

Massachusetts Hospitals Statewide Performance Improvement Agenda
Final Report
MHA Board-approved Quality & Safety Goal January 2013
Reduce preventable CAUTI, CLABSI and SSI by 40% by 2015

Figure 1. Massachusetts Statewide Aggregate Hospital Acquired Infection Data Summary

Hospital-Acquired Infection (Source)	Time Period	Observed Infections (Numerator)	Denominator Count*	Infection Rate*	Infection Rate vs. Baseline % Change	Expected Infections**	Standardized Infection Ratio (SIR)	SIR vs. Baseline % Change	Baseline Time Period
CLABSI/ICU (NHSN/DPH)	JAN'15-DEC'15	161	191,221	0.84	-8.8	410.90	0.39	-8.7	JAN'12-DEC'12
CAUTI/ICU (NHSN/CMS)	JAN'15-DEC'15	374	225,709	1.66	-53.4	476.90	0.78	-53.3	APR'12-MAR'13
SSI/CABG (NHSN/DPH)	JAN'15-DEC'15	31	3,970	7.81	43.9	49.89	0.62	47.8	JAN'12-DEC'12
SSI/HPRO (NHSN/DPH)	JAN'15-DEC'15	64	12,804	5.00	-25.8	96.75	0.66	-27.0	JAN'12-DEC'12
SSI/KPRO (NHSN/DPH)	JAN'15-DEC'15	57	16,222	3.51	-36.1	87.82	0.65	-37.5	JAN'12-DEC'12
SSI/ABHYST (NHSN/DPH)	JAN'15-DEC'15	43	5,115	8.41	27.7	40.10	1.07	21.4	JAN'12-DEC'12
SSI/VHYS (NHSN/DPH)	JAN'15-DEC'15	11	1,640	6.71	-44.8	8.78	1.25	-46.2	JAN'12-DEC'12
SSI Total	JAN'15-DEC'15	206	39,751	5.18	-18.8	283.34	0.73	-20.4	JAN'12-DEC'12
All Infections Combined		741	456,681	1.62	-40.3	1,171.14	0.63	-41.2	

Notes: *Infections per 1,000 catheter days or procedures
** Expected (predicted) infections based on national baseline 2006-2008

Sources: CDC National Healthcare Safety Network (NHSN) data reported by MA DPH or CMS. Data may not be complete and is subject to change.

Figure 1 lists the hospital-acquired infections that were tracked to assess progress in meeting the MHA Board-approved goal to reduce preventable infections, specifically central line-associated bloodstream infections (CLABSI), catheter-associated urinary tract infections (CAUTI), and surgical site infections (SSI) for coronary artery bypass graft surgery (CABG), hip/knee prosthesis (HPRO/KPRO), and abdominal/vaginal hysterectomy (ABHYST/VHYS). Infection rate data for these conditions reported by the Massachusetts Department of Public Health (DPH) and the Centers for Medicare & Medicaid Services (CMS) for calendar year 2015 are compared to baseline infection rate data for calendar year 2012 (or April'12-March'13 for CAUTI) from the CDC National Healthcare Safety Network (NHSN), the underlying data source for the DPH and CMS reports.

Statewide hospital-acquired **CLABSI** data have been reported to MHA by DPH on a monthly basis since 2011 to support hospital efforts to reduce CLABSI. Complete data for calendar year 2015 were reported to MHA in May 2016. Figure 1 CLABSI data show that the 2015 CLABSI rate declined 8.8% since the baseline period. A related measure, the Standardized Infection Ratio (SIR), compares the observed number of CLABSI to the expected number of CLABSI based on consideration of patient and organizational variables and the experience of hospitals across the nation in the period 2006 - 2008. The Massachusetts hospital 2015 CLABSI SIR declined 8.7% since the baseline period. Longer-term Massachusetts hospital-acquired CLABSI data are presented in the attachment to this report (Figure 7), demonstrating that that CLABSI rates had declined by over 25% in the three years preceding the CY 2012 baseline period for this report.

Statewide hospital-acquired **CAUTI** data are updated on a quarterly basis (with a 9-to-12-month lag) by CMS on the *Hospital Compare* website. CMS reported in the October 2016 *Hospital Compare* update that the 2015 Massachusetts hospital CAUTI rate had dropped 53% from the baseline period. The CAUTI SIR declined by the same amount. (* See endnote)

SSI data for January 2015 – December 2015 were reported by DPH in August 2016 and are displayed in Figure 1. Infection rates for **HPRO** and **KPRO** dropped 26% and 36% respectively from the baseline, and the **VHYST** rate dropped 45% from baseline. **CABG** and **ABHYST** rates rose 44% and 28% respectively, although the CABG SIR remained below expected levels at 0.62. Overall combined SSI rates dropped 19% since the baseline period. The number of SSIs in these five categories dropped from 233 in the CY 2012 baseline to 206 in CY 2015 (net minus 27), even as the number of such surgeries grew by 3,262 and the expected number of infections grew by 28.

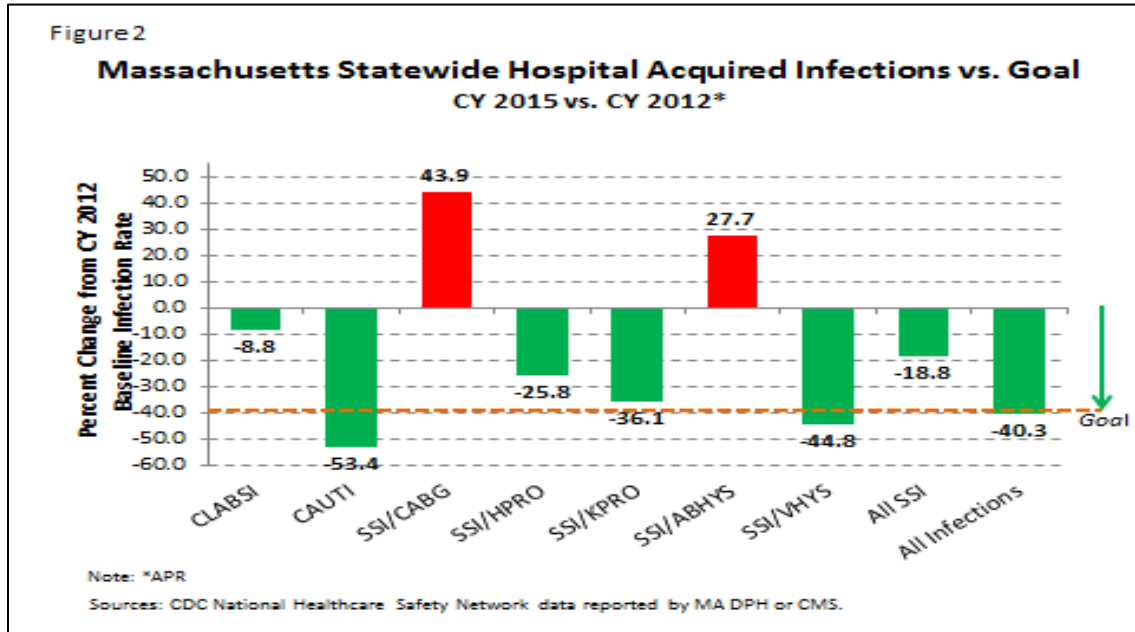
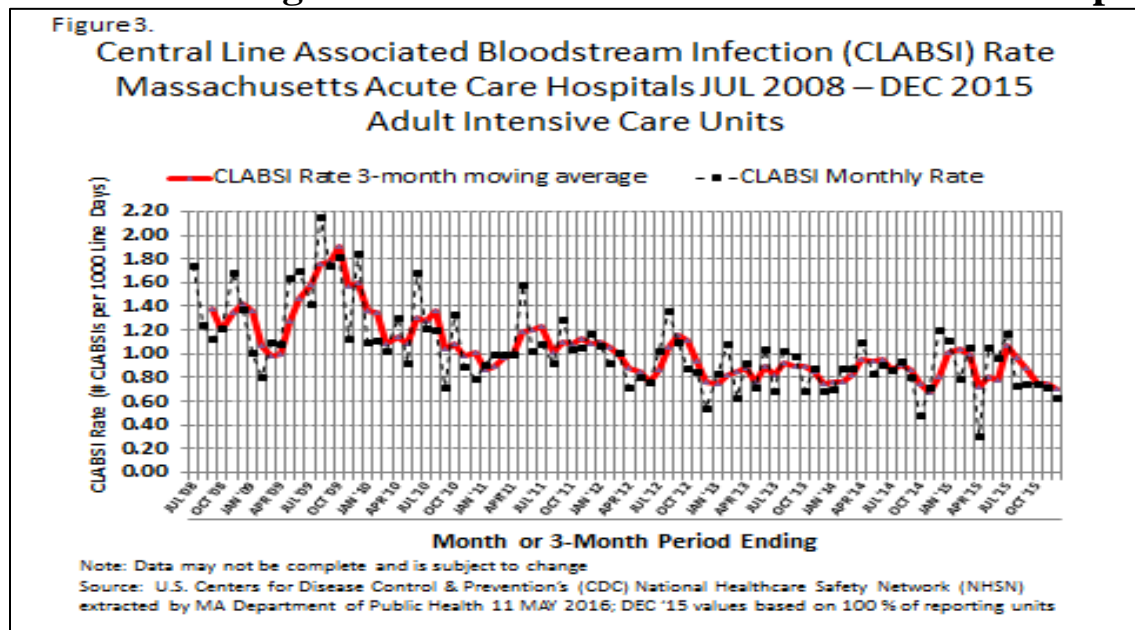
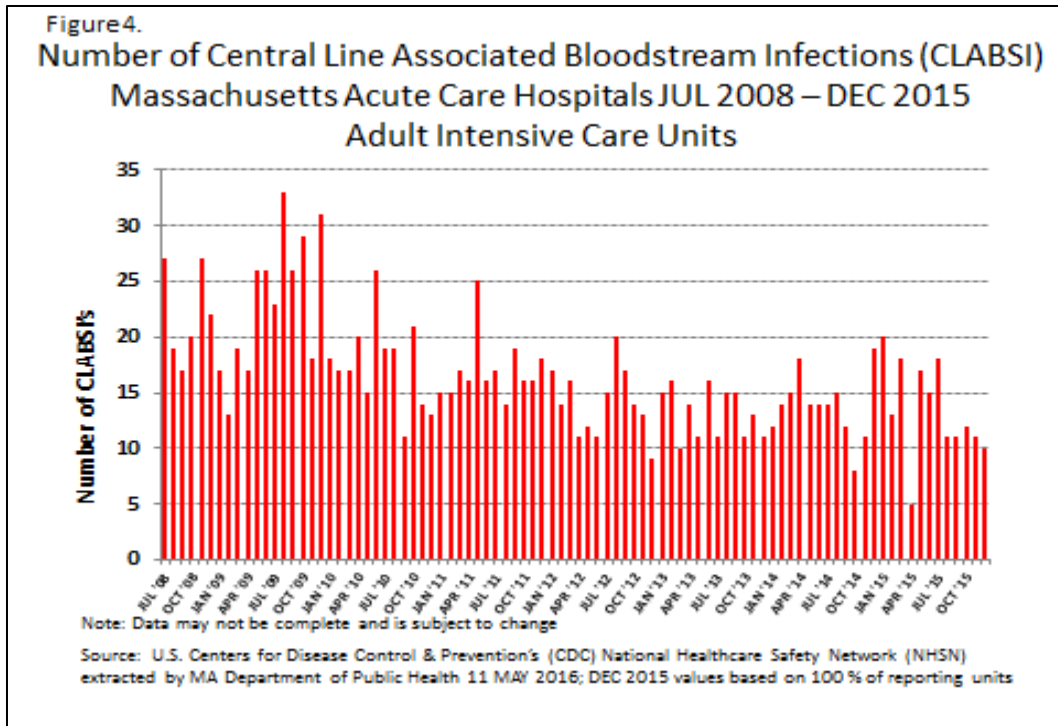


Figure 2 summarizes these findings and displays the change in CY 2015 rates vs. the CY 2012 baseline rates for CLABSI, CAUTI, and SSI relative to the 40-percent reduction goal.

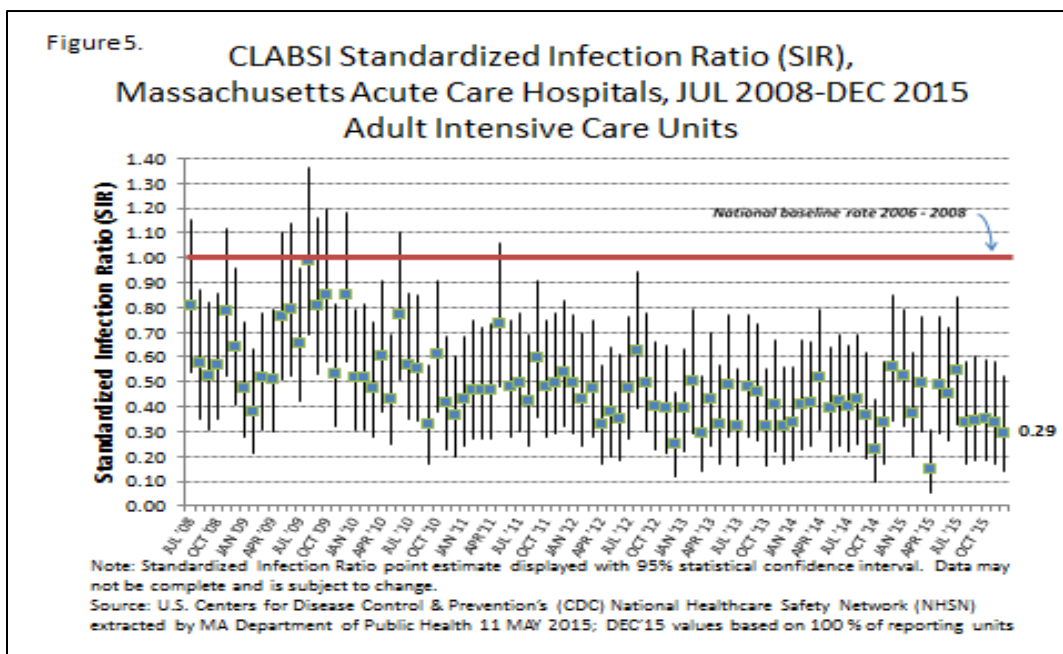
Focus on Reducing CLABSI in Massachusetts Acute Care Hospitals



The CLABSI rate in Massachusetts acute care hospital adult intensive care units for the **3-month period ending DEC 2015** was **0.70 infections per 1,000 line days** (Fig.3). The rate is based on data submitted from 100 percent of planned reporting units as of May 11, 2016. The **rate for the previously reported 3-month period ending in June 2015** was **0.78**. The **one-month rate in December 2015** was **0.63**. Calendar Year rates are displayed in the attachment (Fig.7).

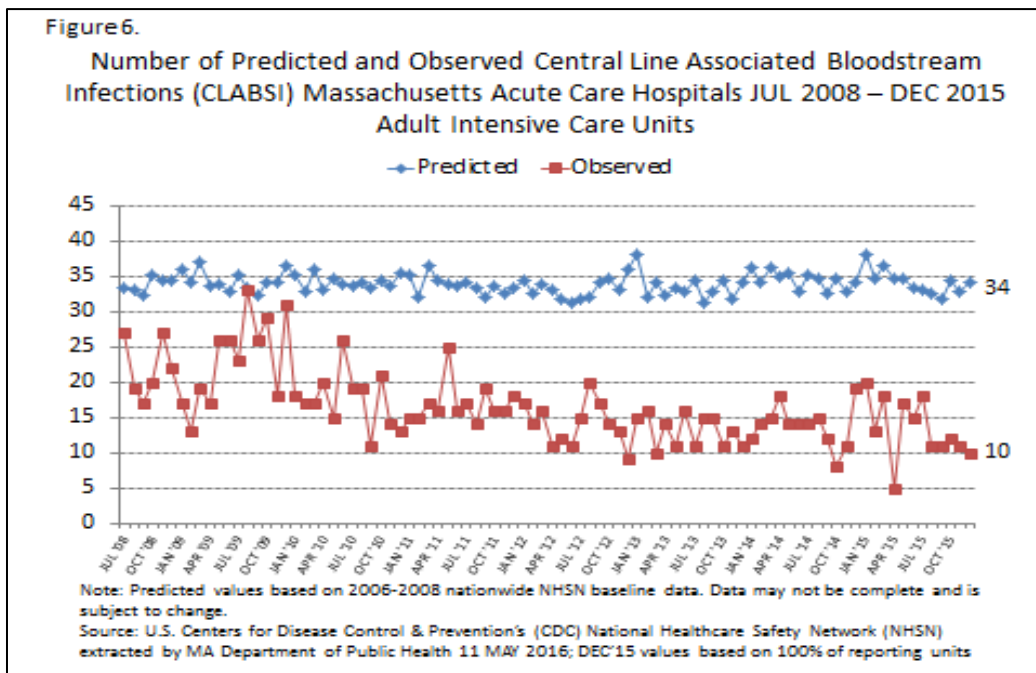


There were **10 reported CLABSI in December 2014** (Fig.4). The mean over the 84 months of data reporting was 16.4 CLABSI and the median was 16.



The **Standardized Infection Ratio (SIR)** compares CLABSI incidence in relation to a national reference standard or baseline covering the period 2006 - 2008. The SIR adjusts for differences in the mix and size of hospital unit types reported on by hospitals, as well as the number of hospitals/units with medical school affiliations. Using the record of hospitals across the nation in the period January 2006 through December 2008, CDC/DPH calculate a predicted (expected) number of CLABSI in each state based on the number of patients and the unit types in which they were hospitalized. The observed (actual) number of CLABSI reported by hospitals in the state are then compared to the number of predicted CLABSI in an observed-to-predicted ratio to arrive at the SIR.

The SIR for Massachusetts hospitals (Fig. 5) in December 2015 was 0.29, meaning the observed number of CLABSI (14) was 71percent fewer (1.00 minus 0.29 = 0.71) than predicted (34) had Massachusetts hospitals performed at the level of hospitals across the nation from 2006 through 2008. The SIR includes a confidence interval around the 0.29 point estimate indicating that the "true" SIR in Massachusetts is between 0.14 and 0.15 with a 95 percent certainty.



The component parts of the SIR, the predicted number of CLABSI and the observed number of CLABSI in Massachusetts acute care hospitals in each month from July 2008 through December 2015 are displayed in Figure 6. The December 2015 counts are based on data from 100 percent of planned reporting units.

We appreciate the cooperation of the Massachusetts Department of Public Health DPH in supplying this monthly data.

New comprehensive data on CLABSI, surgical site infections, and related information was released by DPH in August 2016. Data from that release on statewide aggregate trends through the end of calendar year 2015 may be found at this link: <http://www.mass.gov/eohhs/docs/dph/quality/healthcare/hai/hai-summary-cy2015.pdf>

Data for individual hospitals from DPH's August 2016 release for calendar year 2015 may be found at this link: <http://www.mass.gov/eohhs/docs/dph/quality/healthcare/hai/hai-hospital-data-cy2015.xlsx>

A slide presentation on the CY 2015 HAI data findings presented to the Public Health Council may be found here: <http://www.mass.gov/eohhs/docs/dph/quality/healthcare/hai/hai-cy2015-report.pptx>

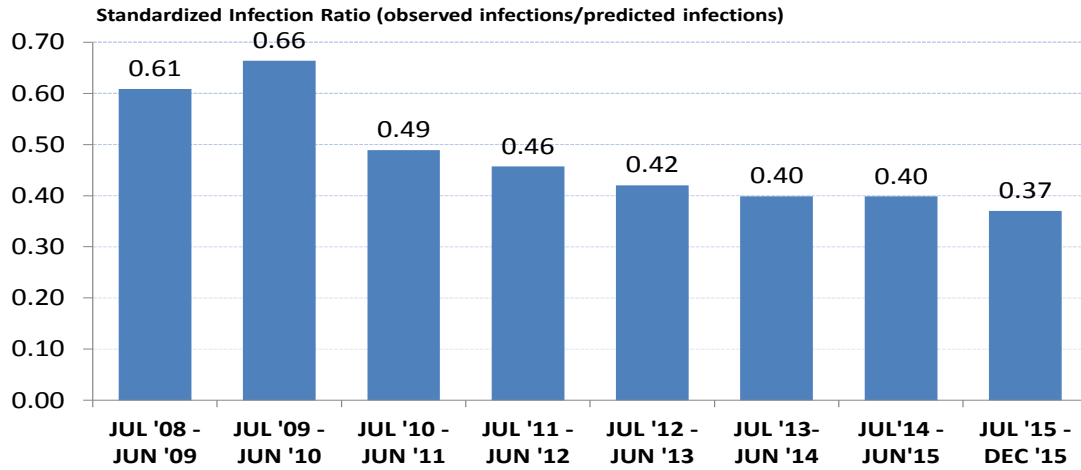
*** Endnote**

As reported by the Massachusetts Department of Public Health in its August 2016 Massachusetts CY 2015 HAI Data Summary, there were significant definition changes for CAUTI in 2015 that limit the ability to compare 2015 data with prior periods. A description of the changes may be found in the CDC NHSN e-News Volume 9, Issue 3, September 2014, p.7. Figure 8 in the attachment illustrates how CAUTI rates behaved before and after implementation of the change.

Attachment

Fig.7

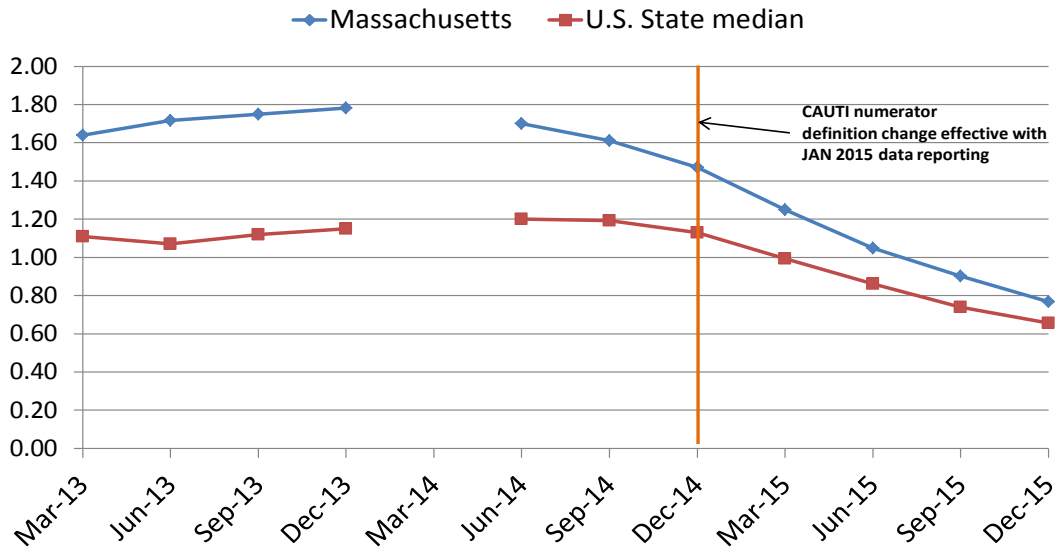
**Central Line-Associated Bloodstream Infection
Annual Standardized Infection Ratio
MA Acute Care Hospital Adult ICUs, JUL 2008 – DEC 2015**



Source: CDC NHSN/MA DPH (rev. MAY 2016)

Fig. 8

**CAUTI SIR Massachusetts vs. U.S. State Median
4 Quarters Ending March 2013 through December 2015**



Note: Data for the 4-quarters ending March 2014 were not published by CMS

Source: Hospital Compare data releases from NHSN data