

Massachusetts HAI Data Update

This document is designed to help you better understand the data presented on the Summary Page that follows.

Standardized Infection Ratio (SIR): This measure indicates how the actual number of healthcare-associated infections at a location compares to the predicted number of infections at that location. If a hospital experiences the same number of infections as predicted, the SIR has a value of 1. If a hospital experiences more infections, the SIR is greater than 1, and vice versa. A statistical interpretation is included with each SIR to indicate if the hospital experienced a statistically significant higher or lower number of infections than anticipated. Statistical significance means that the number of infections observed was unlikely to have occurred by chance alone. More information on the SIR can be found [here](#).

Hospital Survey Statistics

These statistics aim to provide a broad sense of patient care capacity and staffing in Massachusetts acute care hospitals Every hospital in Massachusetts has Infection Preventionists who work to reduce healthcare-associated infections at their hospital. The Society for Healthcare Epidemiology of America (SHEA) recommends that there be at least one Infection Preventionist per 125 hospital beds.

Central Line-Associated Blood Stream Infection (CLABSI)

CLABSI data are reported by ICU type since the risk of infection can vary greatly from one ICU to another depending on the type of patients in the unit and the type of treatments they receive. In addition to adult and pediatric ICUs, 10 hospitals in the state have neonatal ICUs, or NICUs.

The table included shows CLABSI data by each ICU type. **Each location strives for zero infections.** A statistical interpretation of *Same* or *Lower* means that the number of infections was comparable or better than the predicted number of infection, while an interpretation of *Higher* means that the number of infections was worse than the predicted number. The data presented in this table is from calendar year (CY) 2012 (January 1, 2012 – December 31, 2012). The predicted number of infections is calculated by multiplying the state baseline data for a given location, which averages data reported by hospitals for that location type across CY 2010 and 2011 (January 1, 2010 – December 31, 2011), by the number of device days.

The **central line utilization ratio** measures how often and for how long acute care patients have a central venous catheter in place. This statistic is important because **fewer central lines mean fewer chances for infection.** A downward trend may indicate that a hospital has implemented an intervention to try to reduce CLABSIs by removing central lines when not absolutely necessary. An upward trend does not necessarily indicate a change that is within the hospital's control.

The **Hospital and State CLABSI SIRs** chart shows how the hospital SIR and the state SIR have changed over time in adult and pediatric ICUs. The SIRs in this chart use predicted values calculated by multiplying the average rate of infection for a given location from the 2009 national data by the number of device days, so they are different from the values found in the table above. **As CLABSIs are prevented, the SIR for a hospital should decrease.** Data validation efforts made in 2010 may have increased the values starting in that year.

Surgical Site Infection (SSI)

The risk for SSI varies by the type of procedure as well as by individual patient and hospital factors. The CDC recently developed a formula that takes into account important risk factors to determine the predicted number of infections used to calculate the SIR. Infections following surgical procedures can take days to months to develop depending on patient factors and the procedure performed. Procedures that involve implantable devices or hardware are followed for a full year of observation for infection. These procedures include coronary artery bypass graft, hip prosthesis, and knee prosthesis. Abdominal and vaginal hysterectomies are monitored for only 30 days following the procedure to see if an infection develops. Due to these different follow up periods, the reporting for procedures that require implants lags behind the other procedures by a year because their follow-up period is not yet complete.

The table entitled **Hospital SSI SIRs by Procedure Type** contains data for all years available for each procedure currently under surveillance. **Each hospital strives for zero infections.** A statistical interpretation of *Same* or *Lower* means that the number of infections was comparable or better than expected, while an interpretation of *Higher* means that the number of infections was worse than the expected.

The graph included shows the SSI statistical interpretations over time. It is meant to be used as a quick assessment of significant variation of infection rates within surgical type over the captured time period. This does not capture change in infection rates that are not statistically significant. The annual rates of infection and actual SIRs are available in the table above.



Massachusetts HAI Data Update

Statewide Hospital Summary

Update Release Date: May 2014

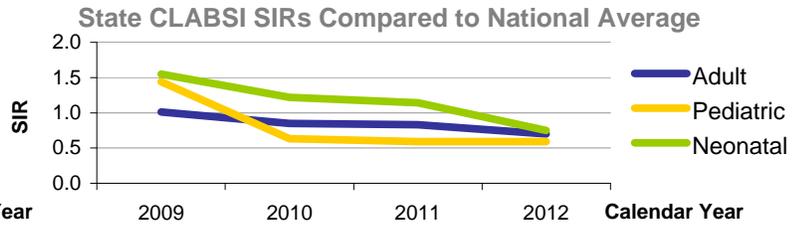
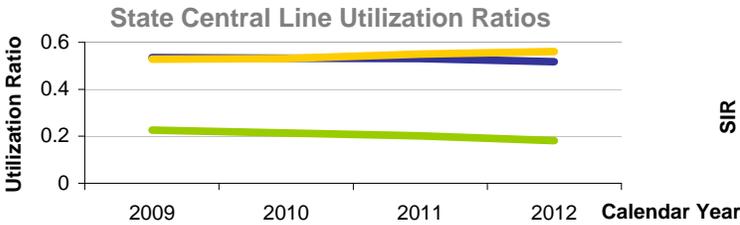
Hospital Survey Statistics 2012

| | Small Hospital <100 Beds | Medium Hospital 100-299 beds | Large Hospital 300+ beds |
|----------------------------------|-----------------------------|---------------------------------|-----------------------------|
| Number of Hospitals | 18 | 40 | 12 |
| Medical School Affiliation | 11% | 40% | 75% |
| Average Number of Beds | 57 | 180 | 560 |
| Average Number of ICU Beds | 6 | 15 | 91 |
| Average Number of Admissions | 3,010 | 10,232 | 33,373 |
| Average Number of Patient Days | 11,847 | 41,436 | 158,254 |
| Beds per Infection Preventionist | 66.5 | 136.6 | 200.0 |

Central Line-Associated Blood Stream Infection

CLABSI Rates by ICU Type for Calendar Year 2012, Compared to State Data from Calendar Years 2010-2011

| ICU Type | Number of ICUs | Infections | Line Days | Rate | Predicted Infections | SIR | Confidence Interval | Interpretation |
|---------------------|----------------|------------|-----------|------|----------------------|------|---------------------|----------------|
| Burn | 2 | 13 | 1,452 | 8.95 | 5.08 | 2.56 | (1.36 - 4.37) | Higher |
| Cardiac | 13 | 18 | 14,812 | 1.22 | 19.26 | 0.94 | (0.55 - 1.47) | Same |
| Cardiothoracic | 12 | 16 | 23,216 | 0.69 | 20.89 | 0.77 | (0.43 - 1.24) | Same |
| Medical | 18 | 37 | 33,482 | 1.11 | 59.40 | 0.62 | (0.43 - 0.85) | Lower |
| Medical/Surgical | 54 | 34 | 49,498 | 0.69 | 53.52 | 0.64 | (0.44 - 0.88) | Lower |
| Pediatric | 9 | 20 | 17,565 | 1.14 | 33.81 | 0.59 | (0.36 - 0.91) | Lower |
| Surgical and Trauma | 24 | 37 | 44,614 | 0.83 | 63.20 | 0.59 | (0.41 - 0.80) | Lower |
| Neonatal | 10 | 19 | 16,034 | 1.18 | 25.41 | 0.75 | (0.45 - 1.16) | Same |



Surgical Site Infection

Hospital SSI SIRs by Procedure Type for Calendar Years 2010-2012

| Procedure | Calendar Year | Hospitals Reporting | Infections | Procedures | Predicted Infections | SIR | Confidence Interval | Interpretation |
|------------------------|---------------|---------------------|------------|------------|----------------------|------|---------------------|----------------|
| Coronary Artery Bypass | 2010 | 14 | 45 | 3,805 | 48.55 | 0.93 | (0.67 - 1.24) | Same |
| | 2011 | 14 | 13 | 3,258 | 41.50 | 0.31 | (0.16 - 0.53) | Lower |
| Knee Prosthesis | 2010 | 67 | 69 | 13,276 | 71.49 | 0.97 | (0.75 - 1.22) | Same |
| | 2011 | 65 | 72 | 13,163 | 70.04 | 1.03 | (0.80 - 1.29) | Same |
| Hip Prosthesis | 2010 | 67 | 64 | 9,811 | 74.34 | 0.86 | (0.66 - 1.09) | Same |
| | 2011 | 65 | 50 | 9,778 | 73.55 | 0.68 | (0.50 - 0.89) | Lower |
| Abdominal Hysterectomy | 2010 | 62 | 43 | 5,338 | 38.05 | 1.13 | (0.81 - 1.52) | Same |
| | 2011 | 59 | 30 | 5,056 | 38.40 | 0.78 | (0.52 - 1.11) | Same |
| | 2012 | 60 | 38 | 5,722 | 43.02 | 0.88 | (0.62 - 1.21) | Same |
| Vaginal Hysterectomy | 2010 | 55 | 21 | 2,116 | 11.75 | 1.79 | (1.10 - 2.73) | Higher |
| | 2011 | 57 | 24 | 2,066 | 11.19 | 2.15 | (1.37 - 3.19) | Higher |
| | 2012 | 58 | 24 | 1,976 | 10.30 | 2.33 | (1.49 - 3.46) | Higher |

Statistically Significant Variation from Predicted Number of Surgical Site Infections Over Time

