Tennessee's Report on Healthcare-Associated Infections:

January 1, 2008 — December 31, 2009

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EXECUTIVE SUMMARY

Since January 2008, hospitals in Tennessee with an average daily census ≥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 ≤15 beds or with >15 beds, neurosurgical, medical cardiac, and cardiothoracic-surgical units. Starting July 2008, neonatal ICUs in Tennessee began to report CLABSIs in NHSN. For each ICU, hospitals collect the number of CLABSIs that occurred, the number of patient days, and the number of central line-days, which includes 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 2009 through December 2009:

CLABSI rates in 2009 were highest in major teaching medical ICUs (7.0 infections per 1,000 central line-days), followed by: major teaching medical-surgical (3.3), pediatric medical-surgical (3.0), medical cardiac (2.6), surgical (2.3), non-major teaching medical (2.1), neurosurgical (1.9), and surgical cardiothoracic (1.5), non-major teaching medical-surgical with ≤15 beds (1.5), and non-major teaching medical-surgical with >15 beds (1.5) (Table 5). Tennessee CLABSI rates were significantly higher than 2006-2008 National Healthcare Safety Network (NHSN) rates in major teaching medical ICUs [7.0 vs. 2.6 infections per 1,000 central line-days; SIR=2.73 (1.98–3.68)] and in major teaching medical-surgical ICUs [3.3 vs. 2.1 infections per 1,000 central line-days; SIR=1.57 (1.23-1.98)] (Table 5).

In 2009, the overall CLABSI rate was 17% higher in Tennessee compared to national rates for 2006-8 (SIR=1.17; 95% CI: 1.07–1.27) (Table 3). In general, CLABSI SIRs among adult and pediatric ICUs followed no consistent trend from January–June 2008 to July–December 2009 (Table 7).

CLABSI rates in 2009 varied across the three grand divisions of Tennessee (Table 7). CLABSI rates were significantly lower than national 2006-8 rates in West Tennessee among pediatric medical-surgical ICUs [1.1 vs. 3.0; SIR=0.4 (0.1–0.8)]. CLABSI rates were significantly higher in West Tennessee among major teaching medical-surgical ICUs [5.0 vs. 2.1; SIR=2.4 (1.6–3.3)] and in Middle Tennessee among major teaching medical ICUs [10.0 vs. 2.6; SIR=3.9 (2.8–5.3)]. The overall SIR was 1.0 (0.9–1.2) in East Tennessee, 1.3 (1.1–1.5) in Middle Tennessee, and 1.2 (1.0–1.4) in West Tennessee. Statistically, the overall CLABSI rate for ICUs in Middle Tennessee was 30% higher than national 2006-8 rates.

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 "Hospital-Specific CLABSI Rates in Adult and Pediatric ICUs".

The microorganisms identified in 501 CLABSI events among adult and pediatric ICU patients are listed in Table 2. The four most common pathogens among total positive isolates were: coagulase-negative *Staphylococcus* (23.7%), *Candida* spp. and other yeasts (22.2%), *Enterococcus* spp. (15.8%), and *Staphylococcus aureus* (11.5%). Methicillin-resistant *S. aureus* (MRSA) accounted for 7.7% and vancomycin-resistant *Enterococcus* (VRE) for 7.1% of total positive isolates.

Central Line-Associated Bloodstream Infections (CLABSIs) in neonatal ICUs in the reporting period from January 2009 through December 2009:

In 2009, overall CLABSI rates in level III and level II/III neonatal ICUs in Tennessee were not statistically different from national 2006-8 data (Table 22). Individual and combined CLABSI and 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).

The overall SIR across all reporting NICUs in Tennessee in 2009 was not statistically significantly different from the national SIR of 1 (SIR=0.92; 95% CI: 0.76–1.10) (Table 20). In general, NICU CLABSI/UCABSI SIRs decreased consistently over time from July–December 2008 to July–December 2009, with the overall NICU SIR for Tennessee decreasing from being significantly greater than 1 (SIR=1.41; 95% CI: 1.14–1.73) to significantly less than 1 (SIR=0.75; 95% CI: 0.56–0.99).

In 2009, combined CLABSI/UCABSI rates in neonatal ICUs varied across the three grand divisions of Tennessee (Table 25). Across the three grand divisions, neither level III nor level II/III neonatal ICUs had combined CLABSI/UCABSI rates that were significantly different from national 2006-8 rates. The overall SIR was 0.8 (0.6–1.1) in East Tennessee, 0.8 (0.6–1.2) in Middle Tennessee, and 1.1 (0.8–1.4) in West Tennessee. As an example, the overall CLABSI rate for ICUs in West Tennessee was 10% higher than the national 2006-8 rate, though this difference was not statistically significant.

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 CLABSI/UCABSI Rates in Neonatal ICUs".

The microorganisms identified in 120 CLABSI/UCABSI events among neonatal ICU patients are listed in Table 19. The most common microorganisms identified in neonatal ICU-related CLABSIs/UCABSIs were coagulase-negative *Staphylococcus* (38.3%), *Candida* spp. and other yeasts (15.0%), *Staphylococcus aureus* (13.5%), and *Enterococcus* spp. (11.3%). MRSA accounted for 7.5% 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 2008 through December 2008:

In 2008, Tennessee hospitals reported 8709 coronary artery bypass graft surgeries; 8185 were coronary bypass procedures with chest and donor site incisions (CBGBs), and 524 were coronary bypass procedures with chest incision only (CBGC). Among the 8185 CBGBs, 160 surgical site infections were reported. Four infections were reported among the 524 CBGC procedures (Table 40). Overall, CBGB SSIs were most often superficial primary (31%) and least often deep secondary infections (5%) (Figure 39). The most common pathogens among total positive isolates were *Staphylococcus aureus* (33.6%) and coagulase-negative *Staphylococcus* species (21.7%) (Table 42). SSIs were most often identified upon readmission (64%) (Figure 40).

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 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 URL: http://www.cdc.gov/ncidod/dhqp/pdf/Scott_CostPaper.pdf). 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, 22 states require reporting of HAI 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 participating 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 2009 through December 2009** and SSI reporting activities for the period from **January 2008 through December 2008**. This report provides CLABSI rates by individual hospital, grand division, and state aggregate and compares these rates to Tennessee data from 2008 and to the most recent available national data (2006-2008); SSI rates are provided by state aggregate only and are compared to the most recent available national 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.

Definition of Terms - HAI Public Report:

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 infections 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).

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: Five patients on the first day of the month had one or more central lines in place. Similarly, five patients on day 2, two patients on day 3, five patients on day 4, three patients on day 5, four patients on day 6, and four patients on day 7 had central lines in place. Adding the number of patients with central lines on days 1 to 7 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, we 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 qualify as an HAI, there must be no evidence that the infection was present or incubating at the time of hospital admission. An 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 before insertion with the right type of disinfectant; wear the recommended sterile gown, gloves and mask; and

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 typically have separate ICUs for medical patients and surgical patients.

National Healthcare Safety Network (NHSN): This is the data reporting system that Tennessee hospitals must use to report HAIs 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.
Hospitals submit specific infection and other information (e.g, number of central line-days, procedural information) to NHSN that is needed to calculate HAI infection rates. Hospitals must confer rights to TDH to collect data from NHSN so that the information can be reported 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 (see 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.

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 75th 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.

Standardized infection ratio (SIR): The SIR is a summary measure used to compare CLABSI 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 the observed number of infections divided by the predicted (or statistically expected) number of infections. The predicted number 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 CLABSIs among 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 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 (divided by 1,000) 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): Infections 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 for 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 data system
- Provide education to the 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 schema4. 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 nonpenetrating (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 and 2009

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 participate in the reporting program for CLABSIs in 2008–2009 if their facility had an average daily census ≥25:

- Medical cardiac ICUs
- Cardiothoracic Surgery ICUs
- Medical ICUs
- Medical-surgical ICUs
- Surgical ICUs
- Neurosurgical ICUs
- Pediatric ICUs
- Neonatal ICUs (NICUs) – level III and level II/III

Burn ICUs and level 1 trauma ICUs were not required to report CLABSIs during this time period. Neonatal ICUs started reporting in July 2008; all other ICUs started to report in January 2008 as shown in the first public report released in December 2009.

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 ample time for questions and answers, 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 copied training materials. TDH also held six NHSN trainings 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. Two facilities are missing data for part of the January 2009–December 2009 reporting period (Table 1). CLABSI rates and SIR values for these facilities only represent the time period for which data are available.

Table 1: Facilities with Incomplete Central Line-Associated Bloodstream Infection (CLABSI) Data for the Reporting Period January 2009–December 2009

Facility	Missing Data		Reason for Missing Data
	From	To	
River Park Hospital	January 2009	July 2009	Staff turnover*

*Indicates that a former IP left the facility without completing NHSN reporting.

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 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.

On-site 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 onsite visits at 30 hospitals are ongoing at the time of publication of this report. 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.

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 CLABSIs, 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.

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 hospital-associated infection. 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 (≤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.

Tennessee State and National Comparisons

This report displays Tennessee CLABSI rates calculated from calendar year 2009 data. For comparison, national data were obtained from the latest National Healthcare Safety Network (NHSN) report, which 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.

While national aggregate CLABSI data for adult/pediatric ICUs are published in the annual NHSN reports, these rates must be stratified by types of locations 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 for 1/2009–12/2009 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 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; an SIR < 1 means the facility is experiencing fewer infections than predicted.

We calculated SIRs for each ICU type as well as an overall SIR for adult and pediatric ICUs in Tennessee compared to national NHSN data. In calculating SIRs for neonatal ICUs, we also took into account birth weight category and line type (central or umbilical). In addition, we calculated SIRs for adult/pediatric ICUs and neonatal ICUs in each of the three Grand Divisions of Tennessee (West, Middle, and East). Finally, an SIR for each facility was calculated separately for data representing adult/pediatric ICUs and neonatal ICUs. This calculation provides a single risk-adjusted summary measure for each hospital, although a facility may have multiple ICUs.

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 2009, 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.

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

Risk Group Stratifier	Observed CLABSI Rates			NHSN CLABSI Rates for 2006-2007 (Standard Population)		
Location Type	**#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.[1]

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.

Calculation of Exact Confidence Interval of the SIR[2]:

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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, which is usually assumed to be the realization of a Poisson variate, to the predicted number of infections, which is assumed to be a constant because the referent rates are usually based on a very large number of persons so that the 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-α) percent confidence are the iterative solutions $\underline{a}$ and $\overline{a}$.

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

Fisher's Exact Test

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

Upper bound: $\sum_{i=0}^{a} \frac{e^{-\overline{a}}\overline{a}^{i}}{i!} = \alpha/2$

Therefore, the exact lower and upper limits for SIR equal to "a/λ" would be

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

The notation for the formulae is:
a = the observed number of infections
λ = 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.

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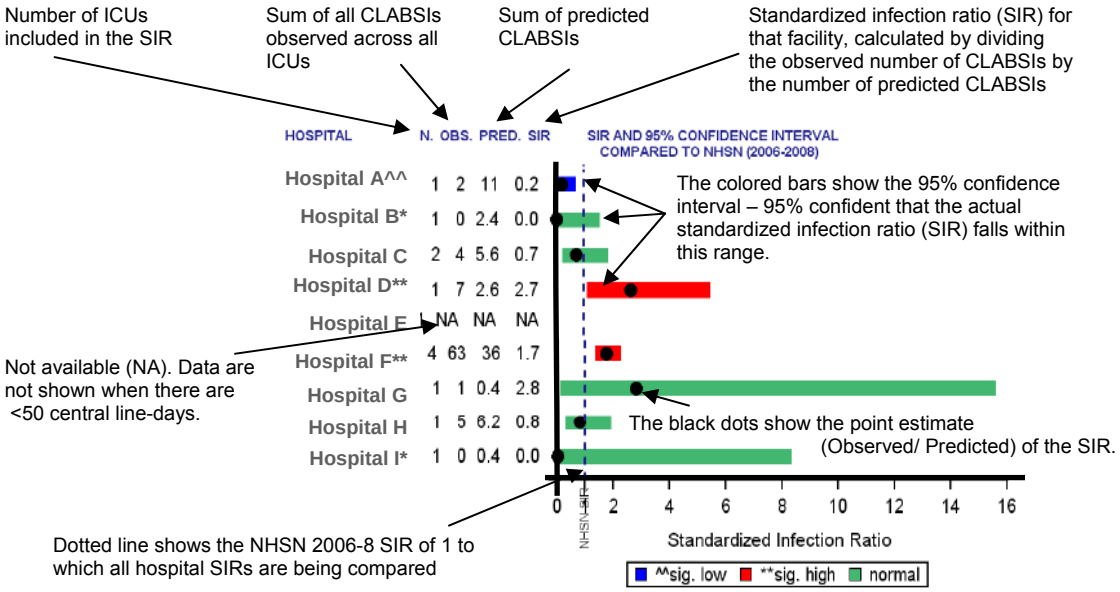
[2] Rothman KJ, Boice JD Jr: Epidemiologic analysis with a programmable calculator. NIH Pub No. 79-1649. Bethesda, MD: National Institutes of Health, 1979;31-32.

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



Data Reported from adult/pediatric ICUs as of February 4, 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 = Standarized 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*

- Hospital A reported CLABSIs from one ICU (N=1). This facility had a total of two CLABSIs in 2009 (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 1/5 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 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, with such a small denominator, the SIR is not stable.

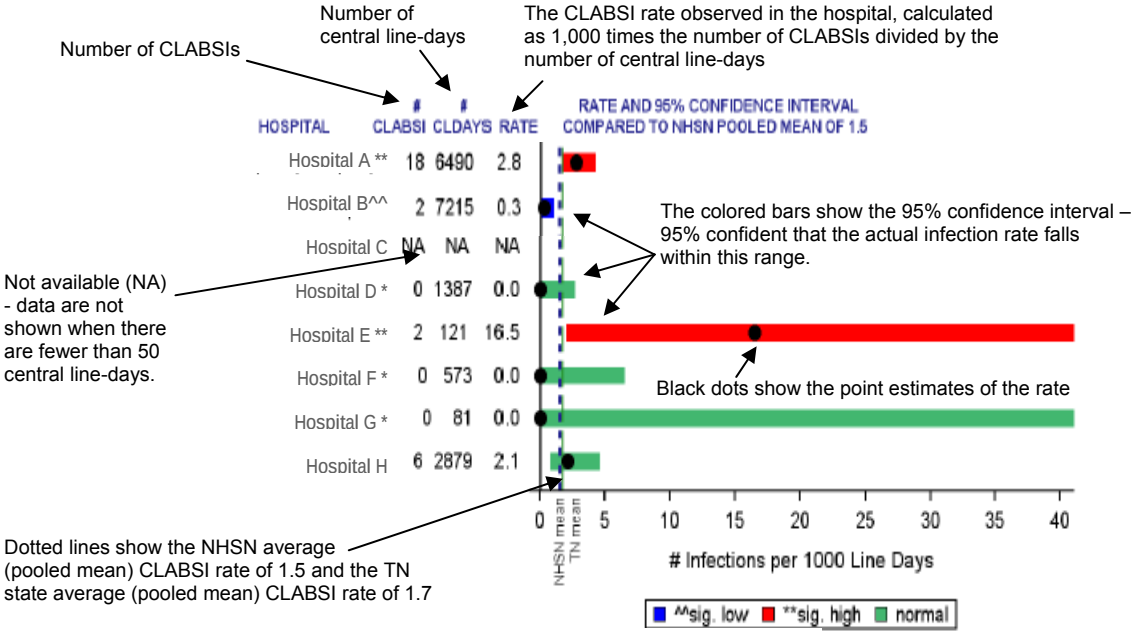
- Hospital F has four ICUs (N=4), and observed 63 CLABSIs across the ICUs during the reporting period. A total of 36 CLABSIs were predicted based on national data. The SIR was 1.7, meaning that Hospital F an infection rate that was 70% higher than the national average. The red bar does not cross the 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. 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 February 4, 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(01/01/2009 - 12/31/2009)=1.8

- 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.

- 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: 145

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 coagulase-negative *Staphylococcus* species (23.7%), *Candida* species and other yeasts (22.2%), *Enterococcus* species (15.8%), and *Staphylococcus aureus* (11.5%). MRSA accounted for 7.7% of organisms identified from CLABSIs, while VRE accounted for 7.1% of total positive isolates.

Tennessee and National Comparisons:

Key Percentiles for Tennessee SIRs (Tables 3–4)

- The overall SIR across all reporting adult and pediatric ICUs in Tennessee in 2009 was statistically significantly higher than the national SIR of 1 (SIR=1.17; 95% CI: 1.07–1.27). This SIR means that overall CLABSI rates in ICUs were 17% higher in Tennessee in 2009 compared to national NHSN 2006-8 rates. The overall Tennessee SIR for 2009 was slightly lower than the overall SIR for 2008 (SIR=1.19; 95% CI: 1.09–1.30).
- In 2009, the median (50^{th} percentile) facility-specific SIR was 0.70, indicating that half of all reporting Tennessee hospitals had a SIR at or below 0.70. This value is an improvement since 2008, when 50% of reporting hospitals had a SIR at or below 0.90. In both years, at least 25% of reporting hospitals had a SIR of 0.
- In 2009, Tennessee CLABSI rates were significantly higher than 2006-8 national rates in major teaching medical ICUs (SIR=2.73; 95% CI: 1.98–3.68) and major teaching medical-surgical ICUs (SIR=1.57; 95% CI: 1.23–1.98). This means, for example, that CLABSI infection rates in medical-surgical ICUs in major teaching hospitals in Tennessee were 57% higher than published national rates. Major teaching medical ICUs, major teaching medical-surgical ICUs, and non-major teaching medical-surgical ICUs with >15 beds also had 2008 CLABSI rates that were significantly higher than national 2006-8 rates (respectively: SIR=1.89, 95% CI: 1.28–2.70; SIR=1.63, 95% CI: 1.29–2.04; SIR=1.28, 95% CI: 1.04–1.56).
- From 2008 to 2009, median unit-specific SIRs decreased among surgical cardiothoracic ICUs (1.03 to 0.74), non-major teaching medical-surgical ICUs with >15 beds (1.13 to 0.88), pediatric medical-surgical ICUs (1.02 and 0.91), and neurosurgical ICUs (0.91 to 0.83). The median SIR remained the same among medical-surgical ICUs with ≤15 beds (0.00).

Rates and SIRs by Unit Type (Tables 5–6, Figures 3–5)

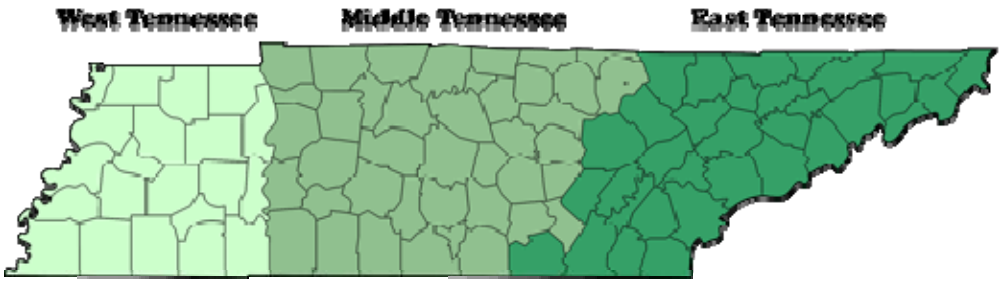
- The following list summarizes the CLABSI rates per 1,000 central line-days in Tennessee for 2009. CLABSI rates were highest in medical ICUs in major teaching hospitals and lowest among surgical cardiothoracic ICUs and medical-surgical ICUs in non-major teaching hospitals:
  - Major teaching medical (7.0),
  - major teaching medical-surgical (3.3),
  - pediatric medical-surgical (3.0),
  - medical cardiac (2.6),
  - surgical (2.3),
  - non-major teaching medical (2.1),
  - neurosurgical (1.9),
  - non-major teaching medical-surgical with ≤15 beds (1.5),
  - non-major teaching medical-surgical with >15 beds (1.5),
  - surgical cardiothoracic (1.5)
- From 2008 to 2009, infection rates decreased among surgical cardiothoracic ICUs (1.8 to 1.5), major teaching medical-surgical ICUs (3.4 to 3.3), non-major teaching medical-surgical ICUs with >15 beds (1.9 to 1.5), pediatric medical-surgical ICUs (3.2 to 3.0), neurosurgical ICUs (2.6 to 1.9), and surgical ICUs (2.6 to 2.3).
- Rates increased among medical cardiac ICUs (2.4 to 2.6), major teaching medical ICUs (4.9 to 7.0), non-major teaching medical ICUs (1.5 to 2.1), and non-major teaching medical-surgical ICUs with ≤15 beds (1.3 to 1.5).

SIRs by Six-Month Reporting Interval and Unit Type (Table 7, Figure 6)

- In general, CLABSI SIRs among adult and pediatric ICUs followed no consistent trend from January–June 2008 to July–December 2009.

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 pediatric medical-surgical ICUs [1.1 vs. 3.0; SIR=0.4 (0.1–0.8); i.e., 60% lower than national 2006-8 rates]
- CLABSI rates were significantly higher in:
  - Middle Tennessee among major teaching medical ICUs [10.0 vs. 2.6; SIR=3.9 (2.8–5.3); i.e., 290% higher than national 2006-8 rates]
  - West Tennessee among major teaching medical-surgical ICUs [5.0 vs. 2.1; SIR=2.4 (1.6–3.3); i.e., 140% higher than national 2006-8 rates]
- The overall SIRs and 95% confidence intervals by Grand Division are as follows:
  - East Tennessee: 1.0 (0.9–1.2)
  - Middle Tennessee: 1.3 (1.1–1.5)
  - West Tennessee: 1.2 (1.0–1.4)
- Overall CLABSI rates among adult and pediatric ICUs in Middle Tennessee were significantly higher (30% higher) than national 2006-8 rates (SIR=1.3; 95% CI: 1.1–1.5).

Central Line Utilization Ratio by Unit Type (Figure 8)

- Higher DU ratios were observed in Tennessee among medical cardiac and pediatric medical-surgical ICUs. In general, DU ratios for other ICU types in Tennessee were similar to national ratios.
- DU ratios in Tennessee changed little from 2008 to 2009, except for a noticeable increase in the DU ratio for non-major teaching medical ICUs.

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 and 2009, thus showing each facility's progress toward reducing CLABSI rates.

Hospital-Specific CLABSI Rates in Adult and Pediatric ICUs (Figures 12–21, Tables 9–18)

- 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 2009 (facilities with <50 line-days excluded) :
  - 3 of 9 medical cardiac ICUs – 33%
  - 3 of 14 surgical cardiothoracic ICUs – 21%

- 0 of 2 major teaching medical ICUs – 0%
- 4 of 18 non-major teaching medical ICUs – 22%
- 0 of 7 major teaching medical-surgical ICUs – 0%
- 21 of 33 non-major teaching medical-surgical ICUs with ≤15 beds – 64%
- 2 of 18 non-major teaching medical-surgical ICUs with >15 beds – 11%
- 2 of 11 surgical ICUs – 18%
- 0 of 7 neurosurgical ICUs – 0%
- 0 of 7 pediatric medical-surgical ICUs – 0%

CLABSIs and UCABSIs in Neonatal ICUs:

Total number of Neonatal ICUs (NICUs) participating in this reporting period: 25

Microorganisms Associated with CLABSIs in Neonatal ICUs (Table 19, Figure 34)

- The most common microorganisms identified in neonatal ICU-related CLABSIs/UCABSIs were coagulase-negative *Staphylococcus* (38.3%), *Candida* species and other yeasts (15.0%), *Staphylococcus aureus* (13.5%), and *Enterococcus* species (11.3%). MRSA accounted for 7.5% of organisms identified from CLABSIs and UCABSIs, while no VRE were found among the isolates.

Tennessee and National Comparisons:

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

Key Percentiles for Tennessee SIRs (Tables 20–21)

- The overall SIR across all reporting NICUs in Tennessee in 2009 was not statistically significantly different from the national SIR of 1 (SIR=0.92; 95% CI: 0.76–1.10). The overall Tennessee SIR for 2009 was lower than the overall SIR for 2008 (SIR=1.41; 95% CI: 1.14–1.73), which was significantly higher than the national SIR of 1.
- In 2009, the median (50th percentile) facility-specific SIR was 0.32, indicating that half of all reporting Tennessee hospitals had a SIR at or below 0.32. This value is an improvement since 2008, when 50% of reporting hospitals had a SIR at or below 0.69. In both years, at least 25% of reporting hospitals had a SIR of 0.
- In 2009, Tennessee CLABSI/UCABSI rates were not significantly different from 2006-8 national rates in level III NICUs (SIR=0.85; 95% CI: 0.68–1.06) or level II/III NICUs (1.10; 95% CI: 0.78–1.50). In 2008, Level II/III NICUs had infection rates that were significantly higher than national 2006-8 rates (SIR=1.70; 95% CI: 1.18–2.36).
- From 2008 to 2009, the median unit-specific SIR decreased among level III NICUs (0.86 to 0.62) and remained the same among level II/III NICUs (0.00).

Combined CLABSI/UCABSI Rates and SIRs by Unit Type and Birth Weight Category (Tables 22–23)

- CLABSI/UCABSI rates per 1,000 line-days were highest among babies with birth weight ≤750 g in level II/III NICUs (5.7) and lowest among babies with birth weight 1501–2500 g in level II/III NICUs (0.5). However, none of the rates were statistically significantly different from national 2006-8 rates.
- From 2008 to 2009, infection rates decreased in among babies in all birth weight categories in level III NICUs and among babies with birth weight ≤750 g, 751–1000 g, and >2500 g in level II/III NICUs.
- Rates increased among babies with birth weight 1001–1500 g and >2500 g in level II/III NICUs.

Combined CLABSI/UCABSI SIRs by Six-Month Reporting Interval, Unit Type, and Birth Weight Category (Table 24, Figure 28)

- In general, NICU CLABSI/UCABSI SIRs decreased consistently over time from July–December 2008 to July–December 2009.
- From July–December 2008 to July–December 2009, the overall NICU SIR for Tennessee decreased from being significantly greater than 1 (SIR=1.41; 95% CI: 1.14–1.73) to significantly less than 1 (SIR=0.75; 95% CI: 0.56–0.99).
- The overall SIR for level III NICUs decreased from 1.28 (0.97–1.66) to 0.63 (0.43–0.90). The overall SIR for level II/III NICUs decreased from 1.70 (1.18–2.36) to 1.06 (0.65–1.64).

Combined CLABSI/UCABSI Rates and SIRs by Unit Type and Grand Division (Table 25, Figure 29)

- Combined CLABSI/UCABSI rates varied across the three grand divisions of Tennessee within neonatal ICU settings.
- Neither level III nor level II/III neonatal ICUs in all three grand regions of Tennessee had infection rates significantly different from national 2006-8 rates.
- The overall SIRs and 95% confidence intervals by Grand Division are as follows:
    - East Tennessee: 0.8 (0.6–1.1)
    - Middle Tennessee: 0.8 (0.6–1.2)
    - West Tennessee: 1.1 (0.8–1.4)

CLABSI and UCABSI Rates and SIRs by Unit Type and Birth Weight Category (Tables 26–29, Figures 22–27)

- The overall CLABSI SIR for level III NICUs in Tennessee in 2009 was not statistically significantly different from national 2006-8 data (SIR= 0.8; 95% CI: 0.6–1.0). Likewise, the overall CLABSI SIR for level II/III NICUs in Tennessee in 2009 was not statistically significantly different from national 2006-8 data (SIR= 1.4; 95% CI: 0.9–1.9). From 2008 to 2009, CLABSI rates decreased in all birth weight categories in level III NICUs.

- The overall UCABSI SIR for level III NICUs in Tennessee in 2009 was not significantly different from national 2006-8 data (SIR= 1.0; 95% CI: 0.6–1.7). Likewise, the overall UCABSI SIR for level II/III NICUs in Tennessee in 2009 was not statistically significantly different from national 2006-8 data (SIR= 0.7; 95% CI: 0.3–1.3). From 2008 to 2009, UCABSI rates decreased in all birth weight categories except >2500 g in level II/III NICUs.
- CLABSI and UCABSI rates in 2009 were not significantly different from corresponding national 2006-8 rates in any birth weight category in level III and level II/III NICUs.

Central Line Utilization Ratio by ICU type (Figures 30–33)

- In level III NICUs in Tennessee, 2009 device utilization (DU) ratios for central lines and umbilical catheters were very similar to national 2006-8 ratios. DU ratios in these units decreased from 2008 to 2009 in all birth weight categories except 1501–2500 g.
- In level II/III NICUs in Tennessee, 2009 DU ratios for central lines were lower than national 2006-8 ratios. DU ratios for umbilical catheters were similar to national 2006-8 ratios, except for birth weight ≤750 g, in which Tennessee's DU ratio was substantially higher than the corresponding national ratio. Differences between 2008 and 2009 DU ratios varied by birth weight category in level II/III NICUs.

Overall Facility-Specific SIRs (Figures 35–36)

- One CLABSI/UCABSI SIR per facility is displayed in Figure 35. 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 11 displays one facility-specific SIR per year for 2008 and 2009, thus showing each facility's progress toward reducing CLABSI/UCABSI rates.

Facility-Specific CLABSI/UCABSI Rates (Tables 30–39)

- Facility-specific combined CLABSI/UCABSI rates in neonatal ICUs are displayed by type of ICU and birth weight category in Tables 30–39.
- The following numbers and percentages of ICUs reported zero (0) infections in 2009 (facilities with <50 line-days excluded):
    - 1 of 7 neonatal level-III ICUs – 14%
    - 10 of 17 neonatal level-II/III ICUs – 59%

CLABSI Figures and Tables

Adult and Pediatric Critical Care Units

Figure 3: Central Line-Associated Bloodstream Infection (CLABSI) Incidence Density Rate per 1,000 Central Line Days (Pooled Means), Tennessee, 2008 and 2009, *vs.* National Healthcare Safety Network (NHSN), 2006-8

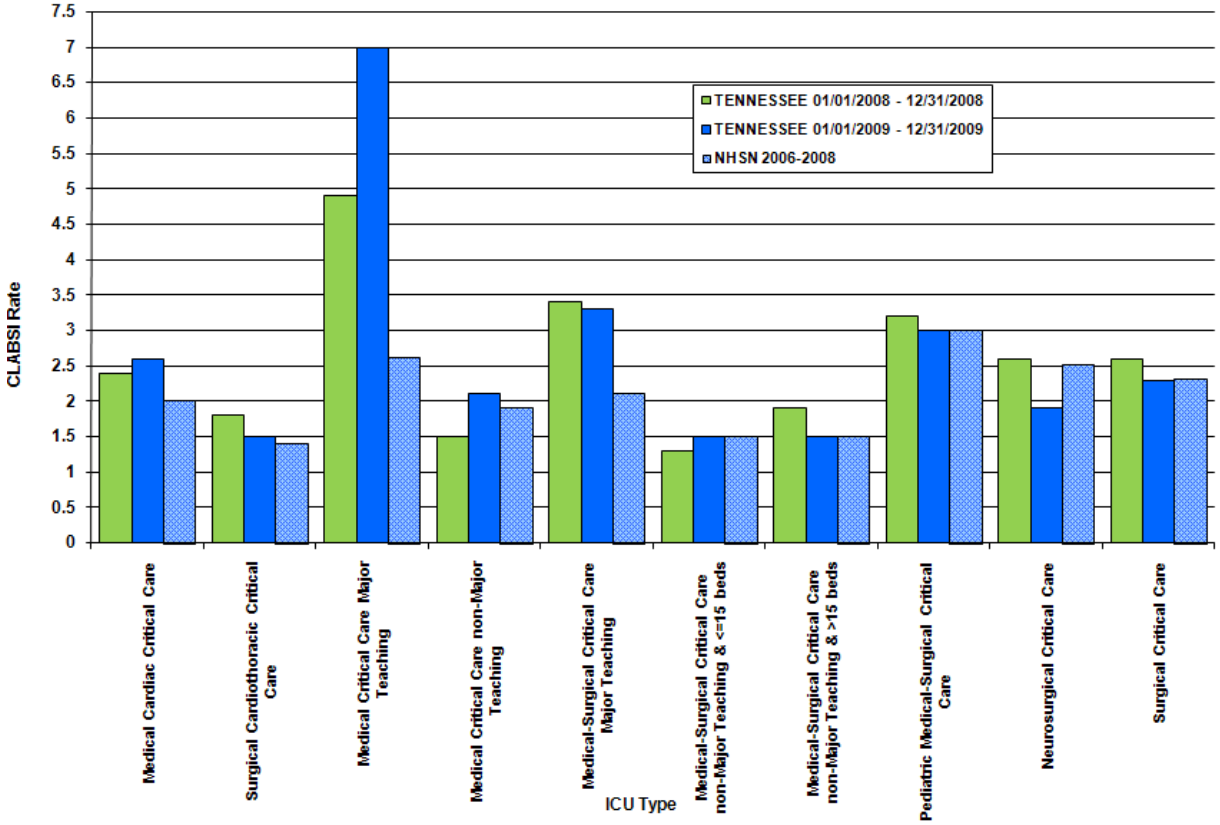


Figure 4: Standardized Infection Ratios (SIR) of Central Line-Associated Bloodstream Infections (CLABSIs) by Intensive Care Unit (ICU) Type, Tennessee, 1/2009–12/2009 [Reference standard: National Healthcare Safety Network (NHSN), 2006-8]

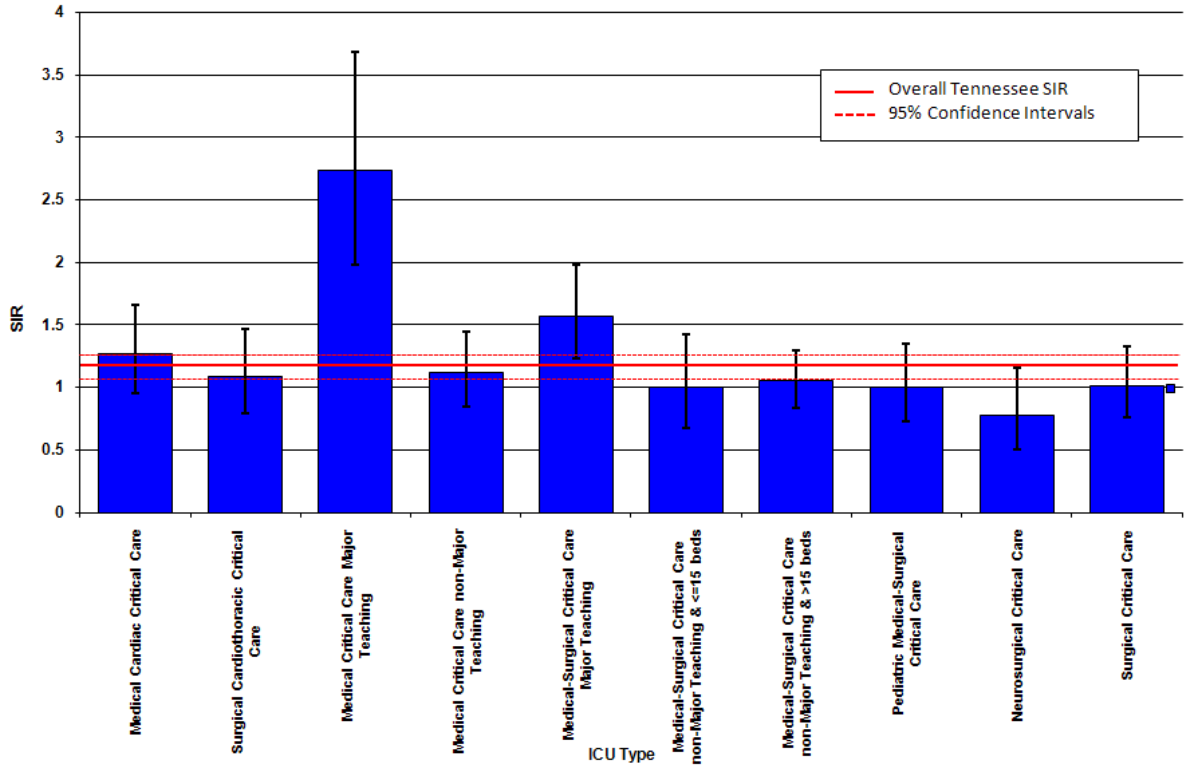


Figure 5: Standardized Infection Ratios (SIR) of Central Line-Associated Bloodstream Infections (CLABSIs) by Intensive Care Unit (ICU) Type, Tennessee, 1/2008–12/2008 and 1/2009–12/2009 [Reference standard: National Healthcare Safety Network (NHSN), 2006-8]

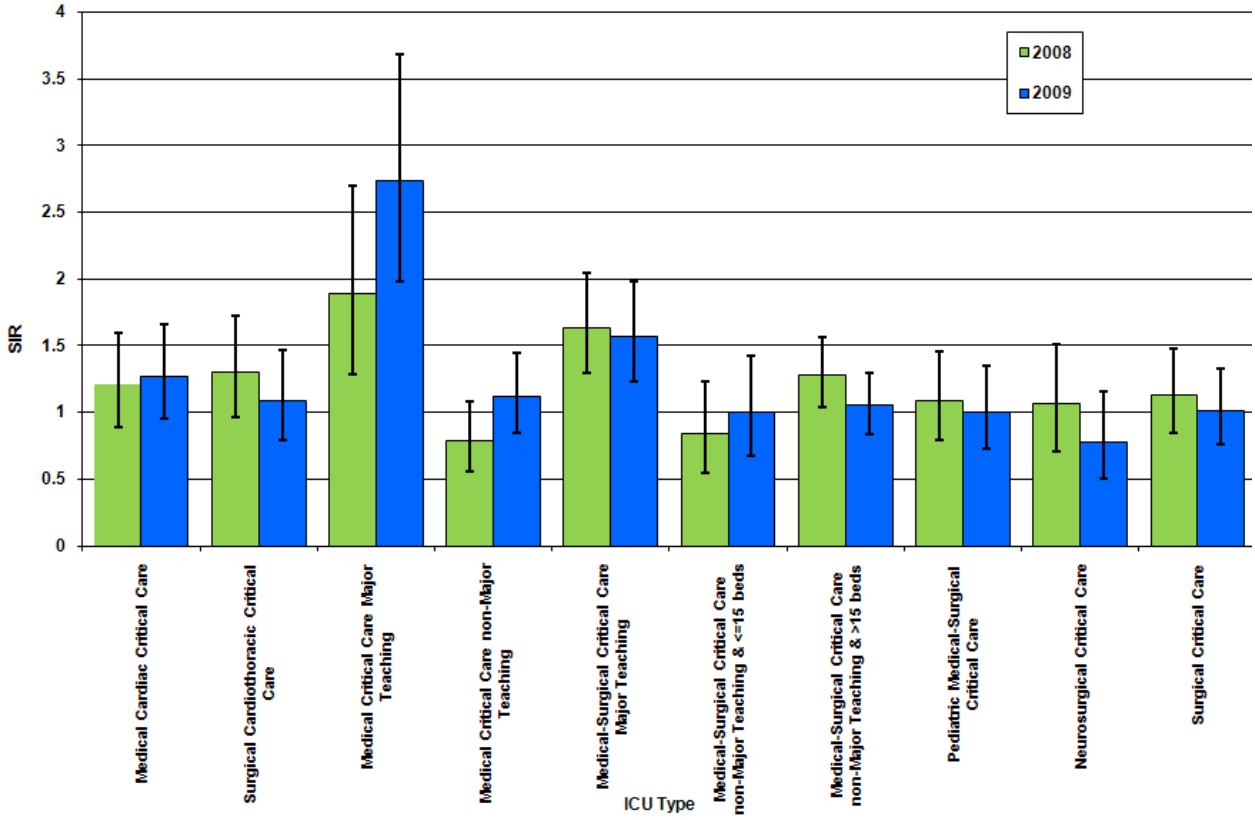


Figure 6: Standardized Infection Ratios (SIR) of Central Line-Associated Bloodstream Infections (CLABSIs) by Six-Month Reporting Interval, Tennessee, 1/2008–12/2009 [Reference standard: National Healthcare Safety Network (NHSN), 2006-8]

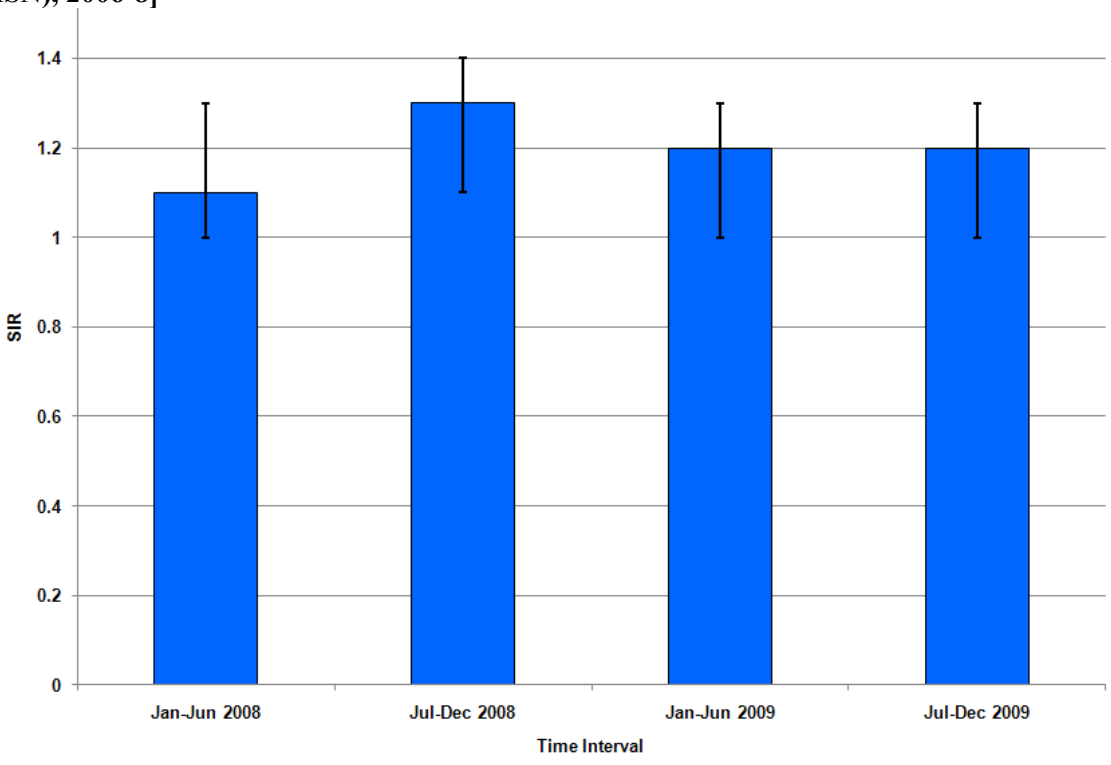


Figure 7: Standardized Infection Ratio (SIR) for Central Line-Associated Bloodstream Infections (CLABSIs) by ICU Type and Grand Division, Tennessee, 1/2009–12/2009. [Reference standard: National Healthcare Safety Network (NHSN), 2006-8]

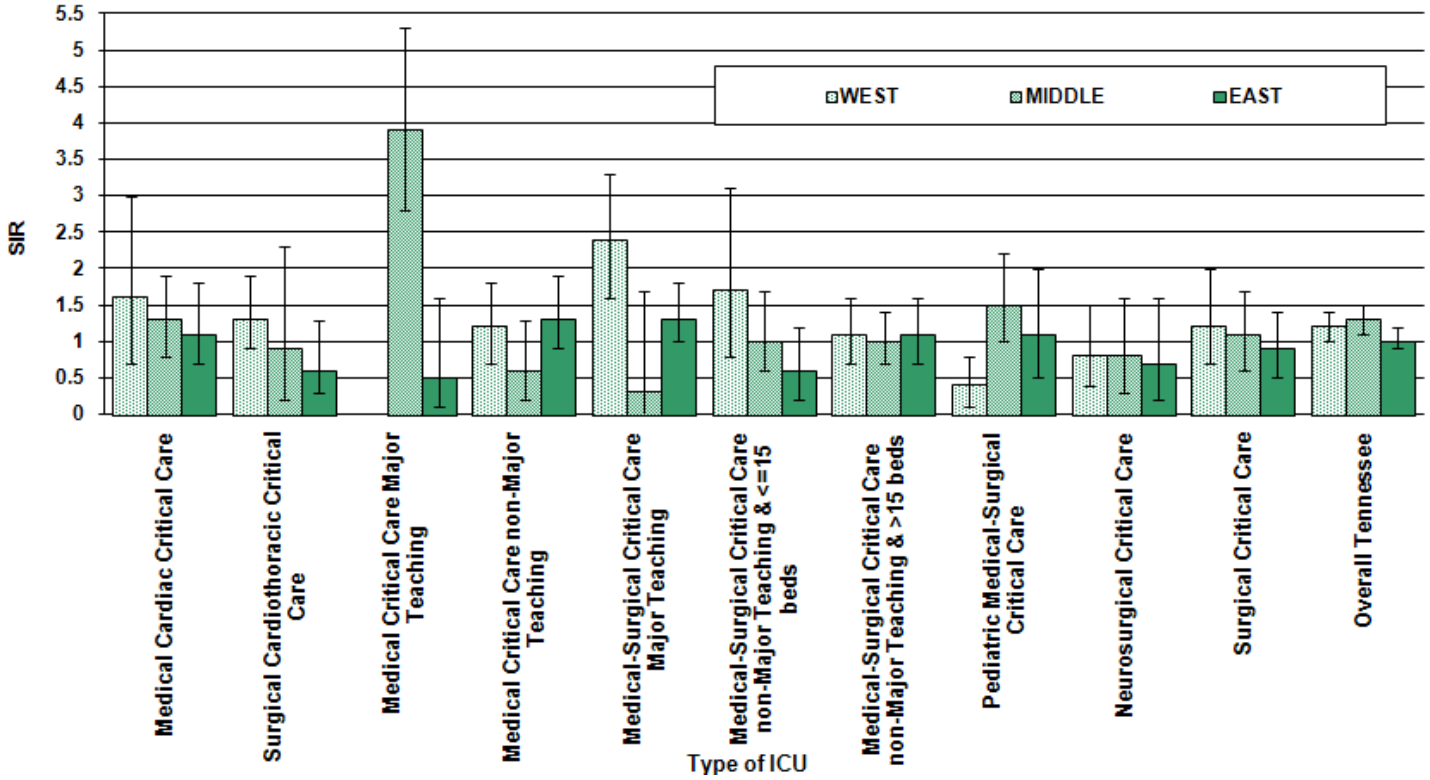
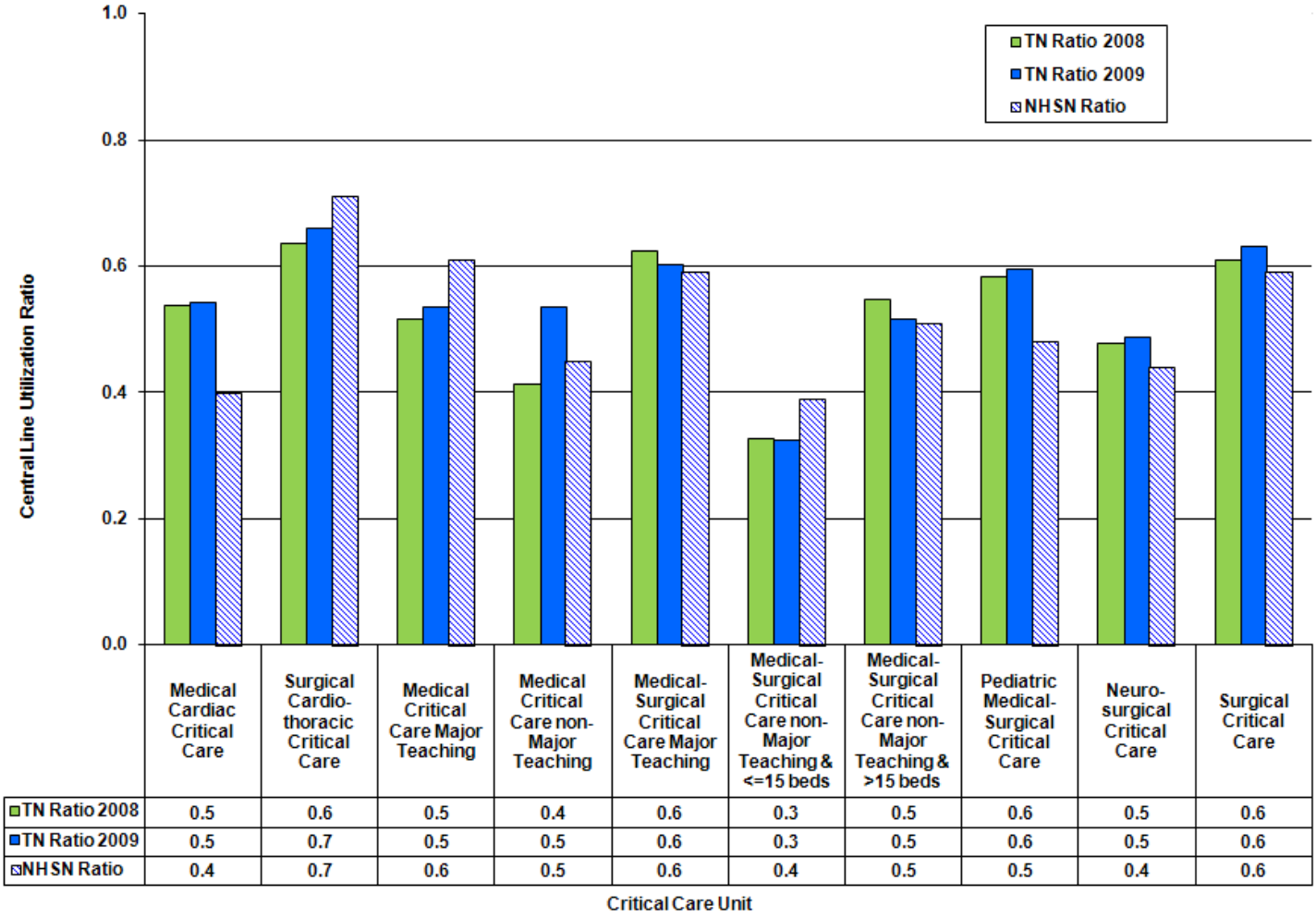


Figure 8: Central Line Utilization Ratio by ICU Type: Tennessee, 2008 and 2009, *vs.* National Healthcare Safety Network (NHSN), 2006-8



	Medical Cardiac Critical Care	Surgical Cardio-thoracic Critical Care	Medical Critical Care Major Teaching	Medical Critical Care non-Major Teaching	Medical-Surgical Critical Care Major Teaching	Medical-Surgical Critical Care non-Major Teaching & <=15 beds	Medical-Surgical Critical Care non-Major Teaching & >15 beds	Pediatric Medical-Surgical Critical Care	Neuro-surgical Critical Care	Surgical Critical Care
TN Ratio 2008	0.5	0.6	0.5	0.4	0.6	0.3	0.5	0.6	0.5	0.6
TN Ratio 2009	0.5	0.7	0.5	0.5	0.6	0.3	0.5	0.6	0.5	0.6
NHSN Ratio	0.4	0.7	0.6	0.5	0.6	0.4	0.5	0.5	0.4	0.6

Critical Care Unit

Figure 9: Organisms Isolated from Central Line-Associated Bloodstream Infections (CLABSIs) in Adult and Pediatric Critical Care Units, Tennessee, 01/01/2009–12/31/2009

Number of organisms = 549; number of events = 501

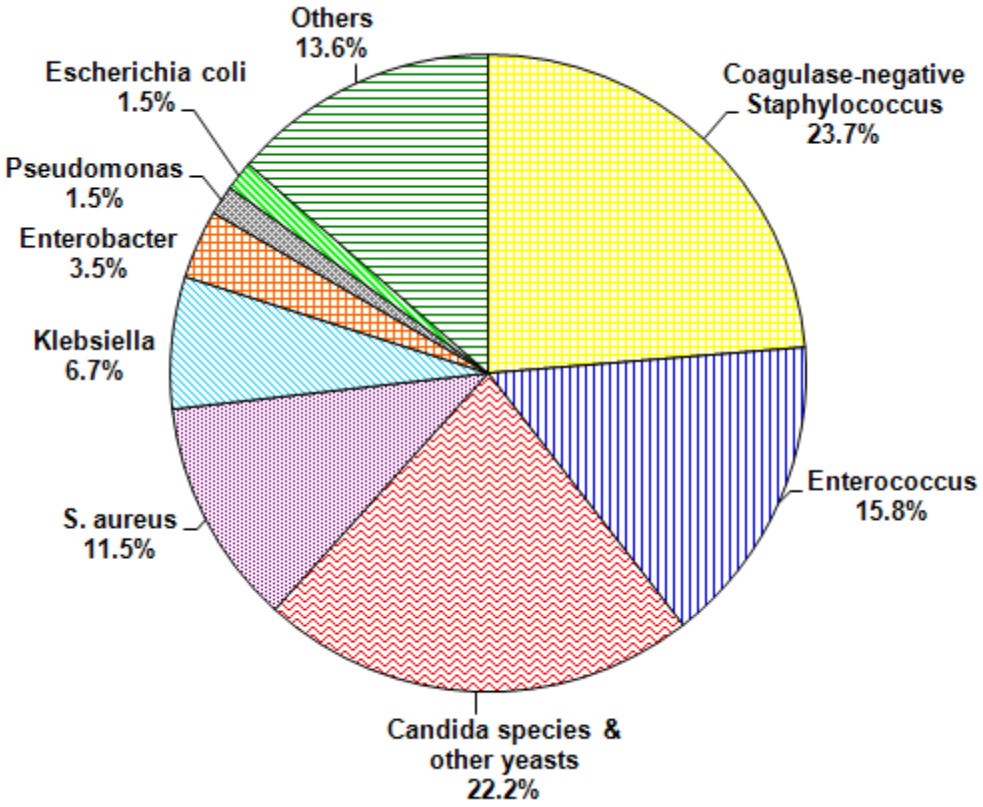


Table 2: Microorganisms Identified in Central Line-Associated Bloodstream Infections (CLABSIs) in Adult and Pediatric Critical Care Units, Tennessee, 01/01/2009–12/31/2009

Number of organisms = 549; number of events: 501

Microorganism	Number Isolates	Percent
Coagulase-negative *Staphylococcus* species	130	23.7
Candida species and other yeasts	122	22.2
Candida albicans only (% of total positive isolates)	53	(9.7)
Enterococcus species	87	15.8
Vancomycin-resistant *Enterococcus* (VRE) only (% of total positive isolates)	39	(7.1)
Staphylococcus aureus	63	11.5
Methicillin-resistant *S. aureus* (MRSA) only (% of total positive isolates)	42	(7.7)
Klebsiella species	37	6.7
Acinetobacter species	25	4.6
Enterobacter species	19	3.5
Serratia species	9	1.6
Pseudomonas species	8	1.5
Escherichia coli	8	1.5
Stenotrophomonas maltophilia	8	1.5
Proteus species	6	1.1
Streptococcus species	5	0.9
Bacteroides species	2	0.4
Citrobacter species	2	0.4
Clostridium species	2	0.4
Cryptococcus species	2	0.4
Morganella species	2	0.4
Propionibacterium species	2	0.4
Other pathogens	8	1.5
Other skin contaminants	2	0.4

Data reported as of February 4, 2011
Total number of isolates= 549; Total number of CLABSI events= 501;
***Other pathogens* =Alcaligenes xylosoxidans, Chromobacterium *spp.*, Lactobacillus acidophilus, Neisseria *spp.*, Pantoea *spp.*, Peptococcus *spp.*, Peptostreptococcus anaerobius, *and coagulase-positive* Staphylococcus**
Other skin contaminants* = Bacillus cereus *and diphtheroids

Table 3: Key Percentiles for Facility-Specific Central Line-Associated Bloodstream Infection (CLABSI) Standardized Infection Ratios (SIRs) by Reporting Year, Tennessee [Reportable period: 01/01/2008–12/31/2009]

			SIR, 95% CONFIDENCE INTERVAL, AND KEY PERCENTILES							
STATE	YEAR	No.	SIR	LOWER LIMIT	UPPER LIMIT	10%	25%	50%	75%	90%
Tennessee	2009	79	1.17	1.07	1.27	0.00	0.00	0.70	1.30	2.04
	2008	79	1.19	1.09	1.30	0.00	0.00	0.90	1.57	2.65

Data reported as of February 4, 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 rate for reporting period is significantly higher than National 2006-2008 rate
Blue highlighting indicates rate for reporting period is significantly lower than National 2006-2008 rate

Table 4: Key Percentiles for Unit-Specific Central Line-Associated Bloodstream Infection (CLABSI) Standardized Infection Ratios (SIRs) by Unit Type and Reporting Year, Tennessee [Reportable period: 01/01/2008–12/31/2009]

			SIR, 95% CONFIDENCE INTERVAL, AND KEY PERCENTILES							
CCU TYPE	YEAR	No.	SIR	LOWER LIMIT	UPPER LIMIT	10%	25%	50%	75%	90%
Medical Cardiac Critical Care	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
Surgical Cardiothoracic Critical Care	2009	14	1.09	0.79	1.47	0.00	0.53	0.74	1.38	1.71
	2008	14	1.30	0.96	1.72	0.00	0.56	1.03	1.31	2.15
Medical Critical Care Major Teaching	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	2009	18	1.12	0.85	1.44	0.00	0.25	0.83	1.61	2.04
	2008	17	0.79	0.56	1.08	0.00	0.17	0.49	1.17	2.68
Medical-Surgical Critical Care Major Teaching	2009	7	1.57	1.23	1.98	0.31	0.62	1.32	2.16	3.39
	2008	7	1.63	1.29	2.04	0.53	1.00	1.26	2.20	2.66
Medical-Surgical Critical Care Non-Major Teaching & ≤15 beds	2009	34	1.00	0.67	1.42	0.00	0.00	0.00	1.12	3.69
	2008	34	0.84	0.55	1.23	0.00	0.00	0.00	1.32	2.57
Medical-Surgical Critical Care Non-Major Teaching & >15 beds	2009	18	1.05	0.83	1.30	0.00	0.28	0.88	1.26	2.63
	2008	18	1.28	1.04	1.56	0.00	0.30	1.13	1.70	2.91
Pediatric Medical-Surgical Critical Care	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
Neurosurgical Critical Care	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
Surgical Critical Care	2009	11	1.01	0.76	1.33	0.00	0.35	0.89	1.76	1.77
	2008	10	1.13	0.85	1.48	0.00	0.75	0.88	1.10	1.89

Data reported as of February 4, 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 rate for reporting period is significantly higher than National 2006-2008 rate
Blue highlighting indicates rate for reporting period is significantly lower than National 2006-2008 rate

Table 5: 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) [Reportable period: 01/01/2009–12/31/2009]

	TENNESSEE 01/01/2009 - 12/31/2009					NHSN 2006-2008				SIR AND 95% CONFIDENCE INTERVAL		
CCU TYPE	No.	CLABSI	CL DAYS	POOLED MEAN*	MEDIAN RATE*	CLABSI	CL DAYS	POOLED MEAN*	MEDIAN RATE*	SIR	LOWER LIMIT	UPPER LIMIT
Medical Cardiac Critical Care	9	53	20760	2.6	2.4	876	436409	2.0	1.3	1.27	0.95	1.66
Surgical Cardiothoracic Critical Care	14	43	28373	1.5	1.0	879	632769	1.4	0.8	1.09	0.79	1.47
Medical Critical Care Major Teaching	2	43	6136	7.0	5.7	1410	549088	2.6	2.3	2.73	1.98	3.68
Medical Critical Care Non-Major Teaching	18	58	27411	2.1	1.6	687	362388	1.9	1.0	1.12	0.85	1.44
Medical-Surgical Critical Care Major Teaching	7	72	21765	3.3	2.8	1474	699300	2.1	1.7	1.57	1.23	1.98
Medical-Surgical Critical Care Non-Major Teaching & ≤15 beds	34	30	20116	1.5	0.0	1130	755437	1.5	0.0	1.00	0.67	1.42
Medical-Surgical Critical Care Non-Major Teaching & >15 beds	18	82	53431	1.5	1.3	1449	986982	1.5	1.1	1.05	0.83	1.30
Pediatric Medical-Surgical Critical Care	7	44	14827	3.0	2.7	929	314306	3.0	2.5	1.00	0.73	1.35
Neurosurgical Critical Care	7	24	12543	1.9	2.0	396	160879	2.5	1.9	0.78	0.50	1.16
Surgical Critical Care	11	52	22229	2.3	2.0	1683	729989	2.3	1.7	1.01	0.76	1.33
TOTAL	.	.	.	.	.	.	.	.	.	1.17	1.07	1.27

Data reported as of February 4, 2011
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 Tennessee rate for 2009 is significantly higher than National 2006-2008 rate
Blue highlighting indicates rate for 2009 is significantly lower than National 2006-2008 rates

Table 6: Comparison of Tennessee Central Line-Associated Bloodstream Infection (CLABSI) Rates by Type of Critical Care Unit (CCU) and Reporting Year [Reportable period: 01/01/2008–12/31/2009]

	TENNESSEE 01/01/2008 - 12/31/2008					TENNESSEE 01/01/2009 - 12/31/2009				
CCU TYPE	No.	CLABSI	CL DAYS	POOLED MEAN*	MEDIAN RATE*	No.	CLABSI	CL DAYS	POOLED MEAN*	MEDIAN RATE*
Medical Cardiac Critical Care	9	48	19873	2.4	2.3	9	53	20760	2.6	2.4
Surgical Cardiothoracic Critical Care	14	49	27091	1.8	1.4	14	43	28373	1.5	1.0
Medical Critical Care Major Teaching	2	30	6179	4.9	4.8	2	43	6136	7.0	5.7
Medical Critical Care Non-Major Teaching	17	39	26146	1.5	0.9	18	58	27411	2.1	1.6
Medical-Surgical Critical Care Major Teaching	7	77	22416	3.4	2.7	7	72	21765	3.3	2.8
Medical-Surgical Critical Care Non-Major Teaching & ≤15 beds	34	26	20761	1.3	0.0	34	30	20116	1.5	0.0
Medical-Surgical Critical Care Non-Major Teaching & >15 beds	18	99	52727	1.9	1.7	18	82	53431	1.5	1.3
Pediatric Medical-Surgical Critical Care	7	43	13402	3.2	3.0	7	44	14827	3.0	2.7
Neurosurgical Critical Care	7	30	11517	2.6	2.2	7	24	12543	1.9	2.0
Surgical Critical Care	10	53	20361	2.6	2.0	11	52	22229	2.3	2.0

Data reported as of February 4, 2011
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 Tennessee rate for reporting period is significantly higher than National 2006-2008 rate
Blue highlighting indicates rate for reporting period is significantly lower than National 2006-2008 rates

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 [Reportable periods: 01/01/2008–12/31/2009]

	Jan-Jun 2008 SIR AND 95% CONFIDENCE INTERVAL			Jul-Dec 2008 SIR AND 95% CONFIDENCE INTERVAL			Jan-Jun 2009 SIR AND 95% CONFIDENCE INTERVAL			Jul-Dec 2009 SIR AND 95% CONFIDENCE INTERVAL		
CCU TYPE	SIR	LOWER LIMIT	UPPER LIMIT	SIR	LOWER LIMIT	UPPER LIMIT	SIR	LOWER LIMIT	UPPER LIMIT	SIR	LOWER LIMIT	UPPER LIMIT
Medical Cardiac Critical Care	0.9	0.5	1.5	1.5	1.0	2.1	1.3	0.9	1.9	1.2	0.8	1.8
Surgical Cardiothoracic Critical Care	1.3	0.8	1.9	1.3	0.8	2.0	1.2	0.7	1.7	1.0	0.6	1.6
Medical Critical Care Major Teaching	1.1	0.5	2.1	2.8	1.7	4.2	2.6	1.6	4.1	2.8	1.8	4.2
Medical Critical Care Non-Major Teaching	0.6	0.3	0.9	1.0	0.7	1.5	1.2	0.8	1.7	1.0	0.7	1.5
Medical-Surgical Critical Care Major Teaching	1.8	1.3	2.4	1.5	1.0	2.0	1.3	0.9	1.9	1.8	1.3	2.4
Medical-Surgical Critical Care Non-Major Teaching & ≤15 beds	0.8	0.4	1.4	0.9	0.5	1.5	1.1	0.6	1.7	0.9	0.5	1.5
Medical-Surgical Critical Care Non-Major Teaching & >15 beds	1.3	1.0	1.7	1.2	0.9	1.7	1.0	0.7	1.4	1.1	0.8	1.5
Pediatric Medical-Surgical Critical Care	1.1	0.7	1.7	1.1	0.7	1.6	1.1	0.7	1.6	0.9	0.6	1.4
Neurosurgical Critical Care	1.0	0.5	1.6	1.2	0.7	1.9	0.8	0.4	1.5	0.7	0.4	1.3
Surgical Critical Care	1.0	0.7	1.5	1.2	0.8	1.7	0.9	0.6	1.4	1.1	0.8	1.6
TOTAL	**1.1**	**1.0**	**1.3**	**1.3**	**1.1**	**1.4**	**1.2**	**1.0**	**1.3**	**1.2**	**1.0**	**1.3**

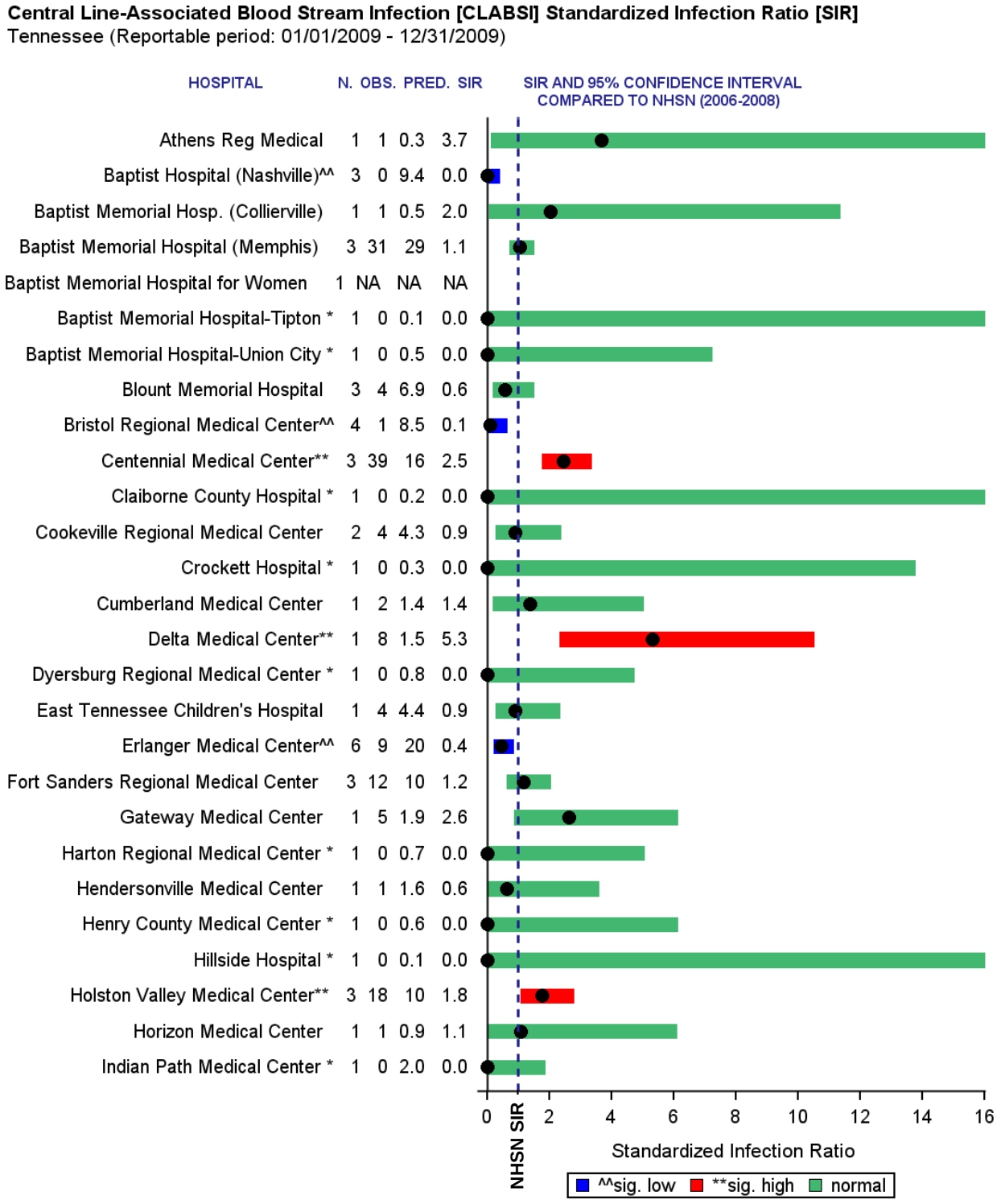
Data reported as of February 4, 2011
No . number of facilities with reporting units; SIR Standardized Infection Ratio (observed number/ statistically 'predicted' number of CLABSI)
NA = not reported if the number of facilities with reporting units is <5
Red highlighting indicates rate for reporting period is significantly higher than National 2006-2008 rate
Blue highlighting indicates rate for reporting period is significantly lower than National 2006-2008 rate

Table 8: Central Line-Associated Bloodstream Infection (CLABSI) Rates by Type of Critical Care Unit (CCU) and Grand Division [Reportable period: 01/01/2009–12/31/2009]

	EAST							MIDDLE							WEST						
CCU TYPE	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	19	8384	2.3	1.1	0.7	1.8	3	25	9496	2.6	1.3	0.8	1.9	1	9	2880	3.1	1.6	0.7	3.0
Surgical Cardiothoracic Critical Care	6	7	8054	0.9	0.6	0.3	1.3	3	4	3196	1.3	0.9	0.2	2.3	5	32	17123	1.9	1.3	0.9	1.9
Medical Critical Care Major Teaching	1	3	2135	1.4	0.5	0.1	1.6	1	40	4001	10.0	3.9	2.8	5.3	.	.	.	.	.	.	.
Medical Critical Care Non-Major Teaching	10	31	12365	2.5	1.3	0.9	1.9	4	6	5507	1.1	0.6	0.2	1.3	4	21	9539	2.2	1.2	0.7	1.8
Medical-Surgical Critical Care Major Teaching	4	39	13800	2.8	1.3	1.0	1.8	1	1	1547	0.6	0.3	0.0	1.7	2	32	6418	5.0	2.4	1.6	3.3
Medical-Surgical Critical Care Non-Major Teaching & ≤15 beds	16	6	7137	0.8	0.6	0.2	1.2	11	14	8993	1.6	1.0	0.6	1.7	7	10	3986	2.5	1.7	0.8	3.1
Medical-Surgical Critical Care Non-Major Teaching & >15 beds	5	24	15065	1.6	1.1	0.7	1.6	8	37	24827	1.5	1.0	0.7	1.4	5	21	13539	1.6	1.1	0.7	1.6
Pediatric Medical-Surgical Critical Care	4	11	3394	3.2	1.1	0.5	2.0	1	27	6053	4.5	1.5	1.0	2.2	2	6	5380	1.1	0.4	0.1	0.8
Neurosurgical Critical Care	2	5	3026	1.7	0.7	0.2	1.6	2	8	4095	2.0	0.8	0.3	1.6	3	11	5422	2.0	0.8	0.4	1.5
Surgical Critical Care	6	19	9389	2.0	0.9	0.5	1.4	3	19	7767	2.4	1.1	0.6	1.7	2	14	5073	2.8	1.2	0.7	2.0
TOTAL	.	.	.	.	1.0	0.9	1.2	.	.	.	.	1.3	1.1	1.5	.	.	.	.	1.2	1.0	1.4

Data reported as of February 4, 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 rate for 2009 is significantly higher than National 2006-2008 rate
Blue highlighting indicates rate for 2009 is significantly lower than National 2006-2008 rate

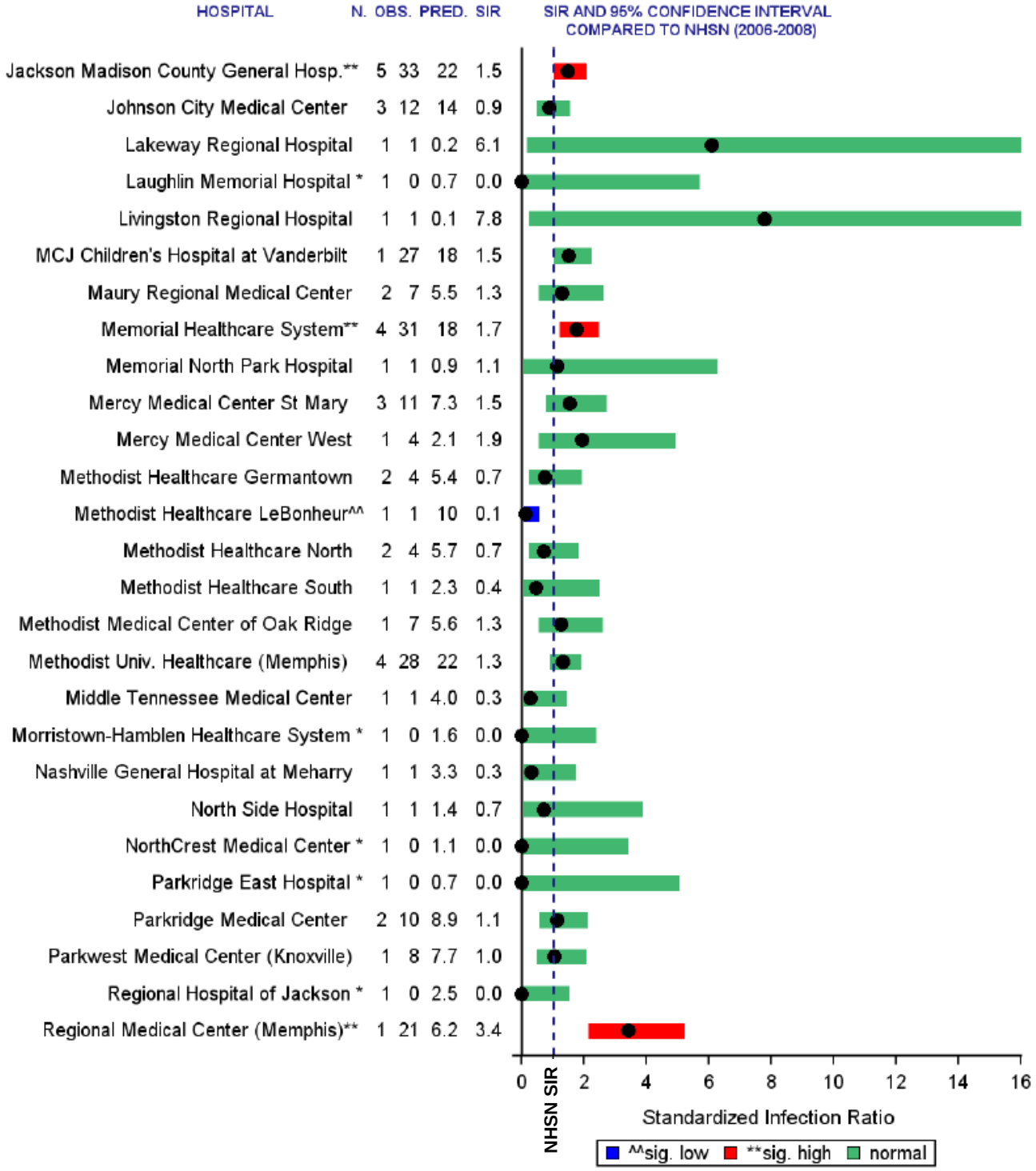
Figure 10: Summary Measure for CLABSIs in Adult and Pediatric Critical Care Units, One Standardized Infection Ratio (SIR) per Facility. Tennessee, 1/2009–12/2009



Data Reported from adult/pediatric ICUs as of February 4, 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 = Standarized 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)

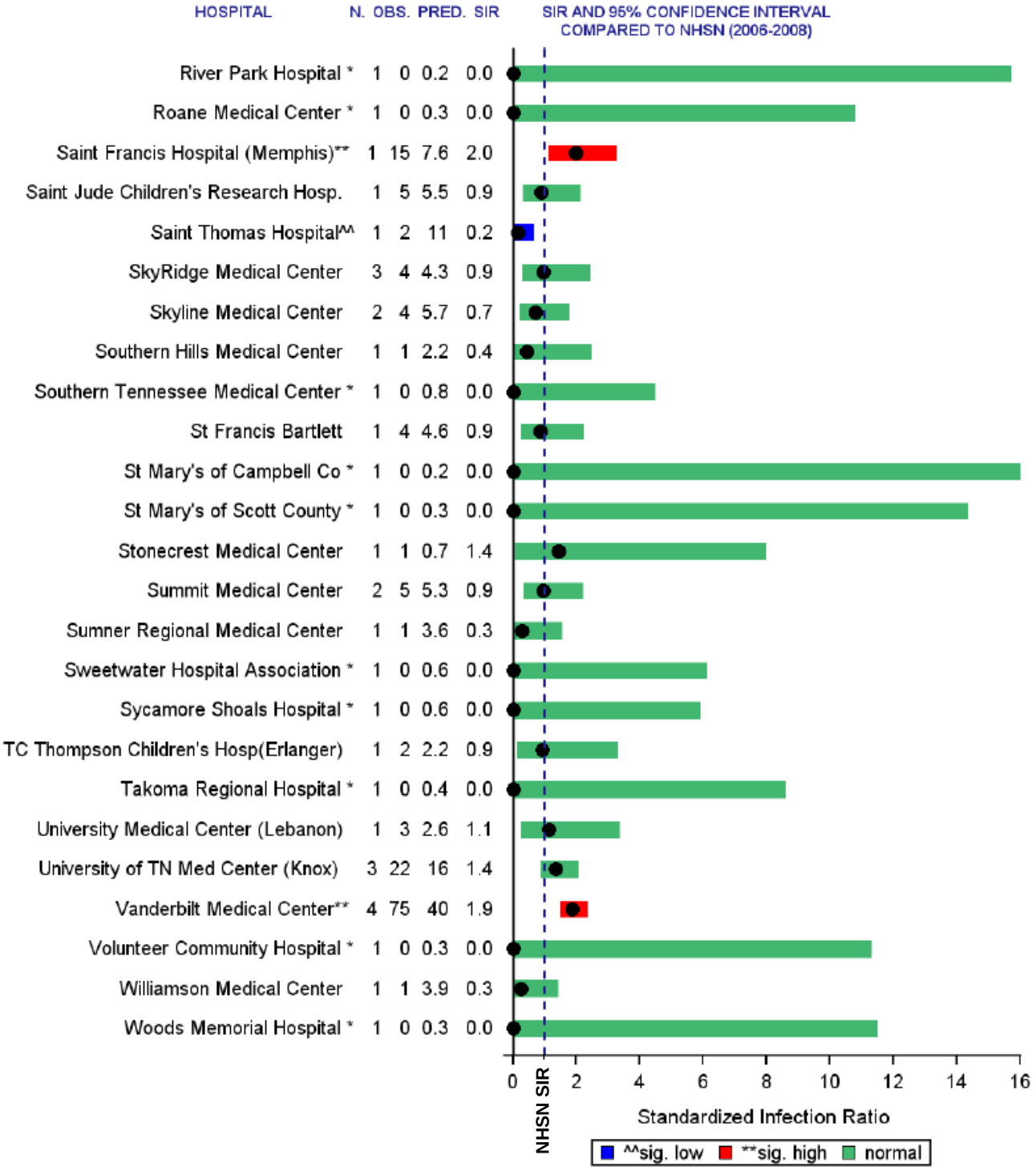
Central Line-Associated Blood Stream Infection [CLABSI] Standardized Infection Ratio [SIR]
Tennessee (Reportable period: 01/01/2009 - 12/31/2009)



Data Reported from adult/pediatric ICUs as of February 4, 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 = Standarized 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*

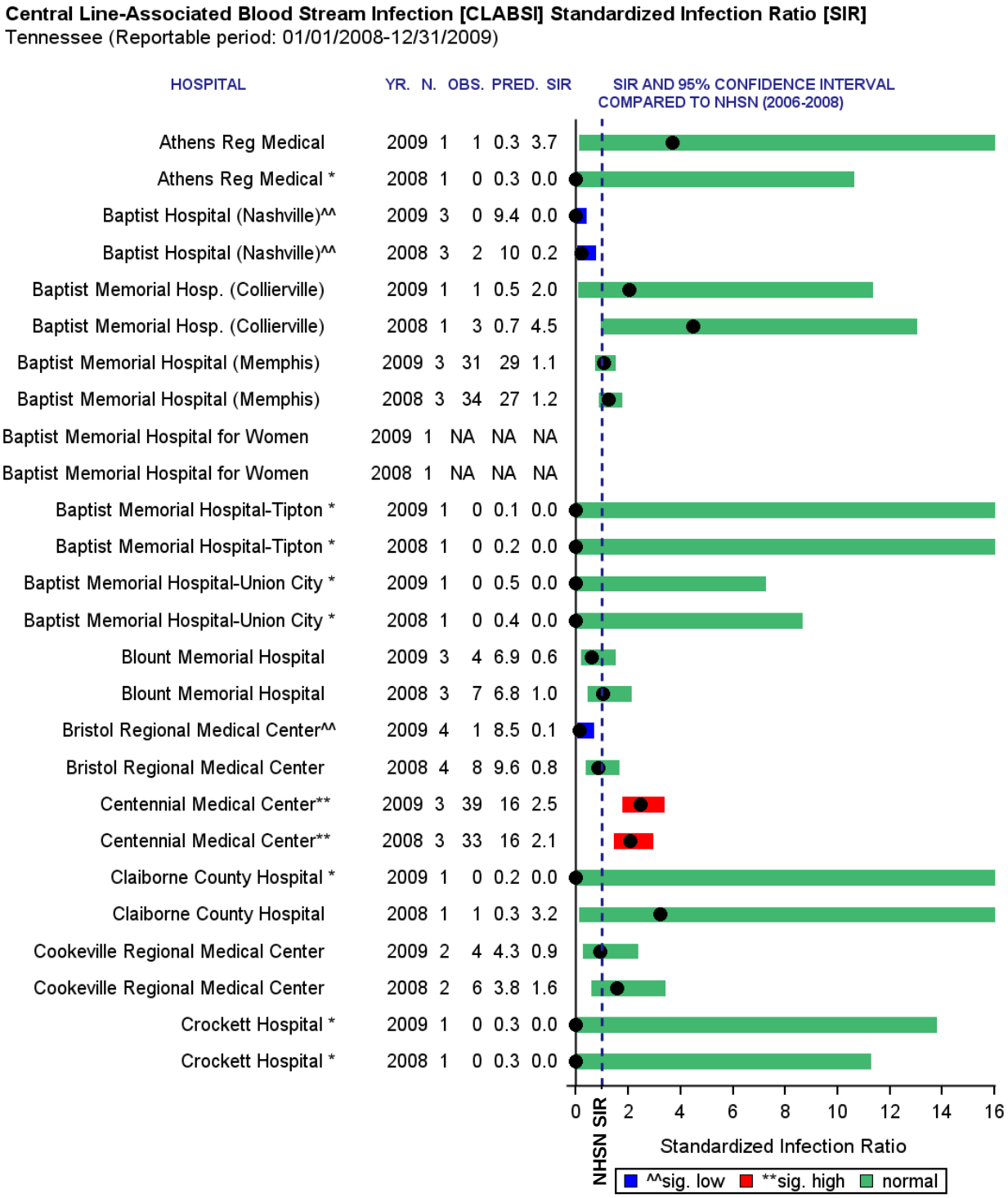
Figure 10 (cont'd)

Central Line-Associated Blood Stream Infection [CLABSI] Standardized Infection Ratio [SIR]
Tennessee (Reportable period: 01/01/2009 - 12/31/2009)



Data Reported from adult/pediatric ICUs as of February 4, 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 = Standarized 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*

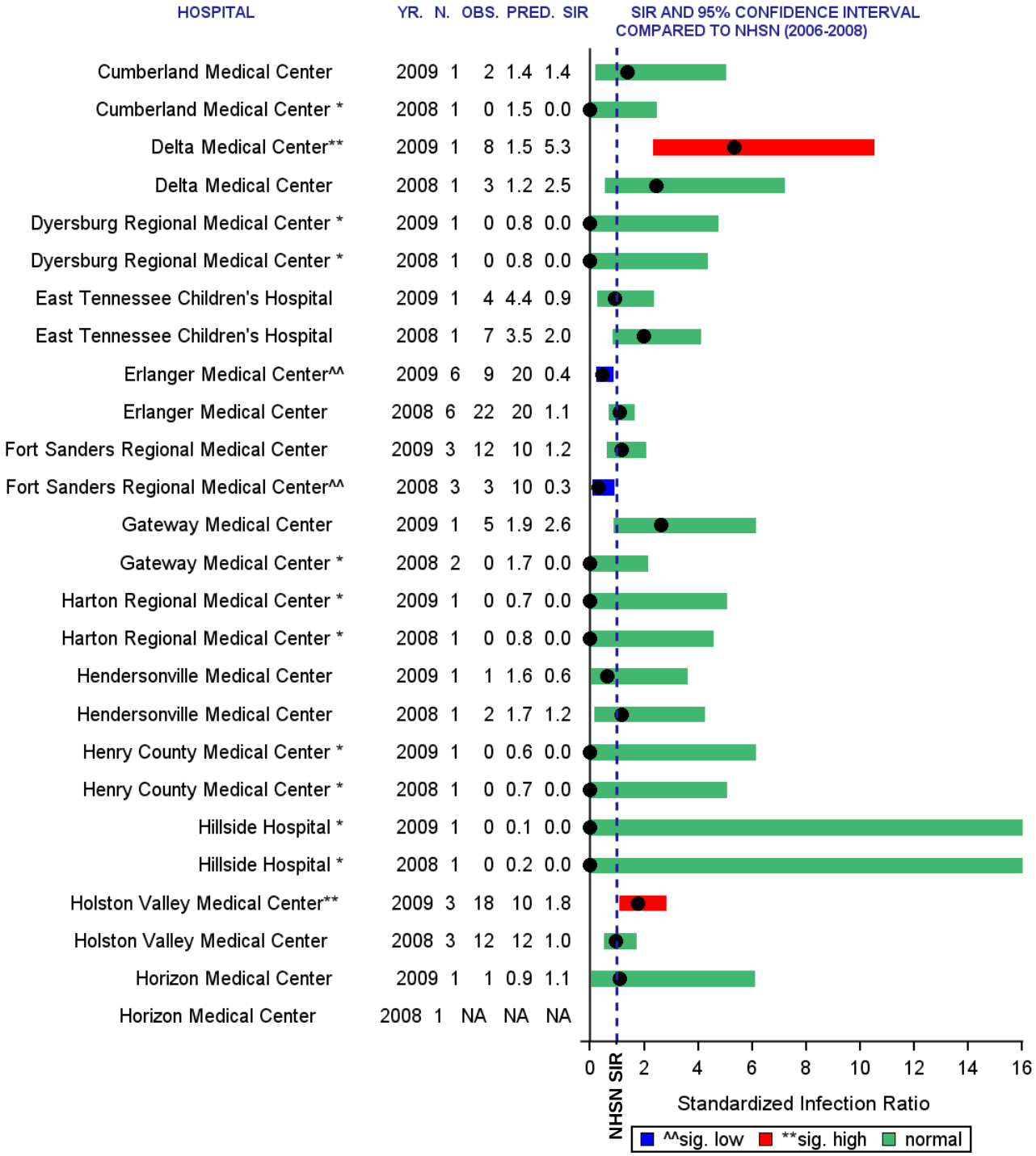
Figure 11: Summary Measure for CLABSIs in Adult and Pediatric Critical Care Units, One Standardized Infection Ratio (SIR) per Facility per Year, Tennessee, 2008 and 2009



Data Reported from adult/pediatric ICUs as of February 4, 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 = Standarized 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)

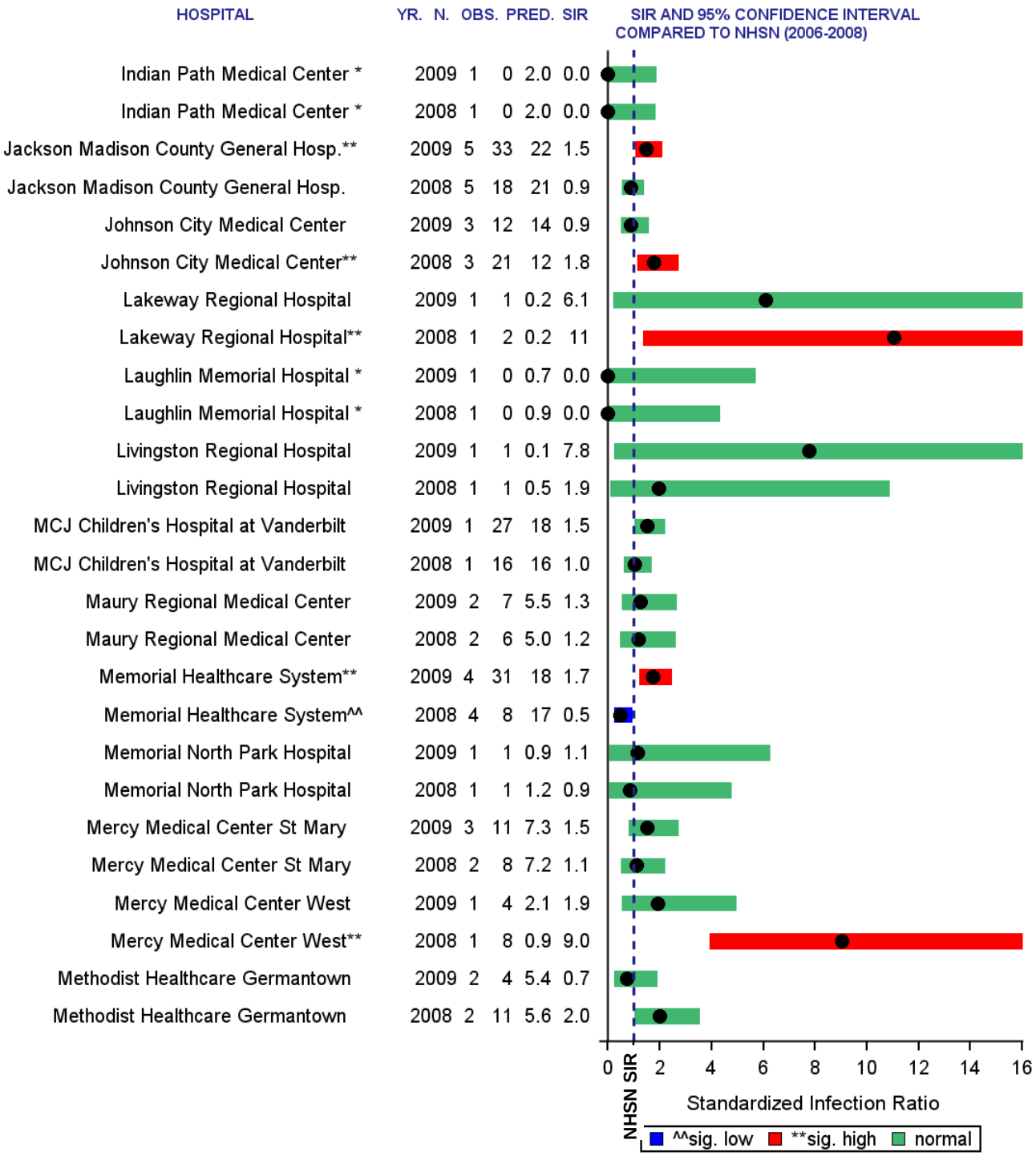
Central Line-Associated Blood Stream Infection [CLABSI] Standardized Infection Ratio [SIR]
Tennessee (Reportable period: 01/01/2008-12/31/2009)



Data Reported from adult/pediatric ICUs as of February 4, 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 = Standarized 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)

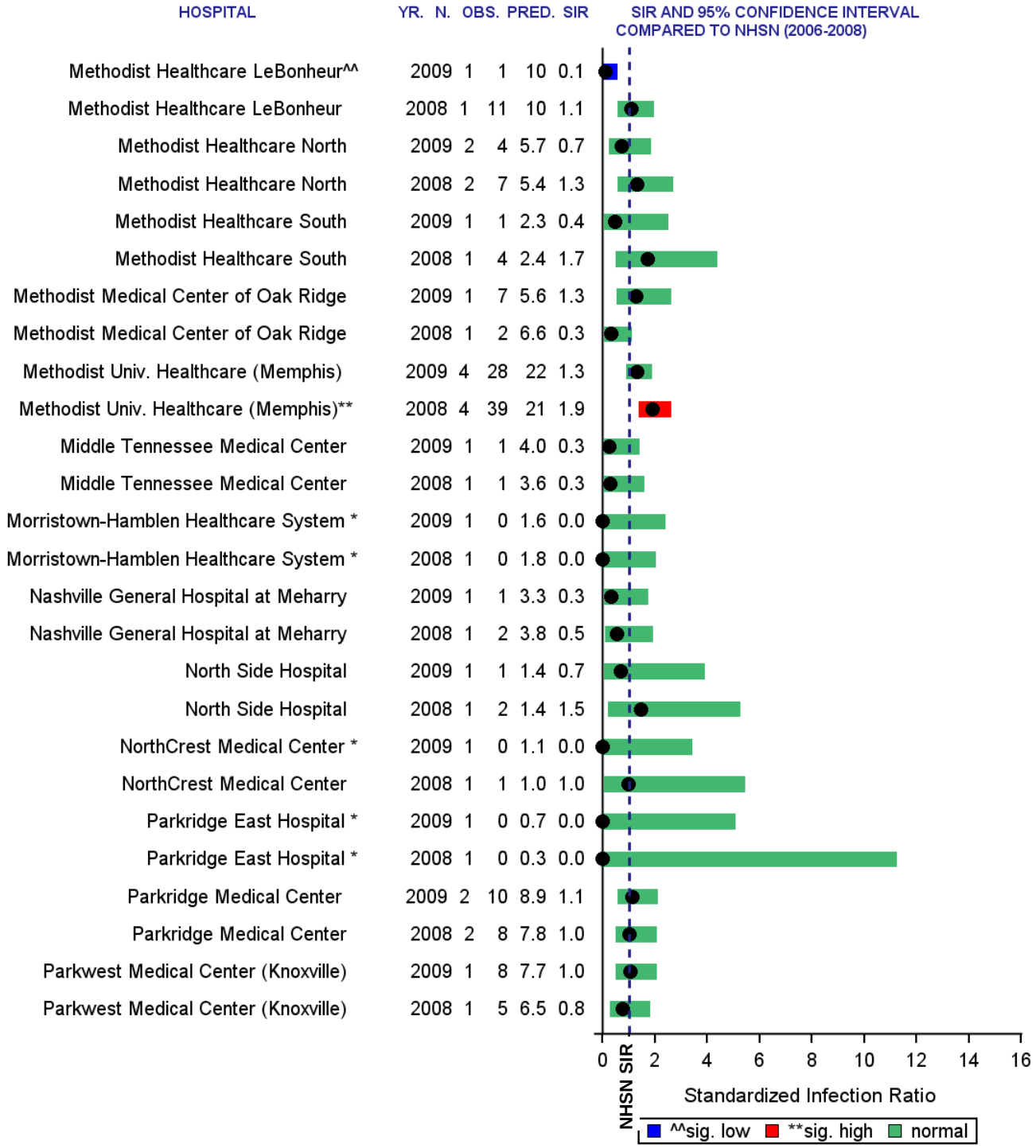
Central Line-Associated Blood Stream Infection [CLABSI] Standardized Infection Ratio [SIR]
Tennessee (Reportable period: 01/01/2008-12/31/2009)



Data Reported from adult/pediatric ICUs as of February 4, 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 = Standarized 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)

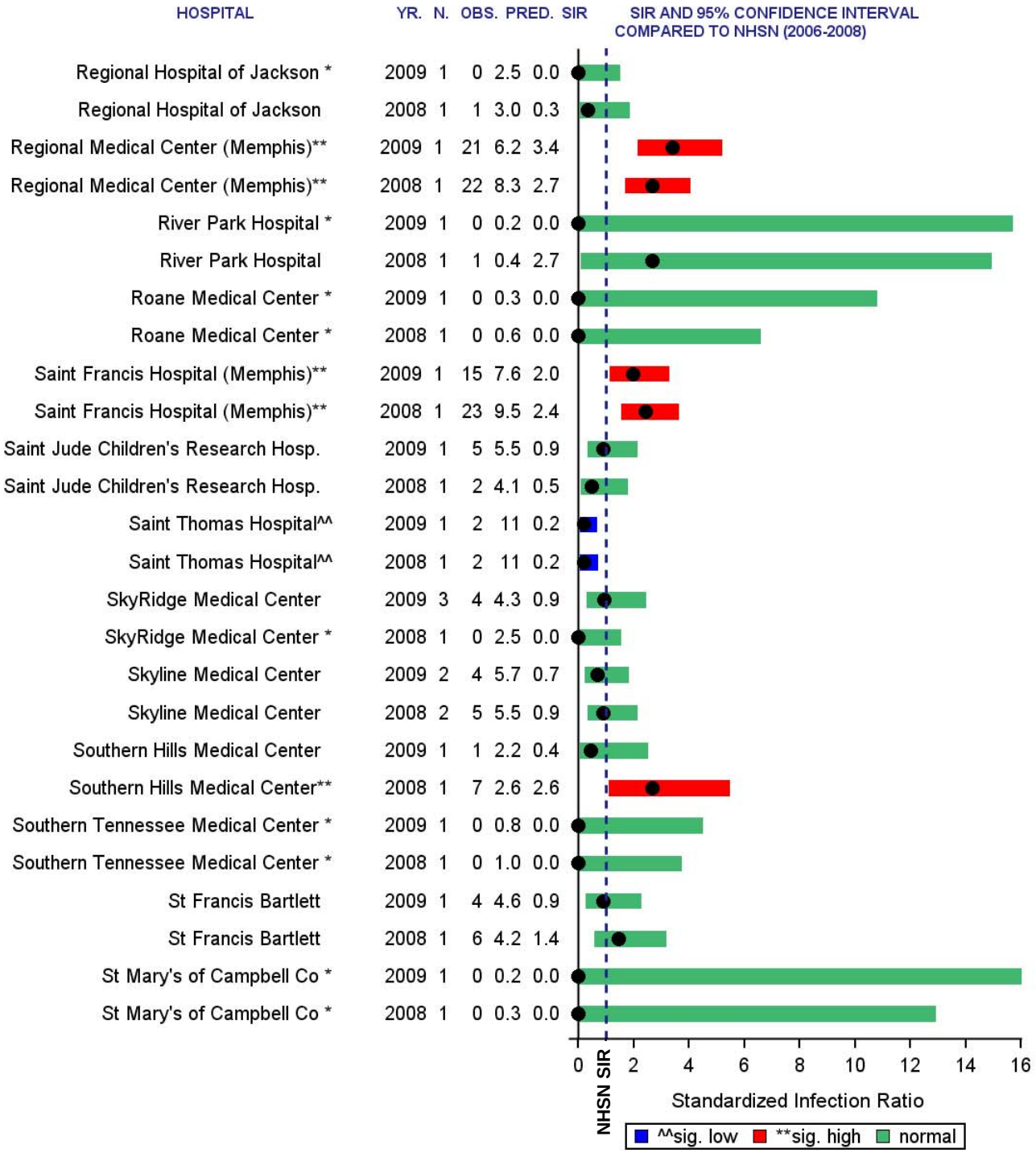
Central Line-Associated Blood Stream Infection [CLABSI] Standardized Infection Ratio [SIR]
Tennessee (Reportable period: 01/01/2008-12/31/2009)



Data Reported from adult/pediatric ICUs as of February 4, 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 = Standarized 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)

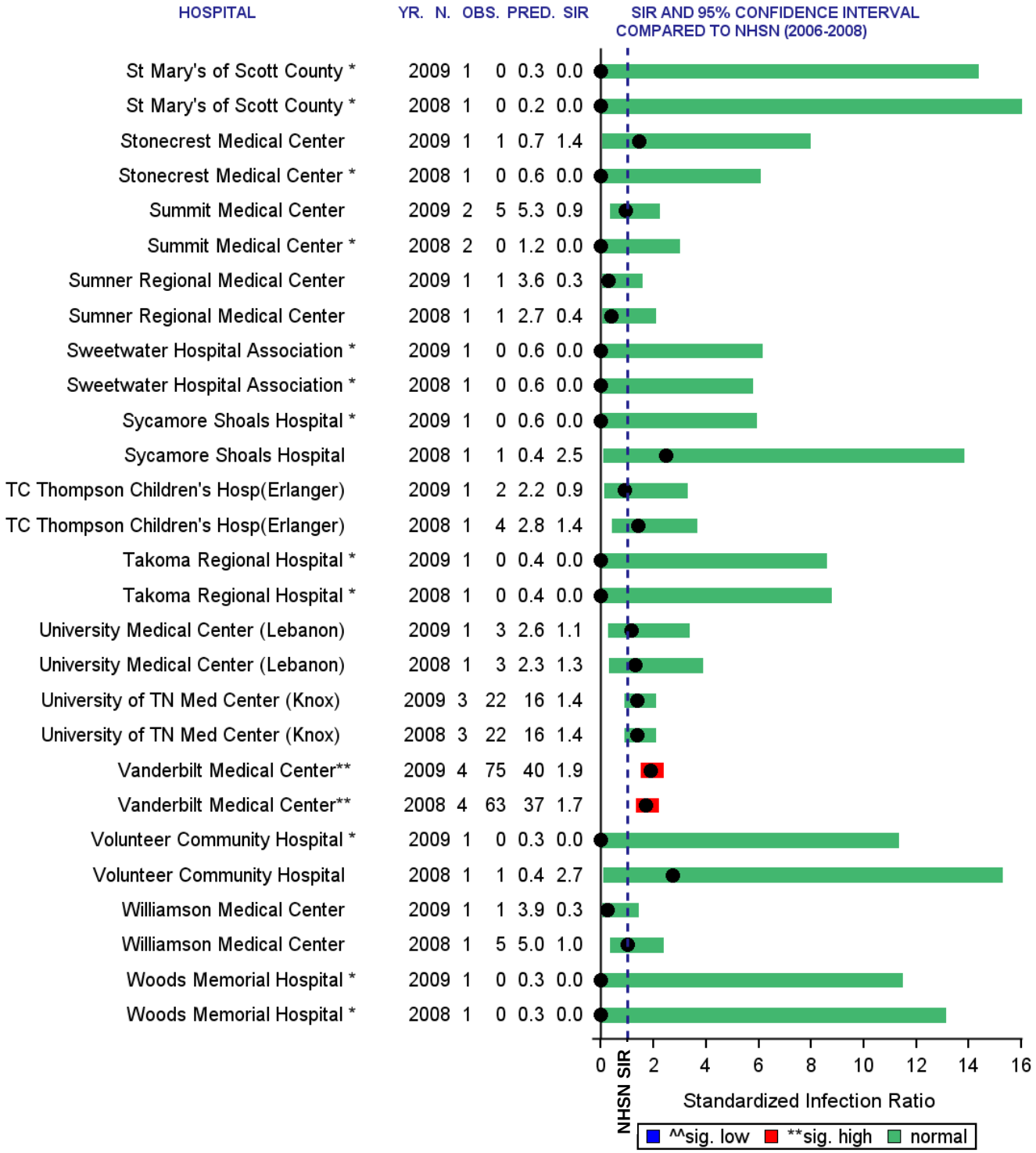
Central Line-Associated Blood Stream Infection [CLABSI] Standardized Infection Ratio [SIR]
Tennessee (Reportable period: 01/01/2008-12/31/2009)



Data Reported from adult/pediatric ICUs as of February 4, 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 = Standarized 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*

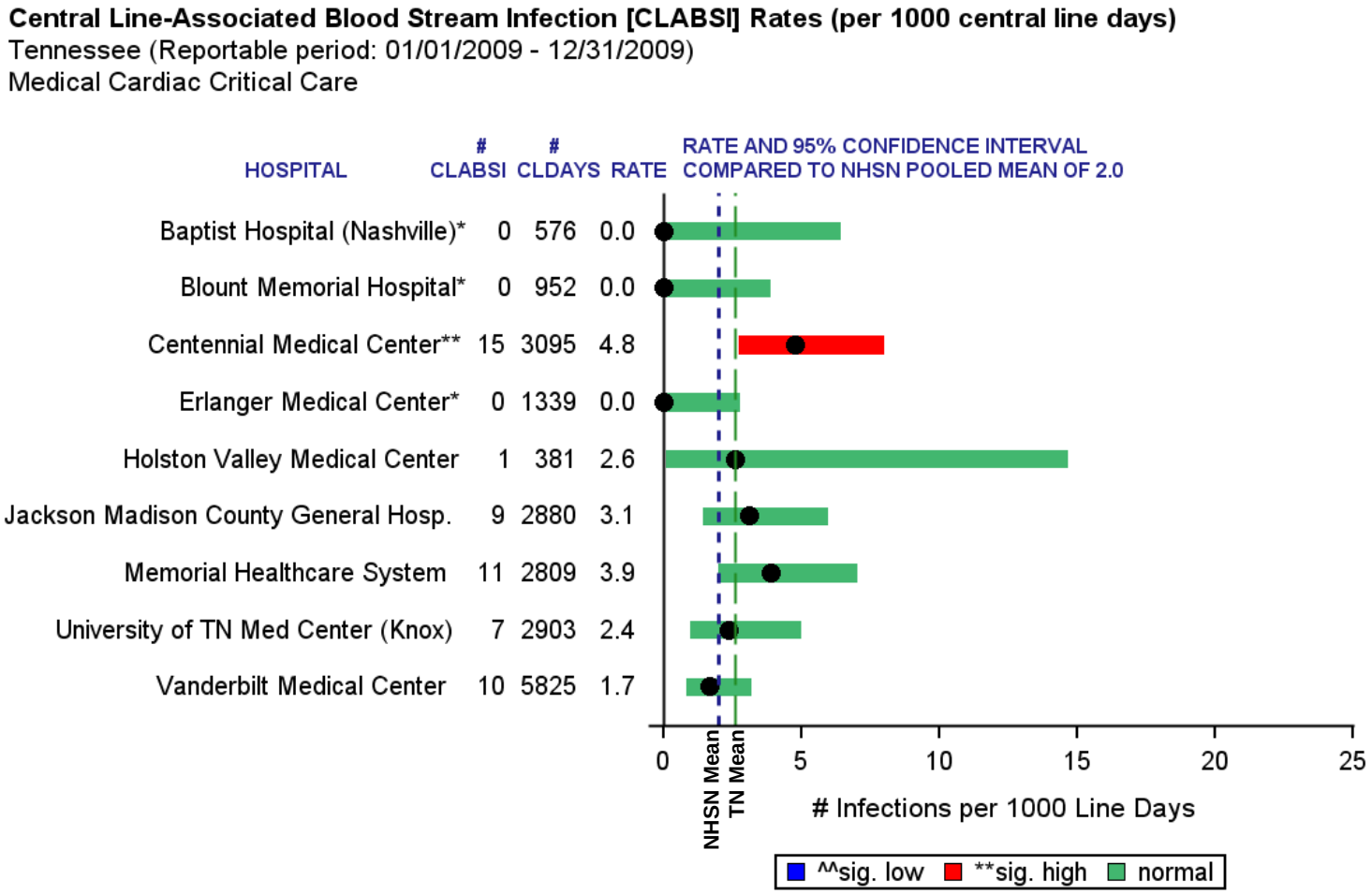
Figure 11 (cont'd)

Central Line-Associated Blood Stream Infection [CLABSI] Standardized Infection Ratio [SIR]
Tennessee (Reportable period: 01/01/2008-12/31/2009)



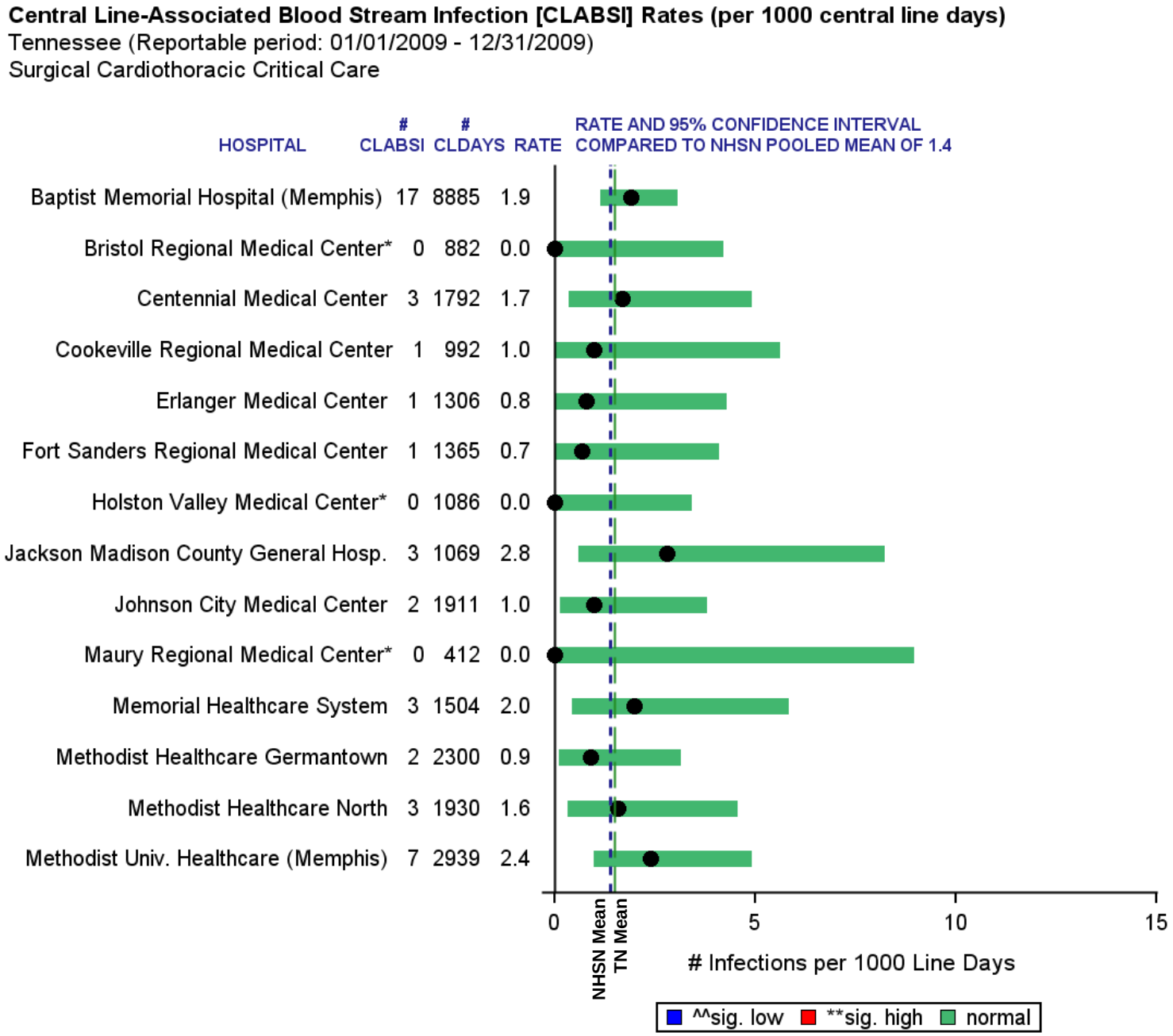
Data Reported from adult/pediatric ICUs as of February 4, 2011.
Yr. = reporting year
N. = number of types of critical care units reportable from a given facility
Obs. = observed number of CLABSI
Pred. = statistically 'predicted' number of CLABSI, based on NHSN data
SIR = Standarized Infection Ratio (observed 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 12: Central Line-Associated Bloodstream Infection Rates per 1,000 Central Line Days in Tennessee, 1/2009–12/2009, Medical Cardiac Critical Care Units



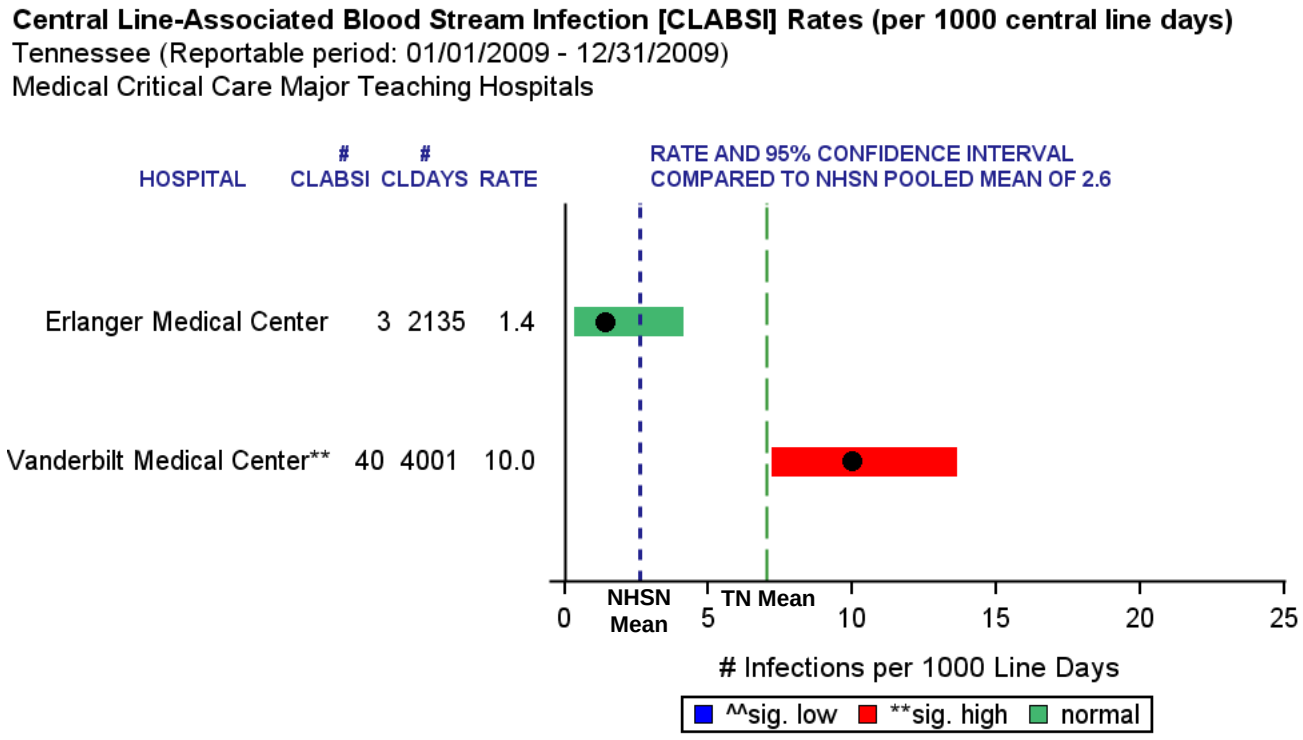
Data Reported as of February 4, 2011.
*** significantly higher than NHSN pooled mean*
^^ significantly lower than NHSN pooled mean
** Zero infections, not statistically significant*
NA Rates are not shown in critical care units with <50 central line days.
NHSN pooled mean (2006-2008)=2.0 ; TN pooled mean (01/01/2009 - 12/31/2009)=2.6

Figure 13: Central Line-Associated Bloodstream Infection Rates per 1,000 Central Line Days in Tennessee, 1/2009–12/2009, Surgical Cardiothoracic Critical Care Units



Data Reported as of February 4, 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(01/01/2009 - 12/31/2009)=1.5

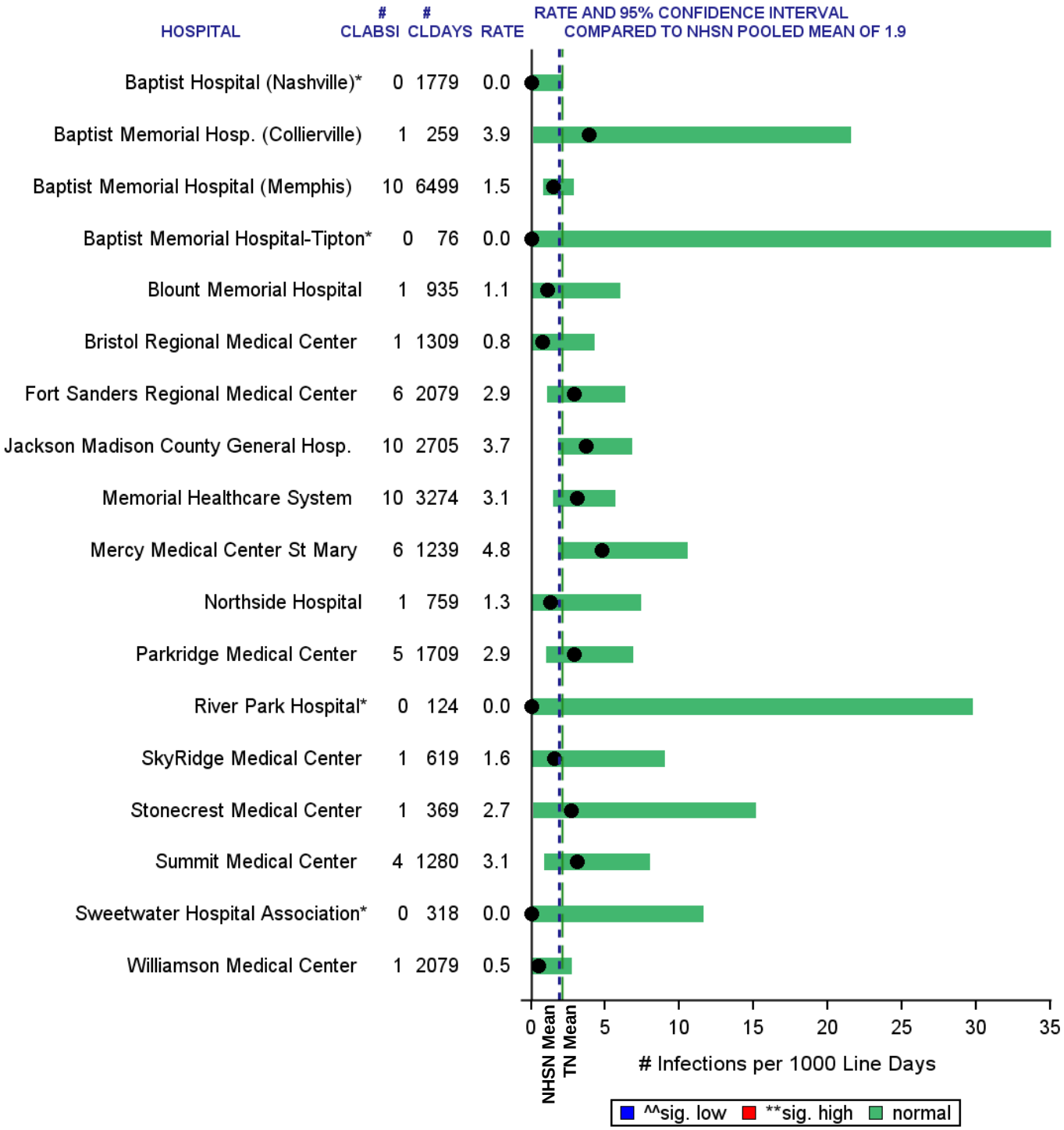
Figure 14: Central Line-Associated Bloodstream Infection Rates per 1,000 Central Line Days in Tennessee, 1/2009–12/2009, Medical Critical Care Units in Major Teaching Hospitals



Data Reported as of February 4, 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)=2.6 ; TN pooled mean(01/01/2009 - 12/31/2009)=7.0

Figure 15: Central Line-Associated Bloodstream Infection Rates per 1,000 Central Line Days in Tennessee, 1/2009–12/2009, Medical Critical Care Units in Non-Major Teaching Hospitals

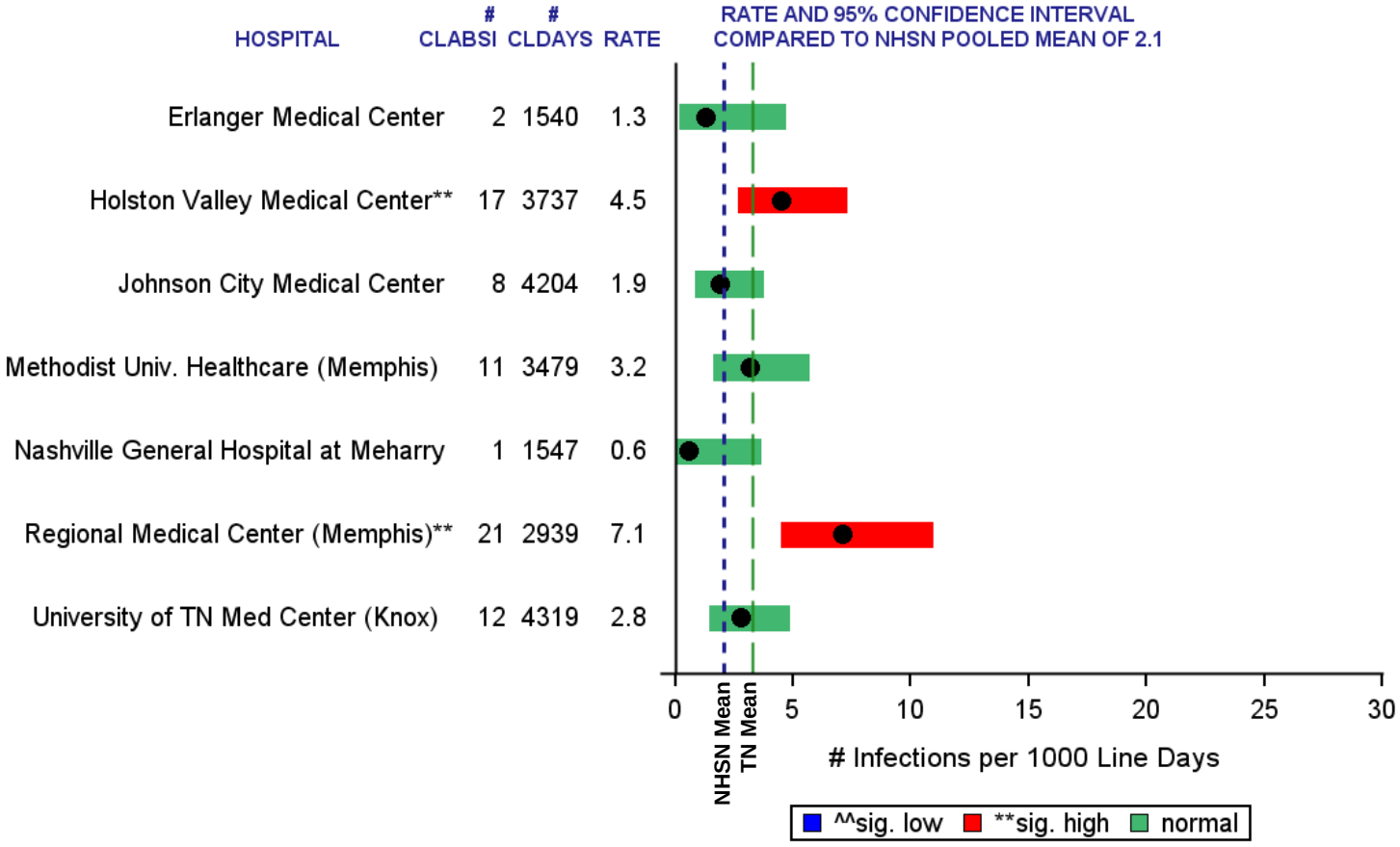
Central Line-Associated Blood Stream Infection [CLABSI] Rates (per 1000 central line days)
Tennessee (Reportable period: 01/01/2009 - 12/31/2009)
Medical Critical Care non-Major Teaching Hospitals



Data Reported as of February 4, 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(01/01/2009 - 12/31/2009)=2.1

Figure 16: Central Line-Associated Bloodstream Infection Rates per 1,000 Central Line Days in Tennessee, 1/2009–12/2009, Medical-Surgical Critical Care Units in Major Teaching Hospitals

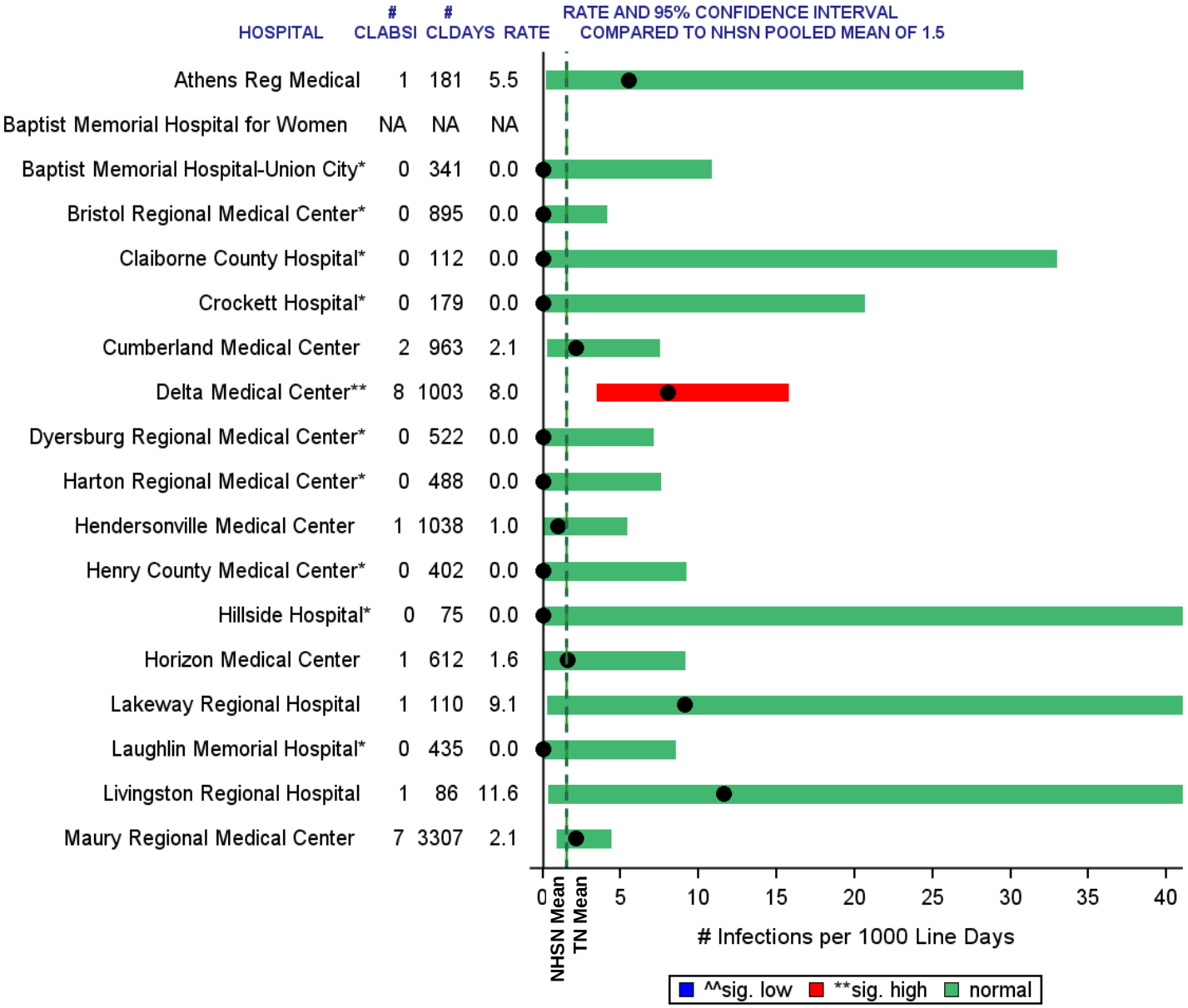
Central Line-Associated Blood Stream Infection [CLABSI] Rates (per 1000 central line days)
Tennessee (Reportable period: 01/01/2009 - 12/31/2009)
Medical-Surgical Critical Care Major Teaching Hospitals



Data Reported as of February 4, 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(01/01/2009 - 12/31/2009)=3.3

Figure 17: Central Line-Associated Bloodstream Infection Rates per 1,000 Central Line Days in Tennessee, 1/2009–12/2009, Medical-Surgical ICUs with ≤15 beds in Non-Major Teaching Hospitals

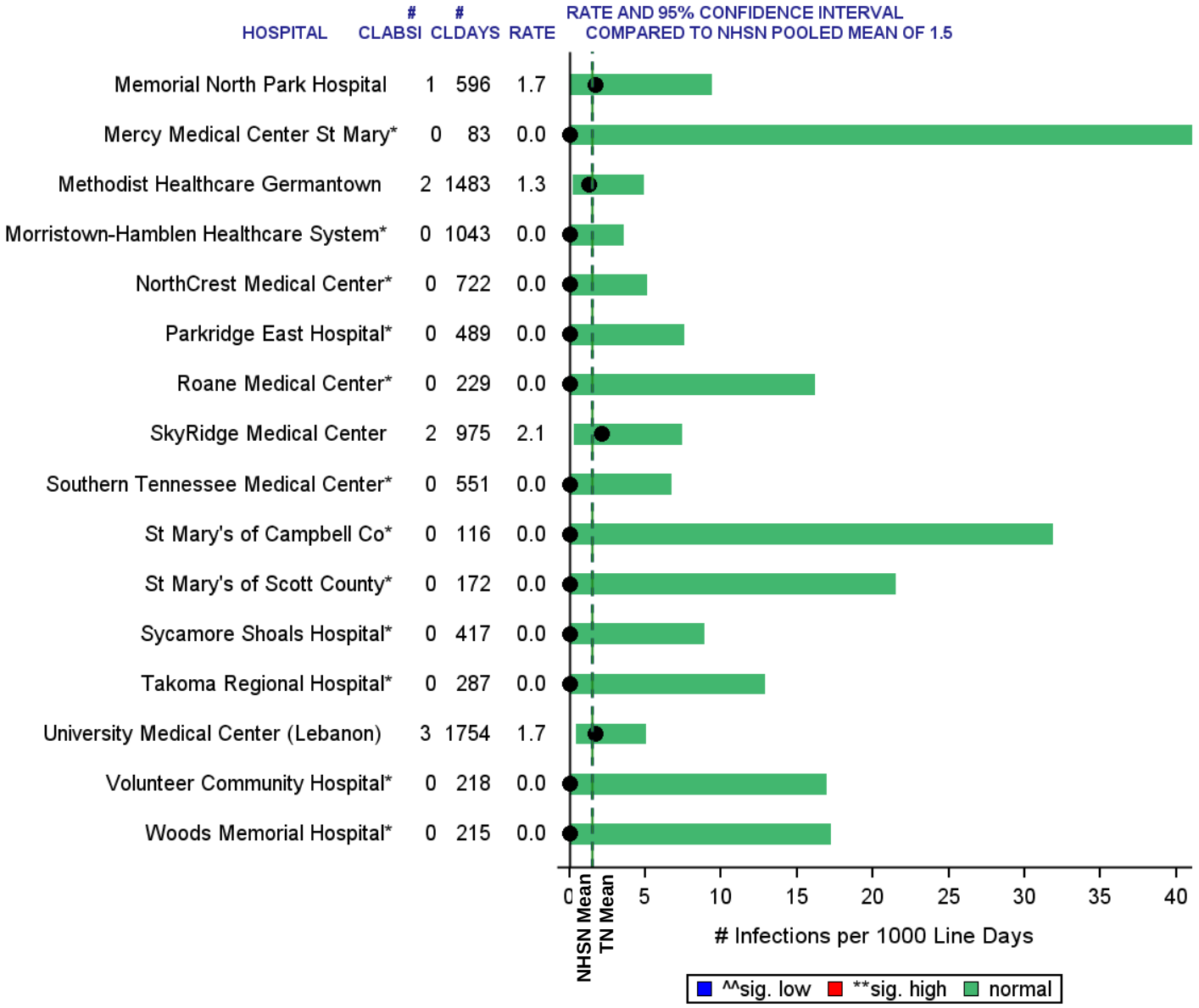
Central Line-Associated Blood Stream Infection [CLABSI] Rates (per 1000 central line days)
Tennessee (Reportable period: 01/01/2009 - 12/31/2009)
Medical-Surgical Critical Care non-Major Teaching Hospitals (ICU beds <=15)



Data Reported as of February 4, 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(01/01/2009 - 12/31/2009)=1.5

Figure 17 (cont'd)

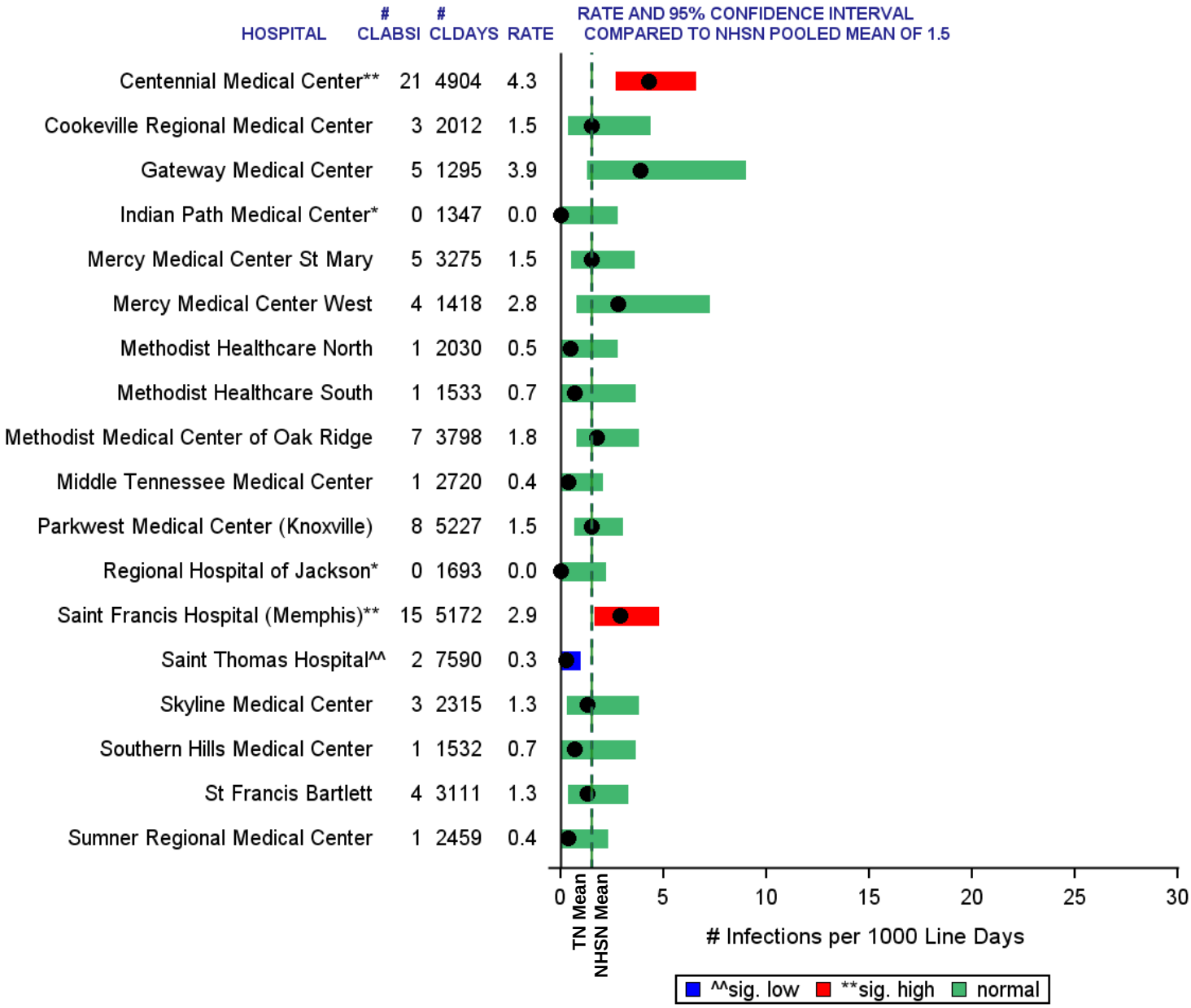
Central Line-Associated Blood Stream Infection [CLABSI] Rates (per 1000 central line days)
Tennessee (Reportable period: 01/01/2009 - 12/31/2009)
Medical-Surgical Critical Care non-Major Teaching Hospitals (ICU beds <=15) [continued...]



Data Reported as of February 4, 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(01/01/2009 - 12/31/2009)=1.5

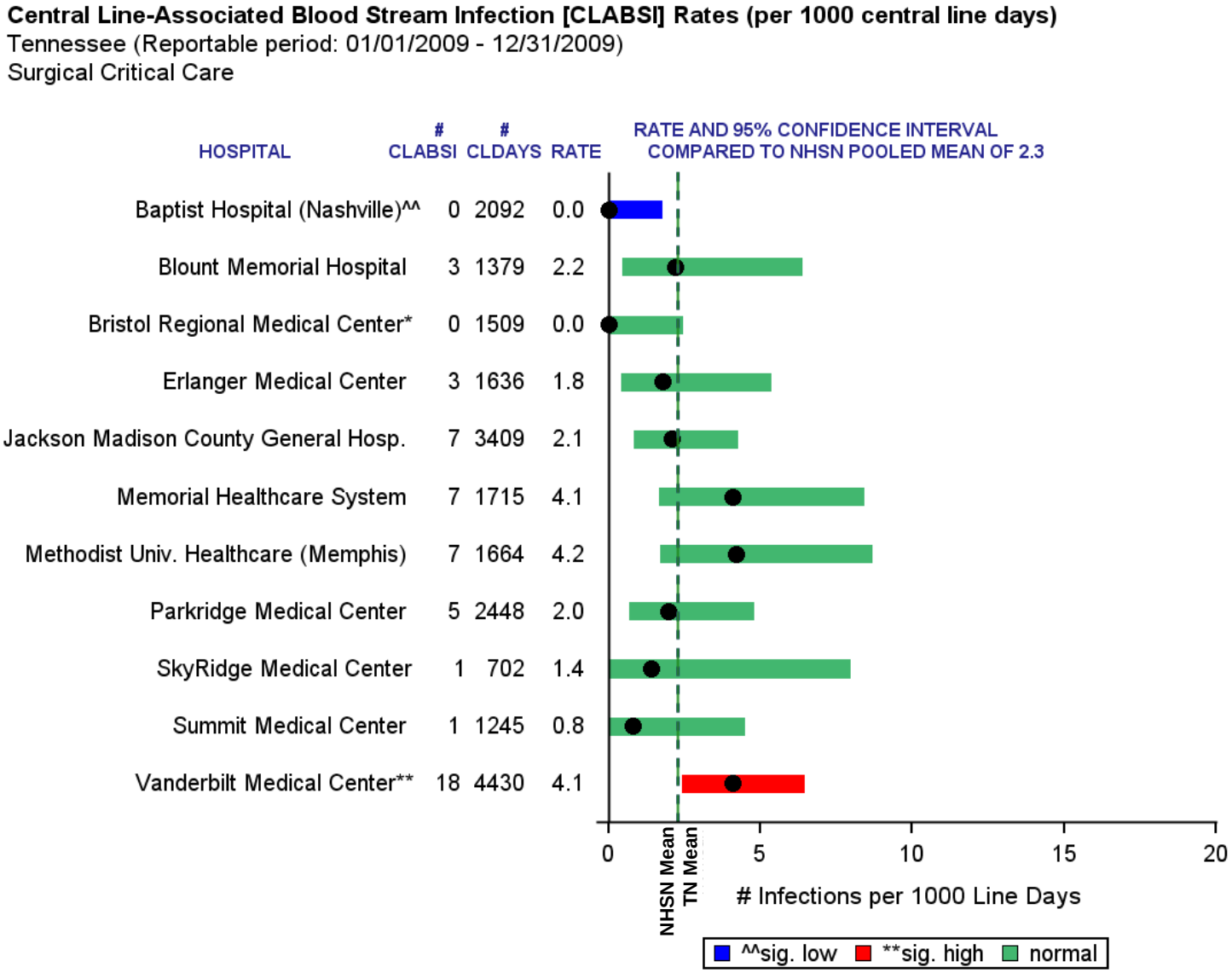
Figure 18: Central Line-Associated Bloodstream Infection Rates per 1,000 Central Line Days in Tennessee, 1/2009–12/2009, Medical-Surgical ICUs with >15 beds in Non-Major Teaching Hospitals

Central Line-Associated Blood Stream Infection [CLABSI] Rates (per 1000 central line days)
Tennessee (Reportable period: 01/01/2009 - 12/31/2009)
Medical-Surgical Critical Care non-Major Teaching Hospitals (ICU beds >15)



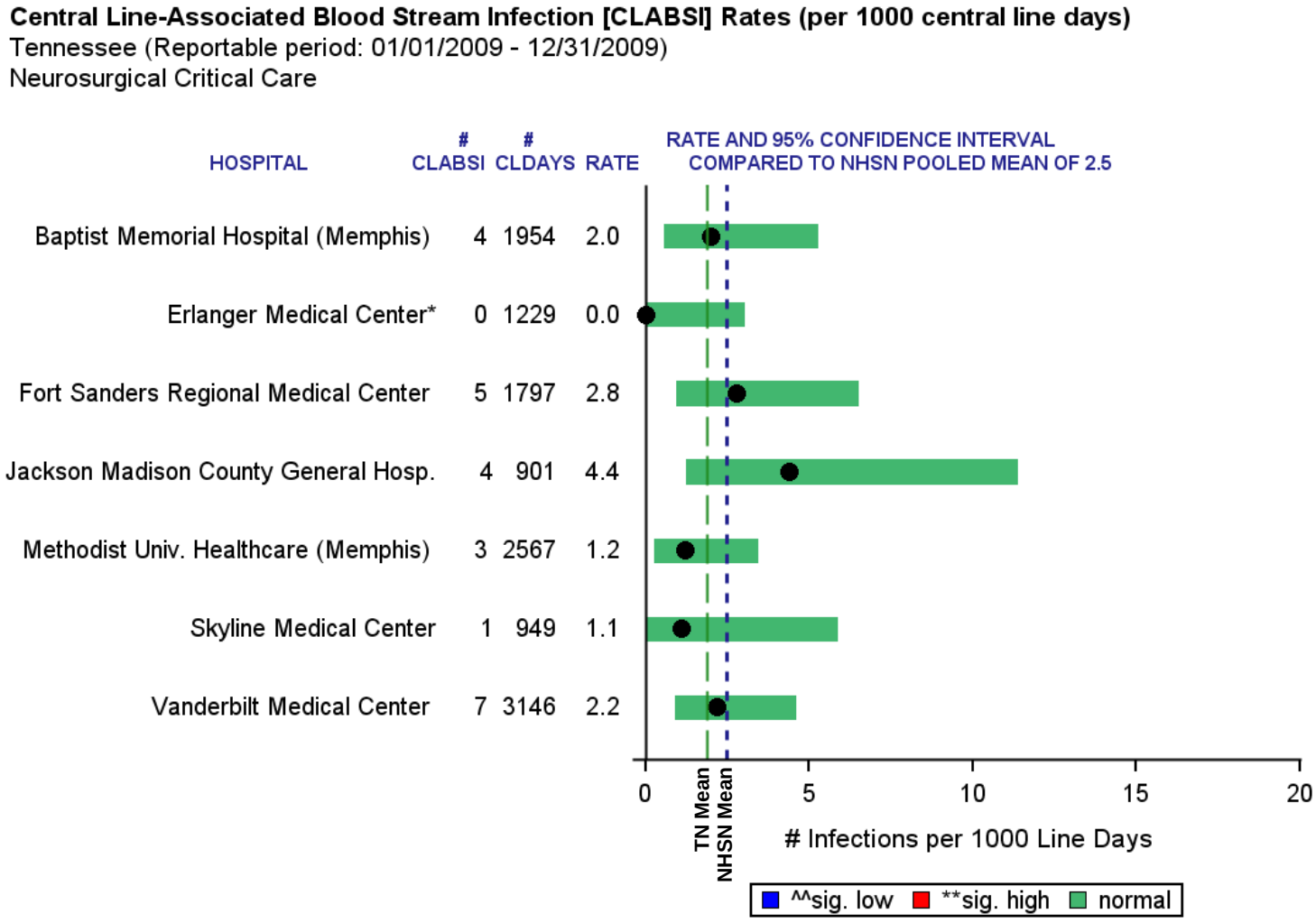
Data Reported as of February 4, 2011.
*** significantly higher than NHSN pooled mean*
^^ significantly lower than NHSN pooled mean
** Zero infections, not statistically significant*
NA Rates are not shown in critical care units with <50 central line days.
NHSN pooled mean(2006-2008)=1.5 ; TN pooled mean(01/01/2009 - 12/31/2009)=1.5

Figure 19: Central Line-Associated Bloodstream Infection Rates per 1,000 Central Line Days in Tennessee, 1/2009–12/2009, Surgical Critical Care Units



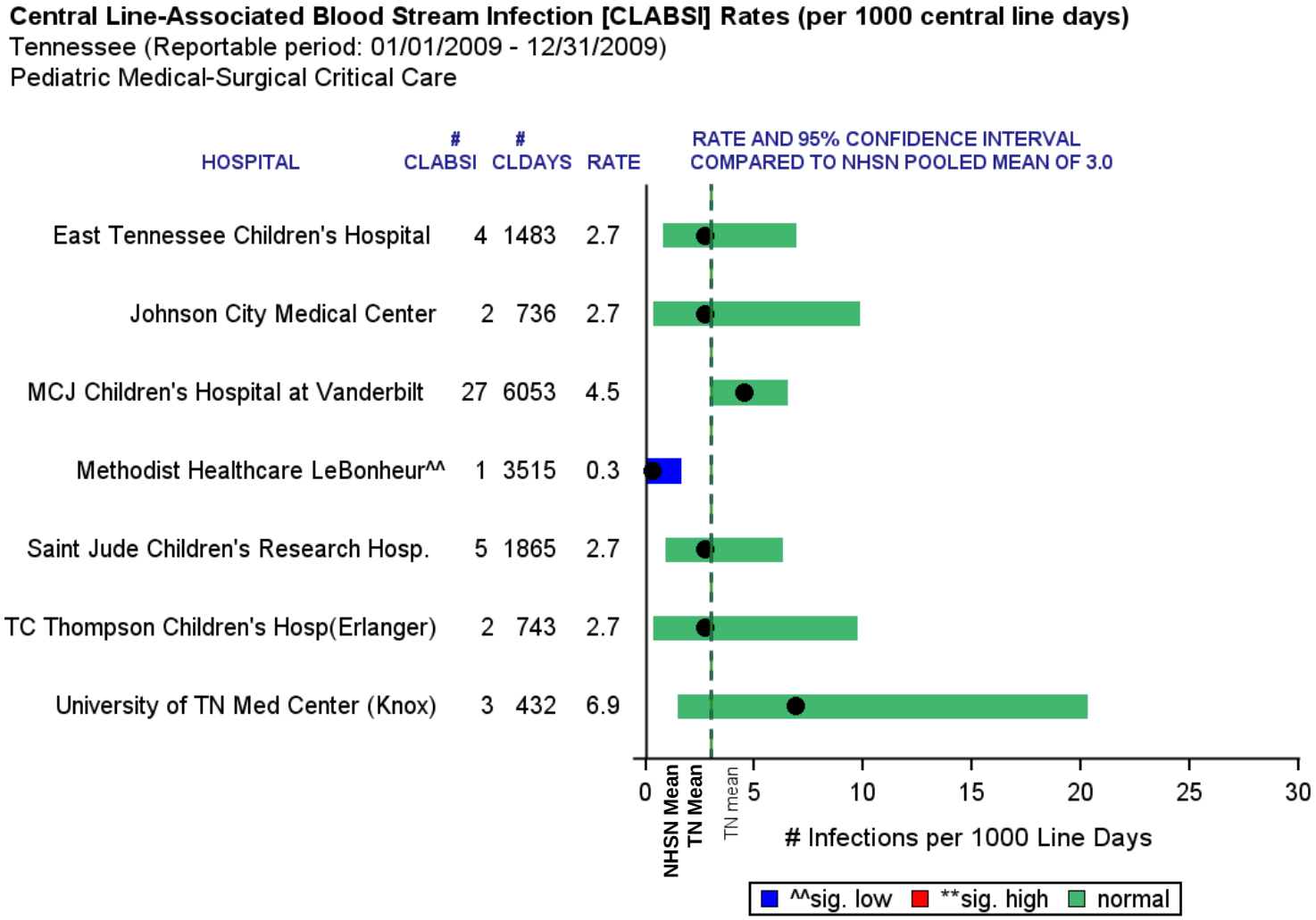
Data Reported as of February 4, 2011.
*** significantly higher than NHSN pooled mean*
^^ significantly lower than NHSN pooled mean
** Zero infections, not statistically significant*
NA Rates are not shown in critical care units with <50 central line days.
NHSN pooled mean(2006-2008)=2.3 ; TN pooled mean(01/01/2009 - 12/31/2009)=2.3

Figure 20: Central Line-Associated Bloodstream Infection Rates per 1,000 Central Line Days in Tennessee, 1/2009–12/2009, Neurosurgical Critical Care Units



Data Reported as of February 4, 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(01/01/2009 - 12/31/2009)=1.9

Figure 21: Central Line-Associated Bloodstream Infection Rates per 1,000 Central Line Days in Tennessee, 1/2009–12/2009, Pediatric Medical-Surgical Critical Care Units



Data Reported as of February 4, 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(01/01/2009 - 12/31/2009)=3.0

Table 9: Measures of Central Line-Associated Bloodstream Infections (CLABSI) by Type of Critical Care Unit, Tennessee [Reportable period: 01/01/2009–12/31/2009]

Location = Medical Cardiac Critical Care

	INCIDENCE DENSITY RATE (LINE DAYS)				DEVICE UTILIZATION		INCIDENCE DENSITY RATE (INPATIENT DAYS)	
Hospital	RATE*	Lower Limit	Upper limit	TN %ile	DU(%)	TN %ile	INPATIENT DAYS	RATE**
Baptist Hospital (Nashville)	0.0	0.0	6.4	14	22	11	2630	0.0
Blount Memorial Hospital	0.0	0.0	3.9	14	46	44	2079	0.0
Centennial Medical Center	4.8	2.7	8.0	100	43	33	7119	2.1
Erlanger Medical Center	0.0	0.0	2.8	14	55	78	2431	0.0
Holston Valley Medical Center	2.6	0.1	14.6	57	34	22	1131	0.9
Jackson Madison County General Hosp.	3.1	1.4	5.9	71	72	100	4007	2.2
Memorial Healthcare System	3.9	2.0	7.0	86	52	56	5381	2.0
University of TN Med Center (Knox)	2.4	1.0	5.0	43	54	67	5349	1.3
Vanderbilt Medical Center	1.7	0.8	3.2	29	71	89	8226	1.2

Data reported as of February 4, 2011
**** per 1000 central line days***
***** per 1000 inpatient days***
TN%ile percentile in TN (01/01/2009–12/31/2009)
DU(%) device utilization(%)
NA not reported due to central line days <50
Red highlighting indicates rate for 2009 is significantly higher than the National 2006-2008 rate of 2.0 CLABSIs/1000 central line days
Blue highlighting indicates rate for 2009 is significantly lower than the National 2006-2008 rate of 2.0 CLABSIs/1000 central line days

Table 10: Measures of Central Line-Associated Bloodstream Infections (CLABSI) by Type of Critical Care Unit, Tennessee [Reportable period: 01/01/2009–12/31/2009]

Location = Surgical Cardiothoracic Critical Care

	INCIDENCE DENSITY RATE (LINE DAYS)				DEVICE UTILIZATION		INCIDENCE DENSITY RATE (INPATIENT DAYS)	
Hospital	RATE*	Lower Limit	Upper limit	TN %ile	DU(%)	TN %ile	INPATIENT DAYS	RATE**
Baptist Memorial Hospital (Memphis)	1.9	1.1	3.1	75	77	85	11529	1.5
Bristol Regional Medical Center	0.0	0.0	4.2	8	42	8	2104	0.0
Centennial Medical Center	1.7	0.3	4.9	67	100	100	1792	1.7
Cookeville Regional Medical Center	1.0	0.0	5.6	42	56	38	1767	0.6
Erlanger Medical Center	0.8	0.0	4.3	25	65	62	2014	0.5
Fort Sanders Regional Medical Center	0.7	0.0	4.1	17	76	77	1807	0.6
Holston Valley Medical Center	0.0	0.0	3.4	8	80	92	1363	0.0
Jackson Madison County General Hosp.	2.8	0.6	8.2	100	76	77	1401	2.1
Johnson City Medical Center	1.0	0.1	3.8	50	49	15	3875	0.5
Maury Regional Medical Center	0.0	0.0	9.0	8	62	46	667	0.0
Memorial Healthcare System	2.0	0.4	5.8	83	71	69	2118	1.4
Methodist Healthcare Germantown	0.9	0.1	3.1	33	52	23	4452	0.4
Methodist Healthcare North	1.6	0.3	4.5	58	55	31	3516	0.9
Methodist Univ. Healthcare (Memphis)	2.4	1.0	4.9	92	64	54	4625	1.5

Data reported as of February 4, 2011
*** per 1000 central line days***
**** per 1000 inpatient days***
TN%ile percentile in TN (01/01/2009–12/31/2009)
DU(%) device utilization(%)
NA not reported due to central line days <50
Red highlighting indicates rate for 2009 is significantly higher than the National 2006-2008 rate of 1.4 CLABSIs/1000 central line days
Blue highlighting indicates rate for 2009 is significantly lower than the National 2006-2008 rate of 1.4 CLABSIs/1000 central line days

Table 11: Measures of Central Line-Associated Bloodstream Infections (CLABSIs) by Type of Critical Care Unit, Tennessee [Reportable period: 01/01/2009–12/31/2009]

Location = Medical Critical Care Major Teaching

	INCIDENCE DENSITY RATE (LINE DAYS)				DEVICE UTILIZATION		INCIDENCE DENSITY RATE (INPATIENT DAYS)	
Hospital	RATE*	Lower Limit	Upper limit	TN %ile	DU(%)	TN %ile	INPATIENT DAYS	RATE**
Erlanger Medical Center	1.4	0.3	4.1	50	59	100	3623	0.8
Vanderbilt Medical Center	10.0	7.1	13.6	100	51	50	7871	5.1

Data reported as of February 4, 2011
*** per 1000 central line days***
**** per 1000 inpatient days***
TN%ile percentile in TN (01/01/2009–12/31/2009)
DU(%) device utilization(%)
NA not reported due to central line days <50
Red highlighting indicates rate for 2009 is significantly higher than the National 2006-2008 rate of 2.6 CLABSIs/1000 central line days
Blue highlighting indicates rate for 2009 is significantly lower than the National 2006-2008 rate of 2.6 CLABSIs/1000 central line days

Table 12: Measures of Central Line-Associated Bloodstream Infections (CLABSIs) by Type of Critical Care Unit, Tennessee [Reportable period: 01/01/2009–12/31/2009]

Location = Medical Critical Care Non-Major Teaching

	INCIDENCE DENSITY RATE (LINE DAYS)				DEVICE UTILIZATION		INCIDENCE DENSITY RATE (INPATIENT DAYS)	
Hospital	RATE*	Lower Limit	Upper limit	TN %ile	DU(%)	TN %ile	INPATIENT DAYS	RATE**
Baptist Hospital (Nashville)	0.0	0.0	2.1	7	40	40	4438	0.0
Baptist Memorial Hosp. (Collierville)	3.9	0.1	21.5	93	25	27	1034	1.0
Baptist Memorial Hospital (Memphis)	1.5	0.7	2.8	40	71	87	9134	1.1
Baptist Memorial Hospital-Tipton	0.0	0.0	48.5	7	18	13	419	0.0
Blount Memorial Hospital	1.1	0.0	6.0	27	47	67	1989	0.5
Bristol Regional Medical Center	0.8	0.0	4.3	20	46	60	2874	0.3
Fort Sanders Regional Medical Center	2.9	1.1	6.3	60	82	100	2547	2.4
Jackson Madison County General Hosp.	3.7	1.8	6.8	87	77	93	3506	2.9
Memorial Healthcare System	3.1	1.5	5.6	73	71	87	4632	2.2
Mercy Medical Center St Mary	4.8	1.8	10.5	100	41	47	2989	2.0
Northside Hospital	1.3	0.0	7.3	33	46	60	1658	0.6
Parkridge Medical Center	2.9	0.9	6.8	67	60	80	2836	1.8
River Park Hospital	0.0	0.0	29.7	7	14	7	866	0.0
SkyRidge Medical Center	1.6	0.0	9.0	47	38	33	1629	0.6
Stonecrest Medical Center	2.7	0.1	15.1	53	18	13	2055	0.5
Summit Medical Center	3.1	0.9	8.0	80	50	73	2546	1.6
Sweetwater Hospital Association	0.0	0.0	11.6	7	23	20	1387	0.0
Williamson Medical Center	0.5	0.0	2.7	13	45	53	4610	0.2

Data reported as of February 4, 2011
**** per 1000 central line days***
***** per 1000 inpatient days***
TN%ile percentile in TN (01/01/2009–12/31/2009)
DU(%) device utilization(%)
NA not reported due to central line days <50
Red highlighting indicates rate for 2009 is significantly higher than the National 2006-2008 rates of 1.9 CLABSIs/1000 central line days
Blue highlighting indicates rate for 2009 is significantly lower than the National 2006-2008 rates of 1.9 CLABSIs/1000 central line days

Table 13: Measures of Central Line-Associated Bloodstream Infections (CLABSIs) by Type of Critical Care Unit, Tennessee [Reportable period: 01/01/2009–12/31/2009]

Location = Medical-Surgical Critical Care Major Teaching

	INCIDENCE DENSITY RATE (LINE DAYS)				DEVICE UTILIZATION		INCIDENCE DENSITY RATE (INPATIENT DAYS)	
Hospital	RATE*	Lower Limit	Upper limit	TN %ile	DU(%)	TN %ile	INPATIENT DAYS	RATE**
Erlanger Medical Center	1.3	0.2	4.7	29	61	67	2533	0.8
Holston Valley Medical Center	4.5	2.7	7.3	86	60	50	6181	2.8
Johnson City Medical Center	1.9	0.8	3.7	43	67	100	6302	1.3
Methodist Univ. Healthcare (Memphis)	3.2	1.6	5.7	71	67	100	5195	2.1
Nashville General Hospital at Meharry	0.6	0.0	3.6	14	48	17	3255	0.3
Regional Medical Center (Memphis)	7.1	4.4	10.9	100	49	33	5965	3.5
University of TN Med Center (Knox)	2.8	1.4	4.9	57	65	83	6675	1.8

Data reported as of February 4, 2011
**** per 1000 central line days***
***** per 1000 inpatient days***
TN%ile percentile in TN (01/01/2009–12/31/2009)
DU(%) device utilization(%)
NA not reported due to central line days <50
Red highlighting indicates rate for 2009 is significantly higher than the National 2006-2008 rate of 2.1 CLABSIs/1000 central line days
Blue highlighting indicates rate for 2009 is significantly lower than the National 2006-2008 rate of 2.1 CLABSIs/1000 central line days

Table 14: Measures of Central Line-Associated Bloodstream Infections (CLABSIs) by Type of Critical Care Unit, Tennessee [Reportable period: 01/01/2009–12/31/2009]

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

	INCIDENCE DENSITY RATE (LINE DAYS)				DEVICE UTILIZATION		INCIDENCE DENSITY RATE (INPATIENT DAYS)	
Hospital	RATE*	Lower Limit	Upper limit	TN %ile	DU(%)	TN %ile	INPATIENT DAYS	RATE**
Athens Reg Medical	5.5	0.1	30.8	79	19	31	954	1.0
Baptist Memorial Hospital for Women	NA	NA	NA	NA	15	19	116	0.0
Baptist Memorial Hospital-Union City	0.0	0.0	10.8	7	26	54	1319	0.0
Bristol Regional Medical Center	0.0	0.0	4.1	7	38	73	2350	0.0
Claiborne County Hospital	0.0	0.0	32.9	7	11	15	1010	0.0
Crockett Hospital	0.0	0.0	20.6	7	16	23	1138	0.0
Cumberland Medical Center	2.1	0.3	7.5	57	33	62	2941	0.7
Delta Medical Center	8.0	3.4	15.7	86	64	92	1572	5.1
Dyersburg Regional Medical Center	0.0	0.0	7.1	7	24	50	2180	0.0
Harton Regional Medical Center	0.0	0.0	7.6	7	21	38	2301	0.0
Hendersonville Medical Center	1.0	0.0	5.4	14	39	77	2666	0.4
Henry County Medical Center	0.0	0.0	9.2	7	24	50	1690	0.0
Hillside Hospital	0.0	0.0	49.2	7	7	4	1092	0.0
Horizon Medical Center	1.6	0.0	9.1	29	36	65	1704	0.6
Lakeway Regional Hospital	9.1	0.2	50.7	93	8	8	1297	0.8
Laughlin Memorial Hospital	0.0	0.0	8.5	7	23	46	1868	0.0
Livingston Regional Hospital	11.6	0.3	64.8	100	7	4	1205	0.8
Maury Regional Medical Center	2.1	0.9	4.4	64	65	96	5088	1.4
Memorial North Park Hospital	1.7	0.0	9.3	36	38	73	1568	0.6
Mercy Medical Center St Mary	0.0	0.0	44.4	7	26	54	319	0.0
Methodist Healthcare Germantown	1.3	0.2	4.9	21	59	88	2531	0.8
Morristown-Hamblen Healthcare System	0.0	0.0	3.5	7	19	31	5462	0.0
NorthCrest Medical Center	0.0	0.0	5.1	7	29	58	2452	0.0
Parkridge East Hospital	0.0	0.0	7.5	7	37	69	1311	0.0
Roane Medical Center	0.0	0.0	16.1	7	29	58	788	0.0
SkyRidge Medical Center	2.1	0.2	7.4	50	46	81	2119	0.9
Southern Tennessee Medical Center	0.0	0.0	6.7	7	19	31	2925	0.0
St Mary's of Campbell Co	0.0	0.0	31.8	7	10	12	1140	0.0
St Mary's of Scott County	0.0	0.0	21.4	7	17	27	996	0.0
Sycamore Shoals Hospital	0.0	0.0	8.8	7	22	42	1879	0.0
Takoma Regional Hospital	0.0	0.0	12.9	7	23	46	1258	0.0
University Medical Center (Lebanon)	1.7	0.4	5.0	43	66	100	2676	1.1

	INCIDENCE DENSITY RATE (LINE DAYS)				DEVICE UTILIZATION		INCIDENCE DENSITY RATE (INPATIENT DAYS)	
Hospital	RATE*	Lower Limit	Upper limit	TN %ile	DU(%)	TN %ile	INPATIENT DAYS	RATE**
Volunteer Community Hospital	0.0	0.0	16.9	7	20	35	1082	0.0
Woods Memorial Hospital	0.0	0.0	17.2	7	20	35	1101	0.0

Data reported as of February 4, 2011
**** per 1000 central line days***
***** per 1000 inpatient days***
TN%ile percentile in TN (01/01/2009–12/31/2009)
DU(%) device utilization(%)
NA not reported due to central line days <50
Red highlighting indicates rate for 2009 is significantly higher than the National 2006-2008 rate of 1.5 CLABSIs/1000 central line days
Blue highlighting indicates rate for 2009 is significantly lower than the National 2006-2008 rate of 1.5 CLABSIs/1000 central line days

Table 15: Measures of Central Line-Associated Bloodstream Infections (CLABSIs) by Type of Critical Care Unit, Tennessee [Reportable period: 01/01/2009–12/31/2009]

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

	INCIDENCE DENSITY RATE (LINE DAYS)				DEVICE UTILIZATION		INCIDENCE DENSITY RATE (INPATIENT DAYS)	
Hospital	RATE*	Lower Limit	Upper limit	TN %ile	DU(%)	TN %ile	INPATIENT DAYS	RATE**
Centennial Medical Center	4.3	2.7	6.5	100	53	69	9298	2.3
Cookeville Regional Medical Center	1.5	0.3	4.4	63	43	44	4666	0.6
Gateway Medical Center	3.9	1.3	9.0	94	36	6	3644	1.4
Indian Path Medical Center	0.0	0.0	2.7	6	42	38	3192	0.0
Mercy Medical Center St Mary	1.5	0.5	3.6	69	50	56	6534	0.8
Mercy Medical Center West	2.8	0.8	7.2	88	48	50	2934	1.4
Methodist Healthcare North	0.5	0.0	2.7	31	51	63	4017	0.2
Methodist Healthcare South	0.7	0.0	3.6	38	39	25	3970	0.3
Methodist Medical Center of Oak Ridge	1.8	0.7	3.8	81	56	75	6837	1.0
Middle Tennessee Medical Center	0.4	0.0	2.0	19	40	31	6761	0.1
Parkwest Medical Center (Knoxville)	1.5	0.7	3.0	75	66	94	7887	1.0
Regional Hospital of Jackson	0.0	0.0	2.2	6	43	44	3923	0.0
Saint Francis Hospital (Memphis)	2.9	1.6	4.8	88	53	69	9812	1.5
Saint Thomas Hospital	0.3	0.0	1.0	13	70	100	10895	0.2
Skyline Medical Center	1.3	0.3	3.8	56	38	19	6078	0.5
Southern Hills Medical Center	0.7	0.0	3.6	44	37	13	4090	0.2
St Francis Bartlett	1.3	0.4	3.3	50	64	88	4887	0.8
Sumner Regional Medical Center	0.4	0.0	2.3	25	59	81	4167	0.2

Data reported as of February 4, 2011
**** per 1000 central line days***
***** per 1000 inpatient days***
TN%ile percentile in TN (01/01/2009–12/31/2009)
DU(%) device utilization(%)
NA not reported due to central line days <50
Red highlighting indicates rate for 2009 is significantly higher than the National 2006-2008 rate of 1.5 CLABSIs/1000 central line days
Blue highlighting indicates rate for 2009 is significantly lower than the National 2006-2008 rate of 1.5 CLABSIs/1000 central line days

Table 16: Measures of Central Line-Associated Bloodstream Infections (CLABSIs) by Type of Critical Care Unit, Tennessee [Reportable period: 01/01/2009–12/31/2009]

Location = Pediatric Medical-Surgical Critical Care

	INCIDENCE DENSITY RATE (LINE DAYS)				DEVICE UTILIZATION		INCIDENCE DENSITY RATE (INPATIENT DAYS)	
Hospital	RATE*	Lower Limit	Upper limit	TN %ile	DU(%)	TN %ile	INPATIENT DAYS	RATE**
East Tennessee Children's Hospital	2.7	0.7	6.9	57	55	50	2711	1.5
Johnson City Medical Center	2.7	0.3	9.8	71	42	17	1763	1.1
MCJ Children's Hospital at Vanderbilt	4.5	2.9	6.5	86	58	67	10358	2.6
Methodist Healthcare LeBonheur	0.3	0.0	1.6	14	64	83	5523	0.2
Saint Jude Children's Research Hosp.	2.7	0.9	6.3	29	94	100	1991	2.5
TC Thompson Children's Hosp(Erlanger)	2.7	0.3	9.7	43	43	33	1739	1.2
University of TN Med Center (Knox)	6.9	1.4	20.3	100	55	50	786	3.8

Data reported as of February 4, 2011
**** per 1000 central line days***
***** per 1000 inpatient days***
TN%ile percentile in TN (01/01/2009–12/31/2009)
DU(%) device utilization(%)
NA not reported due to central line days <50
Red highlighting indicates rate for 2009 is significantly higher than the National 2006-2008 rate of 3.0 CLABSIs/1000 central line days
Blue highlighting indicates rate for 2009 is significantly lower than the National 2006-2008 rate of 3.0 CLABSIs/1000 central line days

Table 17: Measures of Central Line-Associated Bloodstream Infections (CLABSIs) by Type of Critical Care Unit, Tennessee [Reportable period: 01/01/2009–12/31/2009]

Location = Neurosurgical Critical Care

	INCIDENCE DENSITY RATE (LINE DAYS)				DEVICE UTILIZATION		INCIDENCE DENSITY RATE (INPATIENT DAYS)	
Hospital	RATE*	Lower Limit	Upper limit	TN %ile	DU(%)	TN %ile	INPATIENT DAYS	RATE**
Baptist Memorial Hospital (Memphis)	2.0	0.6	5.2	57	59	83	3313	1.2
Erlanger Medical Center	0.0	0.0	3.0	14	47	50	2593	0.0
Fort Sanders Regional Medical Center	2.8	0.9	6.5	86	72	100	2494	2.0
Jackson Madison County General Hosp.	4.4	1.2	11.4	100	59	83	1539	2.6
Methodist Univ. Healthcare (Memphis)	1.2	0.2	3.4	43	51	67	5032	0.6
Skyline Medical Center	1.1	0.0	5.9	29	29	17	3305	0.3
Vanderbilt Medical Center	2.2	0.9	4.6	71	42	33	7440	0.9

Data reported as of February 4, 2011
**** per 1000 central line days***
***** per 1000 inpatient days***
TN%ile percentile in TN (01/01/2009–12/31/2009)
DU(%) device utilization(%)
NA not reported due to central line days <50
Red highlighting indicates rate for 2009 is significantly higher than the National 2006-2008 rate of 2.5 CLABSIs/1000 central line days
Blue highlighting indicates rate for 2009 is significantly lower than the National 2006-2008 rate of 2.5 CLABSIs/1000 central line days

Table 18: Measures of Central Line-Associated Bloodstream Infections (CLABSIs) by Type of Critical Care Unit, Tennessee [Reportable period: 01/01/2009–12/31/2009]

Location = Surgical Critical Care

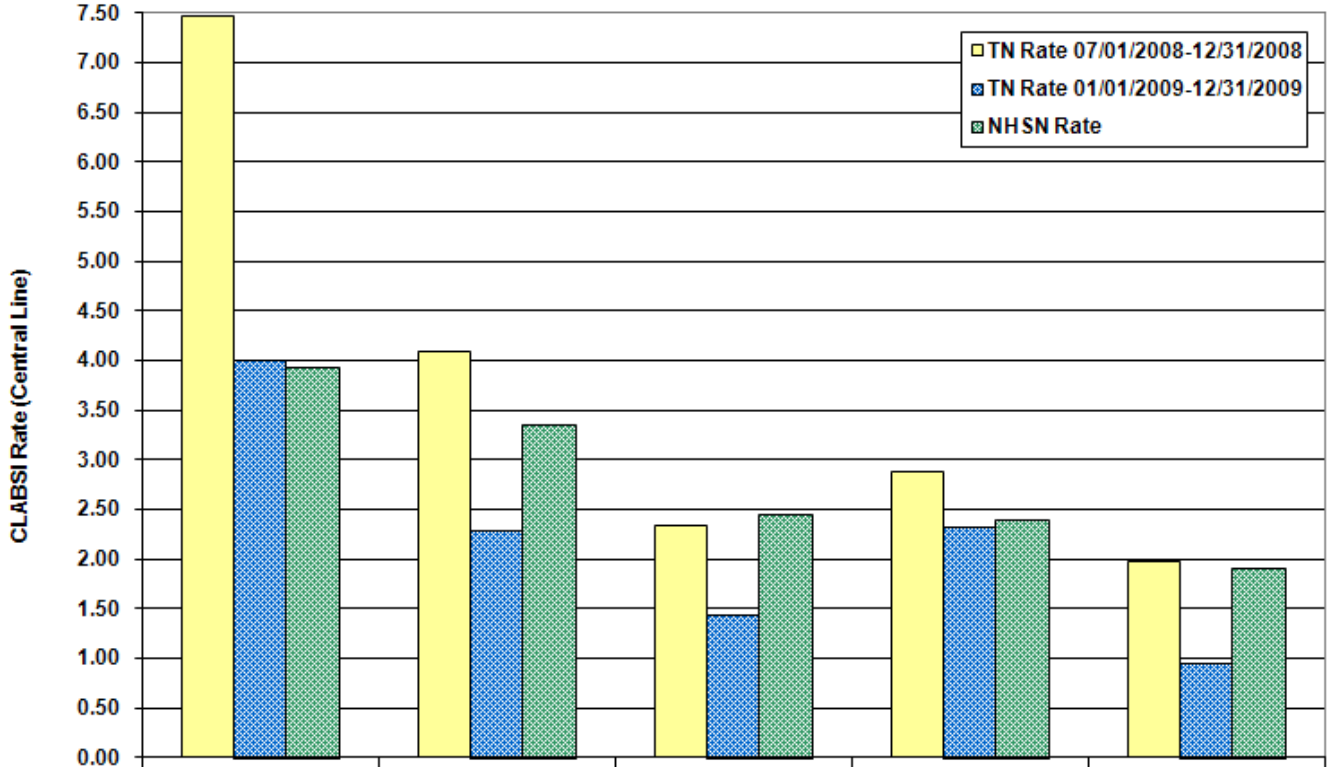
	INCIDENCE DENSITY RATE (LINE DAYS)				DEVICE UTILIZATION		INCIDENCE DENSITY RATE (INPATIENT DAYS)	
Hospital	RATE*	Lower Limit	Upper limit	TN %ile	DU(%)	TN %ile	INPATIENT DAYS	RATE**
Baptist Hospital (Nashville)	0.0	0.0	1.8	10	49	11	4267	0.0
Blount Memorial Hospital	2.2	0.4	6.4	70	64	44	2150	1.4
Bristol Regional Medical Center	0.0	0.0	2.4	10	49	11	3079	0.0
Erlanger Medical Center	1.8	0.4	5.4	40	55	22	2986	1.0
Jackson Madison County General Hosp.	2.1	0.8	4.2	60	74	89	4577	1.5
Memorial Healthcare System	4.1	1.6	8.4	90	72	78	2381	2.9
Methodist Univ. Healthcare (Memphis)	4.2	1.7	8.7	100	65	56	2545	2.8
Parkridge Medical Center	2.0	0.7	4.8	50	81	100	3012	1.7
SkyRidge Medical Center	1.4	0.0	7.9	30	60	33	1174	0.9
Summit Medical Center	0.8	0.0	4.5	20	49	11	2550	0.4
Vanderbilt Medical Center	4.1	2.4	6.4	80	68	67	6469	2.8

Data reported as of February 4, 2011
**** per 1000 central line days***
***** per 1000 inpatient days***
TN%ile percentile in TN (01/01/2009–12/31/2009)
DU(%) device utilization(%)
NA not reported due to central line days <50
Red highlighting indicates rate for 2009 is significantly higher than the National 2006-2008 rate of 2.3 CLABSIs/1000 central line days
Blue highlighting indicates rate for 2009 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

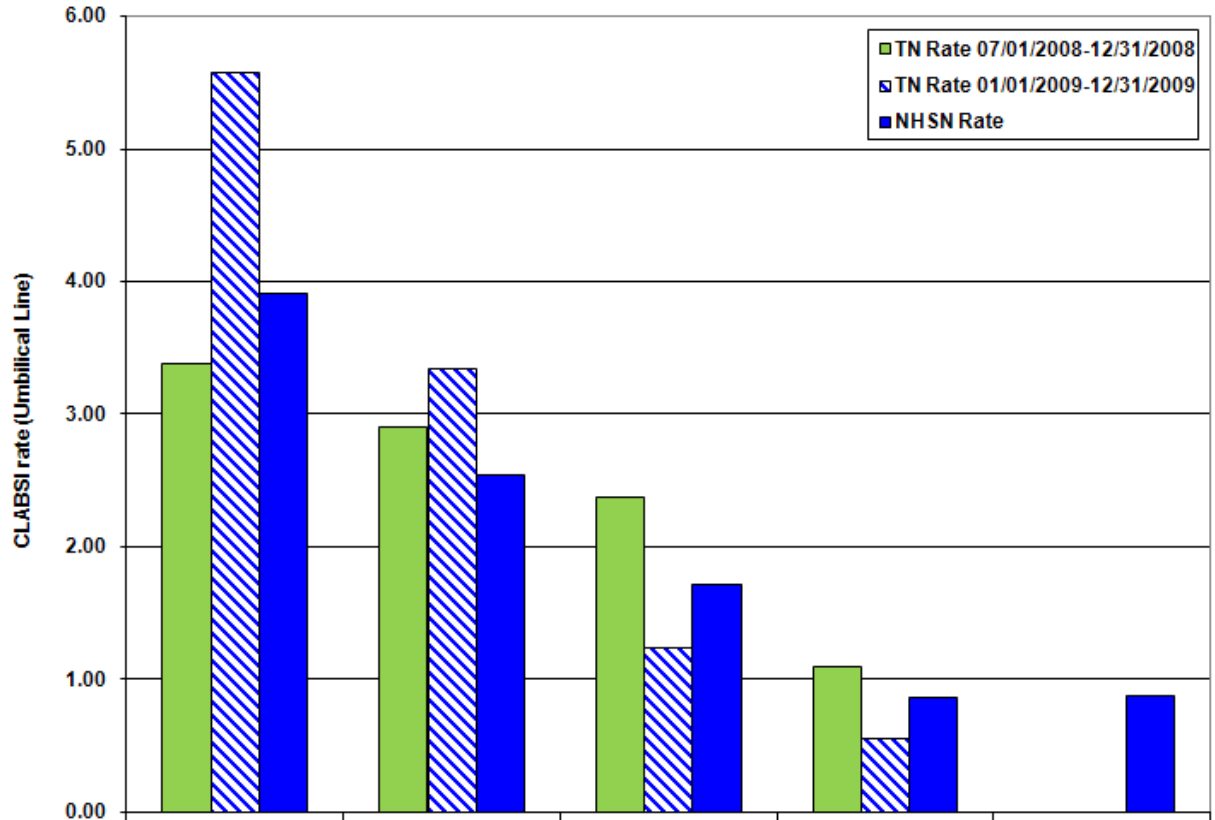
Figure 22: Central Line-Associated Bloodstream Infection (CLABSI) Incidence Density Rate per 1,000 Central Line Days (Pooled Means) in Level III Neonatal Intensive Care Units by Birth Weight Category, Tennessee, 7/2008–12/2008 and 1/2009–12/2009, *vs.* National Healthcare Safety Network (NHSN), 2006-8



	≤750 g	751-1000 g	1001-1500 g	1501-2500 g	>2500 g
TN Rate 07/01/2008-12/31/2008	7.46	4.10	2.33	2.87	1.98
TN Rate 01/01/2009-12/31/2009	4.00	2.28	1.44	2.31	0.96
NHSN Rate	3.93	3.35	2.44	2.39	1.90

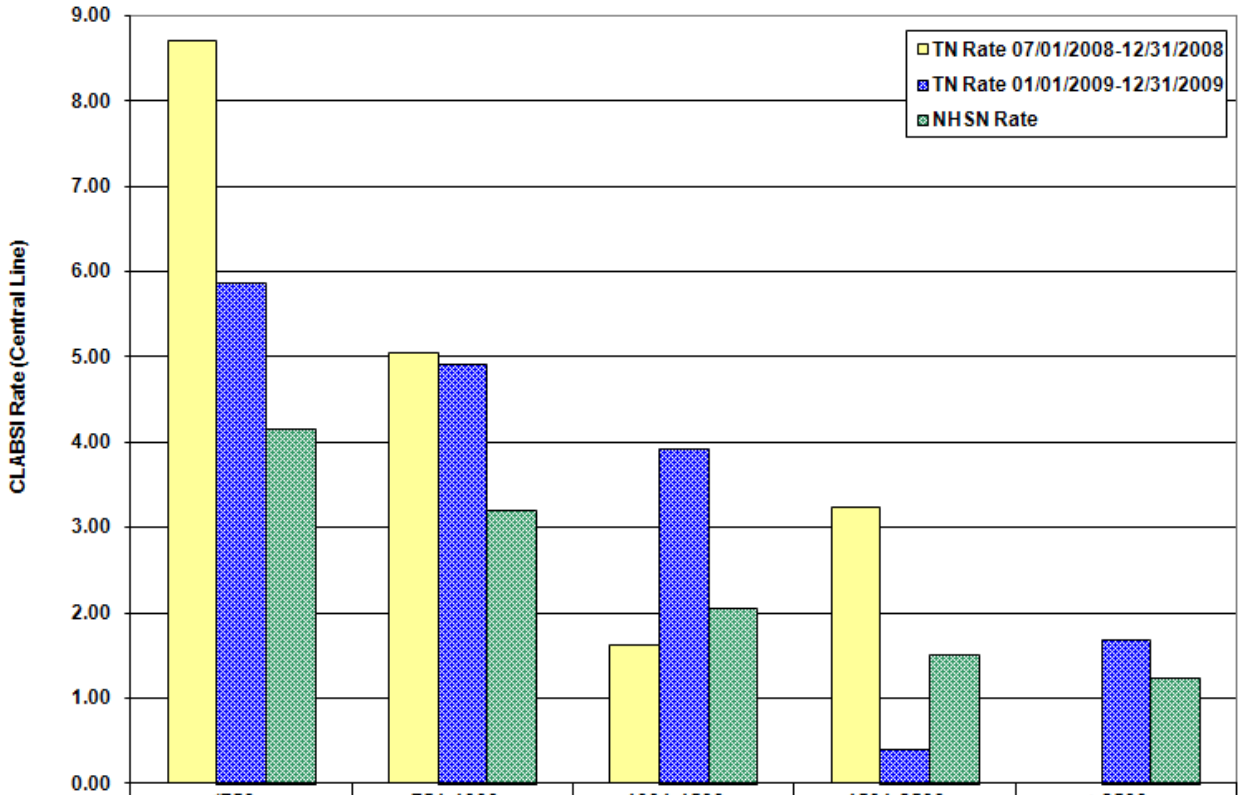
Birth Weight

Figure 23: Umbilical Catheter-Associated Bloodstream Infection (UCABSI) Incidence Density Rate per 1,000 Umbilical Line Days (Pooled Means) in Level III Neonatal Intensive Care Units by Birth Weight Category, Tennessee, 7/2008–12/2008 and 1/2009–12/2009, *vs.* National Healthcare Safety Network (NHSN), 2006-8



	≤750 g	751-1000 g	1001-1500 g	1501-2500 g	>2500 g
TN Rate 07/01/2008-12/31/2008	3.38	2.91	2.37	1.09	0.00
TN Rate 01/01/2009-12/31/2009	5.58	3.34	1.24	0.56	0.00
NHSN Rate	3.92	2.54	1.72	0.86	0.88

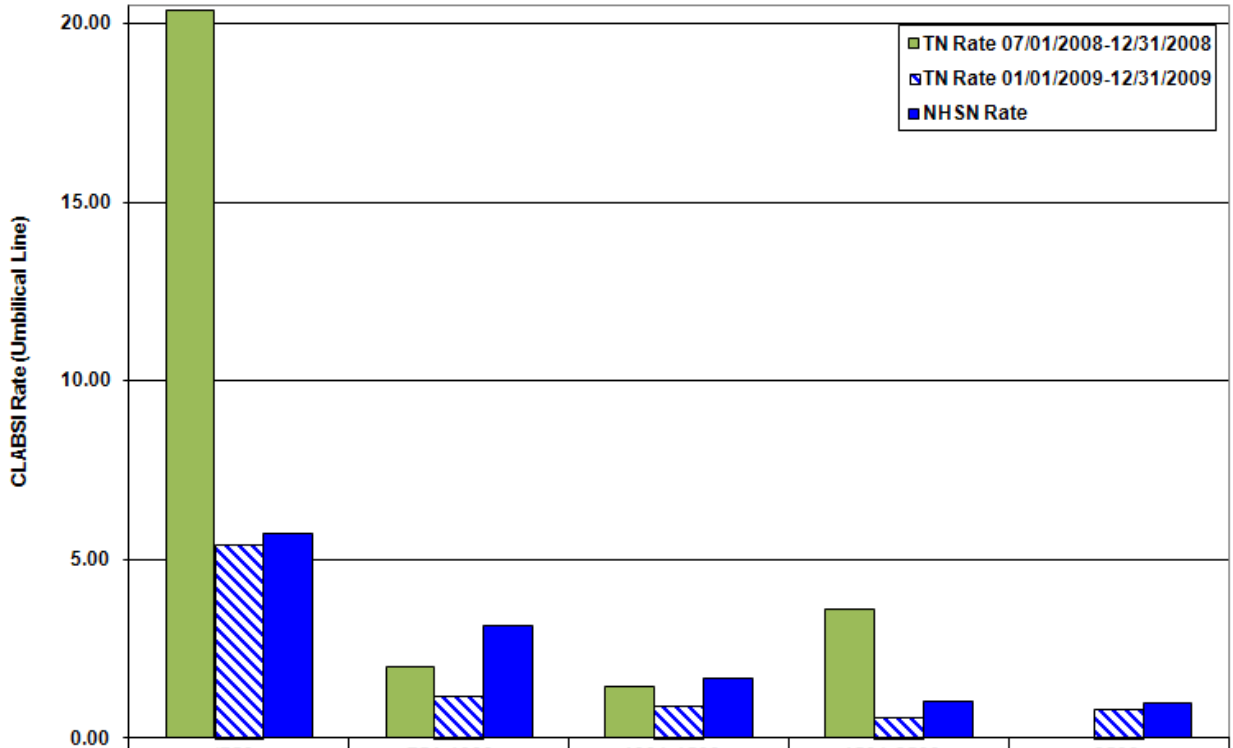
Figure 24: Central Line-Associated Bloodstream Infection (CLABSI) Incidence Density Rate per 1,000 Central Line Days (Pooled Means) in Level II/III Neonatal Intensive Care Units by Birth Weight Category, Tennessee, 7/2008–12/2008 and 1/2009–12/2009, *vs.* National Healthcare Safety Network (NHSN), 2006-8



	≤750 g	751-1000 g	1001-1500 g	1501-2500 g	>2500 g
TN Rate 07/01/2008-12/31/2008	8.70	5.04	1.63	3.24	0.00
TN Rate 01/01/2009-12/31/2009	5.87	4.91	3.90	0.39	1.67
NHSN Rate	4.15	3.20	2.04	1.49	1.24

Birth Weight

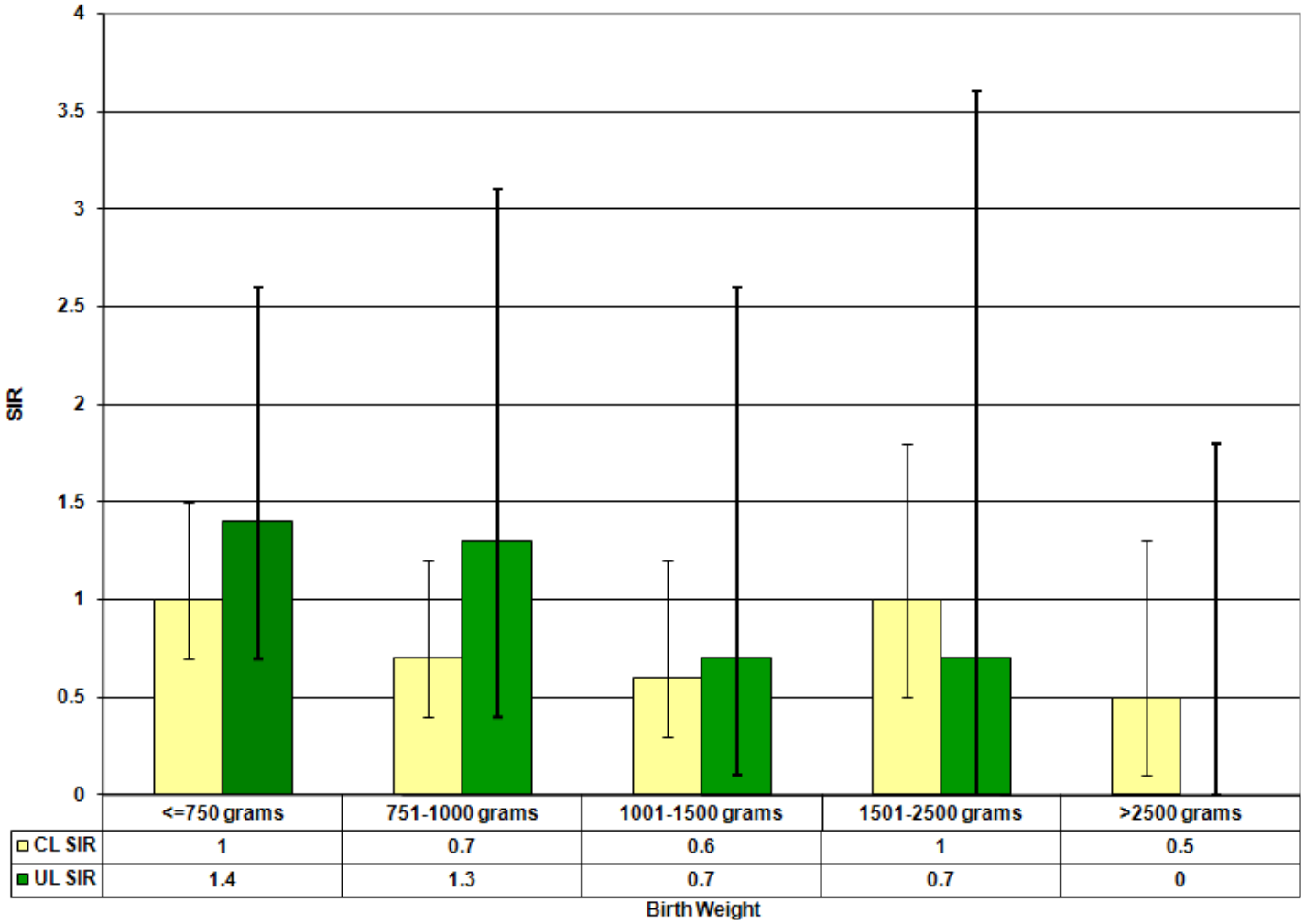
Figure 25: Umbilical Catheter-Associated Bloodstream Infection (UCABSI) Incidence Density Rate per 1,000 Umbilical Line Days (Pooled Means) in Level II/III Neonatal Intensive Care Units by Birth Weight Category, Tennessee, 7/2008–12/2008 and 1/2009–12/2009, *vs.* National Healthcare Safety Network (NHSN), 2006-8



	≤750 g	751-1000 g	1001-1500 g	1501-2500 g	>2500 g
TN Rate 07/01/2008-12/31/2008	20.36	1.98	1.47	3.59	0.00
TN Rate 01/01/2009-12/31/2009	5.41	1.17	0.91	0.58	0.84
NHSN Rate	5.74	3.16	1.70	1.01	1.00

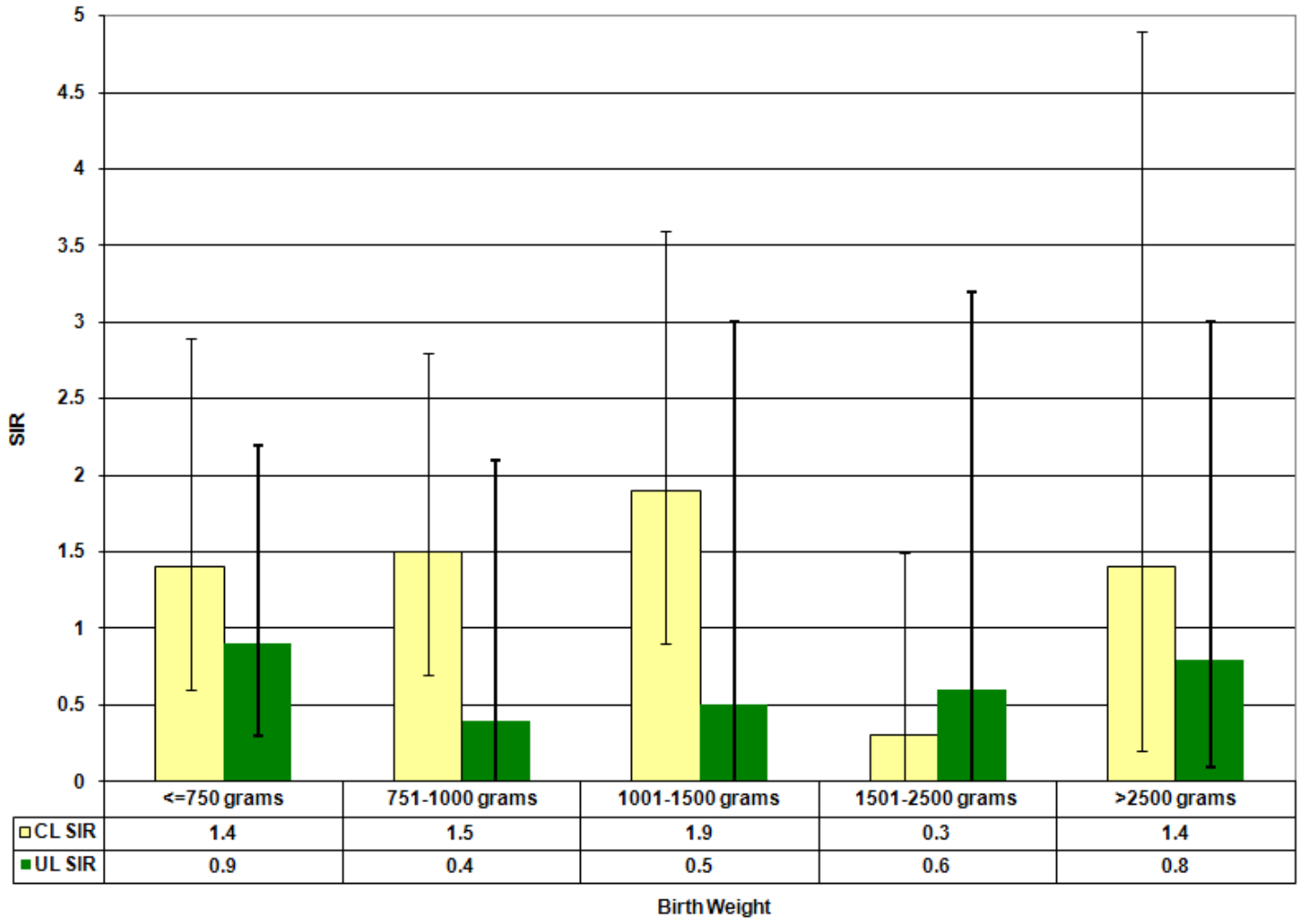
Birth Weight

Figure 26: 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, 1/2009–12/2009. [Reference standard: National Healthcare Safety Network (NHSN), 2006-8]



	<=750 grams	751-1000 grams	1001-1500 grams	1501-2500 grams	>2500 grams
CL SIR	1	0.7	0.6	1	0.5
UL SIR	1.4	1.3	0.7	0.7	0

Figure 27: 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, 1/2009–12/2009. [Reference standard: National Healthcare Safety Network (NHSN), 2006-8]



	<=750 grams	751-1000 grams	1001-1500 grams	1501-2500 grams	>2500 grams
CL SIR	1.4	1.5	1.9	0.3	1.4
UL SIR	0.9	0.4	0.5	0.6	0.8

Figure 28: Central Line- and Umbilical Catheter-Associated Bloodstream Infection (CLABSI/UCABSI) Standardized Infection Ratios (SIRs) by Six-Month Reporting Interval, Tennessee, 7/2008–12/2009 [Reference standard: National Healthcare Safety Network (NHSN), 2006-8]

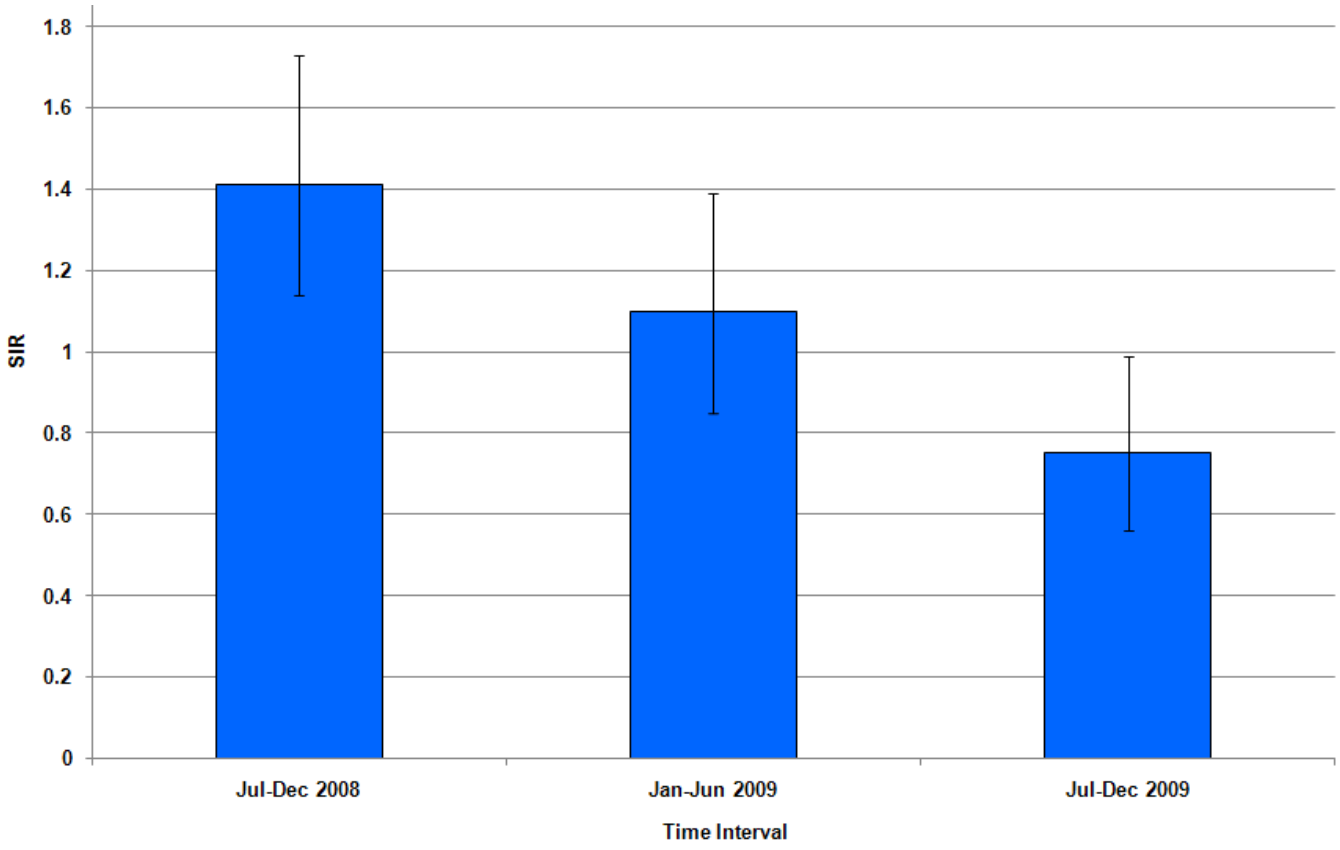


Figure 29: Standardized Infection Ratios (SIRs) for Central Line- and Umbilical Catheter-Associated Blood Stream Infections (CLABSIs/UCABSIs) by Neonatal Intensive Care Unit (NICU) Type and Grand Division, Tennessee, 1/2009–12/2009. [Reference standard: National Healthcare Safety Network (NHSN), 2006-8]

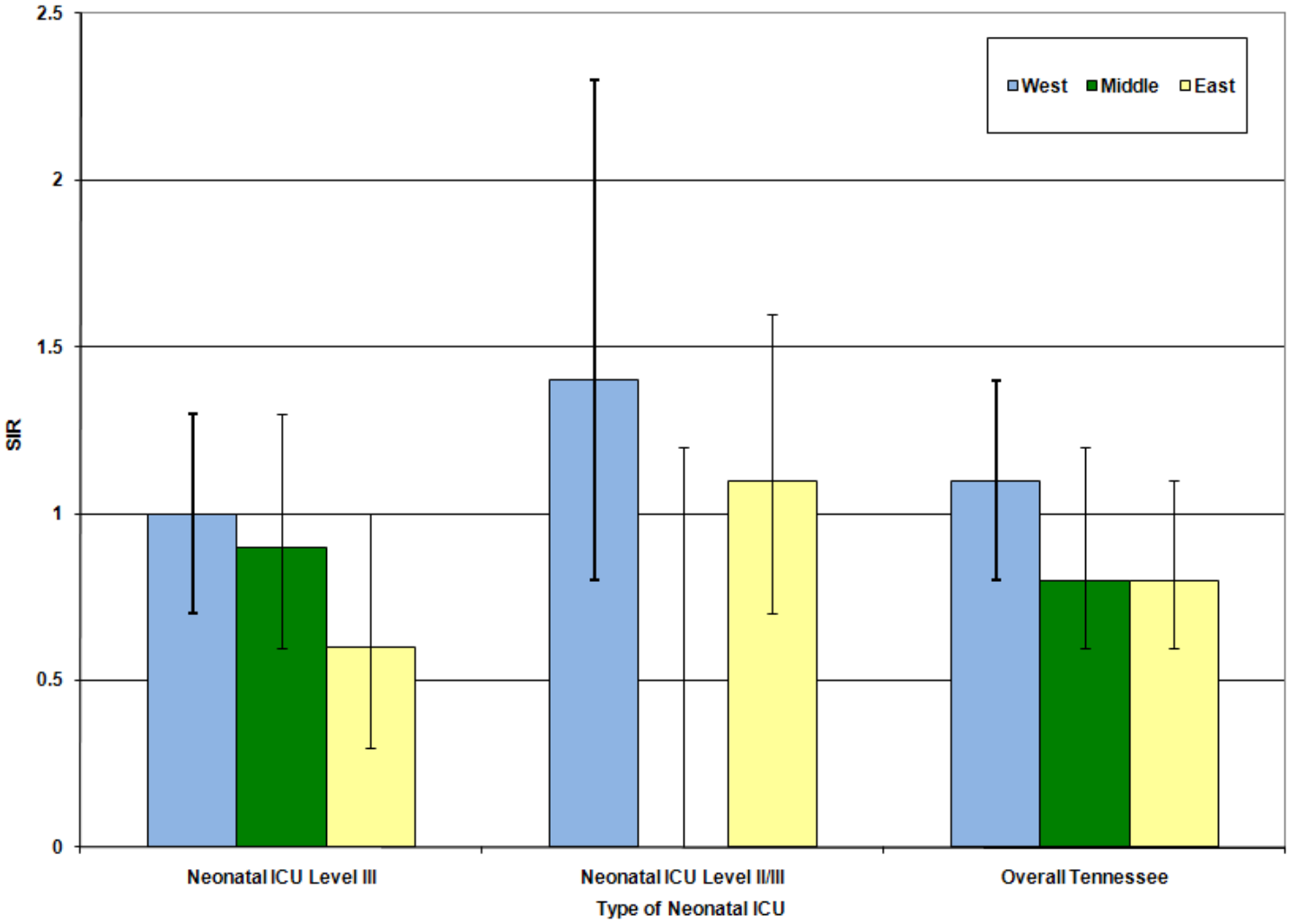
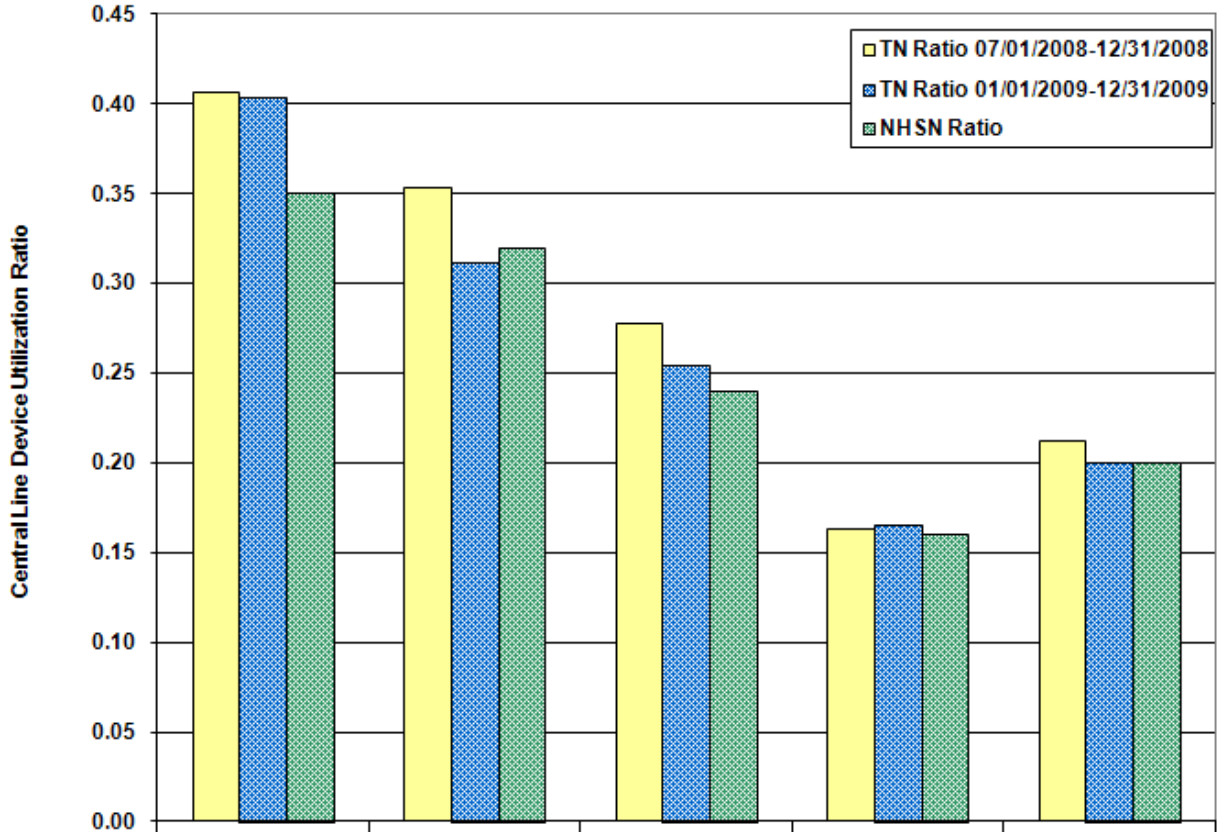
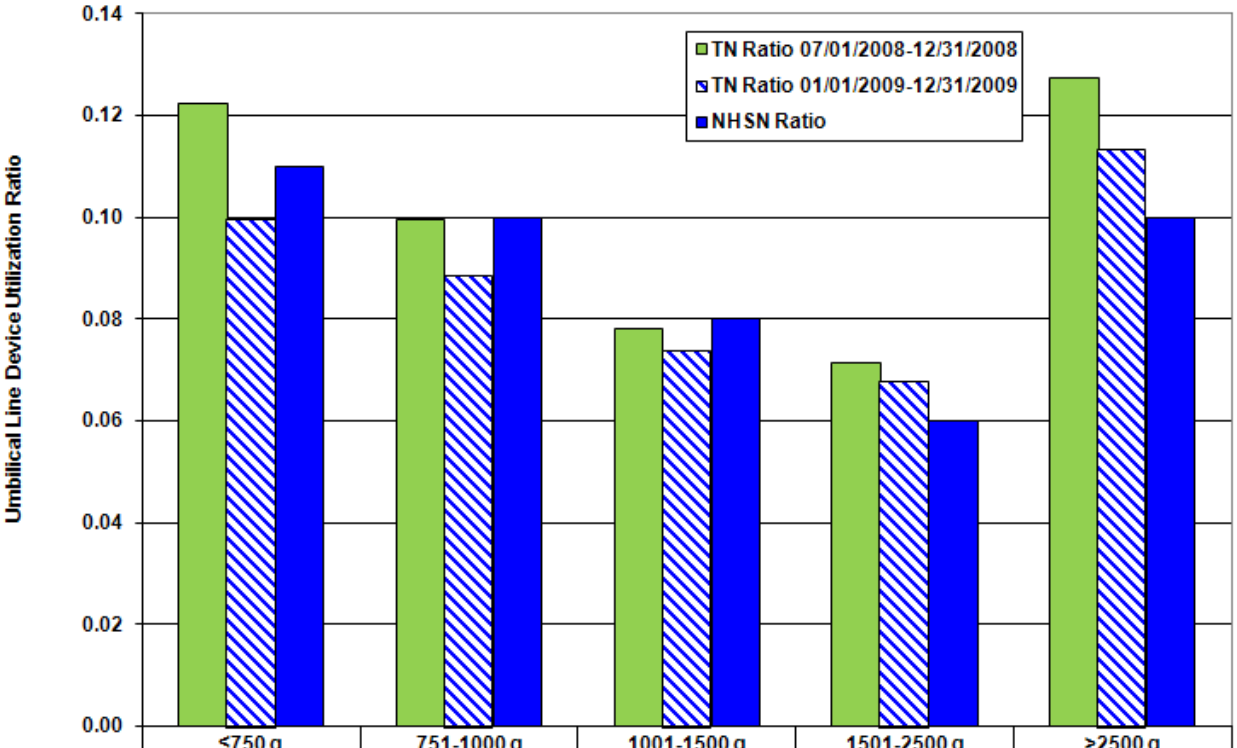


Figure 30: Central Line Utilization Ratios in Level III Neonatal Intensive Care Units (NICUs), Tennessee, 7/2008–12/2008 and 1/2009–12/2009, *vs.* National Healthcare Safety Network (NHSN), 2006-8



	≤750 g	751-1000 g	1001-1500 g	1501-2500 g	>2500 g
TN Ratio 07/01/2008-12/31/2008	0.41	0.35	0.28	0.16	0.21
TN Ratio 01/01/2009-12/31/2009	0.40	0.31	0.25	0.16	0.20
NHSN Ratio	0.35	0.32	0.24	0.16	0.20

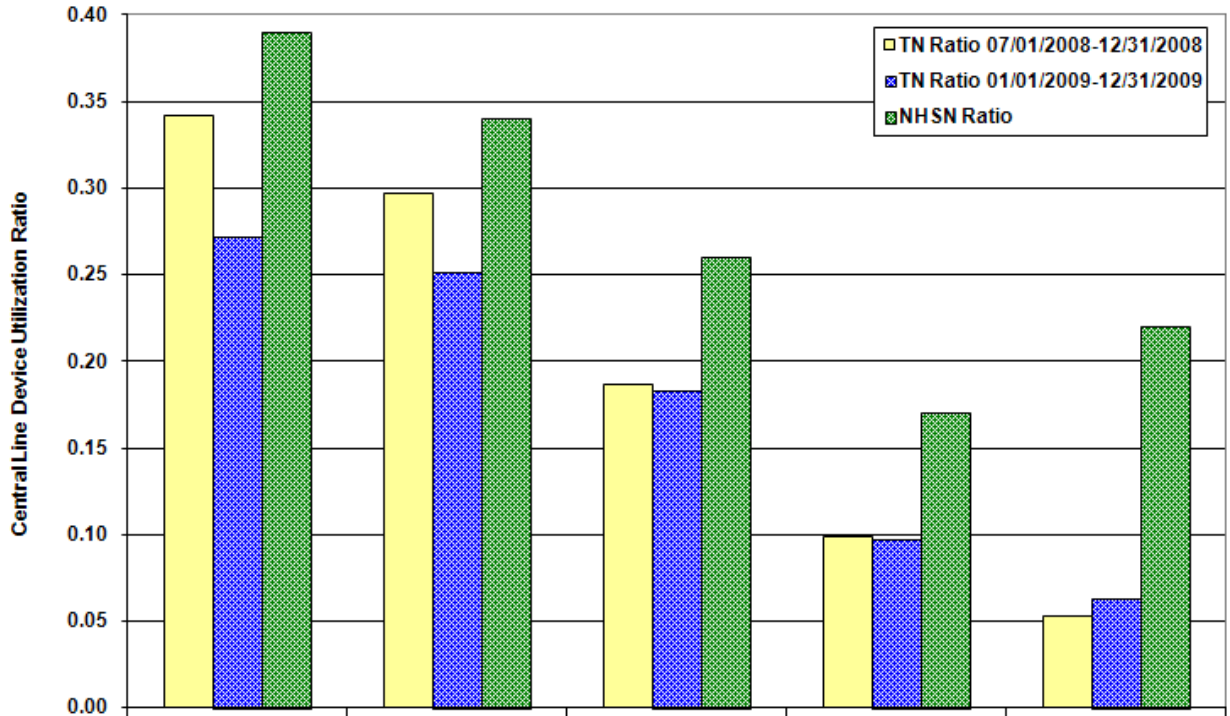
Figure 31: Umbilical Line Utilization Ratios in Level III Neonatal Intensive Care Units (NICUs), Tennessee, 7/2008–12/2008 and 1/2009–12/2009, *vs.* National Healthcare Safety Network (NHSN), 2006-8



	≤750 g	751-1000 g	1001-1500 g	1501-2500 g	>2500 g
TN Ratio 07/01/2008-12/31/2008	0.12	0.10	0.08	0.07	0.13
TN Ratio 01/01/2009-12/31/2009	0.10	0.09	0.07	0.07	0.11
NHSN Ratio	0.11	0.10	0.08	0.06	0.10

Birth Weight

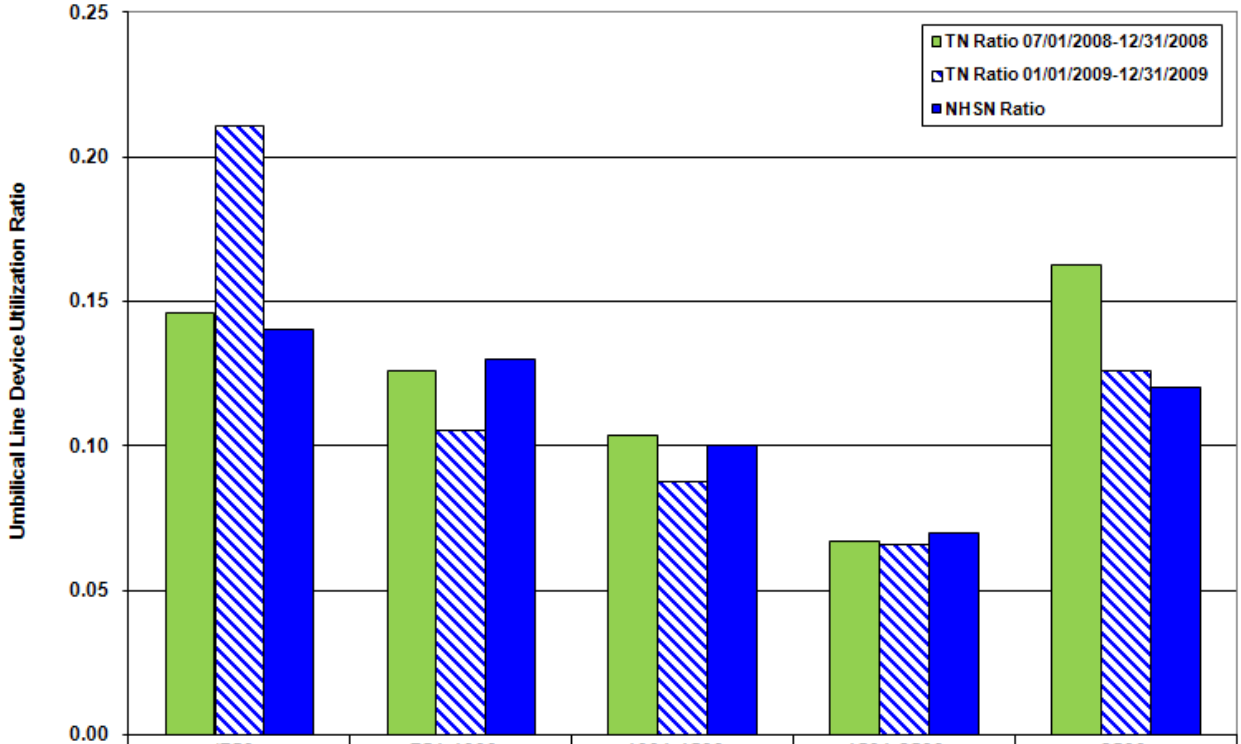
Figure 32: Central Line Utilization Ratios in Level II/III Neonatal Intensive Care Units (NICUs), Tennessee, 7/2008–12/2008 and 1/2009–12/2009, *vs.* National Healthcare Safety Network (NHSN), 2006-8



	≤750 g	751-1000 g	1001-1500 g	1501-2500 g	>2500 g
TN Ratio 07/01/2008-12/31/2008	0.34	0.30	0.19	0.10	0.05
TN Ratio 01/01/2009-12/31/2009	0.27	0.25	0.18	0.10	0.06
NHSN Ratio	0.39	0.34	0.26	0.17	0.22

Birth Weight

Figure 33: Umbilical Line Utilization Ratios in Level II/III Neonatal Intensive Care Units (NICUs), Tennessee, 7/2008–12/2008 and 1/2009–12/2009, *vs.* National Healthcare Safety Network (NHSN), 2006-8



	≤750 g	751-1000 g	1001-1500 g	1501-2500 g	>2500 g
TN Ratio 07/01/2008-12/31/2008	0.15	0.13	0.10	0.07	0.16
TN Ratio 01/01/2009-12/31/2009	0.21	0.11	0.09	0.07	0.13
NHSN Ratio	0.14	0.13	0.10	0.07	0.12

Birth Weight

Figure 34: Organisms Isolated from Central Line-Associated Bloodstream Infections (CLABSIs) in Neonatal Intensive Care Units, Tennessee, 1/2009–12/2009

Number of organisms = 133; number of events: 120

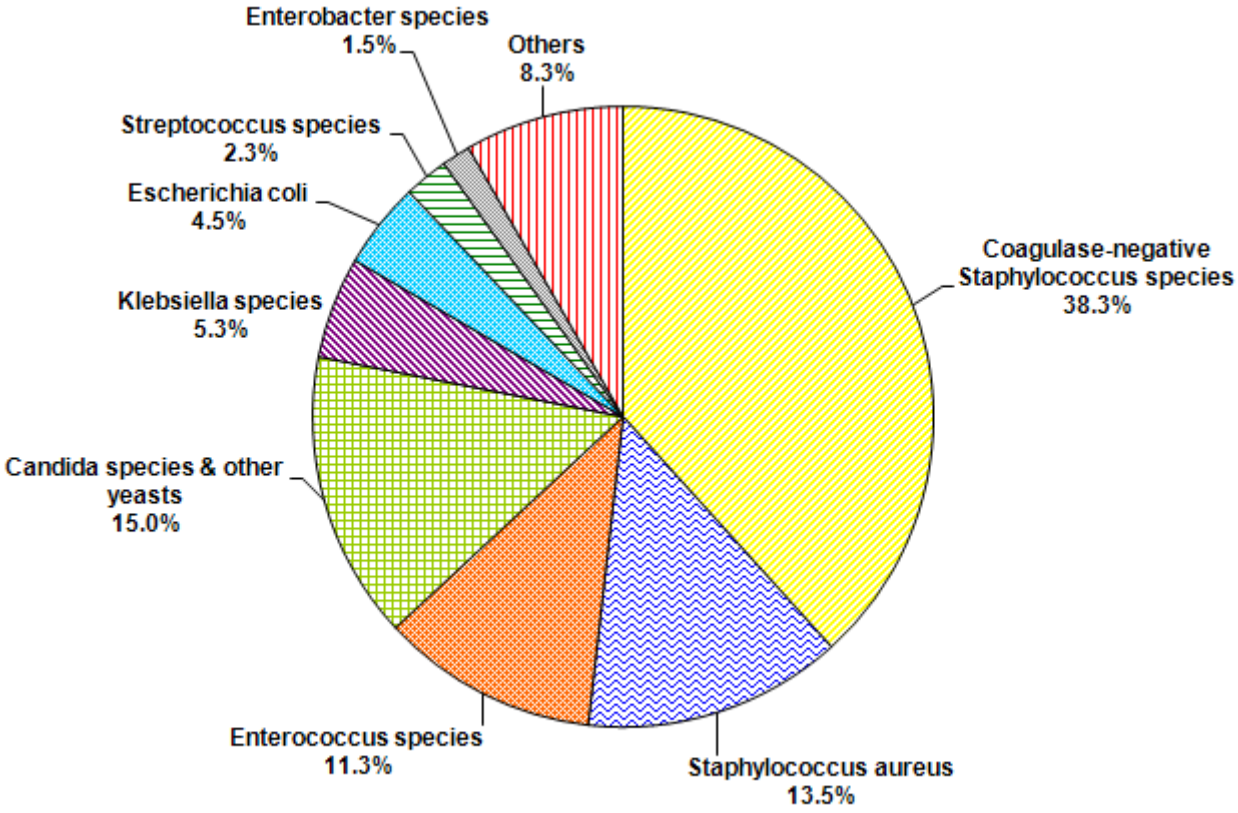


Table 19: Microorganisms Identified in Central Line- and Umbilical Catheter-Associated Bloodstream Infections (CLABSIs/UCABSIs), Neonatal Intensive Care Units, 01/01/2009–12/31/2009

Number of organisms: 133; number of events: 120

Microorganism	Number Isolates	Percent
Coagulase-negative *Staphylococcus* species	51	38.3
Candida species & other yeasts	20	15.0
Candida albicans only (% of total positive isolates)	9	(6.8)
Staphylococcus aureus	18	13.5
Methicillin-resistant *S. aureus* (MRSA) only (% of total positive isolates)	10	(7.5)
Enterococcus species (no VRE reported)	15	11.3
Klebsiella species	7	5.3
Escherichia coli	6	4.5
Streptococcus species	3	2.3
Enterobacter species	2	1.5
Pseudomonas spp.	2	1.5
Proteus species	2	1.5
Other pathogens	6	4.5
Other skin contaminants	1	0.8

Data reported as of February 4, 2011
Total number of isolates= 133; Total number of CLABSI/UCABSI events= 120;
***Other pathogens* = Acinetobacter baumannii, Morganella morganii *ssp.* sibonii, Obesumbacterium *biogroup 2*, Serratia marcescens, Stenotrophomonas maltophilia, *coagulase-positive* Staphylococcus**
Other skin contaminants* = Bacillus *spp.
***VRE = vancomycin-resistant* Enterococcus**

Table 20: Key Percentiles for Facility-Specific Central Line- and Umbilical Catheter-Associated Bloodstream Infection (CLABSI/UCABSI) Standardized Infection Ratios (SIRs) by Reporting Year, Tennessee [Reportable period: 07/01/2008–12/31/2009]

			SIR, 95% CONFIDENCE INTERVAL, AND KEY PERCENTILES							
STATE	YEAR	No.	SIR	LOWER LIMIT	UPPER LIMIT	10%	25%	50%	75%	90%
Tennessee	2009	25	0.92	0.76	1.10	0.00	0.00	0.32	1.05	1.71
	2008	25	1.41	1.14	1.73	0.00	0.00	0.69	1.65	2.35

Data reported as of February 4, 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 rate for reporting period is significantly higher than National 2006-2008 rate
Blue highlighting indicates rate for reporting period is significantly lower than National 2006-2008 rate

Table 21: 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 [Reportable period: 07/01/2008–12/31/2009]

			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	2009	7	0.85	0.68	1.06	0.00	0.24	0.62	1.43	2.29
	2008	8	1.28	0.97	1.66	0.00	0.30	0.86	1.55	1.78
Neonatal ICU Level II/III	2009	18	1.10	0.78	1.50	0.00	0.00	0.00	0.56	1.71
	2008	17	1.70	1.18	2.36	0.00	0.00	0.00	2.30	2.39

Data reported as of February 4, 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 rate for reporting period is significantly higher than National 2006-2008 rate
Blue highlighting indicates rate for reporting period is significantly lower than National 2006-2008 rate

Table 22: 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 [Reportable period: 01/01/2009–12/31/2009]

		TENNESSEE 01/01/2009 - 12/31/2009					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	39	9049	4.3	4.4	610	155220	3.9	1.10	0.78	1.50
	751-1000 grams	7	17	6760	2.5	1.1	448	140785	3.2	0.79	0.46	1.27
	1001-1500 grams	7	10	7162	1.4	0.0	335	147305	2.3	0.61	0.29	1.13
	1501-2500 grams	7	11	6105	1.8	1.7	244	122883	2.0	0.93	0.46	1.66
	>2500 grams	7	4	6558	0.6	0.0	197	128245	1.5	0.40	0.11	1.02
	TOTAL	.	.	.	.	.	.	.	.	0.85	0.68	1.06
Neonatal ICU Level II/III	≤750 grams	18	12	2118	5.7	5.2	348	77283	4.5	1.17	0.60	2.04
	751-1000 grams	18	11	2890	3.8	0.7	210	65801	3.2	1.19	0.60	2.14
	1001-1500 grams	18	10	3408	2.9	0.0	153	78352	2.0	1.52	0.73	2.80
	1501-2500 grams	18	2	4257	0.5	0.0	84	62268	1.3	0.36	0.04	1.31
	>2500 grams	18	4	3589	1.1	0.0	75	65559	1.1	1.03	0.28	2.64
	TOTAL	.	.	.	.	.	.	.	.	1.10	0.78	1.50
TOTAL		.	.	.	.	.	.	.	.	**0.92**	**0.76**	**1.10**

Data reported as of February 4, 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 rate for 2009 is significantly higher than National 2006-2008 rate
Blue highlighting indicates rate for 2009 is significantly lower than National 2006-2008 rate

Table 23: Comparison of Tennessee and National Healthcare Safety Network (NHSN) Central Line- and Umbilical Catheter-Associated Bloodstream Infection (CLABSI/UCABSI) Rates by NICU Type and Year [Reportable period: 07/01/2008–12/31/2009]

		TENNESSEE 07/01/2008 - 12/31/2008					TENNESSEE 01/01/2009 - 12/31/2009				
CCU TYPE	Birth Weight Category	No.	CLABSI	CL DAYS	POOLED MEAN*	MEDIAN RATE*	No.	CLABSI	CL DAYS	POOLED MEAN*	MEDIAN RATE*
Neonatal ICU Level III	≤750 grams	8	25	3836	6.5	6.0	7	39	9049	4.3	4.4
	751-1000 grams	8	12	3128	3.8	3.8	7	17	6760	2.5	1.1
	1001-1500 grams	8	9	3846	2.3	2.1	7	10	7162	1.4	0.0
	1501-2500 grams	8	7	3005	2.3	0.0	7	11	6105	1.8	1.7
	>2500 grams	8	4	3226	1.2	0.0	7	4	6558	0.6	0.0
Neonatal ICU Level II/III	≤750 grams	17	18	1477	12.2	3.4	18	12	2118	5.7	5.2
	751-1000 grams	17	7	1695	4.1	0.0	18	11	2890	3.8	0.7
	1001-1500 grams	17	3	1908	1.6	0.0	18	10	3408	2.9	0.0
	1501-2500 grams	17	7	2070	3.4	0.0	18	2	4257	0.5	0.0
	>2500 grams	17	0	1894	0.0	0.0	18	4	3589	1.1	0.0

Data reported as of February 4, 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 rate for reporting period is significantly higher than National 2006-2008 rate
Blue highlighting indicates rate for reporting period is significantly lower than National 2006-2008 rate

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 [Reportable periods: 07/01/2008–12/31/2009]

		Jul-Dec 2008 SIR AND 95% CONFIDENCE INTERVAL			Jan-Jun 2009 SIR AND 95% CONFIDENCE INTERVAL			Jul-Dec 2009 SIR AND 95% CONFIDENCE INTERVAL		
CCU TYPE		SIR	LOWER LIMIT	UPPER LIMIT	SIR	LOWER LIMIT	UPPER LIMIT	SIR	LOWER LIMIT	UPPER LIMIT
Neonatal ICU Level III	≤750 grams	1.66	1.07	2.44	1.24	0.77	1.90	0.96	0.57	1.52
	751-1000 grams	1.21	0.62	2.11	0.85	0.37	1.67	0.75	0.34	1.42
	1001-1500 grams	1.02	0.46	1.94	0.90	0.39	1.77	0.27	0.03	0.97
	1501-2500 grams	1.21	0.49	2.49	1.46	0.67	2.78	0.35	0.04	1.26
	>2500 grams	0.82	0.22	2.09	0.81	0.22	2.07	0.00	0.00	0.73
	TOTAL	1.28	0.97	1.66	1.08	0.80	1.42	0.63	0.43	0.90
Neonatal ICU Level II/III	≤750 grams	2.63	1.56	4.16	0.69	0.14	2.03	1.52	0.69	2.88
	751-1000 grams	1.29	0.52	2.67	1.01	0.27	2.58	1.33	0.54	2.75
	1001-1500 grams	0.82	0.17	2.40	2.26	0.98	4.45	0.66	0.08	2.39
	1501-2500 grams	2.60	1.05	5.36	0.72	0.09	2.62	0.00	0.00	1.33
	>2500 grams	0.00	0.00	1.84	1.01	0.12	3.63	1.06	0.13	3.82
	TOTAL	1.70	1.18	2.36	1.15	0.69	1.79	1.06	0.65	1.64
TOTAL		**1.41**	**1.14**	**1.73**	**1.10**	**0.85**	**1.39**	**0.75**	**0.56**	**0.99**

Data reported as of February 4, 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 rate for reporting period is significantly higher than National 2006-2008 rate
Blue highlighting indicates rate for reporting period is significantly lower than National 2006-2008 rate

Table 25: Central Line- and Umbilical Catheter-Associated Bloodstream Infection (CLABSI/UCABSI) Rates and Standardized Infection Ratios by NICU Type and Grand Division, Tennessee [Reportable period: 01/01/2009–12/31/2009]

	EAST							MIDDLE							WEST						
CCU TYPE	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
Neonatal ICU Level III	2	14	9158	1.5	0.6	0.3	1.0	2	32	14124	2.3	0.9	0.6	1.3	3	35	12352	2.8	1.0	0.7	1.3
Neonatal ICU Level II/III	6	21	9214	2.3	1.1	0.7	1.6	7	0	2138	0.0	0.0	0.0	1.2	5	18	4910	3.7	1.4	0.8	2.3
TOTAL	.	.	.	.	**0.8**	**0.6**	**1.1**	.	.	.	.	**0.8**	**0.6**	**1.2**	.	.	.	.	**1.1**	**0.8**	**1.4**

Data reported as of February 4, 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 rate for 2009 is significantly higher than National 2006-2008 rates
Blue highlighting indicates rate for 2009 is significantly lower than National 2006-2008 rate

Table 26: Comparison of Tennessee and NHSN Central Line-Associated Bloodstream Infection (CLABSI) Rates in Level III Neonatal ICUs [Reportable period: 01/01/2009–12/31/2009]

	TENNESSEE 1/2009-12/2009					NHSN 2006-2008				SIR AND 95% CONFIDENCE INTERVAL		
Birth Weight	No.	CLABSI	CL DAYS	POOLED MEAN*	MEDIAN RATE*	CLABSI	CL DAYS	POOLED MEAN*	MEDIAN RATE*	SIR	LOWER LIMIT	UPPER LIMIT
≤750 grams	7	29	7257	4.0	4.4	481	122272	3.9	3.2	1.0	0.7	1.5
751-1000 grams	7	12	5264	2.3	1.4	373	111293	3.4	2.5	0.7	0.4	1.2
1001-1500 grams	7	8	5551	1.4	0.0	276	112926	2.4	1.4	0.6	0.3	1.2
1501-2500 grams	7	10	4324	2.3	1.9	216	90384	2.4	0.7	1.0	0.5	1.8
>2500 grams	7	4	4182	1.0	0.2	157	82677	1.9	0.0	0.5	0.1	1.3
TOTAL	.	.	.	.		.	.	.	.	**0.8**	**0.6**	**1.0**

Data reported as of February 4, 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 rate for 2009 is significantly higher than National 2006-2008 rates
Blue highlighting indicates rate for 2009 is significantly lower than National 2006-2008 rates

Table 27: Comparison of Tennessee and NHSN Central Line-Associated Bloodstream Infection (CLABSI) Rates in Level II/III Neonatal ICUs [Reportable period: 01/01/2009–12/31/2009]

	TENNESSEE 1/2009-12/2009					NHSN 2006-2008				SIR AND 95% CONFIDENCE INTERVAL		
Birth Weight	No.	CLABSI	CL DAYS	POOLED MEAN*	MEDIAN RATE*	CLABSI	CL DAYS	POOLED MEAN*	MEDIAN RATE*	SIR	LOWER LIMIT	UPPER LIMIT
≤750 grams	18	7	1193	5.9	0.0	250	60199	4.2	2.6	1.4	0.6	2.9
751-1000 grams	18	10	2037	4.9	0.0	159	49673	3.2	1.7	1.5	0.7	2.8
1001-1500 grams	18	9	2305	3.9	0.0	120	58893	2.0	0.6	1.9	0.9	3.6
1501-2500 grams	18	1	2535	0.4	0.0	65	43544	1.5	0.0	0.3	0.0	1.5
>2500 grams	18	2	1196	1.7	0.0	49	39669	1.2	0.0	1.4	0.2	4.9
TOTAL	.	.	.	.		.	.	.	.	**1.4**	**0.9**	**1.9**

Data reported as of February 4, 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 rate for 2009 is significantly higher than National 2006-2008 rates
Blue highlighting indicates rate for 2009 is significantly lower than National 2006-2008 rates

Table 28: Comparison of Tennessee and NHSN Umbilical Catheter-Associated Bloodstream Infection (UCABSI) Rates in Level III Neonatal ICUs [Reportable period: 01/01/2009–12/31/2009]

	TENNESSEE 1/2009-12/2009					NHSN 2006-2008				SIR AND 95% CONFIDENCE INTERVAL		
Birth Weight	No.	UCABSI	UL DAYS	POOLED MEAN*	MEDIAN RATE*	CLABSI	UL DAYS	POOLED MEAN*	MEDIAN RATE*	SIR	LOWER LIMIT	UPPER LIMIT
≤750 grams	7	10	1792	5.6	4.4	129	32948	3.9	0.0	1.4	0.7	2.6
751-1000 grams	7	5	1496	3.3	0.0	75	29492	2.5	0.0	1.3	0.4	3.1
1001-1500 grams	7	2	1611	1.2	0.0	59	34379	1.7	0.0	0.7	0.1	2.6
1501-2500 grams	7	1	1781	0.6	0.0	28	32499	0.9	0.0	0.7	0.0	3.6
>2500 grams	7	0	2376	0.0	0.0	40	45568	0.9	0.0	0.0	0.0	1.8
TOTAL	.	.	.	.		.	.	.	.	**1.0**	**0.6**	**1.7**

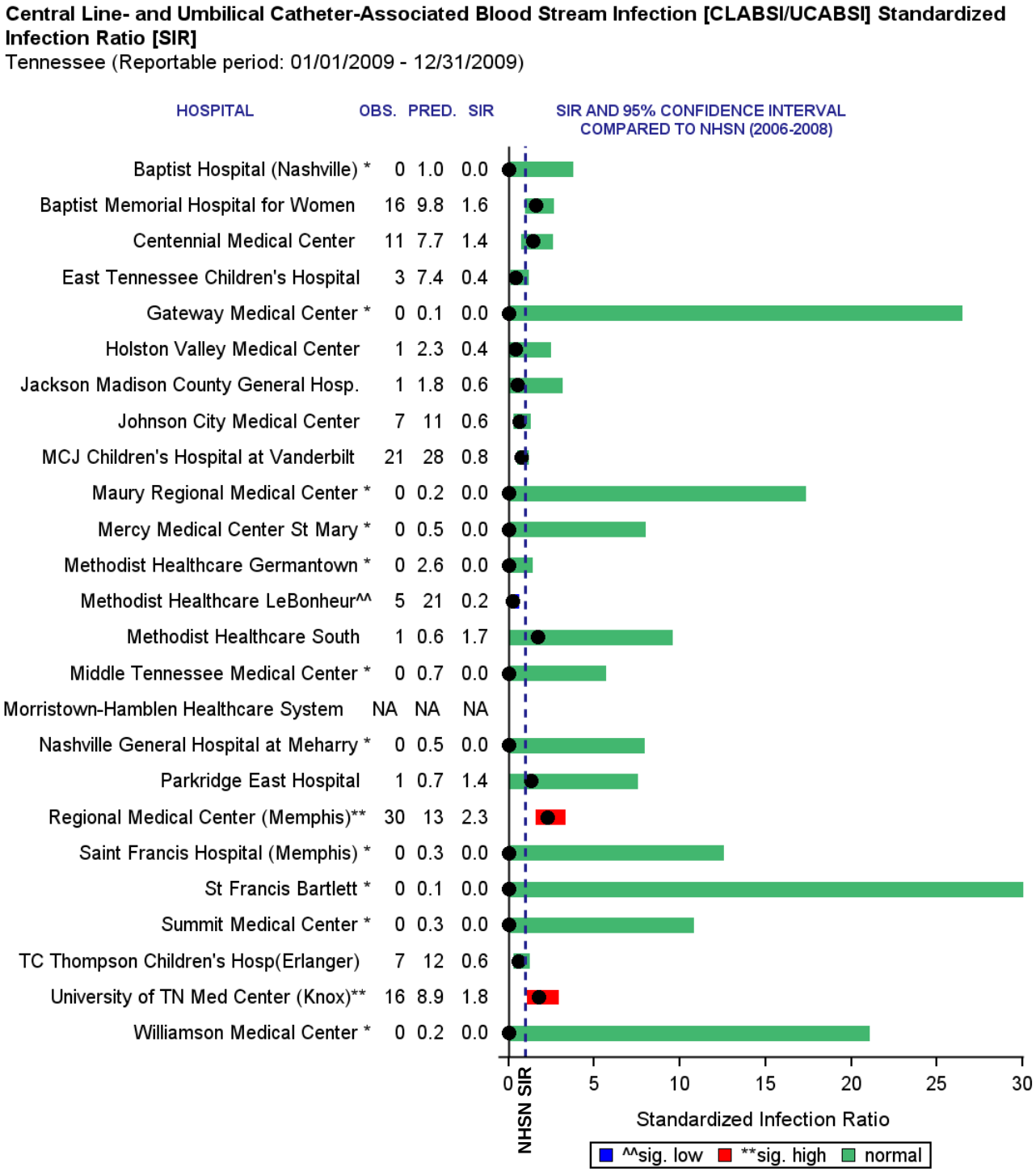
Data reported as of February 4, 2011
No. number of facilities with reporting units
CL Days Central Line Days
SIR Standardized Infection Ratio (observed number/ statistically 'predicted' number of CLABSI)
****per 1000 central line days***
Red highlighting indicates rate for 2009 is significantly higher than National 2006-2008 rates
Blue highlighting indicates rate for 2009 is significantly lower than National 2006-2008 rates

Table 29: Comparison of Tennessee and NHSN Umbilical Catheter-Associated Bloodstream Infection (UCABSI) Rates in Level II/III Neonatal ICUs [Reportable period: 01/01/2009–12/31/2009]

	TENNESSEE 1/2009-12/2009					NHSN 2006-2008				SIR AND 95% CONFIDENCE INTERVAL		
Birth Weight	No.	UCABSI	UL DAYS	POOLED MEAN*	MEDIAN RATE*	CLABSI	UL DAYS	POOLED MEAN*	MEDIAN RATE*	SIR	LOWER LIMIT	UPPER LIMIT
≤750 grams	18	5	925	5.4	0.0	98	17084	5.7	4.0	0.9	0.3	2.2
751-1000 grams	18	1	853	1.2	0.0	51	16128	3.2	0.0	0.4	0.0	2.1
1001-1500 grams	18	1	1103	0.9	0.0	33	19459	1.7	0.0	0.5	0.0	3.0
1501-2500 grams	18	1	1722	0.6	0.0	19	18724	1.0	0.0	0.6	0.0	3.2
>2500 grams	18	2	2393	0.8	0.0	26	25890	1.0	0.0	0.8	0.1	3.0
TOTAL	.	.	.	.		.	.	.	.	**0.7**	**0.3**	**1.3**

Data reported as of February 4, 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 rate for 2009 is significantly higher than National 2006-2008 rates
Blue highlighting indicates rate for 2009 is significantly lower than National 2006-2008 rates

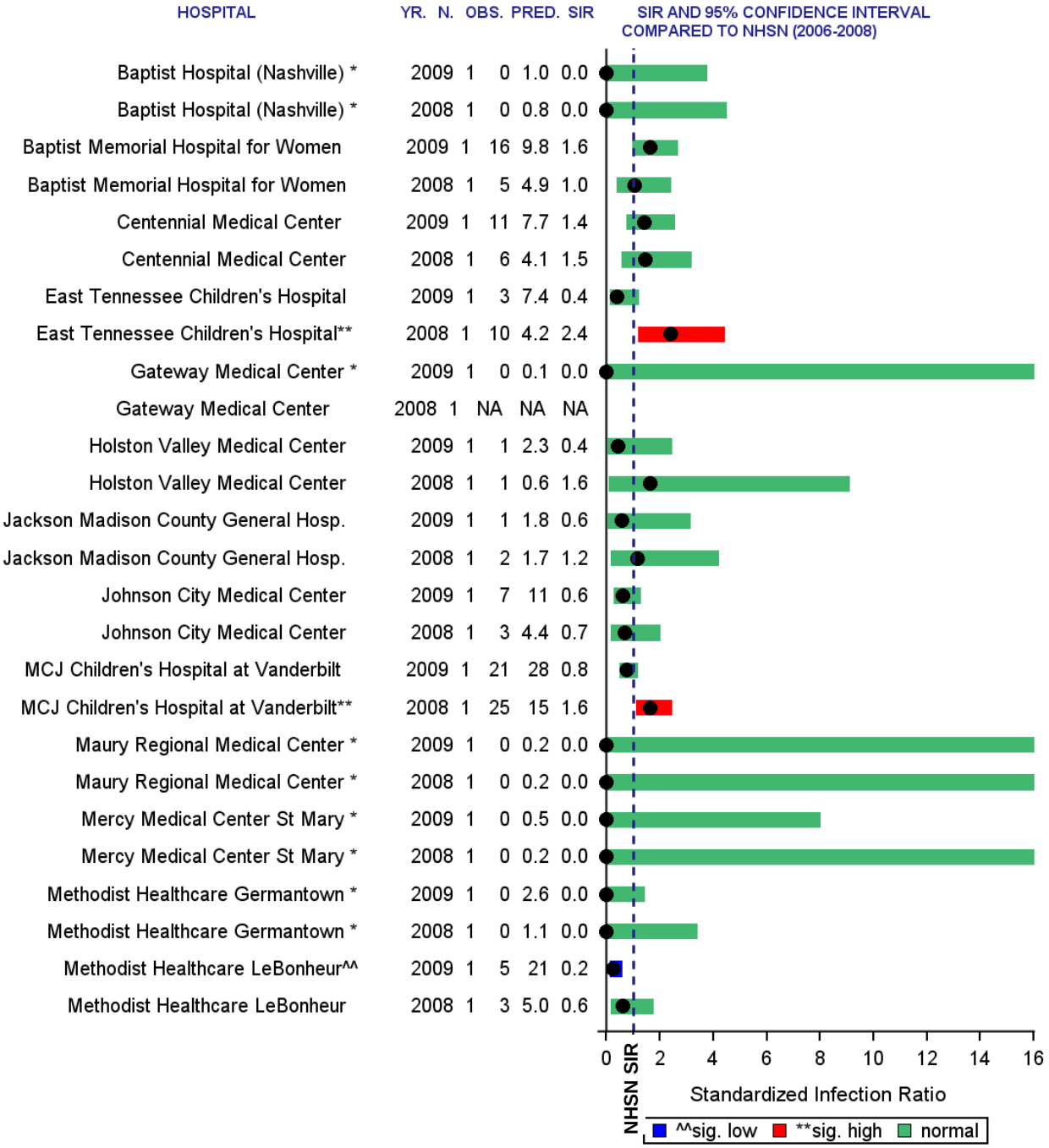
Figure 35: Summary Measure for CLABSIs/UCABSIs in Neonatal Critical Care Units, One Standardized Infection Ratio (SIR) per Facility. Tennessee, 1/2009–12/2009



Data Reported from neonatal ICUs as of February 4, 2011.
Obs. = observed number of CLABSI/UCABSI
Pred. = statistically 'predicted' number of CLABSI/UCABSI, based on NHSN data
SIR = Standarized 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 36: Summary Measure for CLABSIs in Neonatal Critical Care Units, One Standardized Infection Ratio (SIR) per Facility per Year, Tennessee, 2008 and 2009

Central Line- and Umbilical Catheter-Associated Bloodstream Infection [CLABSI/UCABSI] Standardized Infection Ratio [SIR]
Tennessee (Reportable period: 07/01/2008-12/31/2009)

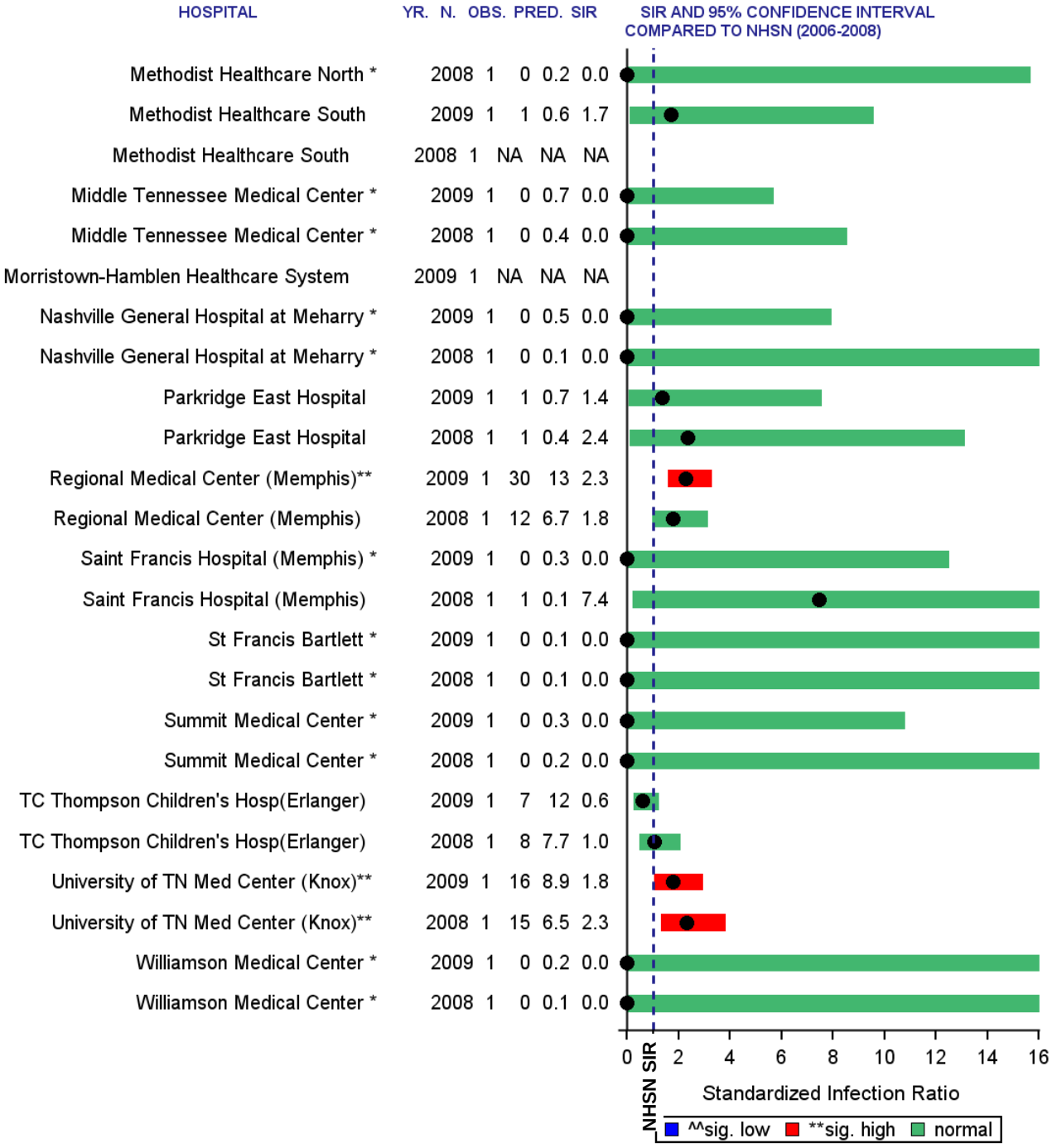


Data Reported from neonatal ICUs as of February 4, 2011.
Yr. = reporting year
N. = number of types of critical care units reportable from a given facility
Obs. = observed number of CLABSI
Pred. = statistically 'predicted' number of CLABSI/UCABSI, based on NHSN data
SIR = Standarized Infection Ratio (observed 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 36 (cont'd)

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

Tennessee (Reportable period: 07/01/2008-12/31/2009)



Data Reported from neonatal ICUs as of February 4, 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 = Standarized 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*

Table 30: Measures of Central Line- and Umbilical Catheter-Associated Bloodstream Infections (CLABSIs/UCABSIs) in Level III Neonatal ICUs, Birth Weight ≤750 grams [Reportable period: 01/01/2009–12/31/2009]

	INCIDENCE DENSITY RATE (LINE DAYS)				DEVICE UTILIZATION		INCIDENCE DENSITY RATE (INPATIENT DAYS)	
Hospital	RATE*	Lower Limit	Upper limit	TN %ile	DU(%)	TN %ile	INPATIENT DAYS	RATE**
Centennial Medical Center	9.5	3.8	19.7	100	31	14	2361	3.0
Johnson City Medical Center	4.4	1.2	11.2	57	70	86	1303	3.1
MCJ Children's Hospital at Vanderbilt	5.3	2.6	9.4	71	53	71	3965	2.8
Methodist Healthcare Germantown	0.0	0.0	12.1	14	35	29	860	0.0
Methodist Healthcare LeBonheur	0.4	0.0	2.3	29	72	100	3375	0.3
Regional Medical Center (Memphis)	9.0	4.9	15.2	86	42	43	3727	3.8
TC Thompson Children's Hosp(Erlanger)	2.0	0.2	7.1	43	42	43	2408	0.8

Data reported as of February 4, 2011
**** per 1000 line days***
***** per 1000 inpatient days***
TN%ile percentile in TN
DU(%) device utilization(%)
NA not reported due to central line days <50
NA* not available because of no inpatient days
Red highlighting indicates rate for 2009 is significantly higher than the National 2006-2008 rate of 3.9 BSIs/1000 line days
Blue highlighting indicates rate for 2009 is significantly lower than the National 2006-2008 rate of 3.9 BSIs/1000 line days

Table 31: Measures of Central Line- and Umbilical Catheter-Associated Bloodstream Infections (CLABSIs/UCABSIs) in Level III Neonatal ICUs, Birth Weight 751-1000 grams [Reportable period: 01/01/2009–12/31/2009]

	INCIDENCE DENSITY RATE (LINE DAYS)				DEVICE UTILIZATION		INCIDENCE DENSITY RATE (INPATIENT DAYS)	
Hospital	RATE*	Lower Limit	Upper limit	TN %ile	DU(%)	TN %ile	INPATIENT DAYS	RATE**
Centennial Medical Center	3.3	0.4	11.8	86	25	14	2435	0.8
Johnson City Medical Center	0.0	0.0	5.7	14	53	86	1227	0.0
MCJ Children's Hospital at Vanderbilt	2.0	0.5	5.2	71	47	71	4240	0.9
Methodist Healthcare Germantown	0.0	0.0	13.9	14	26	29	1036	0.0
Methodist Healthcare LeBonheur	0.0	0.0	3.8	14	72	100	1348	0.0
Regional Medical Center (Memphis)	7.4	3.6	13.6	100	38	57	3542	2.8
TC Thompson Children's Hosp(Erlanger)	1.1	0.0	6.0	57	30	43	3096	0.3

Data reported as of February 4, 2011
**** per 1000 line days***
***** per 1000 inpatient days***
TN%ile percentile in TN
DU(%) device utilization(%)
NA not reported due to central line days <50
NA* not available because of no inpatient days
Red highlighting indicates rate for 2009 is significantly higher than the National 2006-2008 rate of 3.2 BSIs/1000 line days
Blue highlighting indicates rate for 2009 is significantly lower than the National 2006-2008 rate of 3.2 BSIs/1000 line days

Table 32: Measures of Central Line- and Umbilical Catheter-Associated Bloodstream Infections (CLABSIs/UCABSIs) in Level III Neonatal ICUs, Birth Weight 1001-1500 grams [Reportable period: 01/01/2009–12/31/2009]

	INCIDENCE DENSITY RATE (LINE DAYS)				DEVICE UTILIZATION		INCIDENCE DENSITY RATE (INPATIENT DAYS)	
Hospital	RATE*	Lower Limit	Upper limit	TN %ile	DU(%)	TN %ile	INPATIENT DAYS	RATE**
Centennial Medical Center	0.0	0.0	4.3	14	22	43	3878	0.0
Johnson City Medical Center	2.3	0.5	6.8	86	51	86	2524	1.2
MCJ Children's Hospital at Vanderbilt	0.5	0.0	3.1	71	40	71	4522	0.2
Methodist Healthcare Germantown	0.0	0.0	17.7	14	15	14	1395	0.0
Methodist Healthcare LeBonheur	0.0	0.0	4.2	14	67	100	1293	0.0
Regional Medical Center (Memphis)	6.6	2.4	14.4	100	21	29	4329	1.4
TC Thompson Children's Hosp(Erlanger)	0.0	0.0	3.1	14	30	57	3937	0.0

Data reported as of February 4, 2011
**** per 1000 line days***
***** per 1000 inpatient days***
TN%ile percentile in TN
DU(%) device utilization(%)
NA not reported due to central line days <50
NA* not available because of no inpatient days
Red highlighting indicates rate for 2009 is significantly higher than the National 2006-2008 rate of 2.3 BSIs/1000 line days
Blue highlighting indicates rate for 2009 is significantly lower than the National 2006-2008 rate of 2.3 BSIs/1000 line days

Table 33: Measures of Central Line- and Umbilical Catheter-Associated Bloodstream Infection (CLABSIs/UCABSIs) in Level III Neonatal ICUs, Birth Weight 1501-2500 grams [Reportable period: 01/01/2009–12/31/2009]

	INCIDENCE DENSITY RATE (LINE DAYS)				DEVICE UTILIZATION		INCIDENCE DENSITY RATE (INPATIENT DAYS)	
Hospital	RATE*	Lower Limit	Upper limit	TN %ile	DU(%)	TN %ile	INPATIENT DAYS	RATE**
Centennial Medical Center	3.1	0.4	11.1	86	14	43	4665	0.4
Johnson City Medical Center	0.0	0.0	3.6	14	36	71	2862	0.0
MCJ Children's Hospital at Vanderbilt	2.0	0.5	5.0	71	40	86	5123	0.8
Methodist Healthcare Germantown	0.0	0.0	35.1	14	6	14	1628	0.0
Methodist Healthcare LeBonheur	1.7	0.2	6.0	57	52	100	2291	0.9
Regional Medical Center (Memphis)	0.0	0.0	12.6	14	6	14	4701	0.0
TC Thompson Children's Hosp(Erlanger)	3.8	0.8	11.2	100	16	57	4958	0.6

Data reported as of February 4, 2011
**** per 1000 line days***
***** per 1000 inpatient days***
TN%ile percentile in TN
DU(%) device utilization(%)
NA not reported due to central line days <50
NA* not available because of no inpatient days
Red highlighting indicates rate for 2009 is significantly higher than the National 2006-2008 rate of 2.0 BSIs/1000 line days
Blue highlighting indicates rate for 2009 is significantly lower than the National 2006-2008 rate of 2.0 BSIs/1000 line days

Table 34: Measures of Central Line- and Umbilical Catheter-Associated Bloodstream Infections (CLABSIs/UCABSIs) in Level III Neonatal ICUs, Birth Weight >2500 grams [Reportable period: 01/01/2009–12/31/2009]

	INCIDENCE DENSITY RATE (LINE DAYS)				DEVICE UTILIZATION		INCIDENCE DENSITY RATE (INPATIENT DAYS)	
Hospital	RATE*	Lower Limit	Upper limit	TN %ile	DU(%)	TN %ile	INPATIENT DAYS	RATE**
Centennial Medical Center	0.0	0.0	9.7	14	16	43	2299	0.0
Johnson City Medical Center	0.0	0.0	4.4	14	38	71	2166	0.0
MCJ Children's Hospital at Vanderbilt	0.3	0.0	1.9	71	49	86	6017	0.2
Methodist Healthcare Germantown	0.0	0.0	50.5	14	9	29	820	0.0
Methodist Healthcare LeBonheur	1.2	0.1	4.2	86	50	100	3413	0.6
Regional Medical Center (Memphis)	0.0	0.0	36.2	14	3	14	3262	0.0
TC Thompson Children's Hosp(Erlanger)	1.9	0.0	10.6	100	18	57	2984	0.3

Data reported as of February 4, 2011
**** per 1000 line days***
***** per 1000 inpatient days***
TN%ile percentile in TN
DU(%) device utilization(%)
NA not reported due to central line days <50
NA* not available because of no inpatient days
Red highlighting indicates rate for 2009 is significantly higher than the National 2006-2008 rate of 1.5 BSIs/1000 line days
Blue highlighting indicates rate for 2009 is significantly lower than the National 2006-2008 rate of 1.5 BSIs/1000 line days

Table 35: Measures of Central Line- and Umbilical Catheter-Associated Bloodstream Infections (CLABSIs/UCABSIs) in Level II/III Neonatal ICUs, Birth Weight ≤750 grams [Reportable period: 01/01/2009–12/31/2009]

	INCIDENCE DENSITY RATE (LINE DAYS)				DEVICE UTILIZATION		INCIDENCE DENSITY RATE (INPATIENT DAYS)	
Hospital	RATE*	Lower Limit	Upper limit	TN %ile	DU(%)	TN %ile	INPATIENT DAYS	RATE**
Baptist Hospital (Nashville)	0.0	0.0	52.7	10	11	18	614	0.0
Baptist Memorial Hospital for Women	5.2	1.4	13.4	70	69	82	1110	3.6
East Tennessee Children's Hospital	2.1	0.1	11.5	60	52	64	930	1.1
Gateway Medical Center	NA	NA	NA	NA	NA*	NA*	0	NA*
Holston Valley Medical Center	6.4	0.2	35.5	80	56	73	281	3.6
Jackson Madison County General Hosp.	7.6	0.2	42.2	90	92	91	143	7.0
Maury Regional Medical Center	NA	NA	NA	NA	0	9	18	0.0
Mercy Medical Center St Mary	NA	NA	NA	NA	NA*	NA*	0	NA*
Methodist Healthcare South	0.0	0.0	61.5	10	45	45	134	0.0
Middle Tennessee Medical Center	NA	NA	NA	NA	NA*	NA*	0	NA*
Morristown-Hamblen Healthcare System	NA	NA	NA	NA	NA*	NA*	0	NA*
Nashville General Hospital at Meharry	NA	NA	NA	NA	50	55	2	0.0
Parkridge East Hospital	NA	NA	NA	NA	44	36	9	0.0
Saint Francis Hospital (Memphis)	NA	NA	NA	NA	NA*	NA*	0	NA*
St Francis Bartlett	NA	NA	NA	NA	NA*	NA*	0	NA*
Summit Medical Center	NA	NA	NA	NA	100	100	1	0.0
University of TN Med Center (Knox)	11.2	3.6	26.1	100	39	27	1149	4.4
Williamson Medical Center	NA	NA	NA	NA	NA*	NA*	0	NA*

Data reported as of February 4, 2011
**** per 1000 line days***
***** per 1000 inpatient days***
TN%ile percentile in TN
DU(%) device utilization(%)
NA not reported due to central line days <50
NA* not available because of no inpatient days
Red highlighting indicates rate for 2009 is significantly higher than the National 2006-2008 rate of 4.5 BSIs/1000 line days
Blue highlighting indicates rate for 2009 is significantly lower than the National 2006-2008 rate of 4.5 BSIs/1000 line days

Table 36: Measures of Central Line- and Umbilical Catheter-Associated Bloodstream Infections (CLABSIs/UCABSIs) in Level II/III Neonatal ICUs, Birth Weight 751-1000 grams [Reportable period: 01/01/2009–12/31/2009]

	INCIDENCE DENSITY RATE (LINE DAYS)				DEVICE UTILIZATION		INCIDENCE DENSITY RATE (INPATIENT DAYS)	
Hospital	RATE*	Lower Limit	Upper limit	TN %ile	DU(%)	TN %ile	INPATIENT DAYS	RATE**
Baptist Hospital (Nashville)	0.0	0.0	51.2	8	8	21	926	0.0
Baptist Memorial Hospital for Women	7.2	2.6	15.6	92	42	50	2009	3.0
East Tennessee Children's Hospital	1.4	0.0	7.7	69	39	36	1884	0.5
Gateway Medical Center	NA	NA	NA	NA	6	14	16	0.0
Holston Valley Medical Center	0.0	0.0	38.0	8	44	57	222	0.0
Jackson Madison County General Hosp.	0.0	0.0	17.4	8	51	64	412	0.0
Maury Regional Medical Center	NA	NA	NA	NA	0	7	14	0.0
Mercy Medical Center St Mary	0.0	0.0	72.3	8	65	86	78	0.0
Methodist Healthcare South	NA	NA	NA	NA	41	43	107	9.3
Middle Tennessee Medical Center	NA	NA	NA	NA	NA*	NA*	0	NA*
Morristown-Hamblen Healthcare System	NA	NA	NA	NA	NA*	NA*	0	NA*
Nashville General Hospital at Meharry	NA	NA	NA	NA	NA*	NA*	0	NA*
Parkridge East Hospital	5.9	0.1	33.0	85	53	71	318	3.1
Saint Francis Hospital (Memphis)	NA	NA	NA	NA	55	79	64	0.0
St Francis Bartlett	NA	NA	NA	NA	NA*	NA*	0	NA*
Summit Medical Center	NA	NA	NA	NA	100	93	2	0.0
University of TN Med Center (Knox)	3.1	0.4	11.3	77	31	29	2056	1.0
Williamson Medical Center	NA	NA	NA	NA	100	93	1	0.0

Data reported as of February 4, 2011
**** per 1000 line days***
***** per 1000 inpatient days***
TN%ile percentile in TN
DU(%) device utilization(%)
NA not reported due to central line days <50
NA* not available because of no inpatient days
Red highlighting indicates rate for 2009 is significantly higher than the National 2006-2008 rate of 3.2 BSIs/1000 line days
Blue highlighting indicates rate for 2009 is significantly lower than the National 2006-2008 rate of 3.2 BSIs/1000 line days

Table 37: Measures of Central Line- and Umbilical Catheter-Associated Bloodstream Infections (CLABSIs/UCABSIs) in Level II/III Neonatal ICUs, Birth Weight 1001-1500 grams [Reportable period: 01/01/2009–12/31/2009]

	INCIDENCE DENSITY RATE (LINE DAYS)				DEVICE UTILIZATION		INCIDENCE DENSITY RATE (INPATIENT DAYS)	
Hospital	RATE*	Lower Limit	Upper limit	TN %ile	DU(%)	TN %ile	INPATIENT DAYS	RATE**
Baptist Hospital (Nashville)	0.0	0.0	62.5	7	6	13	992	0.0
Baptist Memorial Hospital for Women	2.7	0.5	7.8	93	41	81	2772	1.1
East Tennessee Children's Hospital	0.0	0.0	8.0	7	21	50	2177	0.0
Gateway Medical Center	NA	NA	NA	NA	0	6	240	0.0
Holston Valley Medical Center	0.0	0.0	17.6	7	38	69	551	0.0
Jackson Madison County General Hosp.	0.0	0.0	22.8	7	11	19	1528	0.0
Maury Regional Medical Center	NA	NA	NA	NA	14	38	240	0.0
Mercy Medical Center St Mary	NA	NA	NA	NA	47	88	104	0.0
Methodist Healthcare South	0.0	0.0	55.1	7	23	56	288	0.0
Middle Tennessee Medical Center	NA	NA	NA	NA	NA*	NA*	0	NA*
Morristown-Hamblen Healthcare System	NA	NA	NA	NA	NA*	NA*	0	NA*
Nashville General Hospital at Meharry	0.0	0.0	59.5	7	61	94	101	0.0
Parkridge East Hospital	NA	NA	NA	NA	11	19	253	0.0
Saint Francis Hospital (Memphis)	NA	NA	NA	NA	13	31	360	0.0
St Francis Bartlett	NA	NA	NA	NA	17	44	207	0.0
Summit Medical Center	0.0	0.0	51.2	7	99	100	73	0.0
University of TN Med Center (Knox)	7.2	2.9	14.9	100	36	63	2655	2.6
Williamson Medical Center	NA	NA	NA	NA	38	69	69	0.0

Data reported as of February 4, 2011
**** per 1000 line days***
***** per 1000 inpatient days***
TN%ile percentile in TN
DU(%) device utilization(%)
NA not reported due to central line days <50
NA* not available because of no inpatient days
Red highlighting indicates rate for 2009 is significantly higher than the National 2006-2008 rate of 2.0 BSIs/1000 line days
Blue highlighting indicates rate for 2009 is significantly lower than the National 2006-2008 rate of 2.0 BSIs/1000 line days

Table 38: Measures of Central Line- and Umbilical Catheter-Associated Bloodstream Infections (CLABSIs/UCABSIs) in Level II/III Neonatal ICUs, Birth Weight 1501-2500 grams [Reportable period: 01/01/2009–12/31/2009]

	INCIDENCE DENSITY RATE (LINE DAYS)				DEVICE UTILIZATION		INCIDENCE DENSITY RATE (INPATIENT DAYS)	
Hospital	RATE*	Lower Limit	Upper limit	TN %ile	DU(%)	TN %ile	INPATIENT DAYS	RATE**
Baptist Hospital (Nashville)	0.0	0.0	32.9	6	6	24	1774	0.0
Baptist Memorial Hospital for Women	1.6	0.0	8.6	100	20	76	3190	0.3
East Tennessee Children's Hospital	0.0	0.0	5.2	6	19	71	3726	0.0
Gateway Medical Center	0.0	0.0	46.7	6	7	35	1099	0.0
Holston Valley Medical Center	0.0	0.0	7.6	6	26	82	1863	0.0
Jackson Madison County General Hosp.	0.0	0.0	39.2	6	3	12	3546	0.0
Maury Regional Medical Center	0.0	0.0	46.7	6	11	53	710	0.0
Mercy Medical Center St Mary	0.0	0.0	40.1	6	11	53	812	0.0
Methodist Healthcare South	NA	NA	NA	NA	1	6	469	0.0
Middle Tennessee Medical Center	NA	NA	NA	NA	NA*	NA*	0	NA*
Morristown-Hamblen Healthcare System	NA	NA	NA	NA	5	18	91	0.0
Nashville General Hospital at Meharry	0.0	0.0	24.6	6	39	94	388	0.0
Parkridge East Hospital	0.0	0.0	52.7	6	8	41	933	0.0
Saint Francis Hospital (Memphis)	0.0	0.0	60.5	6	6	24	1065	0.0
St Francis Bartlett	NA	NA	NA	NA	9	47	378	0.0
Summit Medical Center	0.0	0.0	35.1	6	95	100	111	0.0
University of TN Med Center (Knox)	0.7	0.0	3.8	94	26	82	5652	0.2
Williamson Medical Center	0.0	0.0	65.9	6	15	65	377	0.0

Data reported as of February 4, 2011
**** per 1000 line days***
***** per 1000 inpatient days***
TN%ile percentile in TN
DU(%) device utilization(%)
NA not reported due to central line days <50
NA* not available because of no inpatient days
Red highlighting indicates rate for 2009 is significantly higher than the National 2006-2008 rate of 1.3 BSIs/1000 line days
Blue highlighting indicates rate for 2009 is significantly lower than the National 2006-2008 rate of 1.3 BSIs/1000 line days

Table 39: Measures of Central Line- and Umbilical Catheter-Associated Bloodstream Infections (CLABSIs/UCABSIs) in Level II/III Neonatal ICUs, Birth weight >2500 grams [Reportable period: 01/01/2009–12/31/2009]

	INCIDENCE DENSITY RATE (LINE DAYS)				DEVICE UTILIZATION		INCIDENCE DENSITY RATE (INPATIENT DAYS)	
Hospital	RATE*	Lower Limit	Upper limit	TN %ile	DU(%)	TN %ile	INPATIENT DAYS	RATE**
Baptist Hospital (Nashville)	0.0	0.0	25.1	6	22	72	675	0.0
Baptist Memorial Hospital for Women	4.9	0.6	17.6	100	30	83	1351	1.5
East Tennessee Children's Hospital	1.1	0.0	6.0	89	30	83	3113	0.3
Gateway Medical Center	0.0	0.0	68.3	6	7	17	773	0.0
Holston Valley Medical Center	0.0	0.0	19.1	6	19	67	1018	0.0
Jackson Madison County General Hosp.	0.0	0.0	72.3	6	3	6	1678	0.0
Maury Regional Medical Center	0.0	0.0	67.1	6	14	50	385	0.0
Mercy Medical Center St Mary	0.0	0.0	51.2	6	9	28	783	0.0
Methodist Healthcare South	NA	NA	NA	NA	9	28	258	0.0
Middle Tennessee Medical Center	0.0	0.0	5.7	6	18	61	3573	0.0
Morristown-Hamblen Healthcare System	NA	NA	NA	NA	10	39	99	0.0
Nashville General Hospital at Meharry	0.0	0.0	39.2	6	35	94	268	0.0
Parkridge East Hospital	0.0	0.0	64.7	6	10	39	586	0.0
Saint Francis Hospital (Memphis)	NA	NA	NA	NA	7	17	587	0.0
St Francis Bartlett	NA	NA	NA	NA	5	11	509	0.0
Summit Medical Center	0.0	0.0	41.0	6	87	100	104	0.0
University of TN Med Center (Knox)	1.6	0.0	9.0	94	22	72	2880	0.3
Williamson Medical Center	0.0	0.0	55.9	6	17	56	382	0.0

Data reported as of February 4, 2011
**** per 1000 line days***
***** per 1000 inpatient days***
TN%ile percentile in TN
DU(%) device utilization(%)
NA not reported due to central line days <50
NA* not available because of no inpatient days
Red highlighting indicates rate for 2009 is significantly higher than the National 2006-2008 rate of 1.1 BSIs/1000 line days
Blue highlighting indicates rate for 2009 is significantly lower than the National 2006-2008 rate of 1.1 BSIs/1000 line days

Surgical Site Infection (SSI)

Methods and Results

METHODS:

SSI Reporting for 2008

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. 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 CABGs were required to report.

This report displays Tennessee SSI rates calculated from calendar year 2008. These rates are calculated with the following equation:

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

There are two similar procedures that fall under CABG procedures, those with only a chest incision (CBGC) and those with a chest and donor site incision (CBGB). This report displays separate rates for CBGBs and CBGCs.

RESULTS:

In 2008, Tennessee hospitals reported 8709 coronary artery bypass graft surgeries; 8185 were coronary bypass procedures with chest and donor site incisions (CBGBs), and 524 were coronary bypass procedures with chest incision only (CBGC). Among the 8185 CBGBs, 160 surgical site infections were reported. Four infections were reported among the 524 CBGC procedures (Table 40). Overall, CBGB SSIs were most often superficial primary (31%) and least often deep secondary infections (5%) (Figure 39). The most common pathogens among total positive isolates were *Staphylococcus aureus* (33.6%) and coagulase-negative *Staphylococcus* species (21.7%) (Table 42). SSIs were most often identified upon readmission (64%) (Figure 40).

SSI Figures and Tables

CBGB and CBGC Procedures

January 1, 2008 – December 31, 2008

Table 40: Pooled Means of the Distribution of SSI Rates by Operative Procedure and Risk Index Categories, Tennessee, 01/01/2008–12/31/2008

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 Pooled Mean
CBGB	Coronary bypass with chest and donor incision	301	0	12	100	2	**2.00**	0.35
CBGB	Coronary bypass with chest and donor incision	301	1	24	6612	121	**1.83**	2.55
CBGB	Coronary bypass with chest and donor incision	301	2	23	1470	37	**2.52**	4.26
CBGB	Coronary bypass with chest and donor incision	301	2	2	3	0	**0.00**	8.49
CBGC	Coronary bypass with chest incision	286	0,1	22	436	2	**0.46**	1.37
CBGC	Coronary bypass with chest incision	286	2,3	15	88	2	**2.27**	2.29

Data reported as of February 4, 2011
****Per 100 operations***

Table 41: SSI Rates Following Coronary Artery Bypass Graft Procedure with Primary (Chest) and Secondary (Donor) Incisions, by Risk Index Category and Specific Site, Tennessee, 2008

	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
Secondary (donor site)	**1**	**1.00**	**0.12**	**30**	**0.45**	**0.66**	**12**	**0.82**	**1.52**	**0**	**0.00**	**2.82**
Superficial	1	1.00	0.12	26	0.39	0.51	8	0.54	1.13	0	0.00	2.82
Deep	0	0.00	0.00	4	0.06	0.15	4	0.27	0.39	0	0.00	0
Primary	**1**	**1.00**	**0.23**	**90**	**1.36**	**1.89**	**25**	**1.70**	**2.74**	**0**	**0.00**	**5.67**
Superficial	1	1.00	0.11	38	0.57	0.79	10	0.68	1.04	0	0.00	1.89
Deep	0	0.00	0.06	21	0.32	0.58	6	0.41	0.88	0	0.00	1.89
Organ Space	0	0.00	0.06	31	0.47	0.52	9	0.61	0.82	0	0.00	1.89
Total	**2**	**2.00**	**0.35**	**120**	**1.81**	**2.55**	**37**	**0.03**	**4.26**	**0**	**0.00**	**8.49**

NOTE: Denominators for TN rate for the risk categories are as follows: category 0, 100; category 1, 6612; category 2, 1470; category 3, 3.
CBGB coronary artery bypass graft surgery with primary (chest) and secondary (donor) incisions.
****Per 100 operations***

Figure 37: Surgical Site Infections Following Coronary Bypass with Chest and Donor Incision (CBGB) by Risk Category, Tennessee, 2008

Number of Events = 160

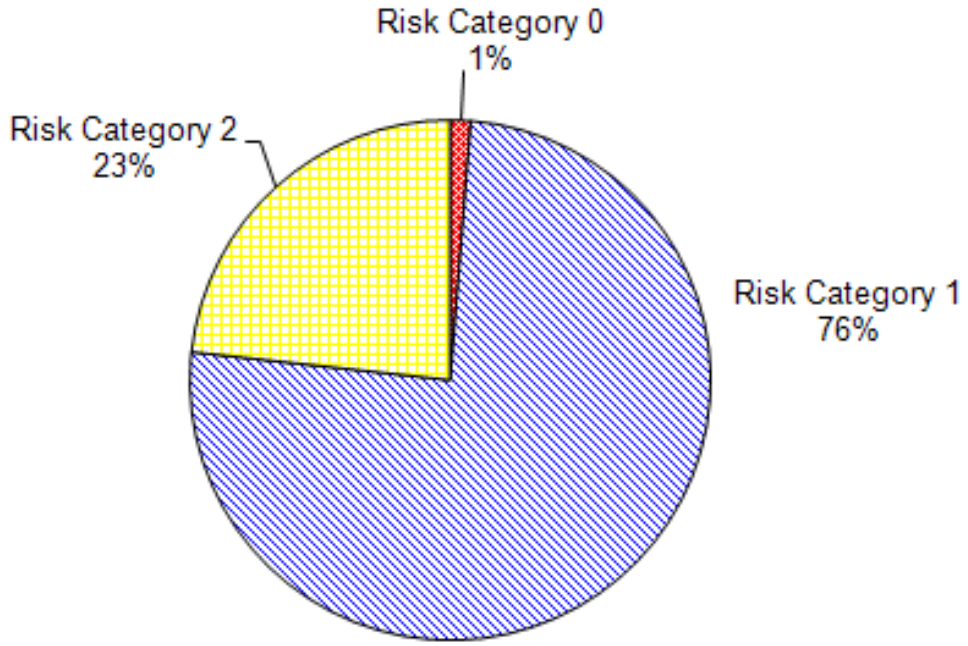


Figure 38: Organisms Isolated from Coronary Artery Bypass Graft (CBGB and CBGC) Surgical Site Infection, Tennessee, 2008

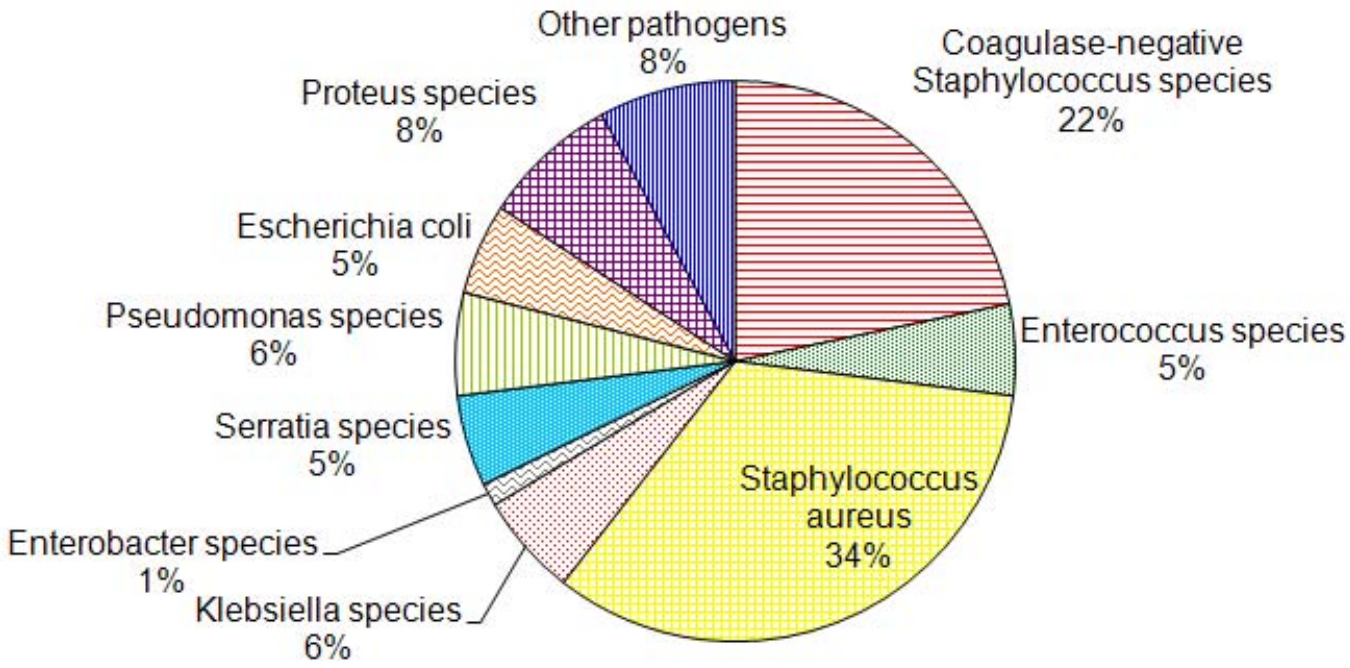


Table 42: Microorganisms Identified in Coronary Artery Bypass Graft Surgical Site Infections (CBGB and CBGC), Tennessee, 2008

Number of organisms = 152; number of events: 164

Microorganism	Number of Isolates	Percent
Staphylococcus aureus	51	33.6
Methicillin-resistant *S. aureus* (MRSA) only (% of total positive isolates)	33	(21.7)
Coagulase-negative *Staphylococcus* species	33	21.7
Proteus species	12	7.9
Klebsiella species	9	5.9
Pseudomonas species	9	5.9
Enterococcus species	8	5.3
Vancomycin-resistant *Enterococcus* (VRE) only (% of total positive isolates)	3	(2.0)
Serratia species	8	5.3
Escherichia coli	8	5.3
Enterobacter species	2	1.3
Other pathogens	12	7.9

Data reported as of February 4, 2011
Other pathogens = **Acinetobacter baumannii, Aeromonas hydrophila, Bacteroides fragilis, Bacillus** *spp.***, Candida albicans, Corynebacterium** *spp, diphtheroids,* **Listeria monocytogenes, Propionibacterium acnes,** ***and*** **Streptococcus** ***viridans*** *spp.*

Figure 39: Site-Specific Surgical Site Infections Following Coronary Bypass with Chest and Donor Incision (CBGB), Tennessee, 2008

Number of Events = 160

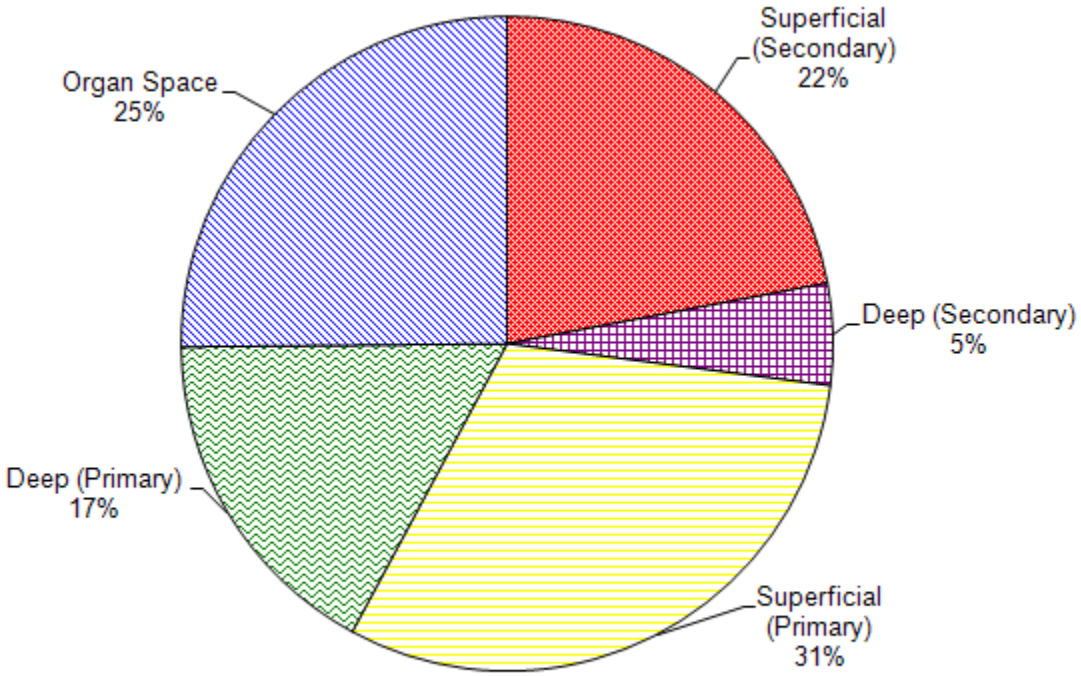


Table 43: Microorganisms Identified in Deep Incisional Primary Coronary Artery Bypass Graft (CBGB and CBGC) Surgical Site Infection, Tennessee, 2008

Number of organisms = 27; number of events: 27

Microorganism	Number of Isolates	Percent
Coagulase-negative *Staphylococcus* species	7	25.9
Staphylococcus aureus	5	18.5
Methicillin-resistant *S. aureus* (MRSA) only (% of total positive isolates)	5	(18.5)
Proteus species	4	14.8
Serratia species	3	11.1
Escherichia coli	2	7.4
Klebsiella species	2	7.4
Pseudomonas species	1	3.7
Streptocossus species	1	3.7
Listeria species	1	3.7
Prevotella species	1	3.7
Corynebacterium species	1	3.7

Data reported as of February 4, 2011

Table 44: Microorganisms Identified in Superficial Incisional Primary Coronary Artery Bypass Graft (CBGB and CBGC) Surgical Site Infection, Tennessee, 2008

Number of organisms = 37; number of events: 37

Microorganism	Number of Isolates	Percent
Coagulase-negative *Staphylococcus* species	11	29.7
Staphylococcus aureus	10	27.0
Methicillin-resistant *S. aureus* (MRSA) only (% of total positive isolates)	6	(16.2)
Klebsiella species	4	10.8
Serratia species	4	10.8
Proteus species	2	5.4
Enterococcus species (no VRE reported)	1	2.7
Enterobacter species	1	2.7
Escherichia coli	1	2.7
Bacillus species	1	2.7
Candida species	1	2.7
Pseudomonas species	1	2.7

Data reported as of February 4, 2011
VRE = vancomycin-resistant Enterococcus

Table 45: Microorganisms Identified in Deep Incisional Secondary Coronary Artery Bypass Graft (CBGB only) Surgical Site Infection, Tennessee, 2008

Number of organisms = 6; number of events: 8

Microorganism	Number of Isolates	Percent
Staphylococcus aureus	3	50.0
Methicillin-resistant *S. aureus* (MRSA) only (% of total positive isolates)	3	(50.0)
Enterobacter species	1	1.7
Pseudomonas species	1	1.7
Proteus species	1	1.7

Data reported as of February 4, 2011

Table 46: Microorganisms Identified in Superficial Incisional Secondary Coronary Artery Bypass Graft (CBGB only) Surgical Site Infection, Tennessee, 2008

Number of organisms = 34; number of events: 35

Microorganism	Number of Isolates	Percent
Staphylococcus aureus	13	38.2
Methicillin-resistant *S. aureus* (MRSA) only (% of total positive isolates)	9	(26.4)
Pseudomonas species	4	11.8
Coagulase-negative *Staphylococcus* species	3	8.8
Enterococcus species	3	8.8
Vancomycin-resistant *Enterococcus* (VRE) only (% of total positive isolates)	1	(2.9)
Escherichia coli	3	8.8
Klebsiella species	3	8.8
Proteus species	3	8.8
Enterobacter species	1	2.9
Aeromonas species	1	2.9

Data reported as of February 4, 2011

Table 47: Microorganisms Identified in Organ/Space Coronary Artery Bypass Graft (CBGB and CBGC) Surgical Site Infection, Tennessee, 2008

Number of organisms = 47; number of events: 40

Microorganism	Number of Isolates	Percent
Staphylococcus aureus	19	40.4
Methicillin-resistant *S. aureus* (MRSA) only (% of total positive isolates)	10	(21.3)
Coagulase-negative *Staphylococcus* species	12	25.5
Enterococcus species	3	6.4
Vancomycin-resistant *Enterococcus* (VRE) only (% of total positive isolates)	1	(2.1)
Proteus species	3	6.4
Pseudomonas species	2	4.3
Escherichia coli	2	4.3
Acinetobacter species	1	2.1
Bacteroides fragilis	1	2.1
Diphtheroids	1	2.1
Propionibacterium species	1	2.1
Enterobacter species	1	2.1
Serratia species	1	2.1

Data reported as of February 4, 2011

Figure 40: Time at Which Coronary Artery Bypass Graft Surgical Site Infection Detected, Tennessee, 2008