

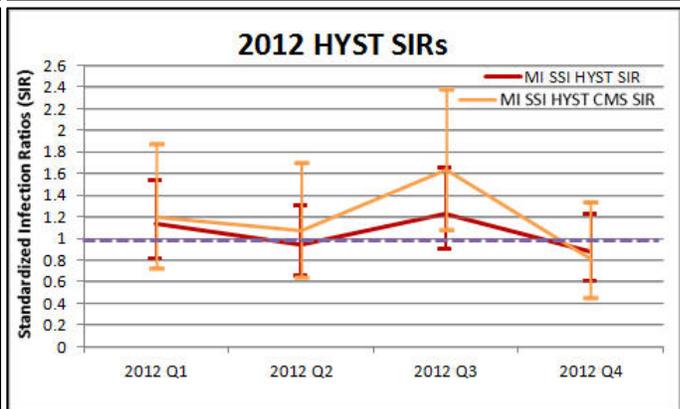
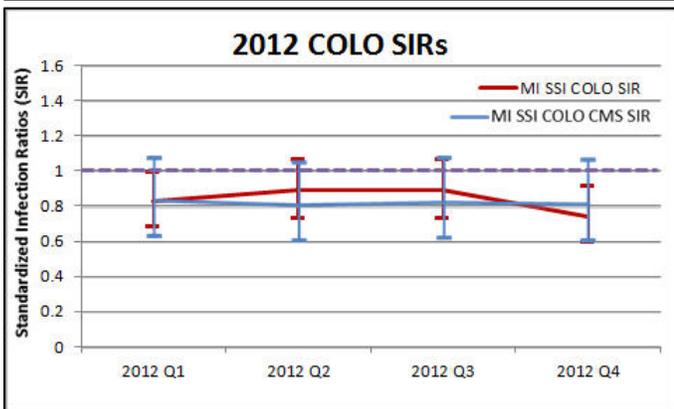
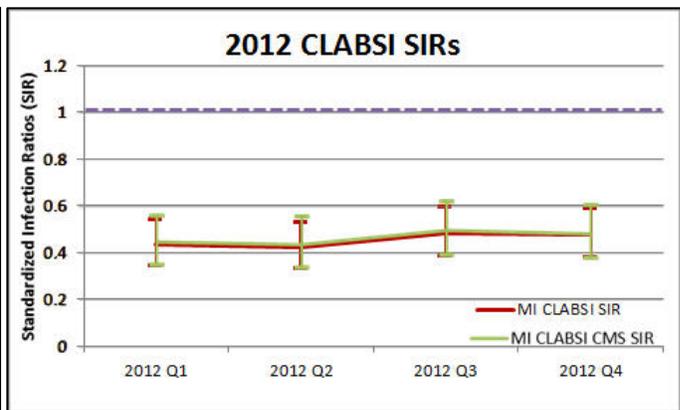
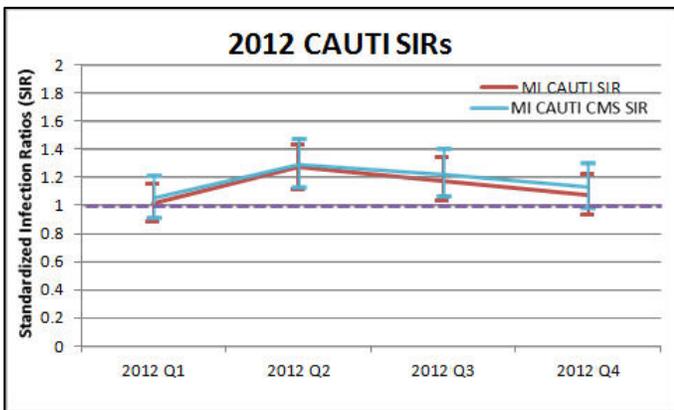


**Standardized Infection Ratios (SIRs) for NHSN Modules**  
**All Data and Centers for Medicare and Medicaid Services (CMS) Required Elements**  
**State of Michigan 2012**

Infection Type	MI Hosp <sup>1</sup>	MI Obs <sup>2</sup>	MI Pred <sup>3</sup>	MI SIR <sup>4</sup>	MI SIR p-value <sup>5</sup>	MI 95% CI <sup>6</sup>	MI CMS Hosp <sup>7</sup>	MI CMS Obs <sup>8</sup>	MI CMS Pred <sup>9</sup>	MI CMS SIR <sup>10</sup>	MI CMS SIR p-value <sup>11</sup>	MI CMS SIR 95% CI <sup>12</sup>
CAUTI <sup>13</sup>	78	933	825.503	1.130↑	0.0001	1.059, 1.205	73	835	710.061	1.176↑	0.0000	1.098, 1.259
CLABSI <sup>14</sup>	75	329	722.746	0.455↓	<0.0001	0.407, 0.507	73	293	628.482	0.466↓	0.0000	0.414, 0.523
SSI <sup>15</sup>	75	982	1053.79	0.932↓	0.0133	0.873, 0.993	-----	-----	-----	-----	-----	-----
SSI COLO <sup>16</sup>	73	430	513.209	0.838↓	0.0001	0.761, 0.921	74	222	269.815	0.823↓	0.0020	0.718, 0.938
SSI HYST <sup>17</sup>	70	155	148.979	1.040	0.3216	0.883, 1.218	75	79	67.410	1.172	0.0910	0.928, 1.461

**Michigan Data for CMS Reporting**

- <sup>1</sup>Total number of Michigan hospitals sharing data with the SHARP Unit for aggregate reporting.
- <sup>2</sup>Michigan Observed: Number of infections reported during the time frame overall for each module.
- <sup>3</sup>Michigan Predicted: The overall number of infections predicted based on the type of hospital unit(s) under surveillance.
- <sup>4</sup>Michigan SIR: Standardized Infection Ratio: Ratio of observed events compared to the number of predicted events, accounting for unit type or procedure. An SIR of 1 can be interpreted as having the same number of events that were predicted. An SIR that is between 0 and 1 represents **fewer** events than predicted, while an SIR of greater than 1 represents **more**. ↑: Michigan had significantly more infections than expected, ↓: Michigan had significantly fewer infections than expected.
- <sup>5</sup>P-value: An SIR p-value of <0.05 is considered significantly different than expected. It can show either significantly more infections (if the SIR is greater than 1 and the p-value is <0.05) or significantly fewer (if the SIR is less than 1 and the p-value is <0.05).
- <sup>6</sup>Michigan 95% CI: 95% confidence interval around the SIR estimate. A 95% CI indicates that 95% of the time, the actual SIR will fall within this interval.
- <sup>7</sup>Number of Michigan hospitals sharing data with the SHARP Unit that fulfills requirements set by the Center for Medicare and Medicaid Services (CMS).
- <sup>8</sup>MI CMS Observed: Number of infections reported during the time frame that meet CMS reporting requirements.
- <sup>9</sup>MI CMS Predicted: The number of infections predicted based on the type of hospital unit(s) under surveillance and including only data that meet CMS reporting requirements
- <sup>10</sup>Michigan CMS SIR: Standardized Infection Ratio including only data that meet CMS reporting requirements. ↑: Michigan's CMS SIR showed significantly more infections than expected, ↓: Michigan's CMS SIR showed significantly fewer infections than expected.
- <sup>11</sup>MI CMS SIR p-value: the SIR p-value indicating statistical significance in data that meet CMS reporting requirements.
- <sup>12</sup>MI CMS SIR 95% CI: 95% confidence interval indicating statistical significance in data that met CMS reporting requirements.
- <sup>13</sup>Catheter-Associated Urinary Tract Infection, <sup>14</sup>Central Line-Associated Blood Stream Infection, <sup>15</sup>Surgical Site Infection, <sup>16</sup>Colon Surgery, <sup>17</sup>Abdominal Hysterectomy



## ***2012 State of Michigan Data Highlights***

This report includes Michigan NHSN data for the 2012 calendar year. It demonstrates aggregate results from all data provided by Michigan hospitals to the MDCH SHARP Unit, as well as the subset of that data which are reported to the Centers for Medicare & Medicaid Services (CMS) to fulfill reporting requirements. All hospitals sharing data with the SHARP Unit will receive a corresponding individualized report (including non-acute care hospitals) comparing their hospital data to the CMS data shown in this report. Comprehensive Michigan Aggregate HAI Surveillance Reports can be found at [www.michigan.gov/hai](http://www.michigan.gov/hai).

### **Standardized Infection Ratios (SIRs) for NHSN Modules: All Data and CMS-Required Elements**

This table provides Standardized Infection Ratios (SIRs) for the four modules required by CMS in 2012, and displays both Michigan's **aggregate annual** and a subset of **CMS-required data**. Aggregate SIRs include data from all locations for the catheter-associated urinary tract infection (CAUTI) and central-line associated bloodstream infection (CLABSI) modules. CMS-required SIRs include adult, pediatric, and neonatal intensive care unit (ICU) data for CLABSIs and adult and pediatric ICU data for CAUTIs. Aggregate surgical site infection (SSI) SIRs include superficial, deep, and organ/space SSIs as well as those identified on admission, readmission, and via post-discharge surveillance. CMS SSIs include only deep incisional primary and organ/space SSIs with an event date within 30 days of the procedures and use only age and American Society of Anesthesiologists (ASA) score to determine risk for colon surgeries (COLO) and abdominal hysterectomies (HYST). Descriptions of terms used in the tables can be found in the table footnotes in the report.

Both the aggregate MI and CMS-required CAUTI SIRs showed that Michigan had significantly more CAUTI infections than expected. The MI SIR was 1.130 (95% Confidence Interval (CI): 1.059, 1.205), and the MI CMS SIR was 1.176 (95% CI: 1.098, 1.259). These can be interpreted as 13.0% and 17.6% more infections than predicted based upon National benchmarks, respectively.

Both the aggregate MI and CMS-required CLABSI SIRs showed that Michigan had significantly fewer CLABSI infections than expected. The MI SIR was 0.455 (95% CI: 0.407, 0.507) and the MI CMS SIR was 0.466 (95% CI: 0.414, 0.523). This means that MI had 54.5% and 53.4% fewer infections than predicted based upon National benchmarks, respectively.

The MI SSI SIR was the only available SIR for all procedures, and was 0.932 (95% CI: 0.873, 0.993), which means that MI had 6.8% fewer infections than expected; this result was statistically significant. The MI SSI COLO SIR was 0.838 (95% CI: 0.761, 0.921) and the MI CMS SSI COLO SIR was 0.823 (95% CI: 0.718, 0.938), indicating that MI had 16.2% and 17.3% fewer infections than predicted based upon National benchmarks, respectively. Both the MI SSI HYST SIR and MI CMS SSI HYST SIRs showed no statistical difference in the number of infections observed compared to the number of expected infections.

### **Descriptions of Graphs**

The report graphs display a comparison of Michigan's aggregate SIR compared to Michigan's CMS-required data for each of the four CMS-required modules. They provide the SIR surrounded by a 95% CI bar for each 2012 **quarter**. When both ends of the bar are above the dashed reference line of 1 (which indicates "no different than expected"), then there are significantly more infections than expected; if both ends of the bar are below 1, then there are significantly fewer infections than expected. If the 95% CI bar crosses 1, then it shows that there was no statistical difference between number of infections and expected number of infections.

For more information on the SIR, please visit this guide provided by the CDC:

[http://www.cdc.gov/nhsn/PDFs/Newsletters/NHSN\\_NL\\_OCT\\_2010SE\\_final.pdf](http://www.cdc.gov/nhsn/PDFs/Newsletters/NHSN_NL_OCT_2010SE_final.pdf). Please contact Allison Murad at [MuradA@michigan.gov](mailto:MuradA@michigan.gov) or at 517-335-8199 with any questions, comments, or suggestions regarding this highlight sheet or your individual hospital report.