



# Tennessee's Report on Healthcare-Associated Infections:

January 1, 2008 — December 31, 2010

Report Date:

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## EXECUTIVE SUMMARY

Since January 2008, hospitals in Tennessee with an average daily census  $\geq 25$  have monitored central line-associated bloodstream infection (CLABSI) rates in the following types of intensive care units (ICUs, also referred to as critical care units): pediatric, surgical, major teaching medical, non-major teaching medical, major teaching medical-surgical, non-major teaching medical-surgical with  $\leq 15$  beds or with  $> 15$  beds, neurosurgical, medical cardiac, surgical cardiothoracic, and pediatric surgical cardiothoracic units. Since July 2008, neonatal ICUs in Tennessee have been reporting CLABSIs to NHSN, and hospitals began reporting CLABSIs in burn and trauma ICUs in July 2010. For each ICU, hospitals collect the number of CLABSIs that occur, the number of patient days, and the number of central line-days, including umbilical line-days in neonatal ICUs.

Hospitals in Tennessee have also reported surgical site infections (SSIs) related to coronary artery bypass graft surgery with both a chest and donor site incision (CBGB) and from coronary artery bypass graft surgery with a chest incision only (CBGC) since January 2008.

### **Central Line-Associated Bloodstream Infections (CLABSIs) in adult and pediatric ICUs in the reporting period from January 2010 through December 2010:**

CLABSI rates in 2010 were highest in burn ICUs (10.5 infections per 1,000 central line-days), followed by: trauma (3.6), pediatric surgical cardiothoracic (3.3), major teaching medical (3.1), major teaching medical-surgical (2.0), neurosurgical (1.6), non-major teaching medical-surgical with  $\leq 15$  beds (1.5), pediatric medical-surgical (1.5), medical cardiac (1.3), non-major teaching medical (1.3), non-major teaching medical-surgical with  $> 15$  beds (1.3), surgical (1.1), and surgical cardiothoracic (1.0) (Table 6, Figure 3). Tennessee CLABSI rates were significantly higher than 2006–2008 National Healthcare Safety Network (NHSN) rates in burn ICUs [10.5 vs. 5.5 infections per 1,000 central line-days; SIR=1.91 (1.17–2.96)]. Tennessee rates were significantly lower than national rates in non-major teaching medical ICUs [1.3 vs. 1.9 infections per 1,000 central line-days; SIR=0.71 (0.49-0.99)], neurosurgical ICUs [1.6 vs. 2.5 infections per 1,000 central line-days; SIR=0.63 (0.38-0.99)], pediatric medical-surgical ICUs [1.5 vs. 3.0 infections per 1,000 central line-days; SIR=0.52 (0.32-0.80)], and surgical ICUs [1.1 vs. 2.3 infections per 1,000 central line-days; SIR=0.49 (0.32-0.72)] (Table 6, Figures 3–4).

Excluding burn and trauma ICUs, which became reportable in Tennessee July 2010, the overall 2010 CLABSI SIR in Tennessee was 22% lower than the national 2006–8 SIR of 1 (SIR=0.78; 95% CI: 0.70–0.86) (Table 3). Viewing the data by half-year, the overall CLABSI SIR in Tennessee went from being no different from the national 2006–8 SIR of 1 in January–June 2008 (SIR=1.11; 95% CI: 0.97–1.26) to being significantly lower than 1 in July–December 2010 (excluding burn and trauma ICUs, SIR=0.66; 95% CI: 0.56–0.78). From January–June 2009 to July–December 2010, CLABSI SIRs decreased in all ICU types for which 2009 data were available.

CLABSI rates in 2010 varied across the three grand divisions of Tennessee (Table 8, Figure 7). CLABSI rates were significantly lower than national 2006–8 rates in West Tennessee among medical cardiac ICUs [0.4 vs. 2.0; SIR=0.18 (0.00–0.98)] and neurosurgical ICUs [0.8 vs. 2.5; SIR=0.34 (0.09-0.87)] and in East Tennessee among surgical ICUs [0.6 vs. 2.3; SIR=0.25 (0.08-0.58)]. CLABSI rates were significantly higher in Middle Tennessee among major teaching medical ICUs [5.1 vs. 2.6; SIR=1.97 (1.30–2.86)]. The overall SIRs for West and East Tennessee were

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significantly lower than the national 2006-8 SIR of 1 [West: SIR=0.74 (0.60–0.91); East: SIR=0.65 (0.53–0.80)]. The overall SIR for ICUs in Middle Tennessee was not statistically significantly different than 1 [SIR=0.92 (0.78–1.09)].

Some hospitals' ICUs reported zero infections. However, because of the low number of central line-days, these results may not be statistically significant. We cannot conclude that these ICUs would continue to have zero infections if there were an increased number of central line-days. The number and proportion of facilities that reported zero infection rates are listed by ICU type in the result section "Facility-Specific CLABSI Rates in Adult and Pediatric ICUs".

The microorganisms identified in 388 CLABSI events among adult and pediatric ICU patients are listed in [Table 2](#) and [Figure 9](#). The four most common pathogens among total positive isolates were *Enterococcus* species (20.5%), *Candida* species and other yeasts (19.6%), coagulase-negative *Staphylococcus* species (18.9%), and *Staphylococcus aureus* (14.3%). Methicillin-resistant *S. aureus* (MRSA) accounted for 9.1% and vancomycin-resistant *Enterococcus* (VRE) for 8.1% of total positive isolates.

### **Central Line-Associated Bloodstream Infections (CLABSI) in neonatal ICUs in the reporting period from January 2010 through December 2010:**

In 2010, overall CLABSI rates in level III neonatal ICUs in Tennessee were statistically significantly lower than national 2006-8 data; CLABSI rates in level II/III NICUs were not statistically different from national 2006-8 data ([Table 22](#)). CLABSI rates in level III NICUs were significantly lower than 2006-8 rates for the largest birth weight category (>2500 g) and overall; in level II/III NICUs, CLABSI rates were not significantly different from national 2006-8 rates. Umbilical catheter-associated bloodstream infection (UCABSI) rates were not significantly different from corresponding national 2006-8 rates in any birth weight category in level III and level II/III NICUs ([Tables 26–29](#), [Figures 23–28](#)).

The overall SIR across all reporting NICUs in Tennessee in 2010 was statistically significantly lower than the national SIR of 1 (SIR=0.69; 95% CI: 0.54–86) ([Table 21](#)). In general, NICU CLABSI/UCABSI SIRs decreased consistently over time from July–December 2008 to July–December 2010, with the overall NICU SIR for Tennessee decreasing from being significantly greater than 1 (SIR=1.52; 95% CI: 1.23–1.87) to significantly less than 1 (SIR=0.57; 95% CI: 0.39–0.81) ([Table 24](#), [Figure 29](#)). In the fourth quarter of 2010, the overall CLABSI/UCABSI SIR in Tennessee was 0.50, reaching the U.S. Department of Health and Human Services' *Action Plan to Prevent Healthcare-Associated Infections* five-year prevention target of SIR = 0.5 ([Figure 30](#)).

In 2010, combined CLABSI/UCABSI rates in neonatal ICUs varied across the three grand divisions of Tennessee ([Table 25](#), [Figure 31](#)). Across the three grand divisions, only level III neonatal ICUs in Middle Tennessee had combined CLABSI/UCABSI rates that were significantly different from national 2006-8 rates; these NICUs had a SIR of 0.55 (0.31–0.89). The overall SIR in Middle Tennessee (SIR=0.53; 95% CI: 0.31–85) was also significantly less than 1, while the overall SIRs in West and East Tennessee were not significantly different from 1 [West: SIR=0.76 (0.52–1.07); East: SIR=0.74 (0.48–1.10)].

Some hospitals' neonatal ICUs reported zero infections. However, because of the low number of central line-days and umbilical line-days, these results may not be statistically significant. We cannot conclude that these ICUs would continue to have zero infections if there were an increased number of central line and/or umbilical line-days. The number and proportion of facilities that reported zero infection rates by neonatal ICU type are listed in the result section "Facility-Specific SIRs and Device Utilization Ratios".

The microorganisms identified in 74 CLABSI/UCABSI events among neonatal ICU patients are listed in [Table 20](#) and [Figure 36](#). The most common microorganisms identified in neonatal ICU-related CLABSIs/UCABSIs were coagulase-negative *Staphylococcus* (31.6%), *Staphylococcus aureus* (25.3%), *Enterococcus* spp. (12.7%), and *Candida* spp. and other yeasts (10.1%). MRSA accounted for 12.7% of organisms identified, while no VRE were found among the isolates.

**Surgical site infections (SSIs) related to coronary artery bypass graft surgery with both a chest and donor site incision (CBGB) and from coronary artery bypass graft surgery with a chest incision only (CBGC) in the reporting period from January 2009 through December 2009:**

In 2009, Tennessee hospitals reported 7743 coronary artery bypass graft surgeries; 7321 were coronary bypass procedures with chest and donor site incisions (CBGB), and 422 were coronary bypass procedures with chest incision only (CBGC). Among the 7321 CBGBs, 150 surgical site infections were reported. Two infections were reported among the 422 CBGC procedures ([Table 34](#)). Overall, SSIs were most often superficial primary (34.2%) and least often deep secondary infections (3.3%) ([Figure 40](#)). The most common pathogens among total positive isolates were *Staphylococcus aureus* (37.3%) and coagulase-negative *Staphylococcus* species (17.0%) ([Table 36](#), [Figure 41](#)). SSIs were most often identified upon readmission (69.1%) ([Figure 42](#)).

## BACKGROUND

Healthcare-associated infections (HAIs) are a major public health problem. According to the Centers for Disease Control and Prevention (CDC), there were an estimated 1.7 million HAIs and 99,000 HAI-related deaths in the United States in 2002, making HAIs one of the top ten leading causes of death (Klevens et al, 2007, Public Health Reports). A 2009 CDC report estimated that the annual medical costs (adjusted to 2007 dollars) of HAIs to U.S. hospitals to be between \$35.7 billion and \$45 billion (Scott, 2009 available at: [http://www.cdc.gov/ncidod/dhqp/pdf/Scott\\_CostPaper.pdf](http://www.cdc.gov/ncidod/dhqp/pdf/Scott_CostPaper.pdf)), though these monetary costs do not measure the effects of HAIs on patients or their family members, friends, and colleagues. The emotional, physical, and personal costs associated with HAIs are not quantifiable.

In June 2006, the Tennessee Legislature passed Senate Bill 2978 and the Governor signed the Public Acts, Public Chapter 904 (PC904) requiring hospitals to report selected HAIs to the Tennessee Department of Health (TDH). The legislation required use of CDC's National Healthcare Safety Network (NHSN) for reporting, making Tennessee the fifth state to use this system. Currently, 26 states require reporting of HAIs using NHSN, which has become the standard system for state reporting. Additionally, as of January 2011, the Centers for Medicare and Medicaid Services (CMS) require hospitals in the Hospital Inpatient Quality Reporting Program to report CLABSIs in ICUs to NHSN.

The following report summarizes the TDH CLABSI reporting activities for the period from **January 2010 through December 2010** and SSI reporting activities for the period from **January 2009 through December 2009**. This report provides CLABSI rates by individual hospital, grand division, and state aggregate. The 2010 CLABSI rates are compared to Tennessee data from 2008 and 2009 and to national baseline data (2006-2008). SSI rates are provided by state aggregate only and are compared to national baseline data (2006-2008).

## DEFINITIONS

Unless a reader works in the healthcare field or understands statistics, he/she may not be familiar with some of the words or labels mentioned in the Tennessee Healthcare-Associated Infections (HAI) Report. On this page, we attempt to explain what some of these terms mean. Do not worry if it seems like too much information to absorb at once. A reader does not need to know all of the terms in order to understand the reports.

**ASA Score:** Assessment by the anesthesiologist of the patient's preoperative physical condition using the American Society of Anesthesiologists' (ASA) Classification of Physical Status. Patient is assigned one of the following which is used as one element of the SSI Basic Risk index:

- 1 -- Normally healthy patient
- 2 -- Patient with mild systemic disease
- 3 -- Patient with severe systemic disease that is not incapacitating
- 4 -- Patient with an incapacitating systemic disease that is a constant threat to life
- 5 -- Moribund patient who is not expected to survive for 24 hours with or without the operation

**Central line:** A flexible tube that is inserted near a patient's heart or into one of the large blood vessels near the heart. A central line (or, for newborns, an umbilical line) can be used to give fluids, antibiotics, medical treatments such as chemotherapy, and liquid food if a patient is unable to eat or digest food normally. If a central line is inserted incorrectly or not cared for properly, it can lead to dangerous bloodstream infections. Central lines are also sometimes called central venous lines or central venous catheters.

**Central line-associated bloodstream infection (CLABSI):** When a patient develops a bloodstream infection while having a central line in place or within 48 hours of central line removal, the infection is considered a CLABSI. According to the Centers for Disease Control and Prevention (CDC), an estimated 200,000 CLABSIs occur in U.S. hospitals each year. These bloodstream infections often lead to longer hospital stays, higher costs, and an increased risk of dying. CLABSIs can be prevented through proper insertion and care of the central line ([see Patient guide to CLABSI \[pdf\]](#)).

**Note:** For the neonatal ICU data in this report, we use the term "umbilical catheter-associated bloodstream infection" (UCABSI) to distinguish BSIs associated with umbilical catheters from other CLABSIs.

**Central line-days:** This is the total number of days a central line is in place for patients in a particular unit. The count is performed at the same time each day. Each patient with one or more central lines at the time the count is performed is counted as one central line day.

For example: 5 patients on the first day of the month had one or more central lines in place. Similarly, 5 patients on day two, 2 patients on day three, 5 patients on day four, 3 patients on day five, 4 patients on day six, and 4 patients on day seven had central lines in place. Adding the number of patients with central lines on days one through seven, we would have  $5 + 5 + 2 + 5 + 3 + 4 + 4 = 28$  central line-days for the first week. The number of central line-days for the month is simply the sum of the daily counts.

**CLABSI infection rate:** To calculate this rate, divide the total number of central line-associated bloodstream infections by the number of central line-days and then multiply the result by 1,000.

**Central line utilization ratio:** This ratio is obtained by dividing the number of central line-days by the number of patient-days. It is also referred to as the device utilization (DU) ratio.

**Confidence intervals:** Confidence intervals tell us about the reliability of a point estimate. If TDH mentions a confidence interval of 95 percent, it means that the TDH is 95 percent confident that the hospital's precise infection rate (the point estimate in this case) falls within the range given.

For TDH reports, the confidence interval is based on the number of infections observed in a hospital during the time period in question and on the number of central line-days.

If two hospitals have different infection rates, but the confidence intervals for the two rates overlap, then it is reasonably possible that the true rates are the same ([Discussion of confidence intervals \[pdf\]](#)).

**Deep incisional SSI:** A surgical site infection that involves the deep soft tissues (e.g., fascial and muscle layers) of the incision and meets the NHSN criteria for a deep incisional SSI as described in the NHSN Patient Safety Manual.

**Deep incisional primary (DIP) SSI:** A deep incisional SSI that is identified in the primary incision in a patient that had an operation with one or more incisions (e.g., C-section incision or chest incision for CBGB).

**Deep incisional secondary (DIS) SSI:** A deep incisional SSI that is identified in the secondary incision in a patient that had an operation with more than one incision (e.g., donor site (leg) incision for CBGB).

**Healthcare-associated infection (HAI):** For an infection to be considered healthcare-associated, there must be no evidence that the infection was present or incubating at the time of hospital admission. A HAI may be confined to one area of the body (localized) or be spread throughout (systemic). It is the body's adverse reaction to the presence of an infectious agent(s) or its toxin(s).

**Implant:** A nonhuman-derived object, material, or tissue that is permanently placed in a patient during an operative procedure and is not routinely manipulated for diagnostic or therapeutic purposes. Examples include porcine or synthetic heart valves, mechanical heart, metal rods, mesh, sternal wires, screws, cements, and other devices.

**Infection control/prevention processes:** These are routine measures that can be used in all healthcare settings to prevent infections. These steps or principles can be expanded to meet the needs of specialized types of hospitals. Some hospitals make the processes mandatory. Examples include:

- Diligent hand cleaning
- Use of personal protective equipment such as gloves, gowns, and/or masks when caring for patients in selected situations to prevent the spread of infections
- Use of an infection prevention checklist when putting in central lines. The list reminds healthcare workers to clean their hands thoroughly; clean the patient's skin with the appropriate type of disinfectant before insertion; wear the recommended sterile gown, gloves and mask; place sterile barriers around the insertion site, etc.
- Monitoring staff to ensure that they are following proper infection prevention procedures

**Infection preventionists (IPs):** These health professionals have special training in infection prevention and monitoring.

**Intensive care unit (ICU) (also known as a "critical care unit"):** ICUs are hospital units that provide intensive observation and treatment for patients either dealing with, or at risk of developing, life-threatening problems. Smaller hospitals typically care for both medical and surgical patients in a combined medical-surgical ICU. Larger hospitals often have separate ICUs for medical patients and surgical patients.

**National Healthcare Safety Network (NHSN):** This is the online system that Tennessee hospitals must use to report HAI data to the Tennessee Department of Health. NHSN is a secure, internet-based surveillance (monitoring and reporting) system. Among other features, the network offers integrated patient and healthcare worker safety surveillance systems. NHSN is managed by CDC's Division of Healthcare Quality Promotion. In NHSN, hospitals submit specific infection and other

information (e.g., number of central line-days, procedural information) that are needed to calculate HAI rates and standardized infection ratios (SIRs). Hospitals must confer rights to TDH in order for TDH to collect data from NHSN and report the information to the public.

**NHSN Patient Safety Component Manual:** This manual contains standardized surveillance definitions and data collection methods that are essential for fair reporting of HAIs ([CDC - PSC Manual - NHSN](#)).

**NHSN operative procedure:** A procedure that:

- 1) is performed on a patient who is an NHSN inpatient or an NHSN outpatient
- 2) takes place during an operation where a surgeon makes at least one incision through the skin or mucous membrane, including laparoscopic approach, and closes the incision before the patient leaves the operating room, and
- 3) that is included in Table 1, Chapter 9 of the NHSN Patient Safety Manual.

**Operation:** A single trip to the operating room (OR) where a surgeon makes at least one incision through the skin or mucous membrane, including laparoscopic approach, and closes the incision before the patient leaves the OR.

**Organ/space SSI:** A surgical site infection that involves any part of the body, excluding the skin incision, fascia, of muscle layers, that is opened or manipulated during the operative procedure (e.g., osteomyelitis).

**SSI risk index:** A score used to predict a surgical patient's risk of acquiring a surgical site infection. The risk index score, ranging from 0 to 3, is the number of risk factors present among the following:

- A patient with an American Society of Anesthesiologists' physical status classification score of 3, 4, or 5
- An operation classified as contaminated or dirty/infected
- An operation lasting longer than the duration cut point in minutes, where the duration cut point is the approximate 75<sup>th</sup> percentile of the duration of surgery in minutes for the operative procedure. The cut point is 301 minutes for CBGB procedures and 286 minutes for CBGC procedures.

Note: In future reports, the SSI risk index will no longer be used to risk-adjust SSI data. Instead, TDH will use the standardized infection ratio (see below) for SSIs, which will be based on a logistic regression model published by CDC.

**Standardized infection ratio (SIR):** The CLABSI SIR is a summary measure used to compare infection rates from a group of reporting locations (e.g., ICUs) to rates based on a "standard population." For HAI reports, the standard population comes from data reported from the hundreds of U.S. hospitals that use the NHSN system.

The SIR is calculated by dividing the observed number of infections by the predicted (or statistically expected) number of infections. The predicted number of CLABSIs is based on national average (pooled mean) infection rates and the number of central line-days accrued by the facility.

**Standardized infection ratio (SIR) methodology:** The indirect standardization method accounts for differences in the risk of HAIs among multiple patient populations. For CLABSIs, the SIR

accounts for differences in risk among patients in different critical care units or, in the case of neonatal ICUs, among different unit type/birth weight/line type categories.

A SIR is the number of observed infections divided by the number of predicted infections. The predicted number of CLABSIs is calculated by multiplying the facility's number of central line-days for each stratum of data (i.e., unit type for adult/pediatric ICUs or unit type/birth weight/line type category for NICUs) by the NHSN pooled mean CLABSI rate (per 1,000 line-days) for that stratum.

- A SIR of 1.0 means the observed number of infections is equal to the number of predicted infections.
- A SIR above 1.0 means that the infection rate is higher than that found in the "standard population." For HAI reports, the standard population comes from data reported by the hundreds of U.S. hospitals that use the NHSN system. The difference above 1.0 is the percentage by which the infection rate exceeds that of the standard population.
- A SIR below 1.0 means that the infection rate is lower than that of the standard population. The difference below 1.0 is the percentage by which the infection rate is lower than that experienced by the standard population.

**Superficial incisional SSI:** A surgical site infection that involves only skin and soft tissue layers of the incision and meets the NHSN criteria for a superficial incisional SSI as described in the NHSN Patient Safety Manual.

**Superficial incisional primary (SIP) SSI:** A superficial incisional SSI that is identified in the primary incision in a patient that has had an operation with one or more incisions (e.g., C-section incision or chest incision for CBGB).

**Superficial incisional secondary (SIS) SSI:** A superficial incisional SSI that is identified in the secondary incision in a patient that has had an operation with more than one incision (e.g., donor site (leg) incision for CBGB).

**Surgical Site Infection (SSI):** Infection found after an operation in the part of the body where the surgery was performed.

**Surveillance:** The process of finding and documenting infections.

- **Active surveillance:** This includes, but is not limited to, active, patient-based, prospective surveillance by a trained infection control professional (IP). The IP seeks out infections during a patient's stay by screening a variety of data sources. The sources may include laboratory, pharmacy, admission/discharge/transfer, radiology/imaging, and pathology databases and patient charts, including history and physical exam notes, nurses/physician notes, and temperature charts. The complete definition of surveillance, including how to capture denominator data to calculate infection rates, is found in each module of the NHSN Patient Safety Component Manual (see above).
- **Post-discharge surveillance:** This is the process IPs use to seek out infections after patients have been discharged from the hospital. Post-discharge surveillance includes screening a variety of data sources, including re-admission and emergency department visit records.

**Validation:** In Tennessee, validation is the process of making sure that HAI data reported to NHSN are complete and accurate. HAIs, the total numbers of surgical procedures performed, central line-days, and patient information for the assignment of risk scores must all be validated. The purpose of the validation visits are to:

- Assess the accuracy and quality of data submitted to NHSN
- Provide hospitals with information to help them correctly use the NHSN application
- Provide education to IPs and other hospital staff to improve data accuracy and quality, if necessary
- Teach IPs how to validate the written or electronic data they receive from hospital departments, such as the Operating Room
- Look for unreported HAIs
- Assess selected infection control processes
- Make recommendations for improvements if data accuracy and/or quality issues are discovered

**Wound Class:** An assessment of the degree of contamination of a surgical wound at the time of the operation. The wound class system used in NHSN is an adaptation of the American College of Surgeons wound classification schema. Wounds are divided into four classes:

Clean: An uninfected operative wound in which no inflammation is encountered and the respiratory, alimentary, genital, or uninfected urinary tracts are not entered. In addition, clean wounds are primarily closed and, if necessary, drained with closed drainage. Operative incisional wounds that follow non-penetrating (blunt) trauma should be included in this category if they meet the criteria.

Clean-Contaminated: Operative wounds in which the respiratory, alimentary, genital, or urinary tracts are entered under controlled conditions and without unusual contamination. Specifically, operations involving the biliary tract, appendix, vagina, and oropharynx are included in this category, provided no evidence of infection or major break in technique is encountered.

Contaminated: Open, fresh, accidental wounds. In addition, operations with major breaks in sterile technique (e.g., open cardiac massage) or gross spillage from the gastrointestinal tract, and incisions in which acute, nonpurulent inflammation is encountered are included in this category.

Dirty or Infected: Includes old traumatic wounds with retained devitalized tissue and those that involve existing clinical infection or perforated viscera. This definition suggests that the organisms causing postoperative infection were present in the operative field before the operation.

**Key Abbreviations Found in the HAI Public Report**

APIC – Association for Professionals in Infection Control and Epidemiology  
ASA – American Society of Anesthesiologists  
CABG – coronary artery bypass graft surgery  
CBGB – coronary artery bypass graft surgery: both chest and donor site incisions  
CBGC – coronary artery bypass graft surgery: chest incision only  
CCU – critical care unit (used interchangeably with intensive care unit (ICU))  
CDC – Centers for Disease Control and Prevention  
CI – confidence interval  
CL days- central line-days  
CLABSI – central line-associated bloodstream infection  
CMS – Centers for Medicare and Medicaid Services  
DIP – deep incisional primary SSI  
DIS – deep incisional secondary SSI  
DU ratio – device utilization ratio  
HAI – healthcare-associated infection  
IP – infection preventionist (new term for ICP)  
ICP – infection control professional (now called IP)  
ICU – intensive care unit (use interchangeably with critical care unit (CCU))  
MRSA – methicillin-resistant *Staphylococcus aureus*  
NHSN – National Healthcare Safety Network  
No. – number  
OR – operating room  
SIP – superficial incisional primary SSI  
SIR – standardized infection ratio  
SIS – superficial incisional secondary SSI  
SSI – surgical site infection  
TDH – Tennessee Department of Health  
THA – Tennessee Hospital Association  
TN – Tennessee  
UCABSI – umbilical catheter-associated bloodstream infection  
VRE – vancomycin-resistant *Enterococcus*

## **Central Line-Associated Bloodstream Infection (CLABSI)**

### **Methods and Results**

## **METHODS**

### **CLABSI Reporting for 2008-2010**

A central line is a tube that is placed into a patient's large vein, usually in the neck, chest, arm or groin. The line is used to give fluids and medication, withdraw blood, and monitor the patient's condition. A bloodstream infection can occur when microorganisms (e.g., bacteria, fungi) are introduced, attach and multiply on the tubing or in fluid administered through the tubing, and then enter the blood.

CLABSIs are not frequently monitored throughout the hospital, but rather, in selected intensive care units (ICUs). ICUs are hospital units that provide intensive observation and treatment for patients either dealing with, or at risk of developing, life-threatening problems. ICUs are also referred to as "critical care units". ICUs are described by the types of patients for which care is provided. In Tennessee, the following ICU types were required to report CLABSIs in 2008–2010 if the facility had an average daily census  $\geq 25$ :

- Medical cardiac ICUs
- Medical ICUs
- Medical-surgical ICUs
- Neurosurgical ICUs
- Pediatric ICUs
- Cardiothoracic Surgery ICUs
- Surgical ICUs
- Neonatal ICUs (NICUs) – level III and level II/III (beginning July 2008)
- Burn ICUs (since July 2010)
- Trauma ICUs (since July 2010)

### **SSI Reporting for 2009**

Surgical site infections (SSIs) are infections found after an operation in the part of the body where the surgery was performed. The majority of SSIs involve only the skin surrounding the incision site; however, others may be deeper and more serious. On January 1, 2008, Tennessee began mandatory reporting of SSIs associated with coronary artery bypass graft (CABG) surgery, including coronary artery bypass graft surgery with both chest and donor site incisions (CBGB) and coronary artery bypass graft surgery with chest incision only (CBGC).

CABG surgery is a procedure performed for heart disease in which a vein or artery from the chest or another part of the body is used to create an alternate path for blood to flow to the heart, bypassing a blocked artery. All facilities performing CBGBs and/or CBGCs were required to report.

### **Training of Infection Preventionists at Healthcare Facilities**

Hospitals were required to review the NHSN patient safety protocol, archived webinars, and other training materials from CDC as per CDC/NHSN instructions. Regional in-person training sessions were conducted throughout Tennessee in April 2007, September 2007, March and April 2009, and May 2010 to ensure full understanding of NHSN protocols and definitions. These sessions included

didactic lectures on NHSN enrollment and definitions, with question-and-answer sessions, case-studies, and a pop quiz. Support from local Association for Professionals in Infection Control and Epidemiology (APIC) chapters and the Tennessee Hospital Association (THA) was essential to the success of this training; these organizations provided venues, logistical support (e.g., registration), and copies of training materials. TDH also held six NHSN training sessions via webinar in 2010. Hospitals continue to participate in monthly NHSN conference calls during which definitions and protocols are clarified and case scenarios are discussed.

### **Timeliness, Completeness and Accuracy of Reporting**

TDH staff monitored the timeliness, completeness, and accuracy of hospital reports and conducted on-site audits to assure compliance with the statutory reporting requirements. In each Tennessee state HAI report, facilities with missing data during the reporting period are displayed in **Table 1**. No facilities were missing data during the current reporting period.

**Table 1: Facilities with Incomplete Central Line-Associated Bloodstream Infection (CLABSI) Data for the Reporting Period January–December 2010**

Facility	Missing Data		Reason for Missing Data
	From	To	
None	N/A	N/A	N/A

### **Data Validation**

Data reported to NHSN are validated using several methods:

Point-of-entry checks – NHSN is a web-based data reporting and submission program that includes validation routines for many data elements, thus reducing common data entry errors. Hospitals can view, edit, and analyze their data at any time.

Monthly checks for internal consistency – Each month, TDH staff download CLABSI data from NHSN and verify completeness with a computerized data validation program. Data that are missing, unusual, inconsistent, or duplicative are identified and investigated through email or telephone communication with hospital staff. Hospitals are given the opportunity to verify and/or correct the data. This process has not yet been implemented for SSI data.

On-site CLABSI audits – Audits of a sample of medical records were conducted by TDH to assess compliance with reporting requirements. Onsite visits were conducted by HAI program staff in 14 reporting hospitals in 2009 and in 30 hospitals in 2010-11. These visits consist of reviewing medical charts from adult, pediatric, and neonatal ICUs. The purposes of the audits were to:

- Enhance reliability and consistency in applying NHSN surveillance definitions
- Evaluate the adequacy of surveillance methods to detect infections
- Evaluate intervention strategies designed to reduce or eliminate specific infections
- Discuss identified inconsistencies and allow hospitals to modify records as needed

Ongoing monitoring, education, and trainings are provided to ensure integrity of the data. Some facilities also conduct their own validation studies.

## **Thresholds for Reporting Hospital-Specific Infection Rates**

Only hospitals that provide ICU care and have an average daily census of at least 25 inpatients were required to report CLABSIs since 2008. Hospital ICUs with very few patients with central lines will have infection rates that may fluctuate greatly over time. Even a few infections will yield a numerically high rate when the denominator of central lines is small. To ensure a fair and representative set of data, TDH adopted the NHSN minimum thresholds for reporting. The minimum thresholds are:

- For CLABSI rates, there must be a minimum of 50 central line-days over a 12-month period. Central line-days are the total number of days that central lines are used for patients in an ICU over a given period of time.
- For the calculation of a facility-wide standard infection ratio (SIR) based on all reporting ICUs, there must be a minimum of 50 central line-days in these ICUs combined over a 12-month period.

Additionally, CLABSI SIR key percentiles are not reported for ICU types with fewer than five ICUs reporting (e.g., major teaching medical ICUs).

## **Risk Adjustment**

Risk adjustment is a statistical technique that allows hospitals to be more fairly compared by accounting for differences in patient populations in terms of severity of illness and other factors that may affect the risk of developing a HAI. A hospital that performs a large number of complex procedures on very sick patients would be expected to have a higher infection rate than a hospital that performs more routine procedures on healthier patients. Therefore, before comparing the infection rates of hospitals, it is important to adjust for the number and proportion of high- and low-risk patients. Different risk adjustment methods are used for different types of HAIs (e.g., CLABSIs and SSIs).

For adult and pediatric patients with central lines, risk adjustment is limited to the type of intensive care unit; hospital type and unit bed size are used to categorize ICUs in some instances. Additional information, including birth weight category ( $\leq 750$  g, 751-1000 g, 1001-1500 g, 1501-2500 g,  $>2500$  g) and line type (central or umbilical), are used for risk adjustment in neonates and infants.

For individuals undergoing surgical procedures, risk adjustment is based on the surgical patient's risk index score. The score ranges from 0 to 3 and indicates the number of risk factors present among the following:

- A patient with an American Society of Anesthesiologists' physical status classification score of 3, 4, or 5
- An operation classified as contaminated or dirty infected
- An operation lasting longer than the duration cut point in minutes, where the duration cut point is the approximate 75<sup>th</sup> percentile of the duration of surgery in minutes for the operative procedure. The cut point is 301 minutes for CBGB procedures and 286 minutes for CBGC procedures.

The SSI risk adjustment procedure used in Tennessee's HAI reports will change once CDC publishes the logistic regression model for calculating standardized infection ratios for SSIs.

Tennessee State and National Comparisons - CLABSI

This report displays Tennessee CLABSI data for 2008-10. For comparison, baseline national data were obtained from the National Healthcare Safety Network (NHSN) report that covered the period of 2006 through 2008 (available at <http://www.cdc.gov/nhsn/PDFs/dataStat/2009NHSNReport.pdf>). The CDC modified definitions as of January 1, 2008, and used the new definitions and methods of analysis for their 2006-2007 report onward. The CDC definition of a CLABSI event no longer includes situations in which a single blood culture was positive for a common skin contaminant even if antibiotic therapy was started. Therefore, although the time periods of the data differ, the analyses and methods used are consistent. Additionally, because CDC discontinued the use of clinical sepsis (CSEP) CLABSI criteria for NICUs in January 2010, national baseline NICU data for this report were adjusted by subtracting any CLABSIs meeting the CSEP criteria (see Tables 17-18 of the NHSN report referenced above).

CLABSI rates must be stratified by location type to be risk-adjusted. This scientifically sound risk-adjustment strategy creates a practical challenge to summarizing this information nationally, regionally, or even for an individual healthcare facility. For instance, when comparing CLABSI rates, there may be a number of different types of locations for which CLABSI rates could be reported. In neonatal ICUs, data are further stratified by birth weight category and line type. This stratification creates the need for a method of combining CLABSI rate data across different risk strata to facilitate data interpretation and comparisons.

Tennessee rates were compared to national rates using the same statistical tests implemented in NHSN for comparing hospital rates to national rates within risk categories. CLABSI rates are based on the Poisson distribution. We used the standardized infection ratio (SIR) as a summary measure to compare pooled mean CLABSI rates in adult, pediatric, and neonatal ICUs in Tennessee to published national (NHSN) rates for 2006-8 for each ICU type. The SIR is identical in concept to a standardized mortality ratio and is an indirect standardization method for summarizing the HAI experience across any number of stratified groups of data.

The CLABSI SIR calculation is based on dividing the total number of observed CLABSI events by the predicted\* number of CLABSIs, using the CLABSI rates from the standard population (in this case, national NHSN 2006-8 data). This predicted number, which can also be understood as a projection, is calculated by multiplying the national CLABSI rate from the standard population by the observed number of central line-days (CLD) for each stratum. When the  $SIR = 1$ , the healthcare facility's ICUs had the same CLABSI rate as the national average (pooled mean) rate. A  $SIR > 1$  implies the facility is experiencing more CLABSIs than predicted; a  $SIR < 1$  means the facility is experiencing fewer infections than predicted.

CLABSI SIRs were calculated for each ICU type, each facility, each Grand Division (West, Middle, and East), all adult/pediatric ICUs in Tennessee, and all NICUs in Tennessee compared to national NHSN data. In calculating SIRs for neonatal ICUs, birth weight category and line type (central or umbilical) were also taken into account. The SIR for each facility was calculated separately for data adult/pediatric ICUs and neonatal ICUs. This calculation provides a single risk-adjusted summary measure for each hospital across all ICU types.

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\* "Predicted" is used throughout the report as a synonym for the standard statistical term "expected".

**Tennessee's Report on Healthcare-Associated Infections: Jan. 1, 2008 - Dec. 31, 2010**

The following table illustrates the method of calculating an SIR across two risk strata (two ICU types: medical cardiac and medical-surgical) for which national data exist from NHSN. If the observed data represented a follow-up period such as 2010, one would state that an SIR of 0.77 implies that there was a 23% reduction in CLABSIs overall for the nation, region, or facility.

Risk Group Stratifier	Observed CLABSI Rates			NHSN CLABSI Rates for 2006-2007 (Standard Population)		
	#CLABSI	#Central line-days	CLABSI rate *	#CLABSI	#Central line-days	CLABSI rate *
Medical cardiac ICU	170	100,000	1.7	1260	600,000	2.1
Med-Surg ICU	58	58,000	1.0	600	400,000	1.5
$\text{SIR} = \frac{\text{observed}}{\text{expected}} = \frac{170 + 58}{100000 \times \left(\frac{2.1}{1000}\right) + 58,000 \times \left(\frac{1.5}{1000}\right)} = \frac{228}{210 + 87} = \frac{228}{297} = 0.77$						

In summary, to calculate the Standardized Infection Ratio (SIR) for a facility:

1. For each reporting ICU, multiply the number of central line-days (CLD) by the published national infection rate for that ICU type to estimate the number of infections predicted (expected) for that ICU if it were to produce CLABSIs at the same frequency as the national rate (CLD x national rate / 1000).
2. Within each hospital, calculate the sum of predicted (expected) infections and the sum of reported infections across all reporting ICUs.
3. Calculate SIR = total reported infections/total predicted (expected) infections.<sup>1</sup>

The SIR concept and calculation are based on the underlying CLABSI rate data that exist across a potentially large number of strata. Thus, the SIR provides a single metric for performing comparisons as an alternative to the cumbersome task of performing multiple comparisons across many strata. Given the underlying CLABSI rate data, one retains the option to perform comparisons within a particular set of strata where observed rates may differ significantly from the rates in the standard population. These more detailed comparisons can be very useful and necessary for identifying areas needing more focused prevention efforts.

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Tennessee State and National Comparisons - SSI

This report displays CBGB and CBGC SSI data for Tennessee during 2009. For comparison, baseline national data were obtained from the National Healthcare Safety Network (NHSN) report that covered the period of 2006 through 2008 (available at <http://www.cdc.gov/nhsn/PDFs/dataStat/2009NHSNReport.pdf>).

SSI rates are calculated as follows:

$$\text{SSI Rate} = \frac{\text{Number of SSI reported}}{\text{Number of procedures reported}} * 100$$

SSI rates are stratified by risk index, as discussed on p. 15.

**Calculation of Exact Confidence Interval of the SIR<sup>2</sup>:**

**Rationale**

Confidence intervals are frequently required in epidemiology, particularly in relation to standardized infection ratios (SIRs). The SIR is the ratio of the observed number of infections, usually assumed to be the realization of a Poisson variate, to the predicted number of infections, which is assumed to be a constant. The predicted number is assumed to be a constant because the reference rates are usually based on a very large number of persons, so that variation in these rates can be ignored. For a larger number of observed infections, several approximation methods are available. When the number of infections is small, however, all of the approximation methods will be inadequate, and exact confidence limits may be desirable.

**Exact Test**

Exact confidence limits for a SIR can be derived by setting limits for the numerator and assuming the expected number in the denominator to be a constant. The limits for 'a' with 100(1- $\alpha$ ) percent confidence are the iterative solutions  $\underline{a}$  and  $\bar{a}$ .

Computations for the iterative solutions  $\underline{a}$  and  $\bar{a}$  are below.

**Fisher's Exact Test**

Lower bound: 
$$\sum_{k=0}^a \frac{e^{-a} a^k}{k!} = 1 - \alpha/2$$

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<sup>2</sup> Rothman KJ, Boice JD Jr: Epidemiologic analysis with a programmable calculator. NIH Pub No. 79-1649. Bethesda, MD: National Institutes of Health, 1979;31-32.

Upper bound:  $\sum_{t=0}^{\infty} \frac{e^{-\lambda t} a^t}{t!} = a/\lambda$

Therefore, the exact lower and upper limits for SIR equal to “ $a/\lambda$ ” would be

$\frac{a}{\lambda}$  and  $\frac{a}{\lambda}$ , respectively.

The notation for the formulae is:

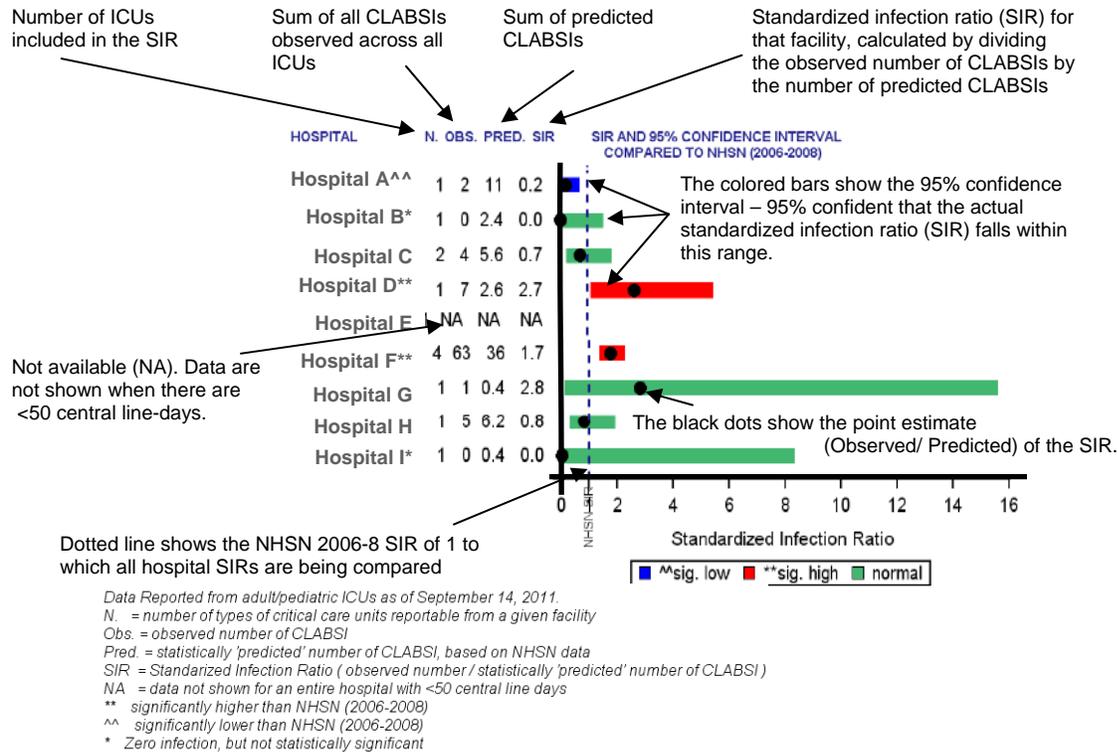
$a$  = the observed number of infections

$\lambda$  = the expected number of infections

In this report, statistical analyses were performed using SAS version 9.2. Tables and figures were created using SAS version 9.2 and/or Microsoft Excel.

Figures 1 and 2 demonstrate how the figures pertaining to facility-specific standardized infection ratios (SIRs) and infection rates should be interpreted in this report.

**Figure 1: How to Read Hospital-Specific Standardized Infection Ratio Figures**

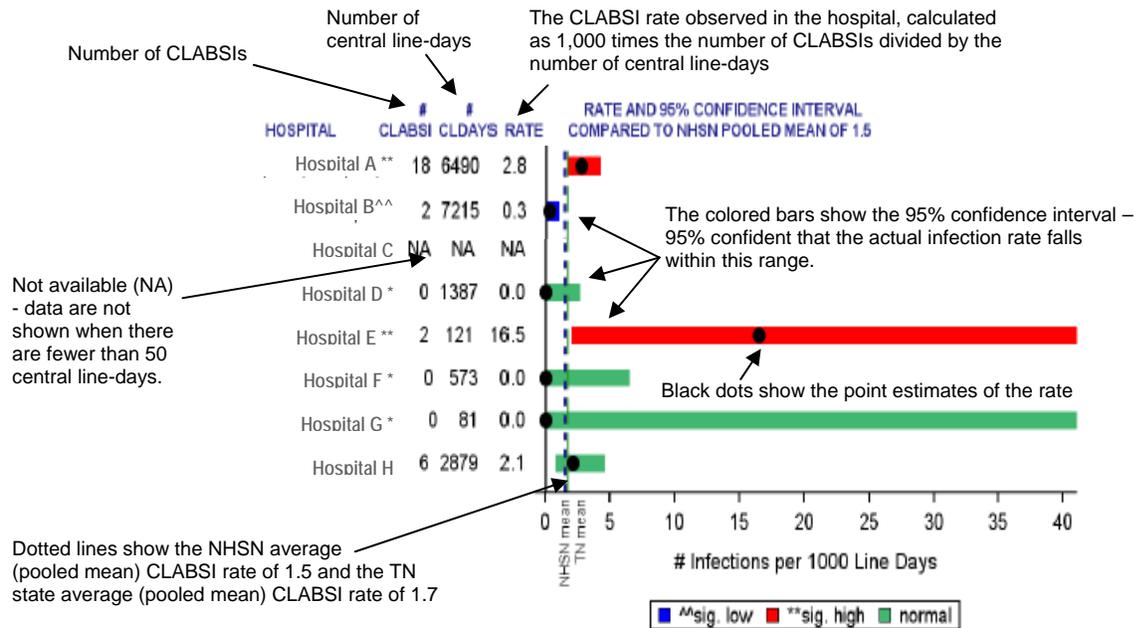


- Hospital A reported CLABSIs from one ICU (N=1). This facility had a total of two CLABSIs in 2010 (OBS). Statistically, 11 CLABSIs were predicted (PRED) during that time, based on the number of central line-days in Hospital A's ICU and the national NHSN rate for that type of ICU (e.g., medical-surgical). The standardized infection ratio (SIR) is 0.2. Thus, the number of infections observed was 20% of what was predicted. This result was statistically significant, as the blue bar did not cross the dotted line at 1, the NHSN 2006-8 reference SIR. The 95% confidence interval is indicated by the width of the blue bar. The 95% confidence interval for hospital A is narrow, probably due to a large number of central line-days.
- Hospital B reported CLABSIs from one ICU (N=1). They totaled zero CLABSIs in 2009 (OBS). Statistically, two CLABSIs were predicted (PRED) during that time, based on the number of central line-days in that ICU and the national rate for that type of ICU. The standardized infection ratio (SIR) is 0, but the green bar indicates that the 95% confidence interval crosses the dotted line. Therefore, the observed number of CLABSIs is not statistically significantly lower than the predicted number based on national rates. All hospitals reporting zero observed infections (and that consequently have an SIR of zero) are noted with a star (\*) because they deserve acknowledgement for achieving zero infections.
- Hospital C has two ICUs (N=2) and reported four infections (5.6 were predicted). Their SIR

point estimate was 0.7, meaning this facility's CLABSI rate was 30% below the national average. However, the green bar crosses the dotted line (national SIR of 1), which indicates that the point estimate was not statistically significantly lower than the national SIR.

- Hospital D has one ICU (N=1) and observed seven CLABSIs (2.6 were predicted). The SIR was 2.7, and the red bar was above the dotted line. The CLABSI rates in Hospital D were 2.7 times (170%) higher than national rates. Although this hospital's SIR was significantly higher than the national SIR (the confidence interval does not cross the dotted line), the wide confidence interval indicates that this SIR is not very stable (it could be as low as 1.5 and as high as 5.5). Hospital D probably has a small number of central line-days.
- Hospital E reported less than 50 central line-days. Hospital E's data are not shown because the SIR is not stable with such a small denominator.
- Hospital F has four ICUs (N=4), and observed 63 CLABSIs across the ICUs during the reporting period. A total of 36 CLABSIs were predicted based on national data. The SIR was 1.7, meaning that Hospital F an infection rate that was 70% higher than the national average. The red bar does not cross the dotted line; thus, the SIR is significantly higher than the national SIR. Because the confidence interval is very narrow, the SIR is stable and we can be more confident in its measurement.
- Hospital G reported one CLABSI from one ICU (N=1). There were 0.4 infections predicted, and the SIR was 2.8 (180% higher than the national average — the highest of any of the hospitals in this figure). However, the green bar crosses the dotted line and is very wide, so we cannot be very confident in the accuracy of this SIR point estimate. Hospital G's SIR is not significantly higher than the national SIR.
- Hospital H reported five CLABSIs from one ICU (N=1). There were 6.2 infections predicted, and the SIR was 0.8. Because the green bar crosses the dotted line, this hospital's SIR is not significantly lower than the national SIR.
- Hospital I reported zero CLABSIs from its one ICU (N=1). There were 0.4 infections predicted, and the SIR was zero. However, the green bar crosses the dotted line. This means that we cannot be certain that this hospital would have continued to have zero infections if there were more central line-days. All hospitals observing zero infections (and consequently have an SIR of zero) receive a star (\*) because they deserve acknowledgement for achieving zero infections.

**Figure 2: How to Read Hospital-Specific Infection Rate Figures**



Data Reported as of September 14, 2011.  
 \*\* significantly higher than NHSN pooled mean  
 ^^ significantly lower than NHSN pooled mean  
 \* Zero infections, not statistically significant  
 NA Rates are not shown in critical care units with <50 central line days.  
 NHSN pooled mean(2006-2008)=1.5; TN pooled mean(01/01/2010 - 12/31/2010)=1.5

- Hospital A had a CLABSI rate of 2.8 per 1,000 central line-days. This infection rate is significantly higher than the national pooled mean (average) rate, graphically represented by the red bar falling entirely above the dotted line representing the national NHSN pooled mean of 1.5 CLABSIs per 1,000 central line-days. The 95% confidence interval is narrow because there were a large number of central line-days (6,490). A narrow confidence interval implies that the rate is stable, and we can be more confident in the rate measurement.
- Hospital B had a rate of 0.3 CLABSIs per 1,000 central line-days, which is significantly lower than the national pooled mean (i.e., the blue bar is entirely below the dotted line representing the national pooled mean of 1.5 CLABSIs per 1,000 central line-days). The 95% confidence interval is very narrow because of a large number of central line-days (7,215). A narrow confidence interval implies that the rate is stable, and we can be more confident in the rate measurement.
- Hospital C data are not shown because there were fewer than 50 central line-days; therefore, the rate is not stable.
- Hospital D had zero CLABSIs, but the rate was not significantly lower than the national pooled mean because the green bar crosses the dotted line. The hospital had 1,387 central line-days, but we cannot be certain that the hospital would have observed zero infections if they had more central line-days. All hospitals observing zero infections receive a star (\*) because they deserve acknowledgement for achieving zero infections.

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- Hospital E had the highest infection rate (16.5 CLABSIs per 1,000 central line-days), which was significantly higher than the national pooled mean because the red bar falls entirely above the dotted line. The confidence interval is wide because there were few central line-days (121).
- Hospital F had zero CLABSIs, but the rate was not statistically lower than the national pooled mean because the green bar crosses the dotted line. The hospital had 573 central line-days, and we cannot be certain the hospital would have seen zero infections if they had more central line-days. All hospitals observing zero infections receive a star (\*) because they deserve acknowledgement for achieving zero infections.
- Hospital G had zero CLABSIs, but the rate was not significantly lower than the national pooled mean because the green bar crosses the dotted line. The hospital only had 81 central line-days, and we cannot be certain the hospital would have seen zero infections if they had more central line-days. The 95% confidence interval is very wide because there were very few central line-days. All hospitals observing zero infections receive a star (\*) because they deserve acknowledgement for achieving zero infections.
- Hospital H had the third highest infection rate (2.1 CLABSIs per 1,000 central line-days), but the rate was not significantly higher than the national pooled mean because the green bar crosses the dotted line. The 95% confidence interval is narrow because there were a large number of central line-days (2,879). A narrow confidence interval implies that the rate is stable, and we can be more confident in the rate measurement.

## RESULTS

### CLABSIs in Adult/Pediatric ICUs:

**Total number of adult/pediatric ICUs participating in this reporting period: 134**

### **Microorganisms Associated with CLABSIs in Adult and Pediatric ICUs (Table 2, Figure 9)**

- The most common microorganisms identified in adult/pediatric ICU-related CLABSIs were *Enterococcus* species (20.5%), *Candida* species and other yeasts (19.6%), coagulase-negative *Staphylococcus* species (18.9%), and *Staphylococcus aureus* (14.3%). MRSA accounted for 9.1% of organisms identified from CLABSIs, while VRE accounted for 8.1% of total positive isolates.

### **Tennessee and National Comparisons:**

#### **Key Percentiles for Tennessee SIRs (Tables 3–5, Figure 4)**

- Excluding burn and trauma ICUs, the overall SIR across all reporting adult and pediatric ICUs in Tennessee in 2010 was statistically significantly lower than the national SIR of 1 (SIR=0.78; 95% CI: 0.70–0.86). This SIR means that overall CLABSI rates in ICUs were 22% lower in Tennessee in 2010 compared to national NHSN 2006-8 rates. The overall Tennessee SIR for 2010 was lower than the overall SIRs for 2008 and 2009.
- Including burn and trauma ICUs, the overall SIR across all reporting adult and pediatric ICUs in Tennessee in 2010 was statistically significantly lower than the national SIR of 1 (SIR=0.82; 95% CI: 0.74–0.90). This SIR means that overall CLABSI rates in ICUs were 18% lower in Tennessee in 2010 compared to national NHSN 2006-8 rates. The overall Tennessee SIR for 2010 was lower than the overall SIRs for 2008 and 2009.
- In 2010, the median (50<sup>th</sup> percentile) facility-specific SIR was 0.45, indicating that half of all reporting Tennessee hospitals had a SIR at or below 0.45. This value is lower compared to the median in 2009, when 50% of reporting hospitals had a SIR at or below 0.69, and in 2008, when 50% of reporting hospitals had a SIR at or below 0.93. During 2008-10, at least 25% of reporting hospitals had a SIR of 0.
- In 2010, Tennessee CLABSI rates were significantly higher than 2006-8 national rates in burn ICUs (SIR=1.91; 95% CI: 1.17–2.96). This means that CLABSI rates in burn ICUs in Tennessee were 91% higher than the published national rate. Medical ICUs in non-major teaching hospitals, neurosurgical ICUs, pediatric medical-surgical ICUs, and surgical ICUs had 2010 CLABSI rates that were significantly lower than national 2006-8 rates (respectively: SIR=0.71, 95% CI: 0.49–0.99; SIR=0.63, 95% CI: 0.38–0.99; SIR=0.52, 95% CI: 0.32–0.80; SIR=0.49, 95% CI: 0.32–0.72).
- From 2008 to 2010, median unit-specific SIRs decreased among medical cardiac ICUs (1.16 to 0.36), medical ICUs in major teaching hospitals (1.13 to 0.67), medical-surgical ICUs with >15 beds (0.89 to 0.60), neurosurgical ICUs (0.91 to 0.42), pediatric medical-surgical ICUs (1.02 to 0.51), surgical cardiothoracic ICUs (1.03 to 0.55), and surgical ICUs (0.88 to 0.31).

**Rates and SIRs by Unit Type (Table 6, Figure 3–4)**

- The following list summarizes the CLABSI rates per 1,000 central line-days in Tennessee for 2010. CLABSI rates were highest in burn ICUs and lowest among surgical cardiothoracic ICUs:
  - Burn (10.5)
  - Trauma (3.6)
  - Pediatric surgical cardiothoracic (3.3)
  - Major teaching medical (3.1)
  - Major teaching medical-surgical (2.0)
  - Neurosurgical (1.6)
  - Non-major teaching medical-surgical with  $\leq 15$  beds (1.5)
  - Pediatric medical-surgical (1.5)
  - Medical cardiac (1.3)
  - Non-major teaching medical (1.3)
  - Non-major teaching medical-surgical with  $> 15$  beds (1.3)
  - Surgical (1.1)
  - Surgical cardiothoracic (1.0)
- From 2009 to 2010, infection rates decreased among medical cardiac ICUs (2.6 to 1.3), surgical cardiothoracic ICUs (1.6 to 1.0), major teaching medical ICUs (7.0 to 3.1), non-major teaching medical ICUs (1.9 to 1.3), major teaching medical-surgical ICUs (2.9 to 2.0), non-major teaching medical-surgical ICUs with  $\leq 15$  beds (1.6 to 1.5), non-major teaching medical-surgical ICUs with  $> 15$  beds (1.6 to 1.3), pediatric medical-surgical ICUs (3.0 to 1.5), neurosurgical ICUs (1.9 to 1.6), and surgical ICUs (2.3 to 1.1).

**SIRs by Six-Month Reporting Interval and Unit Type (Table 7, Figure 5)**

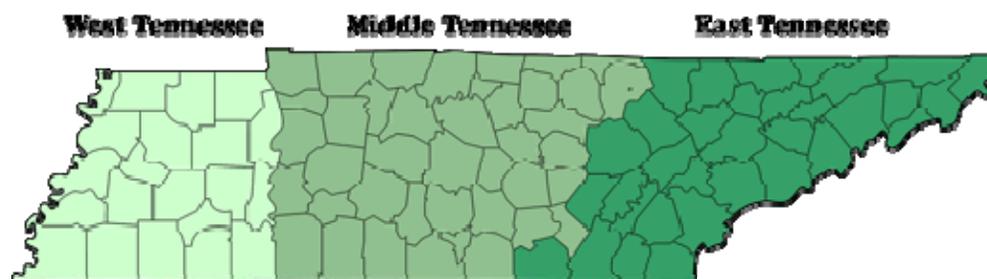
- The overall CLABSI SIR in Tennessee went from being no different from the national 2006–8 SIR of 1 in January–June 2008 (SIR=1.11; 95% CI: 0.97–1.26) to being significantly lower than 1 in July–December 2010 (excluding burn and trauma ICUs, SIR=0.66; 95% CI: 0.56–0.78). From January–June 2009 to July–December 2010, CLABSI SIRs decreased in all ICU types for which 2009 data were available.

**SIRs by Quarter (Figure 6)**

- From January–March 2008 to October–December 2010, the overall CLABSI SIR in Tennessee decreased from 1.12 to 0.56, with most of the reduction in the SIR occurring after the third quarter of 2009. The U.S. Department of Health and Human Services' *Action Plan to Prevent Healthcare-Associated Infections* gives a five-year prevention target of SIR = 0.5.

### Rates and SIRs by Unit Type and Grand Division (Table 8, Figure 7)

The following map depicts the three grand divisions in Tennessee:



- CLABSI rates varied in ICU settings across the three grand divisions of Tennessee.
- CLABSI rates per 1,000 central line-days were significantly lower in:
  - West Tennessee among medical cardiac ICUs [0.4 vs. 2.0; SIR=0.18 (0.00–0.98); 82% lower than the national 2006-8 rate] and neurosurgical ICUs [0.8 vs. 2.3; SIR=0.34 (0.09–0.87); 66% lower than the national 2006-8 rate]
  - East Tennessee among surgical ICUs [0.6 vs. 2.3; SIR=0.25 (0.08–0.58); 75% lower than the national 2006-8 rate]
- CLABSI rates were significantly higher in:
  - Middle Tennessee among medical ICUs in major teaching hospitals [5.1 vs. 2.6; SIR=1.97 (1.30–2.86); 97% higher than national 2006-8 rates]
- Overall CLABSI SIRs for adult and pediatric ICUs in West and East Tennessee were significantly lower than the national 2006-8 SIR of 1. The overall SIRs and 95% confidence intervals by Grand Division are as follows:
  - East Tennessee: 0.65 (0.53–0.80)
  - Middle Tennessee: 0.92 (0.78–1.09)
  - West Tennessee: 0.74 (0.60–0.91)

### Device Utilization by Unit Type (Figure 8)

- DU ratios in Tennessee in 2010 were higher than national 2006-8 ratios among burn ICUs, medical cardiac ICUs, pediatric medical-surgical ICUs, and pediatric surgical cardiothoracic ICUs.
- DU ratios in Tennessee in 2010 were lower than national 2006-8 ratios among surgical cardiothoracic ICUs and medical-surgical ICUs with  $\leq 15$  beds in non-major teaching hospitals.
- From 2009 to 2010, DU ratios in Tennessee decreased slightly in surgical cardiothoracic and neurosurgical ICUs; the DU ratio increased slightly in medical ICUs in major teaching hospitals.

### Overall Facility-Specific SIRs (Figures 10–11)

- One CLABSI SIR that accounts for all reporting ICUs in a given facility is displayed in Figure 10. The bar representing the confidence interval is blue if the CLABSI SIR was

significantly lower than the national SIR of 1 for 2006-8 and red if the CLABSI SIR was significantly higher than 1. Some hospitals have reported zero CLABSIs in specific ICUs, although the SIR may not be statistically significant due to a small number of central line-days.

- **Figure 11** displays one facility-specific SIR per year for 2008–2010, showing each facility's progress toward reducing CLABSI rates.

### **Facility-Specific CLABSI Rates in Adult and Pediatric ICUs (Figures 12–22, Tables 9–19)**

- Facility -specific CLABSI rates are displayed by type of ICU. The bar representing the confidence interval is blue if the CLABSI rate was significantly lower than the national pooled mean rate for 2006-8 and red if the CLABSI rate was significantly higher than the national pooled mean rate. Some hospitals have reported zero CLABSIs in specific ICUs, although the rate may not be statistically significant due to small numbers of patient days and central line-days. The following numbers and percentages of ICUs reported zero infections in 2010 (facilities with <50 line-days excluded) :
  - 3 of 8 medical cardiac ICUs – 38%
  - 0 of 4 major teaching medical ICUs – 0%
  - 6 of 19 non-major teaching medical ICUs – 32%
  - 1 of 10 major teaching medical-surgical ICUs – 10%
  - 20 of 32 non-major teaching medical-surgical ICUs with ≤15 beds – 63%
  - 1 of 16 non-major teaching medical-surgical ICUs with >15 beds – 6%
  - 1 of 7 neurosurgical ICUs – 14%
  - 1 of 7 pediatric medical-surgical ICUs – 14%
  - 0 of 2 pediatric surgical cardiothoracic ICUs – 0%
  - 5 of 15 surgical cardiothoracic ICUs – 33%
  - 4 of 11 surgical ICUs – 36%

### **CLABSIs and UCABSIs in Neonatal ICUs:**

**Total number of Neonatal ICUs (NICUs) participating in this reporting period: 24**

### **Microorganisms Associated with CLABSIs in Neonatal ICUs (Table 20, Figure 36)**

- The most common microorganisms identified in neonatal ICU-related CLABSIs/UCABSIs were coagulase-negative *Staphylococcus* (31.6%), *Staphylococcus aureus* (25.3%), *Enterococcus* species (12.7%), and *Candida* species and other yeasts (10.1%). MRSA accounted for 12.7% of organisms identified from CLABSIs and UCABSIs, while no VRE were identified among the isolates.

### **Tennessee and National Comparisons:**

Note: When comparing data from 2008 with data from 2009 and 2010, please note that only six months of data are available for NICUs in 2008 (July–December).

**Key Percentiles for Tennessee SIRs (Tables 21–22)**

- The overall SIR across all reporting NICUs in Tennessee in 2010 was statistically significantly lower than the national SIR of 1 (SIR=0.69; 95% CI: 0.54–0.86). The overall Tennessee SIR for 2010 was lower than the overall SIRs for 2009 and 2008.
- In 2010, the median (50<sup>th</sup> percentile) facility-specific SIR was 0.43, indicating that half of all reporting Tennessee hospitals had a SIR at or below 0.43. This value is higher than it was in 2009, when 50% of reporting hospitals had a SIR at or below 0.16, but lower than in 2008, in which 50% of reporting hospitals had a SIR at or below 0.76. During 2008–2010, at least 25% of NICUs had a SIR of 0.
- In 2010, the Tennessee CLABSI/UCABSI SIR in level III NICUs was significantly lower than 2006–8 national SIR of 1 (SIR=0.63; 95% CI: 0.47–84). The Tennessee CLABSI/UCABSI SIR in level II/III NICUs was not significantly different from 1 (SIR=0.81; 95% CI: 0.53–1.19). In both level III and level II/III NICUs, the CLABSI/UCABSI SIR decreased from July–December 2008 through 2010.
- From 2008 to 2010, the median unit-specific SIR decreased among level III NICUs (0.95 to 0.61) and remained the same among level II/III NICUs (0.00).

**CLABSI and UCABSI Rates and SIRs by Unit Type and Birth Weight Category (Tables 23 and 26–29, Figures 23–28)**

- Combined CLABSI/UCABSI rates per 1,000 line-days were highest among babies with birth weight  $\leq 750$  g in level II/III NICUs (4.1) and lowest among babies with birth weight  $>2500$  g in level II/III NICUs (0.0). However, neither of these rates was statistically significantly different from national 2006–8 rates.
- Combined CLABSI/UCABSI rates per 1,000 line-days in 2010 were statistically significantly lower than national 2006–8 rates among babies with birth weight 751–1000 g (SIR=0.54; 95% CI: 0.25–0.99) and among babies with birth weight  $>2500$  g (SIR=0.24; 95% CI: 0.03–0.83) in level III NICUs.
- The overall CLABSI SIR for level III NICUs in Tennessee in 2010 was statistically significantly lower than national 2006–8 data (SIR= 0.66; 95% CI: 0.48–0.90). The overall CLABSI SIR for level II/III NICUs in Tennessee in 2010 was not statistically significantly different from national 2006–8 data (SIR= 0.89; 95% CI: 0.53–1.40).
- The overall UCABSI SIR for level III NICUs in Tennessee in 2010 was not significantly different from national 2006–8 data (SIR= 0.49; 95% CI: 0.18–1.06). Likewise, the overall UCABSI SIR for level II/III NICUs in Tennessee in 2010 was not statistically significantly different from national 2006–8 data (SIR= 0.68; 95% CI: 0.29–1.33).
- The CLABSI rate among babies with birth weight  $>2500$  g in level III NICUs was statistically significantly different than the national 2006–8 rate (SIR=0.15, 95% CI: 0.48–0.90). UCABSI rates in 2010 were not significantly different from corresponding national 2006–8 rates in any birth weight category in level III and level II/III NICUs.

**Combined CLABSI/UCABSI SIRs by Six-Month Reporting Interval, Unit Type, and Birth Weight Category (Table 24, Figure 29)**

- In general, NICU CLABSI/UCABSI SIRs decreased consistently over time from July–

December 2008 to July–December 2010.

- From July–December 2008 to July–December 2010, the overall NICU SIR for Tennessee decreased from being significantly greater than 1 (SIR=1.52; 95% CI: 1.23-1.87) to significantly less than 1 (SIR=0.57; 95% CI: 0.39–0.81).
- From January–June 2009 to July–December 2010, the CLABSI/UCABSI SIR decreased among all birth weight categories in both level III and level II/III NICUs.

#### **Combined CLABSI/UCABSI SIRs by Quarter (Figure 30)**

- From July–September 2008 to October–December 2010, the overall CLABSI/UCABSI SIR in Tennessee decreased from 1.63 to 0.50, reaching the U.S. Department of Health and Human Services' *Action Plan to Prevent Healthcare-Associated Infections* five-year prevention target of SIR = 0.5. Apart from an increase in the SIR during the second quarter of 2010, the SIR decreased steadily over time.

#### **Combined CLABSI/UCABSI Rates and SIRs by Unit Type and Grand Division (Table 25, Figure 31)**

- Combined CLABSI/UCABSI rates varied within neonatal ICU settings across the three grand divisions of Tennessee.
- Middle Tennessee was the only Grand Division with a SIR significantly different from 1. Level III neonatal ICUs in this region also had a SIR that was significantly less than 1 (SIR=0.55; 95% CI: 0.31-0.89).
- The overall SIRs and 95% confidence intervals by Grand Division are as follows:
  - East Tennessee: 0.74 (0.48–1.10)
  - Middle Tennessee: 0.53 (0.31–0.85)
  - West Tennessee: 0.76 (0.52–1.07)

#### **Device Utilization by ICU type (Figures 32–35)**

- In level III NICUs in Tennessee, 2010 device utilization (DU) ratios for central lines and umbilical catheters were very similar to national 2006-8 ratios. Differences between 2009 and 2010 DU ratios varied by birth weight category in level III NICUs.
- In level II/III NICUs in Tennessee, 2010 DU ratios for central lines were lower than national 2006-8 ratios. DU ratios for umbilical catheters were similar to national 2006-8 ratios. Differences between 2009 and 2010 DU ratios varied by birth weight category in level II/III NICUs.

#### **Facility-Specific SIRs and Device Utilization Ratios (Figures 37–38, Tables 32-35)**

- One CLABSI/UCABSI SIR per facility is displayed in Figure 37. The bar representing the confidence interval is blue if the CLABSI/UCABSI rate was significantly lower than the national pooled mean rate for 2006-8 and red if the rate was significantly higher than the

national pooled mean rate. Some hospitals have reported zero CLABSIs, although the rate may not be statistically significant due to small numbers of patient days and central line-days.

- **Figure 38** displays one facility-specific SIR per year for 2008–2010, showing each facility's progress toward reducing CLABSI/UCABSI rates.
- Facility-specific CLABSI and UCABSI SIRs and device utilization ratios in neonatal ICUs are displayed by NICU level in **Tables 32–33**. Two level III NICUs had CLABSI SIRs that were significantly less than 1 (highlighted in blue). No other CLABSI or UCABSI SIRs were significantly different from 1.
- The following numbers and percentages of ICUs reported zero infections in 2010 (facilities with <50 line-days excluded):
  - 0 of 7 neonatal level III ICUs – 0%
  - 9 of 16 neonatal level II/III ICUs – 56%

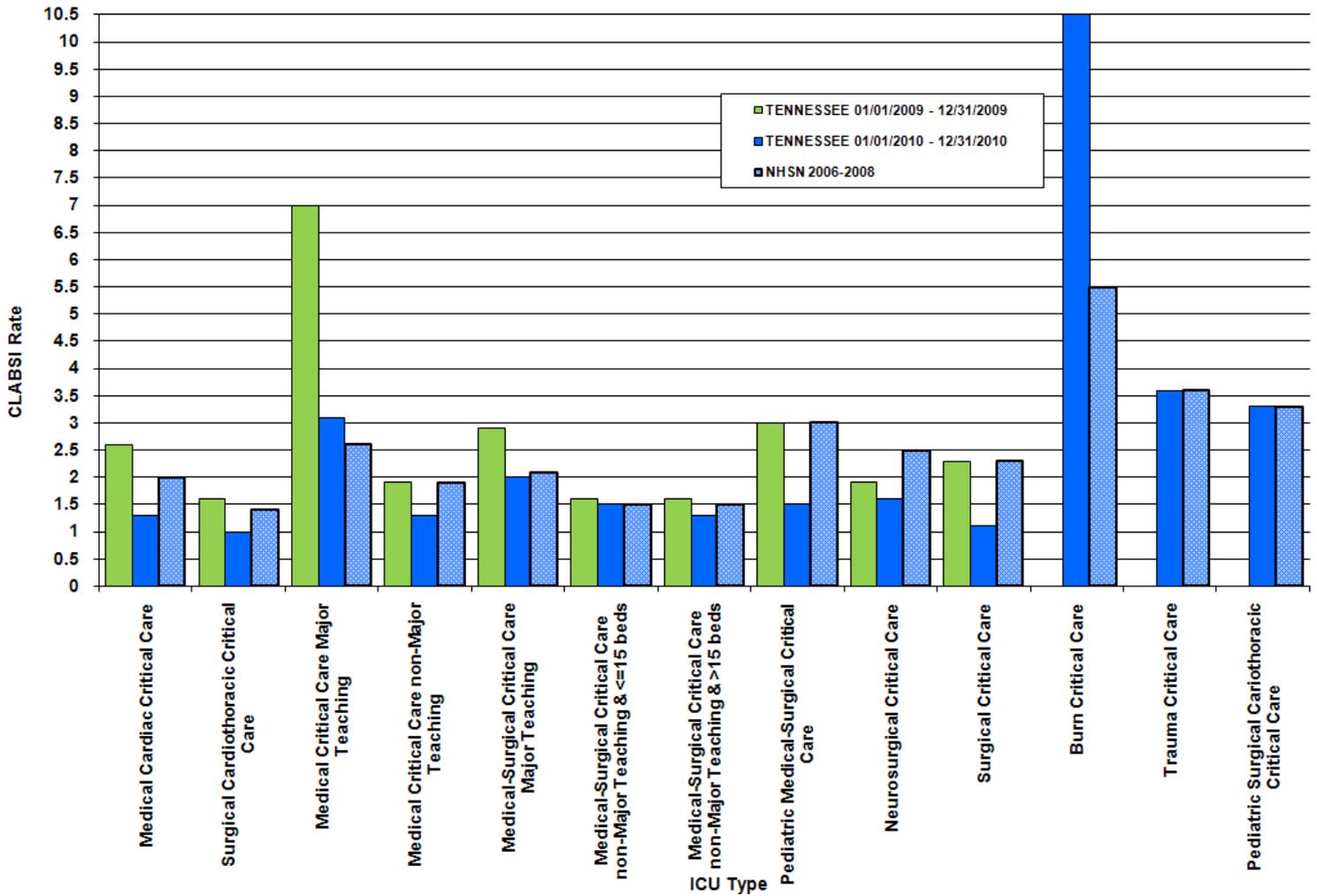
**SSIs Related to CBGB and CBGC Procedures:**

In 2009, Tennessee hospitals reported 7743 coronary artery bypass graft surgeries; 7321 were coronary bypass procedures with chest and donor site incisions (CBGB), and 422 were coronary bypass procedures with chest incision only (CBGC). Among the 7321 CBGBs, 150 surgical site infections were reported. Two infections were reported among the 422 CBGC procedures (Table 34). Of the 152 SSIs, 115 (76%) were associated with a procedure that had a risk category of 1; 37 (24%) were associated with a procedure that had a risk category of 2 (Figure 39). Tennessee's pooled mean SSI rates by risk index were as follows for CBGB procedures: risk category 0 – no SSIs; risk category 1 – 1.92%; risk category 2 – 2.70%; risk category 3 – no SSIs. The pooled mean SSI rates by risk index for CBGC procedures were as follows: risk category 0 or 1 – 0.56%; risk category 2 or 3 – no SSIs (Tables 34-35).

Overall, SSIs were most often superficial primary (34.2%) and least often deep secondary infections (3.3%) (Figure 40). The most common pathogens among total positive isolates were *Staphylococcus aureus* (37.3%) and coagulase-negative *Staphylococcus* species (17.0%) (Table 36, Figure 41). The most common organism identified from deep incisional primary SSIs was *Staphylococcus aureus* (36.8%) (Table 37), while *Klebsiella* spp. (28.6%) were most common among deep incisional secondary SSIs (Table 38). The most common organisms identified from superficial incisional primary SSIs and superficial incisional secondary SSIs were coagulase-negative *Staphylococcus* species (32.6%) and *Staphylococcus aureus* (33.3%), respectively (Tables 39-40). *Staphylococcus aureus* (58.5%) was also cultured most often among organ/space SSIs (Table 41). Overall, SSIs were most often identified upon readmission (69.1%) (Figure 42).

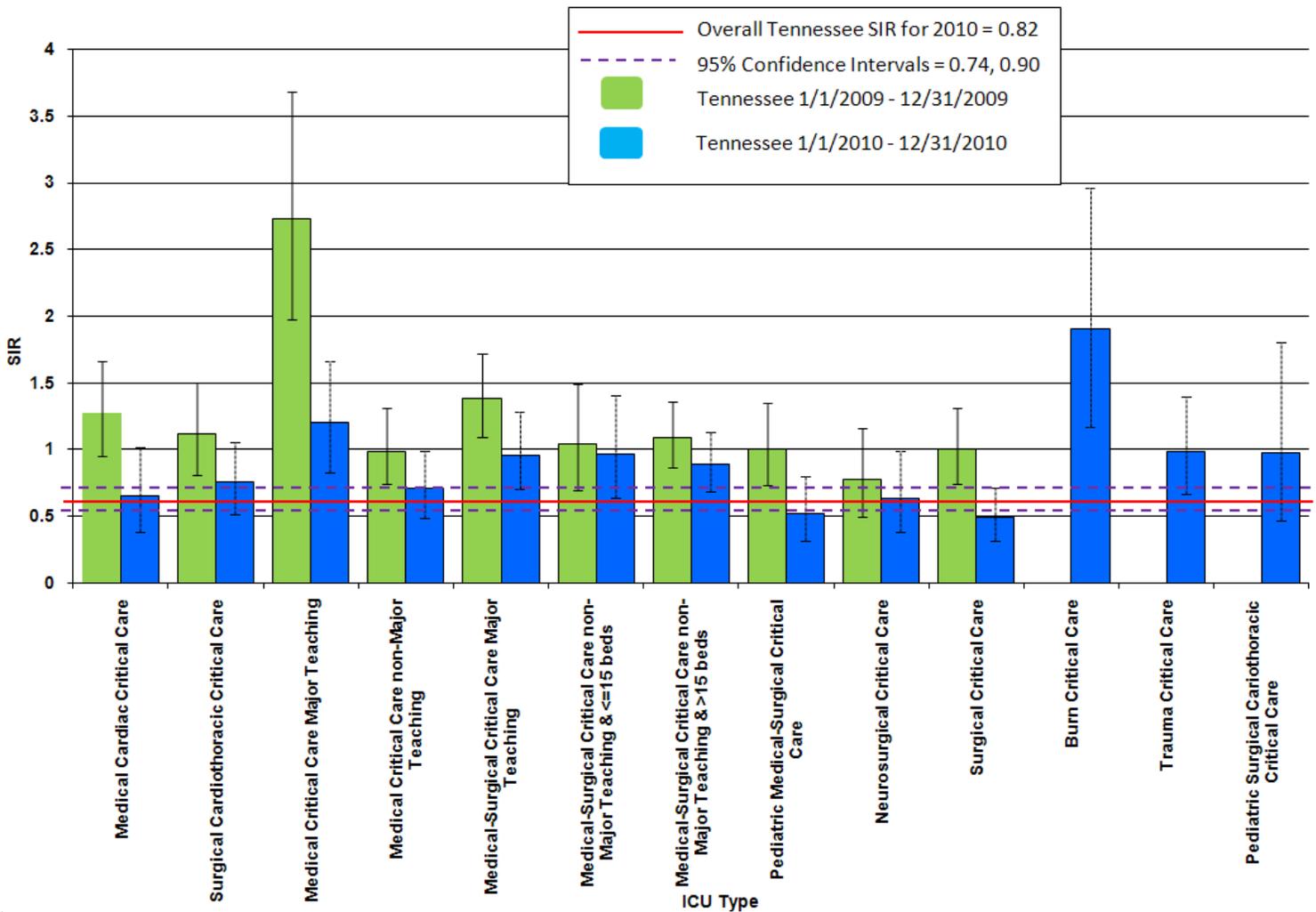
**CLABSI Figures and Tables**  
**Adult and Pediatric Critical Care Units**

**Figure 3: Central Line-Associated Bloodstream Infection (CLABSI) Pooled Mean Rates per 1,000 Central Line Days, Tennessee, 2009 and 2010, vs. National Healthcare Safety Network (NHSN), 2006-8**



**Figure 4: Standardized Infection Ratios (SIR) of Central Line-Associated Bloodstream Infections (CLABSI) by Intensive Care Unit (ICU) Type, Including Burn and Trauma ICUs, Tennessee, 2009 and 2010 [Reference standard: National Healthcare Safety Network (NHSN), 2006-8]**

**Note: Burn and trauma ICU data are available only for July–December 2010**



**Figure 5: Standardized Infection Ratios (SIR) for Central Line-Associated Bloodstream Infections (CLABSIs) by Six-Month Reporting Interval, Excluding Burn and Trauma ICUs, Tennessee, 1/2008–12/2010 [Reference standard: National Healthcare Safety Network (NHSN), 2006-8]**

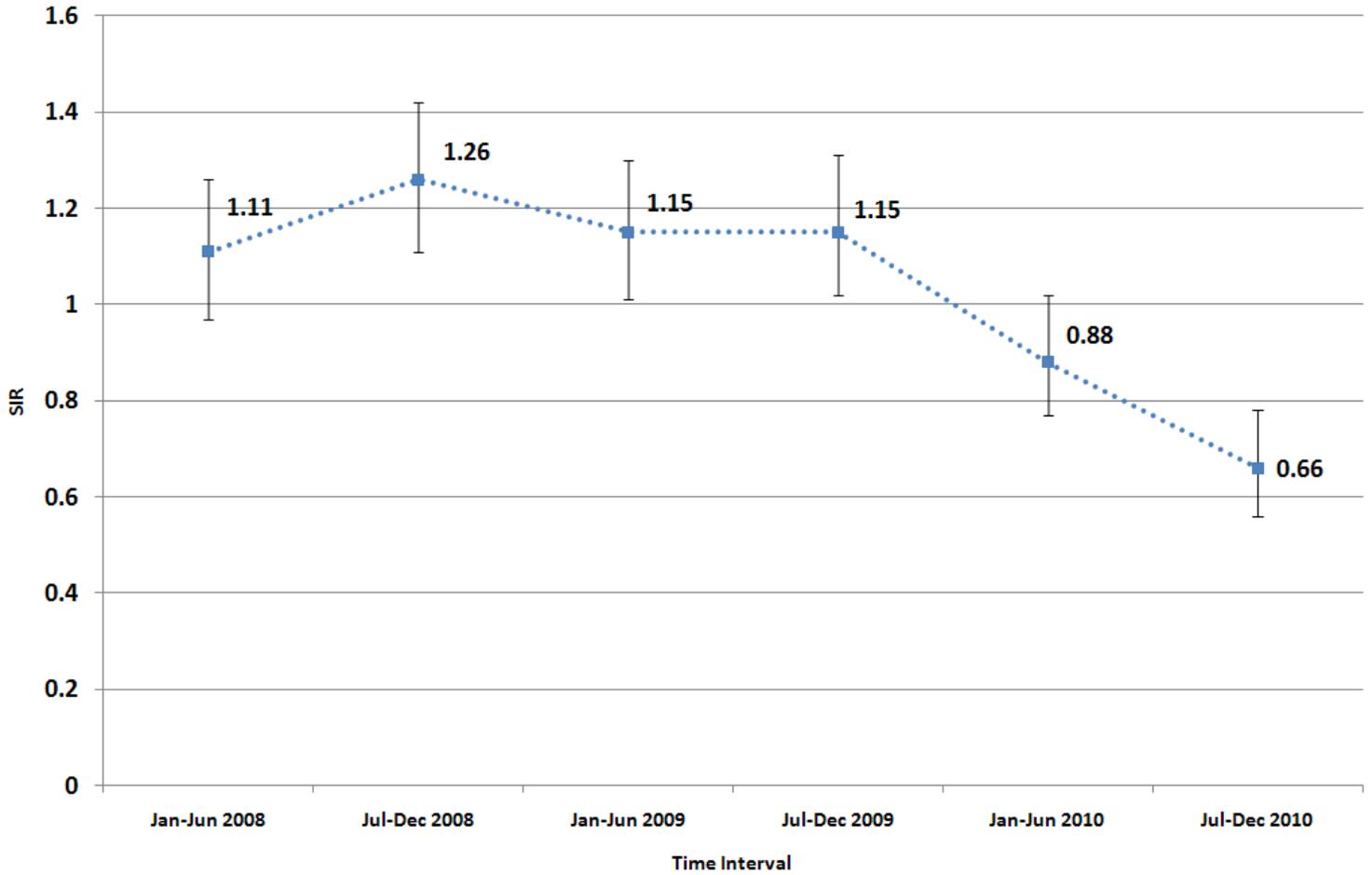
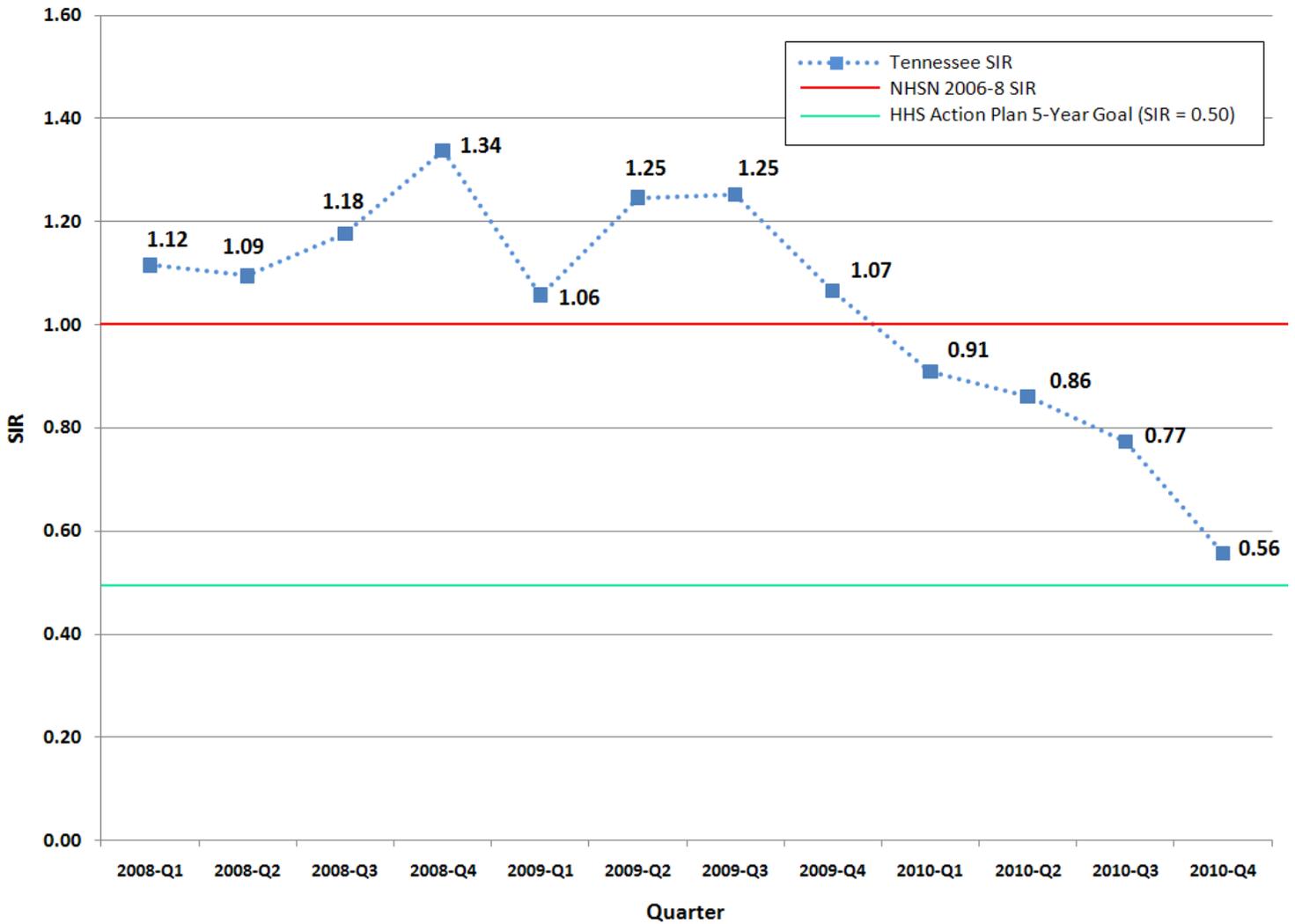


Figure 6: Standardized Infection Ratios (SIR) for Central Line-Associated Bloodstream Infections (CLABSI) by Quarter, Excluding Burn and Trauma ICUs, Tennessee, 1/2008–12/2010 [Reference standard: National Healthcare Safety Network (NHSN), 2006-8]



**Figure 7: Standardized Infection Ratio (SIR) for Central Line-Associated Bloodstream Infections (CLABSI) by ICU Type and Grand Division, Excluding Burn and Trauma ICUs, Tennessee, 1/2010–12/2010 [Reference standard: National Healthcare Safety Network (NHSN), 2006-8]**

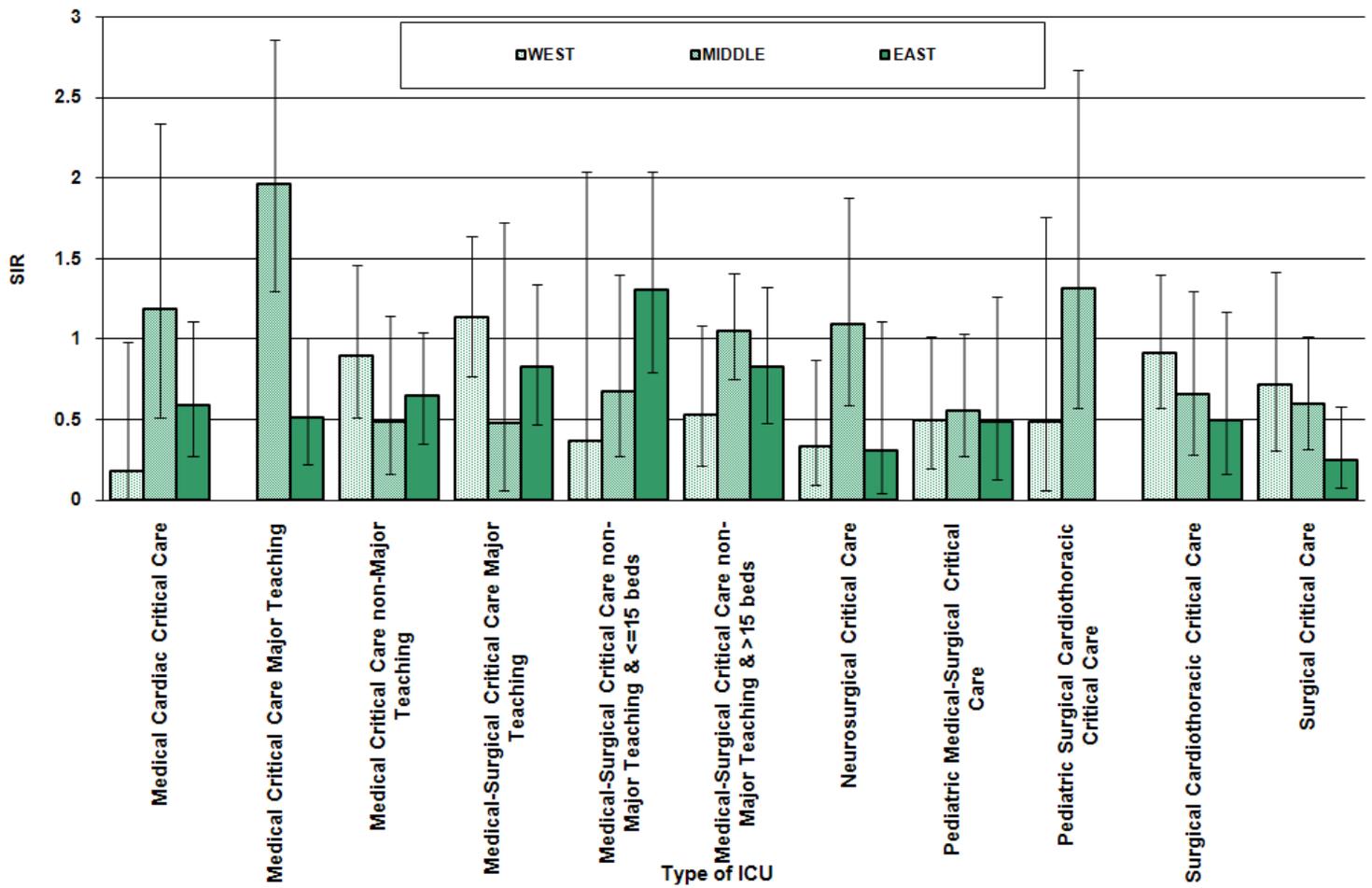
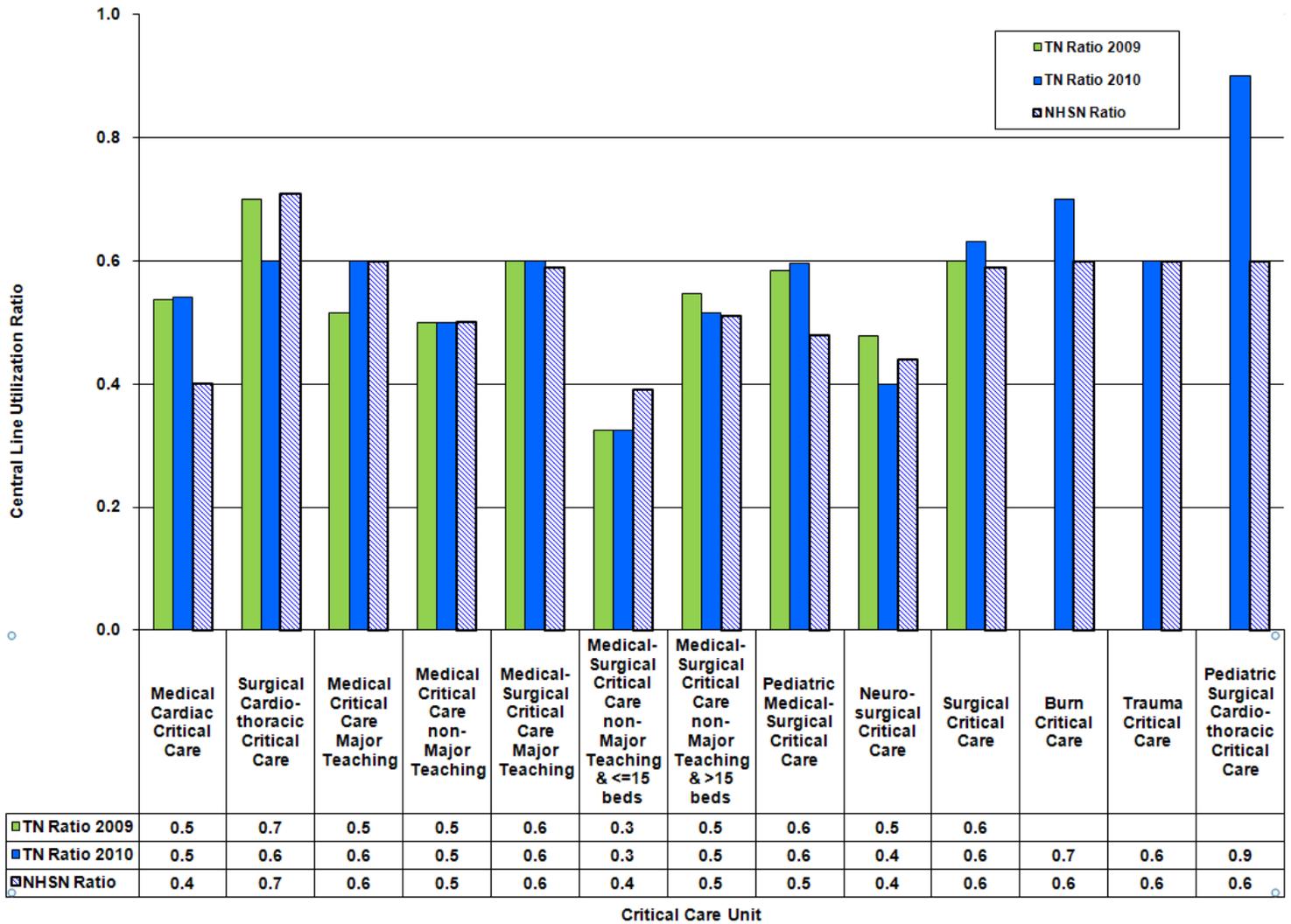
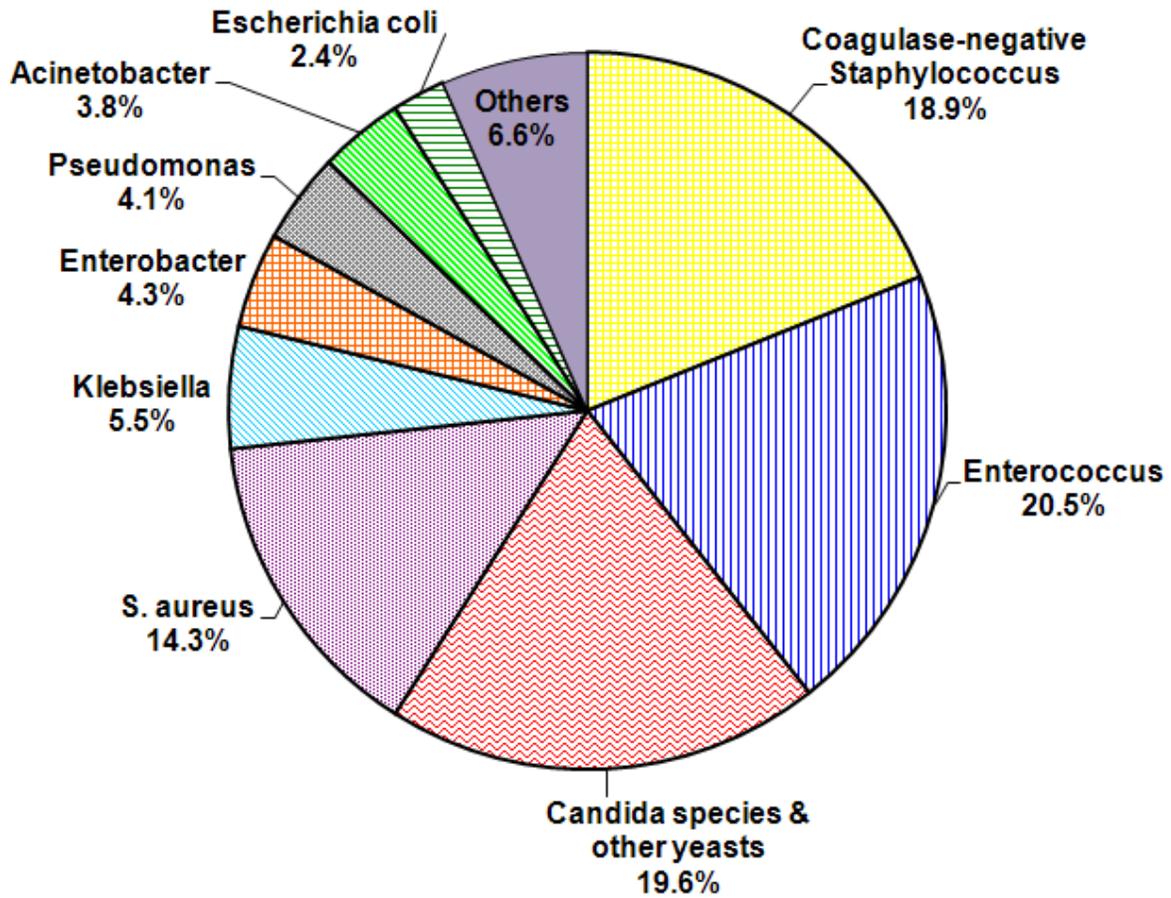


Figure 8: Central Line Utilization Ratio by ICU Type: Tennessee, 2009 and 2010, vs. National Healthcare Safety Network (NHSN), 2006-8



**Figure 9: Organisms Isolated from Central Line-Associated Bloodstream Infections (CLABSIs) in Adult and Pediatric Critical Care Units, Tennessee, 01/01/2010–12/31/2010**

Number of organisms = 419; number of events = 388



**Table 2: Microorganisms Identified in Central Line-Associated Bloodstream Infections (CLABSI) in Adult and Pediatric Critical Care Units, Tennessee, 01/01/2010–12/31/2010**

**Number of organisms = 419; number of events = 388**

<b>Microorganism</b>	<b>Number of Isolates</b>	<b>Percent</b>
<i>Enterococcus</i> species	86	20.5
Vancomycin-resistant <i>Enterococcus</i> (VRE) (% of total positive isolates)	34	(8.1)
<i>Candida</i> species and other yeasts	82	19.6
<i>Candida albicans</i> (% of total positive isolates)	27	(6.4)
Coagulase-negative <i>Staphylococcus</i> species	79	18.9
<i>Staphylococcus aureus</i>	60	14.3
Methicillin-resistant <i>S. aureus</i> (MRSA) (% of total positive isolates)	38	(9.1)
<i>Klebsiella</i> species	23	5.5
<i>Enterobacter</i> species	18	4.3
<i>Pseudomonas</i> species	17	4.1
<i>Acinetobacter</i> species	16	3.8
<i>Escherichia coli</i>	10	2.4
<i>Serratia</i> species	6	1.4
<i>Streptococcus</i> species	6	1.4
<i>Clostridium</i> species	3	0.7
<i>Haemophilus influenzae</i> , not type b	2	0.5
<i>Proteus</i> species	2	0.5
<i>Stenotrophomonas maltophilia</i>	2	0.5
Other pathogens	6	1.4
Other skin contaminants	1	0.2

*Data reported as of September 14, 2011*

*Total number of isolates= 419; Total number of CLABSI events= 388;*

*Other skin contaminants = Bacillus cereus*

*Other pathogens = Bacteroides spp., Gram-negative rod unspecified, Gram-positive rod unspecified, Neisseria spp., Rhodotorula spp., Trichosporon spp.*

Tennessee's Report on Healthcare-Associated Infections: Jan. 1, 2008 - Dec. 31, 2010

**Table 3: Key Percentiles for Facility-Specific Central Line-Associated Bloodstream Infection (CLABSI) Standardized Infection Ratios (SIRs) by Reporting Year, Excluding Burn and Trauma ICUs, Tennessee [Reporting period: 01/01/2008–12/31/2010]**

		SIR, 95% CONFIDENCE INTERVAL, AND KEY PERCENTILES								
STATE	YEAR	No.	SIR	LOWER LIMIT	UPPER LIMIT	10%	25%	50%	75%	90%
Tennessee	2010	80	0.78	0.70	0.86	0.00	0.00	0.45	0.88	1.67
	2009	78	1.15	1.05	1.26	0.00	0.00	0.69	1.30	2.04
	2008	78	1.18	1.08	1.29	0.00	0.00	0.93	1.51	2.65

Data reported as of September 14, 2011

No. = number of facilities with reporting units; SIR = Standardized Infection Ratio (observed number/ statistically 'predicted' number of CLABSI)

NA = not reported if the number of facilities with reporting units is <5

Red highlighting indicates SIR for reporting period is significantly higher than national 2006-2008 SIR of 1.0

Blue highlighting indicates SIR for reporting period is significantly lower than national 2006-2008 SIR of 1.0

**Table 4: Key Percentiles for Facility-Specific Central Line-Associated Bloodstream Infection (CLABSI) Standardized Infection Ratios (SIRs) by Reporting Year, Including Burn and Trauma ICUs, Tennessee [Reporting period: 01/01/2008–12/31/2010]**

		SIR, 95% CONFIDENCE INTERVAL, AND KEY PERCENTILES								
STATE	YEAR	No.	SIR	LOWER LIMIT	UPPER LIMIT	10%	25%	50%	75%	90%
Tennessee	2010	80	0.82	0.74	0.90	0.00	0.00	0.45	0.85	1.67
	2009	78	1.15	1.05	1.26	0.00	0.00	0.69	1.30	2.04
	2008	78	1.18	1.08	1.29	0.00	0.00	0.93	1.51	2.65

Data reported as of September 14, 2011

Includes burn and trauma ICU data for July-December 2010

No. = number of facilities with reporting units; SIR = Standardized Infection Ratio (observed number/ statistically 'predicted' number of CLABSI)

NA = not reported if the number of facilities with reporting units is <5

Red highlighting indicates SIR for reporting period is significantly higher than national 2006-2008 SIR of 1.0

Blue highlighting indicates SIR for reporting period is significantly lower than national 2006-2008 SIR of 1.0

**Tennessee's Report on Healthcare-Associated Infections: Jan. 1, 2008 - Dec. 31, 2010**

**Table 5: Key Percentiles for Unit-Specific Central Line-Associated Bloodstream Infection (CLABSI) Standardized Infection Ratios (SIRs) by Unit Type and Reporting Year, Tennessee [Reporting period: 01/01/2008–12/31/2010]**

CCU TYPE	YEAR	No.	SIR, 95% CONFIDENCE INTERVAL, AND KEY PERCENTILES							
			SIR	LOWER LIMIT	UPPER LIMIT	10%	25%	50%	75%	90%
Burn Critical Care	2010	2	1.91	1.17	2.96	NA	NA	NA	NA	NA
Medical Cardiac Critical Care	2010	8	0.65	0.38	1.02	0.00	0.00	0.36	1.06	2.30
	2009	9	1.27	0.95	1.66	0.00	0.00	1.20	1.56	2.41
	2008	9	1.20	0.89	1.60	0.51	0.79	1.16	1.50	2.59
Medical Critical Care, Major Teaching	2010	4	1.20	0.83	1.66	NA	NA	NA	NA	NA
	2009	2	2.73	1.98	3.68	NA	NA	NA	NA	NA
	2008	2	1.89	1.28	2.70	NA	NA	NA	NA	NA
Medical Critical Care, Non-Major Teaching	2010	19	0.71	0.49	0.99	0.00	0.00	0.49	1.07	1.59
	2009	18	0.99	0.74	1.31	0.00	0.00	0.75	1.52	1.95
	2008	17	0.79	0.56	1.08	0.00	0.17	0.49	1.17	2.68
Medical-Surgical Critical Care, Major Teaching	2010	10	0.96	0.71	1.28	0.10	0.27	0.67	1.09	2.05
	2009	7	1.38	1.09	1.72	0.27	0.31	0.77	1.50	2.85
	2008	7	1.49	1.19	1.83	0.42	1.00	1.13	2.10	2.43
Medical-Surgical Critical Care, Non-Major Teaching & ≤15 beds	2010	34	0.97	0.64	1.41	0.00	0.00	0.00	0.97	2.84
	2009	34	1.04	0.70	1.49	0.00	0.00	0.00	1.26	3.69
	2008	34	0.86	0.56	1.27	0.00	0.00	0.00	1.32	2.57
Medical-Surgical Critical Care, Non-Major Teaching & >15 beds	2010	16	0.89	0.69	1.13	0.27	0.43	0.60	1.11	2.37
	2009	18	1.09	0.87	1.36	0.00	0.27	0.88	1.59	2.63
	2008	18	1.24	1.00	1.52	0.00	0.29	0.89	1.82	2.91
Neurosurgical Critical Care	2010	7	0.63	0.38	0.99	0.00	0.24	0.42	1.09	1.11
	2009	7	0.78	0.50	1.16	0.00	0.43	0.83	1.13	1.80
	2008	7	1.06	0.71	1.51	0.00	0.35	0.91	1.10	2.28

**Tennessee's Report on Healthcare-Associated Infections: Jan. 1, 2008 - Dec. 31, 2010**

CCU TYPE	YEAR	No.	SIR, 95% CONFIDENCE INTERVAL, AND KEY PERCENTILES							
			SIR	LOWER LIMIT	UPPER LIMIT	10%	25%	50%	75%	90%
Pediatric Medical-Surgical Critical Care	2010	8	0.52	0.32	0.80	0.00	0.20	0.51	0.66	1.38
	2009	7	1.00	0.73	1.35	0.10	0.91	0.91	1.51	2.35
	2008	7	1.09	0.79	1.46	0.48	0.86	1.02	1.42	1.99
Pediatric Surgical Cardiothoracic Critical Care	2010	2	0.98	0.47	1.81	NA	NA	NA	NA	NA
Surgical Cardiothoracic Critical Care	2010	15	0.76	0.52	1.06	0.00	0.00	0.55	1.10	1.33
	2009	14	1.12	0.81	1.50	0.00	0.53	0.74	1.38	1.91
	2008	14	1.30	0.96	1.72	0.00	0.56	1.03	1.31	2.15
Surgical Critical Care	2010	11	0.49	0.32	0.72	0.00	0.00	0.31	0.59	0.84
	2009	11	1.00	0.74	1.31	0.00	0.35	0.89	1.52	1.76
	2008	10	1.13	0.85	1.48	0.00	0.75	0.88	1.10	1.89
Trauma Critical Care	2010	6	0.99	0.67	1.40	0.00	0.47	0.94	1.12	1.47

Data reported as of September 14, 2011

Burn and trauma ICU data available for July-December 2010 only

No. = number of facilities with reporting units; SIR = Standardized Infection Ratio (observed number/ statistically 'predicted' number of CLABSI)

NA = not reported if the number of facilities with reporting units is <5

Red highlighting indicates SIR for reporting period is significantly higher than national 2006-2008 SIR of 1.0

Blue highlighting indicates SIR for reporting period is significantly lower than national 2006-2008 SIR of 1.0

Tennessee's Report on Healthcare-Associated Infections: Jan. 1, 2008 - Dec. 31, 2010

**Table 6: Comparison of Tennessee and National Healthcare Safety Network (NHSN) Central Line-Associated Bloodstream Infection (CLABSI) Rates and Standardized Infection Ratios (SIRs) by Type of Critical Care Unit (CCU) [Reporting period: 01/01/2010–12/31/2010]**

CCU TYPE	TENNESSEE 01/01/2010 - 12/31/2010					NHSN 2006-2008				SIR AND 95% CONFIDENCE INTERVAL		
	No.	CLABSI	CL DAYS	POOLED MEAN*	MEDIAN RATE*	CLABSI	CL DAYS	POOLED MEAN*	MEDIAN RATE*	SIR	LOWER LIMIT	UPPER LIMIT
Burn Critical Care	2	20	1901	10.5	12.7	390	70932	5.5	3.1	1.91	1.17	2.96
Medical Cardiac Critical Care	8	18	13834	1.3	0.7	876	436409	2.0	1.3	0.65	0.38	1.02
Medical Critical Care, Major Teaching	4	35	11388	3.1	1.7	1410	549088	2.6	2.3	1.20	0.83	1.66
Medical Critical Care, Non-Major Teaching	19	34	25278	1.3	0.9	687	362388	1.9	1.00	0.71	0.49	0.99
Medical-Surgical Critical Care, Major Teaching	10	47	23212	2.0	1.4	1474	699300	2.1	1.7	0.96	0.71	1.28
Medical-Surgical Critical Care, Non-Major Teaching & ≤15 beds	34	27	18596	1.5	0.0	1130	755437	1.5	0.00	0.97	0.64	1.41
Medical-Surgical Critical Care, Non-Major Teaching & >15 beds	16	66	50457	1.3	0.9	1449	986982	1.5	1.10	0.89	0.69	1.13
Neurosurgical Critical Care	7	19	12228	1.6	1.0	396	160879	2.5	1.9	0.63	0.38	0.99
Pediatric Medical-Surgical Critical Care	8	21	13598	1.5	1.5	929	314306	3.0	2.5	0.52	0.32	0.80
Pediatric Surgical Cardiothoracic Critical Care	2	10	3055	3.3	3.0	195	58626	3.3	NA	0.98	0.47	1.81
Surgical Cardiothoracic Critical Care	15	34	32394	1.0	0.8	879	632769	1.4	0.8	0.76	0.52	1.06
Surgical Critical Care	11	26	23017	1.1	0.7	1683	729989	2.3	1.7	0.49	0.32	0.72
Trauma Critical Care	6	31	8679	3.6	3.4	814	224864	3.6	3.0	0.99	0.67	1.40
<b>TOTAL</b>	.	.	.	.	.	.	.	.	.	0.82	0.74	0.90

Data reported as of September 14, 2011

Burn and trauma ICU data available for July-December 2010 only

No. number of facilities with reporting units

CLDays Central Line Days

SIR Standardized Infection Ratio (observed number/ statistically 'predicted' number of CLABSI)

\*per 1000 central line days

Red highlighting indicates SIR for reporting period is significantly higher than national 2006-2008 SIR of 1.0

Blue highlighting indicates SIR for reporting period is significantly lower than national 2006-2008 SIR of 1.0

**Tennessee's Report on Healthcare-Associated Infections: Jan. 1, 2008 - Dec. 31, 2010**

**Table 7: Comparison of Tennessee Central Line-Associated Bloodstream Infection (CLABSI) Standardized Infection Ratios (SIRs) by Type of Critical Care Unit (CCU) and Reporting Half-Year [Reporting period: 01/01/2009–12/31/2010]**

CCU TYPE	Jan-Jun 2009 SIR AND 95% CONFIDENCE INTERVAL			Jul-Dec 2009 SIR AND 95% CONFIDENCE INTERVAL			Jan-Jun 2010 SIR AND 95% CONFIDENCE INTERVAL			Jul-Dec 2010 SIR AND 95% CONFIDENCE INTERVAL		
	SIR	LOWER LIMIT	SIR	LOWER LIMIT	SIR	LOWER LIMIT	SIR	LOWER LIMIT	UPPER LIMIT	SIR	LOWER LIMIT	UPPER LIMIT
Burn Critical Care	.	.	.	.	.	.	.	.	.	1.91	1.17	2.96
Medical Cardiac Critical Care	1.33	0.89	1.91	1.21	0.78	1.80	0.75	0.38	1.35	0.53	0.21	1.09
Medical Critical Care, Major Teaching	2.62	1.57	4.08	2.83	1.81	4.21	1.72	1.05	2.66	0.85	0.48	1.40
Medical Critical Care, Non-Major Teaching	1.12	0.74	1.63	0.84	0.52	1.26	0.87	0.54	1.31	0.53	0.27	0.93
Medical-Surgical Critical Care, Major Teaching	1.18	0.81	1.66	1.57	1.15	2.09	1.04	0.70	1.49	0.86	0.51	1.35
Medical-Surgical Critical Care, Non-Major Teaching & ≤15 beds	1.19	0.69	1.91	0.89	0.48	1.53	1.21	0.73	1.89	0.66	0.29	1.30
Medical-Surgical Critical Care, Non-Major Teaching & >15 beds	1.04	0.74	1.43	1.14	0.82	1.55	0.86	0.59	1.22	0.92	0.64	1.28
Neurosurgical Critical Care	0.84	0.44	1.48	0.72	0.37	1.26	0.99	0.55	1.63	0.27	0.07	0.69
Pediatric Medical-Surgical Critical Care	1.07	0.68	1.61	0.94	0.58	1.44	0.47	0.20	0.93	0.56	0.30	0.96
Pediatric Surgical Cardiothoracic Critical Care	NA	NA	NA	NA	NA	NA	1.09	0.50	2.07	0.52	0.01	2.92
Surgical Cardiothoracic Critical Care	1.21	0.78	1.81	1.02	0.62	1.57	0.78	0.46	1.23	0.73	0.42	1.19
Surgical Critical Care	0.86	0.53	1.32	1.11	0.75	1.59	0.54	0.30	0.89	0.44	0.22	0.78
Trauma Critical Care	.	.	.	.	.	.	.	.	.	0.99	0.67	1.40
<b>TOTAL</b>	<b>1.15</b>	<b>1.01</b>	<b>1.30</b>	<b>1.15</b>	<b>1.02</b>	<b>1.31</b>	<b>0.88</b>	<b>0.77</b>	<b>1.02</b>	<b>0.75</b>	<b>0.65</b>	<b>0.87</b>

Data reported as of September 14, 2011

Burn and trauma ICU data available for July-December 2010 only; without burn and trauma ICUs, the total SIR and 95% confidence interval for Jul-Dec 2010 is 0.66 (0.56-0.78)

No. number of facilities with reporting units

CLDays Central Line Days

SIR Standardized Infection Ratio (observed number/ statistically 'predicted' number of CLABSI)

\*per 1000 central line days

NA not reported because <2 ICUs of this type existed in Tennessee in 2009

Red highlighting indicates SIR for reporting period is significantly higher than national 2006-2008 SIR of 1.0

Blue highlighting indicates SIR for reporting period is significantly lower than national 2006-2008 SIR of 1.0

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**Table 8: Central Line-Associated Bloodstream Infection (CLABSI) Rates by Type of Critical Care Unit (CCU) and Grand Division, Excluding Burn and Trauma ICUs [Reporting period: 01/01/2010–12/31/2010]**

CCU TYPE	EAST							MIDDLE							WEST						
	No.	CLABSI	CL DAYS	POOLED MEAN*	SIR	Lower Limit	Upper Limit	No.	CLABSI	CL DAYS	POOLED MEAN*	SIR	Lower Limit	Upper Limit	No.	CLABSI	CL DAYS	POOLED MEAN*	SIR	Lower Limit	Upper Limit
Medical Cardiac Critical Care	5	9	7651	1.2	0.59	0.27	1.11	2	8	3354	2.4	1.19	0.51	2.34	1	1	2829	0.4	0.18	0.00	0.98
Medical Critical Care, Major Teaching	3	8	6048	1.3	0.52	0.22	1.01	1	27	5340	5.1	1.97	1.30	2.86	.	.	.	.	.	.	.
Medical Critical Care, Non-Major Teaching	10	13	10481	1.2	0.65	0.35	1.12	5	5	5388	0.9	0.49	0.16	1.14	4	16	9409	1.7	0.90	0.51	1.46
Medical-Surgical Crit. Care, Major Teaching	4	16	9180	1.7	0.83	0.47	1.34	1	2	1994	1.0	0.48	0.06	1.72	5	29	12038	2.4	1.14	0.77	1.64
Medical-Surgical Crit. Care, Non-Major Teaching, ≤15 beds	16	19	9724	2.0	1.31	0.79	2.04	11	7	6894	1.0	0.68	0.27	1.40	6	1	1824	0.6	0.37	0.01	2.04
Medical-Surgical Crit. Care, Non-Major Teaching, >15 beds	4	17	14017	1.2	0.83	0.48	1.32	9	42	27363	1.5	1.05	0.75	1.41	3	7	9077	0.8	0.53	0.21	1.08
Neurosurgical Critical Care	2	2	2636	0.8	0.31	0.04	1.11	2	13	4795	2.7	1.10	0.59	1.88	3	4	4797	0.8	0.34	0.09	0.87
Pediatric Medical-Surgical Critical Care	4	4	2754	1.5	0.49	0.13	1.26	1	10	6063	1.6	0.56	0.27	1.03	3	7	4781	1.5	0.50	0.20	1.02
Pediatric Surgical Cardiothoracic Critical Care	.	.	.	.	.	.	.	1	8	1818	4.4	1.32	0.57	2.61	1	2	1237	1.6	0.49	0.06	1.76
Surgical Cardiothoracic Critical Care	6	5	7175	0.7	0.50	0.16	1.17	4	8	8755	0.9	0.66	0.28	1.30	5	21	16464	1.3	0.92	0.57	1.40
Surgical Critical Care	6	5	8780	0.6	0.25	0.08	0.58	3	13	9409	1.4	0.60	0.32	1.02	2	8	4828	1.7	0.72	0.31	1.42
<b>TOTAL</b>	.	.	.	.	0.65	0.53	0.80	.	.	.	.	0.92	0.78	1.09	.	.	.	.	0.74	0.60	0.91

Data reported as of September 14, 2011

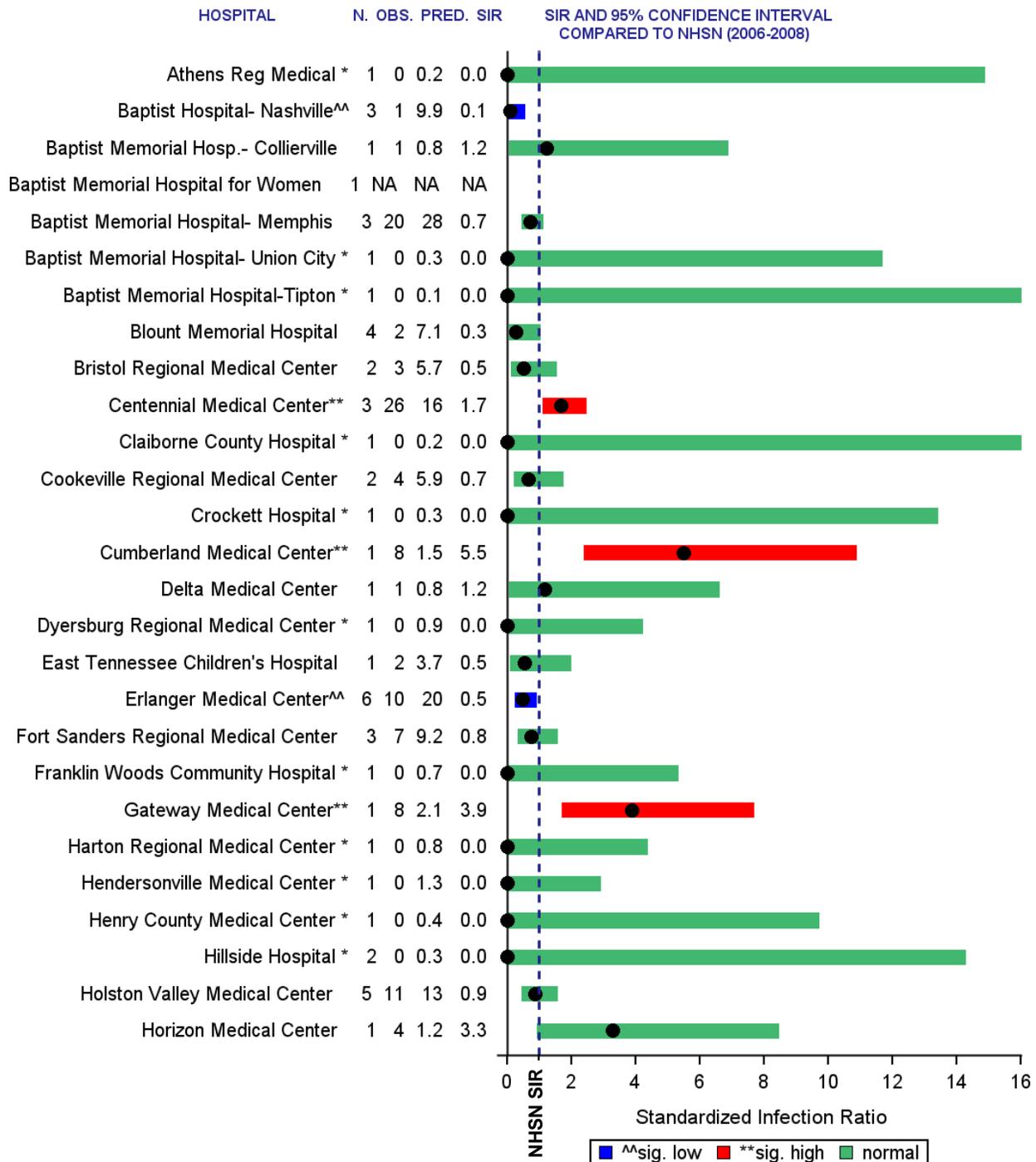
No. number of facilities w/ reporting units; CL Days Central Line Days; SIR Standardized Infection Ratio (observed number/ statistically 'predicted' number of CLABSI) \*per 1000 central line days

Red highlighting indicates SIR for reporting period is significantly higher than national 2006-2008 SIR of 1.0.

Blue highlighting indicates SIR for reporting period is significantly lower than national 2006-2008 SIR of 1.0

Figure 10: Summary Measure for CLABSIs in Adult and Pediatric Critical Care Units, One Standardized Infection Ratio (SIR) per Facility. Tennessee, 1/2010–12/2010

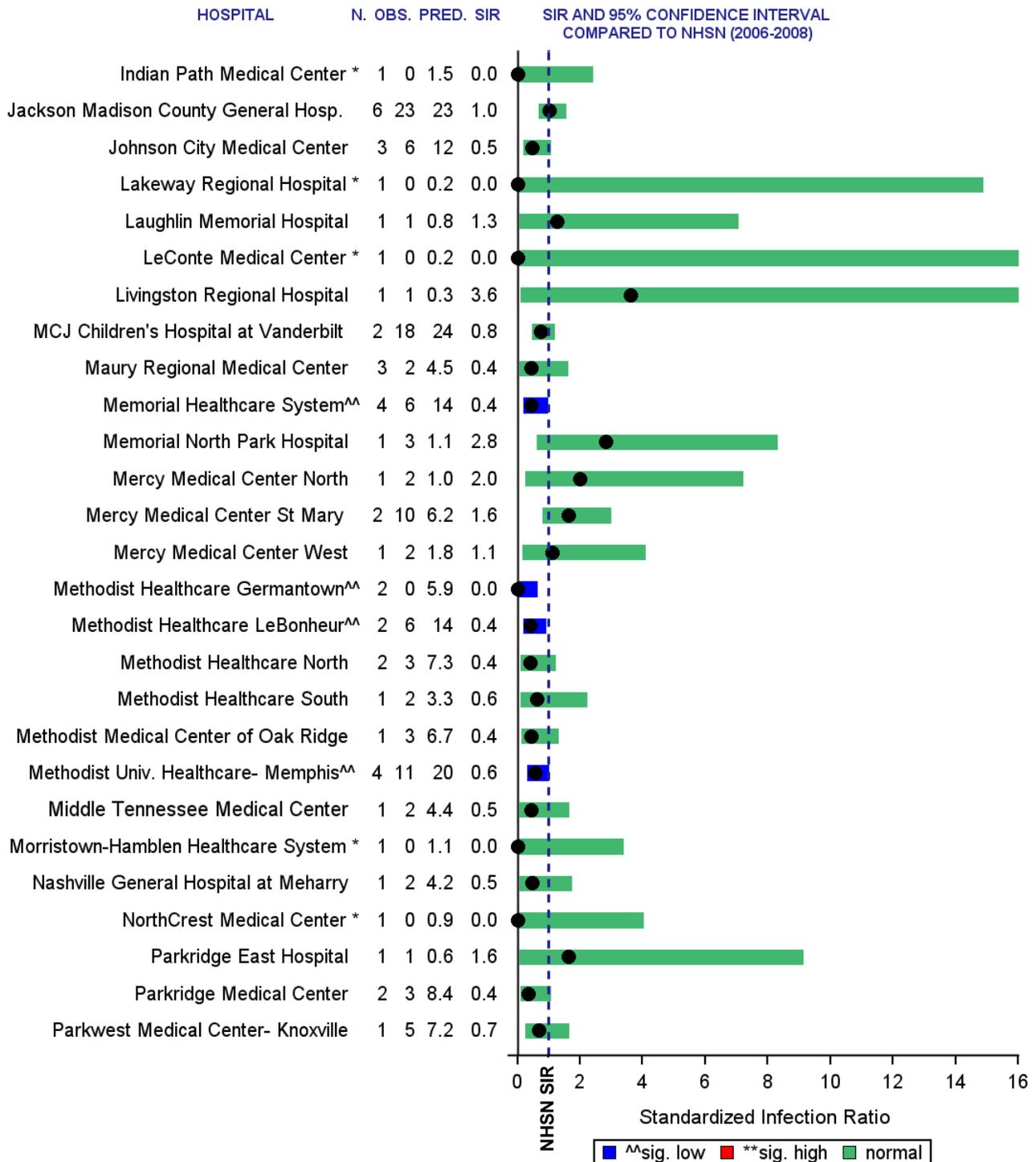
**Central Line-Associated Blood Stream Infection [CLABSI] Standardized Infection Ratio [SIR]**  
Tennessee (Reportable period: 01/01/2010 - 12/31/2010)



Data Reported from adult/pediatric ICUs as of September 14, 2011.  
 N. = number of types of critical care units reportable from a given facility  
 Obs. = observed number of CLABSI  
 Pred. = statistically 'predicted' number of CLABSI, based on NHSN data  
 SIR = Standardized Infection Ratio (observed number / statistically 'predicted' number of CLABSI)  
 NA = data not shown for an entire hospital with <50 central line days  
 \*\* significantly higher than NHSN (2006-2008)  
 ^^ significantly lower than NHSN (2006-2008)  
 \* Zero infection, but not statistically significant

Figure 10 (cont'd)

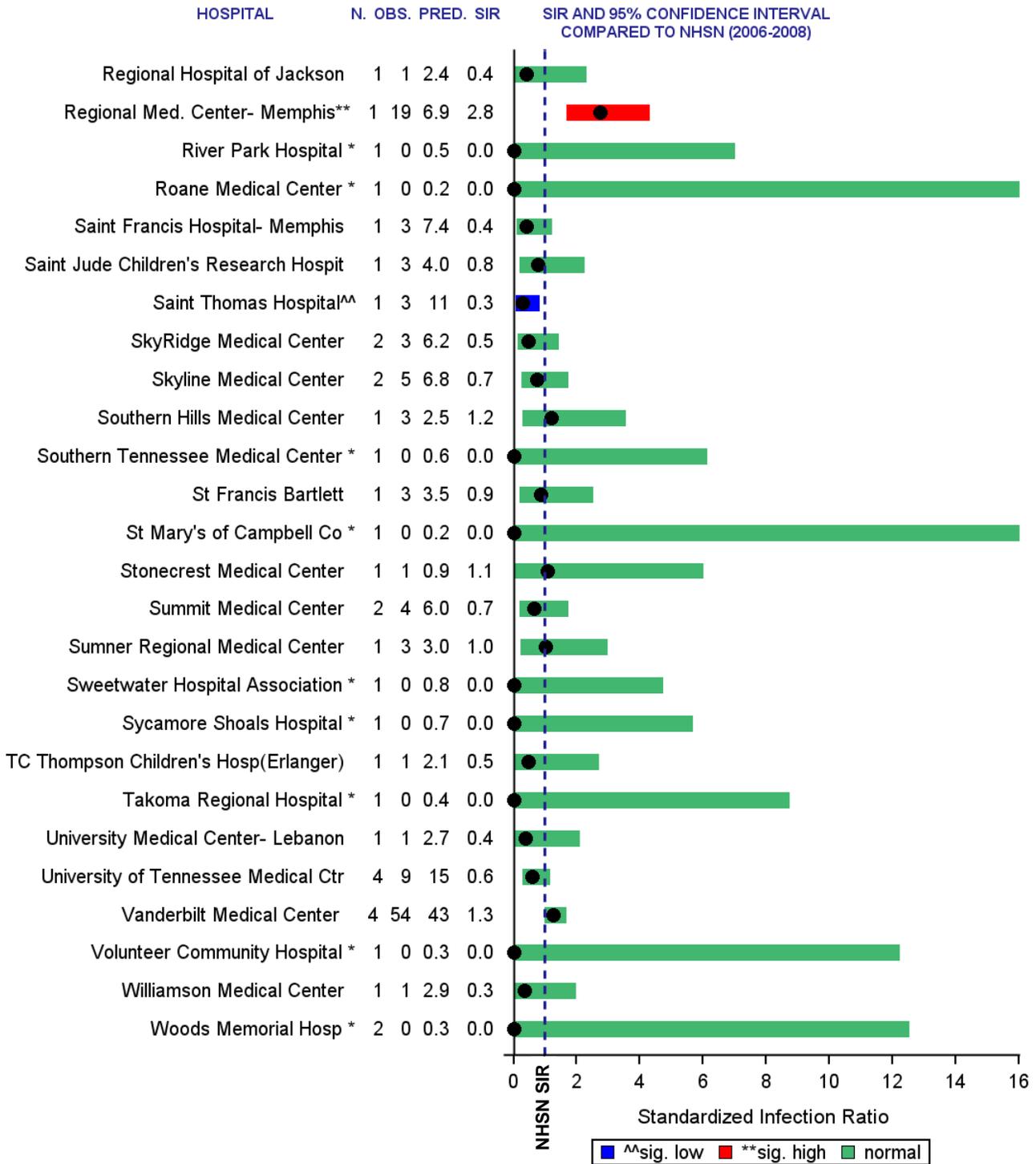
Central Line-Associated Blood Stream Infection [CLABSI] Standardized Infection Ratio [SIR]  
Tennessee (Reportable period: 01/01/2010 - 12/31/2010)



Data Reported from adult/pediatric ICUs as of September 14, 2011.  
 N. = number of types of critical care units reportable from a given facility  
 Obs. = observed number of CLABSI  
 Pred. = statistically 'predicted' number of CLABSI, based on NHSN data  
 SIR = Standardized Infection Ratio (observed number / statistically 'predicted' number of CLABSI)  
 NA = data not shown for an entire hospital with <50 central line days  
 \*\* significantly higher than NHSN (2006-2008)  
 ^^ significantly lower than NHSN (2006-2008)  
 \* Zero infection, but not statistically significant

Figure 10 (cont'd)

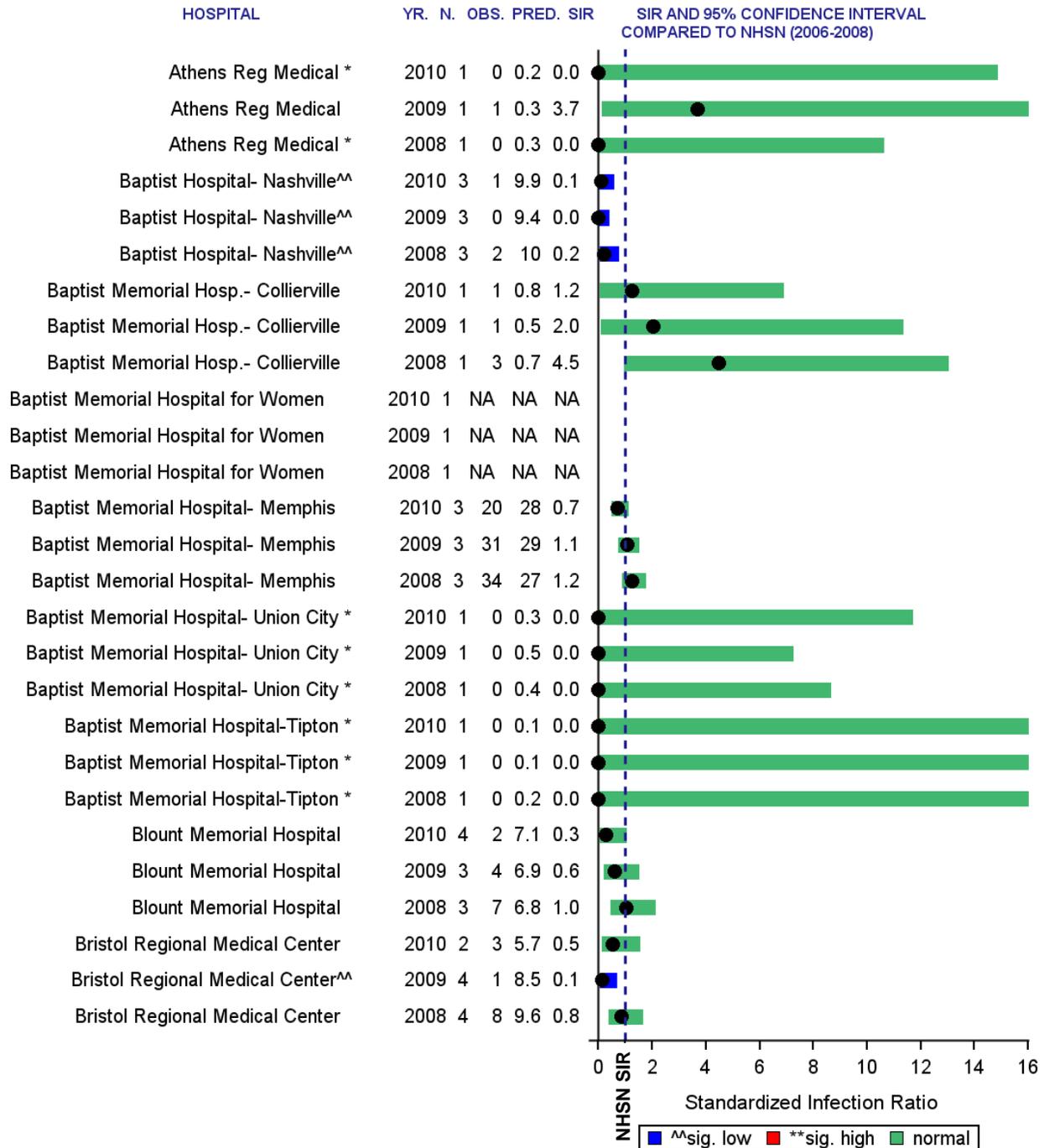
Central Line-Associated Blood Stream Infection [CLABSI] Standardized Infection Ratio [SIR]  
Tennessee (Reportable period: 01/01/2010 - 12/31/2010)



Data Reported from adult/pediatric ICUs as of September 14, 2011.  
 N. = number of types of critical care units reportable from a given facility  
 Obs. = observed number of CLABSI  
 Pred. = statistically 'predicted' number of CLABSI, based on NHSN data  
 SIR = Standardized Infection Ratio (observed number / statistically 'predicted' number of CLABSI)  
 NA = data not shown for an entire hospital with <50 central line days  
 \*\* significantly higher than NHSN (2006-2008)  
 ^^ significantly lower than NHSN (2006-2008)  
 \* Zero infection, but not statistically significant

Figure 11: Summary Measure for CLABSIs in Adult and Pediatric Critical Care Units, One Standardized Infection Ratio (SIR) per Facility per Year, Tennessee, 2008-2010

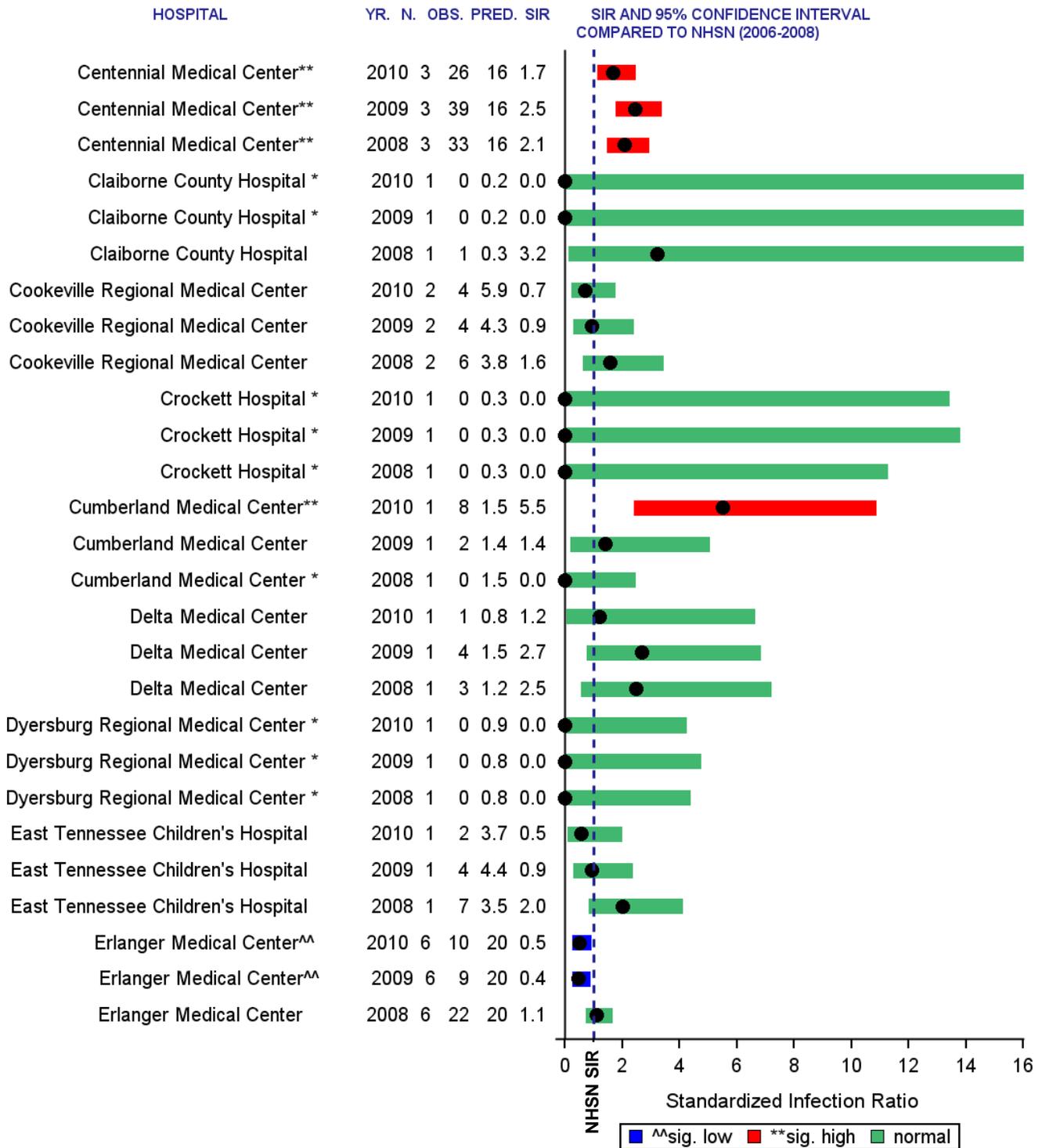
**Central Line-Associated Blood Stream Infection [CLABSI] Standardized Infection Ratio [SIR]**  
Tennessee (Reportable period: 01/01/2008-12/31/2010)



Data Reported from adult/pediatric ICUs as of September 14, 2011.  
 Yr. = reporting year  
 N. = number of types of critical care units reportable from a given facility  
 Obs. = observed number of CLABSI  
 Pred. = statistically 'predicted' number of CLABSI, based on NHSN data  
 SIR = Standardized Infection Ratio (observed number / statistically 'predicted' number of CLABSI)  
 NA = data not shown for an entire hospital with <50 central line days  
 \*\* significantly higher than NHSN (2006-2008)  
<sup>^^</sup> significantly lower than NHSN (2006-2008)  
 \* Zero infection, but not statistically significant

Figure 11 (cont'd)

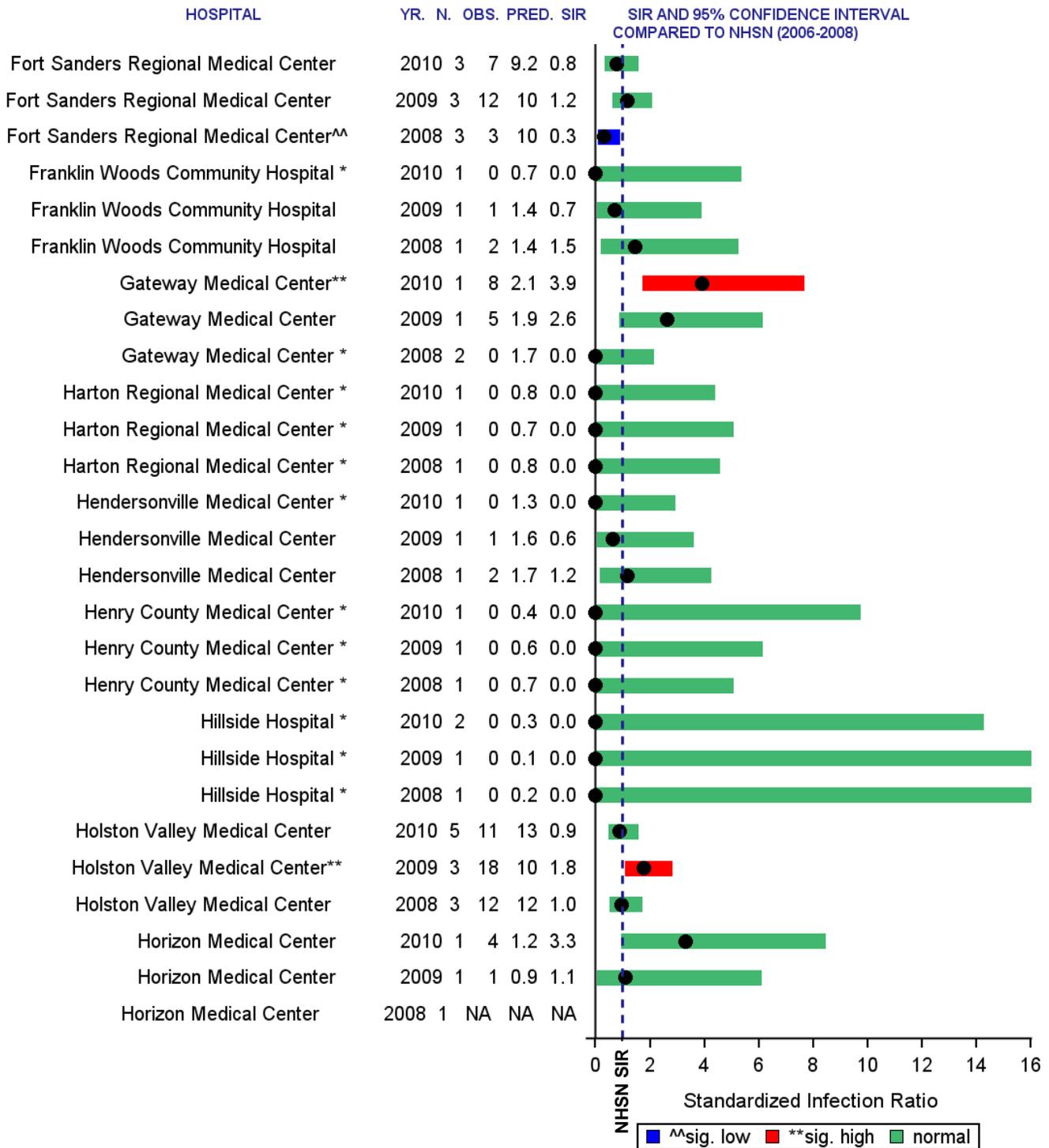
Central Line-Associated Blood Stream Infection [CLABSI] Standardized Infection Ratio [SIR]  
Tennessee (Reportable period: 01/01/2008-12/31/2010)



Data Reported from adult/pediatric ICUs as of September 14, 2011.  
 Yr. = reporting year  
 N. = number of types of critical care units reportable from a given facility  
 Obs. = observed number of CLABSI  
 Pred. = statistically 'predicted' number of CLABSI, based on NHSN data  
 SIR = Standardized Infection Ratio ( observed number / statistically 'predicted' number of CLABSI )  
 NA = data not shown for an entire hospital with <50 central line days  
 \*\* significantly higher than NHSN (2006-2008)  
 ^^ significantly lower than NHSN (2006-2008)  
 \* Zero infection, but not statistically significant

Figure 11 (cont'd)

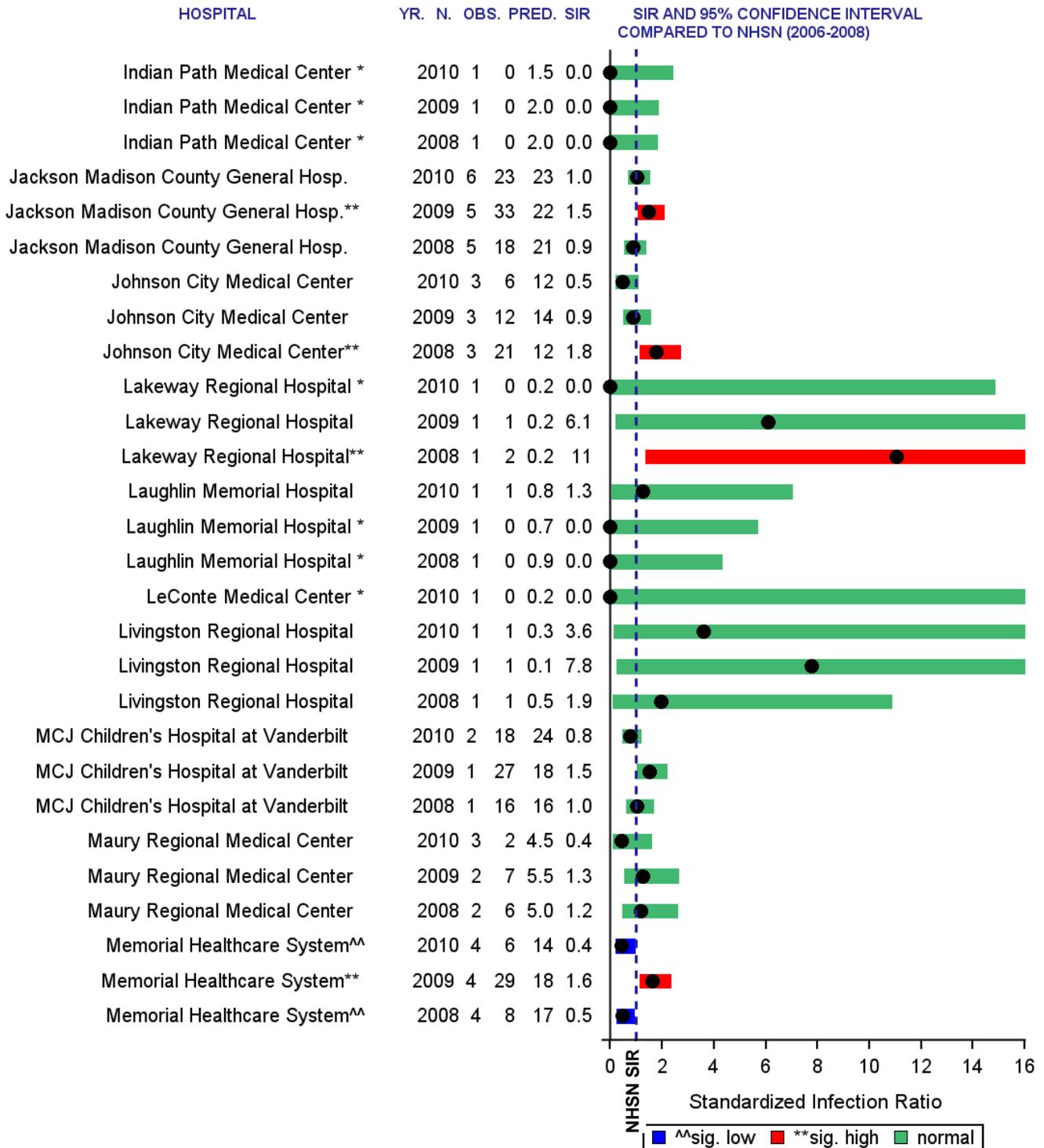
**Central Line-Associated Blood Stream Infection [CLABSI] Standardized Infection Ratio [SIR]**  
Tennessee (Reportable period: 01/01/2008-12/31/2010)



Data Reported from adult/pediatric ICUs as of September 14, 2011.  
 Yr. = reporting year  
 N. = number of types of critical care units reportable from a given facility  
 Obs. = observed number of CLABSI  
 Pred. = statistically 'predicted' number of CLABSI, based on NHSN data  
 SIR = Standardized Infection Ratio ( observed number / statistically 'predicted' number of CLABSI )  
 NA = data not shown for an entire hospital with <50 central line days  
 \*\* significantly higher than NHSN (2006-2008)  
 ^^ significantly lower than NHSN (2006-2008)  
 \* Zero infection, but not statistically significant

Figure 11 (cont'd)

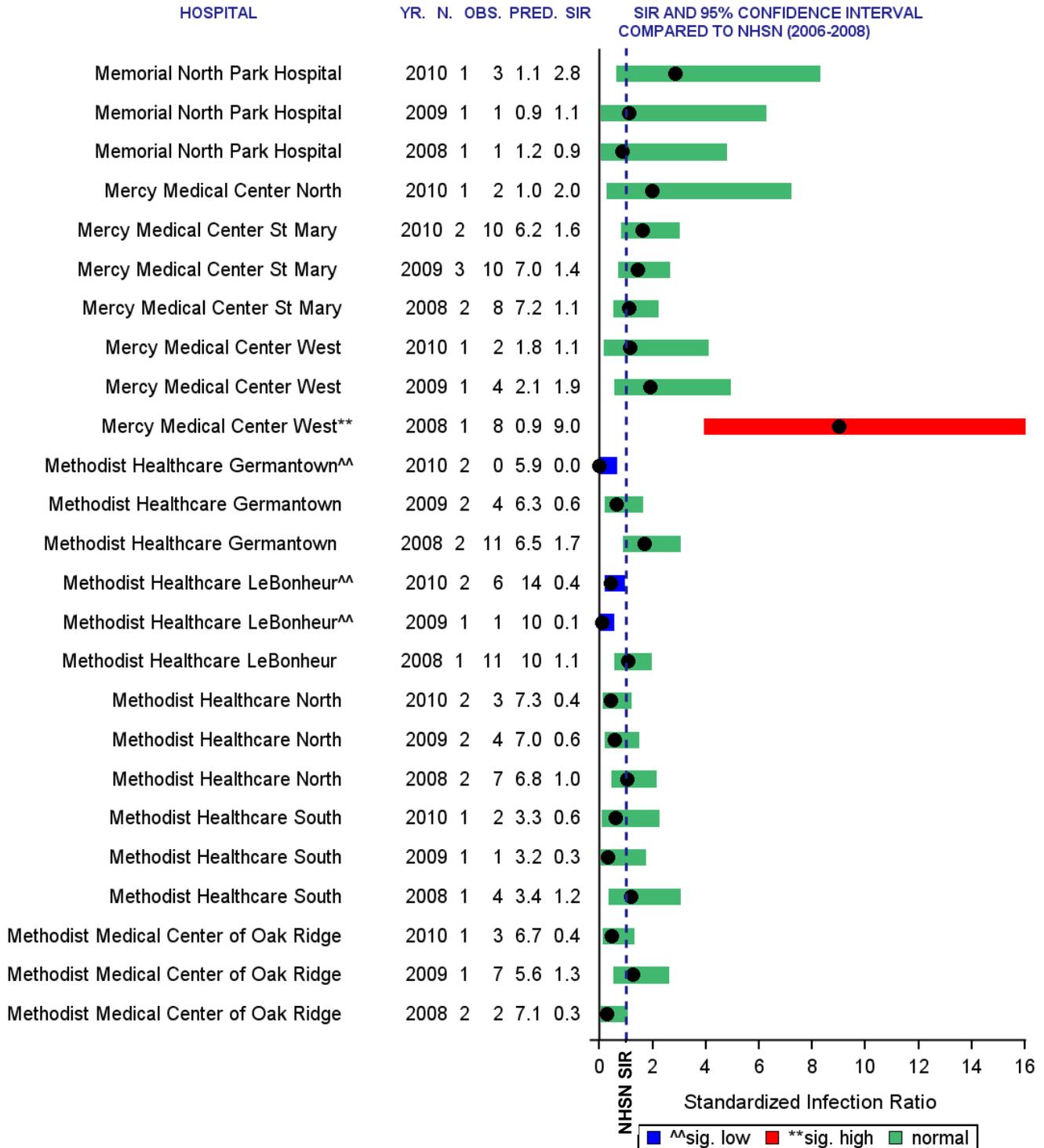
Central Line-Associated Blood Stream Infection [CLABSI] Standardized Infection Ratio [SIR]  
Tennessee (Reportable period: 01/01/2008-12/31/2010)



Data Reported from adult/pediatric ICUs as of September 14, 2011.  
 Yr. = reporting year  
 N. = number of types of critical care units reportable from a given facility  
 Obs. = observed number of CLABSI  
 Pred. = statistically 'predicted' number of CLABSI, based on NHSN data  
 SIR = Standardized Infection Ratio ( observed number / statistically 'predicted' number of CLABSI )  
 NA = data not shown for an entire hospital with <50 central line days  
 \*\* significantly higher than NHSN (2006-2008)  
 ^^ significantly lower than NHSN (2006-2008)  
 \* Zero infection, but not statistically significant

**Figure 11 (cont'd)**

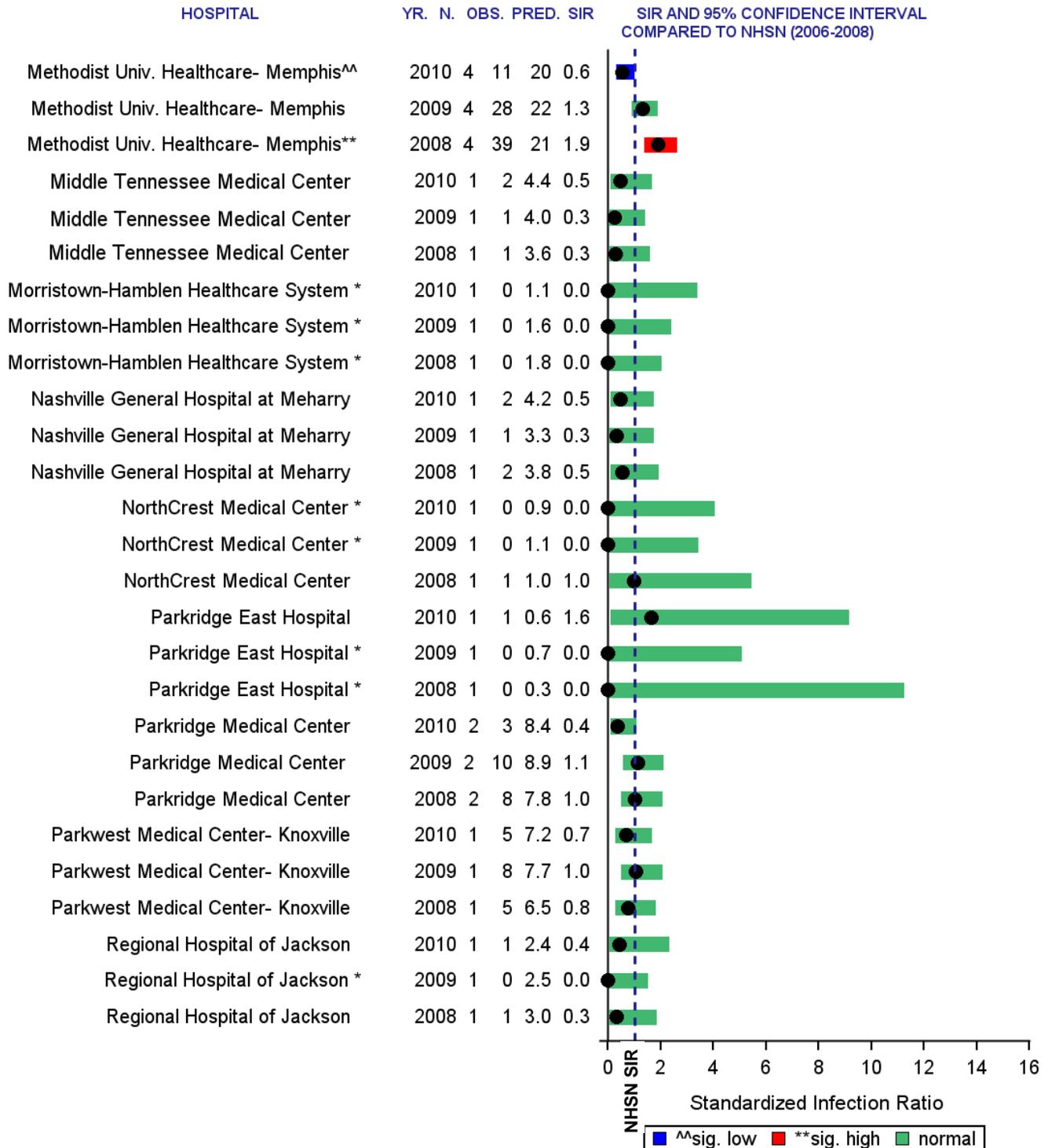
**Central Line-Associated Blood Stream Infection [CLABSI] Standardized Infection Ratio [SIR]**  
Tennessee (Reportable period: 01/01/2008-12/31/2010)



Data Reported from adult/pediatric ICUs as of September 14, 2011.  
 Yr. = reporting year  
 N. = number of types of critical care units reportable from a given facility  
 Obs. = observed number of CLABSI  
 Pred. = statistically 'predicted' number of CLABSI, based on NHSN data  
 SIR = Standardized Infection Ratio ( observed number / statistically 'predicted' number of CLABSI )  
 NA = data not shown for an entire hospital with <50 central line days  
 \*\* significantly higher than NHSN (2006-2008)  
 ^^ significantly lower than NHSN (2006-2008)  
 \* Zero infection, but not statistically significant

**Figure 11 (cont'd)**

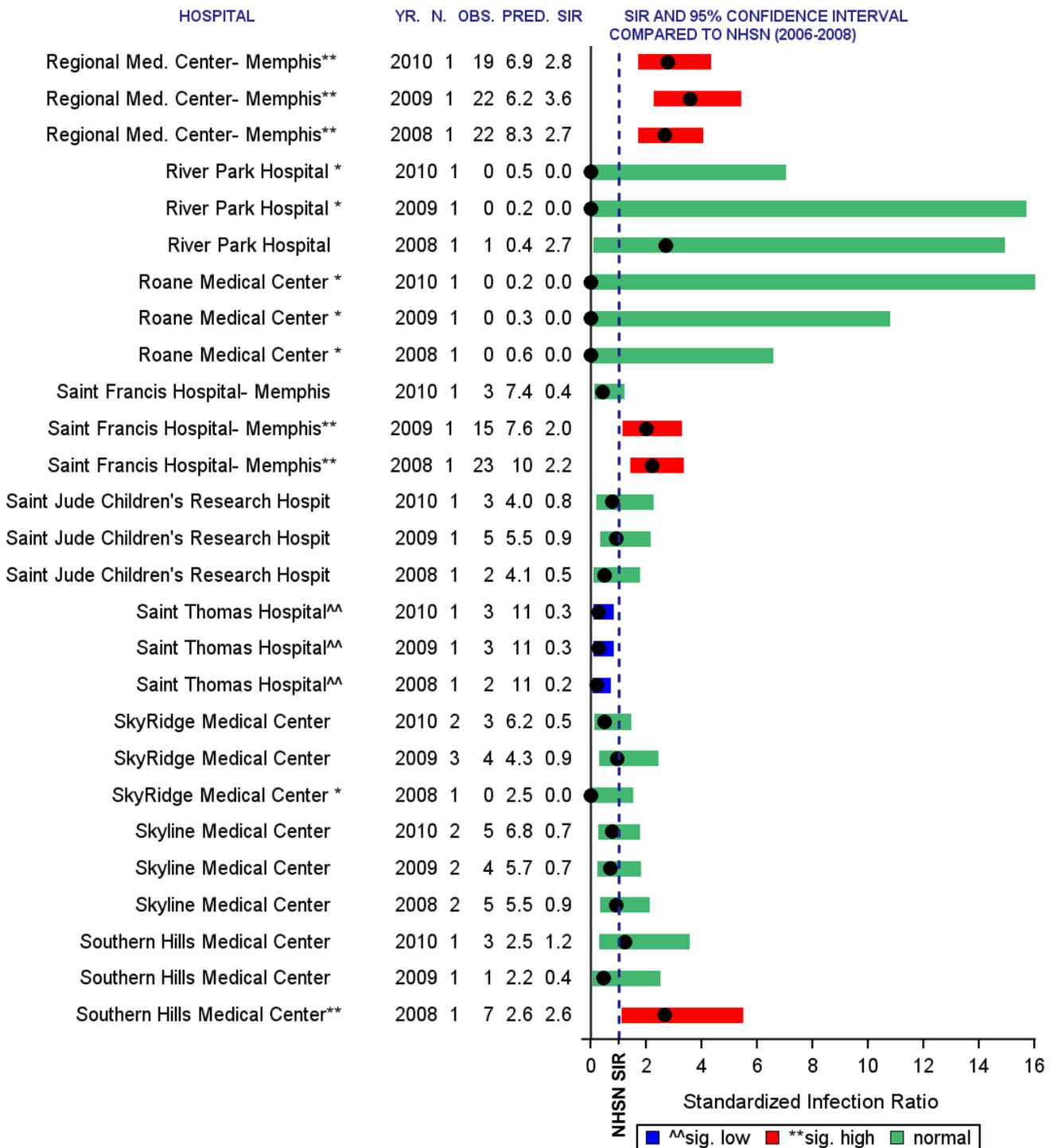
**Central Line-Associated Blood Stream Infection [CLABSI] Standardized Infection Ratio [SIR]  
Tennessee (Reportable period: 01/01/2008-12/31/2010)**



Data Reported from adult/pediatric ICUs as of September 14, 2011.  
 Yr. = reporting year  
 N. = number of types of critical care units reportable from a given facility  
 Obs. = observed number of CLABSI  
 Pred. = statistically 'predicted' number of CLABSI, based on NHSN data  
 SIR = Standardized Infection Ratio (observed number / statistically 'predicted' number of CLABSI)  
 NA = data not shown for an entire hospital with <50 central line days  
<sup>\*\*</sup> significantly higher than NHSN (2006-2008)  
<sup>^^</sup> significantly lower than NHSN (2006-2008)  
 \* Zero infection, but not statistically significant

Figure 11 (cont'd)

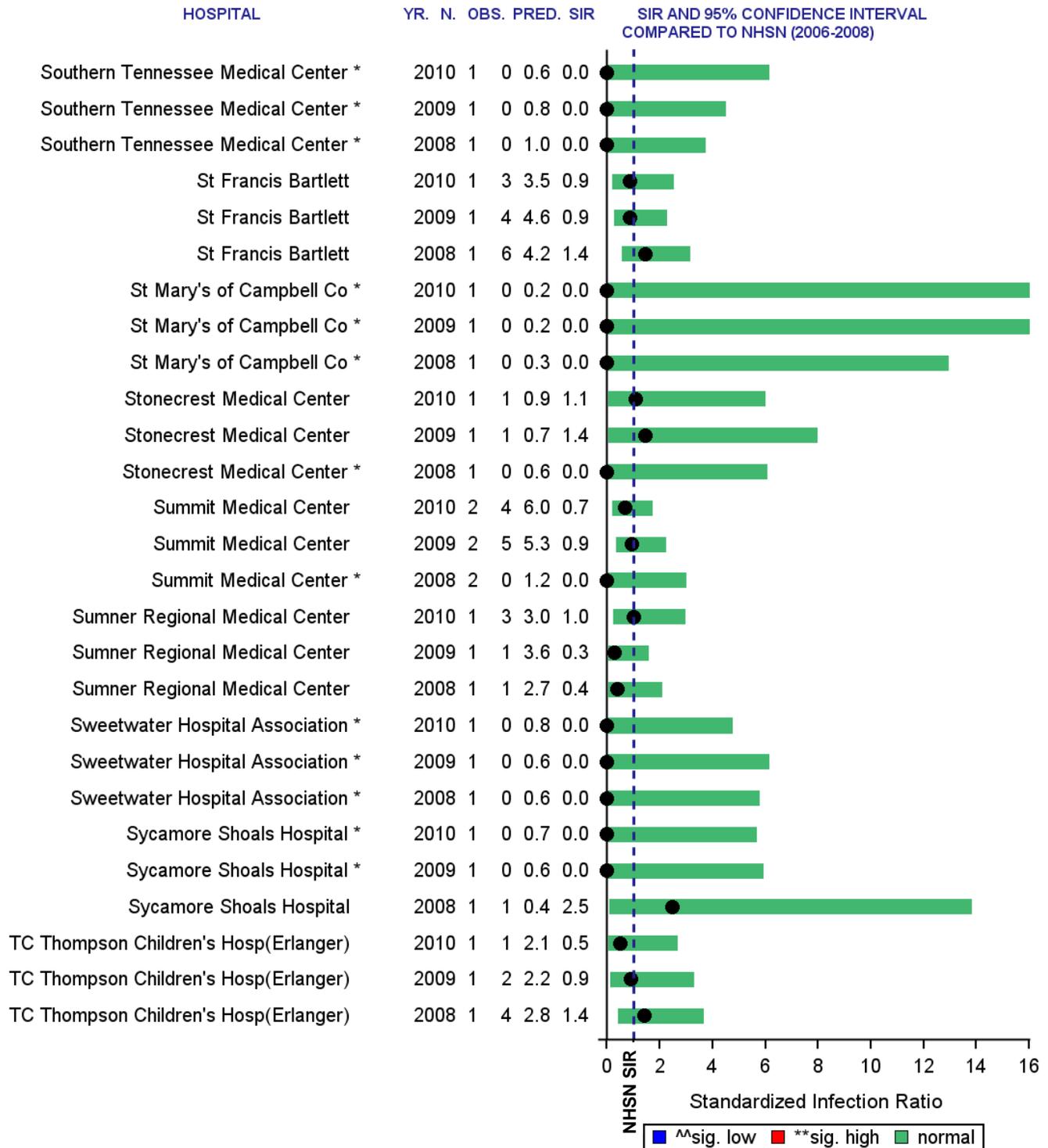
Central Line-Associated Blood Stream Infection [CLABSI] Standardized Infection Ratio [SIR]  
Tennessee (Reportable period: 01/01/2008-12/31/2010)



Data Reported from adult/pediatric ICUs as of September 14, 2011.  
 Yr. = reporting year  
 N. = number of types of critical care units reportable from a given facility  
 Obs. = observed number of CLABSI  
 Pred. = statistically 'predicted' number of CLABSI, based on NHSN data  
 SIR = Standardized Infection Ratio (observed number / statistically 'predicted' number of CLABSI)  
 NA = data not shown for an entire hospital with <50 central line days  
 \*\* significantly higher than NHSN (2006-2008)  
 ^^ significantly lower than NHSN (2006-2008)  
 \* Zero infection, but not statistically significant

**Figure 11 (cont'd)**

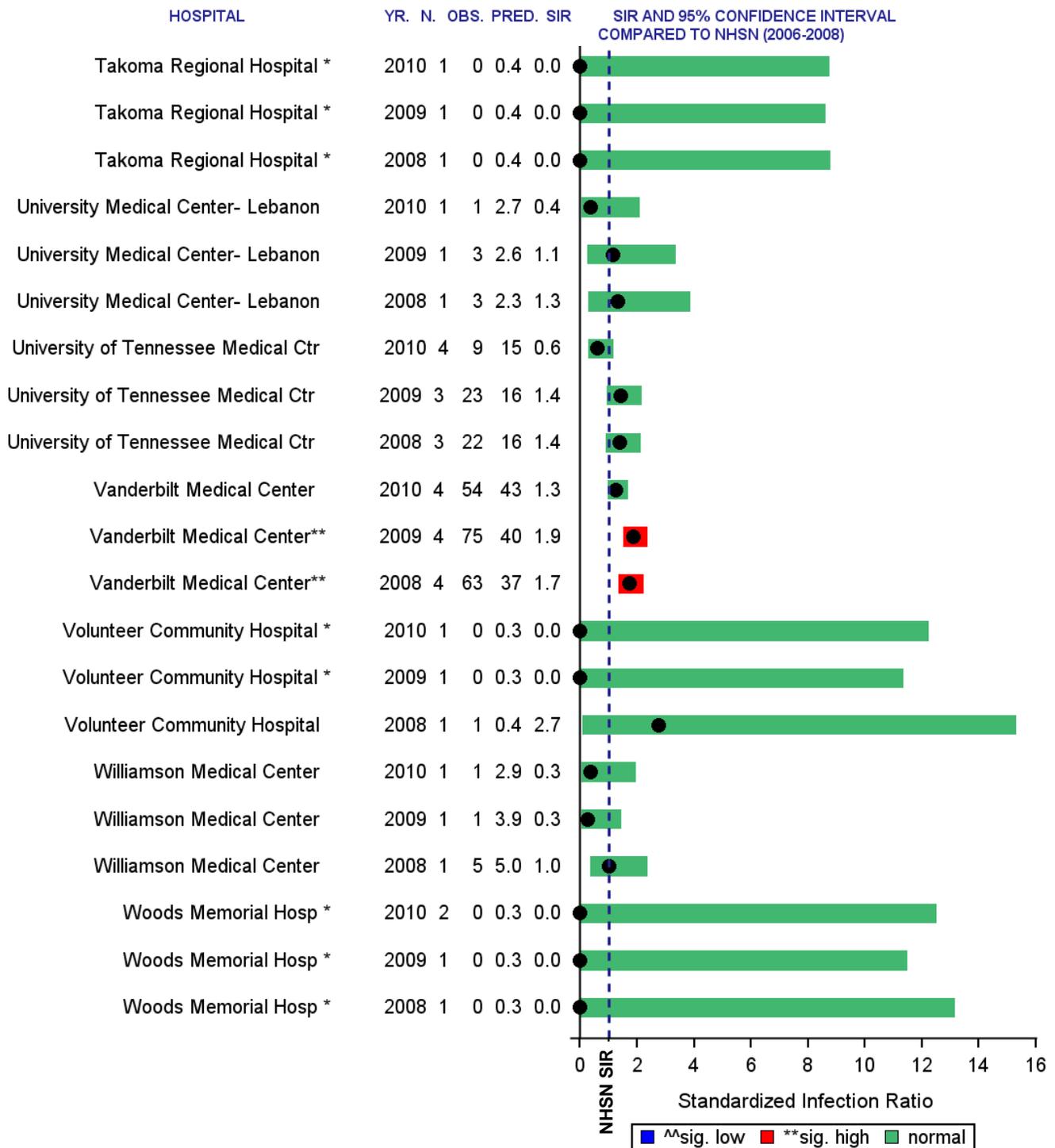
**Central Line-Associated Blood Stream Infection [CLABSI] Standardized Infection Ratio [SIR]**  
 Tennessee (Reportable period: 01/01/2008-12/31/2010)



Data Reported from adult/pediatric ICUs as of September 14, 2011.  
 Yr. = reporting year  
 N. = number of types of critical care units reportable from a given facility  
 Obs. = observed number of CLABSI  
 Pred. = statistically 'predicted' number of CLABSI, based on NHSN data  
 SIR = Standardized Infection Ratio (observed number / statistically 'predicted' number of CLABSI)  
 NA = data not shown for an entire hospital with <50 central line days  
 \*\* significantly higher than NHSN (2006-2008)  
 ^^ significantly lower than NHSN (2006-2008)  
 \* Zero infection, but not statistically significant

Figure 11 (cont'd)

**Central Line-Associated Blood Stream Infection [CLABSI] Standardized Infection Ratio [SIR]**  
Tennessee (Reportable period: 01/01/2008-12/31/2010)

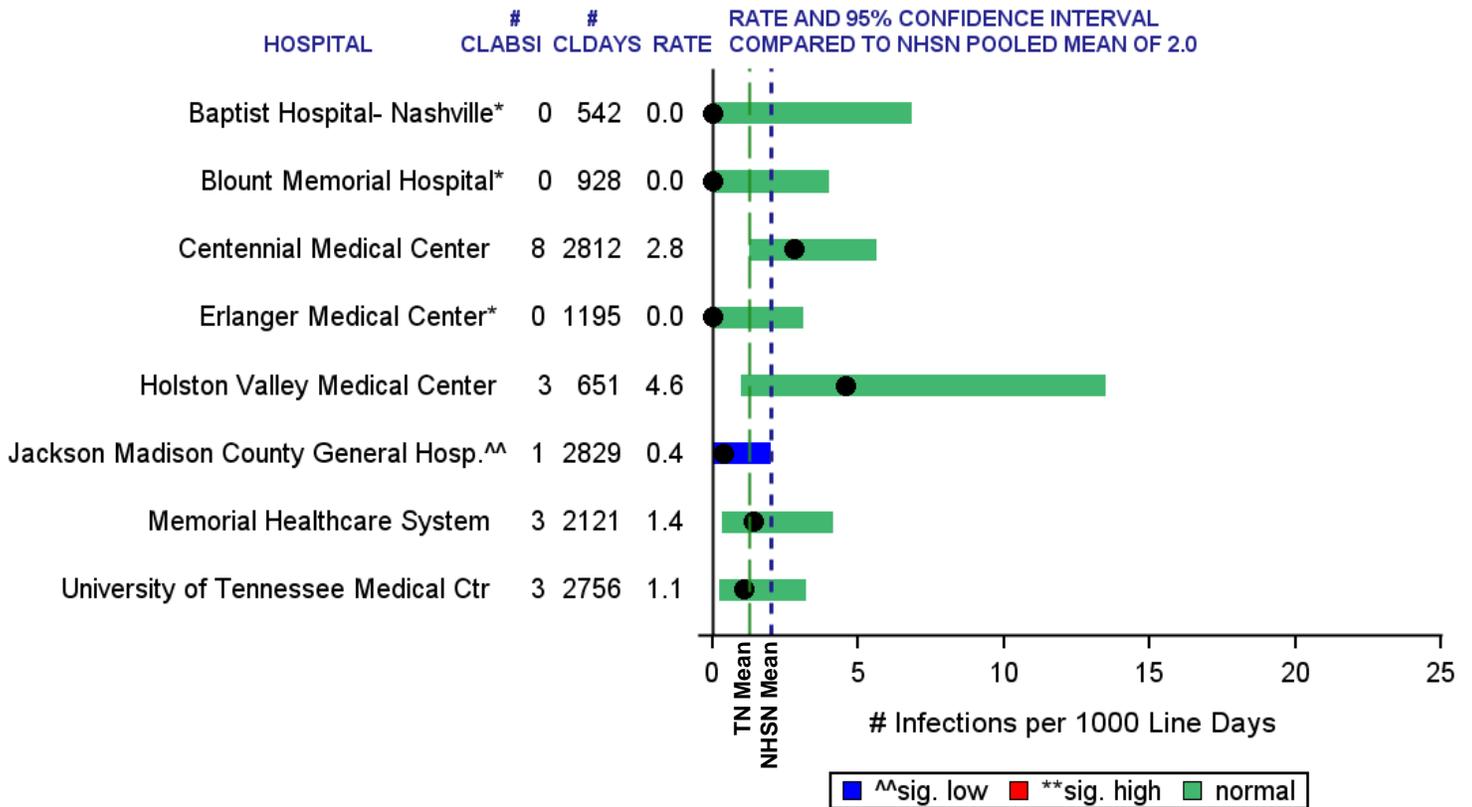


Data Reported from adult/pediatric ICUs as of September 14, 2011.  
 Yr. = reporting year  
 N. = number of types of critical care units reportable from a given facility  
 Obs. = observed number of CLABSI  
 Pred. = statistically 'predicted' number of CLABSI, based on NHSN data  
 SIR = Standardized Infection Ratio (observed number / statistically 'predicted' number of CLABSI)  
 NA = data not shown for an entire hospital with <50 central line days  
 \*\* significantly higher than NHSN (2006-2008)  
 ^^ significantly lower than NHSN (2006-2008)  
 \* Zero infection, but not statistically significant

Tennessee's Report on Healthcare-Associated Infections: Jan. 1, 2008 - Dec. 31, 2010

Figure 12: Central Line-Associated Bloodstream Infection Rates per 1,000 Central Line Days in Tennessee, 1/2010–12/2010, Medical Cardiac Critical Care Units

**Central Line-Associated Blood Stream Infection [CLABSI] Rates (per 1000 central line days)**  
 Tennessee (Reportable period: 01/01/2010 - 12/31/2010)  
 Medical Cardiac Critical Care

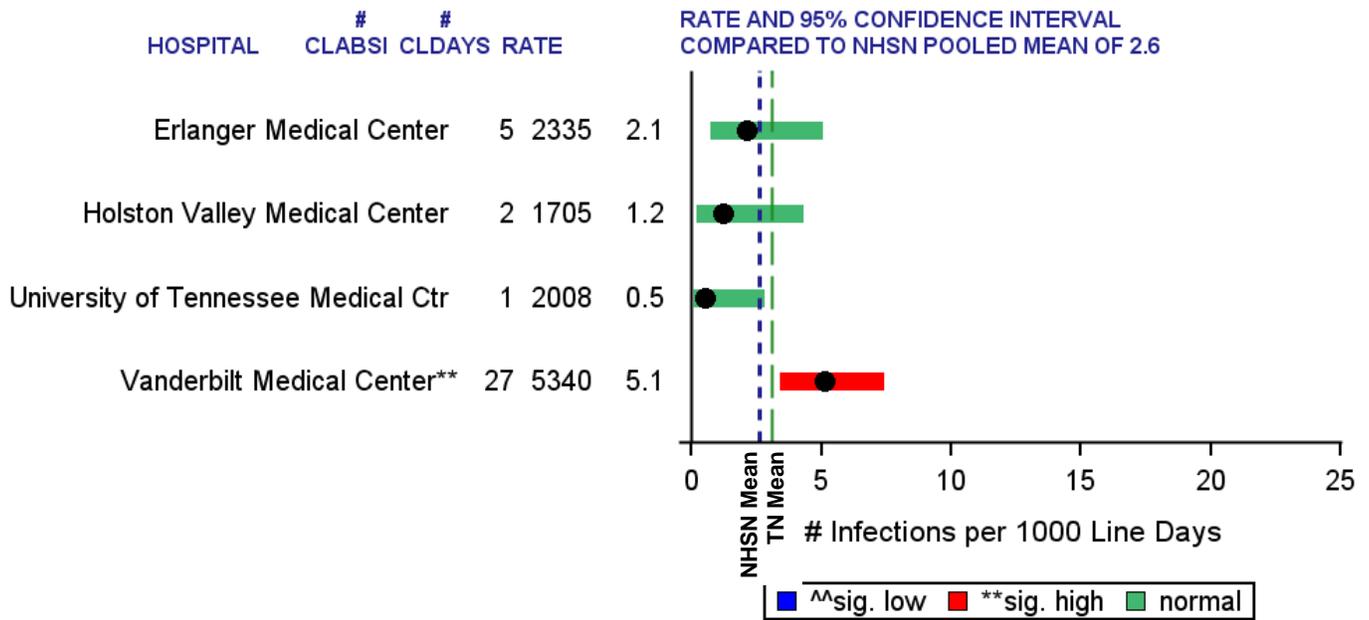


Data Reported as of September 14, 2011.  
 \*\* significantly higher than NHSN pooled mean  
 ^^ significantly lower than NHSN pooled mean  
 \* Zero infections, not statistically significant  
 NA Rates are not shown in critical care units with <50 central line days.  
 NHSN pooled mean (2006-2008)=2.0; TN pooled mean (01/01/2010 - 12/31/2010)=1.3

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Figure 13: Central Line-Associated Bloodstream Infection Rates per 1,000 Central Line Days in Tennessee, 1/2010–12/2010, Medical Critical Care Units in Major Teaching Hospitals

**Central Line-Associated Blood Stream Infection [CLABSI] Rates (per 1000 central line days)**  
 Tennessee (Reportable period: 01/01/2010 - 12/31/2010)  
 Medical Critical Care Major Teaching Hospitals



Data Reported as of September 14, 2011.

\*\* significantly higher than NMSN pooled mean

^^ significantly lower than NMSN pooled mean

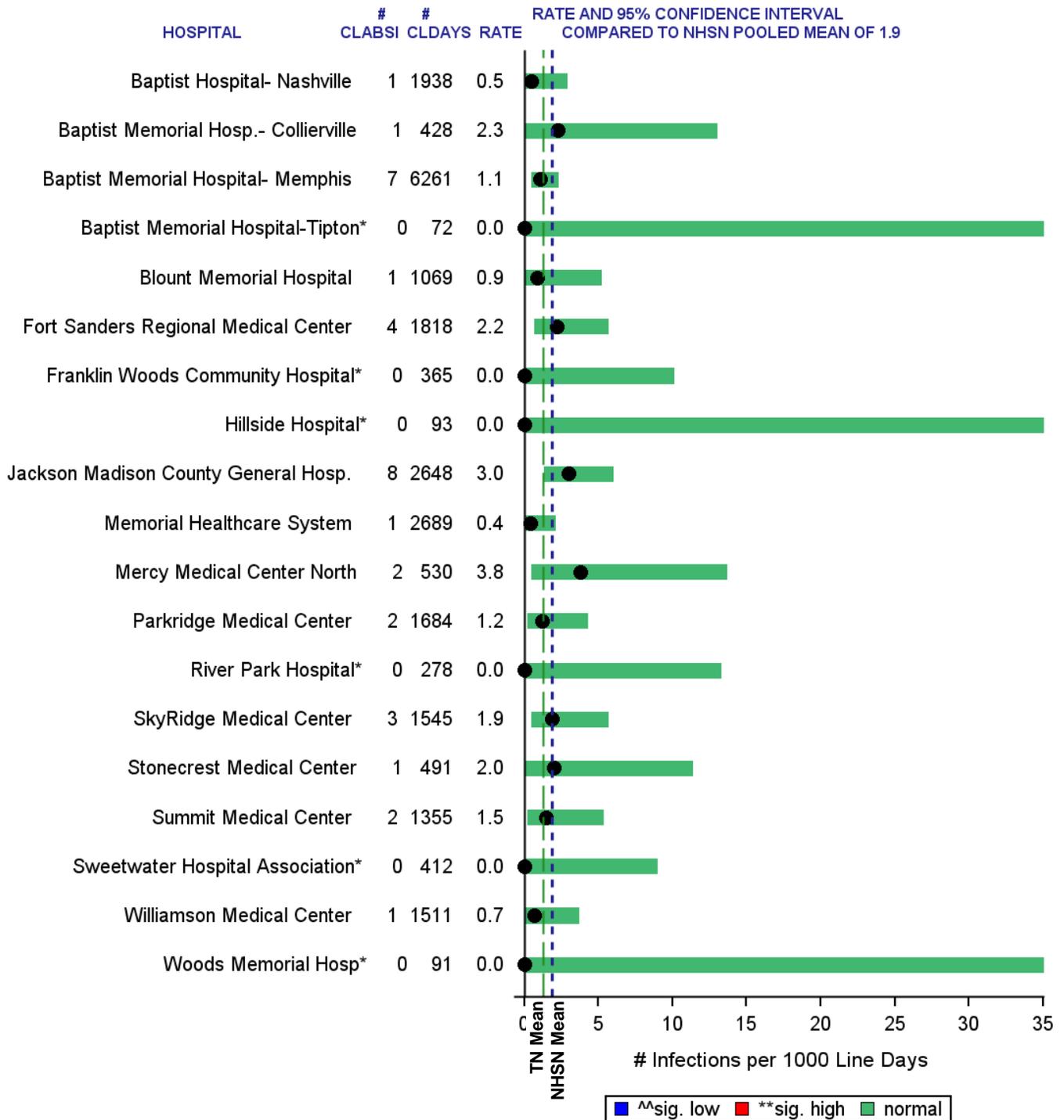
\* Zero infections, not statistically significant

NA Rates are not shown in critical care units with <50 central line days.

NMSN pooled mean(2006-2008)=2.6 ; TN pooled mean(01/01/2010 - 12/31/2010)=3.1

**Figure 14: Central Line-Associated Bloodstream Infection Rates per 1,000 Central Line Days in Tennessee, 1/2010–12/2010, Medical Critical Care Units in Non-Major Teaching Hospitals**

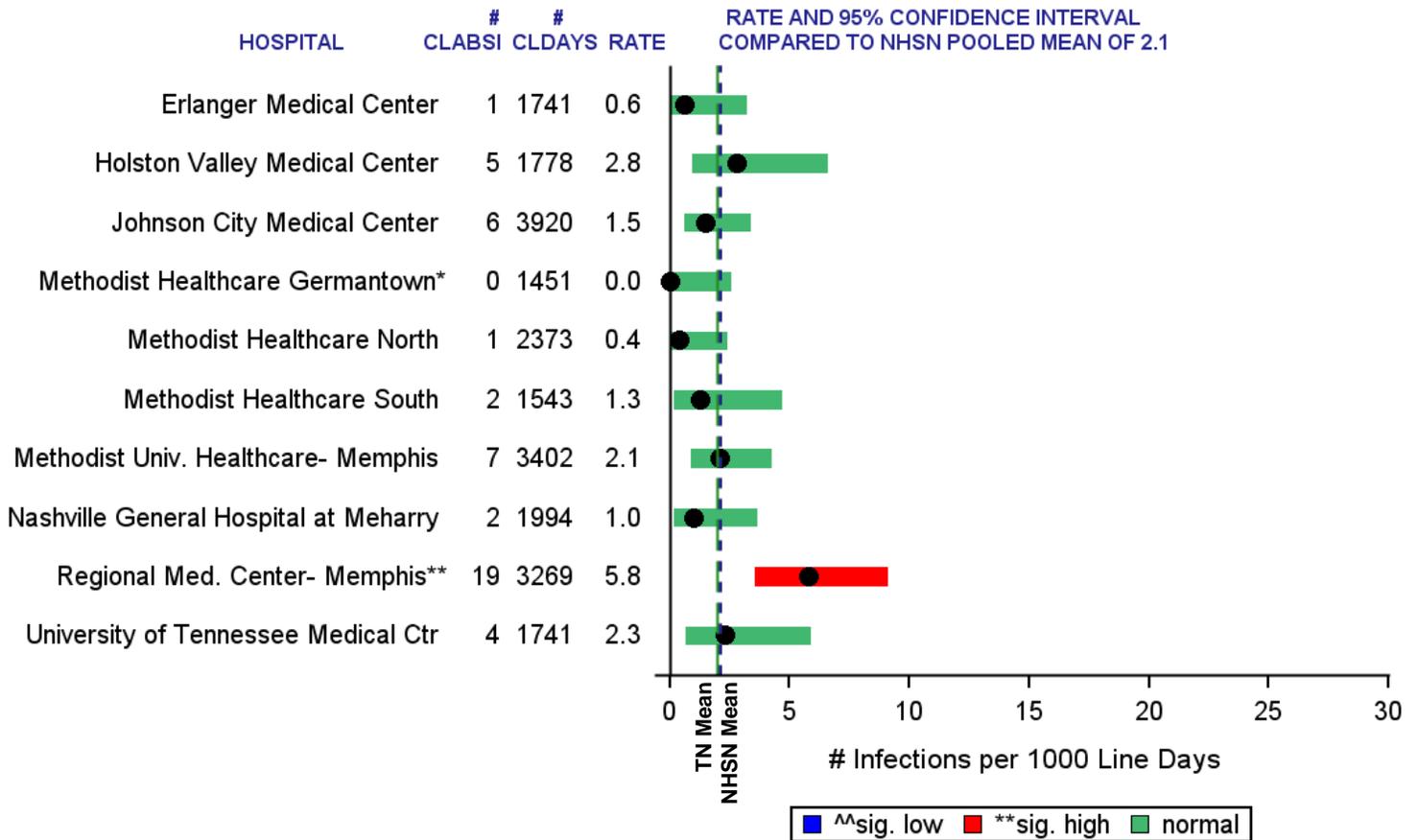
**Central Line-Associated Blood Stream Infection [CLABSI] Rates (per 1000 central line days)**  
 Tennessee (Reportable period: 01/01/2010 - 12/31/2010)  
 Medical Critical Care non-Major Teaching Hospitals



Data Reported as of September 14, 2011.  
 \*\* significantly higher than NHSN pooled mean  
 ^^ significantly lower than NHSN pooled mean  
 \* Zero infections, not statistically significant  
 NA Rates are not shown in critical care units with <50 central line days.  
 NHSN pooled mean(2006-2008)=1.9; TN pooled mean(01/01/2010 - 12/31/2010)=1.3

**Figure 15: Central Line-Associated Bloodstream Infection Rates per 1,000 Central Line Days in Tennessee, 1/2010–12/2010, Medical-Surgical Critical Care Units in Major Teaching Hospitals**

**Central Line-Associated Blood Stream Infection [CLABSI] Rates (per 1000 central line days)**  
 Tennessee (Reportable period: 01/01/2010 - 12/31/2010)  
 Medical-Surgical Critical Care Major Teaching Hospitals



Data Reported as of September 14, 2011.

\*\* significantly higher than NHSN pooled mean

^^ significantly lower than NHSN pooled mean

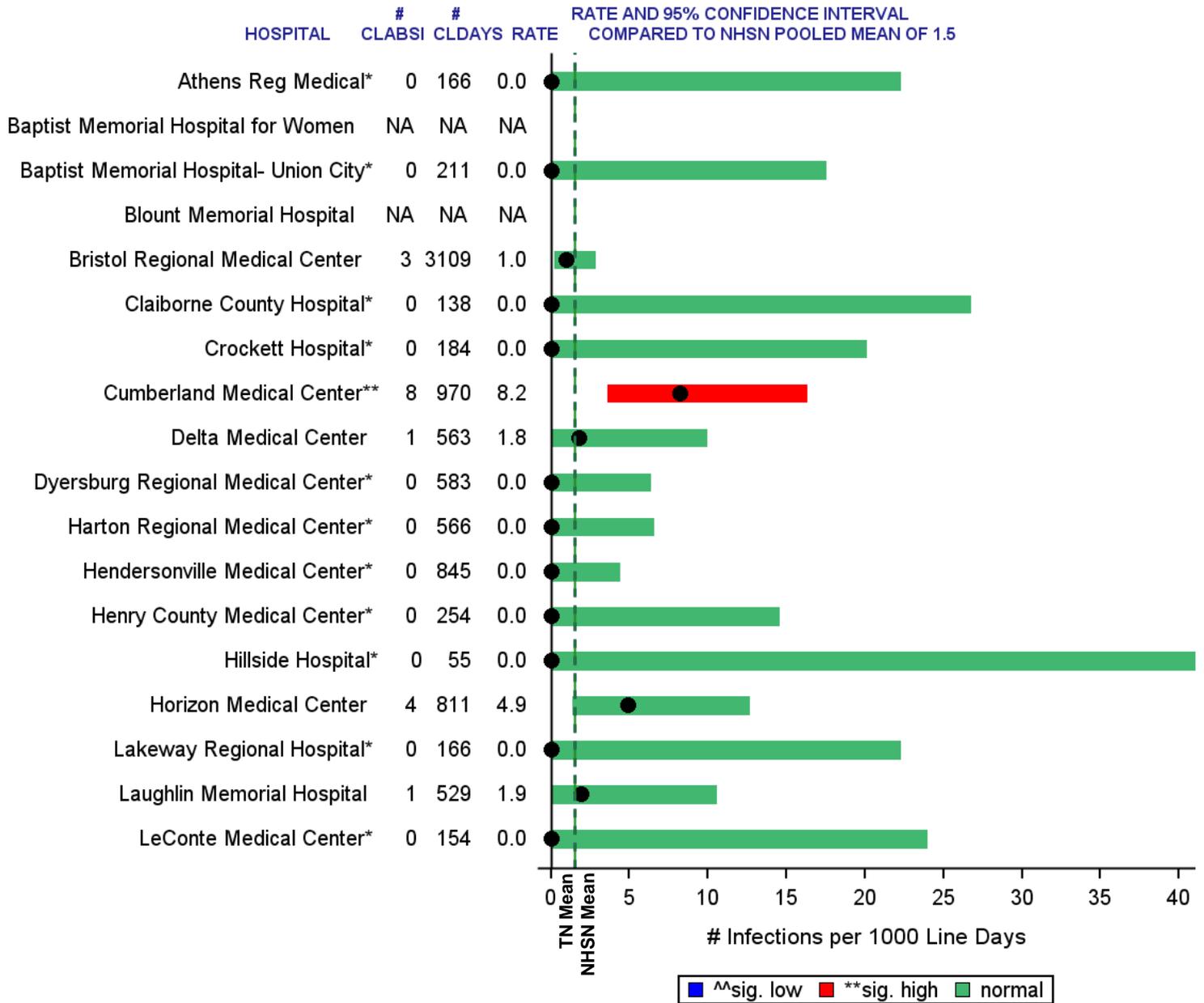
\* Zero infections, not statistically significant

NA Rates are not shown in critical care units with <50 central line days.

NHSN pooled mean(2006-2008)=2.1 ; TN pooled mean(01/01/2010 - 12/31/2010)=2.0

**Figure 16: Central Line-Associated Bloodstream Infection Rates per 1,000 Central Line Days in Tennessee, 1/2010–12/2010, Medical-Surgical ICUs with ≤15 beds in Non-Major Teaching Hospitals**

**Central Line-Associated Blood Stream Infection [CLABSI] Rates (per 1000 central line days)**  
 Tennessee (Reportable period: 01/01/2010 - 12/31/2010)  
 Medical-Surgical Critical Care non-Major Teaching Hospitals (ICU beds <=15)



Data Reported as of September 14, 2011.

\*\* significantly higher than NHSN pooled mean

^^ significantly lower than NHSN pooled mean

\* Zero infections, not statistically significant

NA Rates are not shown in critical care units with <50 central line days.

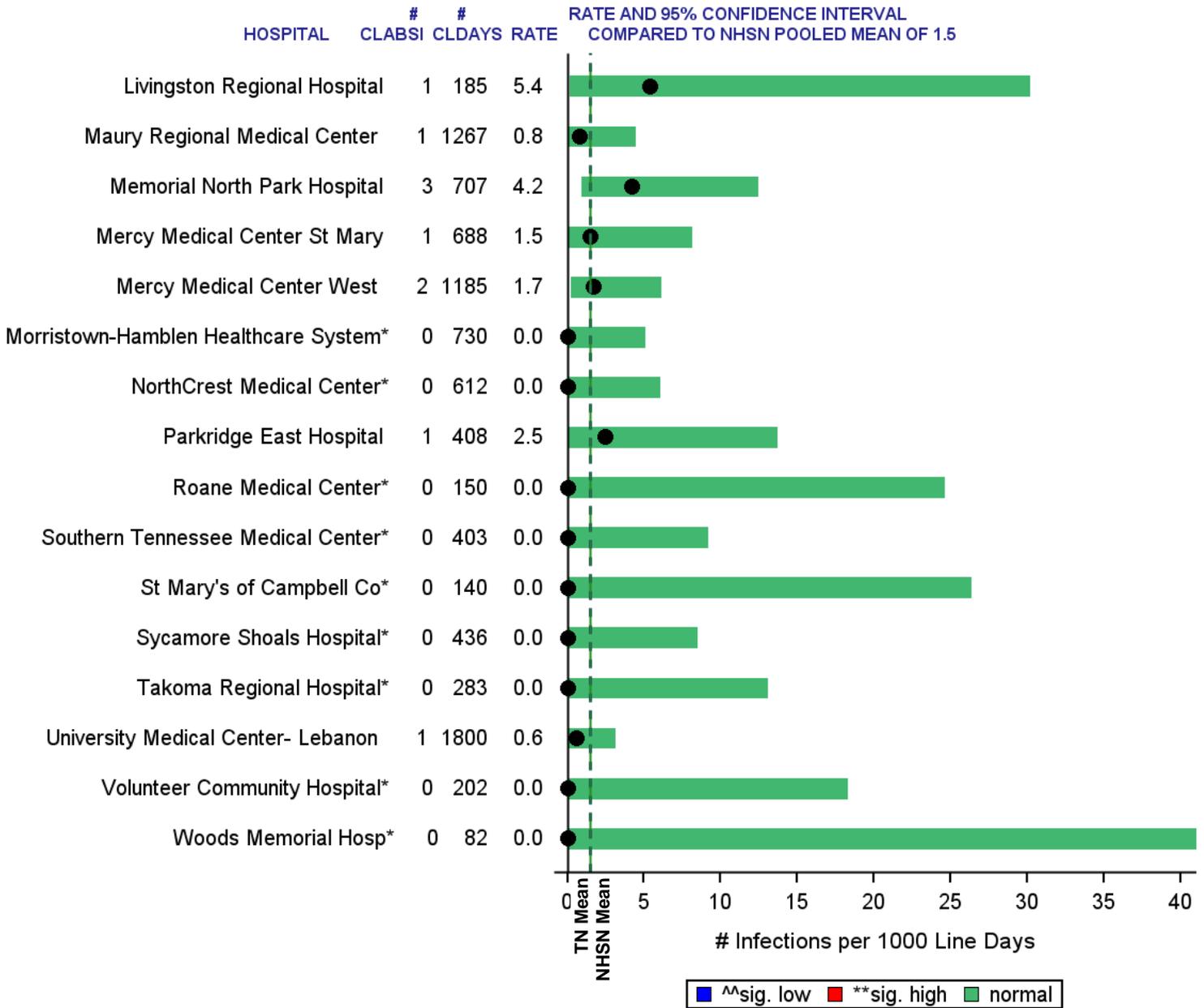
NHSN pooled mean(2006-2008)=1.5; TN pooled mean(01/01/2010 - 12/31/2010)=1.5

Figure 16 (cont'd)

**Central Line-Associated Blood Stream Infection [CLABSI] Rates (per 1000 central line days)**

Tennessee (Reportable period: 01/01/2010 - 12/31/2010)

Medical-Surgical Critical Care non-Major Teaching Hospitals (ICU beds <=15) [continued...]



Data Reported as of September 14, 2011.

\*\* significantly higher than NHSN pooled mean

^^ significantly lower than NHSN pooled mean

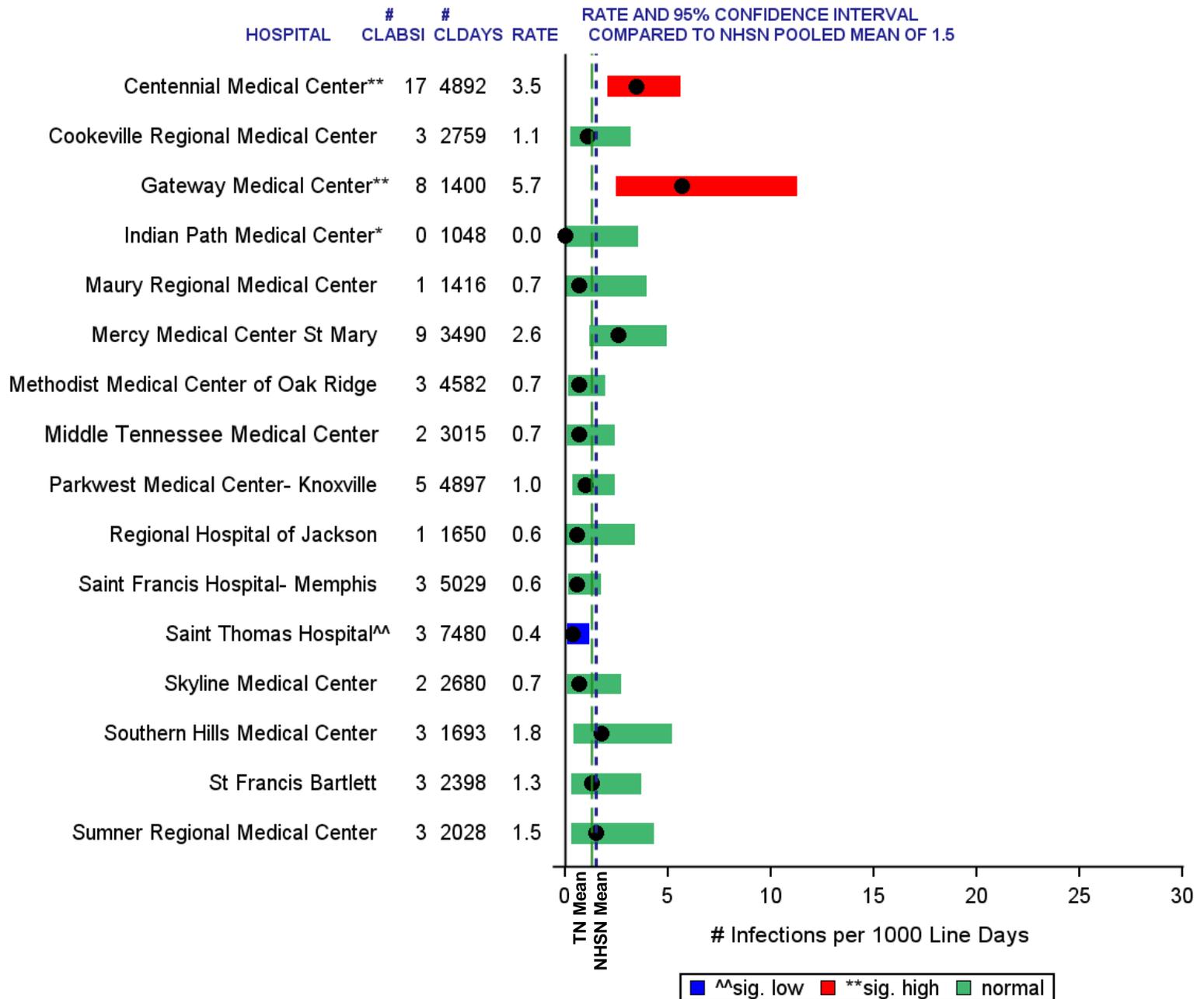
\* Zero infections, not statistically significant

NA Rates are not shown in critical care units with <50 central line days.

NHSN pooled mean(2006-2008)=1.5; TN pooled mean(01/01/2010 - 12/31/2010)=1.5

**Figure 17: Central Line-Associated Bloodstream Infection Rates per 1,000 Central Line Days in Tennessee, 1/2010–12/2010, Medical-Surgical ICUs with >15 beds in Non-Major Teaching Hospitals**

**Central Line-Associated Blood Stream Infection [CLABSI] Rates (per 1000 central line days)**  
 Tennessee (Reportable period: 01/01/2010 - 12/31/2010)  
 Medical-Surgical Critical Care non-Major Teaching Hospitals (ICU beds >15)



Data Reported as of September 14, 2011.

\*\* significantly higher than NHSN pooled mean

^^ significantly lower than NHSN pooled mean

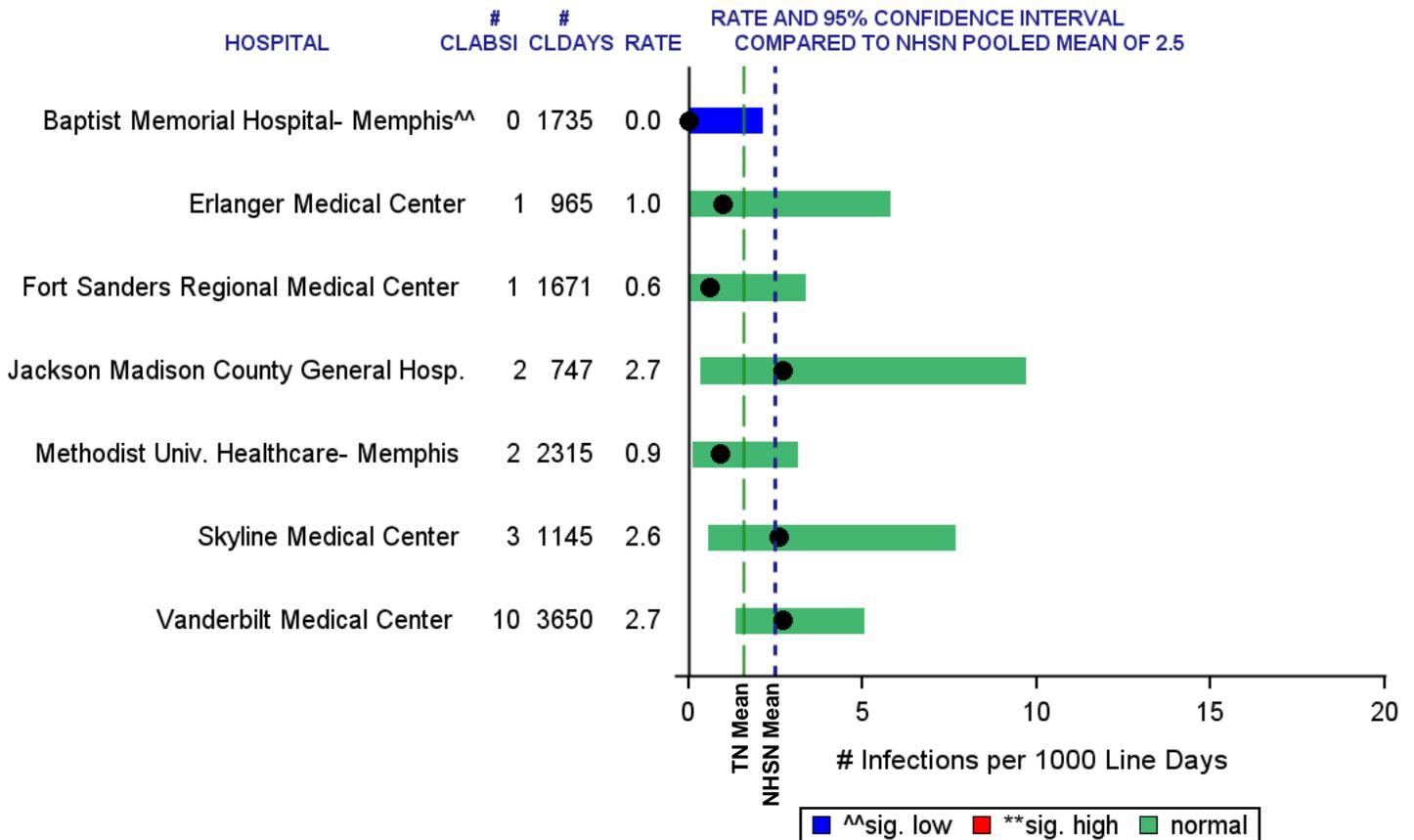
\* Zero infections, not statistically significant

NA Rates are not shown in critical care units with <50 central line days.

NHSN pooled mean(2006-2008)=1.5; TN pooled mean(01/01/2010 - 12/31/2010)=1.3

**Figure 18: Central Line-Associated Bloodstream Infection Rates per 1,000 Central Line Days in Tennessee, 1/2010–12/2010, Neurosurgical Critical Care Units**

**Central Line-Associated Blood Stream Infection [CLABSI] Rates (per 1000 central line days)  
Tennessee (Reportable period: 01/01/2010 - 12/31/2010)  
Neurosurgical Critical Care**



Data Reported as of September 14, 2011.

\*\* significantly higher than NHSN pooled mean

^^ significantly lower than NHSN pooled mean

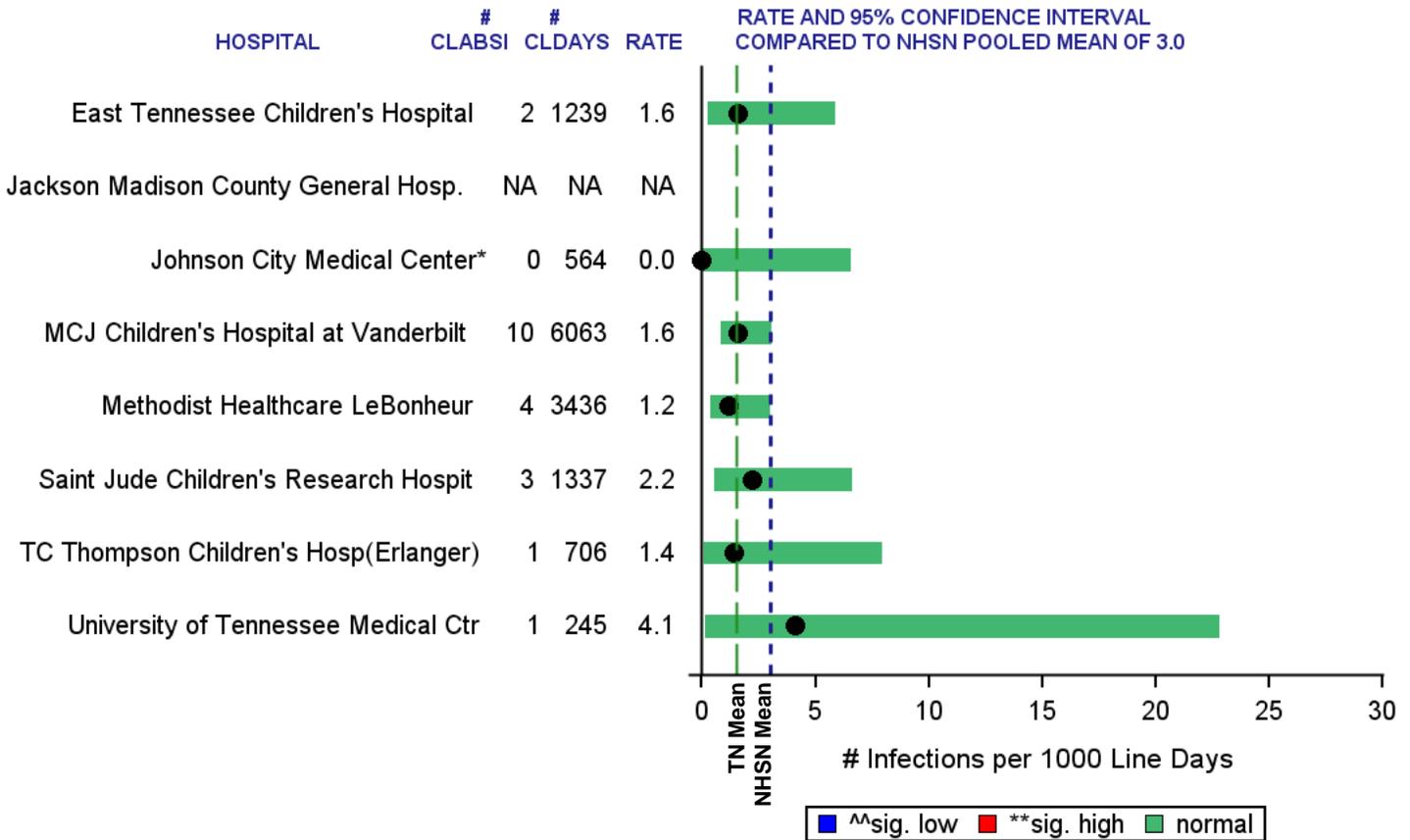
\* Zero infections, not statistically significant

NA Rates are not shown in critical care units with <50 central line days.

NHSN pooled mean(2006-2008)=2.5; TN pooled mean(01/01/2010 - 12/31/2010)=1.6

**Figure 19: Central Line-Associated Bloodstream Infection Rates per 1,000 Central Line Days in Tennessee, 1/20010–12/20010, Pediatric Medical-Surgical Critical Care Units**

**Central Line-Associated Blood Stream Infection [CLABSI] Rates (per 1000 central line days)**  
 Tennessee (Reportable period: 01/01/2010 - 12/31/2010)  
 Pediatric Medical-Surgical Critical Care



Data Reported as of September 14, 2011.

\*\* significantly higher than NHSN pooled mean

^^ significantly lower than NHSN pooled mean

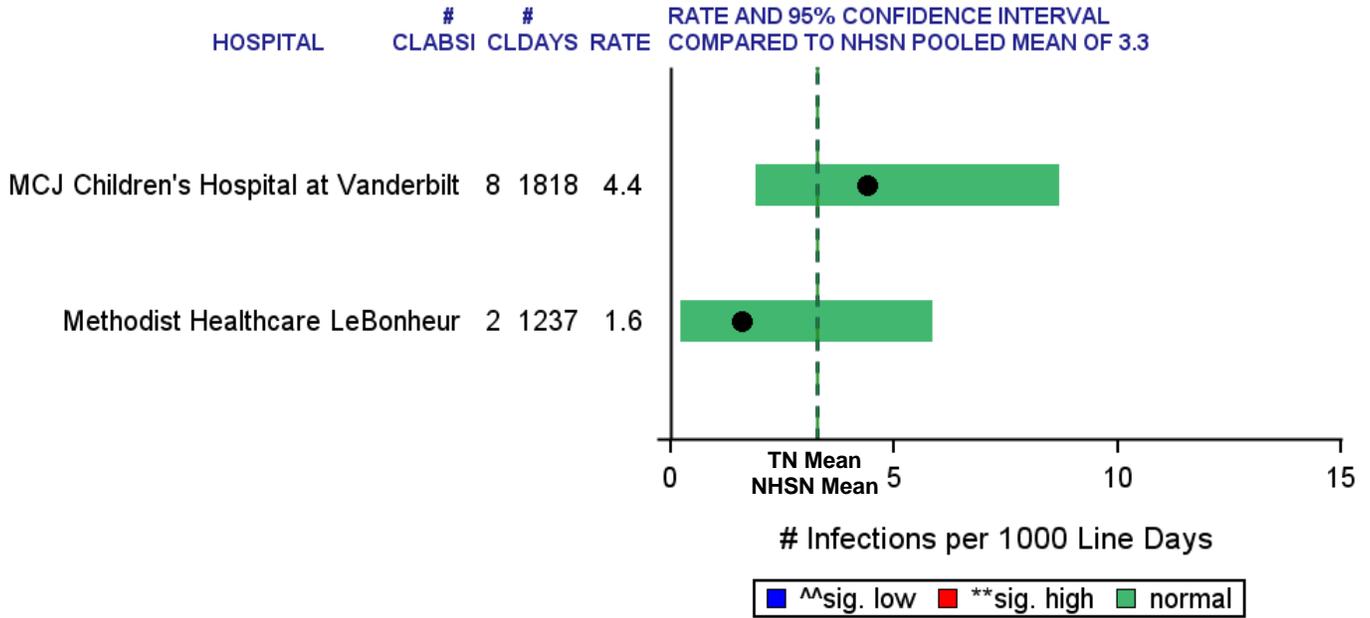
\* Zero infections, not statistically significant

NA Rates are not shown in critical care units with <50 central line days.

NHSN pooled mean(2006-2008)=3.0; TN pooled mean(01/01/2010 - 12/31/2010)=1.5

**Figure 20: Central Line-Associated Bloodstream Infection Rates per 1,000 Central Line Days in Tennessee, 1/2010–12/2010, Pediatric Surgical Cardiothoracic Critical Care Units**

**Central Line-Associated Blood Stream Infection [CLABSI] Rates (per 1000 central line days)  
Tennessee (Reportable period: 01/01/2010 - 12/31/2010)  
Pediatric Surgical Cardiothoracic Critical Care**



Data Reported as of August 24, 2011.

\*\* significantly higher than NHSN pooled mean

^^ significantly lower than NHSN pooled mean

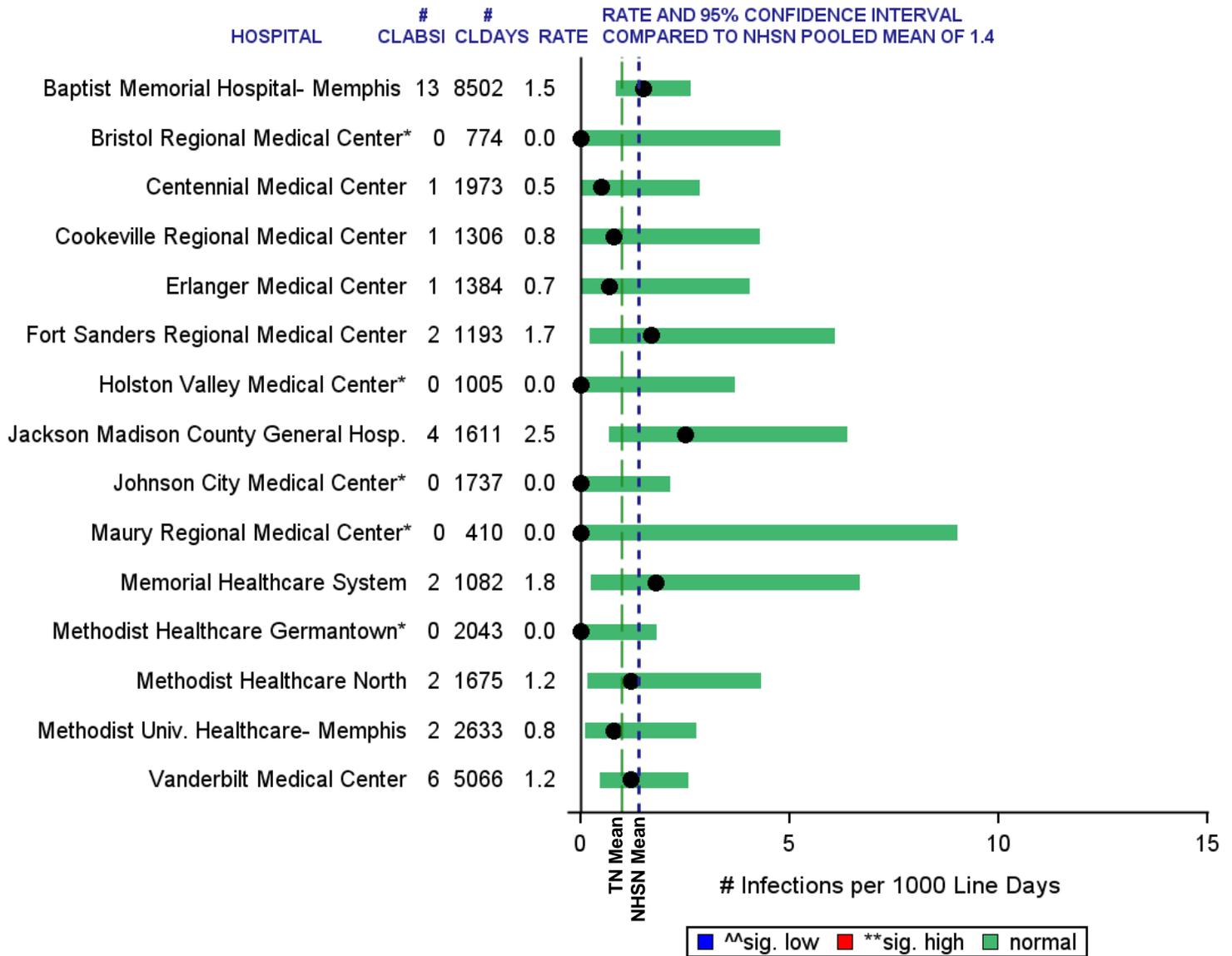
\* Zero infections, not statistically significant

NA Rates are not shown in critical care units with <50 central line days.

NHSN pooled mean(2006-2008)=3.3; TN pooled mean(01/01/2010 - 12/31/2010)=3.3

Figure 21: Central Line-Associated Bloodstream Infection Rates per 1,000 Central Line Days in Tennessee, 1/2010–12/2010, Surgical Cardiothoracic Critical Care Units

**Central Line-Associated Blood Stream Infection [CLABSI] Rates (per 1000 central line days)**  
 Tennessee (Reportable period: 01/01/2010 - 12/31/2010)  
 Surgical Cardiothoracic Critical Care



Data Reported as of September 14, 2011.

\*\* significantly higher than NHSN pooled mean

^^ significantly lower than NHSN pooled mean

\* Zero infections, not statistically significant

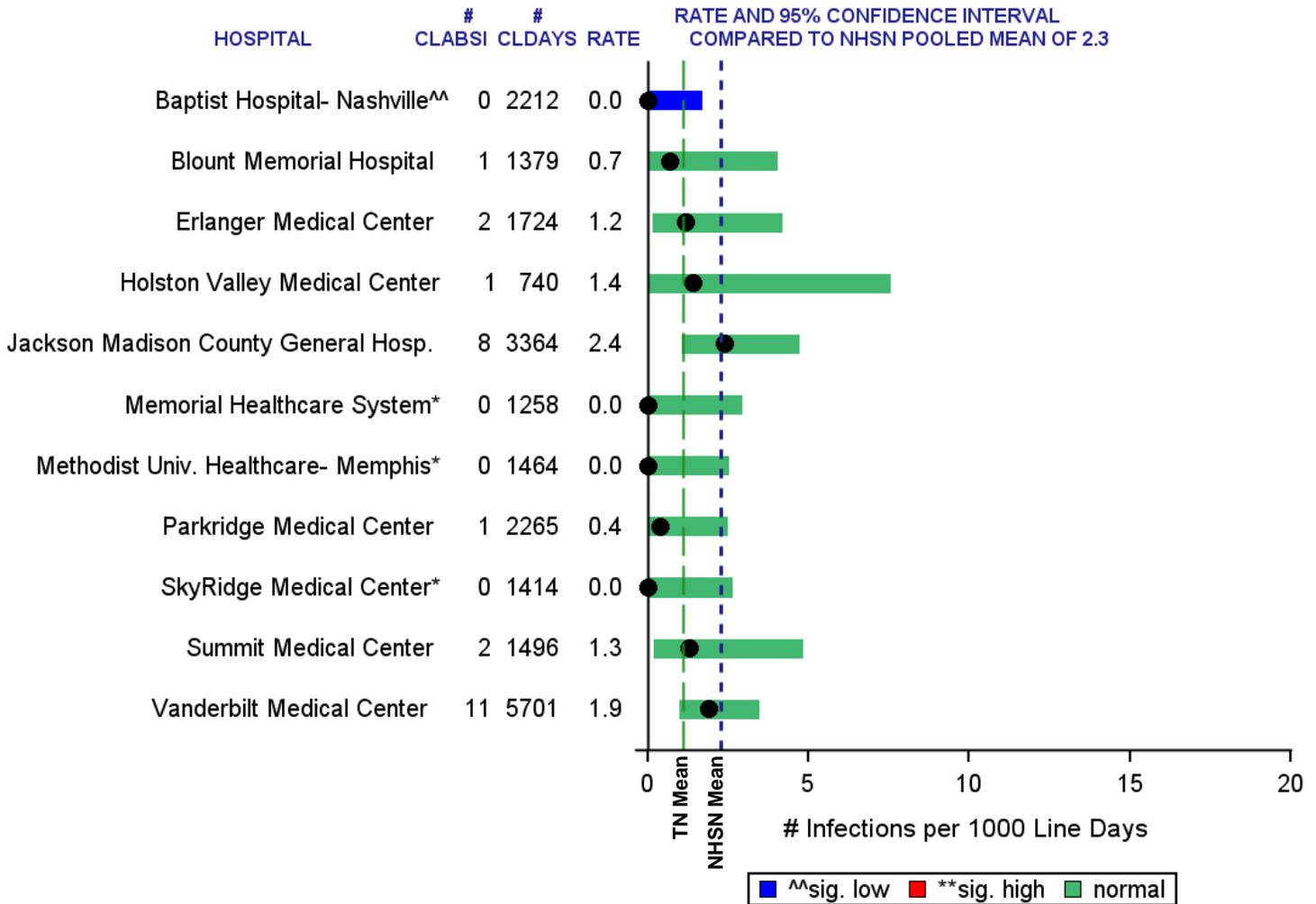
NA Rates are not shown in critical care units with <50 central line days.

NHSN pooled mean(2006-2008)=1.4 ; TN pooled mean(01/01/2010 - 12/31/2010)=1.0

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Figure 22: Central Line-Associated Bloodstream Infection Rates per 1,000 Central Line Days in Tennessee, 1/2010–12/2010, Surgical Critical Care Units

**Central Line-Associated Blood Stream Infection [CLABSI] Rates (per 1000 central line days)**  
Tennessee (Reportable period: 01/01/2010 - 12/31/2010)  
Surgical Critical Care



Data Reported as of September 14, 2011.

\*\* significantly higher than NHSN pooled mean

^^ significantly lower than NHSN pooled mean

\* Zero infections, not statistically significant

NA Rates are not shown in critical care units with <50 central line days.

NHSN pooled mean(2006-2008)=2.3; TN pooled mean(01/01/2010 - 12/31/2010)=1.1

Tennessee's Report on Healthcare-Associated Infections: Jan. 1, 2008 - Dec. 31, 2010

**Table 9: Measures of Central Line-Associated Bloodstream Infections (CLABSI) by Type of Critical Care Unit, Tennessee [Reporting period: 01/01/2010–12/31/2010]**

**Location = Medical Cardiac Critical Care**

Hospital	INCIDENCE DENSITY RATE (LINE DAYS)				DEVICE UTILIZATION		INCIDENCE DENSITY RATE (INPATIENT DAYS)	
	RATE*	Lower Limit	Upper limit	TN %ile	DU(%)	TN %ile	INPATIENT DAYS	RATE**
Baptist Hospital- Nashville	0.0	0.0	6.8	17	21	17	2571	0.0
Blount Memorial Hospital	0.0	0.0	4.0	17	50	83	1848	0.0
Centennial Medical Center	2.8	1.2	5.6	83	40	33	6966	1.1
Erlanger Medical Center	0.0	0.0	3.1	17	50	83	2405	0.0
Holston Valley Medical Center	4.6	1.0	13.5	100	42	50	1535	2.0
Jackson Madison County General Hosp. <sup>§</sup>	0.4	0.0	2.0	33	74	100	3816	0.3
Memorial Healthcare System	1.4	0.3	4.1	67	40	33	5349	0.6
University of Tennessee Medical Ctr	1.1	0.2	3.2	50	49	67	5603	0.5

Data reported as of September 14, 2011

\* per 1000 central line days

\*\* per 1000 inpatient days

TN%ile percentile in TN (01/01/2010–12/31/2010)

DU(%) device utilization(%)

NA not reported due to central line days <50

**Red highlighting** indicates rate for 2010 is significantly **higher** than the national 2006-2008 rate of 2.0 CLABSIs/1000 central line days

**Blue highlighting** indicates rate for 2010 is significantly **lower** than the national 2006-2008 rate of 2.0 CLABSIs/1000 central line days

<sup>§</sup>Note: Due to rounding, the upper confidence limit of Jackson Madison County General Hospital's CLABSI rate appears to include the national rate.

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**Table 10: Measures of Central Line-Associated Bloodstream Infections (CLABSI) by Type of Critical Care Unit, Tennessee [Reporting period: 01/01/2010–12/31/2010]**

**Location = Medical Critical Care, Major Teaching**

Hospital	INCIDENCE DENSITY RATE (LINE DAYS)				DEVICE UTILIZATION		INCIDENCE DENSITY RATE (INPATIENT DAYS)	
	RATE*	Lower Limit	Upper limit	TN %ile	DU(%)	TN %ile	INPATIENT DAYS	RATE**
Erlanger Medical Center	2.1	0.7	5.0	75	62	75	3758	1.3
Holston Valley Medical Center	1.2	0.1	4.2	50	65	100	2640	0.8
University of Tennessee Medical Center	0.5	0.0	2.8	25	60	50	3322	0.3
Vanderbilt Medical Center	5.1	3.3	7.4	100	52	25	10287	2.6

Data reported as of September 14, 2011

\* per 1000 central line days

\*\* per 1000 inpatient days

TN%ile percentile in TN (01/01/2010–12/31/2010)

DU(%) device utilization(%)

NA not reported due to central line days <50

Red highlighting indicates rate for 2010 is significantly higher than the national 2006-2008 rate of 2.6 CLABSIs/1000 central line days

Blue highlighting indicates rate for 2010 is significantly lower than the national 2006-2008 rate of 2.6 CLABSIs/1000 central line days

**Tennessee's Report on Healthcare-Associated Infections: Jan. 1, 2008 - Dec. 31, 2010**

**Table 11: Measures of Central Line-Associated Bloodstream Infections (CLABSIs) by Type of Critical Care Unit, Tennessee [Reporting period: 01/01/2010–12/31/2010]**

**Location = Medical Critical Care, Non-Major Teaching**

Hospital	INCIDENCE DENSITY RATE (LINE DAYS)				DEVICE UTILIZATION		INCIDENCE DENSITY RATE (INPATIENT DAYS)	
	RATE*	Lower Limit	Upper limit	TN %ile	DU(%)	TN %ile	INPATIENT DAYS	RATE**
Baptist Hospital- Nashville	0.5	0.0	2.9	15	44	59	4419	0.2
Baptist Memorial Hosp.- Collierville	2.3	0.1	13.0	85	33	41	1314	0.8
Baptist Memorial Hospital- Memphis	1.1	0.4	2.3	38	69	88	9119	0.8
Baptist Memorial Hospital-Tipton	0.0	0.0	51.2	8	19	18	386	0.0
Blount Memorial Hospital	0.9	0.0	5.2	31	55	71	1959	0.5
Fort Sanders Regional Medical Center	2.2	0.6	5.6	77	79	100	2289	1.7
Franklin Woods Community Hospital	0.0	0.0	10.1	7	26	24	1405	0.0
Hillside Hospital	0.0	0.0	39.7	8	17	12	545	0.0
Jackson Madison County General Hosp.	3.0	1.3	6.0	92	78	94	3392	2.4
Memorial Healthcare System	0.4	0.0	2.1	14	58	81	4604	0.2
Mercy Medical Center North	3.8	0.5	13.6	100	32	35	1654	1.2
Parkridge Medical Center	1.2	0.1	4.3	46	56	76	2986	0.7
River Park Hospital	0.0	0.0	13.3	8	14	6	1955	0.0
SkyRidge Medical Center	1.9	0.4	5.7	62	42	53	3712	0.8
Stonecrest Medical Center	2.0	0.1	11.3	69	28	29	1768	0.6
Summit Medical Center	1.5	0.2	5.3	54	52	65	2588	0.8
Sweetwater Hospital Association	0.0	0.0	9.0	8	28	29	1483	0.0
Williamson Medical Center	0.7	0.0	3.7	23	34	47	4396	0.2
Woods Memorial Hosp	0.0	0.0	40.5	8	17	12	548	0.0

Data reported as of September 14, 2011

\* per 1000 central line days

\*\* per 1000 inpatient days

TN%ile percentile in TN (01/01/2010–12/31/2010)

DU(%) device utilization(%)

NA not reported due to central line days <50

Red highlighting indicates rate for 2010 is significantly higher than the national 2006-2008 rates of 1.9 CLABSIs/1000 central line days

Blue highlighting indicates rate for 2010 is significantly lower than the national 2006-2008 rates of 1.9 CLABSIs/1000 central line days

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**Table 12: Measures of Central Line-Associated Bloodstream Infections (CLABSIs) by Type of Critical Care Unit, Tennessee [Reporting period: 01/01/2010–12/31/2010]**

**Location = Medical-Surgical Critical Care, Major Teaching**

Hospital	INCIDENCE DENSITY RATE (LINE DAYS)				DEVICE UTILIZATION		INCIDENCE DENSITY RATE (INPATIENT DAYS)	
	RATE*	Lower Limit	Upper limit	TN %ile	DU(%)	TN %ile	INPATIENT DAYS	RATE**
Erlanger Medical Center	0.6	0.0	3.2	30	59	63	2927	0.3
Holston Valley Medical Center	2.8	0.9	6.6	90	68	100	2611	1.9
Johnson City Medical Center	1.5	0.6	3.3	60	64	75	6131	1.0
Methodist Healthcare Germantown	0.0	0.0	2.5	10	59	63	2459	0.0
Methodist Healthcare North	0.4	0.0	2.3	20	49	38	4819	0.2
Methodist Healthcare South	1.3	0.2	4.7	50	40	13	3855	0.5
Methodist Univ. Healthcare- Memphis	2.1	0.8	4.2	70	66	88	5117	1.4
Nashville General Hospital at Meharry	1.0	0.1	3.6	40	55	50	3606	0.6
Regional Med. Center- Memphis	5.8	3.5	9.1	100	47	25	6962	2.7
University of Tennessee Medical Center	2.3	0.6	5.9	80	55	50	3191	1.3

Data reported as of September 14, 2011

\* per 1000 central line days

\*\* per 1000 inpatient days

TN%ile percentile in TN (01/01/2010–12/31/2010)

DU(%) device utilization(%)

NA not reported due to central line days <50

Red highlighting indicates rate for 2010 is significantly higher than the national 2006-2008 rate of 2.1 CLABSIs/1000 central line days

Blue highlighting indicates rate for 2010 is significantly lower than the national 2006-2008 rate of 2.1 CLABSIs/1000 central line days

**Table 13: Measures of Central Line-Associated Bloodstream Infections (CLABSIs) by Type of Critical Care Unit, Tennessee [Reporting period: 01/01/2010–12/31/2010]**

**Location = Medical-Surgical Critical Care, Non-Major Teaching with ≤15 beds**

Hospital	INCIDENCE DENSITY RATE (LINE DAYS)				DEVICE UTILIZATION		INCIDENCE DENSITY RATE (INPATIENT DAYS)	
	RATE*	Lower Limit	Upper limit	TN %ile	DU(%)	TN %ile	INPATIENT DAYS	RATE**
Athens Regional Medical Center	0.0	0.0	22.2	8	18	32	925	0.0
Baptist Memorial Hospital for Women	NA	NA	NA	NA	13	9	82	0.0
Baptist Memorial Hospital- Union City	0.0	0.0	17.5	8	17	27	1267	0.0
Blount Memorial Hospital	NA	NA	NA	NA	60	95	5	0.0
Bristol Regional Medical Center	1.0	0.2	2.8	33	49	91	6290	0.5
Claiborne County Hospital	0.0	0.0	26.7	8	14	14	958	0.0
Crockett Hospital	0.0	0.0	20.0	8	14	14	1296	0.0
Cumberland Medical Center	8.2	3.6	16.3	100	36	68	2680	3.0
Delta Medical Center	1.8	0.0	9.9	50	48	86	1170	0.9
Dyersburg Regional Medical Center	0.0	0.0	6.3	8	27	55	2176	0.0
Harton Regional Medical Center	0.0	0.0	6.5	8	26	50	2185	0.0
Hendersonville Medical Center	0.0	0.0	4.4	8	34	64	2512	0.0
Henry County Medical Center	0.0	0.0	14.5	8	20	36	1271	0.0
Hillside Hospital	0.0	0.0	67.1	8	13	9	427	0.0
Horizon Medical Center	4.9	1.3	12.6	83	47	82	1744	2.3
Lakeway Regional Hospital	0.0	0.0	22.2	8	16	23	1054	0.0
Laughlin Memorial Hospital	1.9	0.0	10.5	58	34	64	1556	0.6
LeConte Medical Center	0.0	0.0	24.0	8	13	9	1170	0.0
Livingston Regional Hospital	5.4	0.1	30.1	92	15	18	1212	0.8
Maury Regional Medical Center	0.8	0.0	4.4	25	60	95	2108	0.5
Memorial North Park Hospital	4.2	0.9	12.4	75	39	73	1814	1.7
Mercy Medical Center St Mary	1.5	0.0	8.1	42	40	77	1731	0.6
Mercy Medical Center West	1.7	0.2	6.1	46	51	91	2341	0.9
Morristown-Hamblen Healthcare System	0.0	0.0	5.1	8	13	9	5540	0.0
NorthCrest Medical Center	0.0	0.0	6.0	8	26	50	2315	0.0
Parkridge East Hospital	2.5	0.1	13.7	67	31	59	1313	0.8
Roane Medical Center	0.0	0.0	24.6	8	20	36	736	0.0
Southern Tennessee Medical Center	0.0	0.0	9.2	8	15	18	2720	0.0
St Mary's of Campbell Co	0.0	0.0	26.3	8	11	5	1254	0.0
Sycamore Shoals Hospital	0.0	0.0	8.5	8	22	45	1960	0.0
Takoma Regional Hospital	0.0	0.0	13.0	8	21	41	1327	0.0
University Medical Center- Lebanon	0.6	0.0	3.1	17	69	100	2627	0.4

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Hospital	INCIDENCE DENSITY RATE (LINE DAYS)				DEVICE UTILIZATION		INCIDENCE DENSITY RATE (INPATIENT DAYS)	
	RATE*	Lower Limit	Upper limit	TN %ile	DU(%)	TN %ile	INPATIENT DAYS	RATE**
Volunteer Community Hospital	0.0	0.0	18.3	8	21	41	985	0.0
Woods Memorial Hosp	0.0	0.0	45.0	8	14	14	593	0.0

Data reported as of September 14, 2011

\* per 1000 central line days

\*\* per 1000 inpatient days

TN%ile percentile in TN (01/01/2010–12/31/2010)

DU(%) device utilization(%)

NA not reported due to central line days <50

**Red highlighting** indicates rate for 2010 is significantly **higher** than the national 2006-2008 rate of 1.5 CLABSIs/1000 central line days

**Blue highlighting** indicates rate for 2010 is significantly **lower** than the national 2006-2008 rate of 1.5 CLABSIs/1000 central line days

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**Table 14: Measures of Central Line-Associated Bloodstream Infections (CLABSIs) by Type of Critical Care Unit, Tennessee [Reporting period: 01/01/2010–12/31/2010]**

**Location = Medical-Surgical Critical Care, Non-Major Teaching with >15 beds**

Hospital	INCIDENCE DENSITY RATE (LINE DAYS)				DEVICE UTILIZATION		INCIDENCE DENSITY RATE (INPATIENT DAYS)	
	RATE*	Lower Limit	Upper limit	TN %ile	DU(%)	TN %ile	INPATIENT DAYS	RATE**
Centennial Medical Center	3.5	2.0	5.6	94	53	53	9220	1.8
Cookeville Regional Medical Center	1.1	0.2	3.2	59	54	60	5142	0.6
Gateway Medical Center	5.7	2.5	11.3	100	37	13	3788	2.1
Indian Path Medical Center	0.0	0.0	3.5	6	34	7	3040	0.0
Maury Regional Medical Center	0.7	0.0	3.9	41	59	73	2405	0.4
Mercy Medical Center St Mary	2.6	1.2	4.9	88	54	60	6430	1.4
Methodist Medical Center of Oak Ridge	0.7	0.1	1.9	29	63	87	7247	0.4
Middle Tennessee Medical Center	0.7	0.1	2.4	35	40	20	7475	0.3
Parkwest Medical Center- Knoxville	1.0	0.3	2.4	53	64	93	7630	0.7
Regional Hospital of Jackson	0.6	0.0	3.4	24	41	27	4033	0.2
Saint Francis Hospital- Memphis	0.6	0.1	1.7	18	60	80	8412	0.4
Saint Thomas Hospital	0.4	0.1	1.2	12	71	100	10539	0.3
Skyline Medical Center	0.7	0.1	2.7	47	42	33	6388	0.3
Southern Hills Medical Center	1.8	0.4	5.2	82	42	33	4011	0.7
St Francis Bartlett	1.3	0.3	3.7	65	57	67	4208	0.7
Sumner Regional Medical Center	1.5	0.3	4.3	71	50	40	4060	0.7

Data reported as of September 14, 2011

\* per 1000 central line days

\*\* per 1000 inpatient days

TN%ile percentile in TN (01/01/2010–12/31/2010)

DU(%) device utilization(%)

NA not reported due to central line days <50

Red highlighting indicates rate for 2010 is significantly higher than the national 2006-2008 rate of 1.5 CLABSIs/1000 central line days

Blue highlighting indicates rate for 2010 is significantly lower than the national 2006-2008 rate of 1.5 CLABSIs/1000 central line days

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**Table 15: Measures of Central Line-Associated Bloodstream Infections (CLABSIs) by Type of Critical Care Unit, Tennessee [Reporting period: 01/01/2010–12/31/2010]**

**Location = Neurosurgical Critical Care**

Hospital	INCIDENCE DENSITY RATE (LINE DAYS)				DEVICE UTILIZATION		INCIDENCE DENSITY RATE (INPATIENT DAYS)	
	RATE*	Lower Limit	Upper limit	TN %ile	DU(%)	TN %ile	INPATIENT DAYS	RATE**
Baptist Memorial Hospital- Memphis	0.0	0.0	2.1	14	54	86	3216	0.0
Erlanger Medical Center	1.0	0.0	5.8	57	38	43	2571	0.4
Fort Sanders Regional Medical Center	0.6	0.0	3.3	29	66	100	2523	0.4
Jackson Madison County General Hosp.	2.7	0.3	9.7	86	52	71	1447	1.4
Methodist Univ. Healthcare- Memphis	0.9	0.1	3.1	43	47	57	4959	0.4
Skyline Medical Center	2.6	0.5	7.7	71	31	14	3726	0.8
Vanderbilt Medical Center	2.7	1.3	5.0	100	36	29	10006	1.0

Data reported as of September 14, 2011

\* per 1000 central line days

\*\* per 1000 inpatient days

TN%ile percentile in TN (01/01/2010–12/31/2010)

DU(%) device utilization(%)

NA not reported due to central line days <50

Red highlighting indicates rate for 2010 is significantly higher than the national 2006-2008 rate of 2.5 CLABSIs/1000 central line days

Blue highlighting indicates rate for 2010 is significantly lower than the national 2006-2008 rate of 2.5 CLABSIs/1000 central line days

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**Table 16: Measures of Central Line-Associated Bloodstream Infections (CLABSIs) by Type of Critical Care Unit, Tennessee [Reporting period: 01/01/2010–12/31/2010]**

**Location = Pediatric Medical-Surgical Critical Care**

Hospital	INCIDENCE DENSITY RATE (LINE DAYS)				DEVICE UTILIZATION		INCIDENCE DENSITY RATE (INPATIENT DAYS)	
	RATE*	Lower Limit	Upper limit	TN %ile	DU(%)	TN %ile	INPATIENT DAYS	RATE**
East Tennessee Children's Hospital	1.6	0.2	5.8	57	56	63	2209	0.9
Jackson Madison County General Hosp.	NA	NA	NA	NA	8	13	101	0.0
Johnson City Medical Center	0.0	0.0	6.5	14	34	38	1636	0.0
MCJ Children's Hospital at Vanderbilt	1.6	0.8	3.0	71	66	88	9139	1.1
Methodist Healthcare LeBonheur	1.2	0.3	3.0	29	61	75	5649	0.7
Saint Jude Children's Research Hosp.	2.2	0.5	6.6	86	92	100	1447	2.1
TC Thompson Children's Hosp(Erlanger)	1.4	0.0	7.9	43	32	25	2224	0.4
University of Tennessee Medical Center	4.1	0.1	22.7	100	40	50	617	1.6

Data reported as of September 14, 2011

\* per 1000 central line days

\*\* per 1000 inpatient days

TN%ile percentile in TN (01/01/2010–12/31/2010)

DU(%) device utilization(%)

NA not reported due to central line days <50

Red highlighting indicates rate for 2010 is significantly higher than the national 2006-2008 rate of 3.0 CLABSIs/1000 central line days

Blue highlighting indicates rate for 2010 is significantly lower than the national 2006-2008 rate of 3.0 CLABSIs/1000 central line days

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Table 17: Measures of Central Line-Associated Bloodstream Infections (CLABSIs) by Type of Critical Care Unit, Tennessee [Reporting period: 01/01/2010–12/31/2010]

Location = Pediatric Surgical Cardiothoracic Critical Care

Hospital	INCIDENCE DENSITY RATE (LINE DAYS)				DEVICE UTILIZATION		INCIDENCE DENSITY RATE (INPATIENT DAYS)	
	RATE*	Lower Limit	Upper limit	TN %ile	DU(%)	TN %ile	INPATIENT DAYS	RATE**
MCJ Children's Hospital at Vanderbilt	4.4	1.9	8.7	100	93	100	1953	4.1
Methodist Healthcare LeBonheur	1.6	0.2	5.8	50	83	50	1496	1.3

Data reported as of September 14, 2011

\* per 1000 central line days

\*\* per 1000 inpatient days

TN%ile percentile in TN (01/01/2010–12/31/2010)

DU(%) device utilization(%)

NA not reported due to central line days <50

Red highlighting indicates rate for 2010 is significantly higher than the national 2006-2008 rate of 3.3 CLABSIs/1000 central line days

Blue highlighting indicates rate for 2010 is significantly lower than the national 2006-2008 rate of 3.3 CLABSIs/1000 central line days

**Tennessee's Report on Healthcare-Associated Infections: Jan. 1, 2008 - Dec. 31, 2010**

**Table 18: Measures of Central Line-Associated Bloodstream Infections (CLABSIs) by Type of Critical Care Unit, Tennessee [Reporting period: 01/01/2010–12/31/2010]**

**Location = Surgical Cardiothoracic Critical Care**

Hospital	INCIDENCE DENSITY RATE (LINE DAYS)				DEVICE UTILIZATION		INCIDENCE DENSITY RATE (INPATIENT DAYS)	
	RATE*	Lower Limit	Upper limit	TN %ile	DU(%)	TN %ile	INPATIENT DAYS	RATE**
Baptist Memorial Hospital- Memphis	1.5	0.8	2.6	73	69	69	12296	1.1
Bristol Regional Medical Center	0.0	0.0	4.8	9	34	8	2279	0.0
Centennial Medical Center	0.5	0.0	2.8	18	100	100	1979	0.5
Cookeville Regional Medical Center	0.8	0.0	4.3	45	57	46	2307	0.4
Erlanger Medical Center	0.7	0.0	4.0	27	65	62	2128	0.5
Fort Sanders Regional Medical Center	1.7	0.2	6.1	82	70	77	1714	1.2
Holston Valley Medical Center	0.0	0.0	3.7	9	78	85	1281	0.0
Jackson Madison County General Hosp.	2.5	0.7	6.4	100	86	92	1877	2.1
Johnson City Medical Center	0.0	0.0	2.1	9	48	23	3608	0.0
Maury Regional Medical Center	0.0	0.0	9.0	9	61	54	674	0.0
Memorial Healthcare System	1.8	0.2	6.7	91	52	38	2068	1.0
Methodist Healthcare Germantown	0.0	0.0	1.8	9	47	15	4318	0.0
Methodist Healthcare North	1.2	0.1	4.3	64	49	31	3412	0.6
Methodist Univ. Healthcare- Memphis	0.8	0.1	2.7	36	57	46	4609	0.4
Vanderbilt Medical Center	1.2	0.4	2.6	55	70	77	7235	0.8

Data reported as of September 14, 2011

\* per 1000 central line days

\*\* per 1000 inpatient days

TN%ile percentile in TN (01/01/2010–12/31/2010)

DU(%) device utilization(%)

NA not reported due to central line days <50

Red highlighting indicates rate for 2010 is significantly higher than the national 2006-2008 rate of 1.4 CLABSIs/1000 central line days

Blue highlighting indicates rate for 2010 is significantly lower than the national 2006-2008 rate of 1.4 CLABSIs/1000 central line days

**Tennessee's Report on Healthcare-Associated Infections: Jan. 1, 2008 - Dec. 31, 2010**

**Table 19: Measures of Central Line-Associated Bloodstream Infections (CLABSIs) by Type of Critical Care Unit, Tennessee [Reporting period: 01/01/2010–12/31/2010]**

**Location = Surgical Critical Care**

Hospital	INCIDENCE DENSITY RATE (LINE DAYS)				DEVICE UTILIZATION		INCIDENCE DENSITY RATE (INPATIENT DAYS)	
	RATE*	Lower Limit	Upper limit	TN %ile	DU(%)	TN %ile	INPATIENT DAYS	RATE**
Baptist Hospital- Nashville	0.0	0.0	1.7	13	53	25	4186	0.0
Blount Memorial Hospital	0.7	0.0	4.0	38	67	88	2043	0.5
Erlanger Medical Center	1.2	0.1	4.2	50	56	38	3053	0.7
Holston Valley Medical Center	1.4	0.0	7.5	75	66	75	1114	0.9
Jackson Madison County General Hosp.	2.4	1.0	4.7	100	75	100	4512	1.8
Memorial Healthcare System	0.0	0.0	2.9	13	56	38	2231	0.0
Methodist Univ. Healthcare- Memphis	0.0	0.0	2.5	13	59	50	2465	0.0
Parkridge Medical Center	0.4	0.0	2.5	25	75	100	3004	0.3
SkyRidge Medical Center	0.0	0.0	2.6	13	51	13	2748	0.0
Summit Medical Center	1.3	0.2	4.8	63	59	50	2543	0.8
Vanderbilt Medical Center	1.9	1.0	3.5	88	63	63	9071	1.2

Data reported as of September 14, 2011

\* per 1000 central line days

\*\* per 1000 inpatient days

TN%ile percentile in TN (01/01/2010–12/31/2010)

DU(%) device utilization(%)

NA not reported due to central line days <50

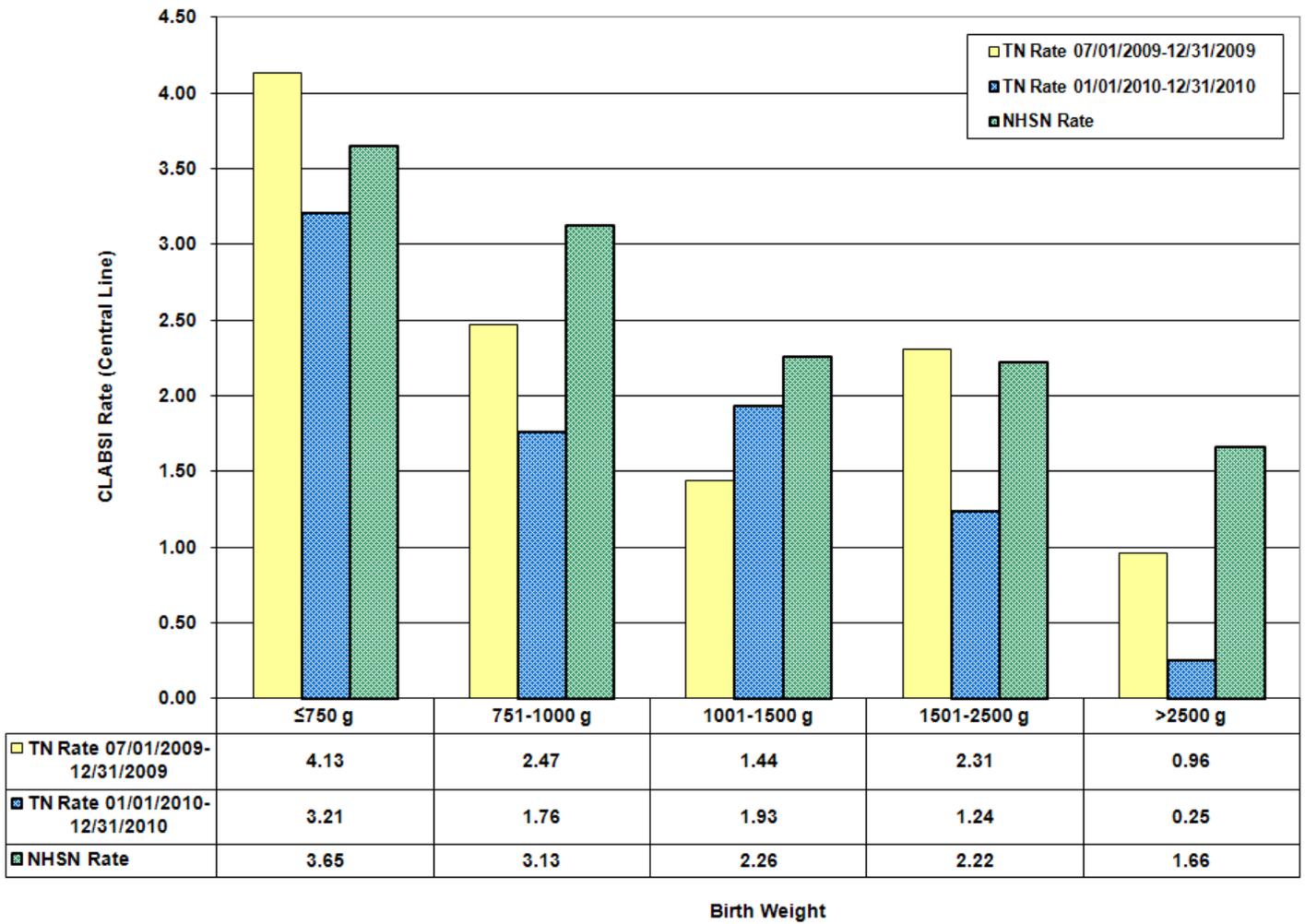
Red highlighting indicates rate for 2010 is significantly higher than the national 2006-2008 rate of 2.3 CLABSIs/1000 central line days

Blue highlighting indicates rate for 2010 is significantly lower than the national 2006-2008 rate of 2.3 CLABSIs/1000 central line days

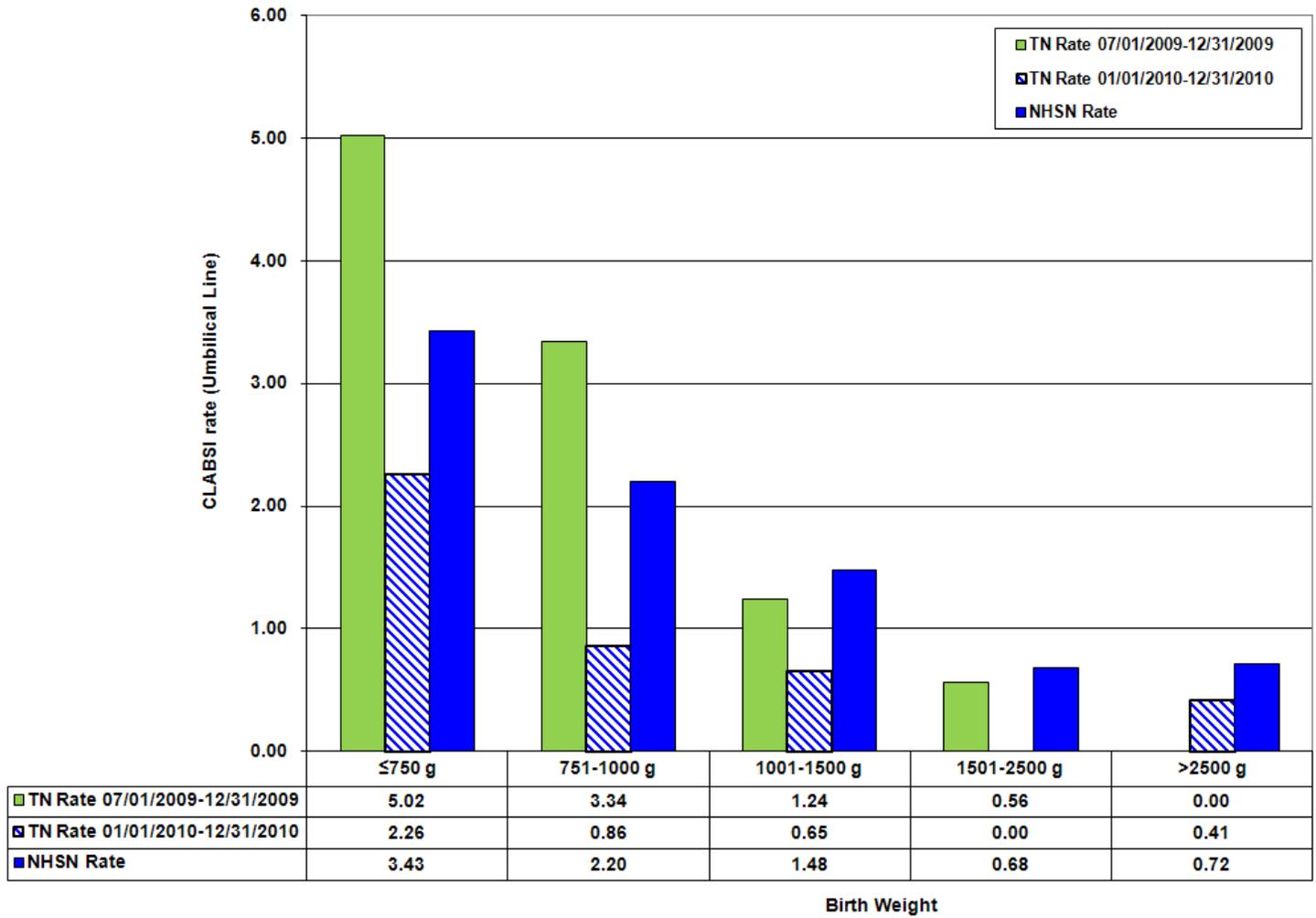
**CLABSI Figures and Tables**

**Neonatal Critical Care Units**

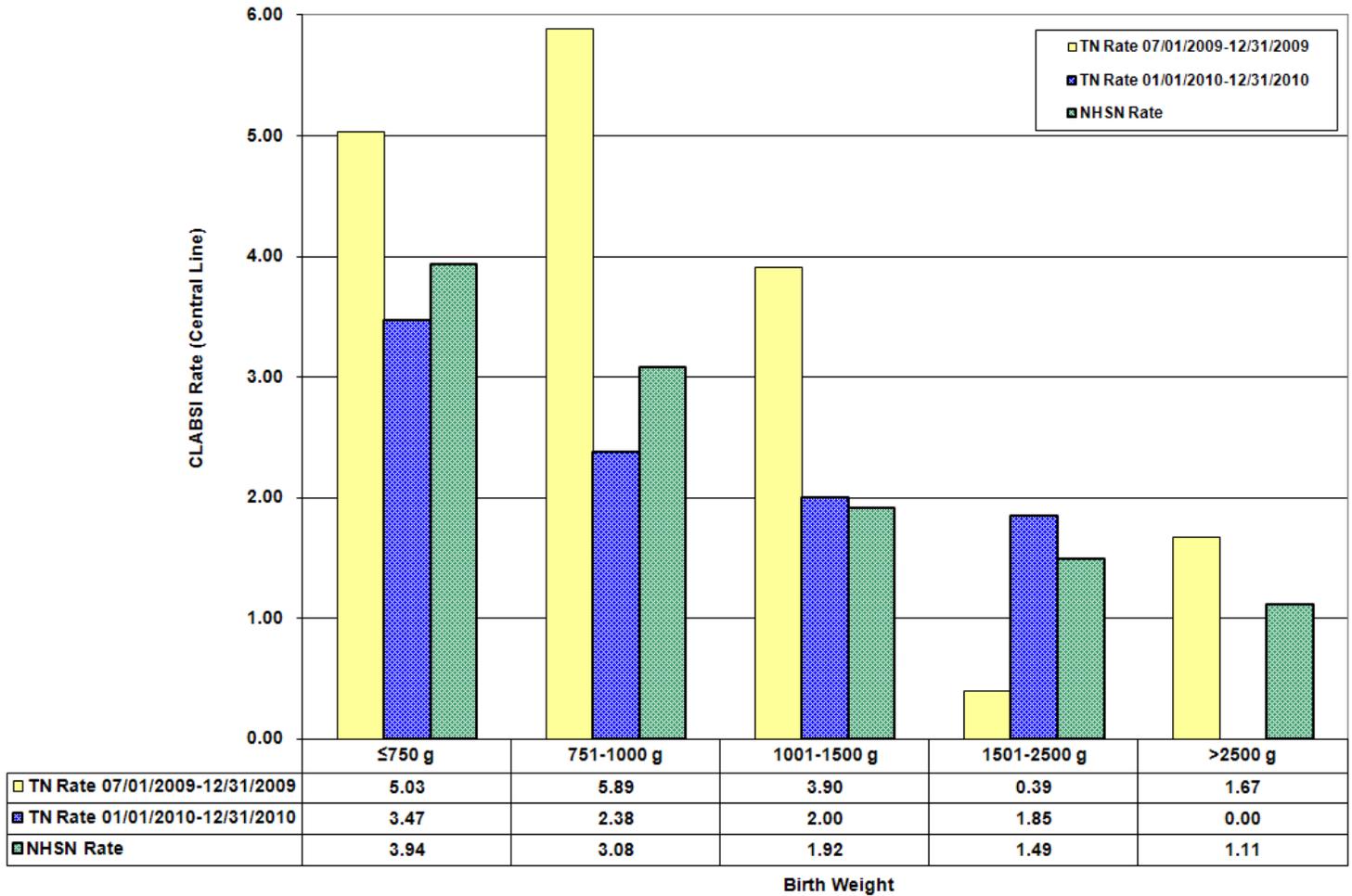
**Figure 23: Central Line-Associated Bloodstream Infection (CLABSI) Pooled Mean Rates per 1,000 Central Line Days in Level III Neonatal Intensive Care Units by Birth Weight Category, Tennessee, 2009 and 2010, vs. National Healthcare Safety Network (NHSN), 2006-8**



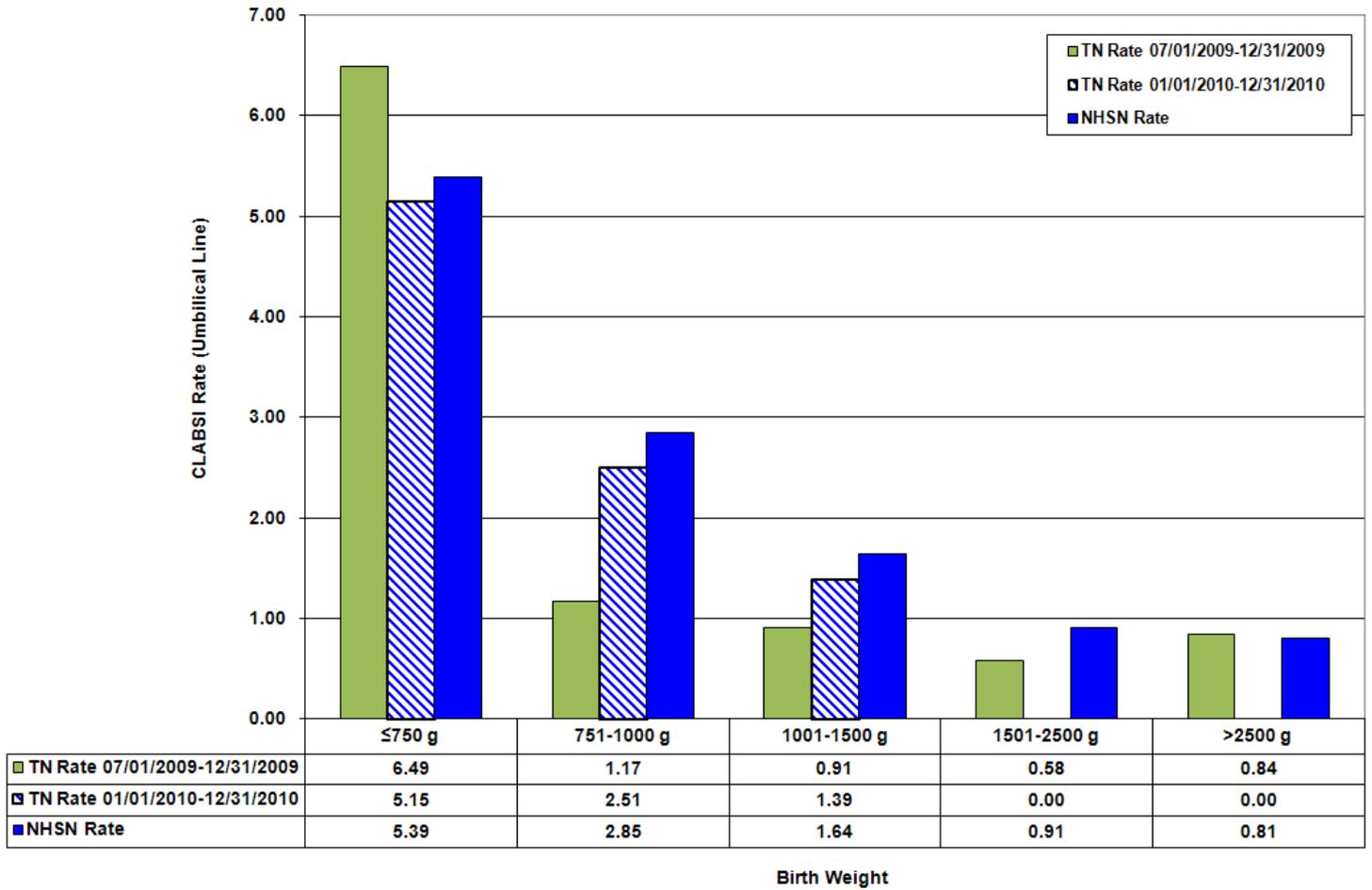
**Figure 24: Umbilical Catheter-Associated Bloodstream Infection (UCABSI) Pooled Mean Rates per 1,000 Umbilical Line Days in Level III Neonatal Intensive Care Units by Birth Weight Category, Tennessee, 2009 and 2010, vs. National Healthcare Safety Network (NHSN), 2006-8**



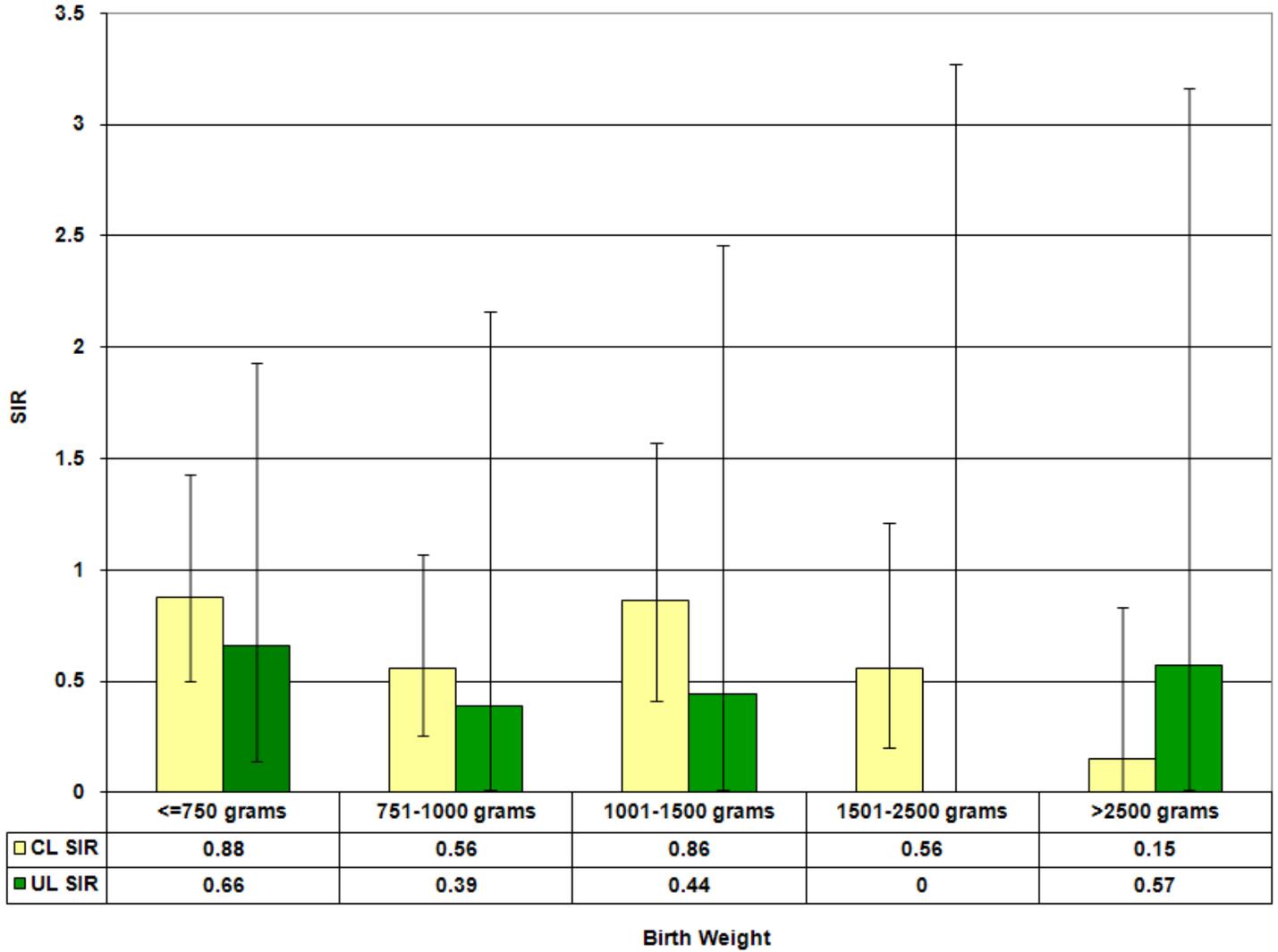
**Figure 25: Central Line-Associated Bloodstream Infection (CLABSI) Pooled Mean Rates per 1,000 Central Line Days in Level II/III Neonatal Intensive Care Units by Birth Weight Category, Tennessee, 2009 and 2010, vs. National Healthcare Safety Network (NHSN), 2006-8**



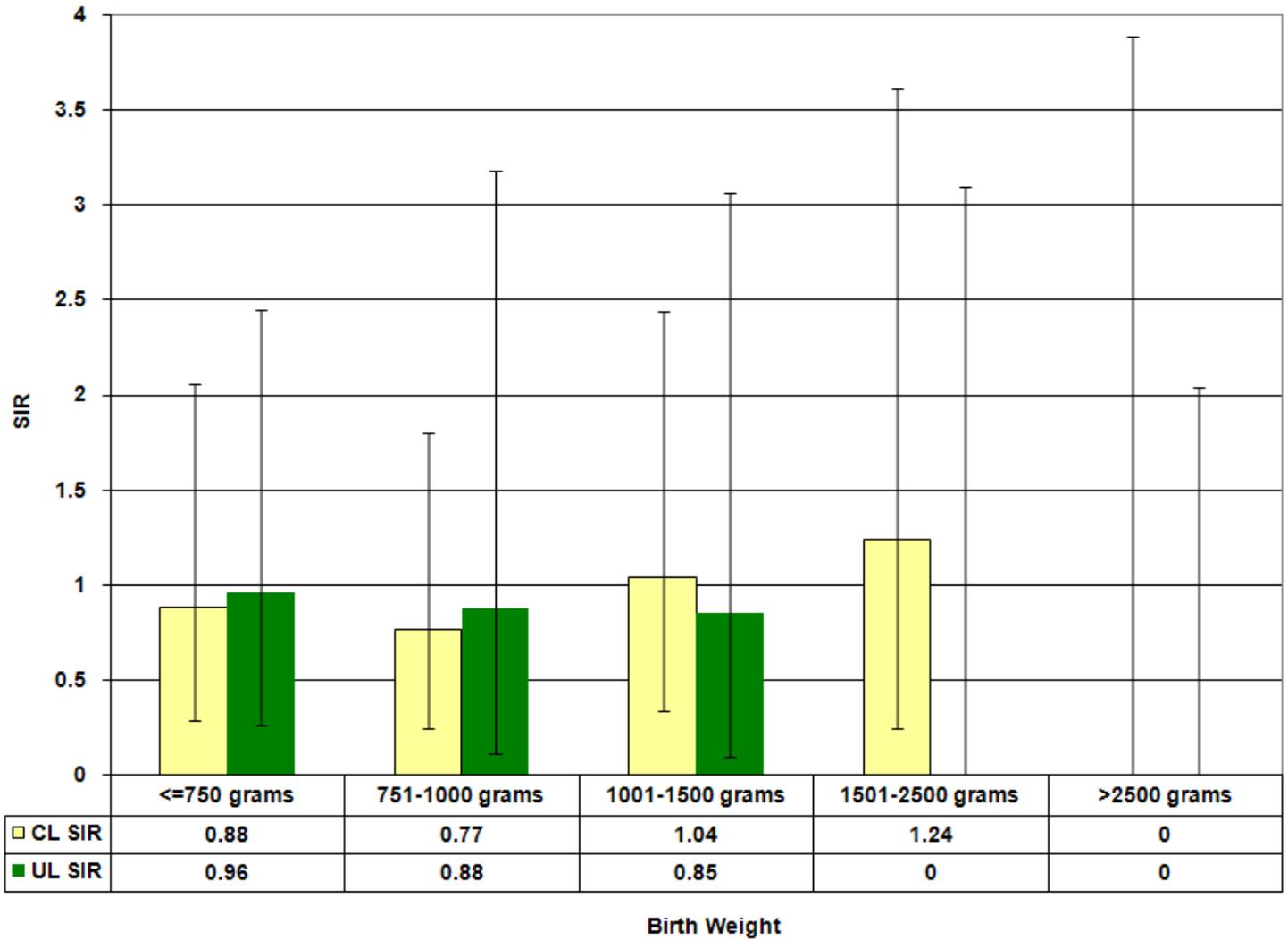
**Figure 26: Umbilical Catheter-Associated Bloodstream Infection (UCABSI) Pooled Mean Rates per 1,000 Umbilical Line Days in Level II/III Neonatal Intensive Care Units by Birth Weight Category, Tennessee, 2009 and 2010, vs. National Healthcare Safety Network (NHSN), 2006-8**



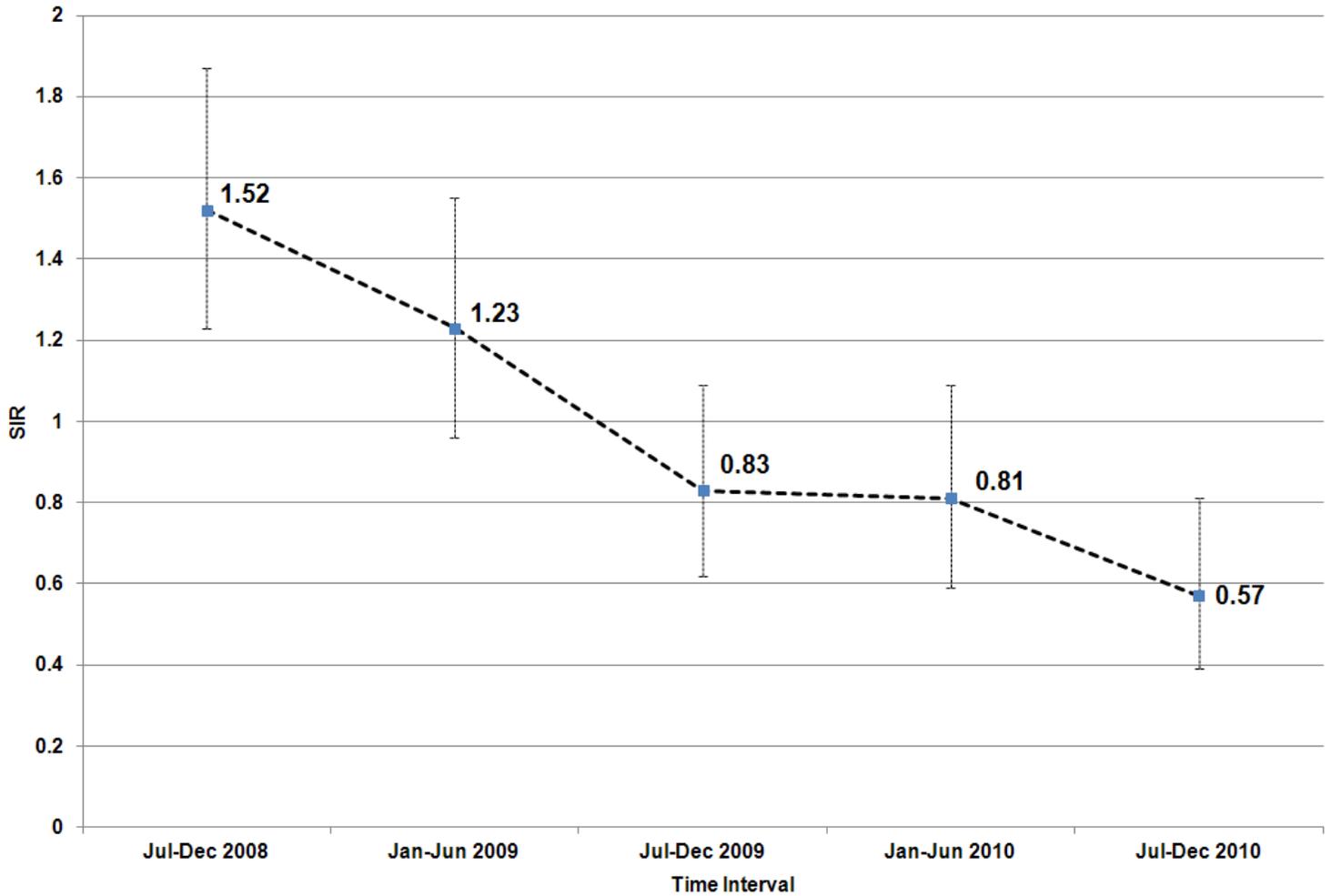
**Figure 27: Central Line- and Umbilical Catheter-Associated Bloodstream Infection (CLABSI/UCABSI) Standardized Infection Ratios (SIRs) in Level III Neonatal ICUs (NICUs) by Birth Weight Category, Tennessee, 1/2010–12/2010 [Reference standard: National Healthcare Safety Network (NHSN), 2006-8]**



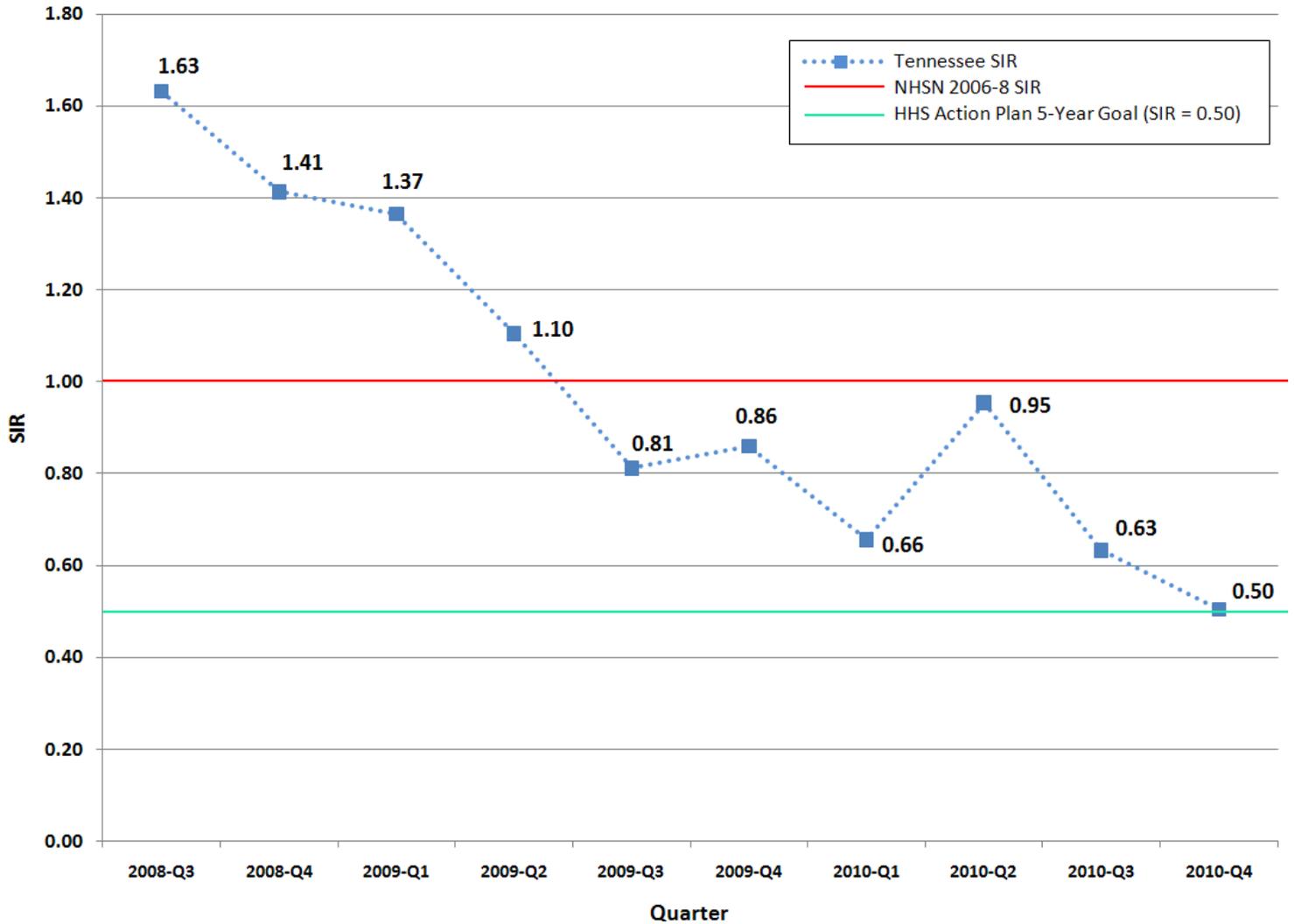
**Figure 28: Central Line- and Umbilical Catheter-Associated Bloodstream Infection (CLABSI/UCABSI) Standardized Infection Ratios (SIRs) in Level II/III Neonatal ICUs (NICUs) by Birth Weight Category, Tennessee, 1/2010–12/2010 [Reference standard: National Healthcare Safety Network (NHSN), 2006-8]**



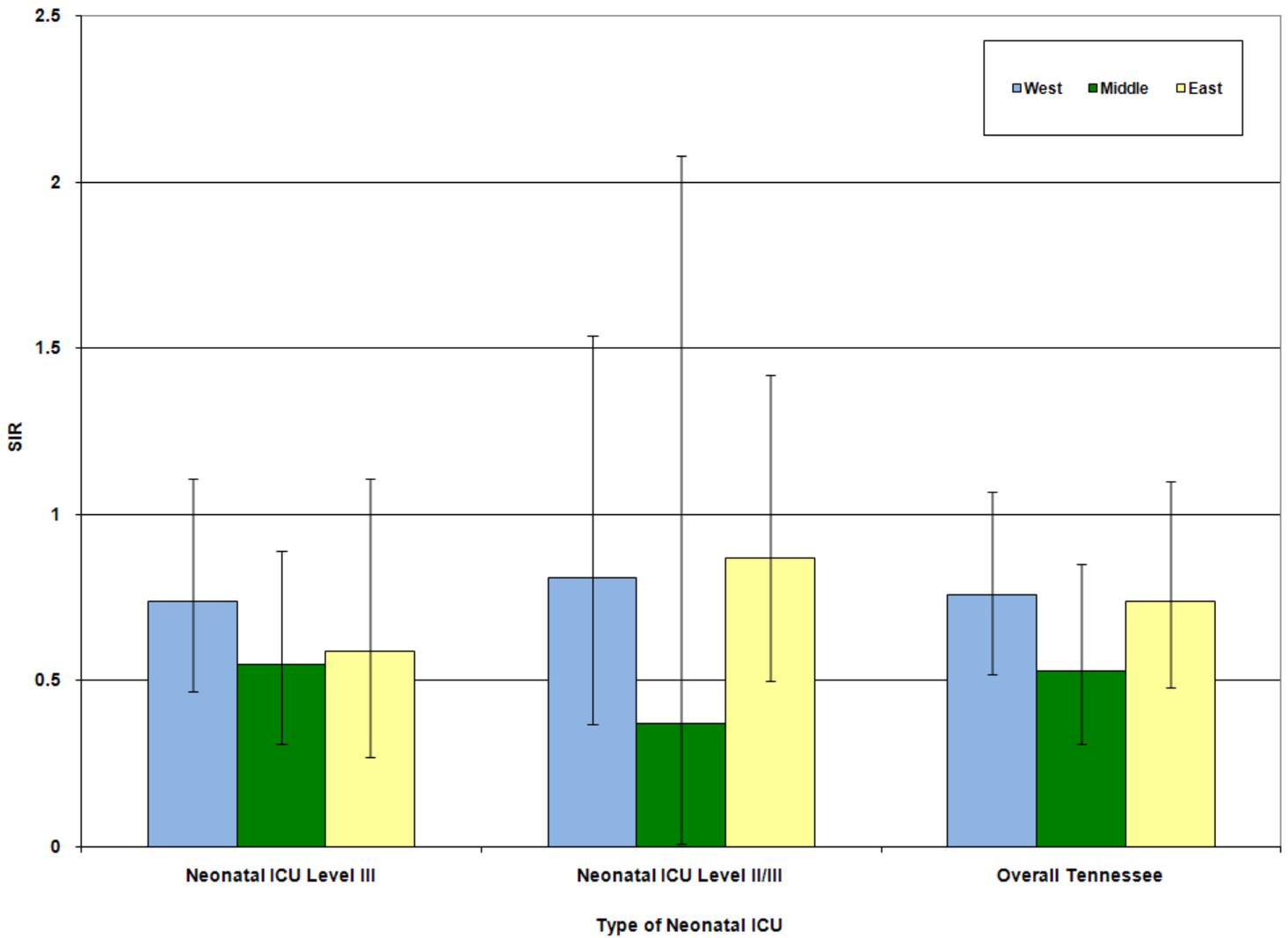
**Figure 29: Central Line- and Umbilical Catheter-Associated Bloodstream Infection (CLABSI/UCABSI) Standardized Infection Ratios (SIRs) by Six-Month Reporting Interval, Tennessee, 7/2008–12/2010 [Reference standard: National Healthcare Safety Network (NHSN), 2006-8]**



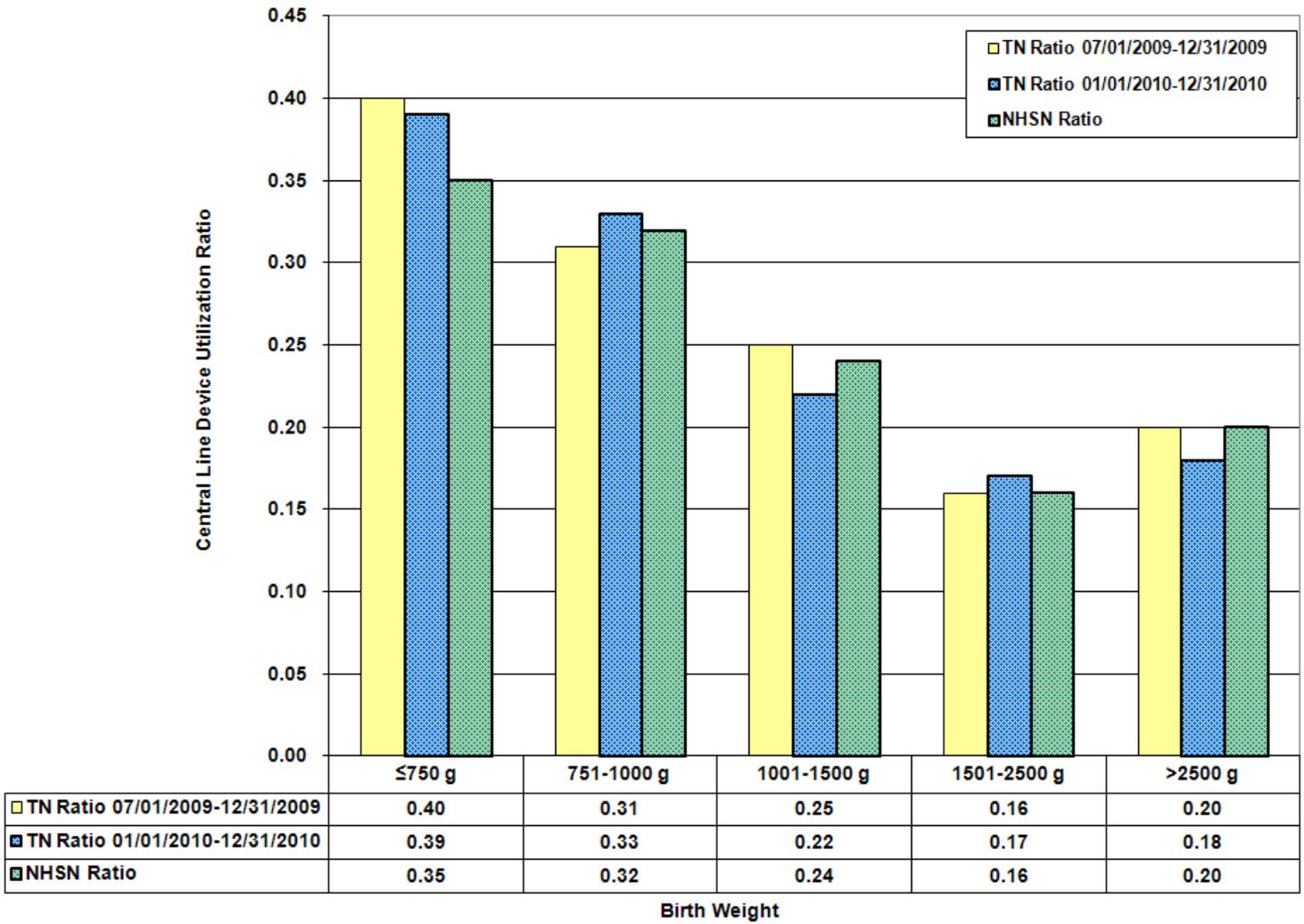
**Figure 30: Central Line- and Umbilical Catheter-Associated Bloodstream Infection (CLABSI/UCABSI) Standardized Infection Ratios (SIRs) by Quarter, Tennessee, 7/2008–12/2010 [Reference standard: National Healthcare Safety Network (NHSN), 2006-8]**



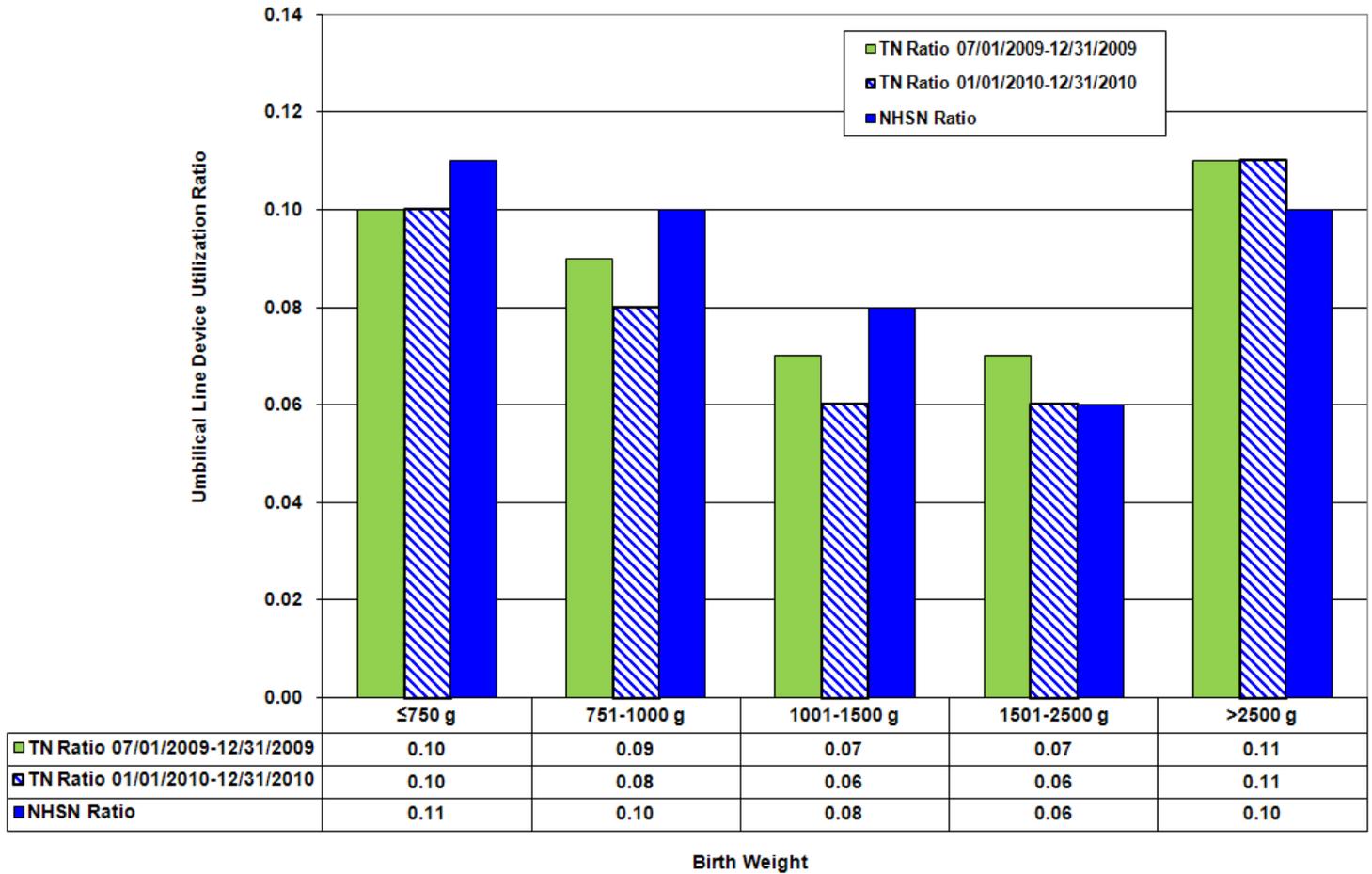
**Figure 31: Standardized Infection Ratios (SIRs) for Central Line- and Umbilical Catheter-Associated Blood Stream Infections (CLABSIs/UCABSIs) by Neonatal Intensive Care Unit (NICU) Type and Grand Division, Tennessee, 1/2010–12/2010 [Reference standard: National Healthcare Safety Network (NHSN), 2006-8]**



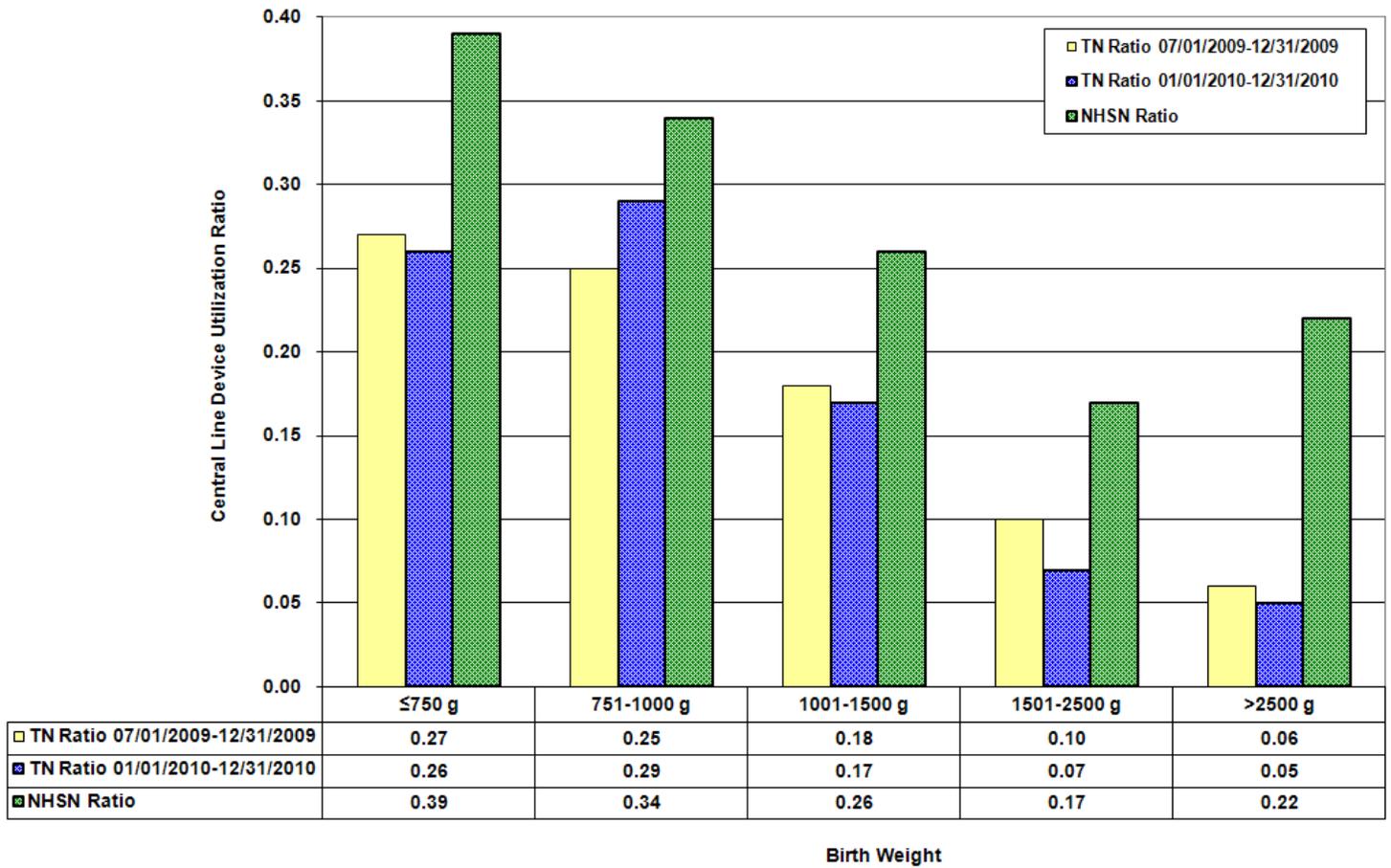
**Figure 32: Central Line Utilization Ratios in Level III Neonatal Intensive Care Units (NICUs), Tennessee, 2009 and 2010, vs. National Healthcare Safety Network (NHSN), 2006-8**



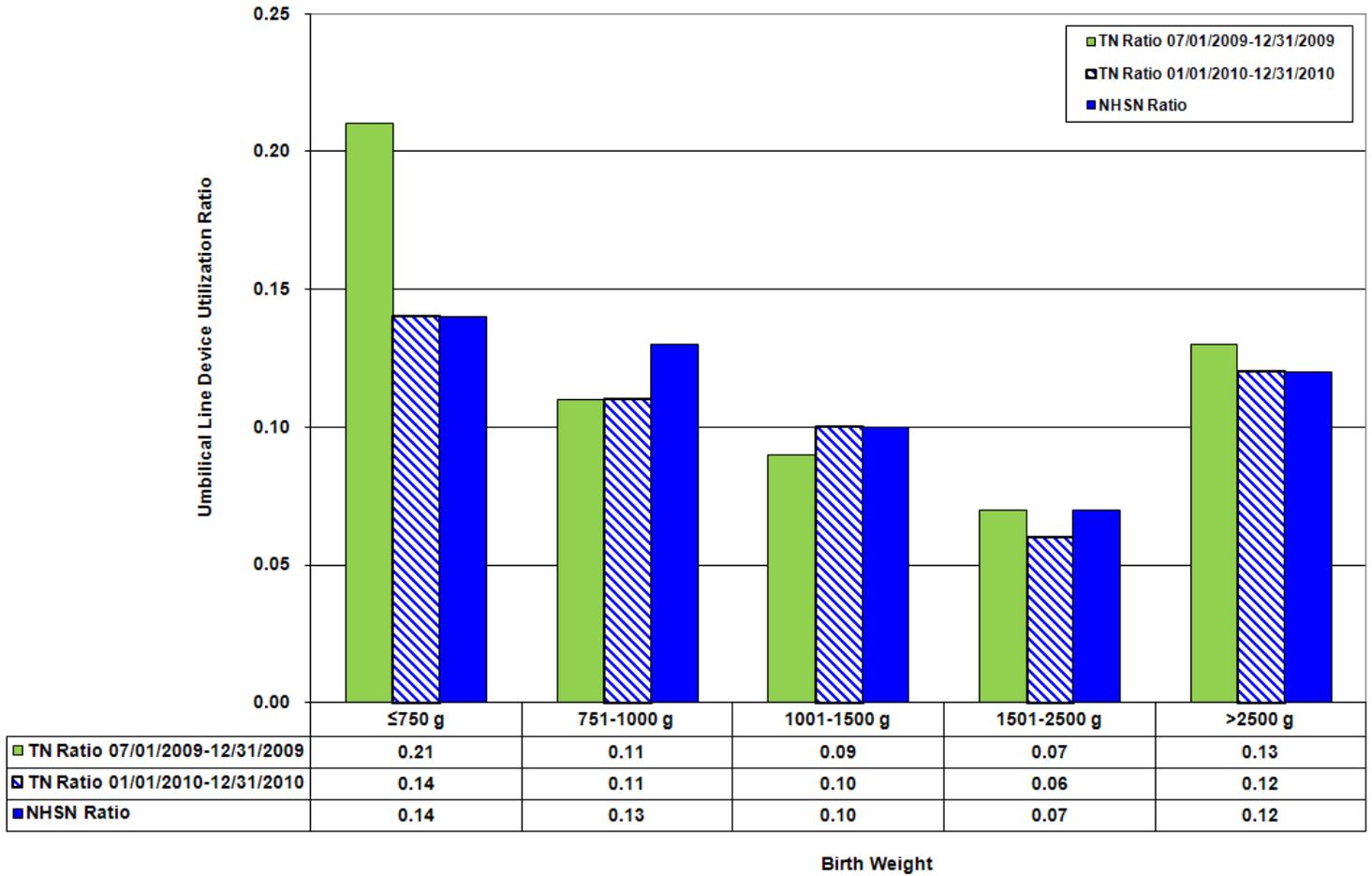
**Figure 33: Umbilical Line Utilization Ratios in Level III Neonatal Intensive Care Units (NICUs), Tennessee, 2009 and 2010, vs. National Healthcare Safety Network (NHSN), 2006-8**



**Figure 34: Central Line Utilization Ratios in Level II/III Neonatal Intensive Care Units (NICUs), Tennessee, 2009 and 2010, vs. National Healthcare Safety Network (NHSN), 2006-8**

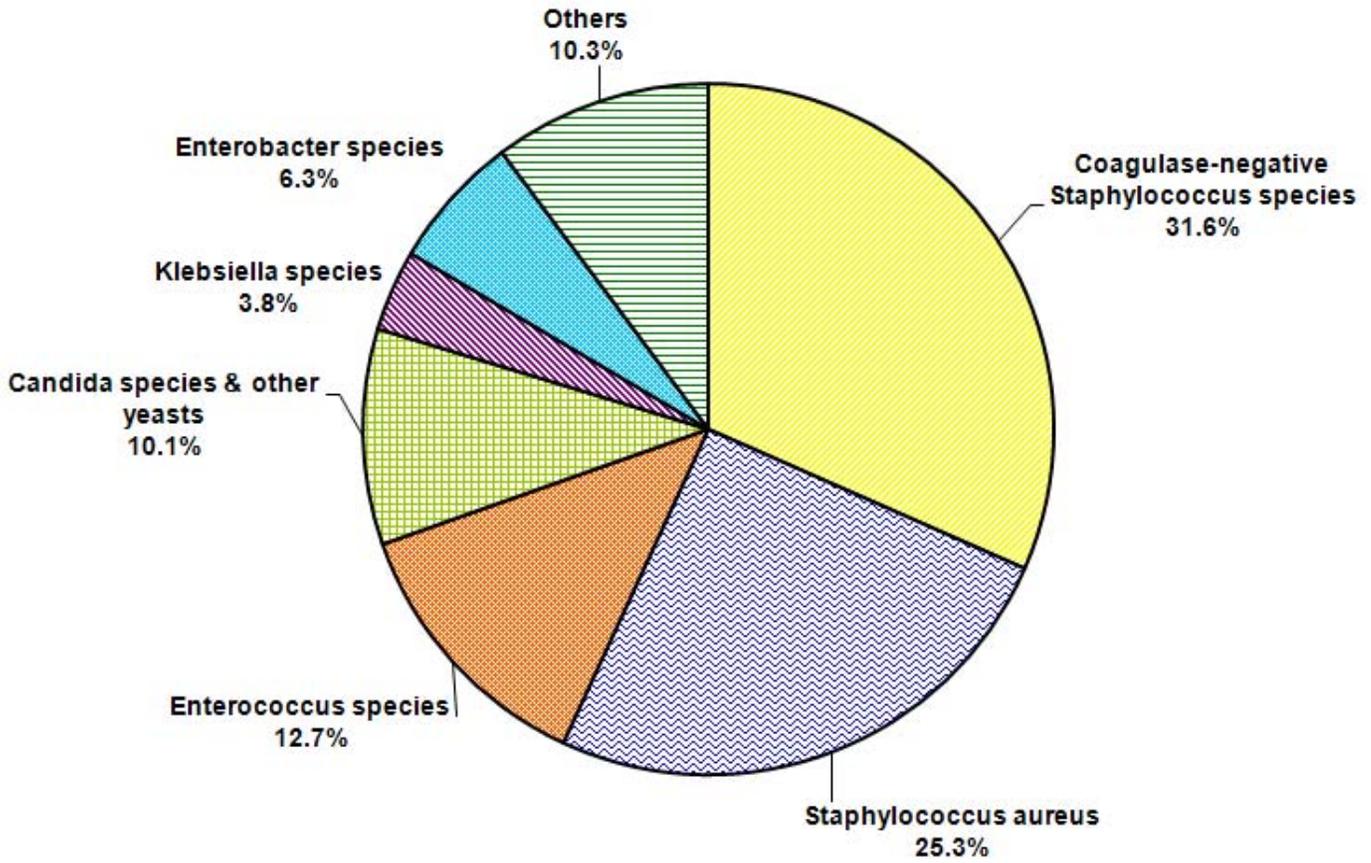


**Figure 35: Umbilical Line Utilization Ratios in Level II/III Neonatal Intensive Care Units (NICUs), Tennessee, 2009 and 2010, vs. National Healthcare Safety Network (NHSN), 2006-8**



**Figure 36: Organisms Isolated from Central Line-Associated Bloodstream Infections (CLABSIs) in Neonatal Intensive Care Units, Tennessee, 1/2010–12/2010**

Number of organisms = 79; number of events: 74



**Table 20: Microorganisms Identified in Central Line- and Umbilical Catheter-Associated Bloodstream Infections (CLABSIs/UCABSIs), Neonatal Intensive Care Units, 01/01/2010–12/31/2010**

**Number of organisms: 79; number of events: 74**

<b>Microorganism</b>	<b>Number of Isolates</b>	<b>Percent</b>
Coagulase-negative <i>Staphylococcus</i> species	25	31.6
<i>Staphylococcus aureus</i>	20	25.3
Methicillin-resistant <i>S. aureus</i> (MRSA) only (% of total positive isolates)	10	(12.7)
<i>Enterococcus</i> species (no VRE reported)	10	12.7
Candida species & other yeasts	8	10.1
<i>Candida albicans</i> only (% of total positive isolates)	5	(6.3)
<i>Enterobacter</i> species	5	6.3
<i>Klebsiella</i> spp.	3	3.8
Other pathogens	8	10.1

*Data reported as of September 14, 2011*

*Total number of isolates= 79; Total number of CLABSI/UCABSI events= 74*

*Other pathogens = Citrobacter freundii, Escherichia coli, Lactobacillus acidophilus, Pantoea spp., Serratia marcescens, Group B Streptococcus*

*VRE = vancomycin-resistant Enterococcus*

Tennessee's Report on Healthcare-Associated Infections: Jan. 1, 2008 - Dec. 31, 2010

**Table 21: Key Percentiles for Facility-Specific Central Line- and Umbilical Catheter-Associated Bloodstream Infection (CLABSI/UCABSI) Standardized Infection Ratios (SIRs) by Reporting Year, Tennessee [Reporting period: 07/01/2008–12/31/2010]**

			SIR, 95% CONFIDENCE INTERVAL, AND KEY PERCENTILES							
STATE	YEAR	No.	SIR	LOWER LIMIT	UPPER LIMIT	10%	25%	50%	75%	90%
Tennessee	2010	24	0.69	0.54	0.86	0.00	0.00	0.43	0.97	1.28
	2009	25	1.02	0.85	1.22	0.00	0.00	0.16	1.21	2.12
	2008	25	1.52	1.23	1.87	0.00	0.00	0.76	1.74	2.54

Data reported as of September 14, 2011

No. = number of facilities with reporting units; SIR = Standardized Infection Ratio (observed number/ statistically 'predicted' number of CLABSI)

NA = not reported if the number of facilities with reporting units is <5

Red highlighting indicates SIR for reporting period is significantly higher than national 2006-2008 SIR of 1.0

Blue highlighting indicates SIR for reporting period is significantly lower than national 2006-2008 SIR of 1.0

Tennessee's Report on Healthcare-Associated Infections: Jan. 1, 2008 - Dec. 31, 2010

**Table 22: Key Percentiles for Unit-Specific Central Line- and Umbilical Catheter-Associated Bloodstream Infection (CLABSI/UCABSI) Standardized Infection Ratios (SIRs) by Unit Type and Reporting Year, Tennessee [Reporting period: 07/01/2008–12/31/2010]**

			SIR, 95% CONFIDENCE INTERVAL, AND KEY PERCENTILES							
CCU TYPE	YEAR	No.	SIR	LOWER LIMIT	UPPER LIMIT	10%	25%	50%	75%	90%
Neonatal ICU Level III	2010	7	0.63	0.47	0.84	0.35	0.42	0.61	1.28	1.37
	2009	7	0.95	0.75	1.17	0.00	0.32	0.72	1.59	2.42
	2008	8	1.38	1.05	1.80	0.00	0.33	0.95	1.67	1.96
Neonatal ICU Level II/III	2010	17	0.81	0.53	1.19	0.00	0.00	0.00	0.92	1.06
	2009	18	1.23	0.89	1.67	0.00	0.00	0.00	0.60	2.12
	2008	17	1.81	1.26	2.52	0.00	0.00	0.00	2.42	2.55

Data reported as of September 14, 2011

No. = number of facilities with reporting units; SIR = Standardized Infection Ratio (observed number/ statistically 'predicted' number of CLABSI)

NA = not reported if the number of facilities with reporting units is <5

Red highlighting indicates SIR for reporting period is significantly higher than national 2006-2008 SIR of 1.0

Blue highlighting indicates SIR for reporting period is significantly lower than national 2006-2008 SIR of 1.0

Tennessee's Report on Healthcare-Associated Infections: Jan. 1, 2008 - Dec. 31, 2010

**Table 23: Comparison of Tennessee and National Healthcare Safety Network (NHSN) Central Line- and Umbilical Catheter-Associated Bloodstream Infection (CLABSI/UCABSI) Rates and Standardized Infection Ratios (SIRs) by NICU Type [Reporting period: 01/01/2010–12/31/2010]**

		TENNESSEE 01/01/2010 - 12/31/2010					NHSN 2006-2008			SIR AND 95% CONFIDENCE INTERVAL		
CCU TYPE	Birth Weight Category	No.	CLABSI	CL DAYS	POOLED MEAN*	MEDIAN RATE*	CLABSI	CL DAYS	POOLED MEAN*	SIR	LOWER LIMIT	UPPER LIMIT
Neonatal ICU Level III	≤750 grams	7	19	6311	3.0	3.8	559	155220	3.6	0.84	0.50	1.31
	751-1000 grams	7	10	6274	1.6	1.3	413	140785	2.9	0.54	0.25	0.99
	1001-1500 grams	7	11	6699	1.6	1.7	306	147305	2.1	0.79	0.39	1.41
	1501-2500 grams	7	6	6504	0.9	0.4	223	122883	1.8	0.50	0.18	1.10
	>2500 grams	7	2	6503	0.3	0.0	170	128245	1.3	0.24	0.03	0.85
	TOTAL	.	.	.	.	.	.	.	.	.	0.63	0.47
Neonatal ICU Level II/III	≤750 grams	17	9	2217	4.1	3.6	329	77283	4.3	0.91	0.42	1.73
	751-1000 grams	17	7	2899	2.4	1.4	199	65801	3.0	0.80	0.32	1.65
	1001-1500 grams	17	7	3933	1.8	0.0	145	78352	1.9	0.98	0.39	2.02
	1501-2500 grams	17	3	2938	1.0	0.0	82	62268	1.3	0.83	0.17	2.42
	>2500 grams	17	0	3090	0.0	0.0	65	65559	1.0	0.00	0.00	1.34
	TOTAL	.	.	.	.	.	.	.	.	.	0.81	0.53
<b>TOTAL</b>		.	.	.	.	.	.	.	.	<b>0.69</b>	<b>0.54</b>	<b>0.86</b>

Data reported as of September 14, 2011

No. number of facilities with reporting units

CL Days Central Line Days (central line catheter and umbilical catheter combined)

SIR Standardized Infection Ratio (observed number/ statistically 'predicted' number of CLABSI)

In these tables, "CLABSI" includes both central line- and umbilical catheter-associated BSIs

\*per 1000 line days

Red highlighting indicates SIR for reporting period is significantly higher than national 2006-2008 SIR of 1.0

Blue highlighting indicates SIR for reporting period is significantly lower than national 2006-2008 SIR of 1.0

Tennessee's Report on Healthcare-Associated Infections: Jan. 1, 2008 - Dec. 31, 2010

Table 24: Comparison of Tennessee Central Line- and Umbilical Catheter-Associated Bloodstream Infection (CLABSI/UCABSI) Standardized Infection Ratios (SIRs) by NICU Type and Reporting Half-Year [Reporting periods: 01/01/2009–12/31/2010]

		Jan-Jun 2009 SIR AND 95% CONFIDENCE INTERVAL			Jul-Dec 2009 SIR AND 95% CONFIDENCE INTERVAL			Jan-Jun 2010 SIR AND 95% CONFIDENCE INTERVAL			Jul-Dec 2010 SIR AND 95% CONFIDENCE INTERVAL		
CCU TYPE		SIR	LOWER LIMIT	UPPER LIMIT									
Neonatal ICU Level III	≤750 grams	1.42	0.89	2.15	0.99	0.58	1.59	0.77	0.33	1.52	0.88	0.44	1.59
	751-1000 grams	0.92	0.40	1.82	0.90	0.43	1.66	0.47	0.13	1.21	0.60	0.22	1.30
	1001-1500 grams	0.98	0.42	1.93	0.30	0.04	1.07	1.27	0.55	2.50	0.39	0.08	1.15
	1501-2500 grams	1.60	0.73	3.04	0.38	0.05	1.39	0.46	0.09	1.34	0.56	0.12	1.65
	>2500 grams	0.94	0.26	2.41	0.00	0.00	0.84	0.00	0.00	0.95	0.43	0.05	1.57
	TOTAL	1.21	0.90	1.59	0.70	0.47	0.99	0.65	0.41	0.97	0.63	0.40	0.92
Neonatal ICU Level II/III	≤750 grams	0.98	0.27	2.51	1.43	0.62	2.82	1.14	0.42	2.48	0.65	0.13	1.91
	751-1000 grams	1.07	0.29	2.73	1.82	0.83	3.45	0.98	0.32	2.29	0.54	0.07	1.97
	1001-1500 grams	2.38	1.03	4.68	0.70	0.08	2.52	1.59	0.58	3.46	0.30	0.01	1.65
	1501-2500 grams	0.75	0.09	2.72	0.00	0.00	1.37	1.58	0.32	4.62	0.00	0.00	2.14
	>2500 grams	1.19	0.14	4.31	1.26	0.15	4.54	0.00	0.00	2.40	0.00	0.00	3.01
	TOTAL	1.29	0.79	1.99	1.19	0.73	1.81	1.14	0.70	1.76	0.41	0.15	0.90
<b>TOTAL</b>		<b>1.23</b>	<b>0.96</b>	<b>1.55</b>	<b>0.83</b>	<b>0.62</b>	<b>1.09</b>	<b>0.81</b>	<b>0.59</b>	<b>1.09</b>	<b>0.57</b>	<b>0.39</b>	<b>0.81</b>

Data reported as of September 14, 2011

No. number of facilities with reporting units; SIR Standardized Infection Ratio (observed number/ statistically 'predicted' number of CLABSI)

NA = not reported if the number of facilities with reporting units is <5

Red highlighting indicates SIR for reporting period is significantly higher than national 2006-2008 SIR of 1.0

Blue highlighting indicates SIR for reporting period is significantly lower than national 2006-2008 SIR of 1.0

Tennessee's Report on Healthcare-Associated Infections: Jan. 1, 2008 - Dec. 31, 2010

**Table 25: Central Line- and Umbilical Catheter-Associated Bloodstream Infection (CLABSI/UCABSI) Rates and Standardized Infection Ratios by NICU Type and Grand Division, Tennessee [Reporting period: 01/01/2010–12/31/2010]**

Critical Care Unit	EAST							MIDDLE							WEST						
	No.	CLABSI/UCABSI	LINE DAYS	POOLED MEAN*	SIR	Lower Limit	Upper Limit	No.	CLABSI/UCABSI	LINE DAYS	POOLED MEAN*	SIR	Lower Limit	Upper Limit	No.	CLABSI/UCABSI	LINE DAYS	POOLED MEAN*	SIR	Lower Limit	Upper Limit
Neonatal ICU Level III	2	9	6656	1.4	0.59	0.27	1.11	2	16	13685	1.2	0.55	0.31	0.89	3	23	11950	1.9	0.74	0.47	1.11
Neonatal ICU Level II/III	5	16	8688	1.8	0.87	0.50	1.42	7	1	1685	0.6	0.37	0.01	2.08	5	9	4704	1.9	0.81	0.37	1.54
TOTAL	.	.	.	.	0.74	0.48	1.10	.	.	.	.	0.53	0.31	0.85	.	.	.	.	0.76	0.52	1.07

Data reported as of September 14, 2011

No. number of facilities with reporting units

SIR Standardized Infection Ratio (observed number/ statistically 'predicted' number of CLABSI)

\*per 1000 line days

Red highlighting indicates SIR for reporting period is significantly higher than national 2006-2008 SIR of 1.0

Blue highlighting indicates SIR for reporting period is significantly lower than national 2006-2008 SIR of 1.0

**Tennessee's Report on Healthcare-Associated Infections: Jan. 1, 2008 - Dec. 31, 2010**

**Table 26: Comparison of Tennessee and NHSN Central Line-Associated Bloodstream Infection (CLABSI) Rates in Level III Neonatal ICUs [Reporting period: 01/01/2010–12/31/2010]**

Birth Weight	TENNESSEE 1/2010-12/2010					NHSN 2006-2008				SIR AND 95% CONFIDENCE INTERVAL		
	No.	CLABSI	CL DAYS	POOLED MEAN*	MEDIAN RATE*	CLABSI	CL DAYS	POOLED MEAN*	MEDIAN RATE*	SIR	LOWER LIMIT	UPPER LIMIT
≤750 grams	7	16	4984	3.2	1.8	446	122272	3.6	3.2	0.88	0.50	1.43
751-1000 grams	7	9	5106	1.8	1.5	348	111293	3.1	2.5	0.56	0.26	1.07
1001-1500 grams	7	10	5171	1.9	1.7	255	112926	2.3	1.4	0.86	0.41	1.57
1501-2500 grams	7	6	4837	1.2	0.5	201	90384	2.2	0.7	0.56	0.20	1.21
>2500 grams	7	1	4062	0.2	0.0	137	82677	1.7	0.0	0.15	0.00	0.83
<b>TOTAL</b>	.	.	.	.	.	.	.	.	.	<b>0.66</b>	<b>0.48</b>	<b>0.90</b>

Data reported as of September 14, 2011

No. number of facilities with reporting units

CL Days Central Line Days

SIR Standardized Infection Ratio (observed number/ statistically 'predicted' number of CLABSI)

\*per 1000 central line days

Red highlighting indicates SIR for reporting period is significantly higher than national 2006-2008 SIR of 1.0

Blue highlighting indicates SIR for reporting period is significantly lower than national 2006-2008 SIR of 1.0

**Table 27: Comparison of Tennessee and NHSN Central Line-Associated Bloodstream Infection (CLABSI) Rates in Level II/III Neonatal ICUs [Reporting period: 01/01/2010–12/31/2010]**

Birth Weight	TENNESSEE 1/2010-12/2010					NHSN 2006-2008				SIR AND 95% CONFIDENCE INTERVAL		
	No.	CLABSI	CL DAYS	POOLED MEAN*	MEDIAN RATE*	CLABSI	CL DAYS	POOLED MEAN*	MEDIAN RATE*	SIR	LOWER LIMIT	UPPER LIMIT
≤750 grams	17	5	1441	3.5	3.1	237	60199	3.9	2.6	0.88	0.29	2.06
751-1000 grams	17	5	2102	2.4	0.0	153	49673	3.1	1.7	0.77	0.25	1.80
1001-1500 grams	17	5	2495	2.0	0.0	113	58893	1.9	0.6	1.04	0.34	2.44
1501-2500 grams	17	3	1626	1.8	0.0	65	43544	1.5	0.0	1.24	0.25	3.61
>2500 grams	17	0	856	0.0	0.0	44	39669	1.1	0.0	0.00	0.00	3.89
<b>TOTAL</b>	.	.	.	.	.	.	.	.	.	0.89	0.53	1.40

Data reported as of September 14, 2011

No. number of facilities with reporting units

CL Days Central Line Days

SIR Standardized Infection Ratio (observed number/ statistically 'predicted' number of CLABSI)

\*per 1000 central line days

Red highlighting indicates SIR for reporting period is significantly higher than national 2006-2008 SIR of 1.0

Blue highlighting indicates SIR for reporting period is significantly lower than national 2006-2008 SIR of 1.0

**Tennessee's Report on Healthcare-Associated Infections: Jan. 1, 2008 - Dec. 31, 2010**

**Table 28: Comparison of Tennessee and NHSN Umbilical Catheter-Associated Bloodstream Infection (UCABSI) Rates in Level III Neonatal ICUs [Reporting period: 01/01/2010–12/31/2010]**

Birth Weight	TENNESSEE 1/2010-12/2010					NHSN 2006-2008				SIR AND 95% CONFIDENCE INTERVAL		
	No.	UCABSI	UL DAYS	POOLED MEAN*	MEDIAN RATE*	UCABSI	UL DAYS	POOLED MEAN*	MEDIAN RATE*	SIR	LOWER LIMIT	UPPER LIMIT
≤750 grams	7	3	1327	2.3	0.0	113	32948	3.4	0.0	0.66	0.14	1.93
751-1000 grams	7	1	1168	0.9	0.0	65	29492	2.2	0.0	0.39	0.01	2.16
1001-1500 grams	7	1	1528	0.7	0.0	51	34379	1.5	0.0	0.44	0.01	2.46
1501-2500 grams	7	0	1667	0.0	0.0	22	32499	0.7	0.0	0.00	0.00	3.27
>2500 grams	7	1	2441	0.4	0.0	33	45568	0.7	0.0	0.57	0.01	3.15
<b>TOTAL</b>	.	.	.	.	.	.	.	.	.	0.49	0.18	1.06

Data reported as of September 14, 2011

No. number of facilities with reporting units

CL Days Central Line Days

SIR Standardized Infection Ratio (observed number/ statistically 'predicted' number of CLABSI)

\*per 1000 central line days

Red highlighting indicates SIR for reporting period is significantly higher than national 2006-2008 SIR of 1.0

Blue highlighting indicates SIR for reporting period is significantly lower than national 2006-2008 SIR of 1.0

**Table 29: Comparison of Tennessee and NHSN Umbilical Catheter-Associated Bloodstream Infection (UCABSI) Rates in Level II/III Neonatal ICUs [Reporting period: 01/01/2010–12/31/2010]**

Birth Weight	TENNESSEE 1/2010-12/2010					NHSN 2006-2008				SIR AND 95% CONFIDENCE INTERVAL		
	No.	UCABSI	UL DAYS	POOLED MEAN*	MEDIAN RATE*	UCABSI	UL DAYS	POOLED MEAN*	MEDIAN RATE*	SIR	LOWER LIMIT	UPPER LIMIT
≤750 grams	17	4	776	5.2	0.0	92	17084	5.4	4.0	0.96	0.26	2.45
751-1000 grams	17	2	797	2.5	0.0	46	16128	2.9	0.0	0.88	0.11	3.18
1001-1500 grams	17	2	1438	1.4	0.0	32	19459	1.6	0.0	0.85	0.10	3.06
1501-2500 grams	17	0	1312	0.0	0.0	17	18724	0.9	0.0	0.00	0.00	3.10
>2500 grams	17	0	2234	0.0	0.0	21	25890	0.8	0.0	0.00	0.00	2.04
<b>TOTAL</b>	.	.	.	.	.	.	.	.	.	0.68	0.29	1.33

Data reported as of September 14, 2011

No. number of facilities with reporting units

CL Days Central Line Days

SIR Standardized Infection Ratio (observed number/ statistically 'predicted' number of CLABSI)

\*per 1000 central line days

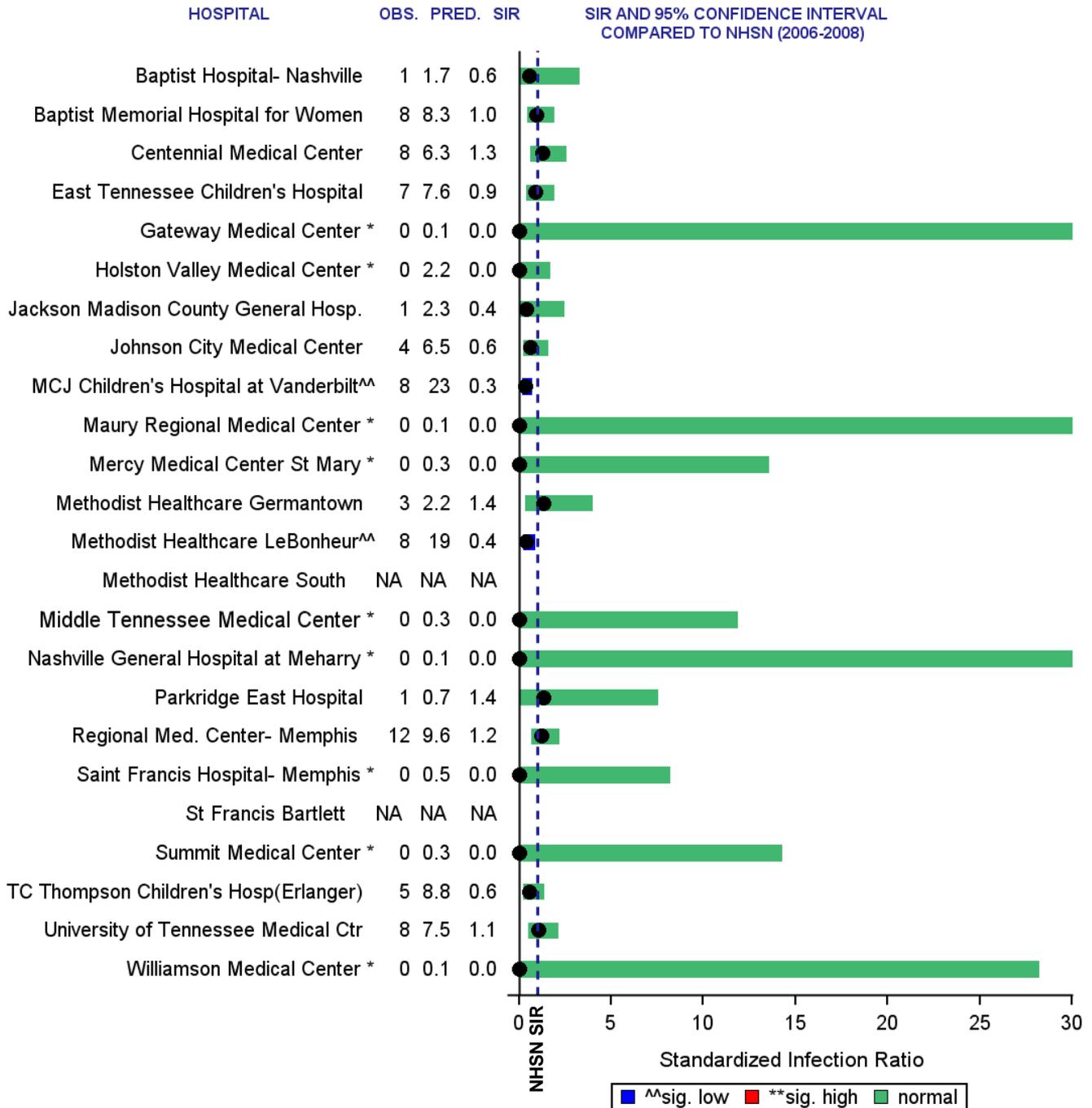
Red highlighting indicates SIR for reporting period is significantly higher than national 2006-2008 SIR of 1.0

Blue highlighting indicates SIR for reporting period is significantly lower than national 2006-2008 SIR of 1.0

**Figure 37: Summary Measure for CLABSIs/UCABSIs in Neonatal Critical Care Units, One Standardized Infection Ratio (SIR) per Facility. Tennessee, 1/2010–12/2010**

**Central Line- and Umbilical Catheter-Associated Bloodstream Infection [CLABSI/UCABSI] Standardized Infection Ratio [SIR]**

Tennessee (Reportable period: 01/01/2010 - 12/31/2010)



Data Reported from neonatal ICUs as of September 14, 2011.

Obs. = observed number of CLABSI/UCABSI

Pred. = statistically 'predicted' number of CLABSI/UCABSI, based on NHSN data

SIR = Standardized Infection Ratio (observed number / statistically 'predicted' number of CLABSI/UCABSI)

NA = data not shown for an entire hospital with <50 central line days

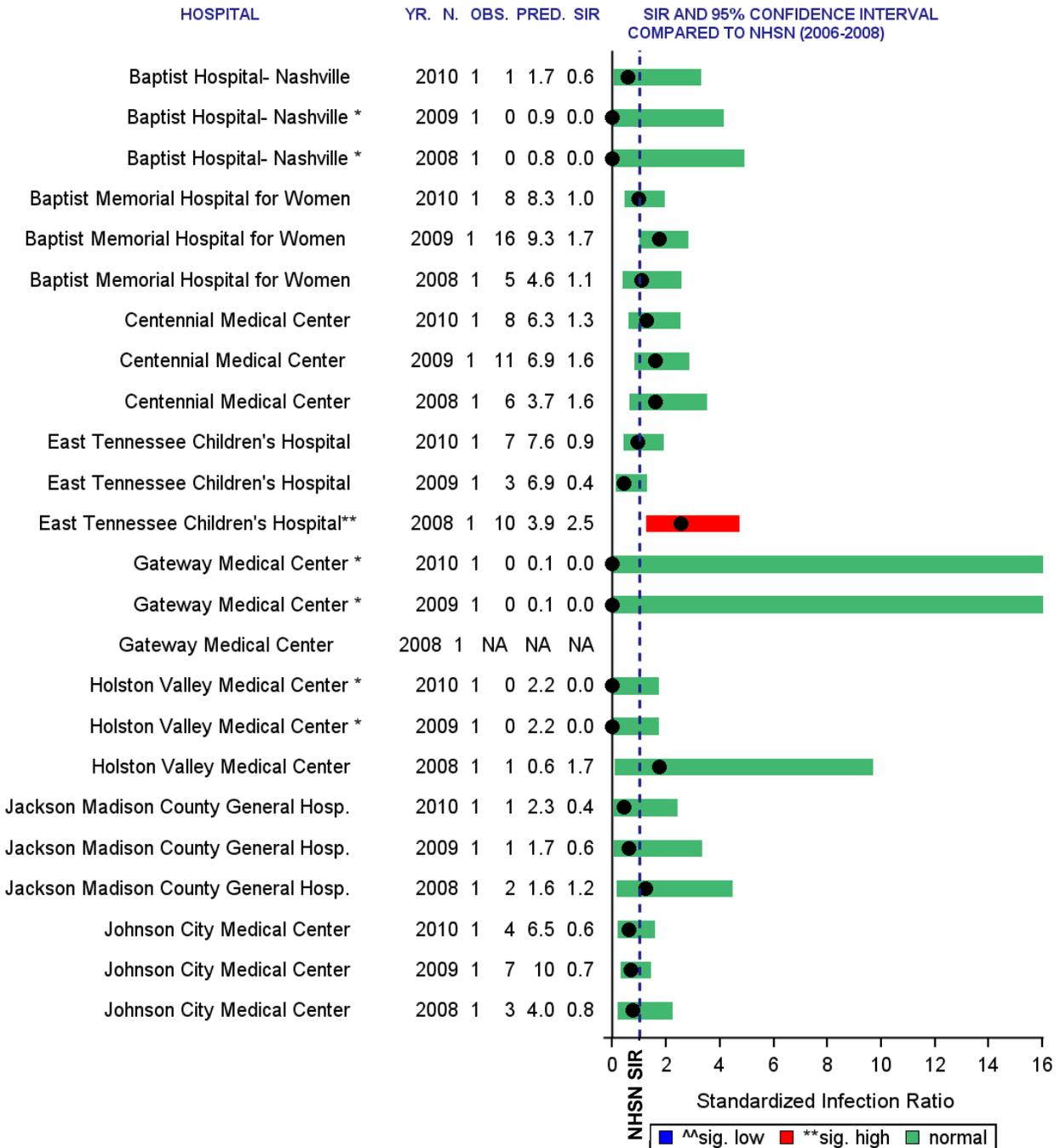
\*\* significantly higher than NHSN (2006-2008)

<sup>^^</sup> significantly lower than NHSN (2006-2008)

\* Zero infection, but not statistically significant

**Figure 38: Summary Measure for CLABSIs in Neonatal Critical Care Units, One Standardized Infection Ratio (SIR) per Facility per Year, Tennessee, 2008-2010**

**Central Line- and Umbilical Catheter-Associated Bloodstream Infection [CLABSI/UCABSI] Standardized Infection Ratio [SIR]**  
Tennessee (Reportable period: 07/01/2008-12/31/2010)

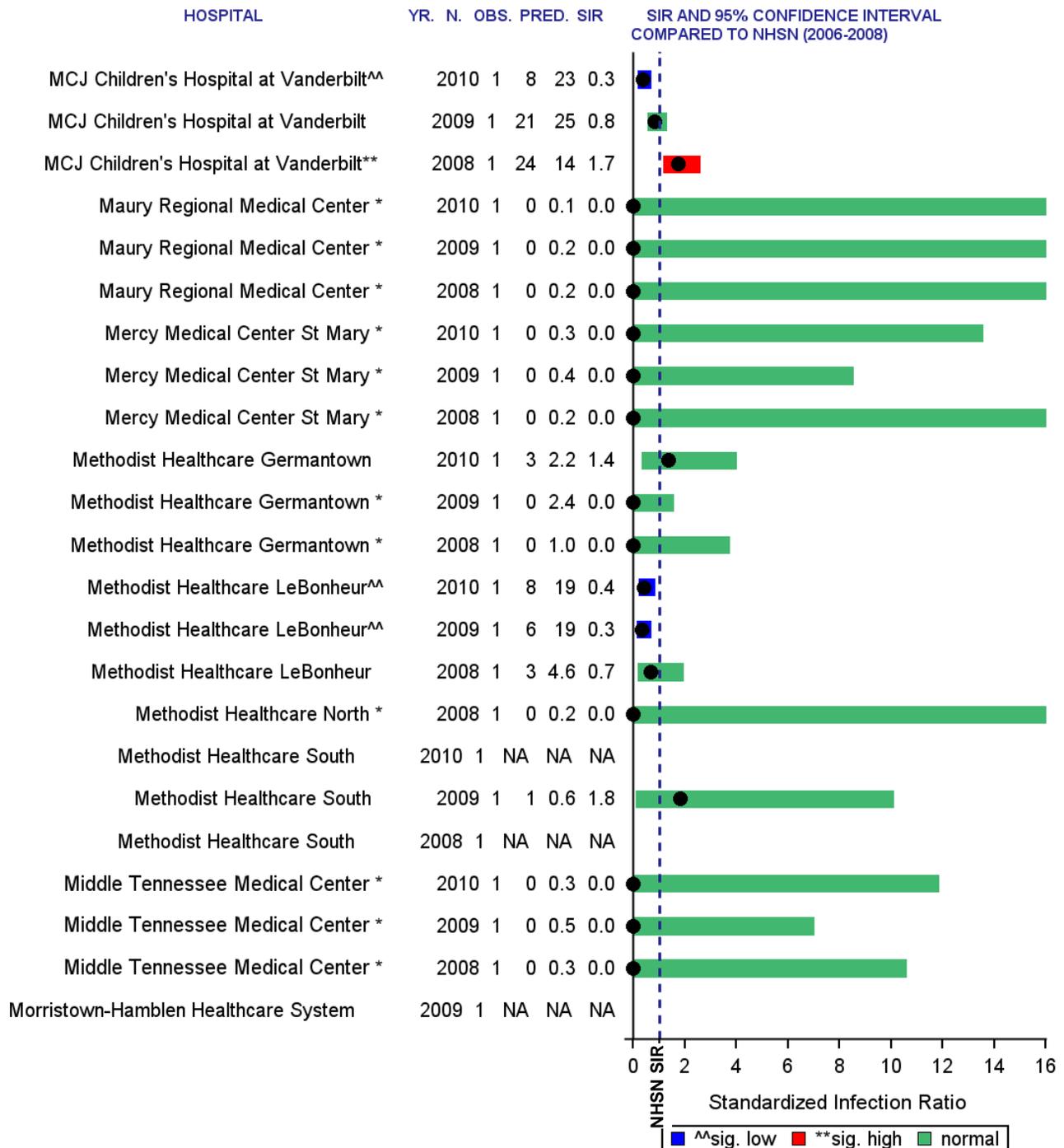


Data Reported from neonatal ICUs as of September 14, 2011.  
 Yr. = reporting year  
 N. = number of types of critical care units reportable from a given facility  
 Obs. = observed number of CLABSI  
 Pred. = statistically 'predicted' number of CLABSI/UCABSI, based on NHSN data  
 SIR = Standardized Infection Ratio (observed number / statistically 'predicted' number of CLABSI/UCABSI)  
 NA = data not shown for an entire hospital with <50 central line days  
 \*\* significantly higher than NHSN (2006-2008)  
 ^^ significantly lower than NHSN (2006-2008)  
 \* Zero infection, but not statistically significant

Figure 38 (cont'd)

Central Line- and Umbilical Catheter-Associated Bloodstream Infection [CLABSI/UCABSI] Standardized Infection Ratio [SIR]

Tennessee (Reportable period: 07/01/2008-12/31/2010)



Data Reported from neonatal ICUs as of September 14, 2011.

Yr. = reporting year

N. = number of types of critical care units reportable from a given facility

Obs. = observed number of CLABSI

Pred. = statistically 'predicted' number of CLABSI/UCABSI, based on NHSN data

SIR = Standardized Infection Ratio (observed number / statistically 'predicted' number of CLABSI/UCABSI)

NA = data not shown for an entire hospital with <50 central line days

<sup>\*\*</sup> significantly higher than NHSN (2006-2008)

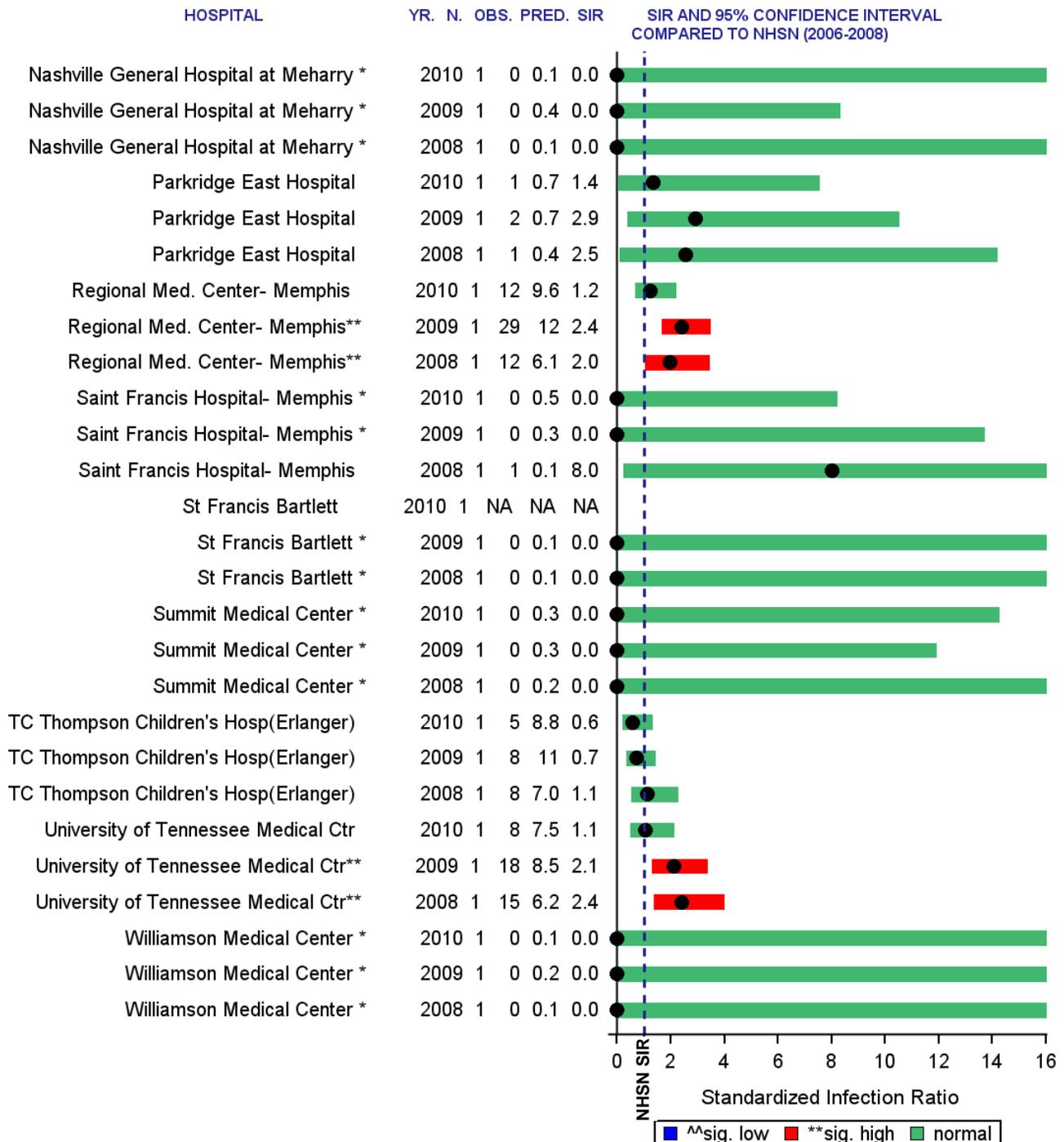
<sup>^^</sup> significantly lower than NHSN (2006-2008)

\* Zero infection, but not statistically significant

Figure 38 (cont'd)

Central Line- and Umbilical Catheter-Associated Bloodstream Infection [CLABSI/UCABSI] Standardized Infection Ratio [SIR]

Tennessee (Reportable period: 07/01/2008-12/31/2010)



Data Reported from neonatal ICUs as of September 14, 2011.

Yr. = reporting year

N. = number of types of critical care units reportable from a given facility

Obs. = observed number of CLABSI

Pred. = statistically 'predicted' number of CLABSI/UCABSI, based on NHSN data

SIR = Standardized Infection Ratio (observed number / statistically 'predicted' number of CLABSI/UCABSI)

NA = data not shown for an entire hospital with <50 central line days

\*\* significantly higher than NHSN (2006-2008)

^^ significantly lower than NHSN (2006-2008)

\* Zero infection, but not statistically significant

**Tennessee's Report on Healthcare-Associated Infections: Jan. 1, 2008 - Dec. 31, 2010**

**Table 32: Central Line- and Umbilical Catheter-Associated Bloodstream Infection (CLABSI and UCABSI) Standardized Infection Ratios (SIRs) and Device Utilization (DU) Ratios in Level III Neonatal ICUs [Reporting period: 01/01/2010–12/31/2010]**

Hospital	CLABSI				UCABSI			
	SIR	Lower Limit	Upper limit	DU(%)	SIR	Lower Limit	Upper Limit	DU(%)
Centennial Medical Center	1.67	0.67	3.44	10	0.49	0.01	2.70	10
Johnson City Medical Center	0.65	0.13	1.90	18	0.52	0.01	2.90	13
MCJ Children's Hospital at Vanderbilt	0.36	0.14	0.74	32	0.28	0.01	1.57	11
Methodist Healthcare Germantown	0.75	0.02	4.17	7	2.32	0.28	8.38	7
Methodist Healthcare LeBonheur	0.43	0.18	0.84	62	0.00	0.00	9.19	3
Regional Med. Center- Memphis	1.52	0.78	2.65	15	0.00	0.00	2.14	5
TC Thompson Children's Hosp(Erlanger)	0.57	0.15	1.45	16	0.57	0.01	3.16	6

Data reported as of September 14, 2011

TN%ile percentile in TN

DU(%) device utilization(%)

NA not reported due to central line days <50

Red highlighting indicates SIR for reporting period is significantly higher than national 2006-2008 SIR of 1.0

Blue highlighting indicates SIR for reporting period is significantly lower than national 2006-2008 SIR of 1.0

**Tennessee's Report on Healthcare-Associated Infections: Jan. 1, 2008 - Dec. 31, 2010**

**Table 33: Central Line- and Umbilical Catheter-Associated Bloodstream Infection (CLABSI and UCABSI) Standardized Infection Ratios (SIRs) and Device Utilization (DU) Ratios in Level II/III Neonatal ICUs [Reporting period: 01/01/2010–12/31/2010]**

Hospital	CLABSI				UCABSI			
	SIR	Lower Limit	Upper limit	DU(%)	SIR	Lower Limit	Upper Limit	DU(%)
Baptist Hospital- Nashville	5.18	0.13	28.88	1	0.00	0.00	2.43	13
Baptist Memorial Hospital for Women	1.33	0.53	2.74	21	0.33	0.01	1.85	14
East Tennessee Children's Hospital	0.44	0.05	1.60	15	1.62	0.53	3.77	14
Gateway Medical Center	NA	NA	NA	0	0.00	0.00	53.47	3
Holston Valley Medical Center	0.00	0.00	2.27	21	0.00	0.00	6.59	9
Jackson Madison County General Hosp.	0.68	0.02	3.77	7	0.00	0.00	4.44	4
Maury Regional Medical Center	NA	NA	NA	3	NA	NA	NA	4
Mercy Medical Center St Mary	0.00	0.00	18.41	7	0.00	0.00	51.26	4
Methodist Healthcare South	NA	NA	NA	0	NA	NA	NA	2
Middle Tennessee Medical Center	NA	NA	NA	0	0.00	0.00	11.84	14
Nashville General Hospital at Meharry	NA	NA	NA	3	0.00	0.00	60.06	11
Parkridge East Hospital	2.85	0.07	15.90	6	0.00	0.00	9.48	8
Saint Francis Hospital- Memphis	NA	NA	NA	2	0.00	0.00	2.14	16
St Francis Bartlett	NA	NA	NA	0	NA	NA	NA	5
Summit Medical Center	NA	NA	NA	16	0.00	0.00	20.62	83
University of Tennessee Medical Center	0.94	0.34	2.05	20	1.75	0.21	6.32	4
Williamson Medical Center	NA	NA	NA	2	0.00	0.00	34.25	13

Data reported as of September 14, 2011

TN%ile percentile in TN

DU(%) device utilization(%)

NA not reported due to line days <50

Red highlighting indicates SIR for reporting period is significantly higher than national 2006-2008 SIR of 1.0

Blue highlighting indicates SIR for reporting period is significantly lower than national 2006-2008 SIR of 1.0

**SSI Figures and Tables**

**CBGB and CBGC Procedures**

**January 1, 2009 – December 31, 2009**

**Tennessee's Report on Healthcare-Associated Infections: Jan. 1, 2008 - Dec. 31, 2010**

**Table 34: Pooled Mean SSI Rates by Operative Procedure and Risk Index Categories, Tennessee, 01/01/2009–12/31/2009**

Procedure Code	Operative Procedure Description	Duration Cutpoint (in minutes)	Risk Index Category	No. of hospitals	No. of procedures	No. of SSI	Tennessee Pooled Mean*	NHSN 2006-2008 Pooled Mean*
CBGB	Coronary bypass with chest and donor incision	301	0	12	44	0	<b>0.00</b>	0.35
CBGB	Coronary bypass with chest and donor incision	301	1	23	5900	113	<b>1.92</b>	2.55
CBGB	Coronary bypass with chest and donor incision	301	2	23	1375	37	<b>2.70</b>	4.26
CBGB	Coronary bypass with chest and donor incision	301	3	1	2	0	<b>0.00</b>	8.49
CBGC	Coronary bypass with chest incision	286	0,1	20	354	2	<b>0.56</b>	1.37
CBGC	Coronary bypass with chest incision	286	2,3	19	68	0	<b>0.00</b>	2.29

*Data reported as of August 24, 2011*

*\*Per 100 operations*

Tennessee's Report on Healthcare-Associated Infections: Jan. 1, 2008 - Dec. 31, 2010

**Table 35: SSI Rates Following Coronary Artery Bypass Graft Procedure with Primary (Chest) and Secondary (Donor) Incisions (CBGB), by Risk Index Category and Specific Site, Tennessee, 01/01/2009-12/31/2009**

	Risk Index Category											
	0			1			2			3		
	No. SSI	TN Rate	US Rate	No. SSI	TN Rate	US Rate	No. SSI	TN Rate	US Rate	No. SSI	TN Rate	US Rate
<b>Secondary (donor site)</b>	<b>0</b>	<b>0.00</b>	<b>0.12</b>	<b>17</b>	<b>0.29</b>	<b>0.66</b>	<b>11</b>	<b>0.80</b>	<b>1.52</b>	<b>0</b>	<b>0.00</b>	<b>2.82</b>
Superficial	0	0.00	0.12	15	0.25	0.51	8	0.58	1.13	0	0.00	2.82
Deep	0	0.00	0.00	2	0.03	0.15	3	0.22	0.39	0	0.00	0
<b>Primary</b>	<b>0</b>	<b>0.00</b>	<b>0.23</b>	<b>96</b>	<b>1.63</b>	<b>1.89</b>	<b>26</b>	<b>1.90</b>	<b>2.74</b>	<b>0</b>	<b>0.00</b>	<b>5.67</b>
Superficial	0	0.00	0.11	44	0.75	0.79	7	0.51	1.04	0	0.00	1.89
Deep	0	0.00	0.06	24	0.41	0.58	7	0.51	0.88	0	0.00	1.89
Organ Space	0	0.00	0.06	28	0.47	0.52	12	0.87	0.82	0	0.00	1.89
<b>Total</b>	<b>0</b>	<b>0.00</b>	<b>0.35</b>	<b>113</b>	<b>1.92</b>	<b>2.55</b>	<b>37</b>	<b>2.70</b>	<b>4.26</b>	<b>0</b>	<b>0.00</b>	<b>8.49</b>

Data reported as of August 24, 2011

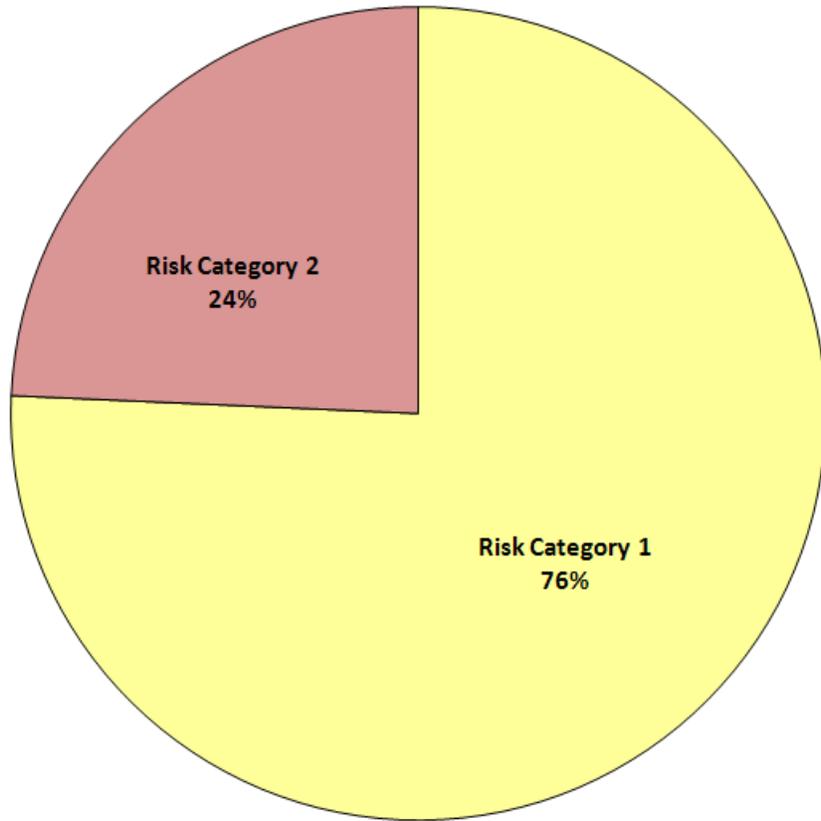
NOTE: Denominators for TN rate for the risk categories are as follows: category 0, 44; category 1, 5900; category 2, 1375; category 3, 2.

CBGB coronary artery bypass graft surgery with primary (chest) and secondary (donor) incisions.

\*Per 100 operations

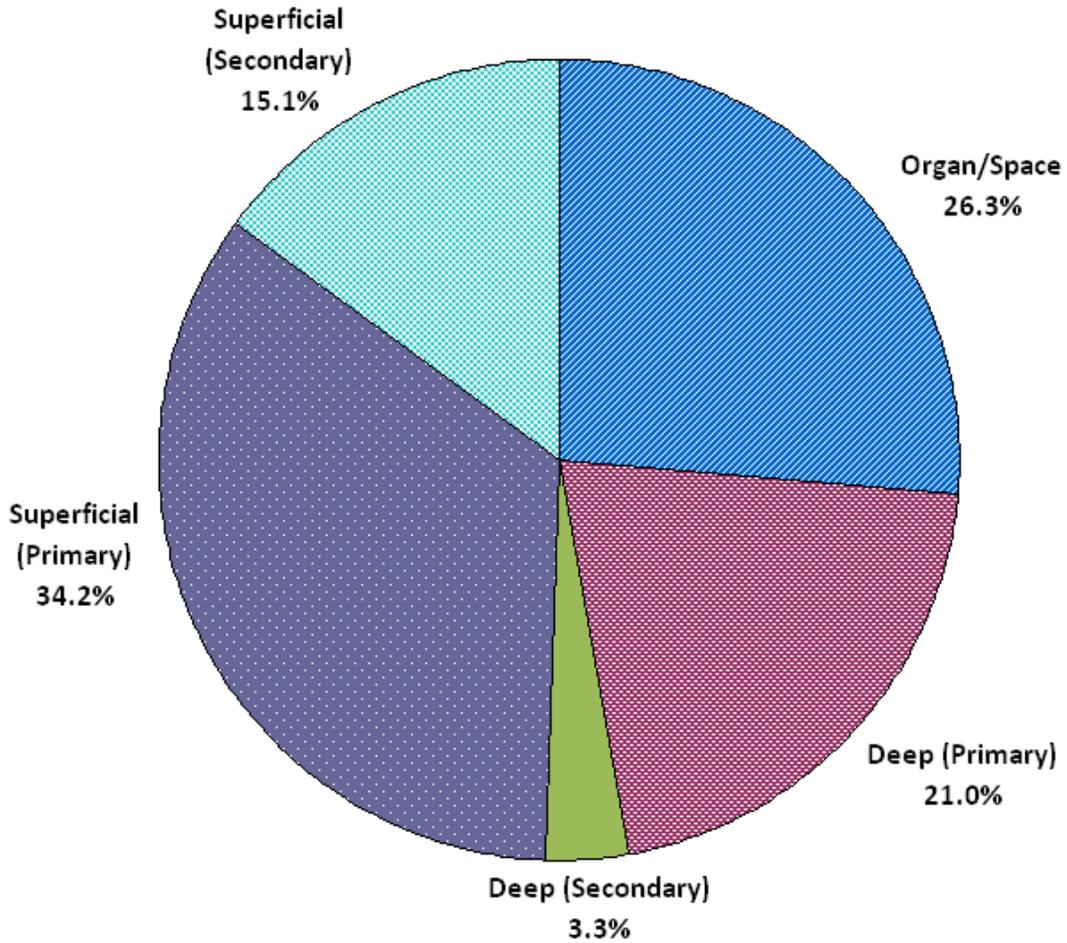
**Figure 39: Surgical Site Infections Following Coronary Artery Bypass Graft (CBGB and CBGC combined) by Risk Category, Tennessee, 01/01/2009-12/31/2009**

**Number of Events = 152**



**Figure 40: Site Specific Surgical Site Infections Following Coronary Artery Bypass Graft (CBGB and CBGC combined), Tennessee, 01/01/2009-12/31/2009**

Number of Events = 152



**Table 36: Microorganisms Identified in Coronary Artery Bypass Graft Surgical Site Infection, Tennessee, 01/01/2009–12/31/2009**

**Number of organisms = 153; number of events: 152**

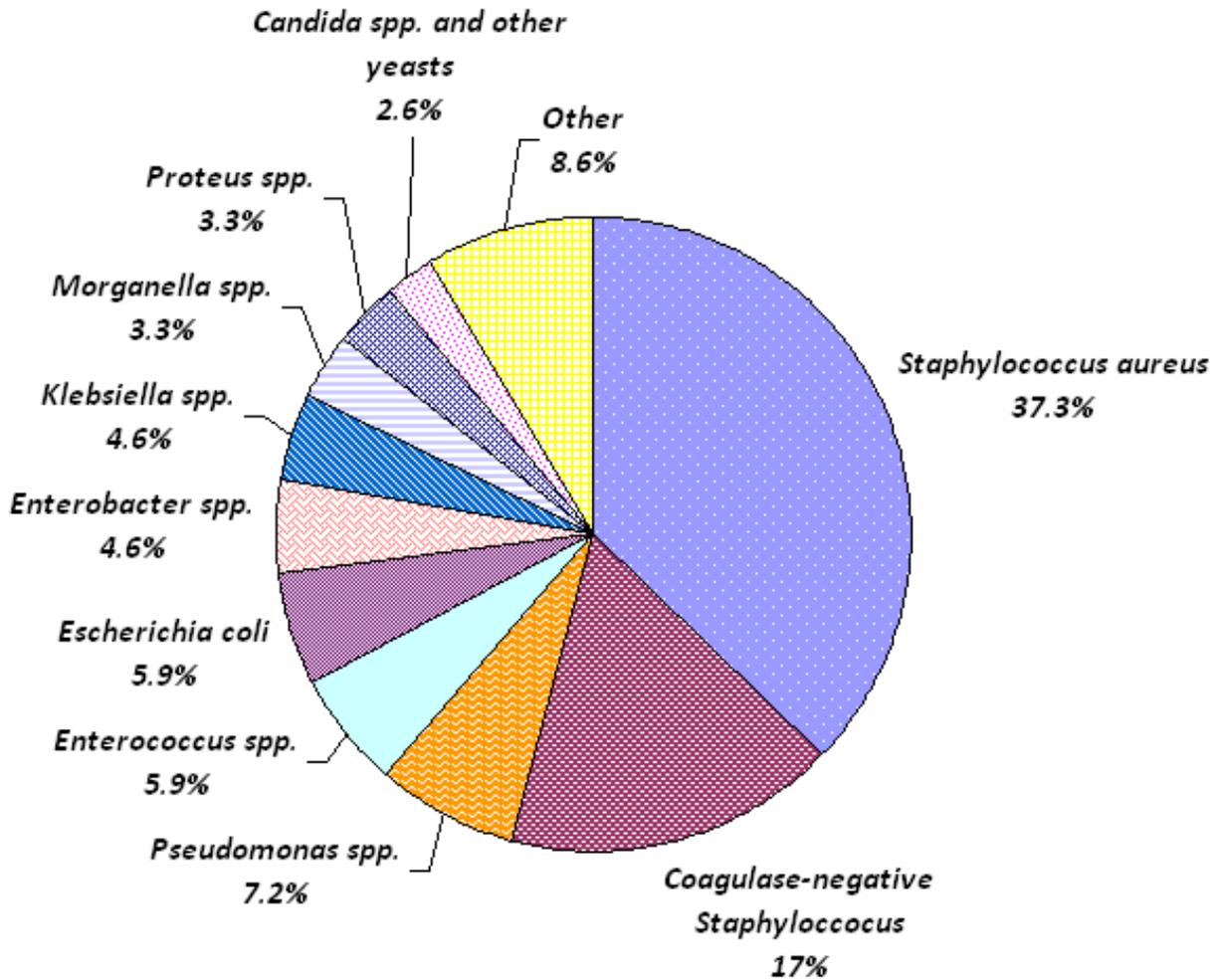
<b>Microorganism</b>	<b>Number of Isolates</b>	<b>Percent</b>
<i>Staphylococcus aureus</i>	57	37.3
Methicillin-resistant <i>S. aureus</i> (MRSA) only (% of total positive isolates)	31	(20.3)
Coagulase-negative <i>Staphylococcus</i> species	26	17.0
<i>Pseudomonas</i> species	11	7.2
<i>Enterococcus</i> species	9	5.9
Vancomycin-resistant <i>Enterococcus</i> (VRE) only (% of total positive isolates)	3	(2.0)
<i>Escherichia coli</i>	9	5.9
<i>Enterobacter</i> species	7	4.6
<i>Klebsiella</i> species	7	4.6
<i>Morganella</i> species	5	3.3
<i>Proteus</i> species	5	3.3
<i>Candida</i> species and other yeasts	4	2.6
<i>Serratia</i> species	3	2.0
<i>Streptococcus</i> species	3	2.0
<i>Acinetobacter</i> species	2	1.3
Other pathogens	5	3.3

*Data reported as of August 24, 2011*

*Other pathogens = Bacteroides fragilis, Citrobacter freundii, Corynebacterium spp., diphtheroids, and Propionibacterium spp.*

*No culture results were available for 29 events*

Figure 41: Organisms Isolated from Coronary Artery Bypass Graft Surgical Site Infection, Tennessee, 01/01/2009–12/31/2009



**Table 37: Microorganisms Identified in Deep Incisional Primary Coronary Artery Bypass Graft Surgical Site Infection, Tennessee, 01/01/2009–12/31/2009**

**Number of organisms = 38; number of events: 32**

Microorganism	Number of Isolates	Percent
<i>Staphylococcus aureus</i>	14	36.8
Methicillin-resistant <i>S. aureus</i> (MRSA) (% of total positive isolates)	6	(15.8)
Coagulase-negative <i>Staphylococcus</i> species	4	10.5
<i>Enterococcus</i> species	4	10.5
Vancomycin-resistant <i>Enterococcus</i> (VRE) (% of total positive isolates)	1	(2.6)
<i>Escherichia coli</i>	4	10.5
<i>Morganella</i> species	3	7.9
<i>Pseudomonas</i> species	3	7.9
<i>Bacteroides</i> species	1	2.6
<i>Citrobacter</i> species	1	2.6
<i>Corynebacterium</i> species	1	2.6
<i>Enterobacter</i> species	1	2.6
<i>Proteus</i> species	1	2.6
<i>Streptococcus</i> species	1	2.6

Data reported as of August 24, 2011  
No culture results were available for 4 events

**Table 38: Microorganisms Identified in Deep Incisional Secondary Coronary Artery Bypass Graft Surgical Site Infection, Tennessee, 01/01/2009–12/31/2009**

**Number of organisms = 7; number of events: 5**

Microorganism	Number of Isolates	Percent
<i>Klebsiella</i> species	2	28.6
<i>Staphylococcus aureus</i> (no MRSA reported)	2	28.6
<i>Enterobacter</i> species	1	14.3
<i>Enterococcus</i> species	1	14.3
Vancomycin-resistant <i>Enterococcus</i> (VRE) (% of total positive isolates)	1	(14.3)
<i>Pseudomonas</i> species	1	14.3

Data reported as of August 24, 2011  
MRSA= methicillin-resistant *Staphylococcus aureus*

**Table 39: Microorganisms Identified in Superficial Incisional Primary Coronary Artery Bypass Graft Surgical Site Infection, Tennessee, 01/01/2009–12/31/2009**

**Number of organisms = 46; number of events = 52**

<b>Microorganism</b>	<b>Number of Isolates</b>	<b>Percent</b>
Coagulase-negative <i>Staphylococcus</i> species	15	32.6
<i>Staphylococcus aureus</i>	10	21.7
Methicillin-resistant <i>S. aureus</i> (MRSA) (% of total positive isolates)	6	(13.0)
<i>Pseudomonas</i> species	4	8.7
<i>Enterobacter</i> species	2	4.3
<i>Enterococcus</i> species	2	4.3
Vancomycin-resistant <i>Enterococcus</i> (VRE) (% of total positive isolates)	1	(2.2)
<i>Escherichia coli</i>	2	4.3
<i>Klebsiella</i> species	2	4.3
<i>Proteus</i> species	2	4.3
<i>Serratia</i> species	2	4.3
<i>Candida</i> species and other yeasts	1	2.2
Diphtheroids	1	2.2
<i>Morganella</i> species	1	2.2
<i>Propionibacterium</i> species	1	2.2
<i>Streptococcus</i> species	1	2.2

*Data reported as of August 24, 2011*

*No culture results were available for 13 events*

**Table 40: Microorganisms Identified in Superficial Incisional Secondary Coronary Artery Bypass Graft Surgical Site Infection, Tennessee, 01/01/2009–12/31/2009**

**Number of organisms = 21; number of events: 23**

<b>Microorganism</b>	<b>Number of Isolates</b>	<b>Percent</b>
<i>Staphylococcus aureus</i>	7	33.3
Methicillin-resistant <i>S. aureus</i> (MRSA) (% of total positive isolates)	5	(23.8)
<i>Pseudomonas</i> species	3	14.3
<i>Escherichia coli</i>	2	9.5
<i>Proteus</i> species	2	9.5
<i>Acinetobacter</i> species	1	4.8
<i>Candida</i> species and other yeasts	1	4.8
Coagulase-negative <i>Staphylococcus</i> species	1	4.8
<i>Enterococcus</i> species (no VRE reported)	1	4.8
<i>Klebsiella</i> species	1	4.8
<i>Morganella</i> species	1	4.8
<i>Streptococcus</i> species	1	4.8

*Data reported as of August 24, 2011*

*No culture results were available for 7 events*

*VRE= vancomycin-resistant Enterococcus*

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**Table 41: Microorganisms Identified in Organ/Space Coronary Artery Bypass Graft Surgical Site Infection, Tennessee, 01/01/2009–12/31/2009**

**Number of organisms = 41; number of events: 40**

<b>Microorganism</b>	<b>Number of Isolates</b>	<b>Percent</b>
<i>Staphylococcus aureus</i>	24	58.5
Methicillin-resistant <i>S. aureus</i> (MRSA) (% of total positive isolates)	14	34.1
Coagulase-negative <i>Staphylococcus</i> species	6	14.6
<i>Enterobacter</i> species	3	7.3
<i>Candida</i> species and other yeasts	2	4.9
<i>Klebsiella</i> species	2	4.9
<i>Acinetobacter</i> species	1	2.4
<i>Enterococcus</i> species (no VRE reported)	1	2.4
<i>Escherichia coli</i>	1	2.4
<i>Serratia</i> species	1	2.4

*Data reported as of August 24, 2011*

*No culture results were available for 7 events*

*VRE= vancomycin-resistant Enterococcus*

**Figure 42: When Coronary Artery Bypass Graft Surgical Site Infection Detected, Tennessee, 01/01/2010–12/31/2010**

