

# HAI/AR Collaborating Partners

Rita Owsiak MS, MT(ASCP), CIC

August 23, 2019



# Agenda

12:00 – 12:10 pm Introductions and opening comments  
Welcome new members and guests

12:10 – 12:20 pm Review of the minutes

12:20 – 1:00 pm Updates:

- Chapter 270
- Program Funding

1:00 – 2:00 pm Maine HAI/AR State Plan

2:00 – 2:15 pm Break

2:15 – 3:15 pm AR Data

- Antibiogram
- IQVIA
- Milliman

3:40 – 3:50 pm Public comments

3:50 – 3:55 pm Meeting Evaluation

3:55 – 4:00 pm Next meeting and parking lot / adjournment

# Update – Chapter 270

- CDI Nursing Home Reporting:
  - Nursing Home Work Group Meeting scheduled for Sept. 10<sup>th</sup>
  - Reporting begins July 1, 2020
- External Validation: CAUTI (CY2018 data)
  - 20 facilities selected, based on CDC External Validation Toolkit
    - 2 Facilities selected were also selected for CMS CAUTI validation for this data time period
      - excused from Maine CAUTI validation activities if they submit their CMS validation summary report to MQF.
      - 2 additional facilities selected in their place.
    - 14 IPPS facilities selected for mandatory validation
    - 6 CAH facilities selected for voluntary validation
    - Current phase: Facility data submission

# Update – Program Funding

- HAI Programs requested \$67M in grant funding
- Federal CDC was able to fund \$36M
- Maine was funded for 44% of the HAI/AR grant request.
  - 2 full-time Healthcare Epidemiology staff
  - 1 part-time lab position
  - Only 20% of travel budget funded
  - Reduced budget for CRE/CRPA testing (Federal CDC may address duplicate testing)
  - Funding was not granted for *Candida auris* testing (this year)
  - Funding was not granted for any educational activities
- Federal CDC Priorities:
  - Containment activities to slow the spread of emerging MDROs
  - HAI/AR Response (e.g. Outbreak)
  - On-Site Assessments
  - Antimicrobial Stewardship
- Due to difference in funding granted vs. requests made, workplans will be discussed and amended. Workplan meetings will be in October.

# State Plan - DRAFT

- Historically, we have written a 5-year plan.
- Federal CDC is now asking for annual plans.
- Maine is combining these two ideas
  - Plan will include a list of projects/goals under the categories RESPOND, ANALYZE, PREVENT.
  - There will be an annual report out on projects and updating of plan (technically, we can update it at anytime).
    - Completed items will be removed
    - New needs/desires can be added → plan moves through approval process
  - Desire to have some long-term (ambitious) goals, should funding arise, this will help us.



# State Plan - DRAFT

<b>RESPOND to...</b>
<b>Outbreaks</b>
Utilize general outbreak definition contained within the Notifiable Conditions Rule vs. developing state HAI and AR specific outbreak definitions. Adopt national HAI and AR specific outbreak definitions put forth by the Council of State and Territorial Epidemiologists (CSTE) and The Council for Outbreak Response: Healthcare-Associated Infections and Antimicrobial-Resistant Pathogens (CORHA).
Develop a list of high-priority pathogens, to increase healthcare facility reporting of clusters/outbreaks.
Develop methodology to prioritize healthcare facilities experiencing outbreaks for Infection Control Assessments.
Determine capacity to offer 'no cost' strain identification for healthcare facility clusters/outbreaks for which determining outbreak source type would be beneficial to institute appropriate control and/or prevention measures.

# State Plan - DRAFT

## RESPOND to...

### Emerging Multidrug-resistant Organisms (MDROs)

(*Candida auris*, carbapenemase-producing organisms, colistin resistance, pan drug-resistance, vancomycin-resistant *Staphylococcus aureus*)

Conduct State surveillance for all emerging MDROs.

Support federal CDC's strategy to contain emerging MDROs by utilizing federal CDC's *Interim Guidance for a Public Health Response to Contain Novel or Targeted MDROs* at the State level.

Serve as liaison with the designated out-of-state public health department when a transfer of a patient with an emerging MDRO occurs across state lines.

### Emerging Special Pathogens

(Viral Hemorrhagic Fever/Ebola, SARS/MERS-CoV/novel influenza, etc.)

Request a National Ebola Training and Education Center (NETEC) readiness assessment to be conducted at each Assessment Hospital before June 2020.

Transition minimum required lab tests (i.e. CBC, LFT, PT) from HETL to each Assessment Hospital by September 2019.

Expand the State Ebola Plan to include other emerging Special Pathogens and apply Assessment Hospital and Treatment Hospital functions across all Special Pathogens.

Add: NETEC now has a Ebola frontline hospital training program – explore ability to host this training in Maine.

# State Plan - **DRAFT**

<b>ANALYZE data ...</b>
<b>From Healthcare-associated infections (HAIs).</b>
Annually, analyze existing data sources to... <ul style="list-style-type: none"><li>• assess State progress; review HAI reporting mandates and PREVENT activities for desired changes.</li><li>• identify healthcare facilities with high rates of HAI.</li></ul>
Analyze data from new State HAI mandates and determine if PREVENT activities are needed for: <ul style="list-style-type: none"><li>• LTC: CDI (reporting begins: July 1, 2020)</li><li>• Hospitals: Total Hips and Total Knees (reporting begins: January 1, 2020)</li></ul>
<b>From Antibiotic use and resistance.</b>
Acquire AR-related data from the State's All Payer Claims Data. (A collaboration with Maine Quality Forum [MQF]).
Analyze Milliman Insight® data pull on select HAI and/or AR related diagnosis.
Analyze IQVIA data pull, which will provide the Healthcare Epidemiology Program with the top 10% of prescribers in Maine [data available for use for one year].
<b>To ensure data quality.</b>
Conduct data validation of NHSN data required under federal and/or state HAI reporting mandate.



# State Plan - DRAFT

<b>PREVENT ...</b>
<b>High rates of HAIs through evidence-based strategies and collaboratives.</b>
Promote the use of federal CDC's Targeted Assessment for Prevention (TAP) strategy for hospitals with high rates of HAI.
Develop a strategy to address Maine's higher than national average UTI rate in Long Term Care, based on Minimum Data Set (MDS) data. (A possible collaborative with QIN-QIO)
Promote on-site Infection Control Assessment visits, by the Healthcare Epidemiology Program, to healthcare facilities with high rates of HAIs, clusters/outbreaks, or admissions of emerging MDROs.
<b>High rates of antibiotic use and resistance through Antimicrobial Stewardship.</b>
Increase Hospital and Nursing Home compliance with meeting all seven of federal CDC's Core Elements of Antimicrobial Stewardship Programs.
Develop a strategy for the use of AR-related data from the one-time data pull from Milliman Insight®.
Develop a strategy for the use of AR-related data from IQVIA, which will provide the Healthcare Epidemiology Program with the top 10% of prescribers in Maine [data available for use for one year].
Develop a strategy for trending of data available via the State Antibigram.

# State Plan - DRAFT

## PREVENT ...

### **HAI and AR through professional development and public education.**

Maintain and grow the Maine Infection Prevention Forum for Extended Care Facilities.  
(A collaborative with Maine Quality Forum [MQF]).

Address Infection Control and Prevention requirements to prevent, identify, report, investigate, and control infections and communicable diseases with leadership of Long-Term Care facilities at the MHCA Fall Conference.  
(A collaboration with Maine Healthcare Association [MHCA]).


Provide hospital Infection Preventionists with annual education on emerging MDROs.

Provide annual education to Infection Preventions in hospitals and nursing homes regarding cluster/outbreak identification, reporting, and public health response.

Offer Nursing Homes education and training on a standardized HAI surveillance methodology, based on *McGeer Criteria for Long Term Care Surveillance Definitions for Infections*.  
(A collaboration with Maine Healthcare Association [MHCA]).

Launch a social media public education campaign on HAI and AR awareness.

# Break



"We will be more successful in all our endeavors if we can let go of the habit of running all the time, and take little pauses to relax and re-center ourselves. And we'll also have a lot more joy in living." ~Thich Nhat Hanh

[anempoweredspirit.com](http://anempoweredspirit.com)

# Antibiotic Use/Resistance Data



DATA



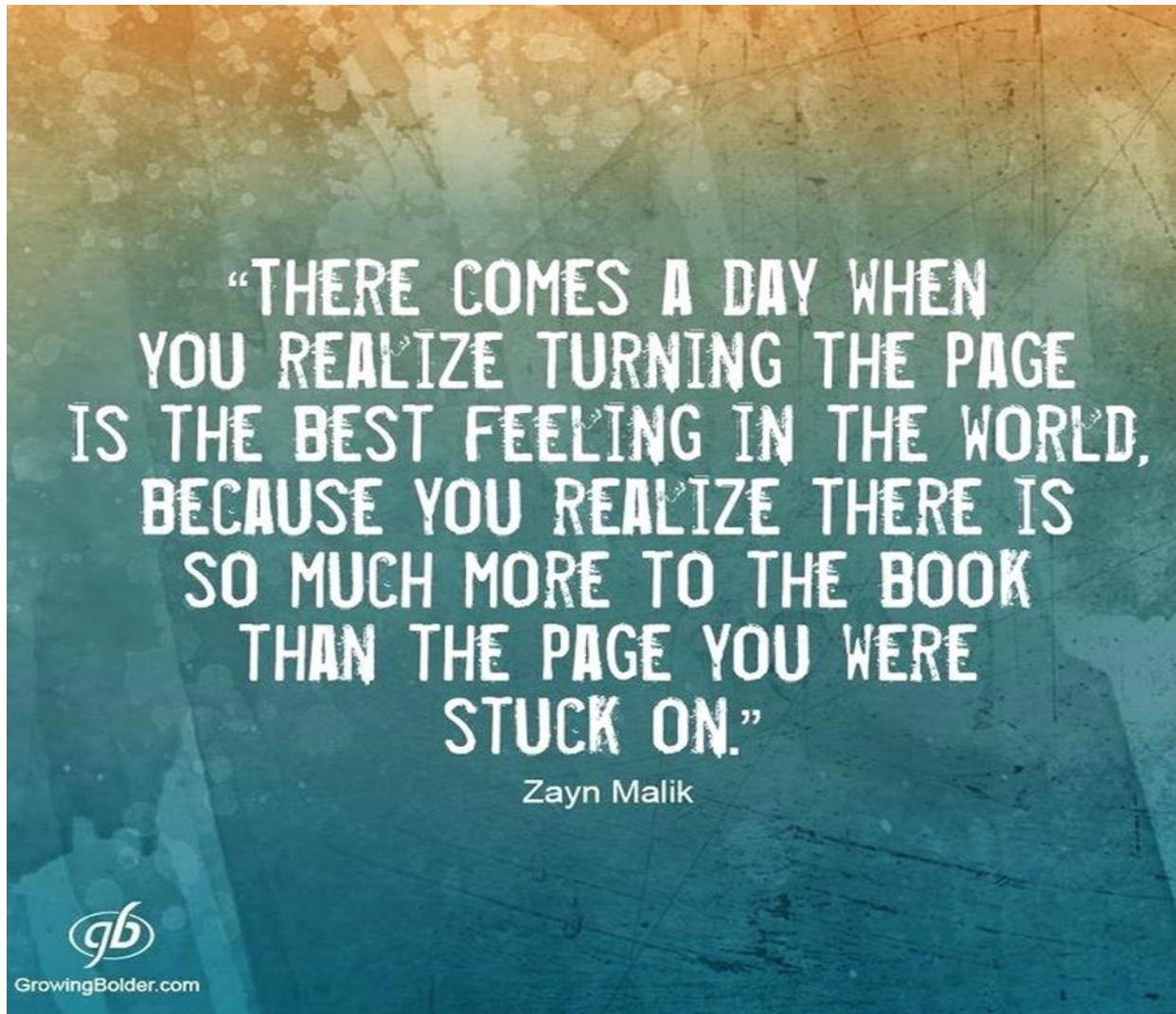
KNOWLEDGE



ACTION

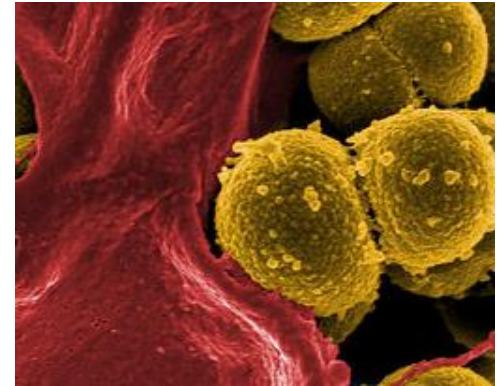
<https://www.data.gov>

# Antibiogram



# Antibiogram

- Antimicrobial Resistance: An ever-increasing public health problem
- U.S. healthcare-associated infections
  - 2 million people infected each year with antibiotic resistant bacteria
  - At least 23,000 people die as a result
- *Staphylococcus aureus*
  - 95% of MRSA worldwide do not respond to first line antibiotics



[https://live.staticflickr.com/8474/8436193898\\_c910433c60\\_b.jpg](https://live.staticflickr.com/8474/8436193898_c910433c60_b.jpg)

Source: CDC 2019 Antimicrobial Resistance in Healthcare Setting Fact Sheet

Kaur DC, Chate SS. Study of Antibiotic Resistance Pattern in Methicillin Resistant Staphylococcus Aureus with Special Reference to Newer Antibiotic. *J Glob Infect Dis.* 2015;7(2):78–84. doi:10.4103/0974-777X.157245

# Antibiogram

What is an local antibiogram?

- An overall profile of antimicrobial susceptibility testing results of a specific microorganism to a collection of antimicrobial agents routinely tested and used, usually specific to one facility

What is a state antibiogram?

- A cumulative aggregation of all local antibiograms

# Antibiogram

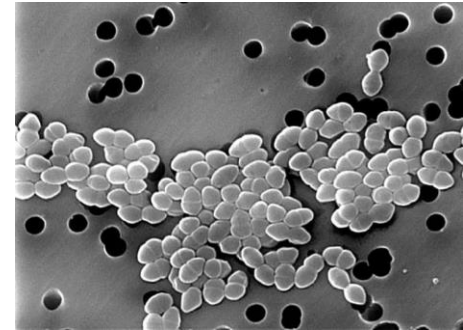
- How is a state antibiogram used?
  - Allows for dissemination and sharing of prevailing resistance patterns
  - May offer a sense of the magnitude of resistance of a given drug
  - Intended to encourage coordinated statewide stewardship in an effort to prevent antibiotic resistance to a given drug
  - Compare local to state antibiogram to inform stewardship efforts



# Antibiogram

## Examples of other uses:

- Tracking precious drugs over time; e.g. Reserve List – last resort (WHO)
- Out-of-country practitioners can access the state antibiogram when treating potential infected patients with acquired infection originating from Maine.
- Guide antimicrobial resistance prevention strategies
- Develop educational campaigns



Vancomycin-resistant Enterococcus. Photo Credit: Janice Haney Carr Content Providers: CDC.

- Note: A state antibiogram should not be used to guide empiric therapy for individual patients undergoing treatment, health professionals should access their local antibiogram first

Source: (World Health Organization (WHO) Model List of Essential Medicines 20<sup>th</sup> list, March 2017)

# Antibiogram

## Methodology:

- Antibiograms were collected from hospitals as well as Northern Lights Lab and NorDx, all 32 in state
- Bug/drug combinations were selected based on what everybody reported across most all facilities
- The year in review is 2018 Jan 1- Dec 31
- < 30 isolates eliminated per CLSI guidelines
- Some isolate counts < 30 from smaller facilities were pool to give us a statewide view of susceptibility
- Stats on all drug/bug combinations run, with overall % susceptibility for the state antibiogram

Source: CLSI. *Performance Standards for Antimicrobial Susceptibility Testing*. 29th ed. CLSI supplement M100. Wayne, PA: Clinical and Laboratory Standards Institute; 2019

CLSI. *Analysis and Presentation of Cumulative Antimicrobial Susceptibility Test Data; Approved Guideline-Fourth Edition*. CLSI document M39-A4. Wayne, PA: Clinical and Laboratory Standards Institute; 2014

# Antibiogram

## 2018 Antibiogram, State of Maine Gram Negative

Gram-Negative Organisms 2018 Data % Susceptible (Isolates)	Ampicillin	Ampicillin/Sulbactam	Piperacillin/Tazobactam	Cefazolin 1 <sup>st</sup> Generation	Cefuroxime 2 <sup>nd</sup> Generation	Ceftriaxone 3 <sup>rd</sup> Generation	Cefipime 4 <sup>th</sup> Generation	Ciprofloxacin	Levofloxacin	Gentamicin	Tobramycin	Trimethoprim/Sulfamethoxazole	Meropenem	Aztreonam	Nitrofurantoin
	AM	A/S	PIP/TAZ	CFZ	CRM	CAX	CPE	CP	LVX	GM	TO	T/S	MEM	AZM	FD
<i>Escherichia coli</i>	<b>65%</b>	<b>71%</b>	<b>98%</b>	<b>88%</b>	<b>92%</b>	<b>95%</b>	<b>97%</b>	<b>86%</b>	<b>87%</b>	<b>95%</b>	<b>95%</b>	<b>85%</b>	<b>100%</b>	<b>96%</b>	<b>98%</b>
	26076	26915	26600	26055	11612	26918	26915	15988	26914	26919	24037	26614	24132	14852	14880
<i>Klebsiella pneumoniae</i>	<b>0%</b>	<b>83%</b>	<b>97%</b>	<b>89%</b>	<b>89%</b>	<b>94%</b>	<b>95%</b>	<b>94%</b>	<b>97%</b>	<b>96%</b>	<b>96%</b>	<b>89%</b>	<b>100%</b>	<b>94%</b>	<b>58%</b>
	0	4613	2396	4502	1978	4429	4613	2604	4602	4613	5332	4568	3836	2487	4184
<i>Enterobacter spp.</i>	<b>R</b>	<b>R</b>	<b>86%</b>	<b>R</b>		<b>81%</b>	<b>94%</b>	<b>96%</b>	<b>97%</b>	<b>98%</b>	<b>98%</b>	<b>93%</b>	<b>100%</b>		<b>76%</b>
			574			574	574	574	574	574	574	574	574		559
<i>Serratia marcescens</i>	<b>R</b>	<b>R</b>	<b>97%</b>	<b>R</b>	<b>R</b>	<b>95%</b>	<b>98%</b>	<b>96%</b>	<b>99%</b>	<b>99%</b>	<b>86%</b>	<b>99%</b>	<b>99%</b>	<b>98%</b>	<b>R</b>
			490			490	490	217	490	490	435	217	490	272	
<i>Proteus mirabilis</i>	<b>84%</b>	<b>91%</b>	<b>99%</b>	<b>44%</b>	<b>98%</b>	<b>99%</b>	<b>100%</b>	<b>78%</b>	<b>83%</b>	<b>95%</b>	<b>95%</b>	<b>85%</b>	<b>99%</b>	<b>99%</b>	
	1935	2019	1269	1981	895	1896	1269	1090	2019	2019	1999	1298	849	1139	
<i>Citrobacter freundii</i>	<b>R</b>	<b>R</b>	<b>87%</b>	<b>R</b>	<b>R</b>	<b>83%</b>	<b>97%</b>	<b>95%</b>	<b>95%</b>	<b>0%</b>	<b>97%</b>	<b>88%</b>	<b>100%</b>	<b>89%</b>	<b>96%</b>
			664			664	664	356	664	664	664	664	604	308	631
<i>P. aeruginosa</i>	<b>R</b>	<b>R</b>	<b>91%</b>		<b>R</b>		<b>93%</b>	<b>83%</b>	<b>82%</b>	<b>94%</b>	<b>98%</b>		<b>91%</b>	<b>81%</b>	
			2158				2171	1165	2042	2166	2041		1987	1985	

Blank Cell: No isolates tested against agent

R: Intrinsic resistance accepted, or poor efficacy

# Antibiogram

## 2018 Antibiogram, State of Maine Gram-Positive

Gram-Positive 2018 Data % Susceptible (Isolates)	Penicillin			Ceftriaxone 1 <sup>st</sup> Generation Cephalosporin	Tetracycline	Levofloxacin	Gentamicin	Vancomycin	Trimethoprim/Sulfamethoxazole	Linezolid	Daptomycin
	Penicillin	Ampicillin	Oxacillin								
	P	AM	OX								
<i>Staphylococcus aureus</i> (MSSA)	R	R	96%	100%	93%	93%	99%	100%	98%	100%	100%
			6413	1006	6930	4510	4510	4694	6929	6867	6351
<i>Staphylococcus aureus</i> (MRSA)	R	R	0%	0%	95%	51%	97%	98%	94%	100%	100%
			2780	496	3082	1433	1836	3082	3082	2796	2744
<i>Staphylococcus sp.</i> (coagulase neg.)	48%	R	60%	79%	96%	73%	91%	100%	82%	100%	100%
	56		2218	232	2227	564	1564	2653	1182	2246	2490
<i>Enterococcus faecalis</i>	100%	99%	R	R	20%	84%	82%	99%	R	100%	99%
	595	2458			1838	1592	239	2536		2450	2278
<i>Enterococcus faecium</i>		21%	R	R	21%	18%	88%	94%	R	100%	94%
		291			1401	153	115	1895		1895	261
<i>Streptococcus pneumonia</i>	84%			97%	83%	99%	R	100%	83%	100%	
	915			948	578	575		450	405	323	

Blank Cell: No isolates tested against agent

R: Intrinsic resistance accepted, or poor efficacy

# Antibiogram

## Broad Spectrum Antibiotics

Gram-Negative Organisms 2018 Data % Susceptible (Isolates)	Ampicillin	Levofloxacin	Gentamicin	Trimethoprim/Sulfamethoxazole
	AM	LVX	GM	T/S
	<i>Escherichia coli</i>	65%	87%	95%
	26076	26914	26919	26614
<i>Klebsiella pneumoniae</i>	0%	97%	96%	89%
	0	4602	4613	4568
<i>Enterobacter spp.</i>	R	97%	98%	93%
		574	574	574
<i>Serratia marcescens</i>	R	99%	99%	99%
		490	490	217
<i>Proteus mirabilis</i>	84%	83%	95%	85%
	1935	2019	2019	1298
<i>Citrobacter freundii</i>	R	95%	0%	88%
		664	664	664
<i>P. aeruginosa</i>	R	82%	94%	
		2042	2166	

Gram-Positive 2018 Data % Susceptible (Isolates)	Ampicillin	Ceftriaxone 1 <sup>st</sup> Generation Cephalosporin	Levofloxacin	Gentamicin	Trimethoprim/Sulfamethoxazole
	AM	CAX	LVX	GM	T/S
<i>Staphylococcus aureus</i> (MSSA)	R	100%	93%	99%	98%
		1006	4510	4510	6929
<i>Staphylococcus aureus</i> (MRSA)	R	0%	51%	97%	94%
		496	1433	1836	3082
<i>Staphylococcus sp.</i> (coagulase neg.)	R	79%	73%	91%	82%
		232	564	1564	1182
<i>Enterococcus faecalis</i>	99%	R	84%	82%	R
	2458		1592	239	
<i>Enterococcus faecium</i>	21%	R	18%	88%	R
	291		153	115	
<i>Streptococcus pneumoniae</i>		97%	99%	R	83%
		948	575		405

# Antibiogram

- Isolates tested against broad spectrum antibiotics show decrease in susceptibility
  - AMS activities around broad spectrum antibiotics
  - Reasons for decrease?

Source: (World Health Organization (WHO) Model List of Essential Medicines 20<sup>th</sup> list, March 2017)

# Antibiogram

Precious Drugs: This group includes antibiotics that should be treated as “last resort” options, accessible, but whose use should be tailored to highly specific patients and settings, when all alternatives have failed (e.g., serious, life-threatening infections due to multi-drug resistant bacteria).

## Precious drugs (WHO) Reserve list:

- Aztreonam
- 4<sup>th</sup> generation cephalosporins
- 5<sup>th</sup> generation cephalosporins
- Polymyxins
- Daptomycin
- Linezolid

Source: (World Health Organization (WHO) Model List of Essential Medicines 20<sup>th</sup> list, March 2017)

# Antibiogram

## Precious Drugs – Reserve List

Gram-Negative Organisms 2018 Data % Susceptible (Isolates)	Cefipime 4 <sup>th</sup> Generation	Aztreonam
	CPE	AZM
<i>Escherichia coli</i>	<b>97%</b>	<b>96%</b>
	26915	14852
<i>Klebsiella pneumoniae</i>	<b>95%</b>	<b>94%</b>
	4613	2487
<i>Enterobacter spp.</i>	<b>94%</b>	
	574	
<i>Serratia marcescens</i>	<b>98%</b>	<b>98%</b>
	490	272
<i>Proteus mirabilis</i>	<b>100%</b>	<b>99%</b>
	1269	1139
<i>Citrobacter freundii</i>	<b>97%</b>	<b>89%</b>
	664	308
<i>P. aeruginosa</i>	<b>93%</b>	<b>81%</b>
	2171	1985

Gram-Positive 2018 Data % Susceptible (Isolates)	Linezolid	Daptomycin
	LNZ	DAP
<i>Staphylococcus aureus</i> (MSSA)	<b>100%</b>	<b>100%</b>
	6867	6351
<i>Staphylococcus aureus</i> (MRSA)	<b>100%</b>	<b>100%</b>
	2796	2744
<i>Staphylococcus sp.</i> (coagulase neg.)	<b>100%</b>	<b>100%</b>
	2246	2490
<i>Enterococcus faecalis</i>	<b>100%</b>	<b>99%</b>
	2450	2278
<i>Enterococcus faecium</i>	<b>100%</b>	<b>94%</b>
	1895	261
<i>Streptococcus pneumoniae</i>	<b>100%</b>	
	323	



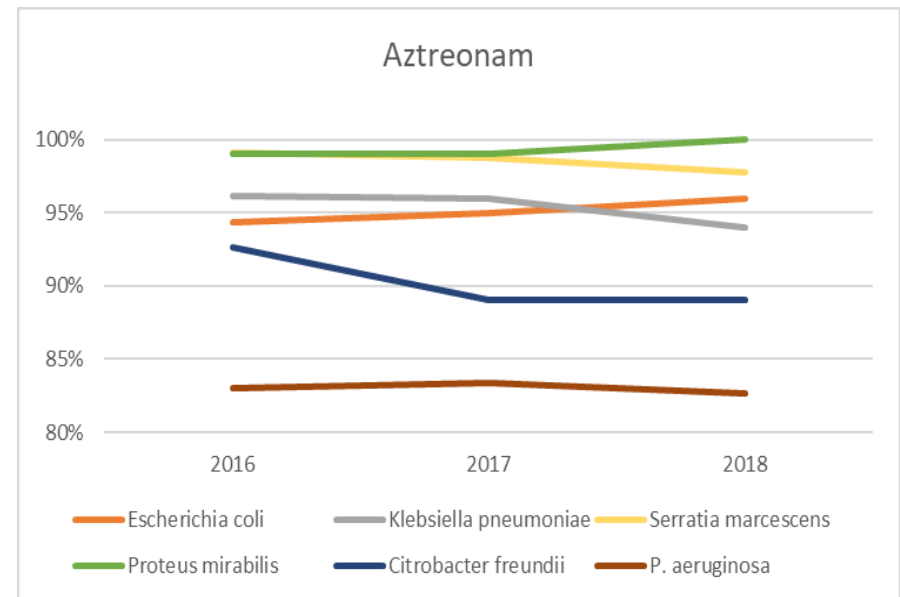
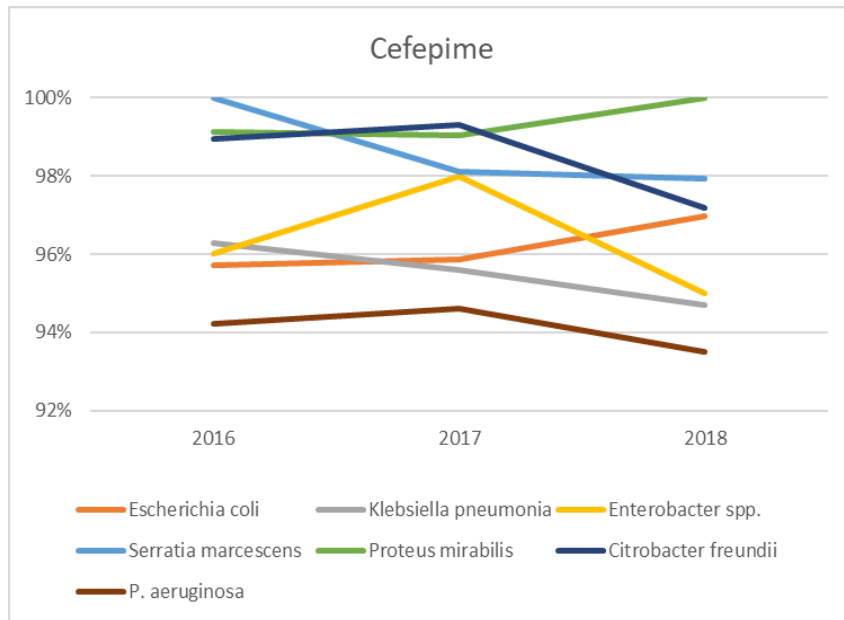
# Antibiogram

## Challenges

- Variation throughout facilities with formats and templates
- Isolate tally; limiting factor in reporting out bug/drug combinations
- Urine vs. non-urine; couldn't separate out for final antibiogram
- Universal reporting

# Antibiogram

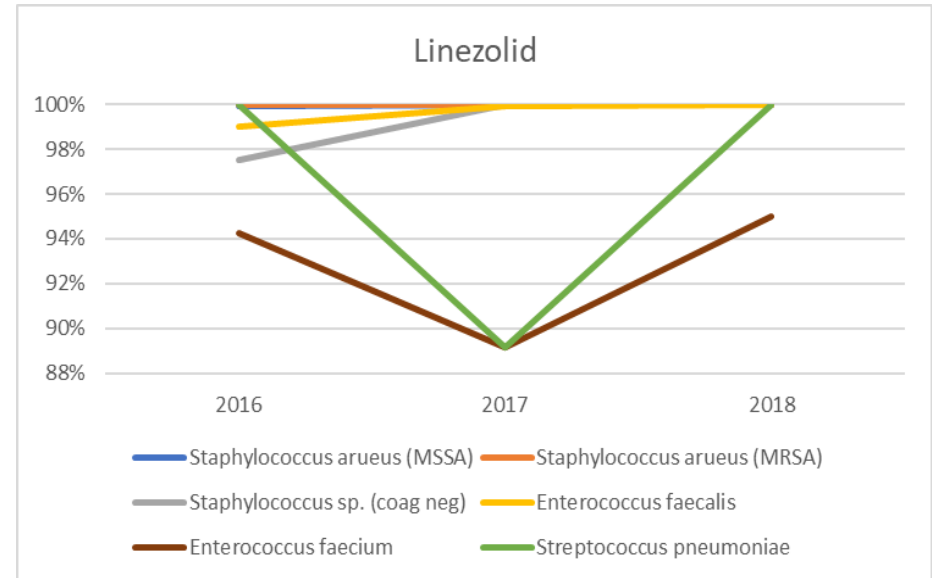
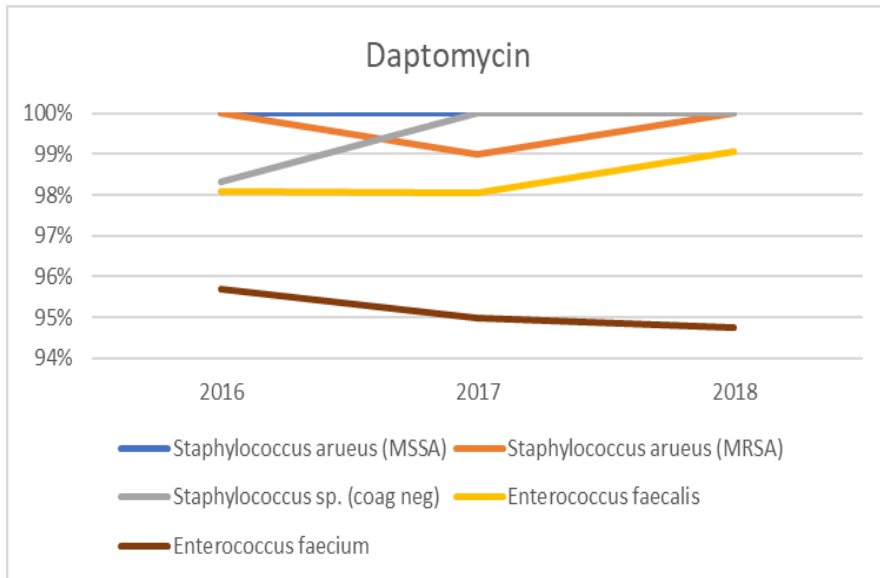
## Gram Negative Precious Drug Trending Data (Drugs Of Last Resort)



For demonstration only, data not inclusive of all facilities

# Antibiogram

## Gram Positive Precious Drug Trending Data (Drugs Of Last Resort)



For demonstration only, data not inclusive of all facilities

# AR Data Sources

(one time data sources)

## Milliman Insight

- An actuarial and consulting firm
- Working with MQF to provide AR use data for (at least)...
  - Adenoviral conjunctivitis
  - Uncomplicated acute tympanostomy tube otorrhea
  - Acute upper respiratory and ear infections
- One time courtesy data pull of all payer claims data

## IQVIA

- A health information technology company.
- Working with federal CDC to provide state-specific data on the top 10% of prescribers to each state.
- Data available for 12 months, then must return it.

# Closing Tasks

- Public Comments
- Meeting Evaluation
- Next Meeting/Parking Lot
  - State Plan
- Adjournment

# Questions?

**Rita Owsiak MS, MT(ASCP), CIC  
HAI Coordinator, Maine CDC**

**Phone: 207-287-6028**

**Email: [rita.Owsiak@maine.gov](mailto:rita.Owsiak@maine.gov)**

