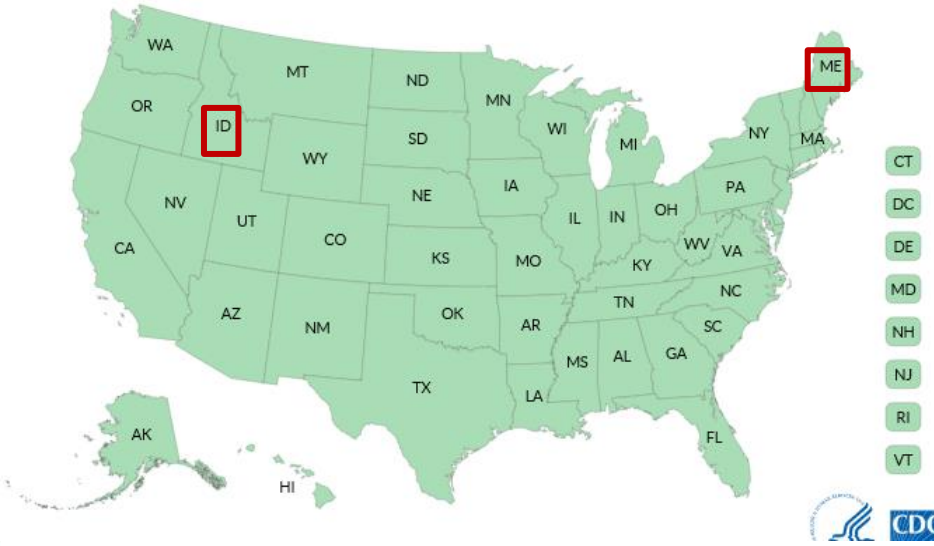
Mechanisms of Carbapenem Resistance in US

Reported to the Centers for Disease Control and Prevention (CDC), by State

KPC-producing CRE



Prior to January 2017



December 2017

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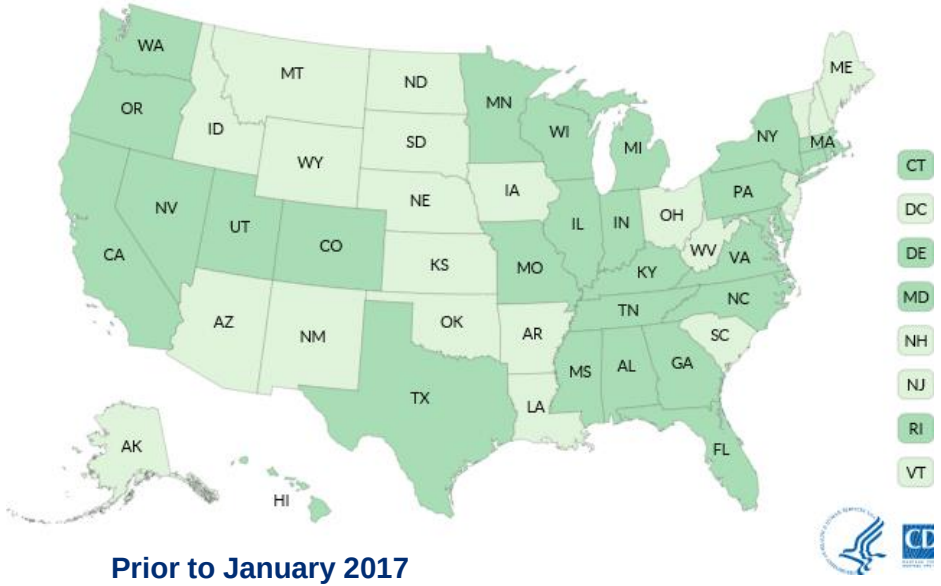
Mechanisms of Carbapenem Resistance in US

Reported to the Centers for Disease Control and Prevention (CDC) 2017, by state

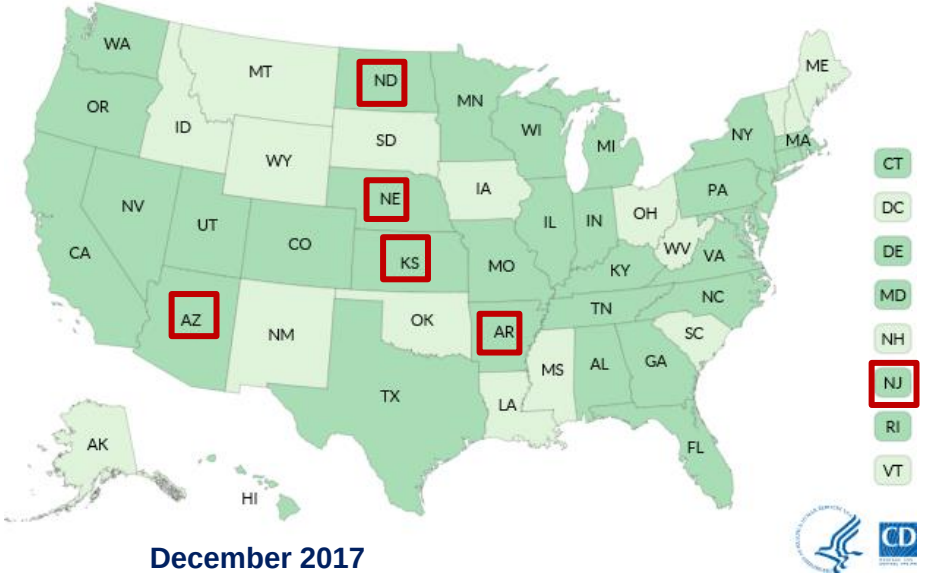
NDM-producing CRE

NDM enzyme
None
Reported



Prior to January 2017

Total NDM-producing CRE = **175**



December 2017

Total NDM-producing CRE = **379**

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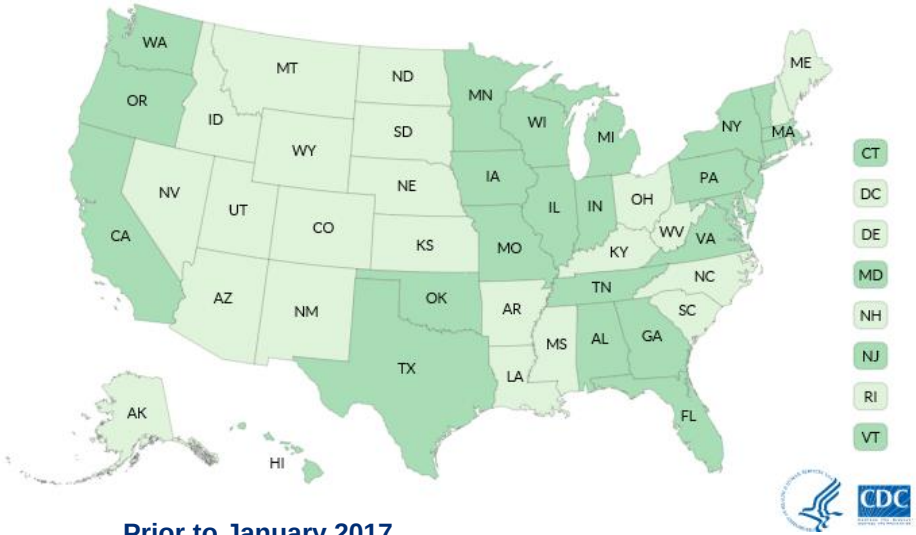
Mechanisms of Carbapenem Resistance in US

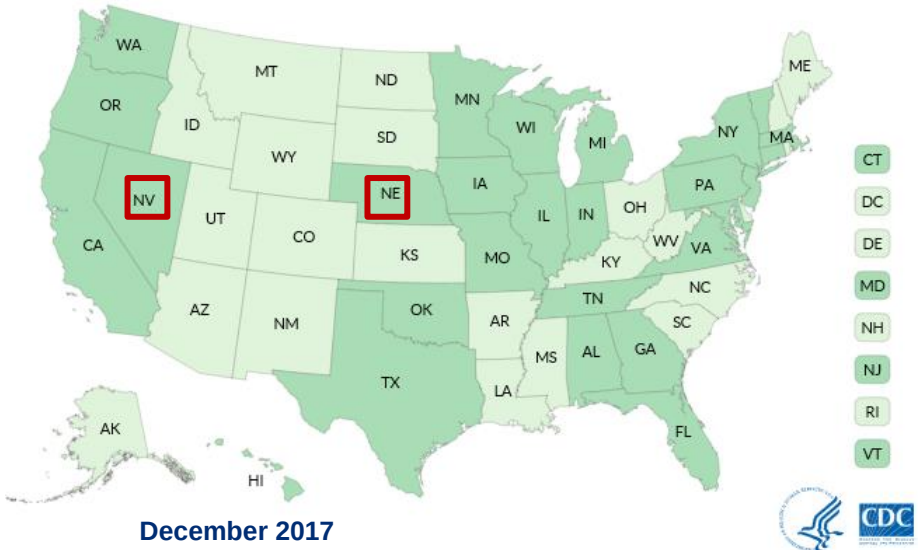
Reported to the Centers for Disease Control and Prevention (CDC), by state

OXA-48-Type-producing CRE



Prior to January 2017

Total OXA-48-producing CRE = **73**



December 2017

Total OXA-48-producing CRE = **146**

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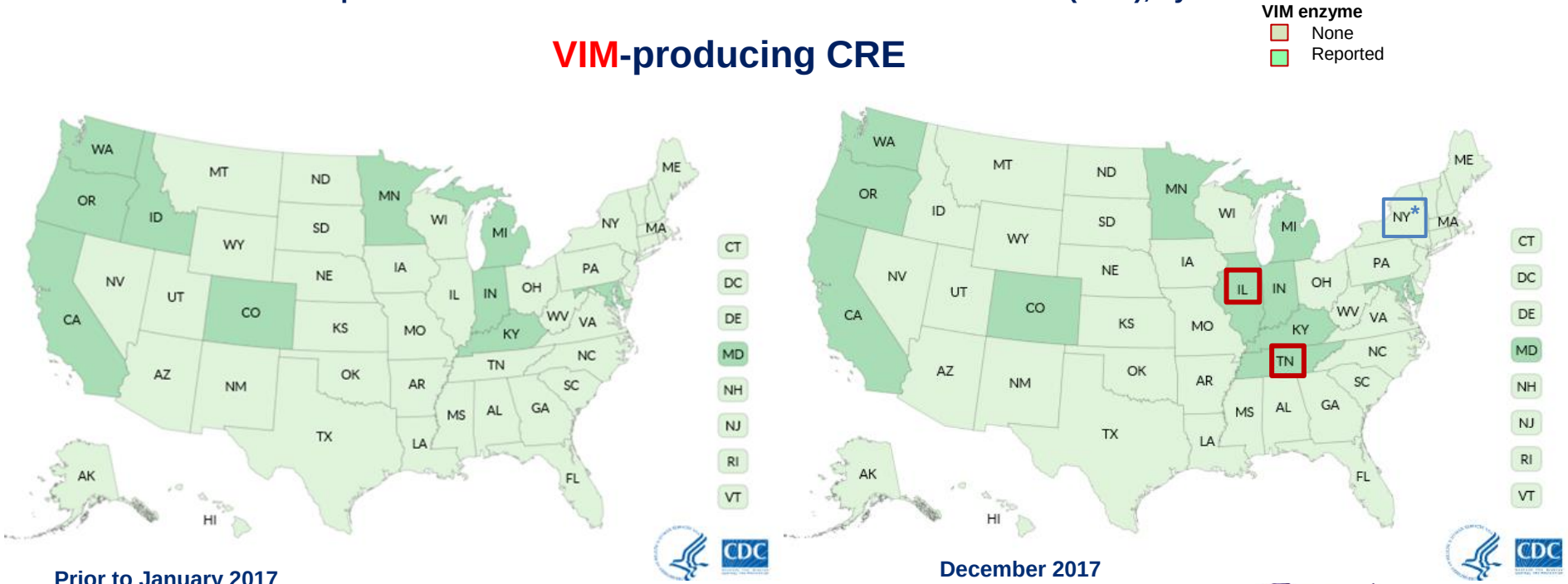
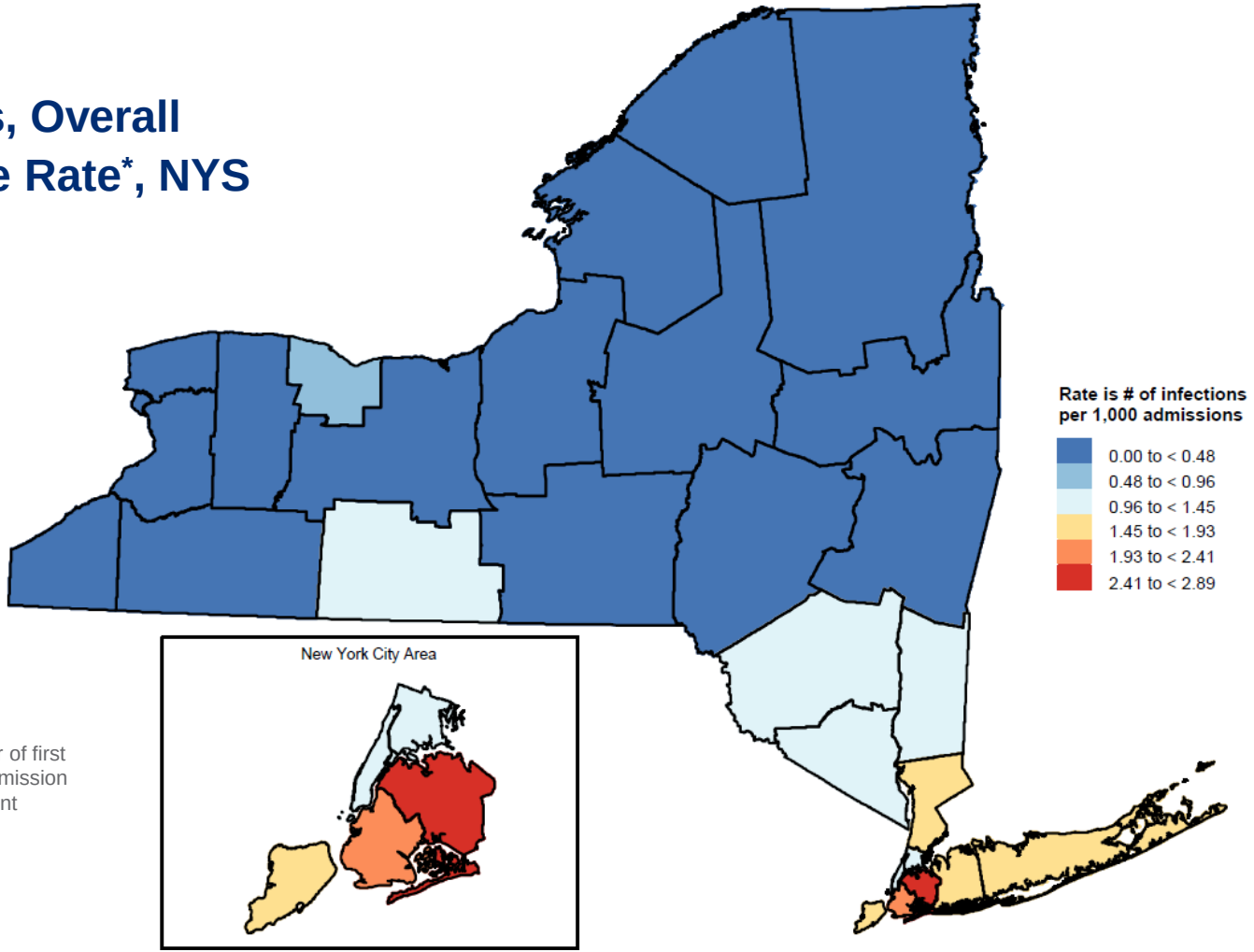
Mechanisms of Carbapenem Resistance in US

Reported to the Centers for Disease Control and Prevention (CDC), by state

VIM-producing CRE



CRE All Species, Overall Patient Prevalence Rate*, NYS 2016



* **Overall Patient Prevalence Rate:** Number of first LabID events per patient per month (e.g., admission prevalent or hospital onset)/ Number of patient admissions to the hospital x 1000

Wadsworth Center Isolate Testing for Novel Resistance Mechanism

72 ALERTS
(July 2017- March 2018)

- NYS (34)
- NJ (19)
- MA (6)
- NYC (4)

2018 Testing (Jan-Mar) (NY, NJ, CT, MA, ME, NH, NYC)
- 164 isolates or specimens received!

February alone
- 33 CRE
- 17 CRPA
- 19 MDR Acinetobacter
- 59 ESBLs
- 17 CRE Colonization

***NYS Findings**
- NDM, OXA-48, VIM, IMP, OXA-23 (CRPA)

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Fungi: *Why Worry?*

Global *C. auris* Emergence: First Report of *C. auris*, Japan, 2009

Candida auris sp. nov., a novel ascomycetous yeast isolated from the external ear canal of an inpatient in a Japanese hospital

Kazuo Satoh[1,2], Koichi Makimura[1,3], Yayoi Hasumi[1], Yayoi Nishiyama[1], Katsuhisa Uchida[1] and Hideyo Yamaguchi[1]

[1]Teikyo University Institute of Medical Mycology, 359 Otsuka, Hachioji, Tokyo 192-0395, [2]Japan Health Sciences Foundation, 13-4 Nihonbashi-Kodenmacho, Chuo-ku, Tokyo 103-0001 and [3]Genome Research Center, Graduate School of Medicine and Faculty of Medicine, Teikyo University, Otsuka 359, Hachioji, Tokyo 192-0395, Japan

Satoh K, Makimura K, Hasumi Y, et al. *Candida auris* sp. nov., a novel ascomycetous yeast isolated from the external ear canal of an inpatient in a Japanese hospital. Microbiol Immunol. 2009;53:41–4.

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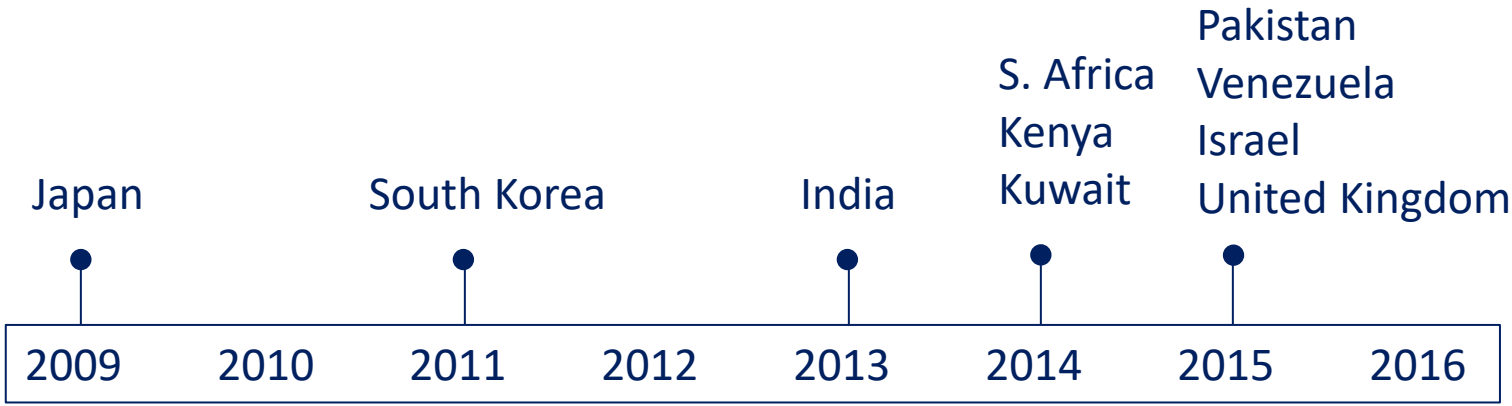
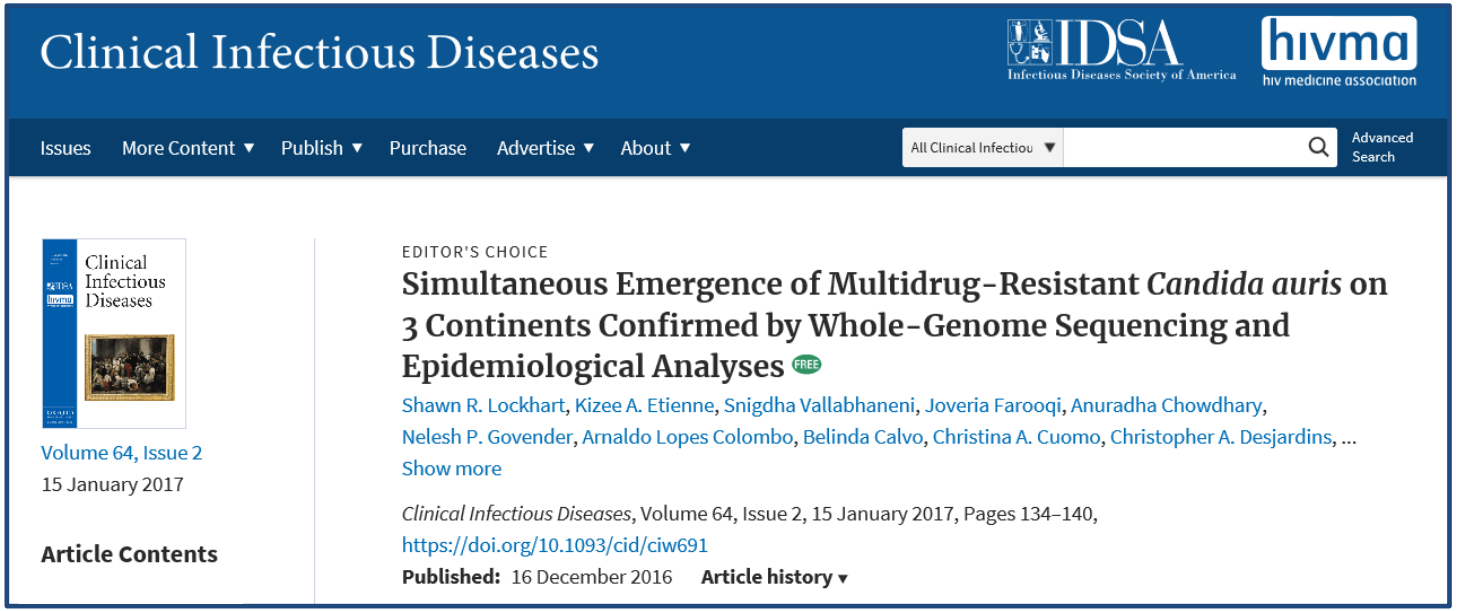
Global *C. auris* Emergence: Rapid Emergence Since 2009



Global *C. auris* Emergence



Clinical Infectious Diseases

IDSA Infectious Diseases Society of America

hivma hiv medicine association

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Clinical Infectious Diseases

Volume 64, Issue 2
15 January 2017

Article Contents

EDITOR'S CHOICE

Simultaneous Emergence of Multidrug-Resistant *Candida auris* on 3 Continents Confirmed by Whole-Genome Sequencing and Epidemiological Analyses FREE

Shawn R. Lockhart, Kizee A. Etienne, Snigdha Vallabhaneni, Joveria Farooqi, Anuradha Chowdhary, Nelesh P. Govender, Arnaldo Lopes Colombo, Belinda Calvo, Christina A. Cuomo, Christopher A. Desjardins, ...
Show more

Clinical Infectious Diseases, Volume 64, Issue 2, 15 January 2017, Pages 134–140,
https://doi.org/10.1093/cid/ciw691
Published: 16 December 2016 **Article history**

https://academic.oup.com/cid/article/64/2/134/2706620

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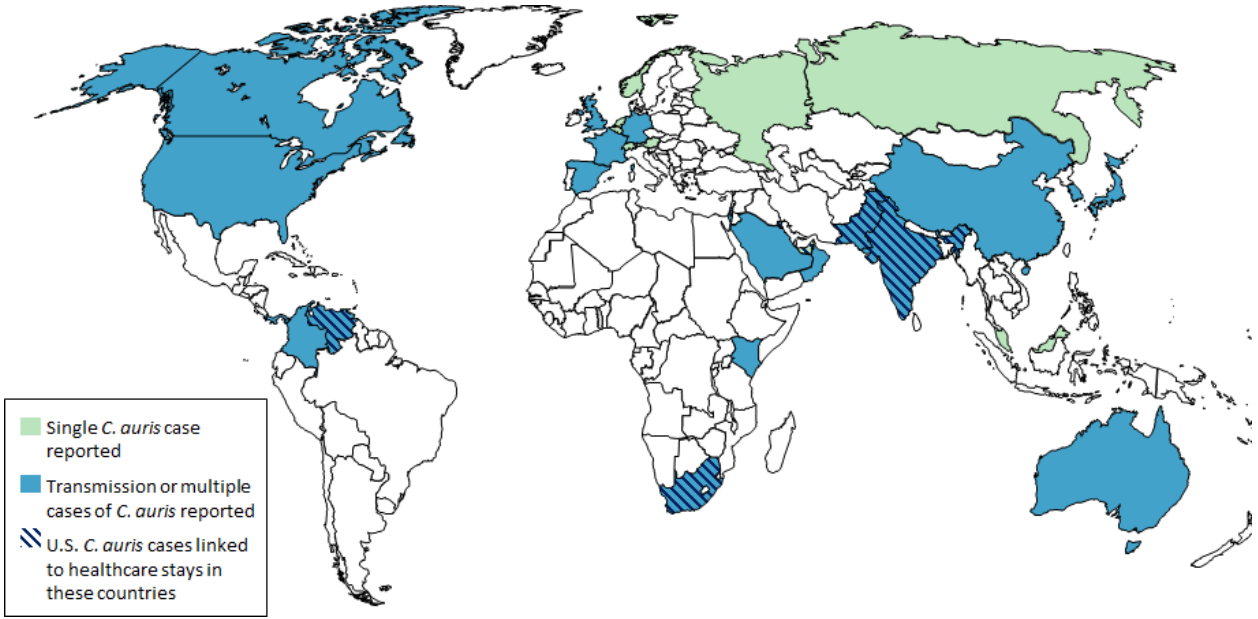
Global *C. auris* Emergence

Countries from which *Candida auris* cases have been reported, as of July 31, 2018



Tracking *Candida auris.* Centers for Disease Control and Prevention website. https://www.cdc.gov/fungal/candida-auris/tracking-c-auris.html. Accessed September 20, 2018.

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C. auris in U.S.

Toussaint, K. Health experts detail 'concerning' outbreak of Candida auris fungus in NYC. *Metro New York City.* September 21-23.

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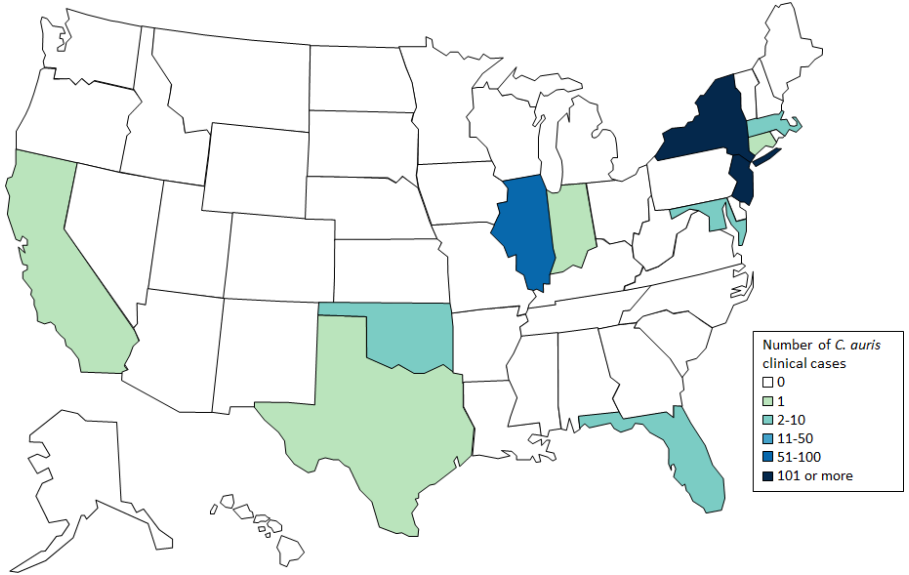
C. auris in U.S.

U.S. Clinical Cases of *Candida auris* Reported by State, United States, as of July 31, 2018



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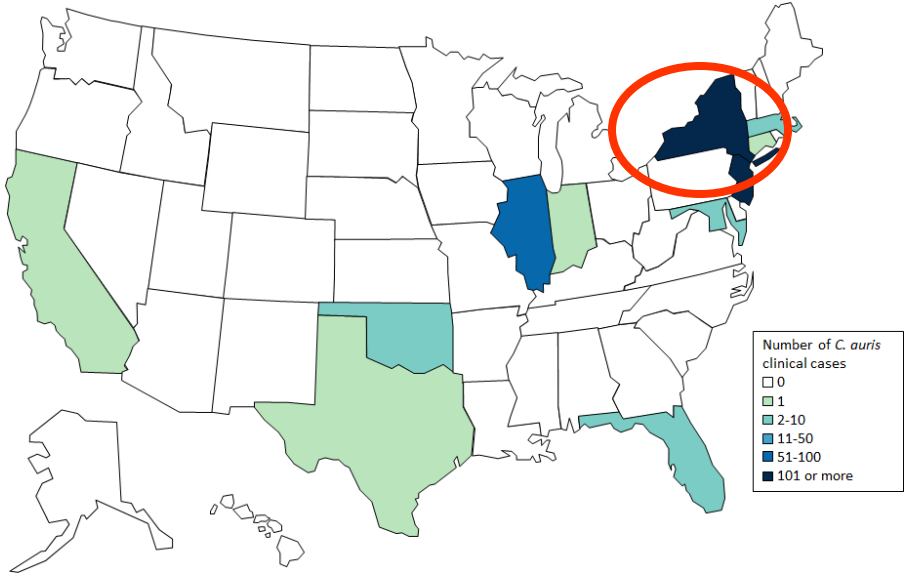

Tracking *Candida auris.* Centers for Disease Control and Prevention website. https://www.cdc.gov/fungal/candida-auris/tracking-c-auris.html. Accessed September 20, 2018.

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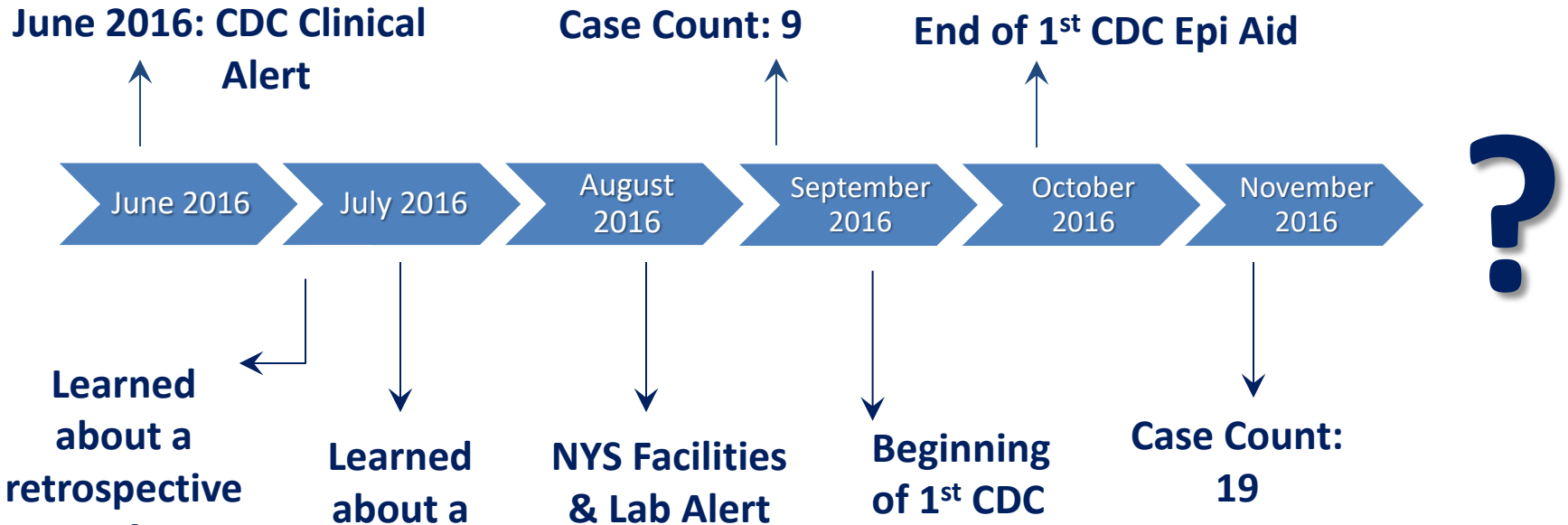
Why Worry?

Why Worry? *C. auris* in New York



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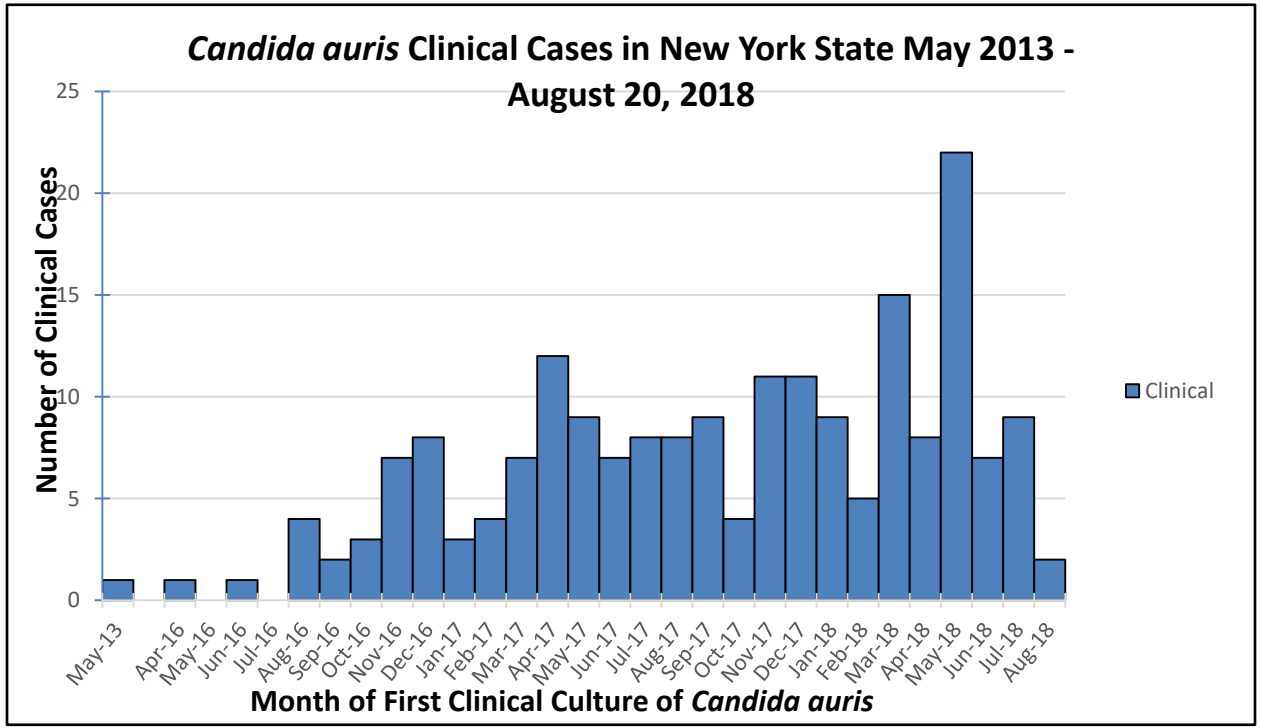
Why Worry? *C. auris* in New York

Spread in Healthcare Facilities

Why Worry? Spread in Healthcare Facilities



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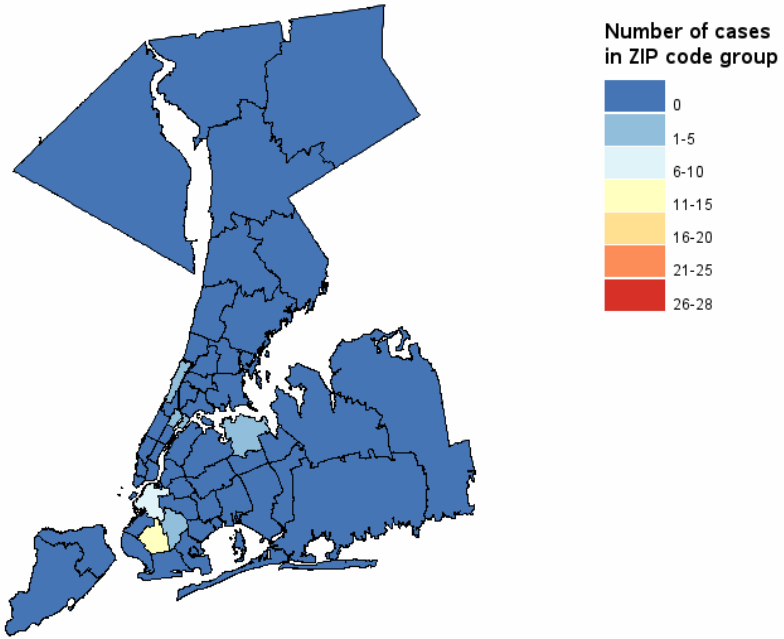
Why Worry? Spread in Healthcare Facilities

Cumulative number of Candida auris clinical cases



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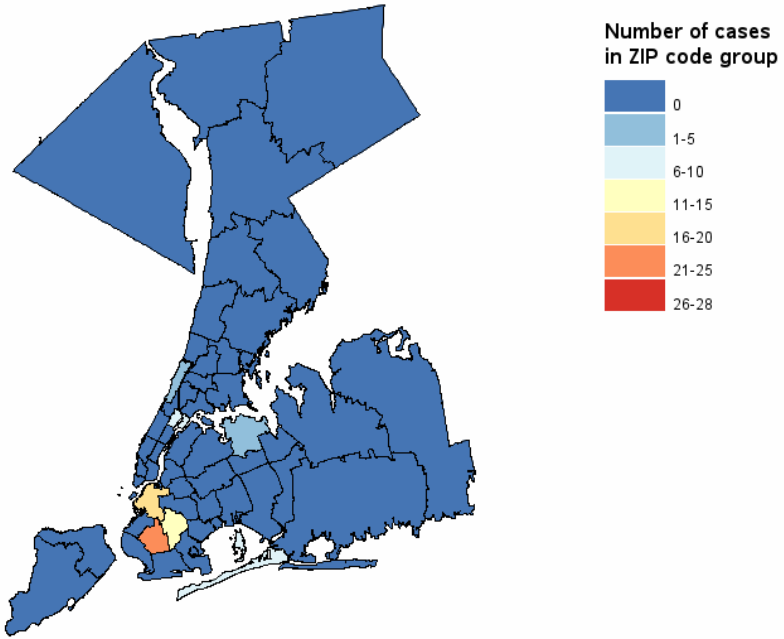
Why Worry? Spread in Healthcare Facilities

Cumulative number of Candida auris clinical cases



---------2017Q1

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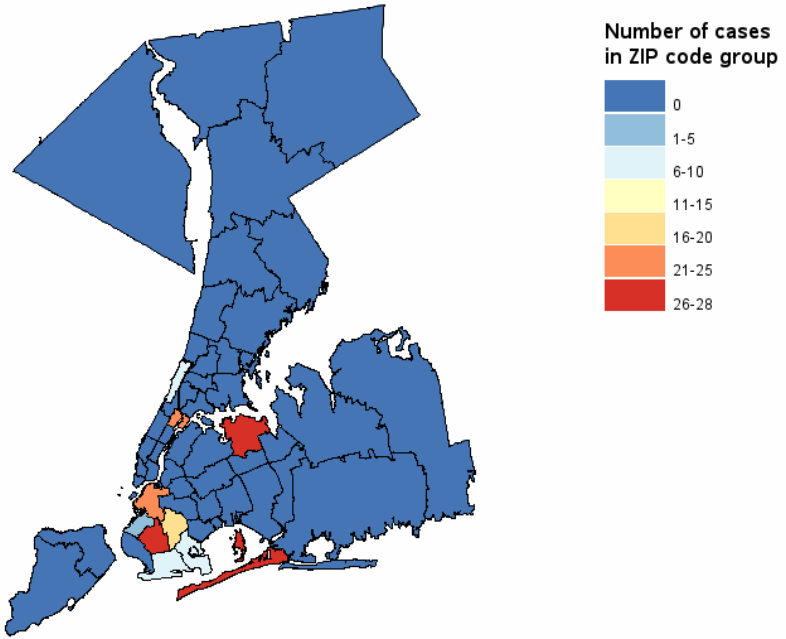
Why Worry? Spread in Healthcare Facilities

Cumulative number of Candida auris clinical cases



----------2017Q2

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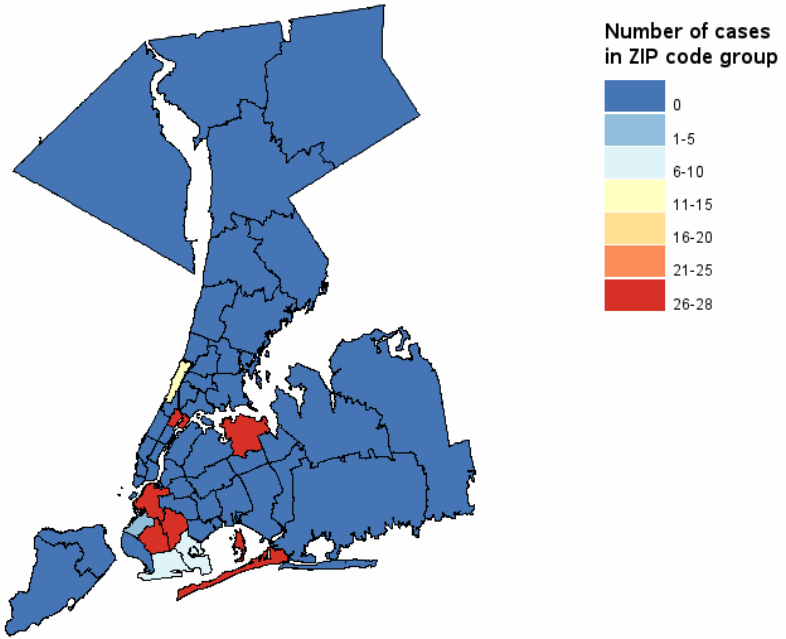
Why Worry? Spread in Healthcare Facilities

Cumulative number of Candida auris clinical cases



----------2017Q3

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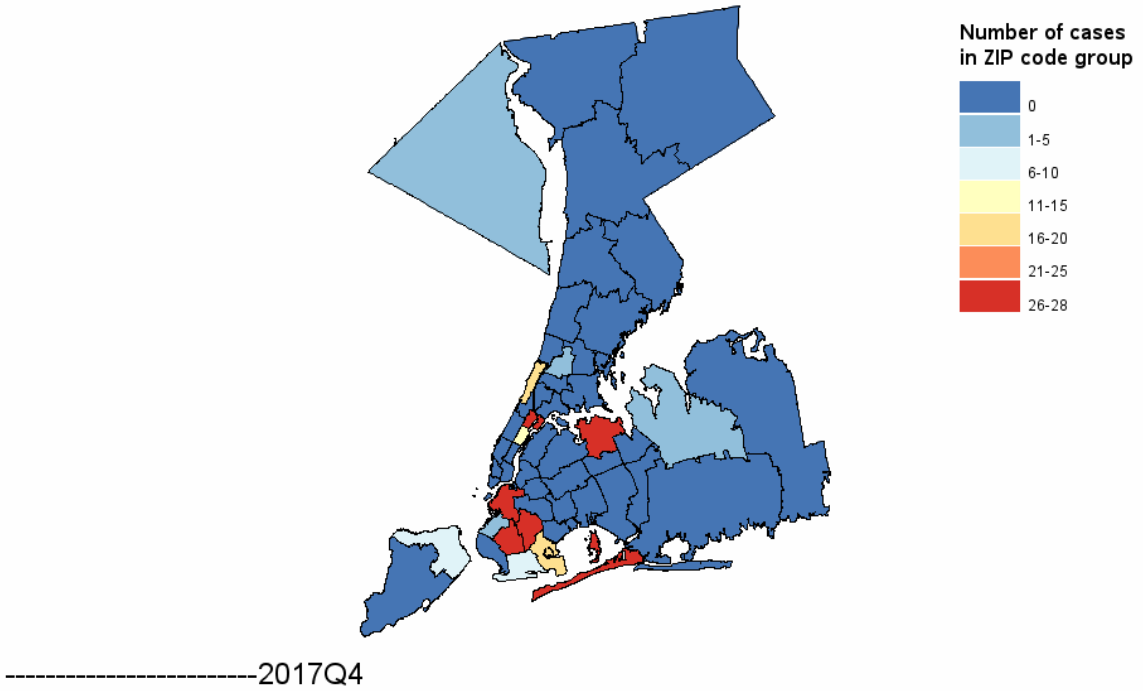
Why Worry? Spread in Healthcare Facilities

Cumulative number of Candida auris clinical cases



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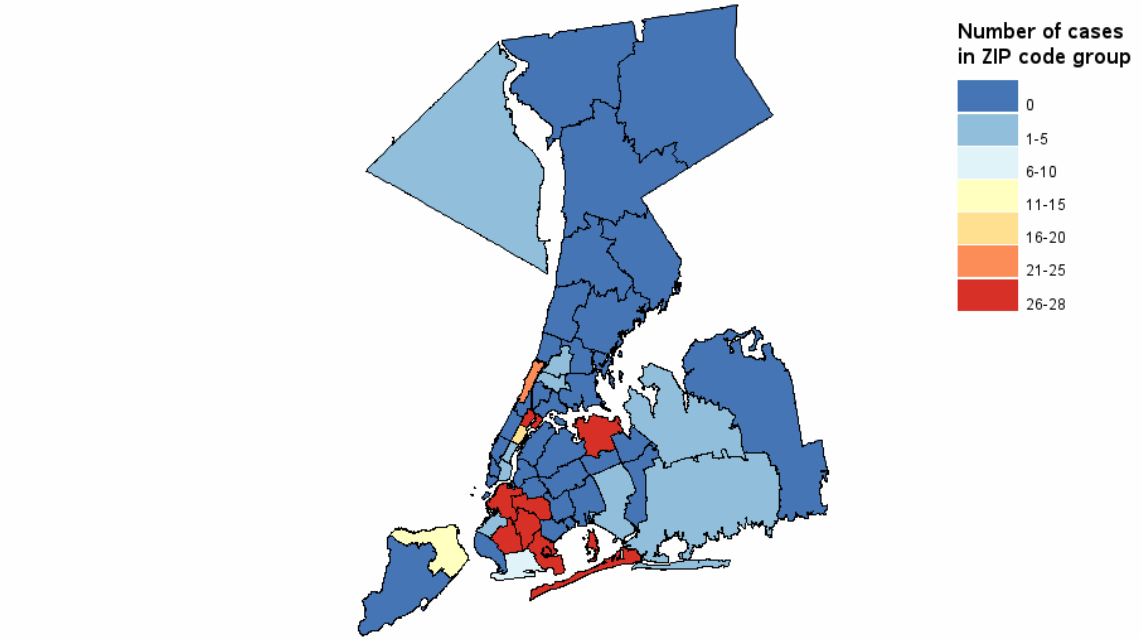
Why Worry? Spread in Healthcare Facilities

Cumulative number of Candida auris clinical cases



----------2018Q1

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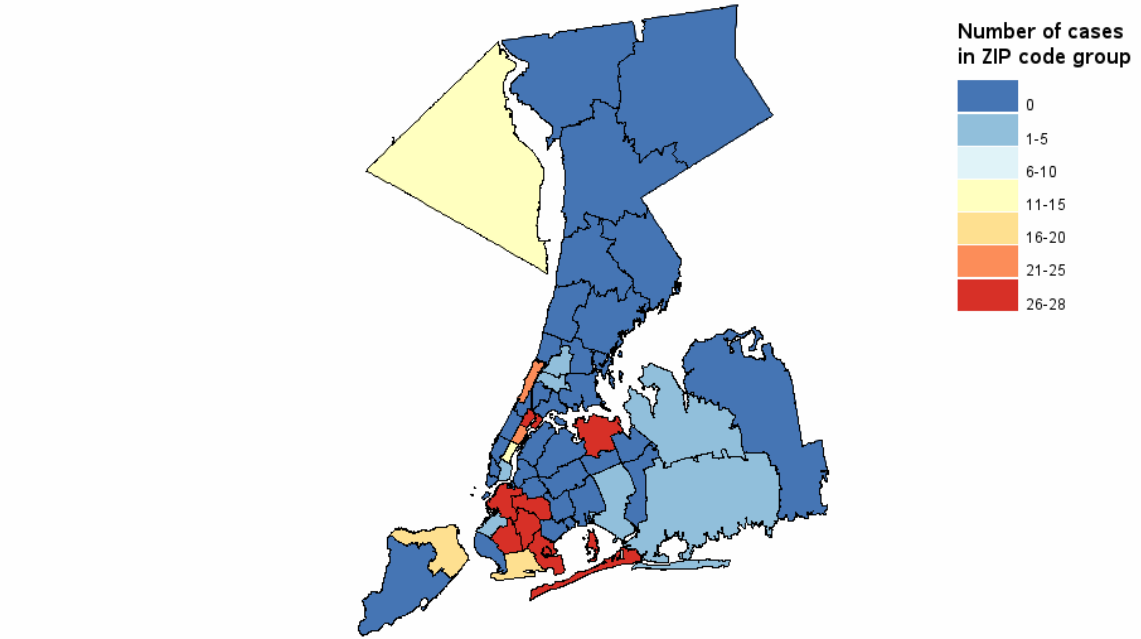
Why Worry? Spread in Healthcare Facilities

Cumulative number of Candida auris clinical cases



----------2018Q2

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Why Worry? Spread in Healthcare Facilities

- Data from first 51 clinical cases in NYS
  - 31 (61%) in Long Term Care Facility (LTCF) immediately before hospital admission
    - 19 of 31 (61%) in LTCFs with ventilator beds

Data from first 212 Clinical Cases

Healthcare Exposure Prior to Current Admission, Prior 90 Days	Number of Cases (n)	Percentage (%)
Acute Care Hospital	185	79%
Long Term Care Facility (Nursing Home)	74	31%
None	32	15%
Community	14	6%
Long Term Acute Care Hospital	6	3%
Other	3	1%

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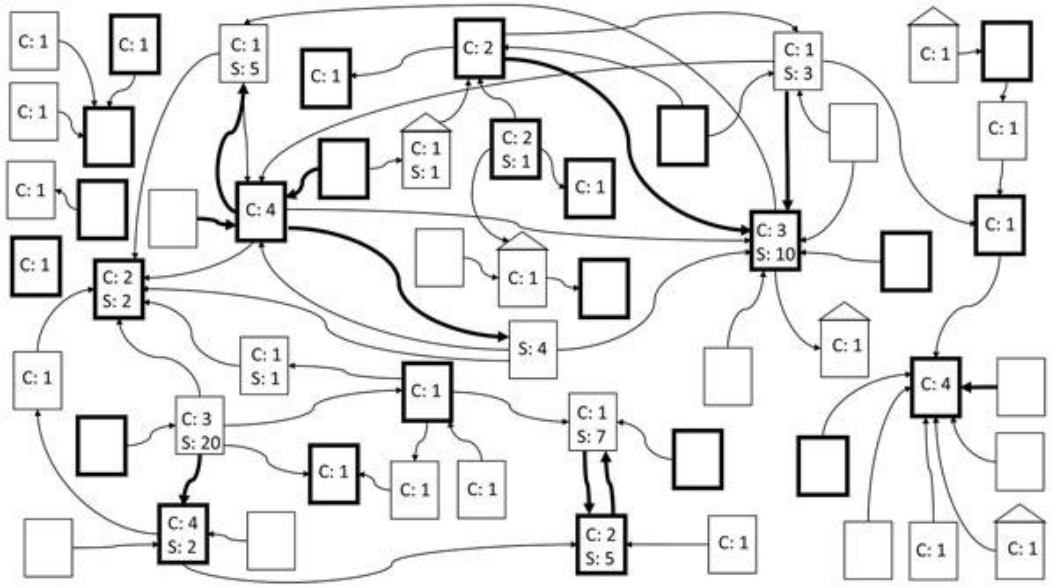
Why Worry? Spread in Healthcare Facilities

Epidemiological Links Between Healthcare Facilities Affected by *C. auris*, New York State, 2013-2017



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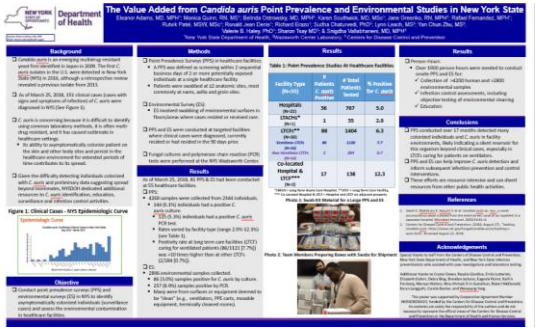
Adams E, Quinn M, Tsay S, Poirot E, Chaturvedi S, Southwick K, et al. Candida auris in Healthcare Facilities, New York, USA, 2013–2017. Emerg Infect Dis. 2018;24(10):1816-1824. https://dx.doi.org/10.3201/eid2410.180649

Why Worry? Spread in Healthcare Facilities

Intense NYS Efforts


The Value Added from *Candida auris* Point Prevalence and Environmental Studies in New York State

- Incident Management System activation
- Case finding
- Hired additional staff
- Roundtable with healthcare leadership
- Required webinar for NYC hospitals and nursing homes
- Required infection control self-assessment survey for all NYC hospitals and nursing homes
- On-site reviews of all hospitals and nursing homes in Brooklyn and Queens to assess compliance with infection control requirements
- Point prevalence studies, environmental surveys & educational infection control assessments

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Why Worry? Spread in Healthcare Facilities

Point Prevalence Surveys (PPS) in New York State

- As of March 25, 2018, 81 point prevalence surveys & environmental surveys had been conducted at 55 healthcare facilities
  - PPS:

    4268 samples were collected from 2344 individuals
    - 144 (6.1%) individuals had a positive *C. auris* culture
    - 125 (5.3%) individuals had a positive *C. auris* PCR test

Why Worry? Spread in Healthcare Facilities

Facility Type (N=55)	# Patients *C. auris* Positive	# Total Patients Tested	% Positive for *C. auris*
Hospitals (N=22)	36	767	5.0
LTACHs* (N=1)	1	35	2.9
LTCFs** (N=30)	88	1404	6.3
Ventilator LTCFs (N=16)	*86*	*1120*	*7.7*
Non-Ventilator LTCFs (N=14)	*2*	*284*	*0.7*
Co-located Hospital & LTCF*** (N=2)	17	138	12.3

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Why Worry? Spread in Healthcare Facilities

Facility Type (N=88)	# Patients *C. auris*	# Total Patients Tested	% Positive for *C. auris*
Hospitals (N=22)			
LTACHs* (N=1)			
LTCFs** (N=30)			
Ventilator LTCFs (N=16)			
Non-Ventilator LTCFs (N=14)			
Co-located Hospital & LTCF*** (N=2)	17	138	12.3

LTCFs (N=30)**	**88**	**1404**	**6.3**
Ventilator LTCFs (N=16)	*86*	*1120*	*7.7*
Non-Ventilator LTCFs (N=14)	*2*	*284*	*0.7*

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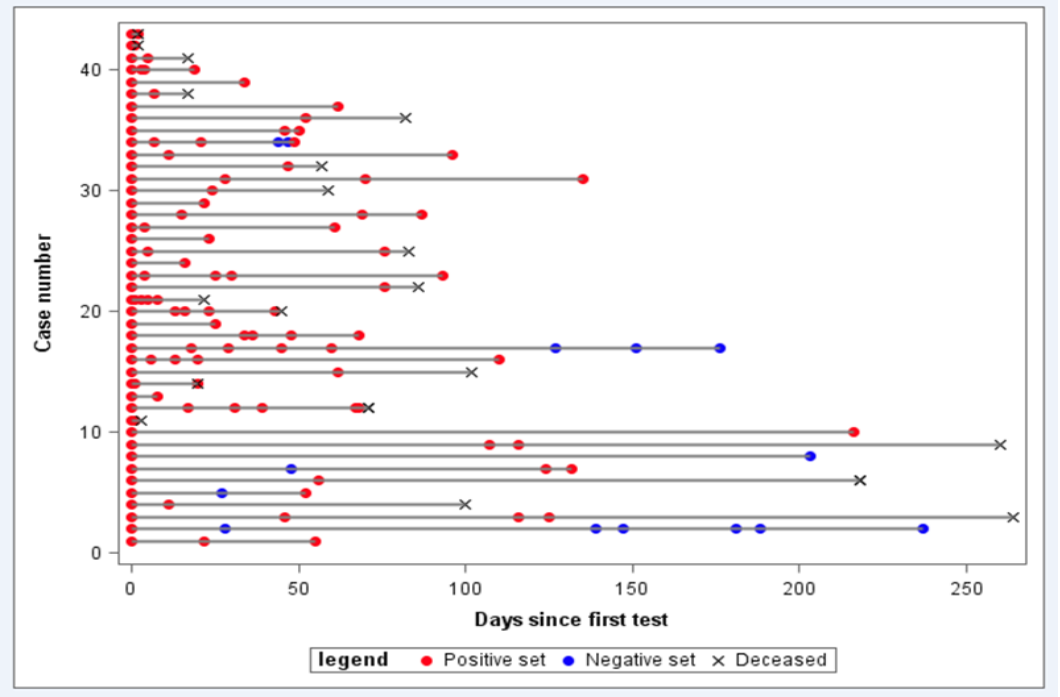
Why Worry? *C. auris* in New York

Persistent Colonization

Why Worry? Persistent Colonization

- Data from first 43 clinical patients in NYS
  - 2 deemed to be “cleared”
  - 19/43 (44%) expired

Follow-up Cultures for Clinical *C. auris* Cases, by Case



Adaptation of Table from: Adams E, Quinn M, Tsay S, et al. Candida auris in Healthcare Facilities, New York, USA, 2013 –2017. Emerg Infect Dis. 2018;24(10):1816-1824. https://dx.doi.org/10.3201/eid2410.180649

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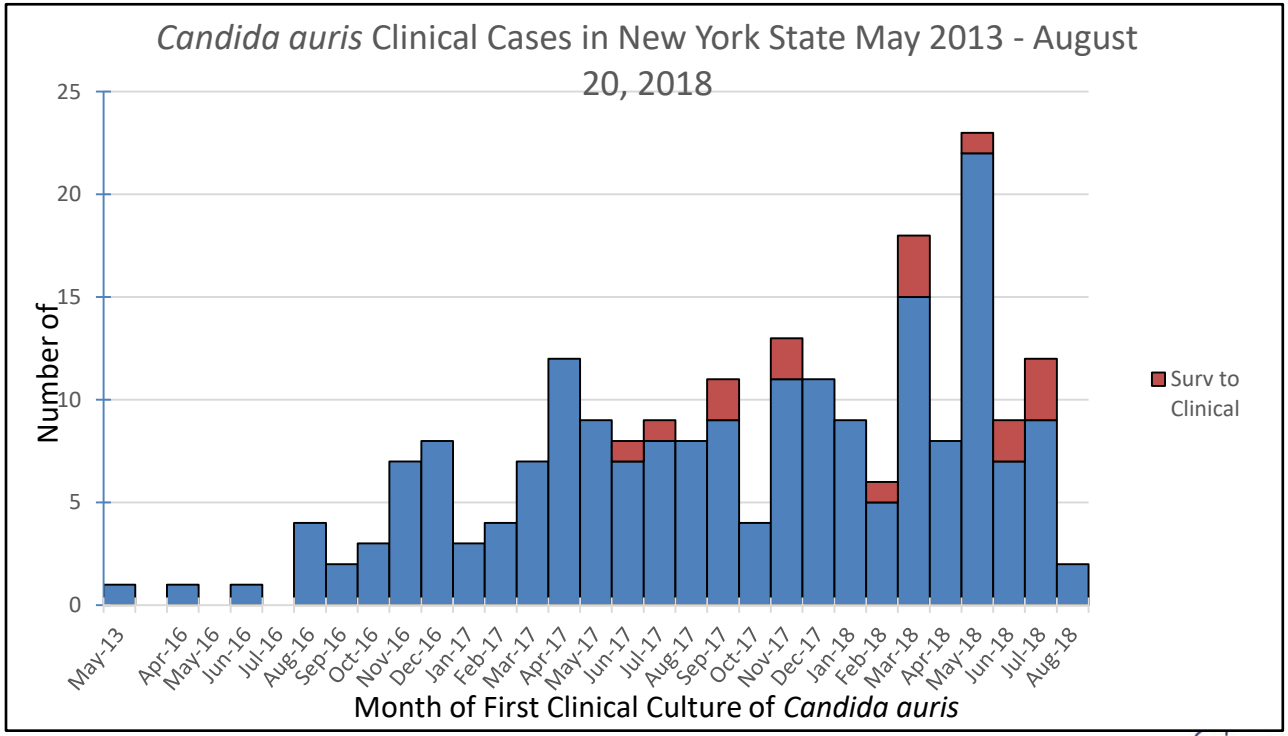
Why Worry? *C. auris* in New York

Colonized Patients are Becoming Infected

Why Worry? Colonization to Infection



Southwick K, Adams E, Greenko J, et al. New York State 2016-2018: Progression from *Candida auris* Colonization to Bloodstream Infection. Poster session presented at:IDWeek, 2018 Oct 3-6; San Francisco, CA.

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Why Worry? *C. auris* in New York

Persistence in the Environment

Why Worry? Persistence in the Environment

Environmental Surveys (ES) in New York State

- As of March 2018, 81 point prevalence surveys & environmental surveys had been conducted at 55 healthcare facilities
  - ES:

    2896 environmental samples collected

- 86 (3.0%) samples positive for *C. auris* by culture
- 257 (8.9%) samples positive by PCR
- Many were from surfaces or equipment deemed to be “clean”

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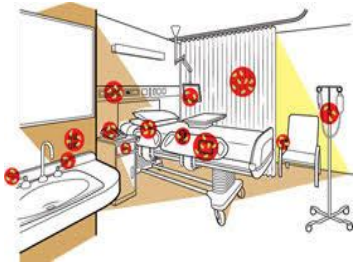
Why Worry? Persistence in the Environment

- *C. auris* recovered from multiple sites within patient & procedure rooms:
  - Call bells
  - TV remotes, telephones
  - Window sills
  - Curtains
  - Light cords
  - Ventilators
  - Blood pressure cuffs
  - PPE carts
  - Medication carts
  - Clean supply carts
  - Housekeeping carts
  - IR suite equipment
  - OR equipment



Why Worry? Persistence in the Environment

AMERICAN SOCIETY FOR MICROBIOLOGY | Journal of Clinical Microbiology

Survival, Persistence, and Isolation of the Emerging Multidrug-Resistant Pathogenic Yeast *Candida auris* on a Plastic Healthcare Surface

Rory M. Welsh, Meghan L. Bentz, Alicia Shams, Hollis Houston, Amanda Lyons, Laura J. Rose, Anastasia P. Litvintseva

DOI: 10.1128/JCM.00921-17

Welsh R, Bentz M, Shams A, et al. Survival, Persistence, and Isolation of the Emerging Multidrug-Resistant Pathogenic Yeast *Candida auris* on a Plastic Healthcare Surface. J Clin Micro. 2017;55(10):2996-3005.

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Why Worry? *C. auris* in New York

Vulnerable Hosts

Why Worry? Vulnerable Hosts

- Currently, 57% of clinical cases are males
- Clinical cases have multiple underlying conditions

Age Range (Years)	# Cases (%)
<1	1 (0%)
1-18	0 (0%)
19-44	15 (12%)
45-64	67 (32 %)
>64	129 (61%)

Why Worry? Vulnerable Hosts

- Clinical cases through August 20, 2018
  - Blood and urine majority of first positive sites
  - Variety of sites

First Positive Site	Count	%
Blood	119	56
Urine	40	19
Wound/skin	18	8
Respiratory site	17	8
Other	9	4
Bile	4	2
Catheter tip or segment	3	1
Ear	2	1
Total	212	100

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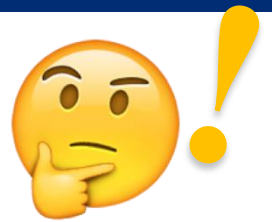
Why Worry? Vulnerable Hosts

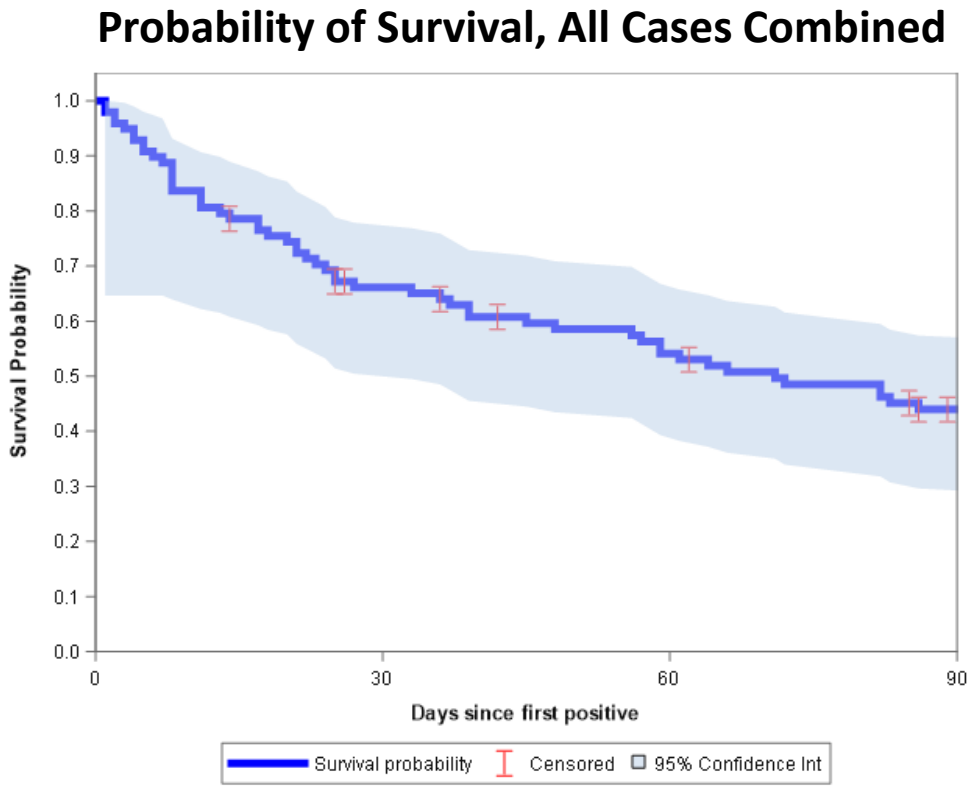


We ARE NOT seeing large numbers of patients with C. auris who:	We ARE seeing large numbers of patients with C. auris who:
Are neutropenic	Are on ventilators
Are children	Have wounds, lines or drains
Are in the community	Are over the age of 65
Do not have co-morbid medical conditions	Are nursing home residents with frequent hospitalizations

Why Worry? *C. auris* in New York

High Mortality

Why Worry? High Mortality



Probability of surviving past:

2 days = 96%
7 days = 89%
30 days = 66%
60 days = 54%
90 days = 44%

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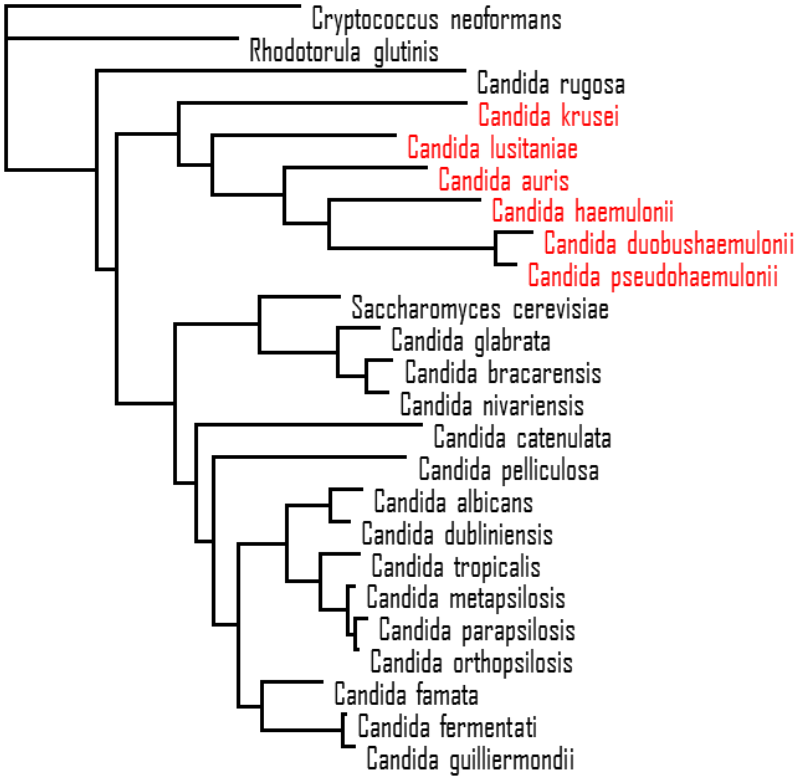
Why Worry? *C. auris* in New York

Antifungal Drug Resistance

Why Worry? Antifungal Drug Resistance



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Why Worry? Antifungal Drug Resistance

- Lockhart 2016: 54 isolates from Pakistan, India, South Africa, Venezuela, and Japan
  - Susceptibility testing
    - 93% resistant to fluconazole, 54% to voriconazole, 35% to amphotericin B, 7% to echinocandins, 6% to flucytosine
    - 41% resistant to ≥2 classes, 2 isolates resistant to 3 classes

Lockhart SR, Etienne KA, Vallabhaneni, S. Simultaneous Emergence of Multidrug-Resistant Candida auris on 3 Continents Confirmed by Whole-Genome Sequencing and Epidemiological Analyses. Clin Infect Dis. 2017 Jan 15;64(2):134-140.

Why Worry: Antifungal Drug Resistance

Antifungal susceptibility data for first *Candida auris* isolates from 51 clinical cases, New York, USA, 2013–2017

Antifungal	Tentative resistance breakpoint	MIC_{50}	MIC range	No. (%) resistant
Fluconazole	>32	>256	8.00 to >256	50 (98)
Caspofungin	>2	0.060	0.03–0.25	0
Micafungin	>4	0.120	0.06–0.25	0
Anidulafungin	>4	0.250	0.12–0.50	0
Amphotericin B	>2	1.500	0.50–4.00	15 (29)
Flucytosine	NA	0.125	0.125–0.25	NA

Adams E, Quinn M, Tsay S, et al. Candida auris in Healthcare Facilities, New York, USA, 2013 – 2017. Emerg Infect Dis. 2018;24(10):1816-1824. https://dx.doi.org/10.3201/eid2410.180649

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But, Why Worry?

But, Why Worry?

Infection Prevention and Control Measures are Challenging…

But They Work!

What Are The Recommendations?

Infection Control & Prevention	Environmental Cleaning
Hand Hygiene	**Use EPA-Registered Hospital Grade Disinfectant Effective Against *C. difficile* spores ("List K")**
Isolation/Cohorting - Contact Precautions - Dedicated Equipment - Attention to transporting	- Attention to contact times - Attention to high touch surfaces & moveable equipment
Reporting & Interfacility Communication	
Lab identification & Screen Contacts	

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Health Advisory: Update to Healthcare Facilities Regarding Multidrug-Resistant Yeast *Candida auris* in New York State. 2017 CDC *C. auris*: https://www.cdc.gov/fungal/diseases/candidiasis/candida-auris.html

Back to the Basics

- Hand Hygiene (HH) is Essential
  - Assure HH dispensers & sinks are available
  - Encourage use of alcohol based hand rub (ABHR) (when appropriate) and soap/water
  - Review indication for HH with healthcare workers
  - Have a system to educate and audit HH (optimally to address different areas, providers & shifts)

Myth Buster: What Do We Encounter at Real Facilities?

Facility

Nursing Homes:

- "This is their home…and we have them [alcohol based hand rub (ABHR) dispensers] inside of the rooms by the sink…"

Pertinent Factors/Data:

- Sinks are INSIDE room
- Does not promote HH on entrance and exit
- Some activities/equipment are in hallway
- Makes auditing challenging

Myth Buster: ABHRs

Facility

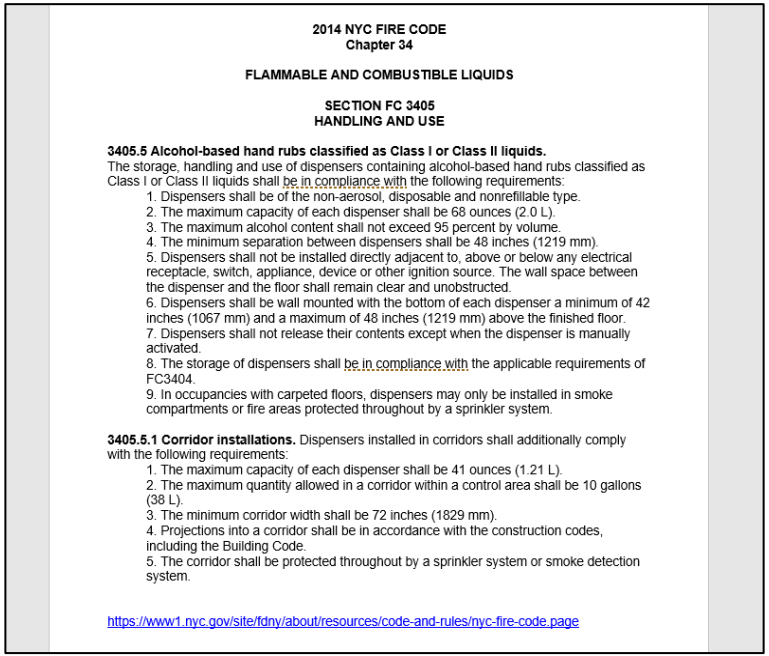
Nursing homes:

- "We will be out of compliance because of fire or regulatory codes…"

Pertinent Factors/Data:

- The NYC Fire Code allows the use and placement of ABHRs in resident corridors/hallways (*NYC Fire Code 2014, Chapter 34, FC 3405)*

Navigating the Codes



2014 NYC FIRE CODE
Chapter 34

FLAMMABLE AND COMBUSTIBLE LIQUIDS

SECTION FC 3405
HANDLING AND USE

3405.5 Alcohol-based hand rubs classified as Class I or Class II liquids.
The storage, handling and use of dispensers containing alcohol-based hand rubs classified as Class I or Class II liquids shall be in compliance with the following requirements:

1. Dispensers shall be of the non-aerosol, disposable and nonrefillable type.
2. The maximum capacity of each dispenser shall be 68 ounces (2.0 L).
3. The maximum alcohol content shall not exceed 95 percent by volume.
4. The minimum separation between dispensers shall be 48 inches (1219 mm).
5. Dispensers shall not be installed directly adjacent to, above or below any electrical receptacle, switch, appliance, device or other ignition source. The wall space between the dispenser and the floor shall remain clear and unobstructed.
6. Dispensers shall be wall mounted with the bottom of each dispenser a minimum of 42 inches (1067 mm) and a maximum of 48 inches (1219 mm) above the finished floor.
7. Dispensers shall not release their contents except when the dispenser is manually activated.
8. The storage of dispensers shall be in compliance with the applicable requirements of FC3404.
9. In occupancies with carpeted floors, dispensers may only be installed in smoke compartments or fire areas protected throughout by a sprinkler system.

3405.5.1 Corridor installations. Dispensers installed in corridors shall additionally comply with the following requirements:

1. The maximum capacity of each dispenser shall be 41 ounces (1.21 L).
2. The maximum quantity allowed in a corridor within a control area shall be 10 gallons (38 L).
3. The minimum corridor width shall be 72 inches (1829 mm).
4. Projections into a corridor shall be in accordance with the construction codes, including the Building Code.
5. The corridor shall be protected throughout by a sprinkler system or smoke detection system.

https://www1.nyc.gov/site/fdny/about/resources/code-and-rules/nyc-fire-code.page

- Addresses:
- Definitions of alcohol based hand rubs
- Installation & volumes of product and placement

Summary Issue- from R. Giardina, NYSDOH

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Myth Buster: HH

Healthcare Workers:

- "Real HH with soap and water is better than alcohol based gel"
- "I don't like it (ABHR)
- "I am wearing gloves"

Pertinent Factors/Data:

- "ABHR is the preferred method for cleaning your hands when they are not visibly dirty" (not *C. difficile*; ok for *C. auris*).
- More effective at killing potentially deadly germs on hands than soap
- Requires less time
- Is more accessible than handwashing sinks
- Produces reduced bacterial counts on hands
- Improves skin condition with less irritation and dryness than soap and water

CDC. Guidelines of HH in HC settings. MMWR. 2002:51 RR-16)
Series tables with studies summarized log reductions (tables I-5 review log reductions)
CDC webpage:" Show me the science."

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Pearls for Practical Implementation

- Have a HH Policy (includes nails)

- Engage Staff in some of the decisions
  - Pilot the products
  - Walk through work flow: ensure enough ABHR, determine placements of ABHR dispensers

- Auditing: Simple, some covert (secret shopper/“in and out”), share the data

Myth Buster: It Fits Like a Glove…

Indications for, and limitations of, glove use:

- Hand contamination may occur as a result of small, undetected holes in examination gloves (Doebbeling 1988, McLane 1983)
- Contamination may occur during glove removal (Olsen 1993)
- Wearing gloves does not replace the need for hand hygiene (Tenorio 2001)
- Failure to remove gloves after caring for a patient may lead to transmission of micro-organizations from one patient to another (Patterson 1991).

Myth Buster: Transmission-Based Precautions Signage

Facility

Nursing homes & Hospitals:

- "We can't have the diagnosis on the door…we can get cited."
- **Default signage: "See Nurse"**

From google images

Pertinent Factors/ Data:

- **CMS (42 C.F.R. section 483.10), signage restrictions do not apply to "the CDC isolation precaution transmission based signage for reasons of public health protection, *as long as the sign does not reveal the type of infection*" (CMS State Operations Manual, Appendix PP)*.**
- **Bottom line: Signs can be more informative**

*Diagnosis, organism, or resident identifiers (e.g., name, bed number) should not be disclosed on for Transmission-Based Precautions Signs.

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NYSDOH Resource

Table 1: Pros and Cons of Various Types of Transmission-based Precautions Signs*

Description	Pros	Cons	Comments
Signs stating the type of precautions (e.g. "Contact Precautions")	Easily recognizable and meaningful for healthcare providers	Not meaningful for visitors – might need additional language such as "Visitors: see nurse"	
Signs stating the type of precautions but without the word "precautions" (e.g. "Contact", "Droplet")	Likely recognizable and meaningful for healthcare providers; might be less alarming to visitors than signs with the word "precautions"	Not meaningful for visitors – might need additional language such as "Visitors: see nurse"	
Signs stating the type of precautions (e.g. "Contact Precautions") and providing detailed information about what those precautions entail (e.g. pictures of PPE to be worn)	Easily recognizable and meaningful for healthcare providers; remind healthcare providers what needs to be done while caring for the resident	Might be confusing or alarming for visitors and might need additional language such as "Visitors: see nurse"; might result in a large, obtrusive, and/or cluttered sign	
Signs with language such as "See nurse before entering"	Useful for visitors; may be less alarming than signs that are more explicit about precautions	Might not be understood to indicate Transmission-Based Precautions by healthcare providers	NYSDOH staff have witnessed healthcare providers entering rooms with these types of signs without using PPE because the signs were not recognized as indicating Transmission-Based Precautions. If these types of signs are chosen, the facility should ensure that all healthcare providers and other staff receive effective, periodic training on the meaning of the signs. Regardless of sign type, adherence should be monitored.
Signs consisting of colored dots to indicate which type of precautions are required	Unobtrusive	Not meaningful for visitors – might need additional language such as "Visitors: see nurse"; might not be understood to indicate Transmission-Based Precautions by healthcare providers; not useful for healthcare providers who are color-blind	
Signs consisting of symbols to indicate precaution types (e.g. a water drop to indicate Droplet Precautions)	Unobtrusive and relatively easy for healthcare providers to remember	Not meaningful for visitors – might need additional language such as "Visitors: see nurse"; might not be understood to indicate Transmission-based Precautions by healthcare providers	

* Legal questions regarding signage content and ensuring such signage complies with CMS and HIPAA requirements should be directed to facility counsel.

NYSDOH Resource: Transmission Based Precautions in Long Term Care Facilities Memo

Pros and Cons to different types signage

- **See the nurse**
- **"Contact precautions"**
- **Each precaution**
- **Verbal description PPE**
- **Pictures of PPE**

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It's Not What You Wear… It's How You Wear It: Practical Implementation for PPE and isolation

- Understanding of standard and transmission based precautions
  -- Including isolation and who can be "cohorted together"
- Having PPE accessible
- Training on When and How to Don and Doff PPE
  - Include environmental staff
- Engaging the Staff in some of the decisions
  - Piloting the products
  - Walk through of work flow
- Auditing: simple, some covert (secret shopper), share data

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But…Why Worry?

Environmental Cleaning is Challenging…

But it Works!

It's Not Just What You Clean… It's How You Clean It: Practical Implementation for Cleaning & Disinfection

The "Right" Stuff:

- Right Products:
  - EPA Register hospital grade disinfectants
  - For C. auris **List K**- EPA Registered to be effective against C. difficile spores
- Right Time: Contact time
- Right Surfaces: Attention to highly touched
- Right Training
- Right Quality

http://www.cleanlink.com/hs/article/Identifying-And-Using-Hospital-Grade-Disinfectants--16318
NYSDOH. Health Advisory: Update to Healthcare Facilities Regarding Multidrug-Resistant Yeast Candida auris in New York State. 2017.

So Much to Clean, So Little Time…

Myth Buster: "The housekeepers take care of cleaning so it isn't my problem…"

- Many surfaces and equipment in the healthcare environment NOT cleaned by **OR** NOT ONLY by environmental services

- Address:
  - Detailed Cleaning Grid---"Who Cleans What List with What and When…?"
  - Multi-disciplinary rounds

Quality is Not Expensive… It's Priceless

Method	Pro	Con
Supervision/Visual Inspection	- Aids in training	- Labor Intensive - Only when done - You can't see microorganisms
Multi disciplinary Rounds	- Engages staff - Identifies issues that cross staff type	- Requires buy-in
Check lists	- Cheap	- Can be cumbersome - Subjective
Markers Tide Pen Glow Germ	- Aids in training - Simple/ Cheap - More objective (track trends)	- Need to be planned - Can be "gamed" - No quantitative measure
ATP	- Quantitative measure - Realtime feedback	- Expensive

Why Worry: Summary

***C. auris*:**

- **Emerged independently multiple times**
- **Spread rapidly among healthcare facilities in NYC area**
- **Individuals can be colonized for many months**
- **Colonized individuals can develop infections**
- **It is affecting individuals who are vulnerable hosts**
- **High mortality rate among infected individuals**
- **Can persist in the healthcare environment**
- **Potential for antifungal drug resistance**

But, Why Worry?

***C. auris*:**

- **We have learned how *C. auris* and is transmitted**
- **Extensive infection control efforts to identify cases and optimize infection control interventions do work**
- **Local health department staff, hospital and nursing home staff, and federal agency staff are wonderful partners who are willing to assist with NYS efforts**
- **The more we know, the better!**

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