

# Practice Makes Improvement: Catheter-Associated Urinary Tract Infection (CAUTI) Trends in Michigan

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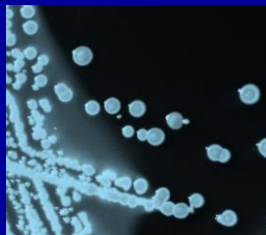
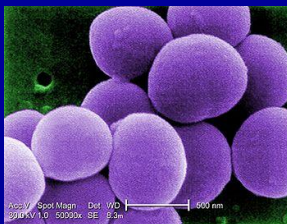
## Disclosures

- I have nothing to disclose

## Acronyms

- **MDCH** = Michigan Department of Community Health
- **SHARP** = Surveillance for Healthcare-Associated and Resistant Pathogens Unit
- **MHA** = Michigan Health and Hospital Association
- **SIR** = Standardized Infection Ratio  
(observed infections / expected infections)
- **DU Ratio** = Device Utilization Ratio  
(device days / patient days)

## Background

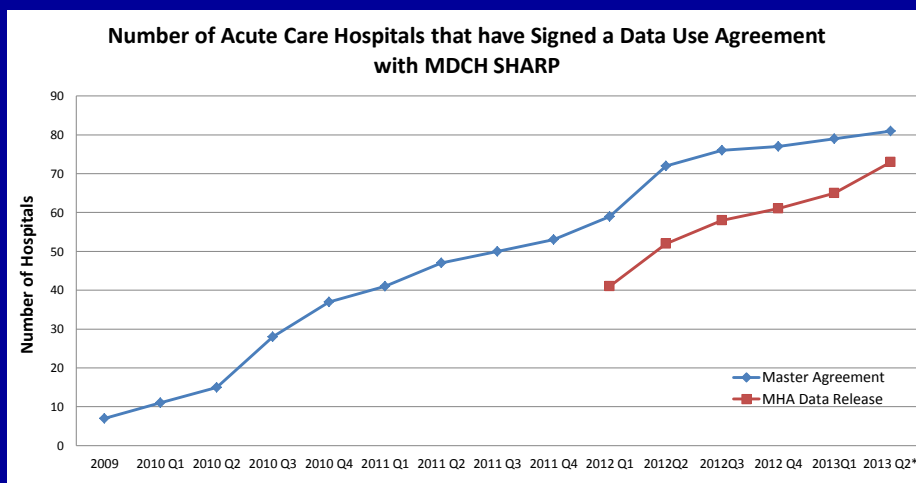


## Michigan Reporting Requirements

- Approximately 90 diseases or conditions are reportable in Michigan (required by Michigan law)
- HAI surveillance via NHSN is not mandated in Michigan
- Unusual occurrences, outbreaks, and epidemics of any disease or condition (including HAIs) are reportable

## National Healthcare Safety Network

- MDCH SHARP Unit receives voluntarily-reported HAI data from 81 Michigan hospitals via NHSN



## Michigan CAUTI History

- Historically, Michigan has reported low CAUTI standardized infection ratios (SIRs) and device utilization (DU) ratios
  - SHARP Surveillance Reports
    - 2011 Annual Report: SIR=0.638 (0.527, 0.766)
  - State SIR Reports provided by CDC
    - 2011: SIR=0.581 (0.490, 0.684)

## Why are Michigan CAUTI SIRs and DU Ratios so low?

- Longstanding CAUTI surveillance and prevention efforts
  - Efforts of the MHA Keystone Center for Patient Safety & Quality since 2007
    - Hospital Engagement Network (HEN) since 2011
  - SHARP Unit HAI Surveillance Initiative in place since 2009

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- A National Comparative study by Saint, et al. found that Michigan hospitals more frequently:
  - participated in collaboratives to reduce HAI and
  - used bladder scanners and catheter reminders or stop orders and/or nurse-initiated discontinuation of catheters

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## **The Problem**

- Michigan CAUTI SIRs and DU ratios began to increase dramatically in 2012

**Why did this happen???**

## Methods

- Aggregate SIRs and DU ratios using the NHSN analysis function were calculated:
  - Overall and Quarterly for 2011
  - Overall and Quarterly in 2012
- 25 hospitals shared CAUTI data with SHARP in 2011
- 73 hospitals shared CAUTI data with SHARP in 2012

## Methods – Stratification Variables

- Quarterly variables examined included:
  - Overall vs. original 25 participating hospitals
  - Hospitals sharing data with MHA Keystone through the SHARP Unit vs. non-sharing hospitals
  - ICU vs. Non-ICU within each of the above categories

## Results



## Variables of No Difference

- ICU vs. Non-ICU comparison was not significant
- MHA Keystone-participating hospitals showed the same trend as overall Michigan hospitals

## Significant Variable Comparison

- Overall (all participating hospitals) vs. original 25 participating hospitals

## Michigan CAUTI SIRs

	Group	Number of Hospitals	SIR	SIR P-Value	SIR 95% CI
<b>2011 Overall</b>	Overall	25	0.739	0.0002	0.618, 0.877
<b>2012 Quarter 1</b>	Overall	69	1.062	0.1998	0.924, 1.214
	Original 25	24	0.743	0.0339	0.526, 1.020
<b>2012 Quarter 2</b>	Overall	70	1.314**	0.0000, 0.0230**	1.156, 1.487
	Original 25	24	0.962	0.4353	0.702, 1.287
<b>2012 Quarter 3</b>	Overall	73	1.160	0.0127	1.019, 1.315
	Original 25	24	0.613	0.0025	0.414, 0.875
<b>2012 Quarter 4</b>	Overall	73	1.052	0.2247	0.923, 1.195
	Original 25	24	0.760	0.0449	0.540, 1.039

**Highlight**—Significantly fewer infections than expected based on p-value and confidence interval

**Highlight**—Significantly more infections than expected based on p-value and confidence interval

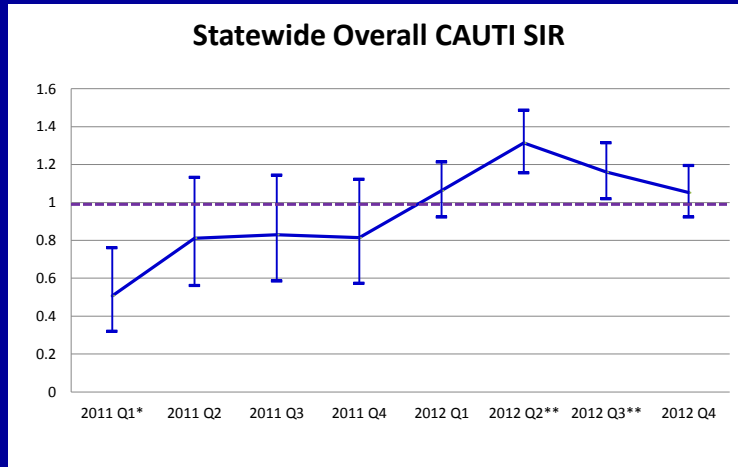
**Highlight**—Significantly different than expected based on p-value; not significant based on confidence interval

\*=Significantly more infections than previous quarter based on p-value

\*\*=Significantly fewer infections than previous quarter based on p-value

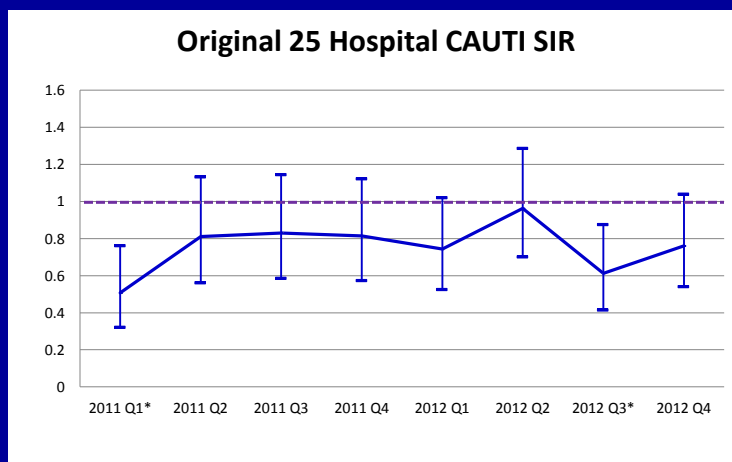


## Overall Michigan CAUTI SIR Trends



\*=Significantly fewer infections than expected based on p-value and confidence interval agreement  
 \*\*=Significantly more infections than expected based on p-value and confidence interval agreement

## Original 25 Hospitals CAUTI SIR Trends



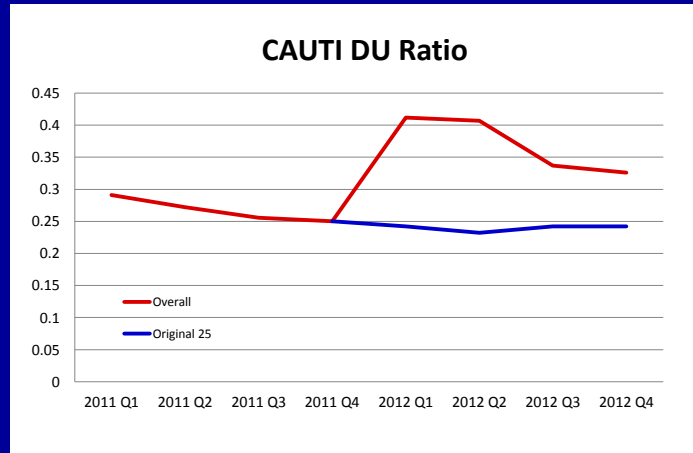
\*=Significantly fewer infections than expected based on p-value and confidence interval agreement  
 \*\*=Significantly more infections than expected based on p-value and confidence interval agreement

## Michigan CAUTI DU Ratios

	Group	Number of Hospitals	DU Ratio
<b>2011 Overall</b>	Overall	25	0.267
<b>2012 Quarter 1</b>	Overall	69	0.412**
	Original 25	24	0.242
<b>2012 Quarter 2</b>	Overall	70	0.407*
	Original 25	24	0.232
<b>2012 Quarter 3</b>	Overall	73	0.337*
	Original 25	24	0.242
<b>2012 Quarter 4</b>	Overall	73	0.326*
	Original 25	24	0.242

\*=Significantly less than previous quarter or year based on p-value  
 \*\*=Significantly greater than previous quarter or year based on p-value  
 Green box=Original 25 is significantly lower than corresponding overall DU Ratio

## Michigan CAUTI DU Ratio Trends



## Discussion

**DON'T BE NAUGHTY!  
PREVENT CAUTI!**

- Follow hospital policy on urinary catheter insertion, maintenance, and removal.
- Remove the catheter ASAP.
- Remember to document your actions!

Quality Improvement Organizations  
Sharing Knowledge. Improving Health Care.  
Creating the culture of continuous improvement.

IPRO

**Why** does your patient need that catheter?

Prevent Catheter-Associated Urinary Tract Infections.

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## Why were Michigan SIRs so low to begin with?

- MHA Keystone Work to reduce CAUTIs with *On the CUSP: Stop CAUTI*
  - Implemented in 2007 for 163 units in 71 hospitals
  - Implemented two bundles addressing:
    - Timely removal of non-essential catheters
    - Insertion of catheters

## Why weren't MHA Keystone hospitals significant?

- MHA Keystone-participating hospitals were included regardless of:
  - When they began sharing data
  - When they implemented bundles
  - Which units they focused on
- MHA Keystone Hospital Engagement Network (HEN) wasn't created until late 2011

## Why weren't ICU locations significant?

- The SIR is already risk-adjusted for location type
  - Therefore, expect no difference when comparing ICU to Non-ICU SIRs.

## What was different between 2011 and 2012?

- Addition of 48 hospitals in 2012 due to CMS mandate
  - Contributed to a dramatic increase in overall state SIR and DU ratio values
  - Acute care hospitals were now mandated to report CAUTI data

## Why did these hospitals make such an impact?

- We hypothesize that:
  - The 25-hospital subset included hospitals more familiar with reporting and prevention
    - Experience with CAUTI prevention led to the maintenance of low SIRs
    - Familiarity with CAUTI reporting leads to more accurate reporting techniques

## Conclusions

- The 25-hospital subset continued to demonstrate low SIRs and DU ratios
- By the end of 2012, the Overall CAUTI SIRs and DU Ratios had begun to decrease slightly
  - We will continue to monitor this trend

## Summary

- CAUTI prevention and surveillance initiatives can contribute to improvements in infection reduction over time
- Hospitals that sustain efforts to reduce catheter usage and prevent infections can maintain a lower-than-expected number of infections

## Next Steps

- Continue to monitor CAUTI surveillance data
- Determine 25-hospital subset prevention efforts prior to the CMS mandate
- Validate HAI reporting techniques at an individual hospital level

## Thank You!

Any Questions?

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