HAI/AR Prevention in Illinois - Updates

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Disclaimers

• No conflict of interest to report

• The IDPH HAI/AR Prevention Program is supported with ELC cooperative agreement funds from the Centers for Disease Control and Prevention (CDC)
Objectives

• Review state-specific antimicrobial prescribing and resistance data
• List priorities from the *Illinois Action Plan to Prevent Healthcare Associated Infections and Antimicrobial Resistance*
• Discuss state-specific initiatives to promote and track antibiotic stewardship
Pretest Question 1

• True or False: In 2015, the number of people treated in Illinois hospitals with *Clostridium difficile* infection would be more than the capacity of the large outdoor concert venue at Millennium Park in downtown Chicago.
Pretest Question 2

Which of the following are priorities of the Illinois Action Plan to Prevent Healthcare Associated Infections and Antimicrobial Resistance?

A) Infection Prevention Infrastructure, Standards, and Practices
B) Assessment/Treatment/Outbreak
C) Antimicrobial Stewardship
D) Multi-Drug Resistant Organisms
E) All of the above.
National Healthcare Safety Network (NHSN)

Clostridium difficile

Trend of NHSN CDI SIR, Illinois Acute Care Hospitals 2012-2015

<table>
<thead>
<tr>
<th>Reporting Year</th>
<th># of Facilities Reported</th>
<th>Number of CDIs</th>
<th>Standardized Infection Ratio (SIR)</th>
<th>95% Confidence Interval (SIR)</th>
<th>Statistical Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>179</td>
<td>4620 (Observed) 4994.79 (Predicted)</td>
<td>0.925</td>
<td>0.899 - 0.952</td>
<td>Lower</td>
</tr>
<tr>
<td>2013</td>
<td>183</td>
<td>4466 (Observed) 4939.25 (Predicted)</td>
<td>0.904</td>
<td>0.878 - 0.931</td>
<td>Lower</td>
</tr>
<tr>
<td>2014</td>
<td>183</td>
<td>4640 (Observed) 4661.34 (Predicted)</td>
<td>0.995</td>
<td>0.967 - 1.024</td>
<td>Similar</td>
</tr>
<tr>
<td>* 2015</td>
<td>183</td>
<td>4355 (Observed) 4538.26 (Predicted)</td>
<td>0.960</td>
<td>0.931 - 0.988</td>
<td>Lower</td>
</tr>
</tbody>
</table>

*2015 data is preliminary
National Healthcare Safety Network (NHSN)

*Clostridium difficile*

Another way to look at these data...

- Recent antibiotic exposure is a primary risk factor for CDI
- A substantial proportion of antibiotic exposures (e.g., prescriptions) are unnecessary
- In 2015, IL hospitals reported 15,476 cases of CDI to NHSN
- Half of these (7,711) were designated as community onset cases
- There are likely more community CDI cases not captured by NHSN
The Chicago Symphony Orchestra looks out at a capacity crowd during a 2012 concert, c. Todd Rosenberg (98.7wfmt)

Pritzker Pavillion at Millennium Park has a capacity of 11,000 (4,000 seats; 7,000 lawn)
National Healthcare Safety Network (NHSN) Prescribing Data - Illinois

• NHSN Antibiotic Use (AU) module
  – 12 (of 183) acute care hospitals in IL are reporting

• NHSN facility survey
  – Only 44% of hospitals have all seven core elements of antimicrobial stewardship in place
Extensively Drug Resistant Organism Registry: CRE reported in Illinois (as of June 6, 2016)

- Number of patients (unique cases): 2745
- Number of reports ever reported: 4308
Antibiotic Resistance Patient Safety Atlas from CDC

• Geospatial representation of AR data from device and procedure related HAIs reported to NHSN (CLABSI, CAUTI, SSI) by ACHs, LTACHs, and IRFs
• 31 resistant phenotypes (bug-drug combinations)
• Not a national estimate of burden of these infections (only HAIs captured by NHSN)
### Carbapenem-Resistant Enterobacteriaceae spp. | All HAIs | Combined Years (2011-2014)

#### National % Resistance

<table>
<thead>
<tr>
<th>Year</th>
<th>National % Resistant</th>
<th>Lower 95%</th>
<th>Upper 95%</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>4.3</td>
<td>3.9</td>
<td>4.6</td>
</tr>
<tr>
<td>2012</td>
<td>3.2</td>
<td>2.8</td>
<td>3.3</td>
</tr>
<tr>
<td>2013</td>
<td>3.9</td>
<td>3.6</td>
<td>4.1</td>
</tr>
<tr>
<td>2014</td>
<td>3.2</td>
<td>2.9</td>
<td>3.4</td>
</tr>
</tbody>
</table>

#### Additional Resources
- Learn about Atlas terms and abbreviations in the [Data Dictionary](#).
- Read how resistance is threatening future use of the powerful drugs listed above.
- See more information on these bug-drug profiles in the [phenotype definitions document](#).
- Find answers in the [Frequently Asked Questions document](#).

#### About this Pathogen
- The three most common types of Enterobacteriaceae causing healthcare associated infections include *Enterobacter* spp., *Klebsiella* spp., and *E. coli*.
- These bacteria cause pneumonia, urinary tract infections, and bloodstream infections in patients. Collectively, Enterobacteriaceae spp. are the most common group of pathogens causing healthcare e-associated infections.
- Emerging resistance to carbapenems makes treating these resistant infections very difficult.
- Threat level: Urgent. Find more information on carbapenem-resistant Enterobacteriaceae in the AR Threat Report.
- Read more about this bug-drug profile in the [Phenotype Definitions document](#).
Illinois vs. National

Carbapenem-Resistant *Enterobacteriaceae* spp. | All HAIs | Combined Years (2011-2014)

Illinois
- 3.6% resistant
- Click for more information

National
- 3.5% resistant

Resistance Over Time

Year | IL %Resistant | IL Lower/95% | IL Upper/95% | National %Resistant | National Lower/95% | National Upper/95%
--- | --- | --- | --- | --- | --- | ---
2011 | 3.5 | 1.7 | 6.3 | 4.3 | 4.1 | 4.6
2012 | 2.3 | 1.4 | 3.6 | 3.2 | 2.9 | 3.3
2013 | 4.7 | 3.4 | 6.2 | 3.9 | 3.6 | 4.1
2014 | 3.8 | 2.6 | 5.2 | 3.2 | 2.9 | 3.4

Resistance by Event Type

<table>
<thead>
<tr>
<th>Event Type</th>
<th>State value</th>
<th>National value</th>
<th>Age Group</th>
<th>State value</th>
<th>National value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAUTI</td>
<td>3.5</td>
<td>1.7</td>
<td>LT</td>
<td>14</td>
<td>1.3</td>
</tr>
<tr>
<td>CLABSI</td>
<td>1.4</td>
<td>1.6</td>
<td>1.5-4</td>
<td>1.5</td>
<td>1.9</td>
</tr>
<tr>
<td>SSIs</td>
<td>1.5</td>
<td>1.4</td>
<td>10-94</td>
<td>3.3</td>
<td>3.3</td>
</tr>
<tr>
<td>All HAIs</td>
<td>3.6</td>
<td>3.0</td>
<td>65+</td>
<td>4.2</td>
<td>4.1</td>
</tr>
</tbody>
</table>

Additional Resources
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- See more information on these bug-drug profiles in the [phenotype definitions document](#).
- Find answers in the [Frequently Asked Questions document](#).
Illinois vs. National

MDR Acinetobacter spp. | All HAIs | Combined Years (2011-2014)

Illinois
- 76.2% Resistant
- Click for more information

National
- 54.8% Resistant
- 2011 Number Resistant: 122
- 2010 Number Tested: 366

Illinois % Resistance
- Resistance Over Time
- Include National Average

Data Resources
- Export state specific data in CSV
- Export state specific data in Excel
- Export National data in CSV
- Export National data in Excel

Additional Resources
- Learn about Atlas terms and abbreviations in the Data Dictionary [PDF]
- Read how resistance is threatening future use of the powerful drugs listed above
- See more information on these bug drug profiles in the phenotype definitions document [PDF]
- Find answers in the Frequently Asked Questions document [PDF]
Illinois Action Plan to Prevent Healthcare Associated Infections and Antimicrobial Resistance

Priorities:
• Infection Prevention Infrastructure, Standards, and Practices
• Assessment/Treatment/Outbreak
• Antimicrobial Stewardship
• Multi-Drug Resistant Organisms

Key Strategies
• Education & Training
• Policy Development
• Data/Surveillance
• Communication
Illinois Action Plan to Prevent Healthcare Associated Infections and Antimicrobial Resistance

Priorities:

• Infection Prevention Infrastructure, Standards, and Practices
  – Goal #1: Illinois will implement a comprehensive and effective infection prevention and control system with standards, policies, and practices in place for all healthcare settings.

• Assessment/Treatment/Outbreak
  – Goal #2: Improve detection, investigation and response to infectious outbreaks including community and healthcare associated infections (HAI) and antimicrobial resistant (AR) organisms.

• Antimicrobial Stewardship
  – Goal #3: Improve antimicrobial prescribing practices across all healthcare settings.
  – Goal #4: Raise public awareness about antibiotic use and misuse.

• Multi-Drug Resistant Organisms
  – Goal #5: Slow the emergence of resistant bacteria and Clostridium difficile, and prevent their transmission.
## Data for Action


**Hospital A, City A, County A**

Here is your facility’s Healthcare Associated Infection Surveillance Report, produced by the Illinois Department of Public Health. Provide feedback by email to: dph.dpsq@illinois.gov.

### Legend

| Fewer infections (BETTER) than predicted based on the state experience. | = | About the same number of infections (SAME) as predicted based on the state experience | More infections (WORSE) than predicted based on the state experience. | No Conclusion | When the number of predicted infections is less than 1, no conclusion can be made. | Congratulations on achieving ZERO infections! |
|---|---|---|---|---|---|

### Healthcare-Associated Infections (HAI) Summary by Infection Type, 01/01/2014 - 12/31/2014

<table>
<thead>
<tr>
<th>NHSN HAI</th>
<th>Description</th>
<th>Device Days, # of Procedures, or Patient Days</th>
<th>Infections</th>
<th>Standardized Infection Ratio (SIR)</th>
<th>Facility SIR Compared to State SIR</th>
<th>Interpretation (Facility SIR Compared to State SIR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLABSI</td>
<td>Adult ICU</td>
<td>10017</td>
<td>Observed: 2, Predicted: 19.35</td>
<td>Facility SIR: 0.10, State SIR: 0.46</td>
<td>Facility SIR/State SIR: 0.22, 95% CI (Ratio): (0.087, 0.947)</td>
<td>★ BETTER</td>
</tr>
<tr>
<td>LABID</td>
<td>MRSA Bacteremia</td>
<td>215343</td>
<td>Observed: 9, Predicted: 17.43</td>
<td>Facility SIR: 0.52, State SIR: 0.71</td>
<td>Facility SIR/State SIR: 0.73, 95% CI (Ratio): (0.421, 1.509)</td>
<td>= SAME</td>
</tr>
<tr>
<td></td>
<td>C. difficile Infection</td>
<td>192502</td>
<td>Observed: 215, Predicted: 164.42</td>
<td>Facility SIR: 1.31, State SIR: 1.00</td>
<td>Facility SIR/State SIR: 1.31, 95% CI (Ratio): (1.153, 1.514)</td>
<td>✗ WORSE</td>
</tr>
<tr>
<td>SSI</td>
<td>Coronary Artery Bypass Surgery</td>
<td>324</td>
<td>Observed: 4, Predicted: 6.31</td>
<td>Facility SIR: 0.63, State SIR: 0.38</td>
<td>Facility SIR/State SIR: 1.66, 95% CI (Ratio): (0.782, 5.374)</td>
<td>= SAME</td>
</tr>
<tr>
<td></td>
<td>Knee Replacement Surgery</td>
<td>527</td>
<td>Observed: 4, Predicted: 5.68</td>
<td>Facility SIR: 0.70, State SIR: 0.47</td>
<td>Facility SIR/State SIR: 1.49, 95% CI (Ratio): (0.731, 4.672)</td>
<td>= SAME</td>
</tr>
</tbody>
</table>

NHSN Data generated 09/23/15
Data for Action

Infection preventionist staffing information

Number of patient beds in this facility: 500
Total number of FTE infection preventionists in this facility: 4

Number of FTE infection preventionists per 100 beds in this facility: 0.8 *

*Infection prevention staff is essential in reducing acquisition and transmission of infections during a hospital stay. The Delphi Project, published in 2002, suggested 0.8-1.0 IP FTEs per 100 occupied acute care beds. The IP's role has expanded significantly since this measure was developed, given increased external reporting mandates coupled with a more complex patient population and healthcare system. The Association for Professionals in Infection Control and Epidemiology (APIC) are expected to release new guidelines on IP staffing in acute care hospitals which will be included in future HAI Data for Action Reports.

Data for Action

• Reports sent to 182 hospitals: 152 completed follow-up survey

• 49 hospitals were prompted by the report to take action to reduce HAIs, including enhancing antimicrobial stewardship programs

• Future reports may summarize NHSN survey responses re core elements of stewardship
Initiatives to promote and track antibiotic stewardship & prevent antimicrobial resistance

- Expand reporting to NHSN Antibiotic Use and Resistance Modules
- Precious Drugs & Scary Bugs – outpatient campaign
- LTC pharmacy data on antibiotics via Prescription Monitoring Program (coming soon?)
- Catalyst for Antimicrobial Stewardship Improvement (CASI) Project

- IP Liaison Program – QI assessments & expert consultations - APIC Consulting & Chicago Dept of Health
- XDRO registry enhancements (e.g., auto alerts, ego network analysis)
Post-Test Question 1

- True or False: In 2015, the number of people treated in Illinois hospitals with *Clostridium difficile* infection would be more than the capacity of the large outdoor concert venue at Millennium Park in downtown Chicago.
Post-Test Question 2

• Which of the following are priorities of the Illinois Action Plan to Prevent Healthcare Associated Infections and Antimicrobial Resistance?

A) Infection Prevention Infrastructure, Standards, and Practices
B) Assessment/Treatment/Outbreak
C) Antimicrobial Stewardship
D) Multi-Drug Resistant Organisms
E) All of the above.
THANK YOU

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