

# **Tennessee's Report on HAI: Overview of Report, Methodology, Format**

---

**Marion Kainer  
Tennessee Department of Health  
THA Webinar  
August 3, 2009**

# Acknowledgements:

- **THA/ TCPS for hosting this webinar**
- **Jonathan R. Edwards (DHQP, CDC)**
- **Valerie Haley (NY)**
- **Rachel Stricof (NY)**
- **Minn Soe**
- **Joan Mitchell**
  
- **All who collected and reported the data!**

# Objectives

- **Background:**
  - Review HAI point estimation
  - Explain standardized infection ratio (SIR)
  - Describe SIR calculations
- **Describe structure of Tennessee's report on HAI**
  - Draft examples

# Point Estimate

- What you get when you calculate HAI rates
- Turns surveillance “data” into decision making “information”
- Expresses surveillance information in numerical terms or metrics

$$\frac{\text{Numerator}}{\text{Denominator}} \times \text{Constant}$$

# Incidence Density Rate

- Type of rate that accounts for differences in follow-up (exposure) time for each person included in the at-risk population.
- Numerator is number of new cases of disease.
- Denominator is “person-time” units.

## Example 1:

Central line-associated BSI (CLABSI) rate

$$\frac{12 \text{ CLABSIs}}{4,000 \text{ central line-days}} \times 1,000 = 3.0$$

# Example CLABSI Rate Table

SAS Output - Windows Internet Explorer provided by ITS0

File Edit View Favorites Tools Help SnagIt

National Healthcare Safety Network

Rate Table for Central Line-Associated BSI Data for ICU-Other

As of: May 12, 2008 at 10:54 AM

Date Range: All CLAB\_RATESICU

**Local CLABSI Rates**

**Aggregate CLABSI Rate**

**p-values for local vs. aggregate**

Org ID=10000 CDC Location=IN:ACUTE CC:S

Location	Summary Mon/Yr	CLA BSI Count	Central Line Days	CLA BSI Rate	NHSN CLAB Pooled Mean	Incidence Density p-value	Incidence Density Percentile	Patient Days	CL Util Ratio	NHSN Line DU Pooled Mean	Proportion p-value	Proportion Percentile
SICU	2005M10	0	394	0.0	2.7	0.3385	10	436	0.90	0.62	0.0000	93
SICU	2005M11	1	314	3.2	2.7	0.5782	63	464	0.68	0.62	0.0054	72
SICU	2005M12	0	314	0.0	2.7	0.4218	10	452	0.69	0.62	0.0005	72
SICU	2006M01	1	541	1.8	2.7	0.5620	45	833	0.65	0.62	0.0337	46
SICU	2006M02	1	391	2.6	2.7	0.7082	56	476	0.82	0.62	0.0000	91
SICU	2006M04	1	218	4.6	2.7	0.4508	76	451	0.48	0.62	0.0000	31
SICU	2006M05	1	404	2.5	2.7	0.6951	55	931	0.43	0.62	0.0000	14
SICU	2006M06	3	298	10.1	2.7	0.0502	95	833	0.36	0.62	0.0000	14
SICU	2006M07	0	400	0.0	2.7	0.3329	10	844	0.47	0.62	0.0000	31
SICU	2006M08	0	200	0.0	2.7	0.5770	10	388	0.52	0.62	0.0000	31
SICU	2006M09	0	89	0.0	2.7	0.7829	10	291	0.31	0.62	0.0000	8

Source of aggregate data: NHSN Report, Am J Infect Control 2007;35:290-301

Data contained in this report were last generated on April 17, 2008 at 9:26 AM.

**Percentile rank among all units**

# Proportion

A fraction in which the numerator is included within the denominator

- Numerator is the magnitude of the part
- Denominator is the magnitude of the whole
- Often expressed as a percent

## Example 2:

**Surgical site infection rate:**

$$\frac{4 \text{ SSI in hysterectomy patients}}{280 \text{ women undergoing hysterectomy}} \times 100 = 1.4\%$$

# Example SSI Rate Table

SAS Output - Windows Internet Explorer provided by ITS0

National Healthcare Safety Network

Rate Table for Surgical Site Infection Data by Procedure and Risk Index

As of: December 1, 2008 at 3:26 PM

Date Range: All SSI\_RATESPROC\_RISK

orgID=10000

**Local SSI Rates**      **Aggregate SSI Rate**      **p-value for local vs. aggregate**

procCode	riskcat	outpatient	summaryYM	SSICount	ProcCount	SSIRate	SSI_Mean	P_pval	P_pctl
CBGB	1	N	2006M11	0	45	0.00	2.96	0.2324	10
CBGB	1	N	2007M07	0	12	0.00	2.96	0.6975	10
HPRO	0	N	2006M11	0	13	0.00	0.75	0.9071	25
HPRO	1	N	2005M02	0	11	0.00	1.68	0.8304	25
HPRO	1	N	2006M01	2	16	12.50	1.68	0.0290	100
HPRO	1	N	2006M04	1	12	8.33	1.68	0.1839	100
HPRO	1	N	2006M11	0	19	0.00	1.68	0.7255	25
HPRO	1	N	2007M07	0	21	0.00	1.68	0.7014	25
HPRO	1	N	2007M08	0	17	0.00	1.68	0.7504	25
HPRO	1	N	2007M11	2	17	11.76	1.68	0.0325	100
HYST	0	N	2006M11	0	50	0.00	1.12	0.5690	25
KPRO	1	N	2006M11	0	12	0.00	1.12	0.8733	25

Source of aggregate data: NHSN Report, Am J Infect Control 2008;36:609-26

Data contained in this report were last generated on December 1, 2008 at 2:31 PM.

**Percentile rank among all hospitals**

# Standardized Infection Ratio (SIR)



# Standardized Infection Ratio?

- **Standardized Infection Ratio, SIR, is a summary measure used to compare the HAI experience among one or more groups of patients to that of a standard population's (e.g. NHSN)**
- **Indirect standardization method**
- **Accounts for differences in risk of HAI among the groups**

# Standardized Infection Ratio (SIR)

- **Ratio of Observed to Expected infections**
- **Risk-adjusted summary measure**
- **Used to compare overall HAI rates of any two patient cohorts, groups, or hospitals**

# Calculating an SIR

$$\text{SIR} = \frac{\text{Observed (O) HAIs}}{\text{Expected (E) HAIs}}$$

- To calculate O, sum the number of HAIs among a group
- To calculate E, requires the use of the appropriate aggregate data (risk-adjusted rates)

# Central Line-associated Bloodstream Infections

Calculating the SIR



# Annual NHSN Report

612 Vol. 36 No. 9


Edwards et al *AJIC*

**Table 3.** Pooled means and key percentiles of the distribution of central line-associated BSI rates and central line utilization ratios, by type of location, DA module, 2006 through 2007

Type of location	Central line-associated BSI rate*				Percentile				
	No. of locations	No. of CLABSI	Central line-days	Pooled mean	10%	25%	50% (median)	75%	90%
Critical care units									
Burn	22	239	42,452	5.6	0.0	1.5	3.8	8.2	13.5
Coronary	121	373	181,079	2.1	0.0	0.0	1.3	2.8	5.3
Surgical cardiothoracic	97	397	275,194	1.4	0.0	0.0	1.2	1.9	3.4
Medical	144	1073	454,839	2.4	0.0	0.6	1.9	3.6	5.3
Medical/surgical, major teaching	104	692	342,214	2.0	0.0	0.5	1.5	3.0	4.2
Medical/surgical, all others	343	972	662,489	1.5	0.0	0.0	0.6	2.0	3.6

# Annual NHSN Report

612 Vol. 36 No. 9

Edwards et al 

**Table 3.** Pooled means and key percentiles of the distribution of central line-associated BSI rates and central line utilization ratios, by type of location, DA module, 2006 through 2007

Type of location	Central line-associated BSI rate*				Percentile				
	No. of locations	No. of CLABSI	Central line-days	Pooled mean	10%	25%	50% (median)	75%	90%
Critical care units									
Burn		239	42,452	5.6	0.0	1.5	3.8	8.2	13.5
Coronary		373	181,079	2.1	0.0	0.0	1.2	1.9	3.4
Surgical cardiothoracic		397	275,194	1.4	0.0	0.6	1.9	3.6	5.3
Medical		1073	454,839	2.4	0.0	0.5	1.5	3.0	4.2
Medical/surgical, major teaching		692	342,214	2.0	0.0	0.0	0.6	2.0	3.6
Medical/surgical, all others		972	662,489	1.5					

# Example CLABSI Rate Table

## Hospital A

Type of Location	# CLABSI	# Central line-days	CLABSI Rate	NHSN Rate	p-value
Coronary	2	380	5.26	2.1	0.09
Cardiothoracic	1	257	3.89	1.4	0.15
Medical	3	627	4.78	2.4	0.11
Med/Surg, major teaching	2	712	2.81	2.0	0.32
<b>Total</b>	<b>8</b>	<b>1,976</b>	<b>4.05</b>	<b>---</b>	<b>---</b>

# Example CLABSI Rate Table Hospital A

Type of Location	# CLABSI	# Central line-days	CLABSI Rate	NHSN Rate	p-value	Expected # of CLABSI
Coronary	2	380	5.26	2.1	0.09	0.80
Cardiothoracic	1	257	3.89	1.4	0.15	
Medical	3	627	4.78	2.4	0.11	
Med/Surg, major teaching	2	712	2.81	2.0	0.32	
<b>Total</b>	<b>8</b>	<b>1,976</b>	<b>4.05</b>	<b>---</b>	<b>---</b>	

**Expected Number =  $380 * (2.1 / 1,000) = 380 * 0.0021 = 0.8$**

# Example CLABSI Rate Table Hospital A

Type of Location	# CLABSI	# Central line-days	CLABSI Rate	NHSN Rate	p-value	Expected # of CLABSI
Coronary	2	380	5.26	2.1	0.09	0.80
Cardiothoracic	1	257	3.89	1.4	0.15	
Medical	3	627	4.78	2.4	0.11	
Med/Surg, major teaching	2	712	2.81	2.0	0.32	
Total	8	1,976	4.05	---	---	

Expected Number =  $380 * (2.1 / 1,000) = 380 * 0.0021 = 0.8$

# Example CLABSI Rate Table Hospital A

Type of Location	# CLABSI	# Central line-days	CLABSI Rate	NHSN Rate	p-value	Expected # of CLABSI
Coronary	2	380	5.26	2.1	0.09	0.80
Cardiothoracic	1	257	3.89	1.4	0.15	
Medical	3	627	4.78	2.4	0.11	
Med/Surg, major teaching	2	712	2.81	2.0	0.32	
<b>Total</b>	<b>8</b>	<b>1,976</b>	<b>4.05</b>	<b>---</b>	<b>---</b>	

**Expected Number =  $380 * (2.1 / 1,000) = 380 * 0.0021 = 0.8$**

# Example CLABSI Rate Table

## Hospital A

Type of Location	# CLABSI	# Central line-days	CLABSI Rate	NHSN Rate	p-value	Expected # of CLABSI
Coronary	2	380	5.26	2.1	0.09	0.80
Cardiothoracic	1	257	3.89	1.4	0.15	0.36
Medical	3	627	4.78	2.4	0.11	1.15
Med/Surg, major teaching	2	712	2.81	2.0	0.32	1.42
<b>Total</b>	<b>8</b>	<b>1,976</b>	<b>4.05</b>	<b>---</b>	<b>---</b>	<b>3.73</b>

# Example CLABSI Rate Table Hospital A

Type of Location	# CLABSI	# Central line-days	CLABSI Rate	NHSN Rate	p-value	Expected # of CLABSI
Coronary	2	380	5.26	2.1	0.09	0.80
Cardiothoracic	1	257	3.89	1.4	0.15	0.36
Medical	3	627	4.78	2.4	0.11	1.15
Med/Surg, major teaching	2	712	2.81	2.0	0.32	1.42
<b>Total</b>	<b>8</b>	<b>1,976</b>	<b>4.05</b>	<b>---</b>	<b>---</b>	<b>3.73</b>

$$\text{Standardized Infection Ratio (SIR)} = \frac{\text{Observed}}{\text{Expected}} = \frac{8}{3.73} = 2.14$$

# Example CLABSI Rate Table

## Hospital A

Type of Location	# CLABSI	# Central line-days	CLABSI Rate	NHSN Rate	p-value	Expected # of CLABSI
Coronary	2	380	5.26	2.1	0.09	0.80
Cardiothoracic	1	257	3.89	1.4	0.15	0.36
Medical	3	627	4.78	2.4	0.11	1.15
Med/Surg, major teaching	2	712	2.81	2.0	0.32	1.42
<b>Total</b>	<b>8</b>	<b>1,976</b>	<b>4.05</b>	<b>---</b>	<b>---</b>	<b>3.73</b>

$$\text{Standardized Infection Ratio (SIR)} = \frac{\text{Observed}}{\text{Expected}} = \frac{8}{3.73} = 2.14$$

# Interpreting an SIR

- If  $SIR = 1$ , or  $O = E$ , observed CLABSIs equals the expected CLABSIs based on NHSN
- If SIR is significantly  $>1$ , this suggests the institution may need further investigation for the contributing ICUs/locations

# Hospital SIRs Compared to 1

<b>Hospital</b>	<b>SIR</b>	<b>p-value</b>	<b>Status group</b>
<b>A</b>	<b>1.2</b>	<b>0.12</b>	<b>Same</b>
<b>B</b>	<b>0.9</b>	<b>0.23</b>	<b>Same</b>
<b>C</b>	<b>2.7</b>	<b>0.001</b>	<b>High</b>
<b>D</b>	<b>0.7</b>	<b>0.002</b>	<b>Low</b>
<b>E</b>	<b>1.5</b>	<b>0.001</b>	<b>High</b>

# Hospital SIRs Compared to 1

<b>Hospital</b>	<b>SIR</b>	<b>95% Confidence Interval</b>	<b>Status group</b>
<b>A</b>	<b>1.2</b>	<b>0.7-2.4</b>	<b>Same</b>
<b>B</b>	<b>0.9</b>	<b>0.4-1.6</b>	<b>Same</b>
<b>C</b>	<b>2.7</b>	<b>2.3-3.8</b>	<b>High</b>
<b>D</b>	<b>0.7</b>	<b>0.3-0.9</b>	<b>Low</b>
<b>E</b>	<b>1.5</b>	<b>1.3-1.9</b>	<b>High</b>

# Confidence Interval for SIR

- A  $(1 - \alpha)100\%$  confidence interval for  $p$

$$SIR_L = \frac{O}{E} \left( 1 - \frac{1}{9O} - \frac{Z_{\alpha/2}}{\sqrt{9O}} \right)^3$$

$$SIR_U = \frac{(O+1)}{E} \left( 1 - \frac{1}{9(O+1)} - \frac{Z_{\alpha/2}}{\sqrt{9(O+1)}} \right)^3$$

- **Example normal curve values**

**90% confidence  $\rightarrow z_{.05} = 1.645$**

**95% confidence  $\rightarrow z_{.025} = 1.96$**

**99% confidence  $\rightarrow z_{.005} = 2.58$**

# Tennessee's Report on HAI

- **Time Period: Jan.- Dec. 2008**
- **CLABSI data**
  - Adult and pediatric ICUs
  - NOT include NICU data
    - Only have 6 months of data (Jul. '08- Dec. '08)
- **Reference Population**
  - NHSN national data (2006-2007)
    - Published in AJIC, 2008
    - Reference population within NHSN application

# Tennessee's Report on HAI

- **Descriptive epidemiology of CLABSIs in ICUs in Tennessee**
  - **CLABSI rate by type of ICU and compare to national NHSN CLABSI rate by ICU type**
    - **State-wide**
    - **By grand division (West, Middle, East)**
  - **Organisms (Name, Number, Proportion)**

# Tennessee's Report on HAI

- **CLABSI rate by ICU type, named facility**
  - Number of infections,
  - Number of central line days
  - Rate per 1,000 central line days
  - **Graphical representation**
    - Point estimate + 95% confidence intervals,
    - Line indicating national (NHSN 2006-7) pooled mean,
    - Line indicating Tennessee pooled mean
    - Color coded to reflect statistical significance (compared to national (NHSN- 2006-7) pooled mean

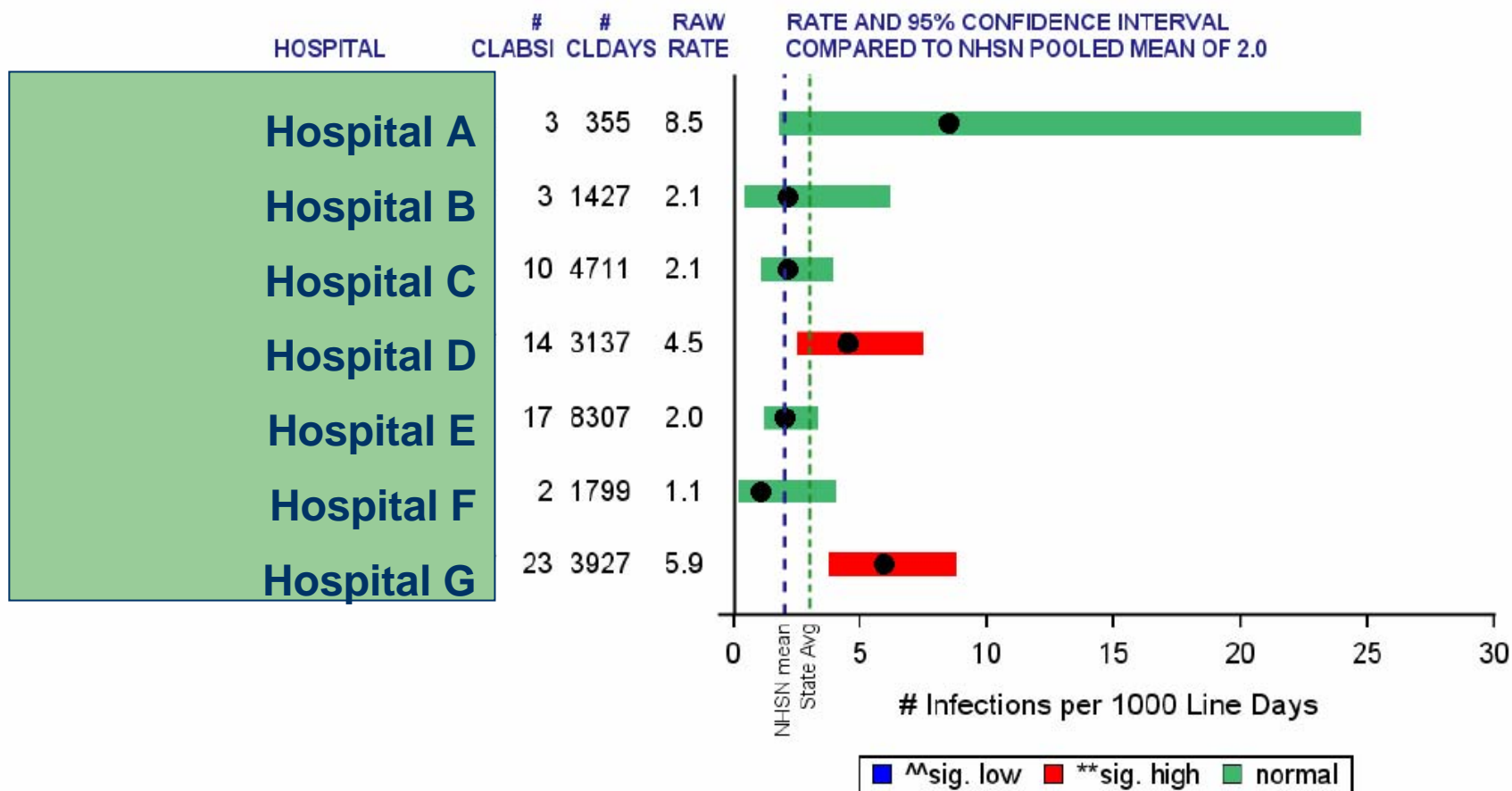
# **Example of CLABSI Rate by ICU Type (draft)**



## Central Line-Associated Blood Stream Infection (CLABSI) Rates

Tennessee (Reportable period: January 1 - December 31, 2008)

Medical-Surgical ICUs in Major Teaching Hospitals



Data Reported as of August 10, 2009.

\*\* significantly higher than NHSN pooled mean

^ significantly lower than NHSN pooled mean

\* Zero infections, not statistically significant

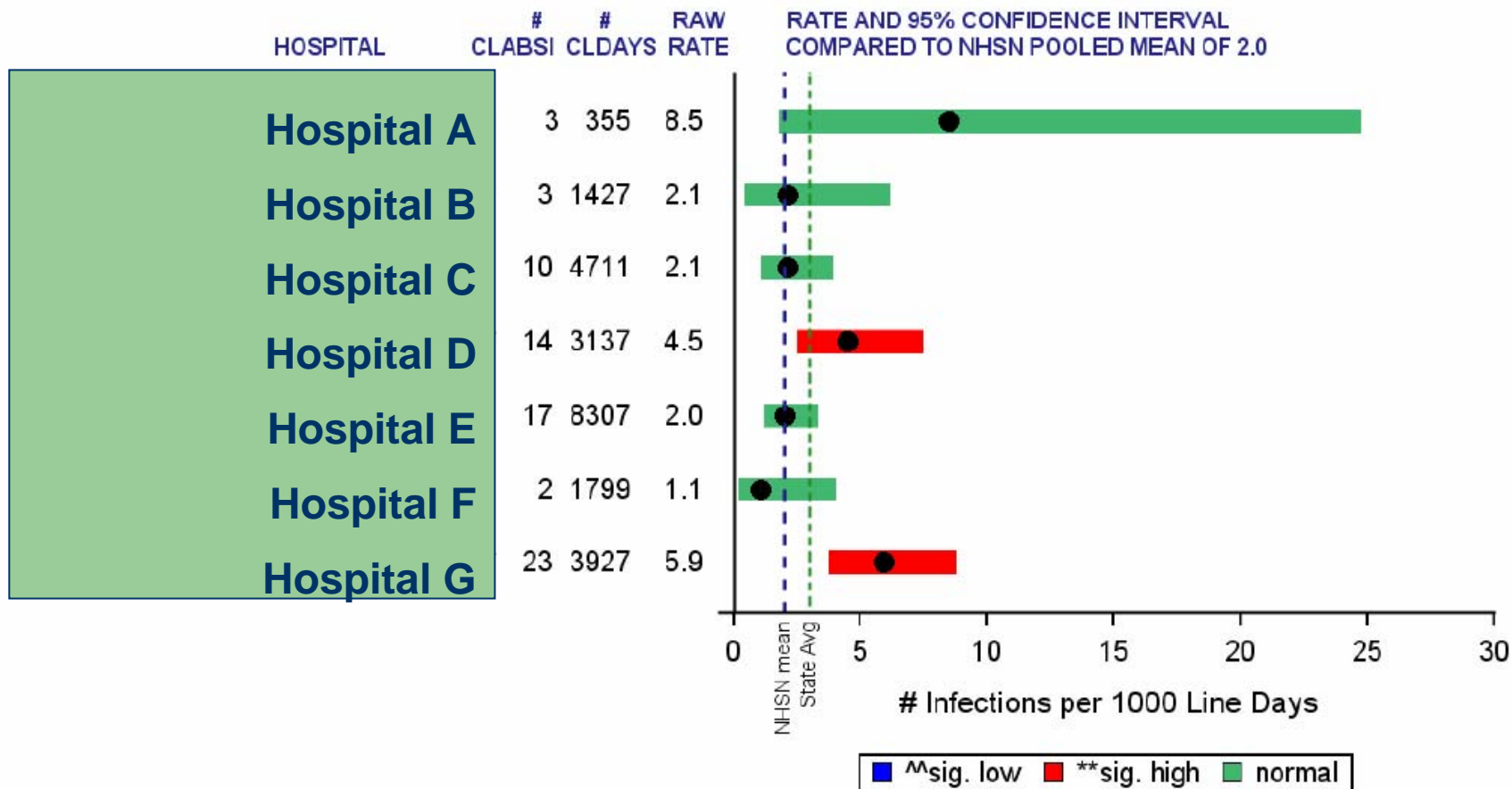
NA Rates are not shown in ICUs with <50 central line days.

# Tennessee: Reportable Period: Jan- Dec 2008

## Central Line-Associated Blood Stream Infection (CLABSI) Rates

Tennessee (Reportable period: January 1 - December 31, 2008)

Medical-Surgical ICUs in Major Teaching Hospitals



Data Reported as of August 10, 2009.

\*\* significantly higher than NHSN pooled mean

^ significantly lower than NHSN pooled mean

\* Zero infections, not statistically significant

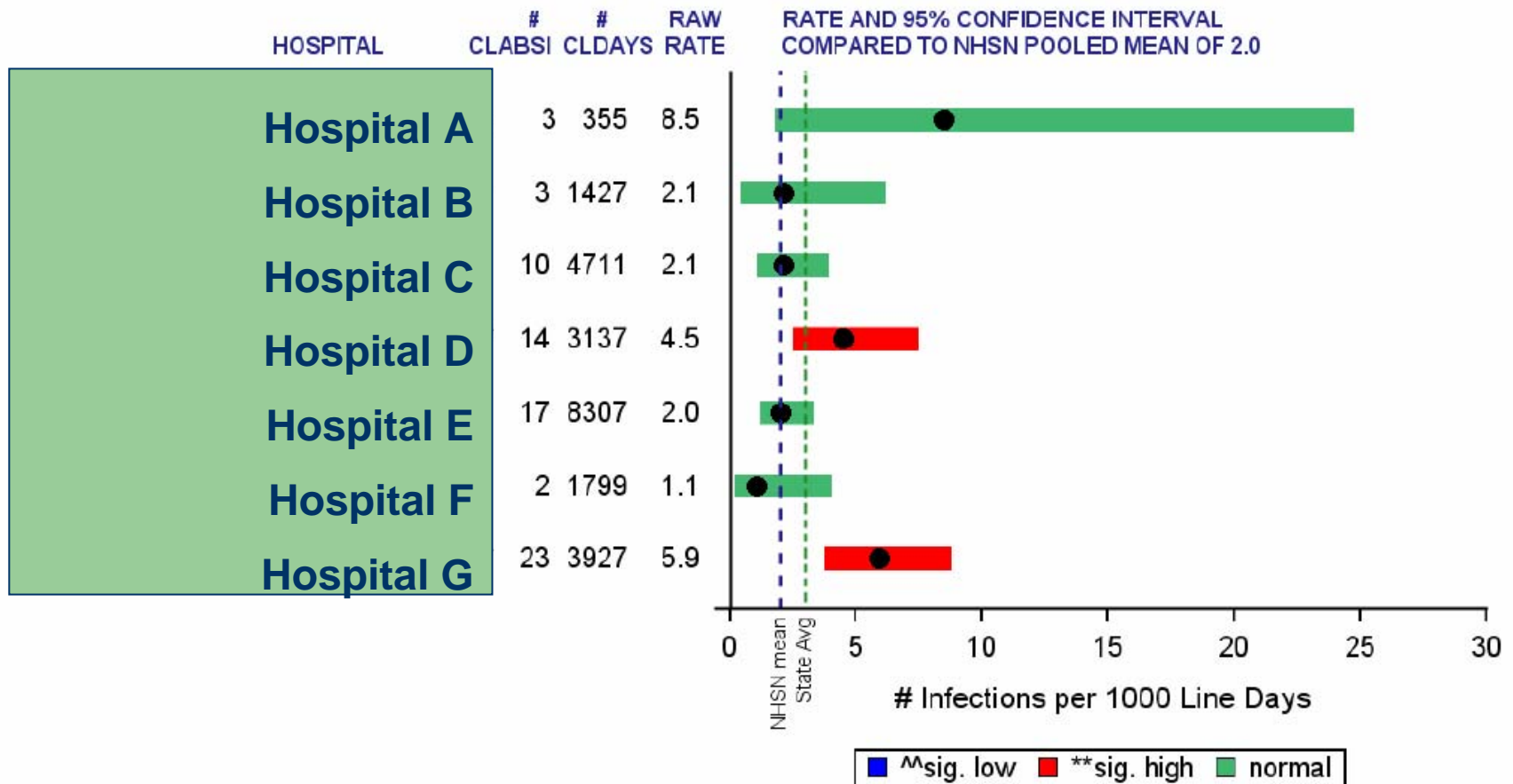
NA Rates are not shown in ICUs with <50 central line days.

# Type of ICU: Med-Surg in Major Teaching Hospitals

## Central Line-Associated Blood Stream Infection (CLABSI) Rates

Tennessee (Reportable period: January 1 - December 31, 2008)

### Medical-Surgical ICUs in Major Teaching Hospitals



Data Reported as of August 10, 2009.

\*\* significantly higher than NHSN pooled mean

^ significantly lower than NHSN pooled mean

\* Zero infections, not statistically significant

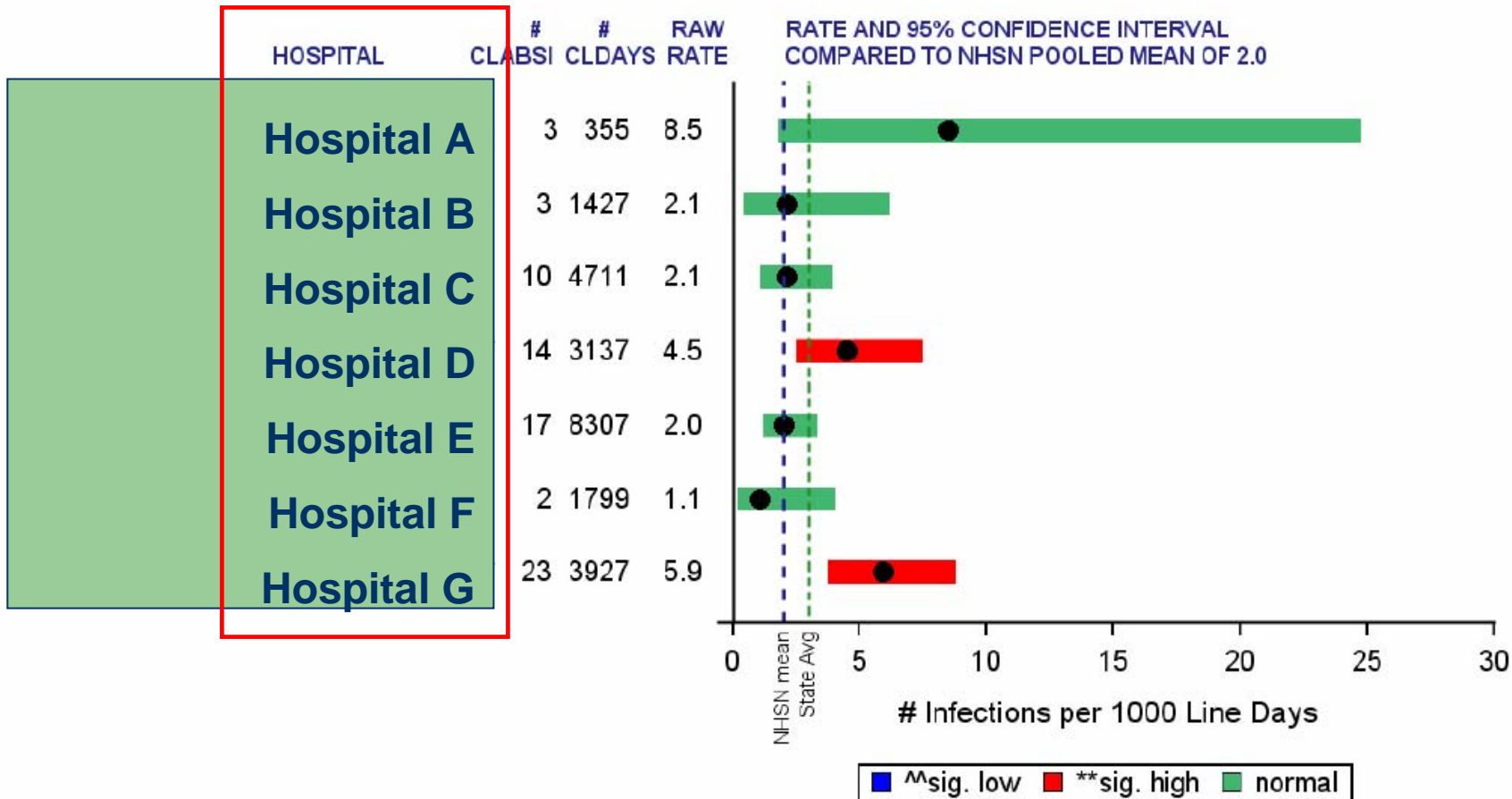
NA Rates are not shown in ICUs with <50 central line days.

# Name of Facility (Campus) in Alphabetical Order

## Central Line-Associated Blood Stream Infection (CLABSI) Rates

Tennessee (Reportable period: January 1 - December 31, 2008)

Medical-Surgical ICUs in Major Teaching Hospitals



Data Reported as of August 10, 2009.

\*\* significantly higher than NHSN pooled mean

^ significantly lower than NHSN pooled mean

\* Zero infections, not statistically significant

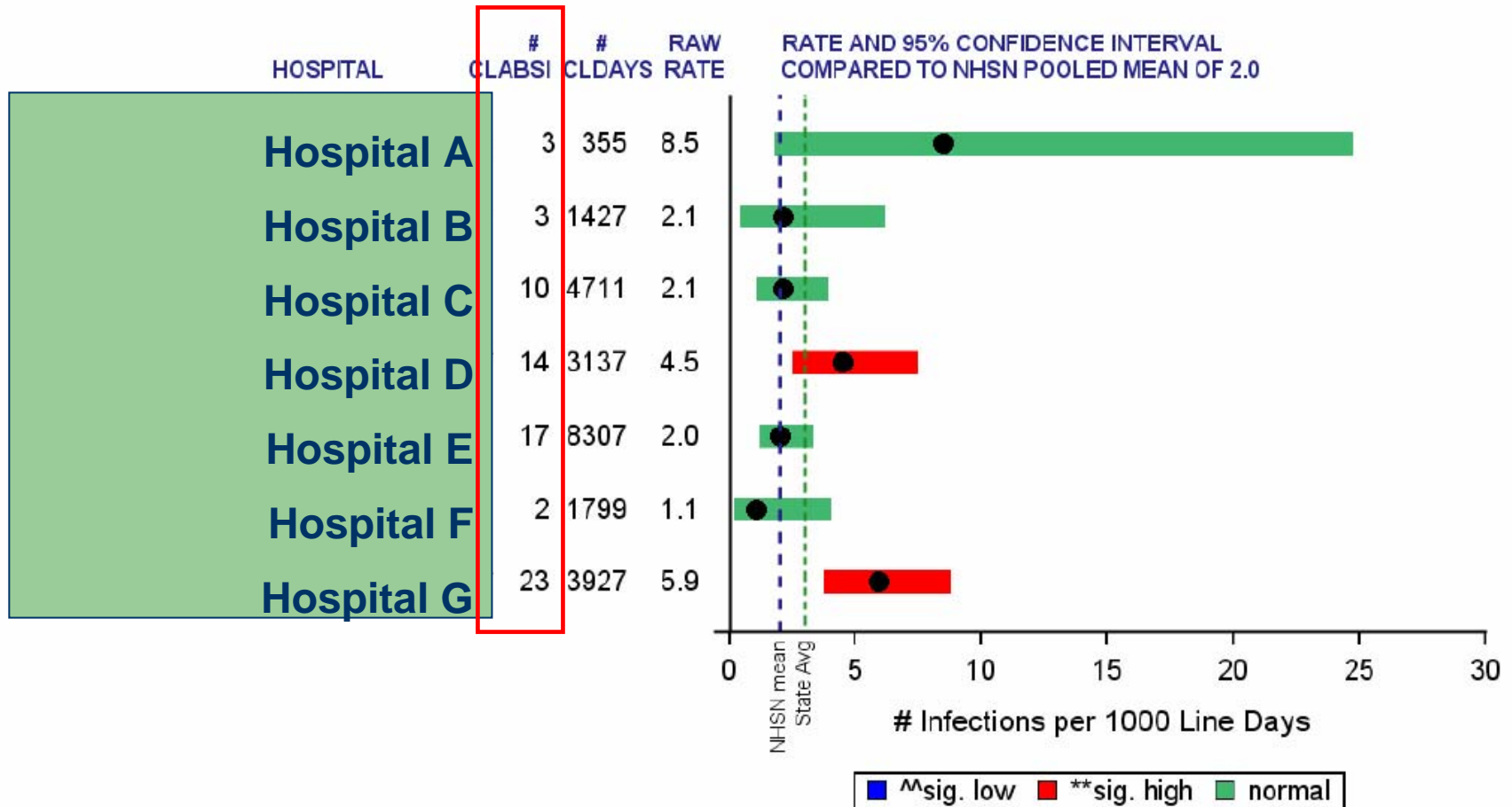
NA Rates are not shown in ICUs with <50 central line days.

## Number of CLABSIs identified in 2008 In med-surg ICU (major teaching hospitals)

### Central Line-Associated Blood Stream Infection (CLABSI) Rates

Tennessee (Reportable period: January 1 - December 31, 2008)

Medical-Surgical ICUs in Major Teaching Hospitals



Data Reported as of August 10, 2009.

\*\* significantly higher than NHSN pooled mean

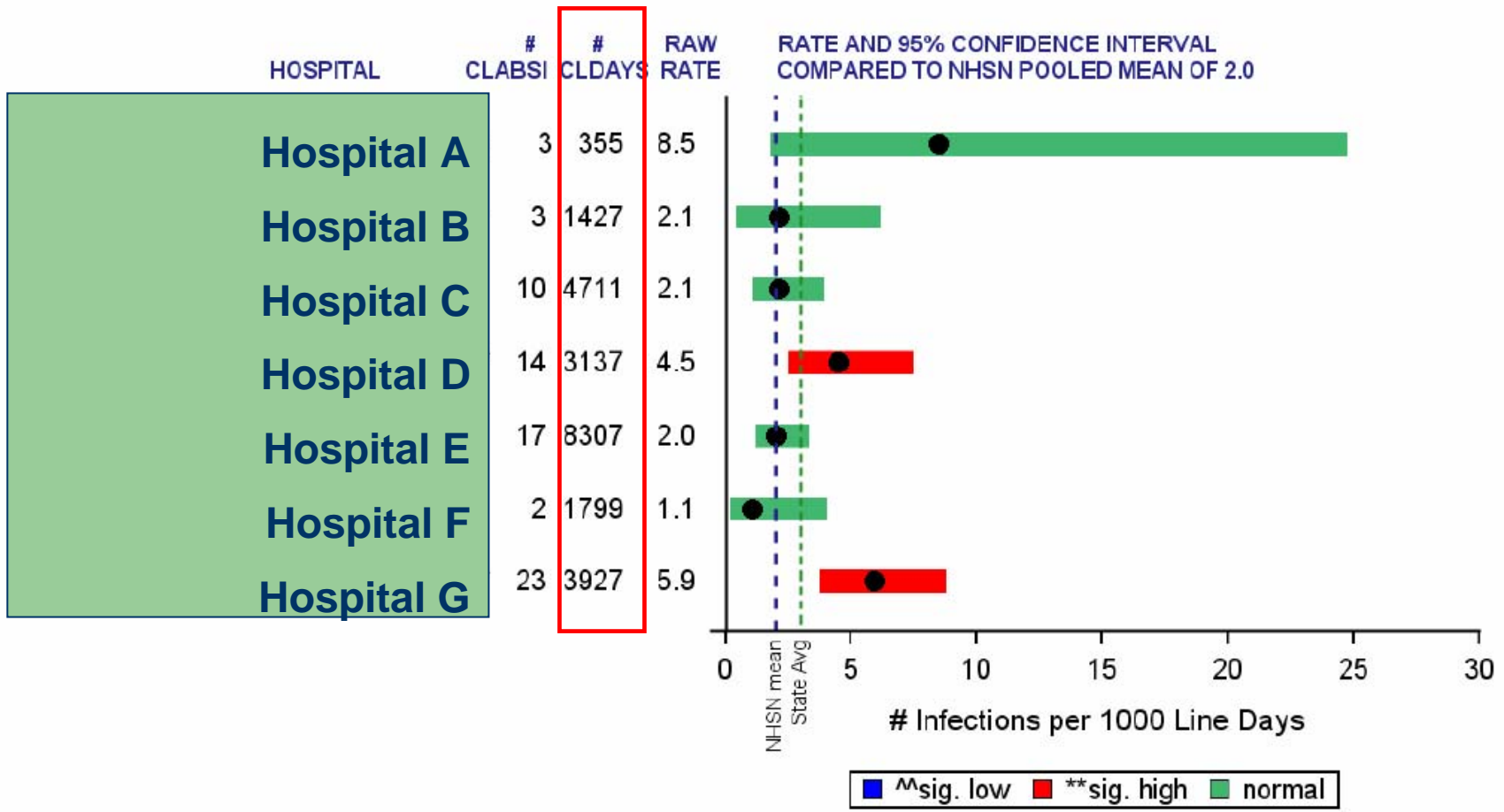
^^ significantly lower than NHSN pooled mean

\* Zero infections, not statistically significant

NA Rates are not shown in ICUs with <50 central line days.

# Number of Central Line Days per Facility in the Med-Surg ICU

**Central Line-Associated Blood Stream Infection (CLABSI) Rates**  
 Tennessee (Reportable period: January 1 - December 31, 2008)  
 Medical-Surgical ICUs in Major Teaching Hospitals



Data Reported as of August 10, 2009.  
 \*\* significantly higher than NHSN pooled mean  
 ^^ significantly lower than NHSN pooled mean  
 \* Zero infections, not statistically significant  
 NA Rates are not shown in ICUs with <50 central line days.

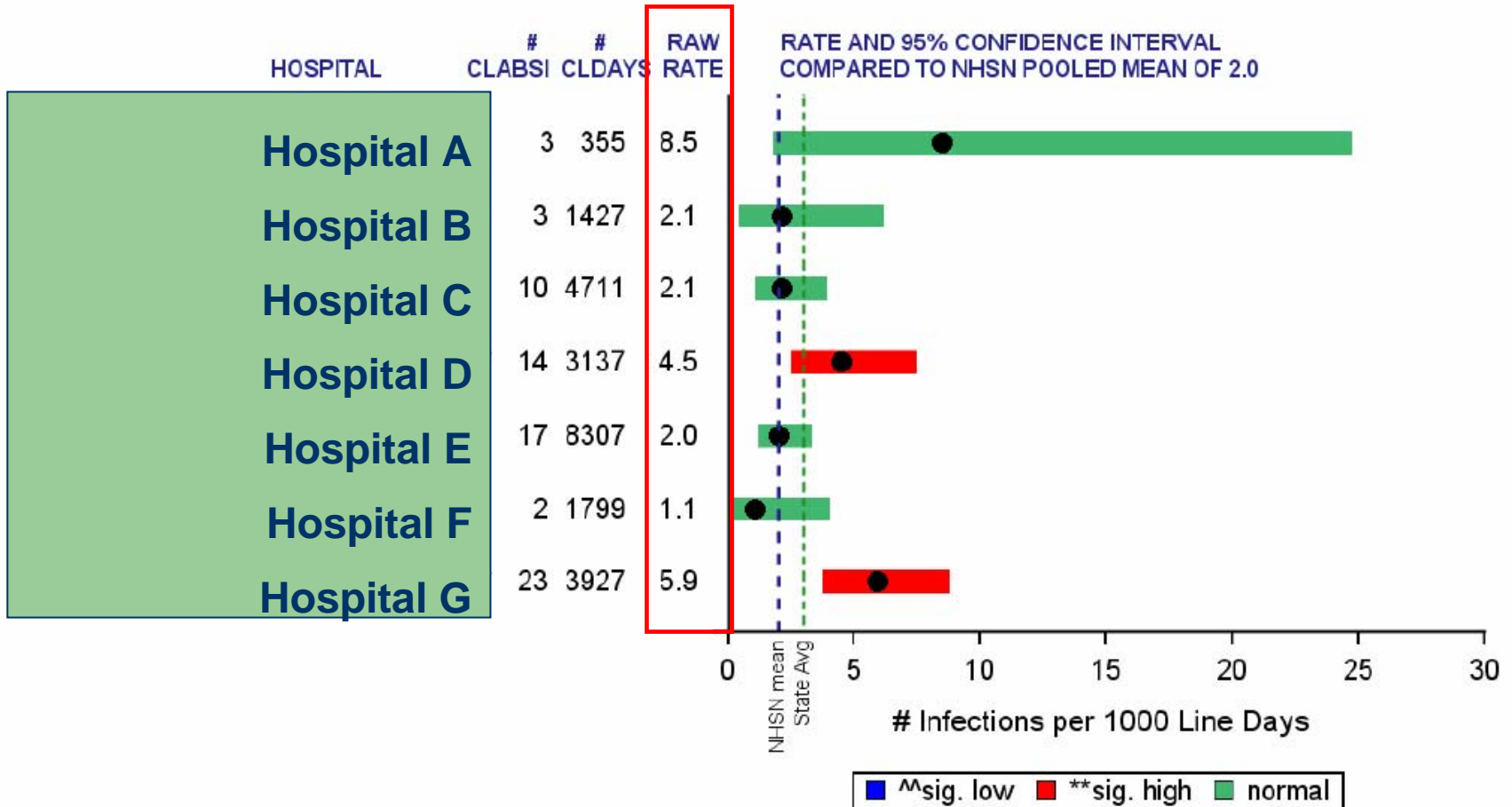


# CLABSI Rate per Facility (Med-Surg ICU)

## Central Line-Associated Blood Stream Infection (CLABSI) Rates

Tennessee (Reportable period: January 1 - December 31, 2008)

Medical-Surgical ICUs in Major Teaching Hospitals



Data Reported as of August 10, 2009.

\*\* significantly higher than NHSN pooled mean

^^ significantly lower than NHSN pooled mean

\* Zero infections, not statistically significant

NA Rates are not shown in ICUs with <50 central line days.

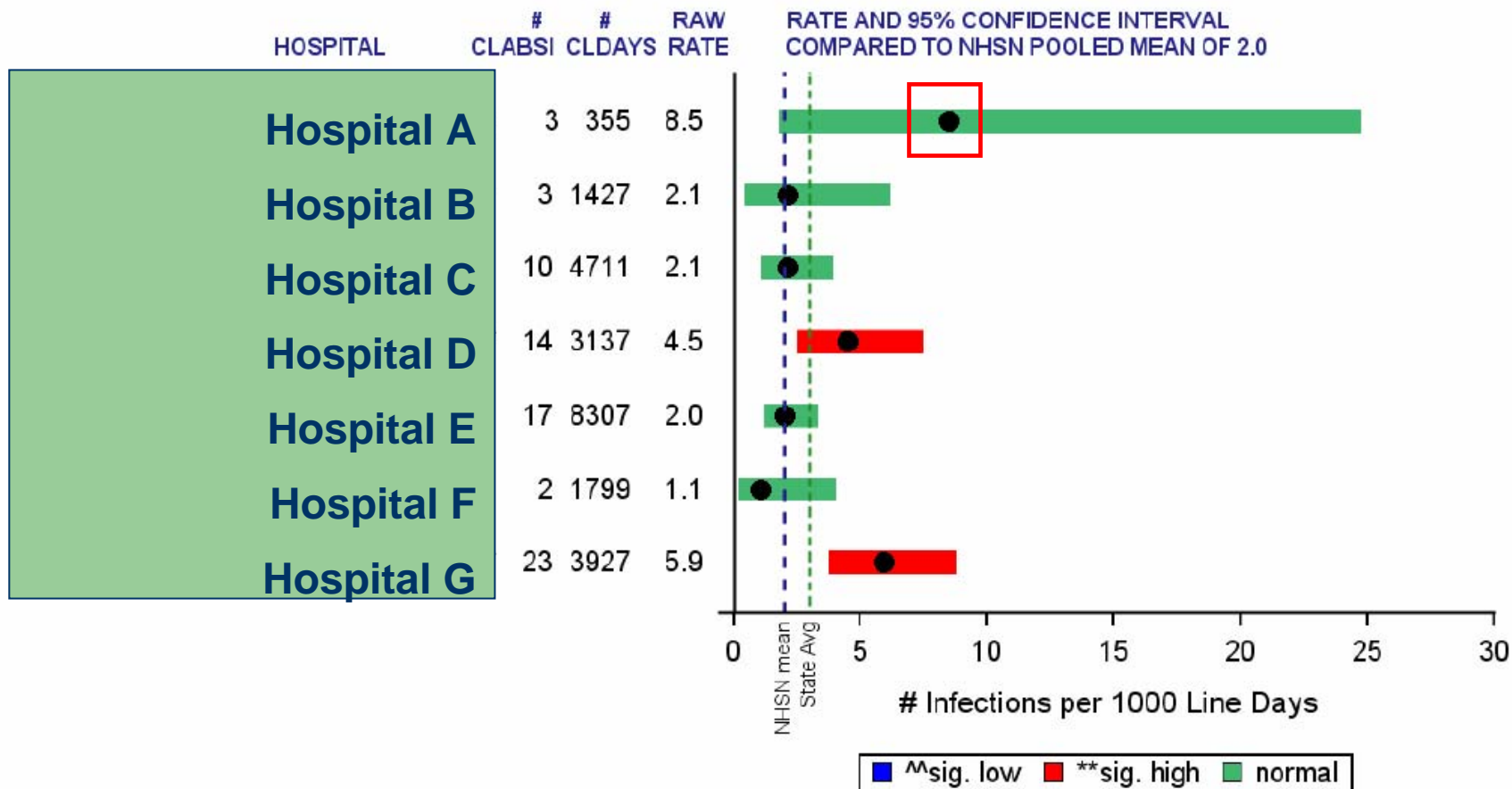


## Point Estimate for CLABSI Rate In Med-Surg ICU (8.5 for Hospital A)

### Central Line-Associated Blood Stream Infection (CLABSI) Rates

Tennessee (Reportable period: January 1 - December 31, 2008)

Medical-Surgical ICUs in Major Teaching Hospitals



Data Reported as of August 10, 2009.

\*\* significantly higher than NHSN pooled mean

^^ significantly lower than NHSN pooled mean

\* Zero infections, not statistically significant

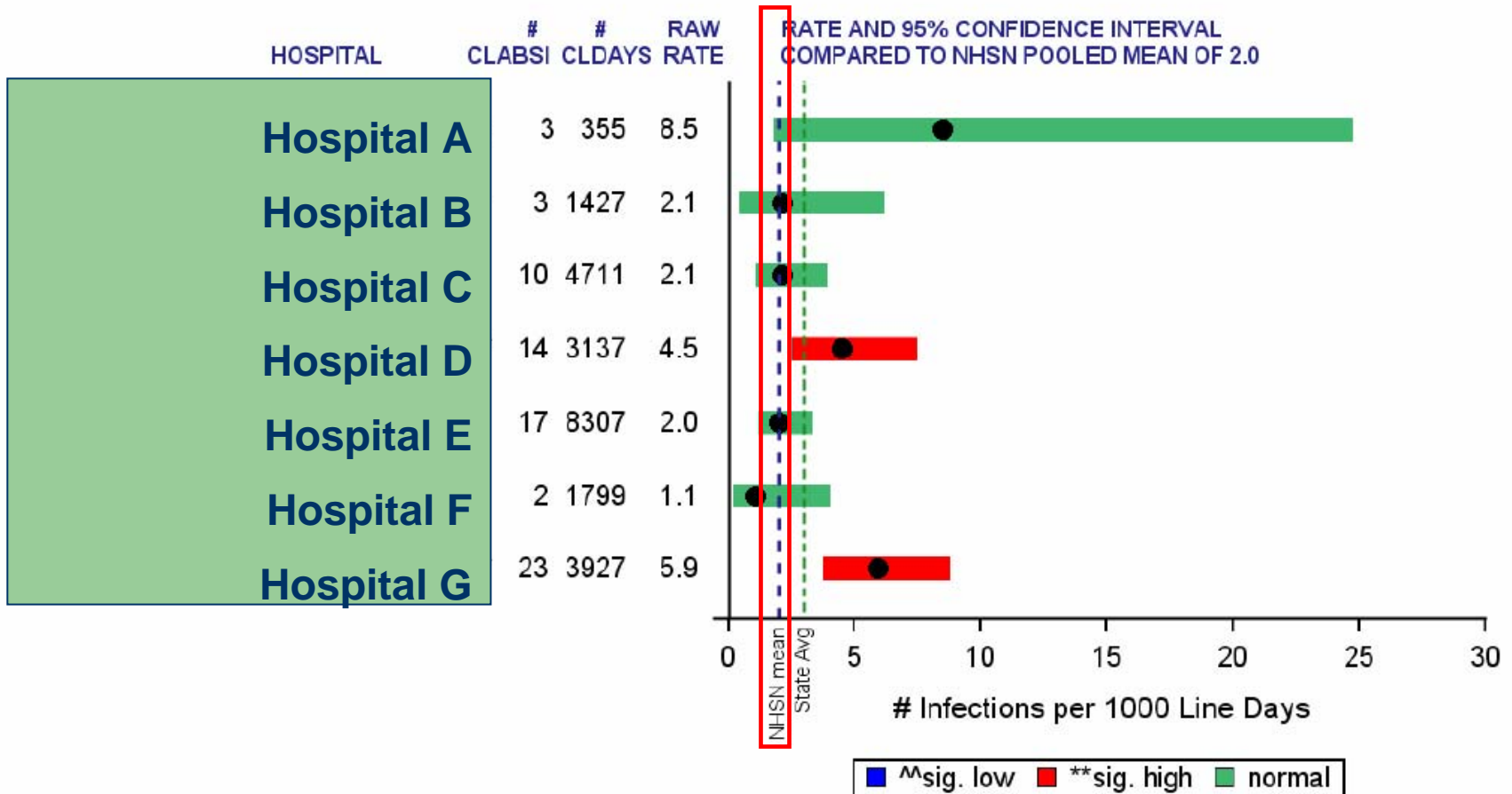
NA Rates are not shown in ICUs with <50 central line days.

# NHSN Pooled Mean for 2006-7 (=2.0) for Med-Surg ICU (major teaching hospital)

## Central Line-Associated Blood Stream Infection (CLABSI) Rates

Tennessee (Reportable period: January 1 - December 31, 2008)

Medical-Surgical ICUs in Major Teaching Hospitals



Data Reported as of August 10, 2009.

\*\* significantly higher than NHSN pooled mean

^ significantly lower than NHSN pooled mean

\* Zero infections, not statistically significant

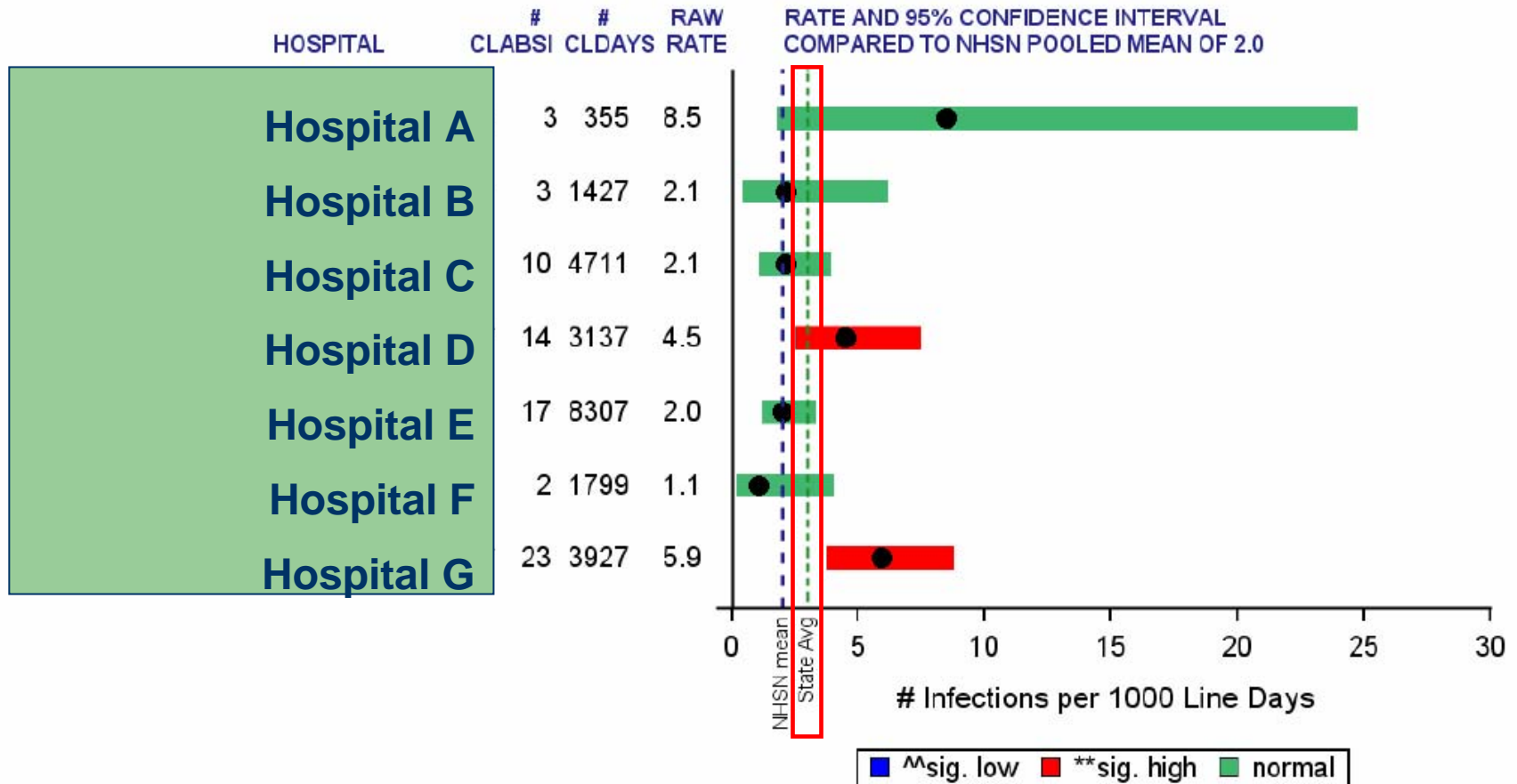
NA Rates are not shown in ICUs with <50 central line days.

## Tennessee Pooled Mean for 2008 for Med-Surg ICU (major teaching hospital)

### Central Line-Associated Blood Stream Infection (CLABSI) Rates

Tennessee (Reportable period: January 1 - December 31, 2008)

Medical-Surgical ICUs in Major Teaching Hospitals



Data Reported as of August 10, 2009.

\*\* significantly higher than NHSN pooled mean

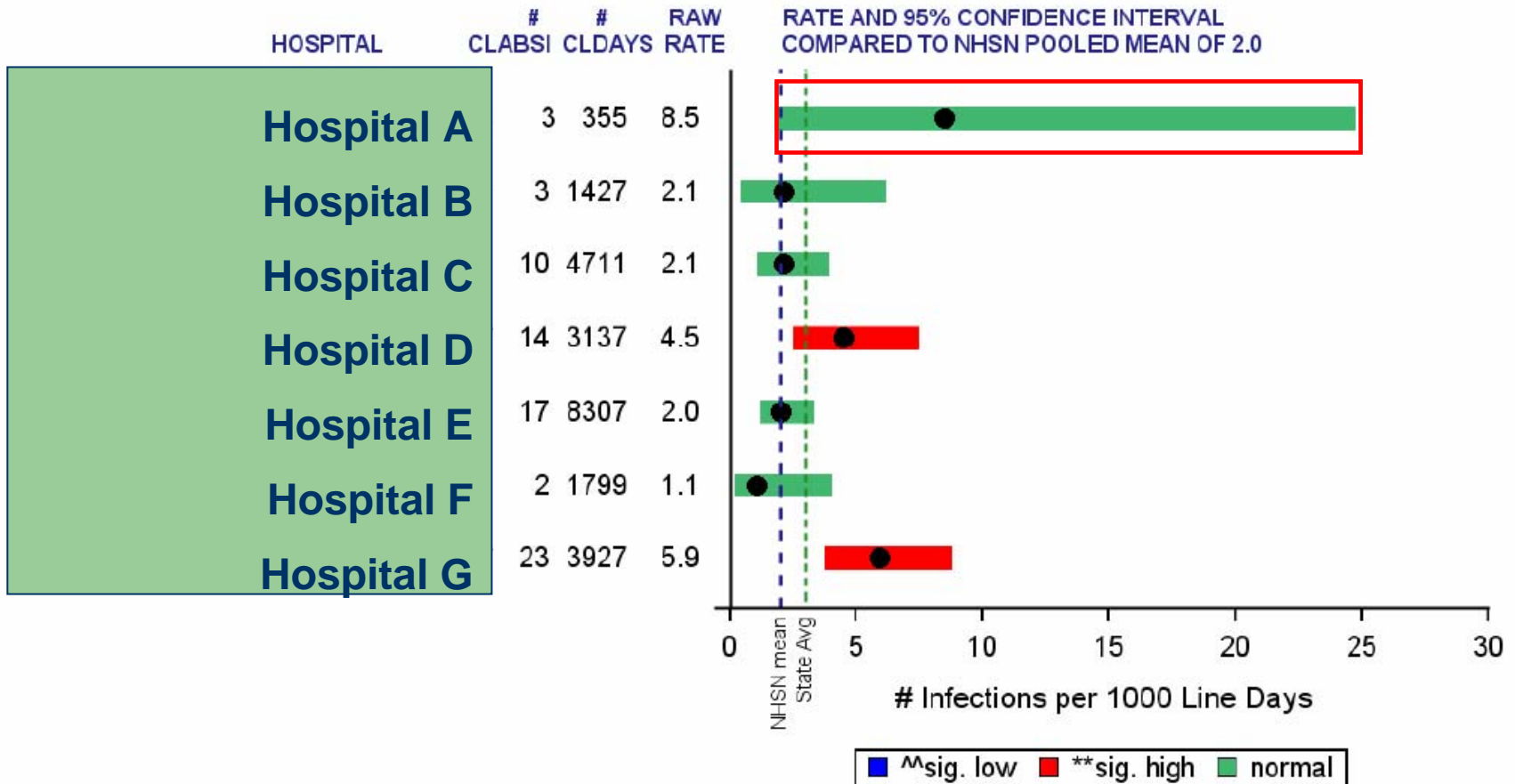
^ significantly lower than NHSN pooled mean

\* Zero infections, not statistically significant

NA Rates are not shown in ICUs with <50 central line days.

## 95% Confidence Interval for Hospital A, Not significantly different vs. NHSN pooled mean

**Central Line-Associated Blood Stream Infection (CLABSI) Rates**  
Tennessee (Reportable period: January 1 - December 31, 2008)  
Medical-Surgical ICUs in Major Teaching Hospitals



Data Reported as of August 10, 2009.

\*\* significantly higher than NHSN pooled mean

^ significantly lower than NHSN pooled mean

\* Zero infections, not statistically significant

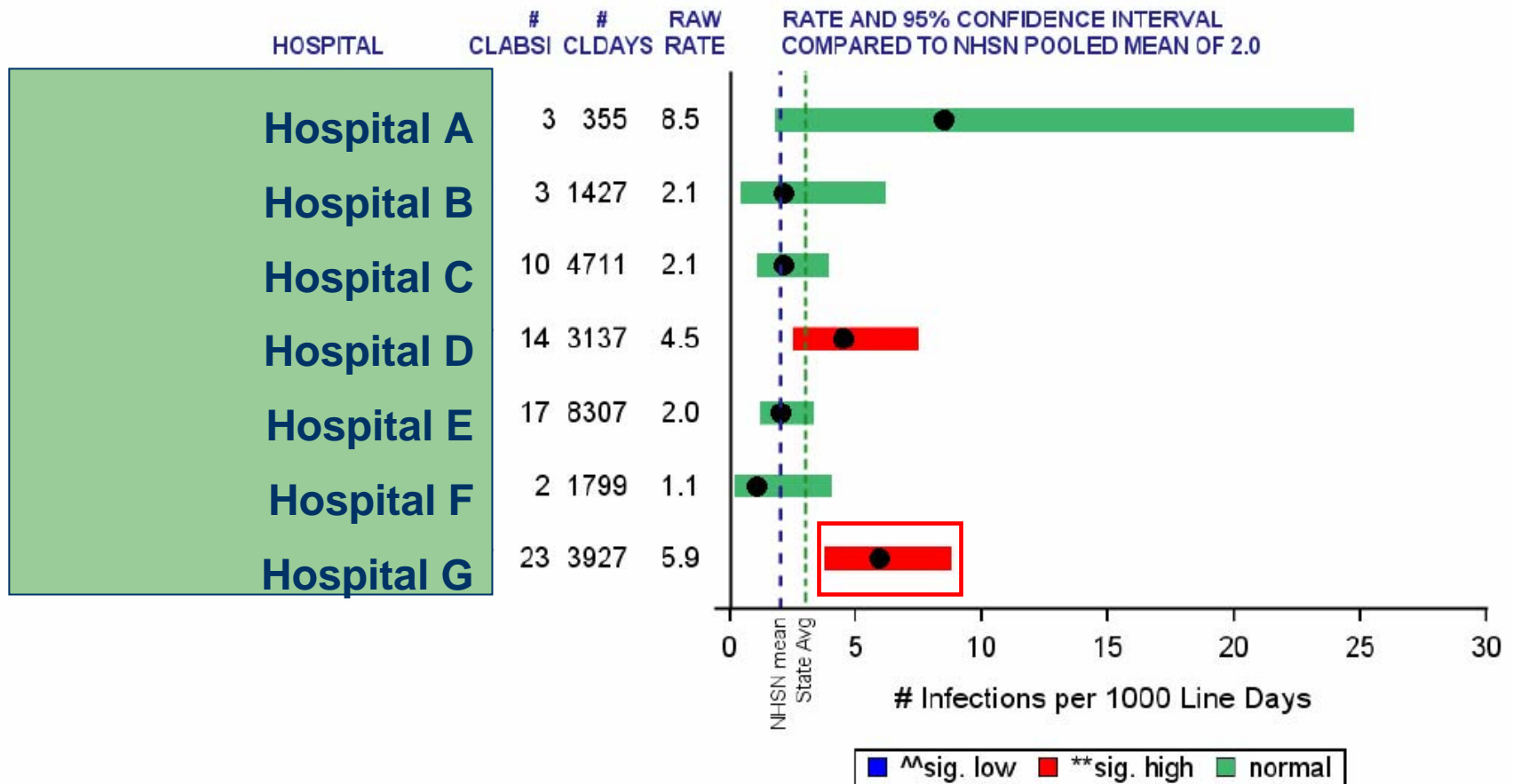
NA Rates are not shown in ICUs with <50 central line days.

## 95% Confidence Interval for Hospital G, Significantly HIGHER vs. NHSN pooled mean

### Central Line-Associated Blood Stream Infection (CLABSI) Rates

Tennessee (Reportable period: January 1 - December 31, 2008)

Medical-Surgical ICUs in Major Teaching Hospitals



Data Reported as of August 10, 2009.

\*\* significantly higher than NHSN pooled mean

^ significantly lower than NHSN pooled mean

\* Zero infections, not statistically significant

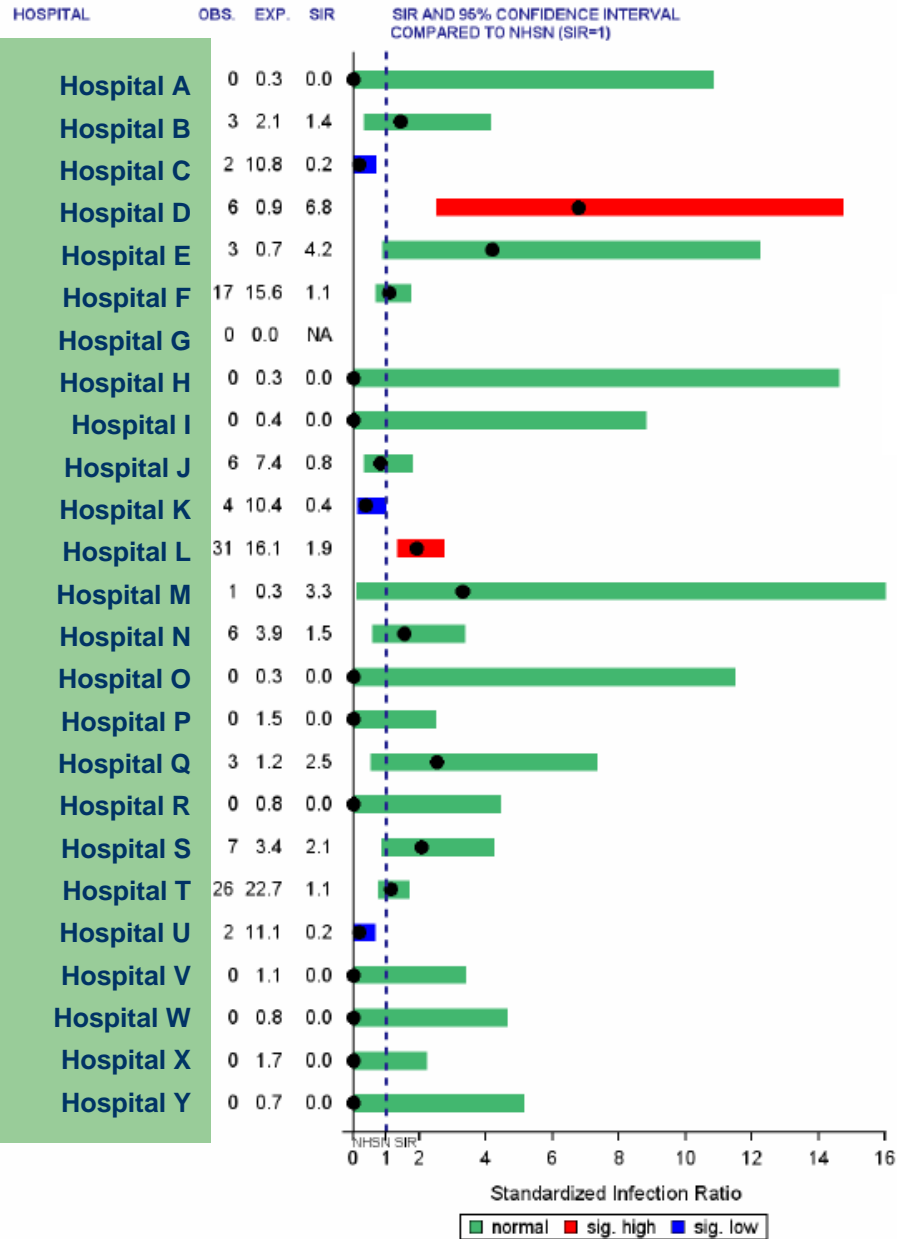
NA Rates are not shown in ICUs with <50 central line days.

# **SIR per Facility for CLABSIs**

**Summary Measure for  
CLABSIs for Each  
Facility**

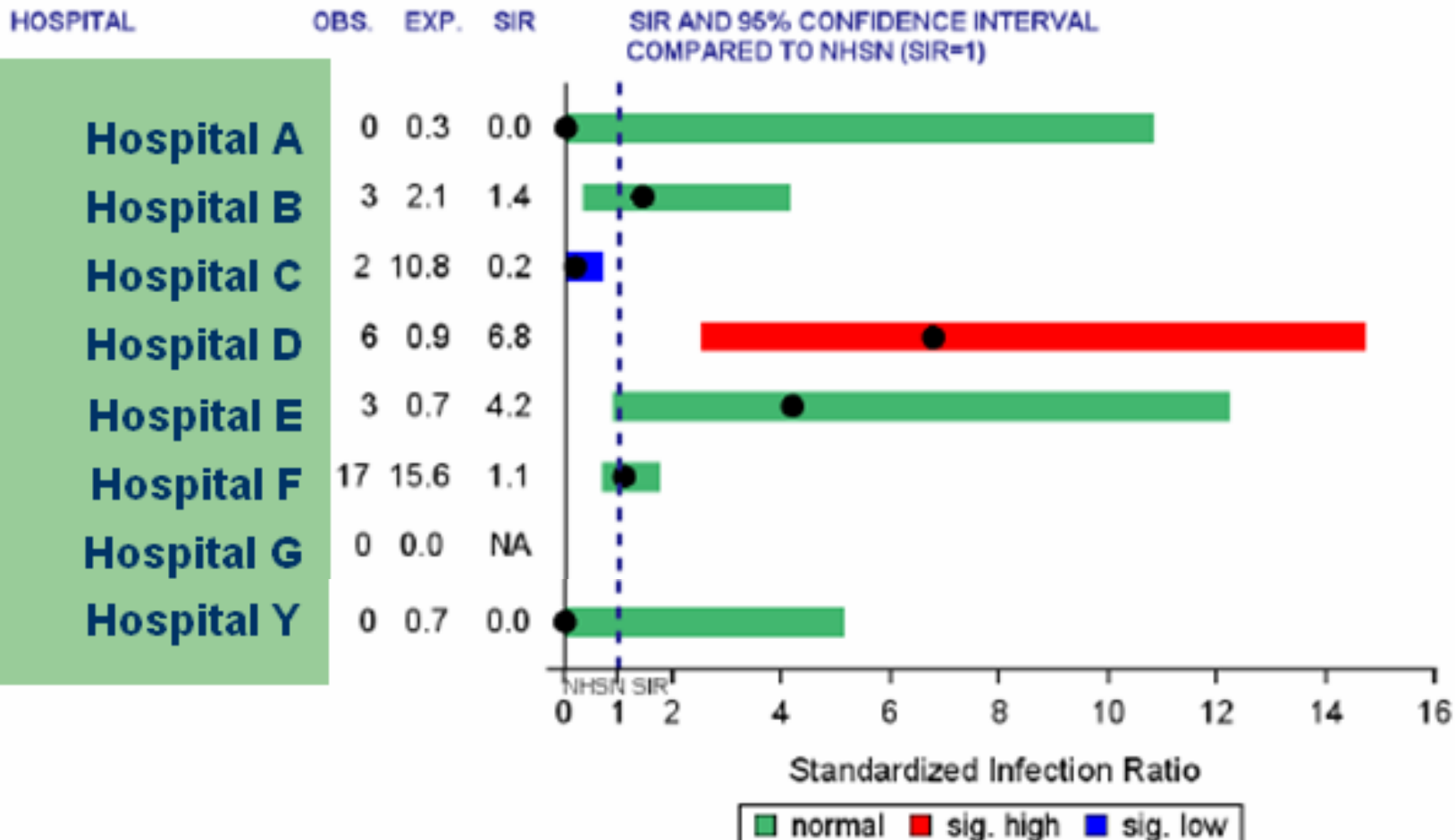
---

**Central Line-Associated Blood Stream Infection (CLABSI) Standardized Infection Ratio (SIR)**  
 Tennessee (Reportable period: January 1 - December 31, 2008)



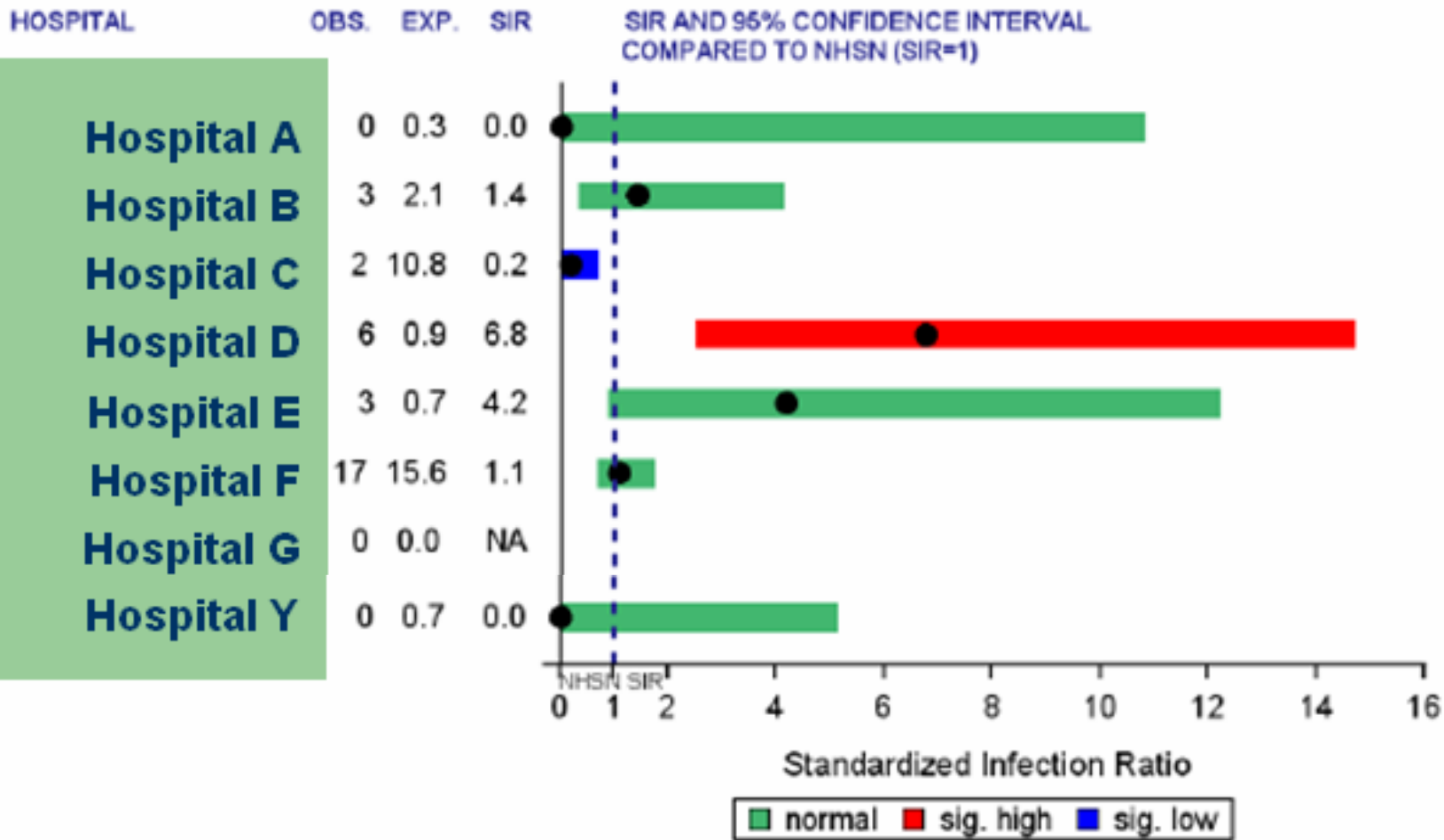
Data Reported as of August 1, 2009.  
 Obs. = observed number of CLABSI  
 Exp. = expected number of CLABSI based on NHSN  
 SIR = observed number / expected number of CLABSI  
 NA = SIR not shown in entire hospital with <50 central line days

**Central Line-Associated Blood Stream Infection (CLABSI) Standardized Infection Ratio (SIR)**  
 Tennessee (Reportable period: January 1 - December 31, 2008)



Data Reported as of August 1, 2009.  
 Obs. = observed number of CLABSI  
 Exp. = expected number of CLABSI based on NHSN  
 SIR = observed number / expected number of CLABSI  
 NA = SIR not shown in entire hospital with <50 central line days

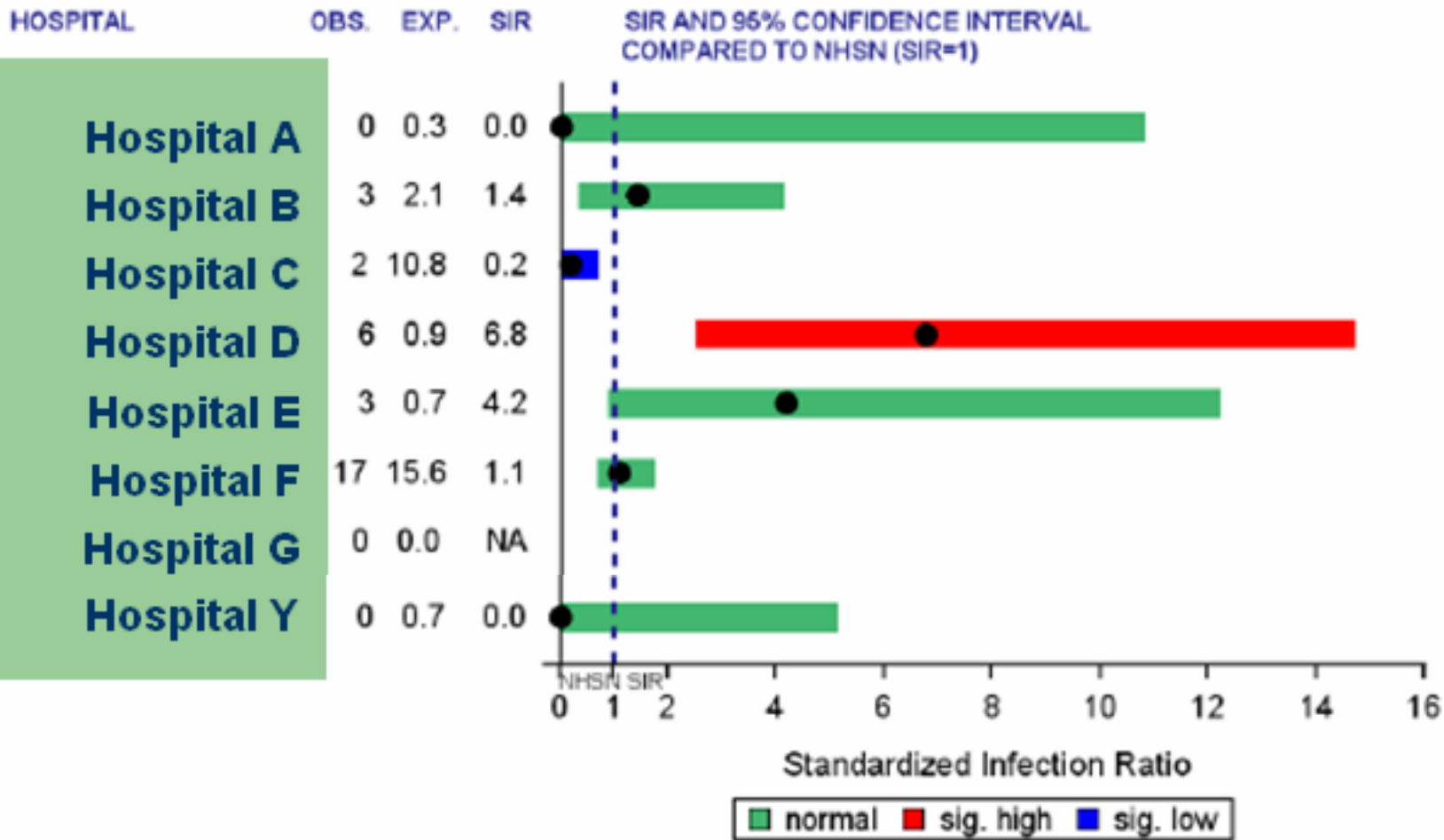
**Central Line-Associated Blood Stream Infection (CLABSI) Standardized Infection Ratio (SIR)**  
 Tennessee (Reportable period: January 1 - December 31, 2008)



Data Reported as of August 1, 2009.  
 Obs. = observed number of CLABSI  
 Exp. = expected number of CLABSI based on NHSN  
 SIR = observed number / expected number of CLABSI  
 NA = SIR not shown in entire hospital with <50 central line days

**Standardized Infection Ratio [SIR]**  
 Summary measure for each facility

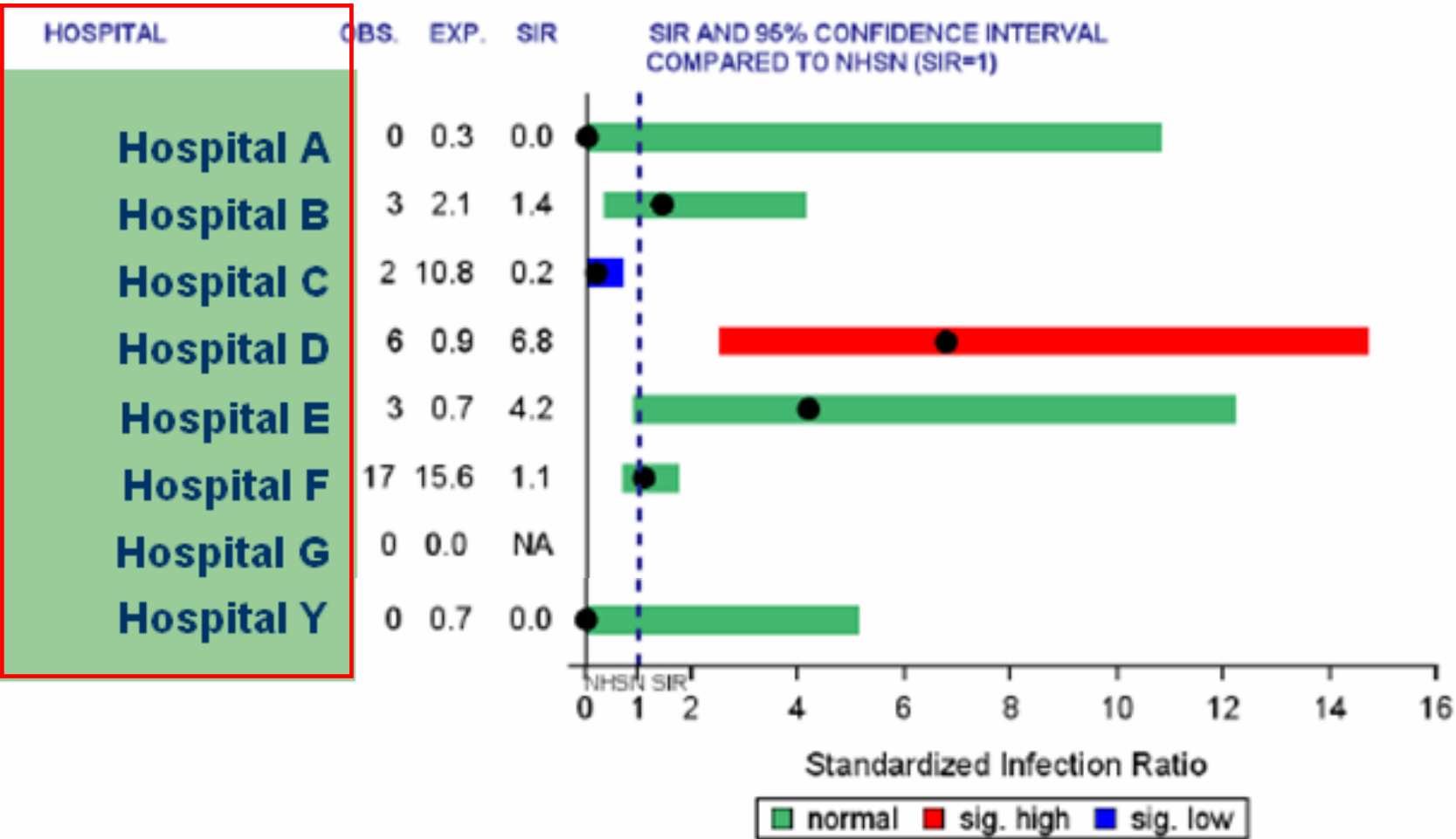
**Central Line-Associated Blood Stream Infection (CLABSI) Standardized Infection Ratio (SIR)**  
**Tennessee (Reportable period: January 1 - December 31, 2008)**



Data Reported as of August 1, 2009  
 Obs. = observed number of CLABSI  
 Exp. = expected number of CLABSI based on NHSN  
 SIR = observed number / expected number of CLABSI  
 NA = SIR not shown in entire hospital with <50 central line days

**Reportable Period : Jan 1- Dec 31, 2008**

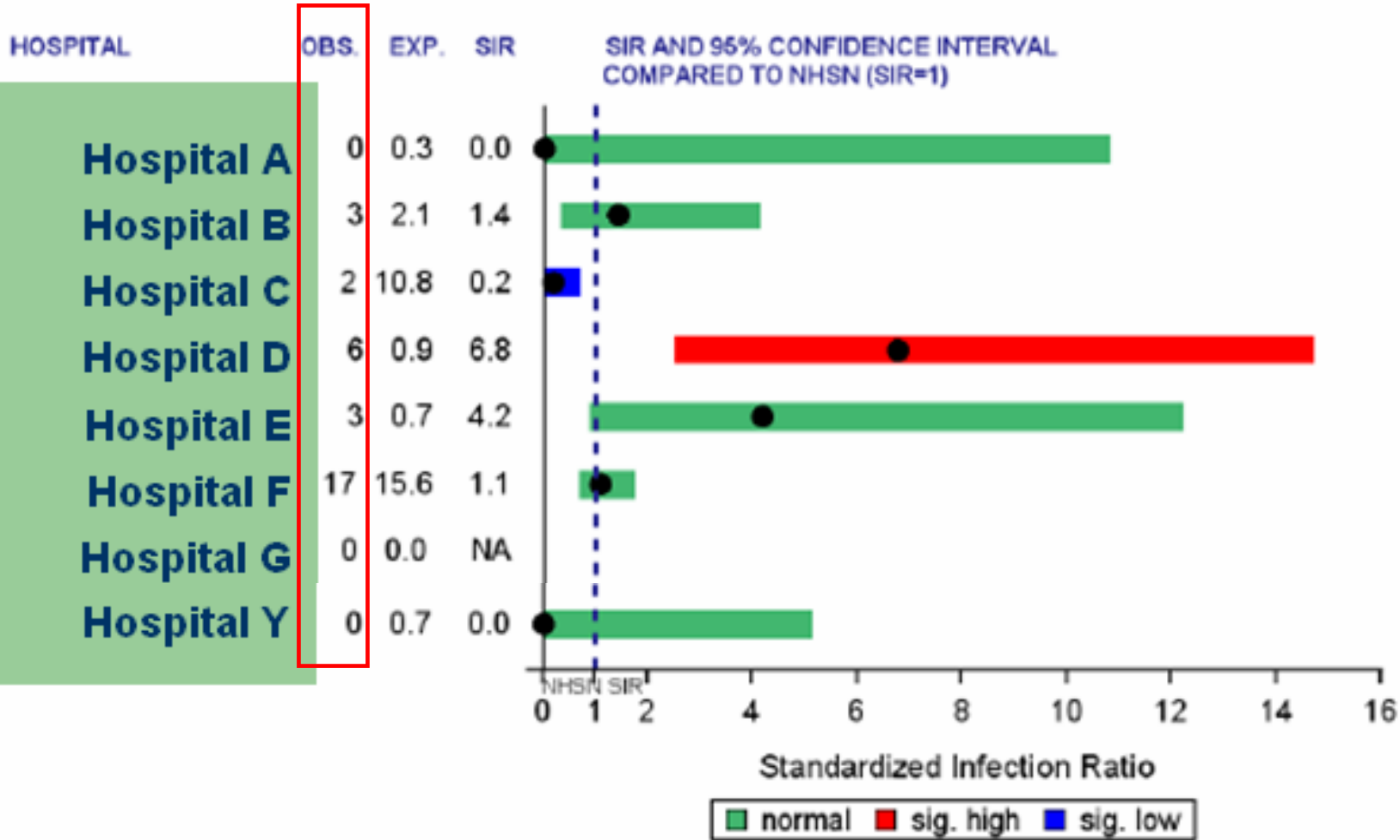
**Central Line-Associated Blood Stream Infection (CLABSI) Standardized Infection Ratio (SIR)**  
 Tennessee (Reportable period: January 1 - December 31, 2008)



Data Reported as of August 1, 2009.  
 Obs. = observed number of CLABSI  
 Exp. = expected number of CLABSI based on NHSN  
 SIR = observed number / expected number of CLABSI  
 NA = SIR not shown in entire hospital with <50 central line days

**Name of Hospital/Campus**  
**All Hospitals that were required to report CLABSI in any ICU type (alphabetical)**

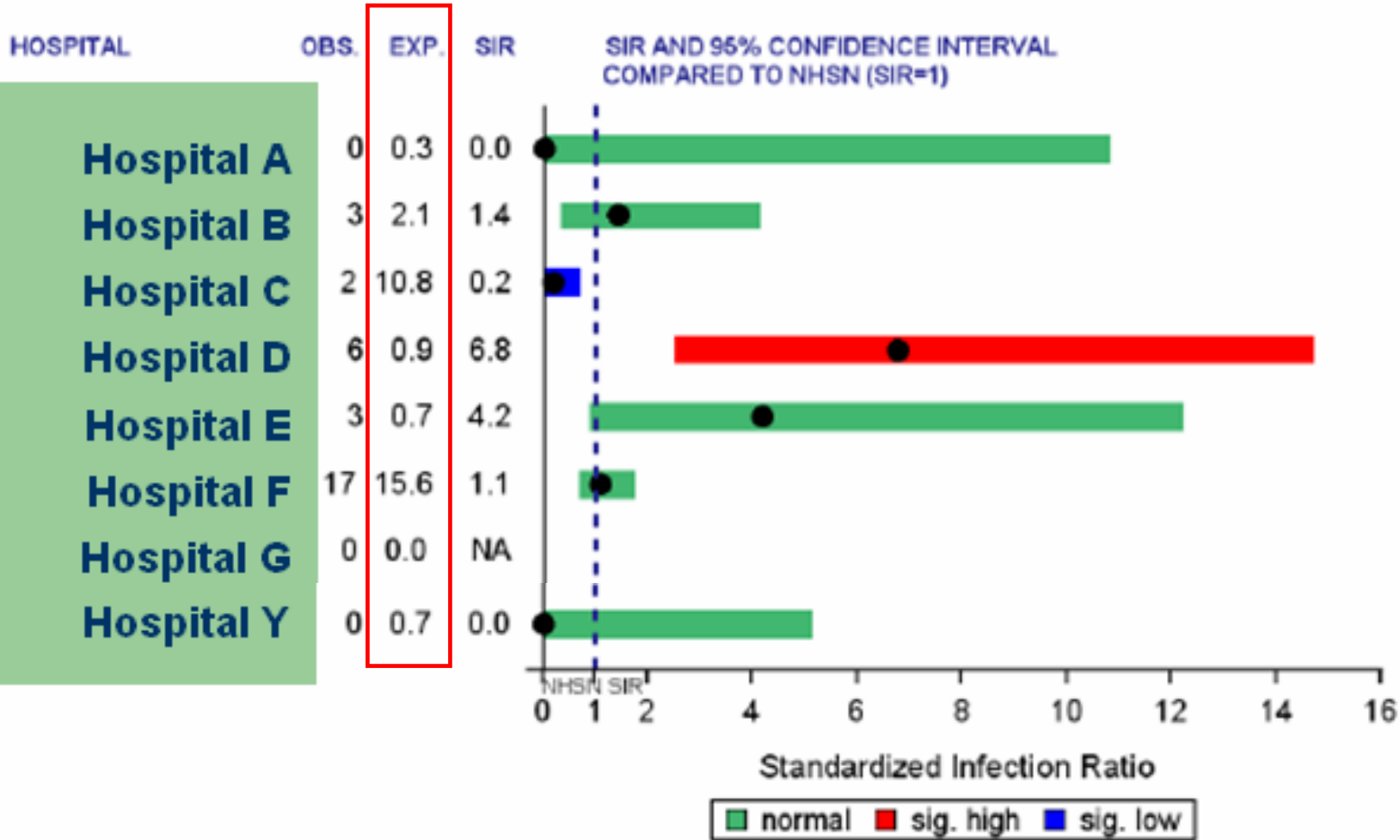
**Central Line-Associated Blood Stream Infection (CLABSI) Standardized Infection Ratio (SIR)**  
 Tennessee (Reportable period: January 1 - December 31, 2008)



Data Reported as of August 1, 2009.  
 Obs. = observed number of CLABSI  
 Exp. = expected number of CLABSI based on NHSN  
 SIR = observed number / expected number of CLABSI  
 NA = SIR not shown in entire hospital with <50 central line days

**Total number of CLABSIs observed in each facility across all monitored ICUs**

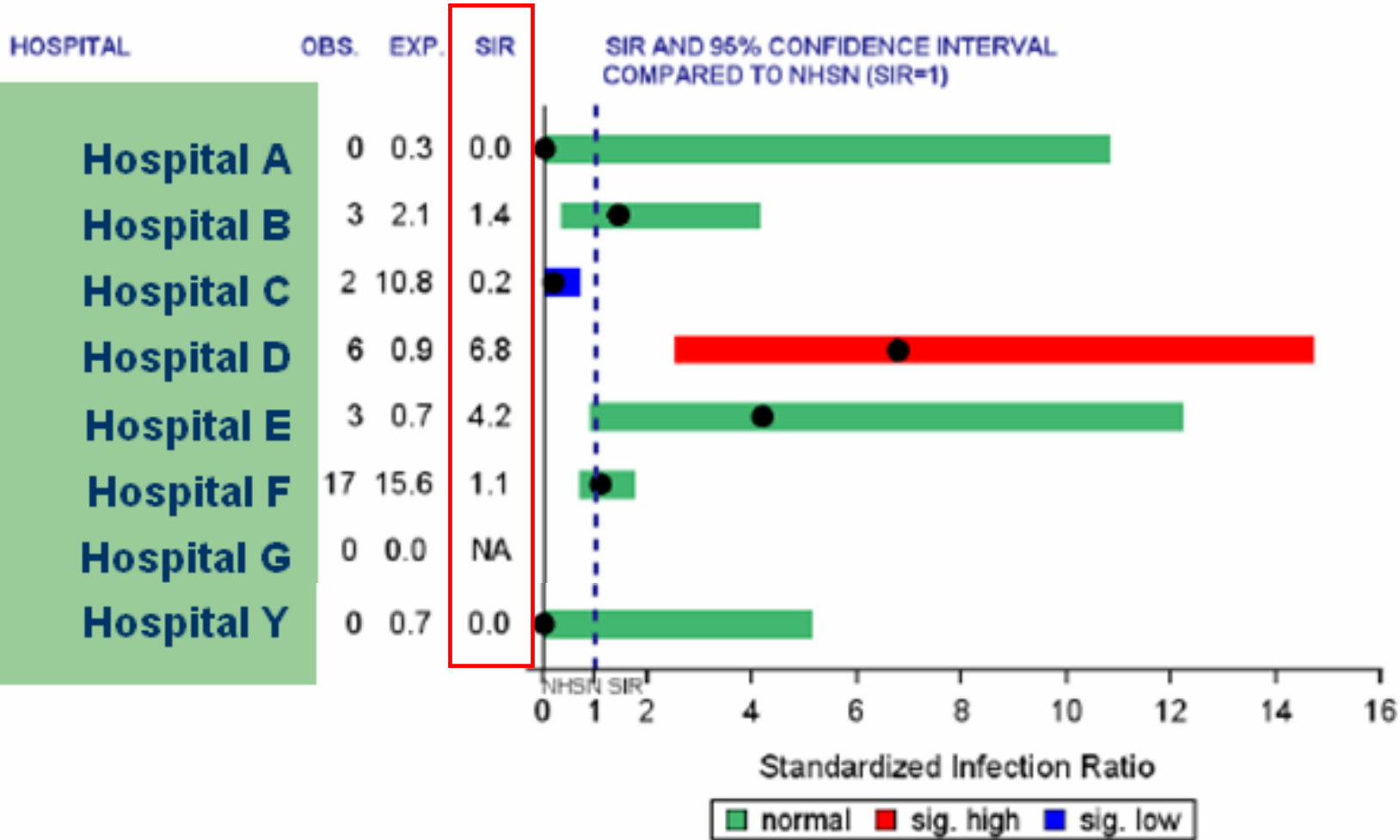
# Central Line-Associated Blood Stream Infection (CLABSI) Standardized Infection Ratio (SIR) Tennessee (Reportable period: January 1 - December 31, 2008)



Data Reported as of August 1, 2009  
 Obs. = observed number of CLABSI  
 Exp. = expected number of CLABSI based on NHSN  
 SIR = observed number / expected number of CLABSI  
 NA = SIR not shown in entire hospital with <50 central line days

**Total number of expected CLABSIs in each facility across all monitored ICUs**

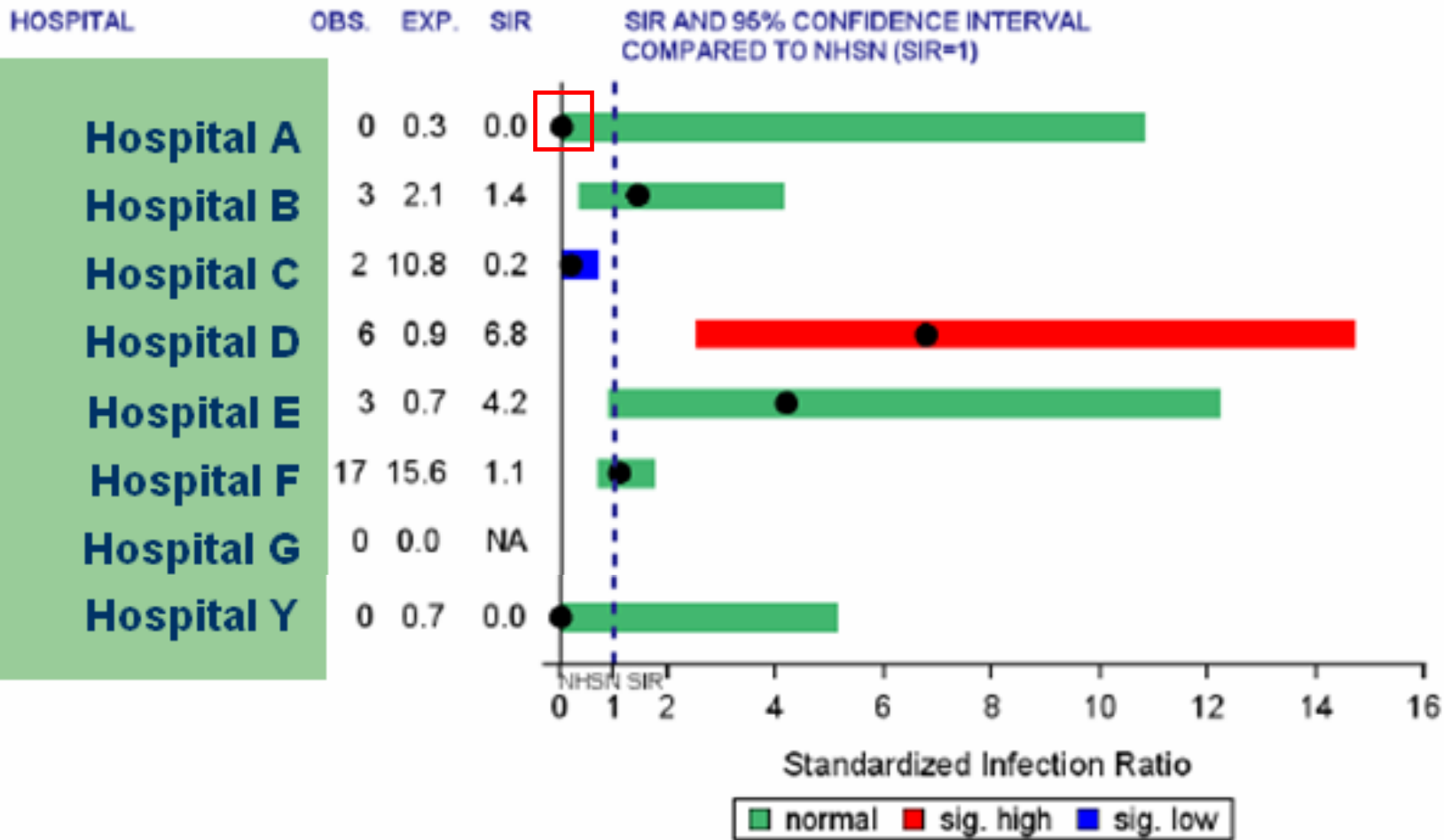
**Central Line-Associated Blood Stream Infection (CLABSI) Standardized Infection Ratio (SIR)**  
 Tennessee (Reportable period: January 1 - December 31, 2008)



Data Reported as of August 1, 2009.  
 Obs. = observed number of CLABSI  
 Exp. = expected number of CLABSI based on NHSN  
 SIR = observed number / expected number of CLABSI  
 NA = SIR not shown in entire hospital with <50 central line days

**Standardized infection ratio [SIR] for each Facility (observed/expected)**

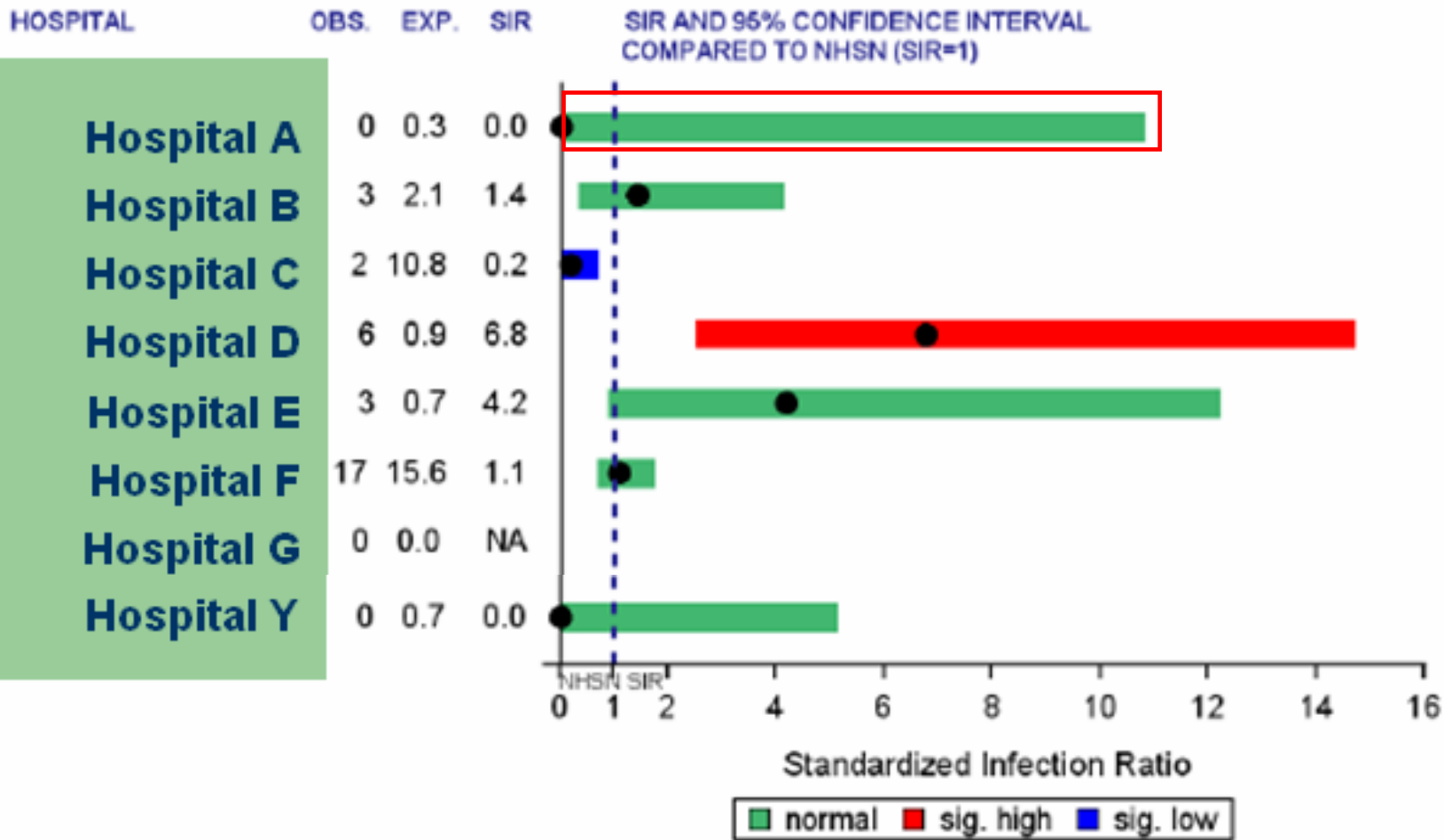
**Central Line-Associated Blood Stream Infection (CLABSI) Standardized Infection Ratio (SIR)**  
 Tennessee (Reportable period: January 1 - December 31, 2008)



Data Reported as of August 1, 2009.  
 Obs. = observed number of CLABSI  
 Exp. = expected number of CLABSI based on NHSN  
 SIR = observed number / expected number of CLABSI  
 NA = SIR not shown in entire hospital with <50 central line days

**Point estimate of the SIR.**  
**For Hospital A, point estimate = 0**

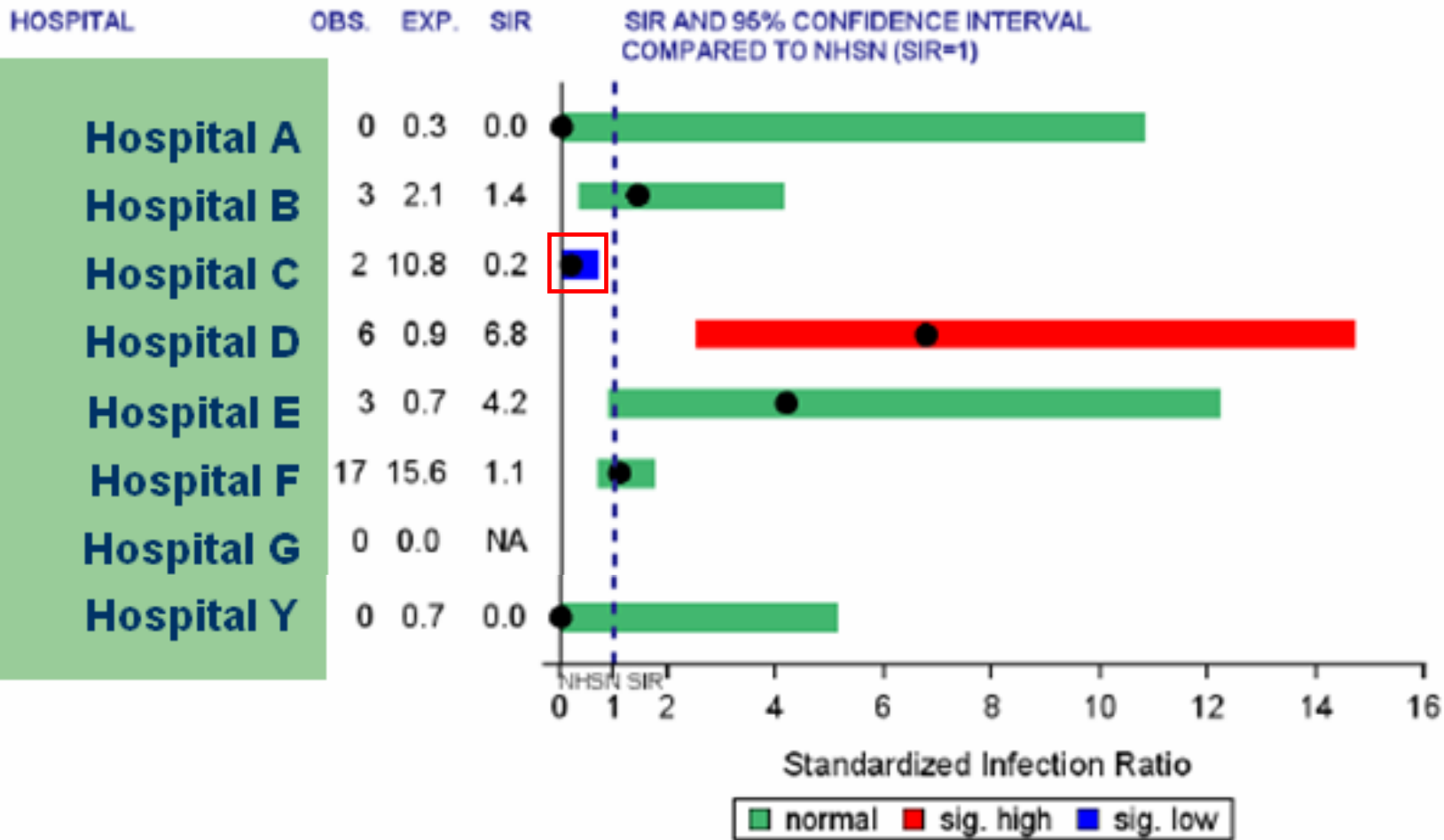
**Central Line-Associated Blood Stream Infection (CLABSI) Standardized Infection Ratio (SIR)**  
 Tennessee (Reportable period: January 1 - December 31, 2008)



Data Reported as of August 1, 2009.  
 Obs. = observed number of CLABSI  
 Exp. = expected number of CLABSI based on NHSN  
 SIR = observed number / expected number of CLABSI  
 NA = SIR not shown in entire hospital with <50 central line days

**95% confidence interval for SIR,  
 For Hospital A, crosses "1" i.e., not  
 Significantly different to NHSN 2006-7 data**

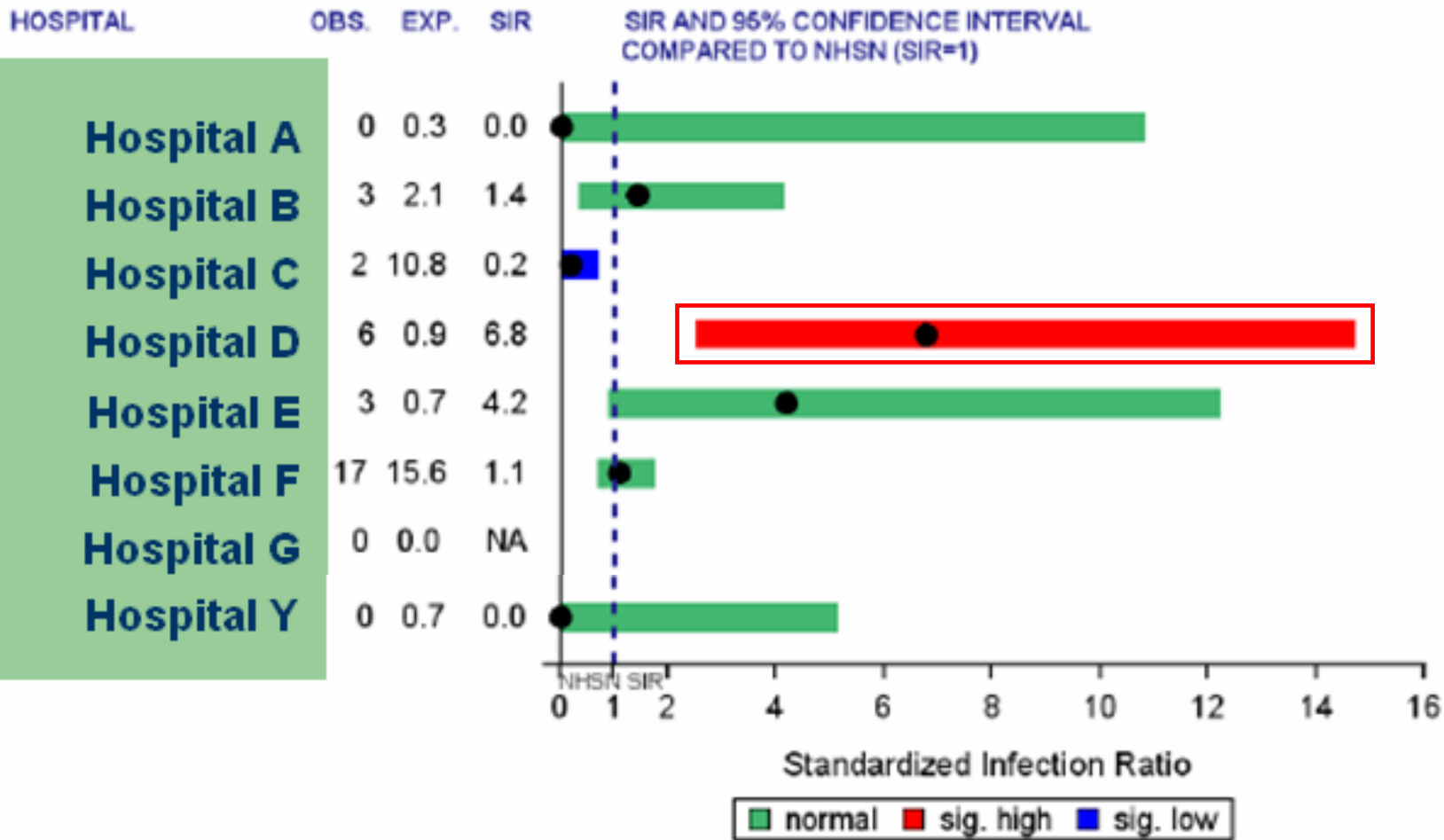
**Central Line-Associated Blood Stream Infection (CLABSI) Standardized Infection Ratio (SIR)**  
 Tennessee (Reportable period: January 1 - December 31, 2008)



Data Reported as of August 1, 2009.  
 Obs. = observed number of CLABSI  
 Exp. = expected number of CLABSI based on NHSN  
 SIR = observed number / expected number of CLABSI  
 NA = SIR not shown in entire hospital with <50 central line days

**95% confidence interval for SIR,  
 For Hospital C, does NOT cross "1"  
 Significantly LESS than NSHN 2006-2007**

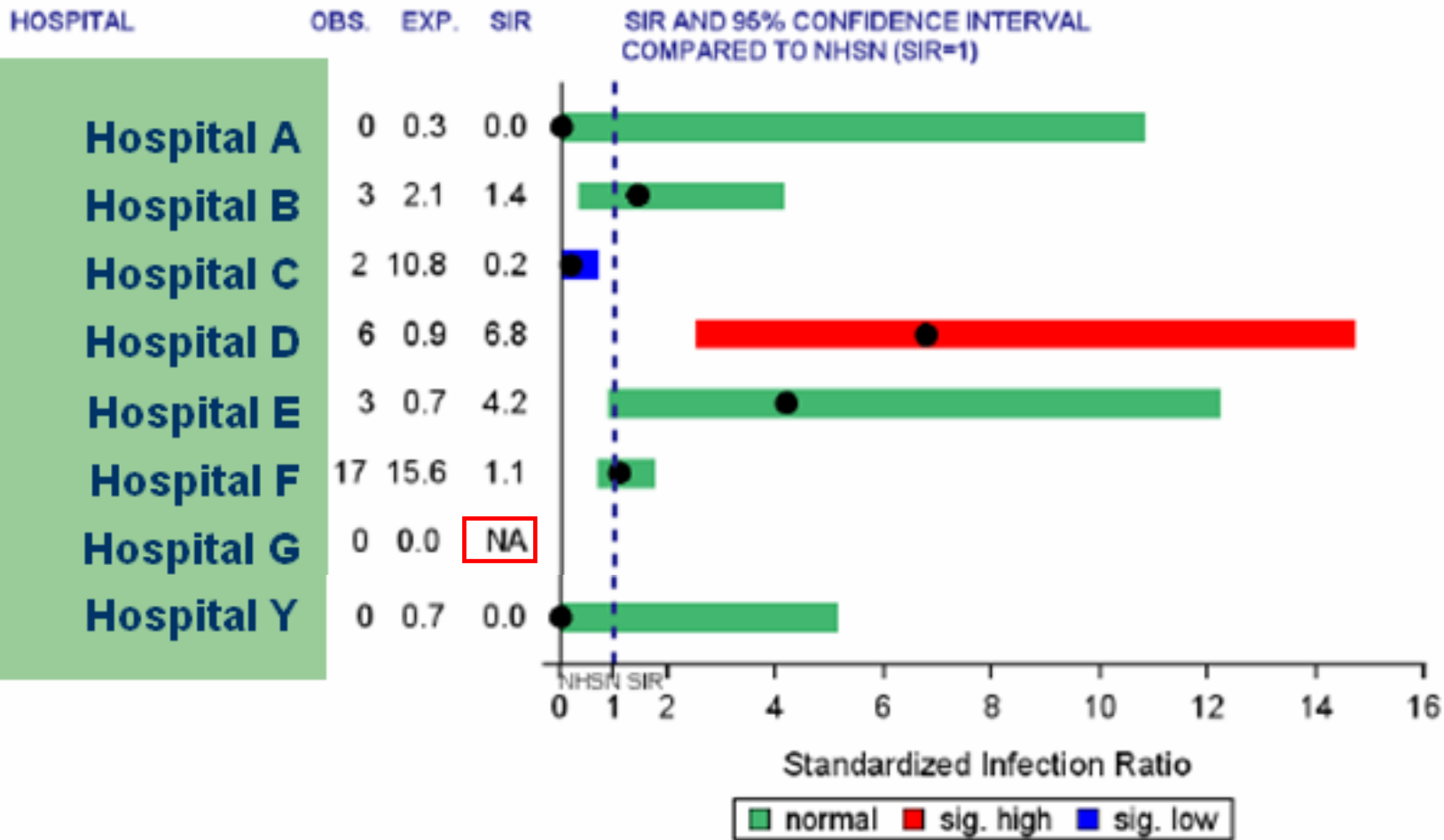
**Central Line-Associated Blood Stream Infection (CLABSI) Standardized Infection Ratio (SIR)**  
 Tennessee (Reportable period: January 1 - December 31, 2008)



Data Reported as of August 1, 2009.  
 Obs. = observed number of CLABSI  
 Exp. = expected number of CLABSI based on NHSN  
 SIR = observed number / expected number of CLABSI  
 NA = SIR not shown in entire hospital with <50 central line days

**95% confidence interval for SIR,  
 For Hospital D, does NOT cross "1"  
 Significantly HIGHER than NSHN 2006-2007**

**Central Line-Associated Blood Stream Infection (CLABSI) Standardized Infection Ratio (SIR)**  
 Tennessee (Reportable period: January 1 - December 31, 2008)



Data Reported as of August 1, 2009.  
 Obs. = observed number of CLABSI  
 Exp. = expected number of CLABSI based on NHSN  
 SIR = observed number / expected number of CLABSI  
 NA = SIR not shown in entire hospital with <50 central line days

**NA– SIR is not shown for Hospital G, Total number of central line days for Hospital G were LESS than 50**

**Questions?**

