

Central Line-associated Bloodstream Infection (CLABSI) Reporting in Illinois Acute Care Hospitals, 2015

Illinois hospitals have been reporting CLABSI data from adult intensive care units (ICU) to the Illinois Department of Public Health (IDPH) using the CDC’s National Healthcare Safety Network (NHSN since October, 2008. Reporting of CLABSI data from both pediatric ICUs (PICU) and neonatal ICUs (NICU) commenced in October, 2009. CLABSI data are summarized using the standardized infection ratio (SIR), a summary statistic used to measure relative difference in CLABSI occurrence during a reporting period, in this case 2015, compared to a common referent period (national data collected during 2006-2008). For additional information on Standardized Infection Ratios (SIRs), and confidence intervals (CI), see the methodology section of the Illinois Hospital Report Card website.

<http://www.healthcarereportcard.illinois.gov/contents/view/methodology>

Table 1. CLABSIs by Type of Intensive Care Unit (ICU), 2015

ICU Type	Number of Units Reporting	Number of CLABSI Infections		Standardized Infection Ratio (SIR)	95% Confidence Interval (SIR)		Statistical Interpretation
		Observed	Predicted		Lower	Upper	
All ICU Combined	266	389	767.47	0.51	0.458	0.559	Lower
Adult ICU	205	286	553.33	0.52	0.46	0.579	Lower
Neonatal ICU (NICU)	20	32	83.04	0.39	0.268	0.538	Lower
Pediatric ICU (PICU)	41	71	131.11	0.54	0.426	0.679	Lower

* NHSN CLABSI data was generated on July 26, 2016.

Table 1 provides a snapshot summary of central line-associated bloodstream infections in Illinois ICUs during 2015. For all ICU combined, 389 CLABSIs were reported compared to 767 CLABSIs predicted, for an SIR of 0.51 (95% CI: 0.458, 0.559). This translates to 49% less infections compared to the national referent period noted above. This statistically significant reduction in CLABSIs was achieved in all three intensive care settings – adult ICUs (AICU), neonatal ICUs (NICU) and pediatric ICUs (PICU). The reduction of CLABSIs was 48% in adult ICUs, 61% in NICUs, and 46% in PICUs, respectively.

Trend Analysis of CLABSI SIRs in Illinois Acute Care Hospitals, 2012 - 2015

Joinpoint regression version 4.1 was used to analyze trends in CLABSI SIR in Illinois Acute Care Hospitals over time by year. Joinpoint regression is a trend analysis software program developed by the US National Cancer Institute for the analysis of data from the Surveillance Epidemiology and End Results Program.² The resulting annual percent change (APC) in SIR values was estimated and reflects the

magnitude of the trend during specific reporting periods. The APC is tested for statistical significance to determine whether a difference exists from the null hypothesis of no change (0%).² Refer to Table 2 for the observed SIRs and APC by ICU Type, and Figures 1 and 2 for the trend graphs for reporting years 2012 through 2015.

Table 2. Changes in CLABSI Standardized Infections Ratios (SIRs) in Illinois ICUs from 2009 - 2015

Year	2009	2010	2011	2012	2013	2014	2015	Annual Percent Change (APC)
All ICUs Combined	0.86	0.67	0.58	0.54	0.46	0.45	0.51	-7.9% ^
Adult ICUs	0.87	0.65	0.60	0.61	0.49	0.46	0.52	-8.3% ^
NICUs	0.77	0.66	0.48	0.41	0.41	0.51	0.39	-8.9% ^
PICUs	0.95	0.85	0.66	0.34	0.36	0.25	0.54	-8.9% ^

^ The Annual Percent Change (APC) is significantly different from zero at alpha = 0.05

Figure 1. CLABSI SIRs in Illinois Hospital ICUs (combined) from 2009 – 2015

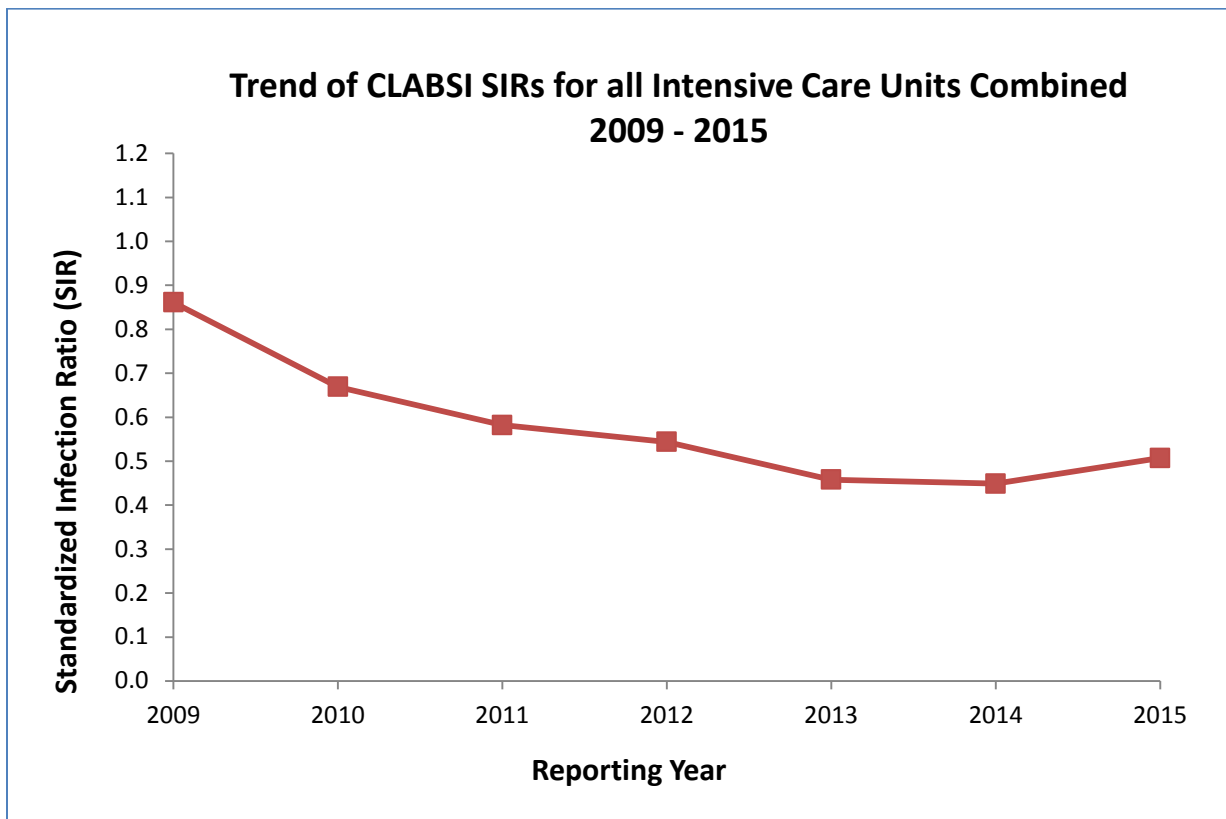
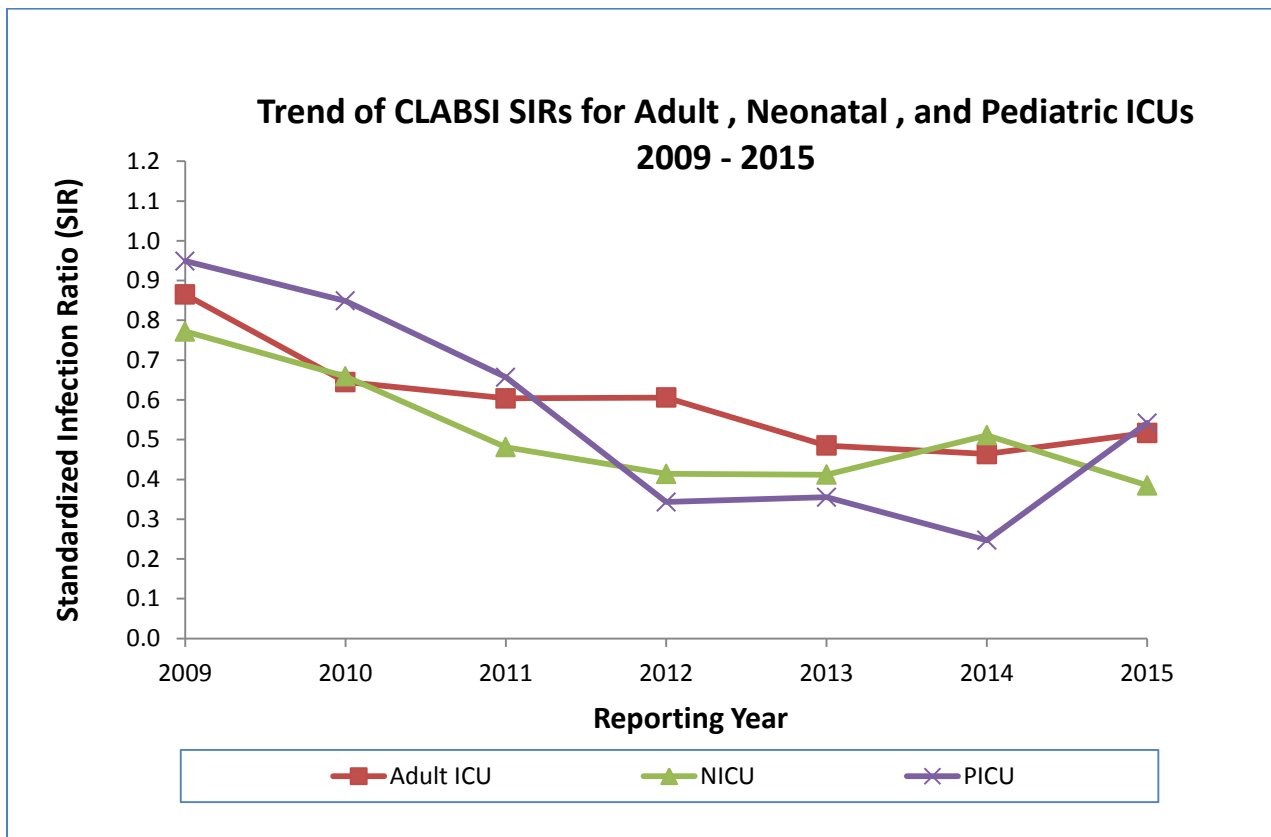


Figure 2. Trend of CLABSI SIRs in Adult ICU, Neonatal ICU, and Pediatric ICU from 2009 – 2015



Summary

Since 2009, the CLABSI SIR in Illinois acute care hospitals have been lower compared to the national referent SIR. This trend continues in reporting year 2015, where statistically significant reduction in CLABSI SIRs was achieved in all three intensive care settings – adult ICUs (AICU), neonatal ICUs (NICU) and pediatric ICUs (PICU). The reduction of CLABSIs was 48% in adult ICUs, 61% in NICUs, and 46% in PICUs, respectively. Refer to Table 1.

Trend analysis by year and ICU type of CLABSI SIR in Illinois Acute Care Hospitals from 2009 – 2015 were performed to assess percent change over time. Data analysis by year using Joinpoint regression indicates that the overall Illinois SIRs for CLABSIs have been steadily decreasing on the average of 7.9% per year since 2009. Individually, the annual percent change of SIRs for Adult ICU, NICU, and PICU have steadily decreased (8.3%, 8.9%, and 8.9% per year, respectively). The overall CLABSI adult ICU, Neonatal ICU, and pediatric ICU annual percent change were all statistically significant. Refer to Table 2 for SIR and APC by ICU Type and by year.

References:

¹ Kim HJ, Fay MP, Feuer EJ, Midthune DN. Permutation tests for joinpoint regression with applications to cancer rates. Stat Med 2000;19:335–51.