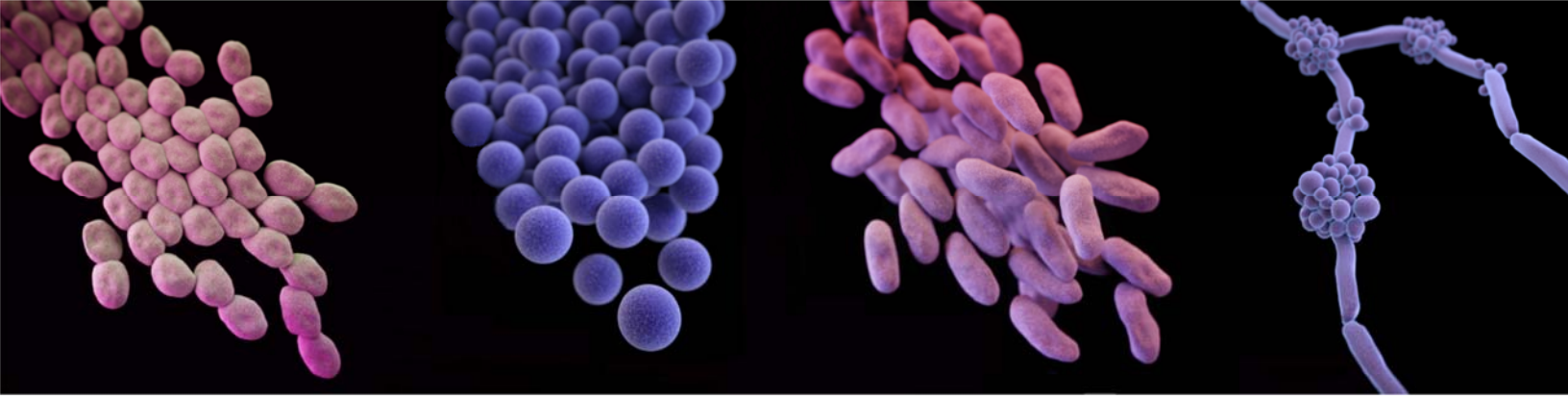

Hospital-Acquired Infections in New York State, 2015

Part 2: Technical Report

NEW YORK STATE | Department of Health

March 29, 2017

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Introduction

In accordance with Public Health Law 2819, New York State (NYS) has been tracking HAIs since 2007. This law was created to provide the public with fair, accurate, and reliable HAI data to compare hospital infection rates and to support quality improvement and infection prevention activities in hospitals.

NYSDOH evaluates which HAI indicators should be reported annually with the help of a Technical Advisory Workgroup (TAW), a panel of experts in the prevention and reporting of HAIs. In 2007, hospitals were required to report central line-associated bloodstream infections (CLABSIs) in intensive care units (ICUs) and surgical site infections (SSIs) following colon and coronary artery bypass graft (CABG) surgeries. In 2008, hip replacement SSIs were added; in 2010, *Clostridium difficile* (CDI) infections were added; in 2012, abdominal hysterectomy SSIs were added; and in 2014, carbapenem-resistant Enterobacteriaceae (CRE) infections were added.

In addition to reporting the HAI data mandated by NYS, hospitals enter data into NHSN for federal programs, regional collaboratives, and local surveillance. The Centers for Medicare and Medicaid Services (CMS) Hospital Inpatient Quality Reporting (IQR) Program provides higher reimbursement to hospitals that report certain types of HAI data, including catheter-associated urinary tract infections (CAUTIs) and methicillin-resistant *Staphylococcus aureus* (MRSA) bacteremia. In addition, the CMS Hospital Value-Based Purchasing Program provides incentive payments to hospitals based on how well they perform on certain HAI measures.

NYS entered into a data use agreement (DUA) with CDC that allows NYS to see all NHSN data for surveillance or prevention purposes. The DUA implemented in May 2013 prohibits the use of the data for public reporting of facility-specific data or for regulatory action. More information about the DUA is available on the CDC website http://www.cdc.gov/hai/pdfs/stateplans/New-York_DUA.pdf.

Table 1 summarizes the progression of NYS reporting requirements through 2015 and includes additional data visible through the DUA.

Table 1. Hospital-acquired infections reported by New York State hospitals, by year

Type of Infection	2007	2008	2009	2010	2011	2012	2013	2014	2015
Central line-associated bloodstream infections in ICUs	P1	✓	✓	✓	✓	✓	✓	✓	✓
Colon surgical site infections	P1	✓	✓	✓	✓	✓	✓	✓	✓
Coronary artery bypass graft surgical site infections	P1	✓	✓	✓	✓	✓	✓	✓	✓
Hip replacement surgical site infections		✓	✓	✓	✓	✓	✓	✓	✓
Clostridium difficile infections			P2	✓	✓	✓	✓	✓	✓
Abdominal hysterectomy surgical site infections						✓	✓	✓	✓
Carbapenem-resistant Enterobacteriaceae infections							P2	✓	✓
Central line-associated bloodstream infections in wards							DUA	DUA	✓
Catheter-associated urinary tract infections							DUA	DUA	DUA
Methicillin-resistant *Staphylococcus aureus* bacteremia							DUA	DUA	DUA

✓ = full reporting (publish hospital-specific rates)

P1 = pilot reporting full year (do not publish hospital-specific rates)

P2 = pilot reporting half year from July (do not publish hospital-specific rates)

DUA = Not required by New York, but reported for Centers for Medicare and Medicaid Services Inpatient Prospective Payment System and visible through data use agreement between CDC and NYS beginning May 2013.

This report focuses on HAI rates in NYS hospitals in 2015. The detailed information is primarily intended for use by hospital Infection Preventionists (IPs), but it may also be used by others who want more detailed information than is available in "Part 1: Summary for Consumers".

CDC HAI surveillance definitions have changed over time so that it is no longer possible to accurately quantify progress since the onset of NYS reporting in 2007. CDC has declared that 2015 is the new "baseline" for assessment of trends in coming years (http://www.cdc.gov/nhsn/2015rebaseline/index.html). NYS will also consider 2015 to be a new baseline for assessment of trends until surveillance definitions change such that the comparisons are no longer valid, or until policy changes require a new baseline. Crude trend plots have been included in this report for transparency regarding how HAI counts in 2015 compared to counts in previous years, but the valid interpretation of these plots is limited by the degree of changes to the definitions.

Surgical Site Infections (SSIs)

For each type of SSI, the following pages present detailed information on the severity (depth) of infections, the circumstance of detection (initial hospitalization, readmission, etc.), the microorganisms involved, and time trends. In addition, detailed plots show each individual hospital's risk-adjusted infection rates compared to the state average.

SSIs are categorized into three groups depending on the severity of the infection:

- Superficial Incisional SSI - This infection occurs in the area of the skin where the surgical incision was made. The patient may have pus draining from the incision or laboratory-identified pathogens from cultures of the incision.
- Deep Incisional SSI - This infection occurs beneath the incision in muscle tissue. Pus may drain from the incision, and patients may experience fever and pain. The incision may reopen on its own, or a surgeon may reopen the wound.
- Organ or Space SSI - This type of infection occurs in body organs or the space between organs. Pus may collect in an abscess below the muscles, resulting in inflammation and pain.

Hospital IPs use a wide variety of surveillance methods to identify SSIs. Some routinely review all procedures for SSIs, while others review a subset of procedures that are flagged based on data mining systems, wound culture reports, readmission, return to surgery, and discharge coding. IPs review the selected procedures using many data sources, including lab reports, operative reports, physician dictated operative notes, progress notes, discharge notes, history and physical examination documentation, return to surgery, radiology reports, infectious disease consultations, intraoperative reports, outpatient/emergency room visits, documentation of vital signs, antibiotic prescriptions, and coding summary sheets.

SSIs may be detected on the original hospital admission, readmission to the same hospital, readmission to a different hospital, or only in outpatient settings (post-discharge surveillance and not readmitted, [PDS]). The ability to identify SSIs among patients seen by physicians in outpatient settings varies among hospitals. PDS infections are included in statewide rates, but excluded from hospital-specific comparisons in this report so as not to penalize facilities with the best surveillance systems.

In January 2015, hospitals began specifying which SSIs were related to infections "present at time of surgery (PATOS)." If there is evidence of clinical infection or abscess at the time a surgical procedure is performed, any resulting SSI would have the term PATOS attached to it. The number of PATOS SSIs are summarized for each type of procedure. Because PATOS SSIs are more difficult to prevent, these SSIs and procedures are excluded from the final hospital risk-adjusted rates.

Major changes in the SSI surveillance protocol for all surgery types (e.g. colon, CABG, hip, hysterectomy) are summarized in Table 2.

Table 2: Changes in surgical site infection definitions and guidance

Year	Description
2007	• An NHSN operative procedure is a procedure that takes place during an operation (defined as 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). • Primary closure: If the skin incision edges do not meet because of wires or devices or other objects extruding through the incision, the incision is not considered primarily closed and therefore the procedure is not considered an NHSN-reportable operation. • Superficial SSI: Infection occurs within 30 days after the operative procedure. • Deep/Organ Space SSI: Infection occurs within 30 days after the operative procedure if no implant is left in place or within one year if implant is in place and the infection appears to be related to the operative procedure. • If more than one NHSN operative procedure was done through a single incision, attempt to determine the procedure that is thought to be associated with the infection. If it is not clear (as is often the case when the infection is a superficial incisional SSI), use the NHSN Principal Operative Procedure Selection Lists to select which operative procedure to report. (Colon procedure 6th on priority list, small bowel 1st, and rectal procedures 5th.) • Date of Event: The date when the first clinical evidence of the SSI appeared or the date the specimen used to make or confirm the diagnosis was collected, whichever comes first. • Scope definition: Yes if the entire operative procedure was performed using an endoscope/laparoscope, otherwise No.
2008	• NYS mandates inter-facility communication; SSIs that meet NHSN criteria must be entered into NHSN by the hospital where the procedure was originally performed.
2009	No significant changes
2010	No significant changes
2011	No significant changes
2012	• SSIs detected on readmission must now be reported as "RF" – readmission to facility in which the original procedure was performed – or "RO" – readmission to a facility other than the one in which the original procedure was performed. • Scope definition: Yes, if the entire operative procedure was performed using an endoscope/laparoscope; No, if the endoscope incision was extended to allow hand assistance, or fully converted to open approach. • Clarification that SSIs following invasive manipulation of the operative site are not reportable to the original procedure.

2013	• The definition of primary closure was revised to include procedures where devices remain extruding through the incision at the end of surgery. Procedure end time redefined to accommodate open procedures. • The requirement for reporting implants was removed. • Follow-up for SSI surveillance limited to 30 days for all SSI types and operative procedures, except for a subset of 14 procedures that will require a 90-day follow-up period for deep incisional and organ/space infections. • The NHSN Principal Operative Procedure Category Selection lists were revised to reflect current NHSN SSI data and the order of procedures updated. Major impact on colon SSI: colon procedures are now higher on the list than small bowel and rectal procedures, increasing the number of colon SSIs. Minor impact on hysterectomy: hysterectomy procedures moved above cesarean section procedures.
2014	• Open procedures must be reported, and closure technique is reported for all procedures. • "Periprosthetic joint infection" added as part of SSI surveillance definitions. • Hip procedure classification changed from 4 groups (total primary, partial primary, total revision, partial revision) to three groups (total, hemi, resurfacing) with additional subgroups to indicate primary procedure or revision. • Date of Event: The date when the last element used to meet the CDC/NHSN site-specific infection criterion occurred. Date of event must be within 30 days or 90 days of the date of procedure, depending on the operative procedure category. • Height and weight added as risk adjustment variables.
2015	• Infection present at time of surgery (PATOS) designation required for all SSI events (not all procedures). PATOS denotes that an infection is present at the start of, or during, the index surgical procedure. • If a total or partial revision of a hip replacement is performed, variable "prior infection at index joint" added a new risk factor. • Diabetes added as new risk factor. • Endoscope definition: Yes, if the NHSN operative procedure was coded as a laparoscopic procedure performed using a laparoscope/robotic assist method, otherwise No. If a scope site has to be extended for hand assist or removal of specimen this will still meet scope = Yes. If the procedure is converted to an open procedure would it will be scope = No. • Date of Event: The date that the first element used to meet the infection criterion occurs for the first time within the infection window period.

Colon Surgical Site Infections

Among 18,845 colon procedures performed in 2015, 1,381 (7.3%) developed SSIs. Of these infections, 37% were superficial, 11% were deep, and 52% were organ/space (Table 3). The majority of the SSIs (61%) were detected during the initial hospitalization; 28% were identified upon readmission to the same hospital; 3% involved readmission to another hospital; and 8% were detected using post-discharge surveillance and not readmitted. The majority of the PDS infections were superficial. Detection of SSIs in outpatient locations is labor intensive and is not standardized across hospitals; therefore, the NYSDOH did not include these 117 PDS infections for hospital-specific comparisons.

Table 3. Method of detection of colon surgical site infection by depth of infection, New York State 2015

	When Detected				
Extent (Row%) (Column%)	**Initial Hospitalization**	**Readmitted to the Same Hospital**	**Readmitted to Another Hospital**	**Post-Discharge Surveillance Not Readmitted**	**Total**
Superficial Incisional	283 (55.0%) (33.6%)	115 (22.3%) (30.3%)	14 (2.7%) (33.3%)	103 (20.0%) (88.0%)	515 (37.3%)
Deep Incisional	92 (61.7%) (10.9%)	43 (28.9%) (11.3%)	6 (4.0%) (14.3%)	8 (5.4%) (6.8%)	149 (10.8%)
Organ/Space	467 (65.1%) (55.5%)	222 (31.0%) (58.4%)	22 (3.1%) (52.4%)	6 (0.8%) (5.1%)	717 (51.9%)
Total	842 (61.0%)	380 (27.5%)	42 (3.0%)	117 (8.5%)	1,381

New York State data reported as of August 5, 2016

The most common microorganisms associated with colon SSIs were Enterococci and *Escherichia coli* (Table 4).

Table 4. Microorganisms identified in colon surgical site infections, New York State 2015

Microorganism	Number of Isolates	Percent of Infections
Enterococci	420	30.4
(VRE)	(82)	(5.9)
Escherichia coli	352	25.5
(CRE-*E. coli*)	(4)	(0.3)
Staphylococcus aureus	142	10.3
(MRSA)	(82)	(5.9)
Klebsiella spp.	102	7.4
(CRE-*Klebsiella*)	(7)	(0.5)
(CephR-*Klebsiella*)	(13)	(0.9)
Pseudomonas spp.	99	7.2
Enterobacter spp.	84	6.1
Bacteroides	81	5.9
Yeast	75	5.4
Streptococci	72	5.2
Coagulase negative staphylococci	68	4.9
Proteus spp.	39	2.8
Citrobacter spp.	33	2.4
Clostridia spp.	22	1.6
Morganella morganii	20	1.4
Prevotella spp.	11	0.8
Actinomyces spp.	9	0.7
Gram-negative bacilli	8	0.6
Acinetobacter spp.	6	0.4
(MDR-*Acinetobacter*)	(5)	(0.4)
Gram-negative coccus	5	0.4
Other	51	3.7

New York State data reported as of August 5, 2016. Out of 1,381 infections, no microorganisms identified for 364 (26%) infections.
VRE: vancomycin-resistant enterococci; CephR: cephalosporin-resistant; CRE: carbapenem-resistant Enterobacteriaceae; MDR: multidrug resistant; MRSA: methicillin-resistant *Staphylococcus aureus; s;* spp: multiple species

Colon PATOS SSIs

Of the 1,381 infections, 243 (17.7%) were classified as PATOS. These SSIs were predominantly Organ/Space (Table 5). At completion of the surgery 75% were primarily closed.

Table 5: Depth of SSIs that were present at time of surgery

Extent	# (%)
Superficial Incisional	16 (7%)
Deep Incisional	4 (2%)
Organ/Space	223 (92%)
Total	243

Risk adjusting for PATOS SSIs is not possible because pre-procedure infection status is not reported for all procedures; it is only reported for SSIs. Reducing the risk of PATOS SSIs is more difficult than reducing the risk of other SSIs. For these reasons, NYSDOH did not include these 243 infections in hospital-specific comparisons. However, to encourage hospitals to continue to implement prevention efforts for these types of procedures, the percentage of procedures excluded from the performance indicator due to colon PATOS SSIs is summarized by hospital in Table 6.

Table 6: Surgical site infections with an infectious status at time of surgery, New York State 2015

Hospital Name	Number of PATOS SSI	Number of Procedures	Percent PATOS
ALL HOSPITALS	243	18,845	1.3
Albany Med Ctr	6	452	1.3
Arnot Ogden Med Ctr	1	71	1.4
Bellevue Hospital	3	115	2.6
Brookhaven Memorial	1	86	1.2
Brooklyn Hosp Ctr	1	78	1.3
Buffalo General	5	163	3.1
Cayuga Medical Ctr	2	62	3.2
Champlain Valley	2	90	2.2
Crouse Hospital	6	265	2.3
Ellis Hospital	1	175	0.6
Elmhurst Hospital	2	61	3.3
Erie County Med Ctr	1	92	1.1
FF Thompson	3	80	3.8
Geneva General	2	46	4.3
Good Samar. W Islip	2	266	0.8
Highland Hospital	3	154	1.9
Huntington Hospital	2	169	1.2
JT Mather Hospital	2	117	1.7
Jacobi Med Ctr	2	104	1.9
Jamaica Hospital	3	82	3.7
Jones Memorial	1	16	6.3
Kings County Hosp	4	148	2.7
Kingsbrook Jewish MC	2	49	4.1
Lenox Hill Hospital	1	250	0.4
Long Isl Jewish(LIJ)	1	345	0.3
Maimonides Med Ctr	4	251	1.6
Massena Memorial	1	6	16.7

Table 6: Surgical site infections with an infectious status at time of surgery, New York State 2015

Hospital Name	Number of PATOS SSI	Number of Procedures	Percent PATOS
Memor SloanKettering	7	785	0.9
Mercy Hosp Buffalo	3	262	1.1
Mercy Med Ctr	2	74	2.7
Metropolitan Hosp	1	33	3.0
MidHudson Reg of WMC	2	47	4.3
Millard Fill. Suburb	3	267	1.1
Montefiore-Einstein	1	207	0.5
Montefiore-Wakefield	4	37	10.8
Mount St. Marys	1	36	2.8
Mt Sinai	34	931	3.7
Mt Sinai Beth Israel	2	236	0.8
Mt Sinai St Lukes	1	62	1.6
NY Methodist	2	204	1.0
NYP-Columbia	1	390	0.3
NYP-Lawrence	1	77	1.3
NYP-Queens	4	213	1.9
NYP-Weill Cornell	9	583	1.5
NYU Langone Med Ctr	2	425	0.5
North Central Bronx	1	8	12.5
North Shore	10	537	1.9
Northern Westchester	1	127	0.8
Oneida Healthcare	2	96	2.1
OrangeReg Goshen-Mid	2	198	1.0
Our Lady of Lourdes	1	137	0.7
Phelps Memorial	1	49	2.0
Plainview Hospital	5	116	4.3
Putnam Hospital	2	97	2.1
Queens Hospital	1	59	1.7
Richmond Univ MC	1	98	1.0

Table 6: Surgical site infections with an infectious status at time of surgery, New York State 2015

Hospital Name	Number of PATOS SSI	Number of Procedures	Percent PATOS
Rochester General	4	444	0.9
Samaritan- Watertown	3	68	4.4
Saratoga Hospital	4	127	3.1
Sisters of Charity	1	130	0.8
Sisters- St Joseph	3	58	5.2
South Nassau Comm.	5	186	2.7
Southside	7	200	3.5
St Barnabas	1	48	2.1
St Elizabeth Medical	1	73	1.4
St Francis- Roslyn	5	164	3.0
St Johns Riverside	2	57	3.5
St Joseph -Bethpage	1	44	2.3
St Josephs- Syracuse	9	310	2.9
St LukesNewburgh-Cor	1	65	1.5
St Peters Hospital	3	367	0.8
Strong Memorial	1	402	0.2
Syosset Hospital	1	16	6.3
Univ Hosp SUNY Upst	5	169	3.0
Univ Hosp StonyBrook	2	276	0.7
Westchester Medical	3	115	2.6
White Plains Hosp	3	151	2.0
Winthrop University	5	325	1.5
Woman and Childrens	1	30	3.3
Wyckoff Heights	1	43	2.3

Data reported as of August 5, 2016 for hospitals with at least one PATOS SSI. PATOS=present at time of surgery; SSI= surgical site infection. Use caution when interpreting percentages based on a small number of procedures.

Risk-Adjustment for Colon SSIs

In 2015, after excluding SSIs reported as part of PDS methods that did not result in hospitalization and PATOS SSIs, the NYS colon SSI rate was 1,030/18,611=5.5%. The following risk factors were associated with these SSIs and included in the risk-adjustment model:

- Patients with severe systemic disease (American Society of Anesthesiologists (ASA) score of 3, 4, or 5) were 1.4 times more likely to develop an SSI than healthier patients (ASA score of 1 or 2).
- Procedures with duration greater than three hours were 2.3 times more likely to result in SSI than procedures less than two hours. Procedures with duration between two and three hours were 1.7 times more likely to result in SSI than procedures less than two hours.
- Procedures that used traditional surgical incisions were 1.8 times more likely to result in SSI than procedures performed entirely with a laparoscopic instrument.
- Obese patients (with body mass index [BMI] greater than 30) were 1.3 times more likely to develop an SSI than patients with BMI less than or equal to 30.

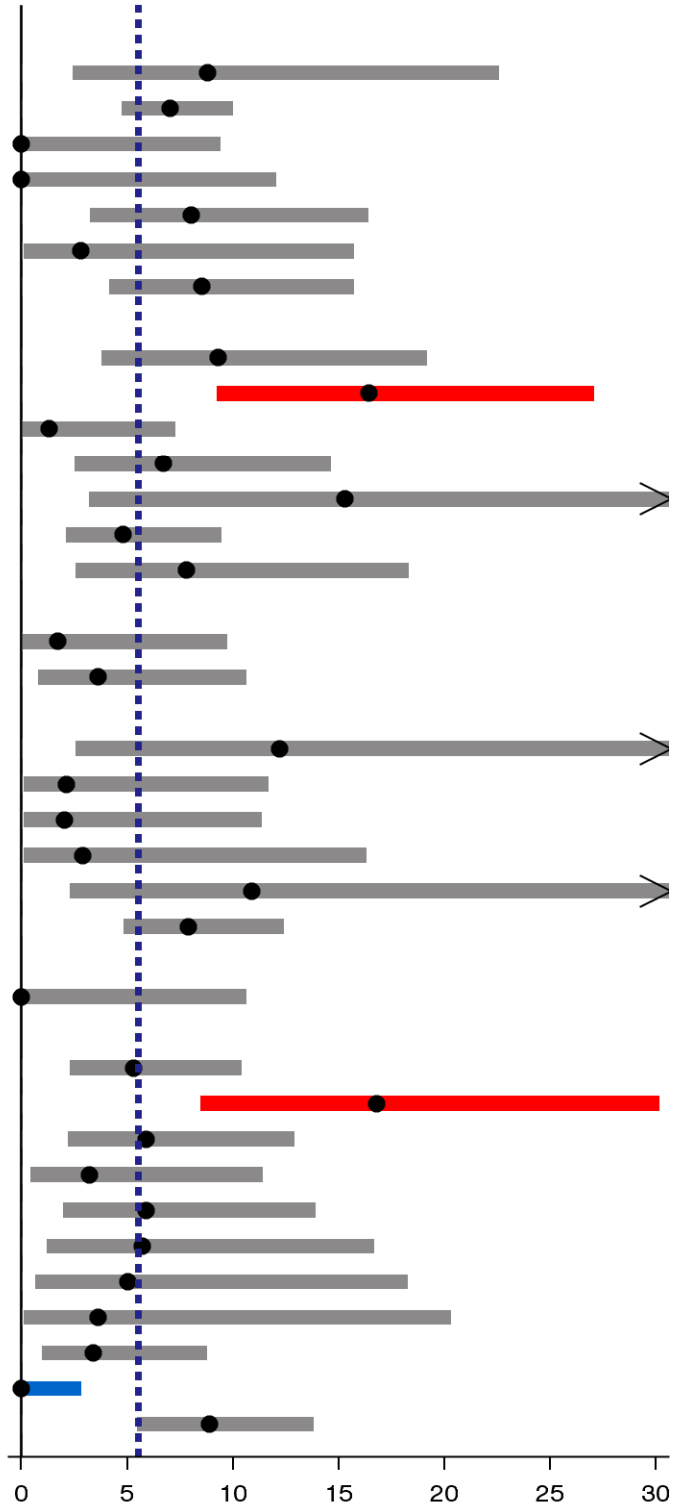
Hospital-Specific Colon SSI Rates

Hospital-specific colon SSI rates are provided in Figure 1. Six hospitals (4%) had colon SSI rates that were statistically higher than the state average. Two of these hospitals were high for two years in a row, and one was high for three years in a row. All six hospitals will submit improvement plans following the NYSDOH HAI Reporting Program's Policy for Facilities with Consecutive Years of High HAI Rates.

Five hospitals (4%) had rates that were statistically lower than the state average; HealthAlliance of the Hudson Valley Broadway Campus has been significantly lower for six years in a row (2010-2015).

Figure 1: Colon Surgical Site Infection Rates, New York 2015 (page 1 of 4)

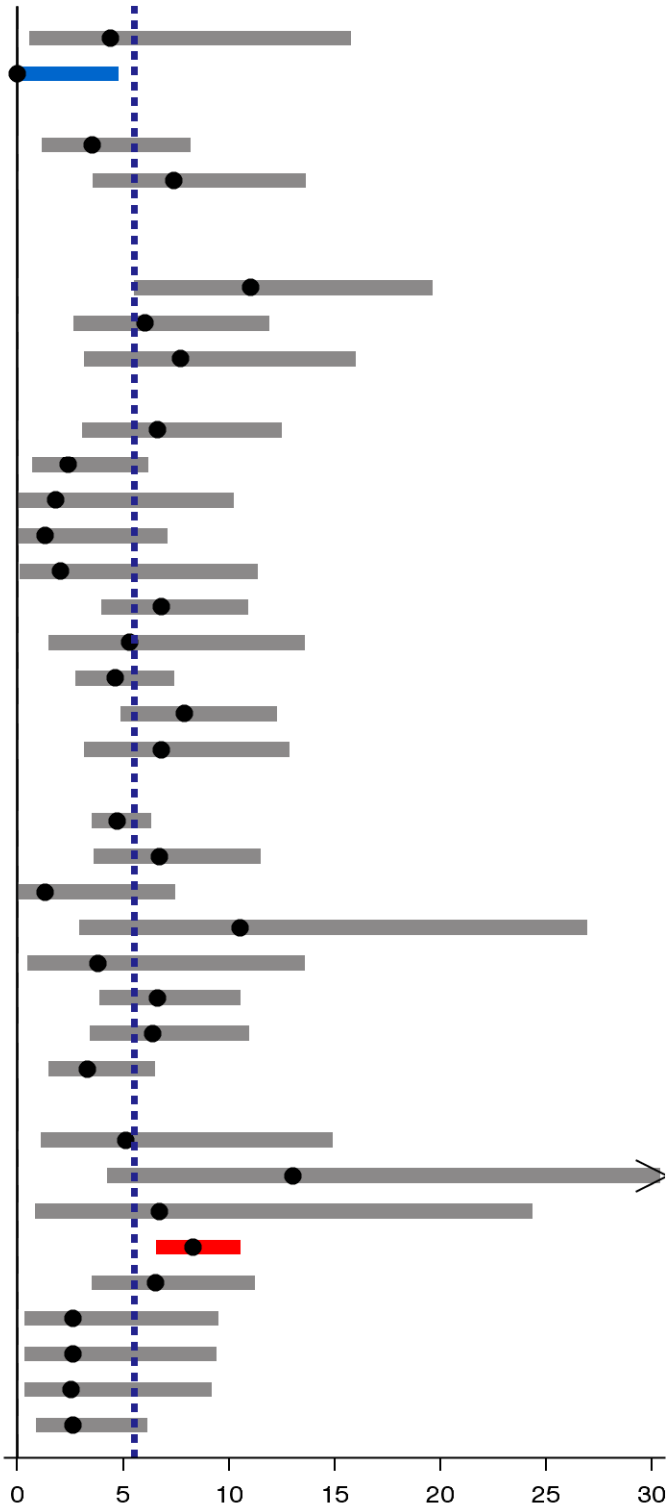
HOSPITAL	# SSI	#PDS EXCL	# PROCS	RAW RATE	ADJ RATE
AO Fox Memorial	NA	NA	NA	NA	NA
Adirondack Medical	4	1	85	4.7	8.8
Albany Med Ctr	30	5	446	6.7	7.0
Albany Memorial	0	0	37	0.0	0.0
Alice Hyde Med Ctr	0	0	25	0.0	0.0
Arnot Ogden Med Ctr	7	1	70	10.0	8.0
Auburn Memorial	1	0	35	2.9	2.8
Bellevue Hospital	10	1	112	8.9	8.5
Bon Secours	NA	NA	NA	NA	NA
Bronx-Lebanon	7	0	79	8.9	9.3
Brookdale Hospital^^	15	2	65	23.1	16.4
Brookhaven Memorial	1	0	85	1.2	1.3
Brooklyn Hosp Ctr	6	0	77	7.8	6.7
Brooks Memorial	3	1	20	15.0	15.3
Buffalo General	8	0	158	5.1	4.8
Canton-Potsdam	5	1	60	8.3	7.8
Catskill Regional	NA	NA	NA	NA	NA
Cayuga Medical Ctr	1	2	60	1.7	1.7
Champlain Valley	3	0	89	3.4	3.6
Claxton-Hepburn	NA	NA	NA	NA	NA
Clifton Springs	3	0	27	11.1	12.2
Columbia Memorial	1	1	61	1.6	2.1
Coney Island Hosp	1	1	55	1.8	2.0
Corning Hospital	1	0	34	2.9	2.9
Cortland Reg Med	3	0	27	11.1	10.9
Crouse Hospital	19	0	259	7.3	7.9
DeGraff Memorial	NA	NA	NA	NA	NA
East. Niag. Lockport	0	0	33	0.0	0.0
Eastern Long Island	NA	NA	NA	NA	NA
Ellis Hospital	8	0	174	4.6	5.3
Elmhurst Hospital^^	11	0	59	18.6	16.8
Erie County Med Ctr	6	0	91	6.6	5.9
FF Thompson	2	0	77	2.6	3.2
Faxton St. Lukes	5	0	88	5.7	5.9
Flushing Hospital	3	0	54	5.6	5.7
Geneva General	2	0	44	4.5	5.0
Glen Cove Hospital	1	0	26	3.8	3.6
Glens Falls Hospital	4	3	171	2.3	3.4
Good Samar. Suffern**	0	0	134	0.0	0.0
Good Samar. W Islip	20	0	264	7.6	8.9



Data reported as of August 05, 2016. ┆State Average. ●Risk-adjusted Infection rate. ▬^^Signif. higher than state average. ▬**Significantly lower than state average. ▬Average. > Upper confidence limit exceeds graph area. NA: less than 20 procedures.
SSI: surgical site infections, Procs: procedures. Rates are per 100 procedures. Adjusted using ASA score, obesity, duration, and endoscope. Excludes SSIs present at time of surgery and non-readmitted cases identified using post discharge surveillance (PDS).

Figure 1: Colon Surgical Site Infection Rates, New York 2015 (page 2 of 4)

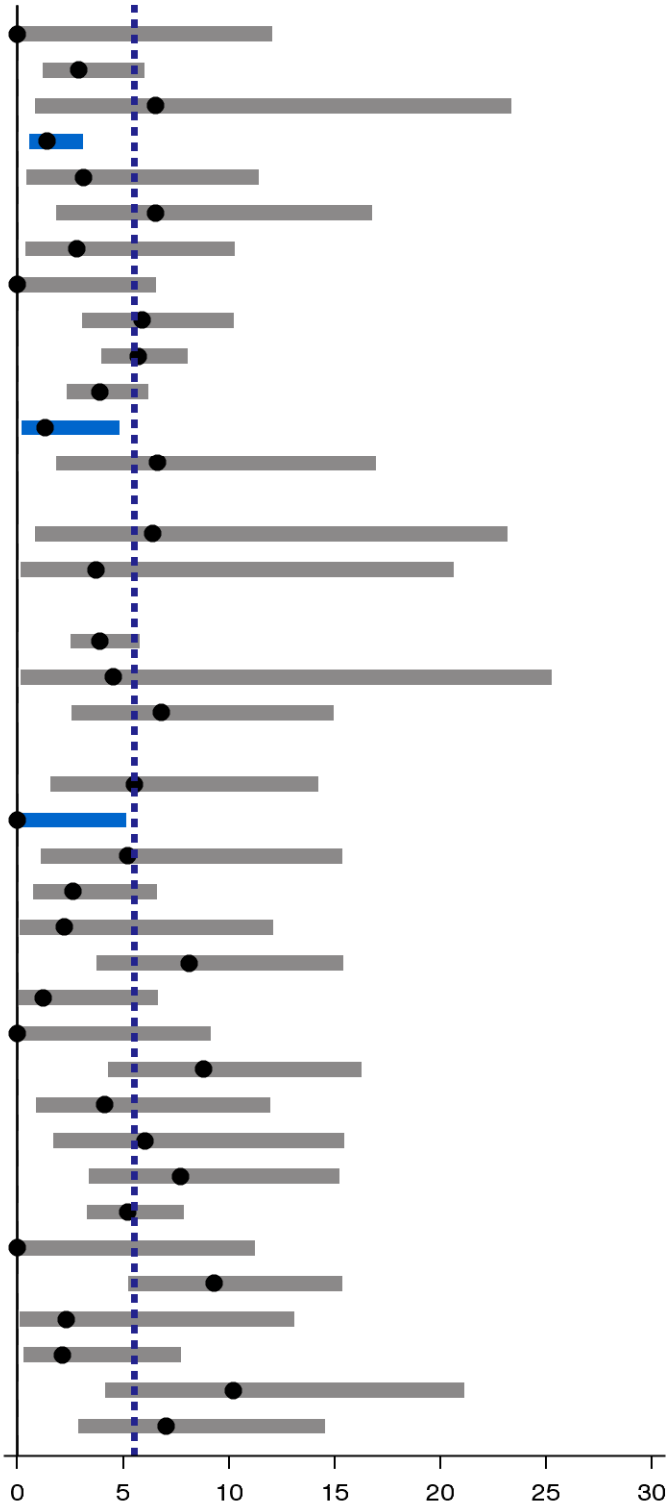
HOSPITAL	# SSI	#PDS EXCL	# PROCS	RAW RATE	ADJ RATE
Harlem Hospital	2	0	43	4.7	4.4
HealthAlli Broadway**	0	0	64	0.0	0.0
HealthAlli MarysAve	NA	NA	NA	NA	NA
Highland Hospital	5	0	151	3.3	3.5
Huntington Hospital	10	0	167	6.0	7.4
Interfaith Med Ctr	NA	NA	NA	NA	NA
Ira Davenport	NA	NA	NA	NA	NA
JT Mather Hospital	11	1	116	9.5	11.0
Jacobi Med Ctr	8	2	102	7.8	6.0
Jamaica Hospital	7	1	79	8.9	7.7
Jones Memorial	NA	NA	NA	NA	NA
Kenmore Mercy	9	0	159	5.7	6.6
Kings County Hosp	4	0	144	2.8	2.4
Kingsbrook Jewish MC	1	0	47	2.1	1.8
LIJ at Forest Hills	1	0	92	1.1	1.3
LIJ at Valley Stream	1	0	47	2.1	2.0
Lenox Hill Hospital	17	0	249	6.8	6.8
Lincoln Med Ctr	4	0	59	6.8	5.3
Long Isl Jewish(LIJ)	17	0	344	4.9	4.6
Maimonides Med Ctr	20	4	247	8.1	7.9
Mary Imogene Bassett	9	1	124	7.3	6.8
Massena Memorial	NA	NA	NA	NA	NA
Memor SloanKettering	47	6	778	6.0	4.7
Mercy Hosp Buffalo	13	0	259	5.0	6.7
Mercy Med Ctr	1	0	72	1.4	1.3
Metropolitan Hosp	4	2	32	12.5	10.5
MidHudson Reg of WMC	2	1	45	4.4	3.8
Millard Fill. Suburb	17	0	264	6.4	6.6
Montefiore-Einstein	13	4	206	6.3	6.4
Montefiore-Moses	8	1	229	3.5	3.3
Montefiore-Mt Vernon	NA	NA	NA	NA	NA
Montefiore-NewRochl	3	1	60	5.0	5.1
Montefiore-Wakefield	5	0	33	15.2	13.0
Mount St. Marys	2	0	35	5.7	6.7
Mt Sinai^^	71	18	899	7.9	8.3
Mt Sinai Beth Israel	13	1	234	5.6	6.5
Mt Sinai Brooklyn	2	1	57	3.5	2.6
Mt Sinai Queens	2	0	75	2.7	2.6
Mt Sinai St Lukes	2	0	61	3.3	2.5
Mt Sinai West	5	0	165	3.0	2.6



Data reported as of August 05, 2016. ┆State Average. ●Risk-adjusted Infection rate. ▬^^Signif. higher than state average. ▬**Significantly lower than state average. ▬Average. > Upper confidence limit exceeds graph area. NA: less than 20 procedures.
SSI: surgical site infections, Procs: procedures. Rates are per 100 procedures. Adjusted using ASA score, obesity, duration, and endoscope. Excludes SSIs present at time of surgery and non-readmitted cases identified using post discharge surveillance (PDS).

Figure 1: Colon Surgical Site Infection Rates, New York 2015 (page 3 of 4)

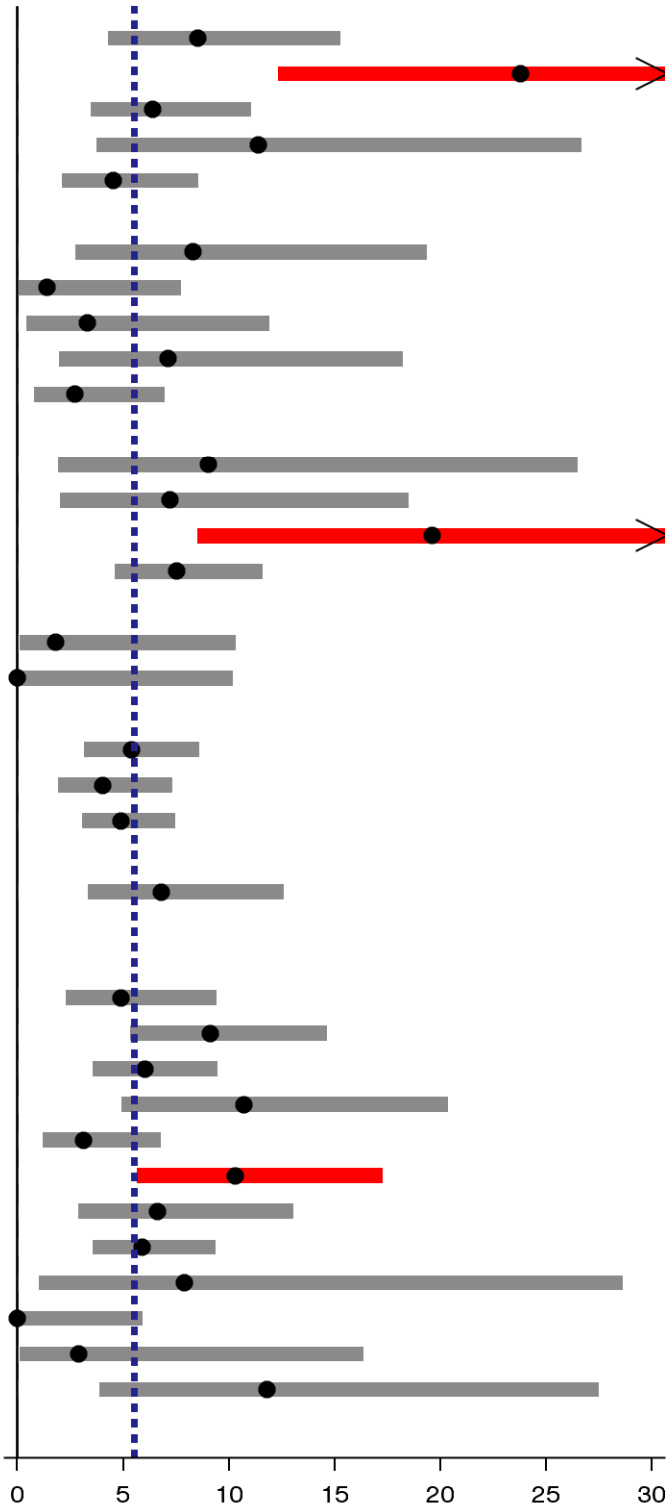
HOSPITAL	# SSI	#PDS EXCL	# PROCS	RAW RATE	ADJ RATE
NY Community Hosp	0	0	26	0.0	0.0
NY Methodist	7	0	202	3.5	2.9
NYP-Allen	2	0	26	7.7	6.5
NYP-Columbia**	6	0	389	1.5	1.4
NYP-Hudson Valley	2	1	61	3.3	3.1
NYP-Lawrence	4	0	76	5.3	6.5
NYP-Lower Manhattan	2	0	69	2.9	2.8
NYP-Morgan Stanley	0	0	36	0.0	0.0
NYP-Queens	12	0	209	5.7	5.9
NYP-Weill Cornell	33	0	574	5.7	5.7
NYU Langone Med Ctr	18	1	423	4.3	3.9
NYU Lutheran**	2	2	139	1.4	1.3
Nassau University	4	0	53	7.5	6.6
Nathan Littauer	NA	NA	NA	NA	NA
Newark Wayne	2	0	37	5.4	6.4
Niagara Falls	1	0	29	3.4	3.7
North Central Bronx	NA	NA	NA	NA	NA
North Shore	24	2	527	4.6	3.9
Northern Dutchess	1	0	24	4.2	4.5
Northern Westchester	6	0	126	4.8	6.8
Noyes Memorial	NA	NA	NA	NA	NA
Nyack Hospital	4	1	82	4.9	5.5
Olean General**	0	1	70	0.0	0.0
Oneida Healthcare	3	1	94	3.2	5.2
OrangeReg Goshen-Mid	4	0	196	2.0	2.6
Oswego Hospital	1	2	42	2.4	2.2
Our Lady of Lourdes	9	2	136	6.6	8.1
Peconic Bay Medical	1	0	74	1.4	1.2
Phelps Memorial	0	0	48	0.0	0.0
Plainview Hospital	10	0	112	8.9	8.8
Putnam Hospital	3	1	95	3.2	4.1
Queens Hospital	4	0	58	6.9	6.0
Richmond Univ MC	8	2	97	8.2	7.7
Rochester General	22	0	440	5.0	5.2
Rome Memorial	0	2	28	0.0	0.0
Roswell Park	15	7	154	9.7	9.3
SUNY Downstate MedCr	1	0	52	1.9	2.3
Samaritan- Troy	2	2	109	1.8	2.1
Samaritan- Watertown	7	1	65	10.8	10.2
Saratoga Hospital	7	0	124	5.6	7.0



Data reported as of August 05, 2016. ¦State Average. ●Risk-adjusted Infection rate. —^^Signif. higher than state average. —**Significantly lower than state average. —Average. > Upper confidence limit exceeds graph area. NA: less than 20 procedures.
SSI: surgical site infections, Procs: procedures. Rates are per 100 procedures. Adjusted using ASA score, obesity, duration, and endoscope. Excludes SSIs present at time of surgery and non-readmitted cases identified using post discharge surveillance (PDS).

Figure 1: Colon Surgical Site Infection Rates, New York 2015 (page 4 of 4)

HOSPITAL	# SSI	#PDS EXCL	# PROCS	RAW RATE	ADJ RATE
Sisters of Charity	11	0	129	8.5	8.5
Sisters- St Joseph^^	12	0	55	21.8	23.8
South Nassau Comm.	13	0	181	7.2	6.4
Southampton	5	0	55	9.1	11.4
Southside	9	0	193	4.7	4.5
St Anthony	NA	NA	NA	NA	NA
St Barnabas	5	1	48	10.4	8.3
St Catherine Siena	1	0	72	1.4	1.4
St Charles Hospital	2	0	48	4.2	3.3
St Elizabeth Medical	4	1	72	5.6	7.1
St Francis- Roslyn	4	0	159	2.5	2.7
St James Mercy	NA	NA	NA	NA	NA
St Johns Episcopal	3	0	30	10.0	9.0
St Johns Riverside	4	0	55	7.3	7.2
St Joseph -Bethpage^^	8	0	43	18.6	19.6
St Josephs- Syracuse	20	0	301	6.6	7.5
St Josephs- Yonkers	NA	NA	NA	NA	NA
St LukesNewburgh-Cor	1	0	64	1.6	1.8
St Marys Amsterdam	0	0	50	0.0	0.0
St Marys Troy	NA	NA	NA	NA	NA
St Peters Hospital	17	0	364	4.7	5.4
Staten Island U N-S	10	3	205	4.9	4.0
Strong Memorial	21	1	401	5.2	4.9
Syosset Hospital	NA	NA	NA	NA	NA
UHS Bingham/Wilson	10	1	163	6.1	6.8
UHS Chenango Memor	NA	NA	NA	NA	NA
United Memorial	NA	NA	NA	NA	NA
Unity Hosp Rochester	9	0	185	4.9	4.9
Univ Hosp SUNY Upst	17	2	164	10.4	9.1
Univ Hosp StonyBrook	18	5	274	6.6	6.0
Upst. Community Gen	9	0	79	11.4	10.7
Vassar Brothers	6	0	180	3.3	3.1
Westchester Medical^^	14	1	112	12.5	10.3
White Plains Hosp	8	0	148	5.4	6.6
Winthrop University	18	0	320	5.6	5.9
Woman and Childrens	2	0	29	6.9	7.9
Womans Christian	0	0	68	0.0	0.0
Woodhull Med Ctr	1	0	29	3.4	2.9
Wyckoff Heights	5	0	43	11.6	11.8
Wyoming County Comm.	NA	NA	NA	NA	NA

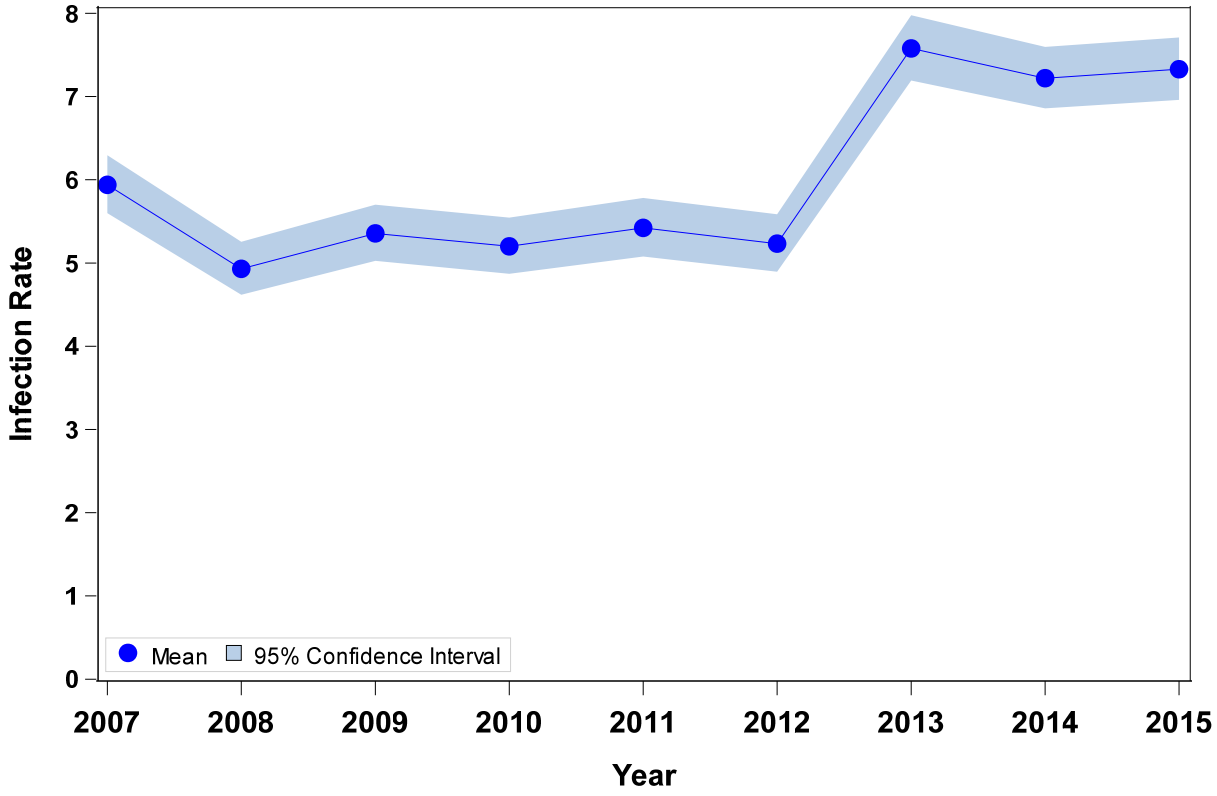


Data reported as of August 05, 2016. ┆State Average. ●Risk-adjusted Infection rate. ▬^^Signif. higher than state average. ▬**Significantly lower than state average. ▬Average. > Upper confidence limit exceeds graph area. NA: less than 20 procedures.
SSI: surgical site infections, Procs: procedures. Rates are per 100 procedures. Adjusted using ASA score, obesity, duration, and endoscope. Excludes SSIs present at time of surgery and non-readmitted cases identified using post discharge surveillance (PDS).

Time trends for Colon SSIs

Trends in colon SSI rates are summarized for informational purposes in Figure 2. The large increase between 2012 and 2013 was likely due the definition change that attributed some SSIs to colon rather than rectal or small bowel procedures. Definition changes between 2014 and 2015 were minor, and colon SSI rates in 2014 and 2015 were similar.

Figure 2. Trend in colon surgical site infection rates, New York State 2007-2015



Year	# Hospitals	# Procedures	For statewide trend[1]		For hospital comparisons[2]	
			Total # Infections	Total Infection Rate	# Infections excluding PDS/PATOS	Infection Rate excluding PDS/PATOS
2007	182	17,965	1,067	5.94	1,067	5.94
2008	178	18,135	894	4.93	804	4.43
2009	173	17,439	934	5.36	848	4.86
2010	172	16,884	878	5.20	803	4.76
2011	172	16,230	880	5.42	804	4.95
2012	173	16,340	855	5.23	763	4.67
2013	167	17,775	1,347	7.58	1,228	6.91
2014	162	19,169	1,384	7.22	1,279	6.67
2015	159	18,845/18,611[3]	1,381	7.33	1,030	5.53

New York State Data reported as of August 5, 2016. PDS=post-discharge surveillance. PATOS=present at time of admission. Infection rate is the number of infections divided by the number of procedures, multiplied by 100.

[1]To assess trends, all NHSN data are included and graphed in the figure.

[2]To assess hospital-specific performance, compare the hospital's rate to the state average in the same year. Beginning in 2008, SSIs detected by PDS and not readmitted were excluded, and beginning in 2015, SSIs and procedures[3] classified as PATOS were excluded.

Coronary Artery Bypass Graft (CABG) Surgical Site Infections

CABG surgery usually involves two surgical sites: a chest incision and a separate site to harvest "donor" vessels. Because infections can occur at either incision site the SSI rates are presented separately.

CABG Chest Infections

Among 10,694 CABG procedures performed in 2015, 205 (1.9%) developed SSIs within 90 days. Of these infections, 33% were superficial, 34% were deep, and 34% were organ/space (Table 7). The majority of the SSIs (73%) were detected upon readmission to the same hospital, 18% were identified during the initial hospitalization, 4% involved readmission to another hospital, and 5% were detected in outpatient settings. Detection of SSIs in outpatient locations is labor intensive and is not standardized across hospitals; therefore, the NYSDOH did not include these 10 infections for hospital-specific comparisons. The detection and depth of CABG chest SSIs is consistent with previous published NYS HAI public reports. There were no PATOS SSIs.

Table 7. Method of detection of coronary artery bypass graft chest site infection by depth of infection, New York State 2015

Extent (Row%) (Column%)	When Detected				
	Initial Hospitalization	Readmitted to the Same Hospital	Readmitted to Another Hospital	Post-Discharge Surveillance Not Readmitted	Total
Superficial Incisional	7 (10.4%) (18.9%)	52 (77.6%) (34.9%)	0 (0.0%) (0.0%)	8 (11.9%) (80.0%)	67 (32.7%)
Deep Incisional	12 (17.4%) (32.4%)	48 (69.6%) (32.2%)	7 (10.1%) (77.8%)	2 (2.9%) (20.0%)	69 (33.9%)
Organ/Space	18 (26.1%) (48.6%)	49 (71.0%) (32.9%)	2 (2.9%) (22.2%)	0 (0.0%) (0.0%)	69 (33.7%)
Total	37 (18.0%)	149 (72.7%)	9 (4.4%)	10 (4.9%)	205

New York State data reported as of August 5, 2016

Microorganisms Associated with CABG Chest SSIs

In NYS, the most common microorganisms associated with CABG Chest SSIs were *Staphylococcus aureus* and coagulase-negative Staphylococci (Table 8).

Table 8. Microorganisms identified in coronary artery bypass graft chest site infections, New York State 2015

Microorganism	Number of Isolates	Percent of Infections
Staphylococcus aureus	52	25.4
(MRSA)	(16)	(7.8)
Coagulase negative staphylococci	38	18.5
Serratia spp.	20	9.8
Enterobacter spp.	15	7.3
Klebsiella spp.	15	7.3
(CephR-*Klebsiella*)	(1)	(0.5)
Enterococci	14	6.8
(VRE)	(3)	(1.5)
Escherichia coli	13	6.3
Pseudomonas spp.	11	5.4
Proteus spp.	8	3.9
Streptococci	6	2.9
Morganella morganii	5	2.4
Yeast	5	2.4
Acinetobacter spp.	1	0.5
(MDR-*Acinetobacte*r)	(1)	(0.5)
Other	19	9.3

New York State data reported as of August 5, 2016. Out of 205 infections (includes post-discharge surveillance). No microorganisms identified for 38 (18.5%) infections. VRE: vancomycin-resistant enterococci; MRSA: methicillin-resistant *Staphylococcus aureus; CephR:* cephalosporin-resistant; *MDR: Multidrug resistant;* spp: multiple species

Risk Adjustment for CABG Chest SSIs

Certain patient and procedure-specific risk factors increased the risk of developing a chest SSI following CABG surgery. In 2015, the following risk factors were associated with SSIs and were included in the risk-adjustment:

- Patients with diabetes were 1.7 times more likely to develop an SSI than patients without diabetes.

- Very obese patients (with body mass index [BMI] greater than or equal to 40) were 2.8 times more likely to develop an SSI, and obese patients (with BMI between 30 and 39) were 1.9 times more likely to develop an SSI than patients with BMI less than 30.
- Females were 1.9 times more likely to develop an SSI than males.
- Patients who underwent procedures with a total duration longer than five hours were 1.4 times more likely to develop an SSI than patients undergoing shorter procedures.

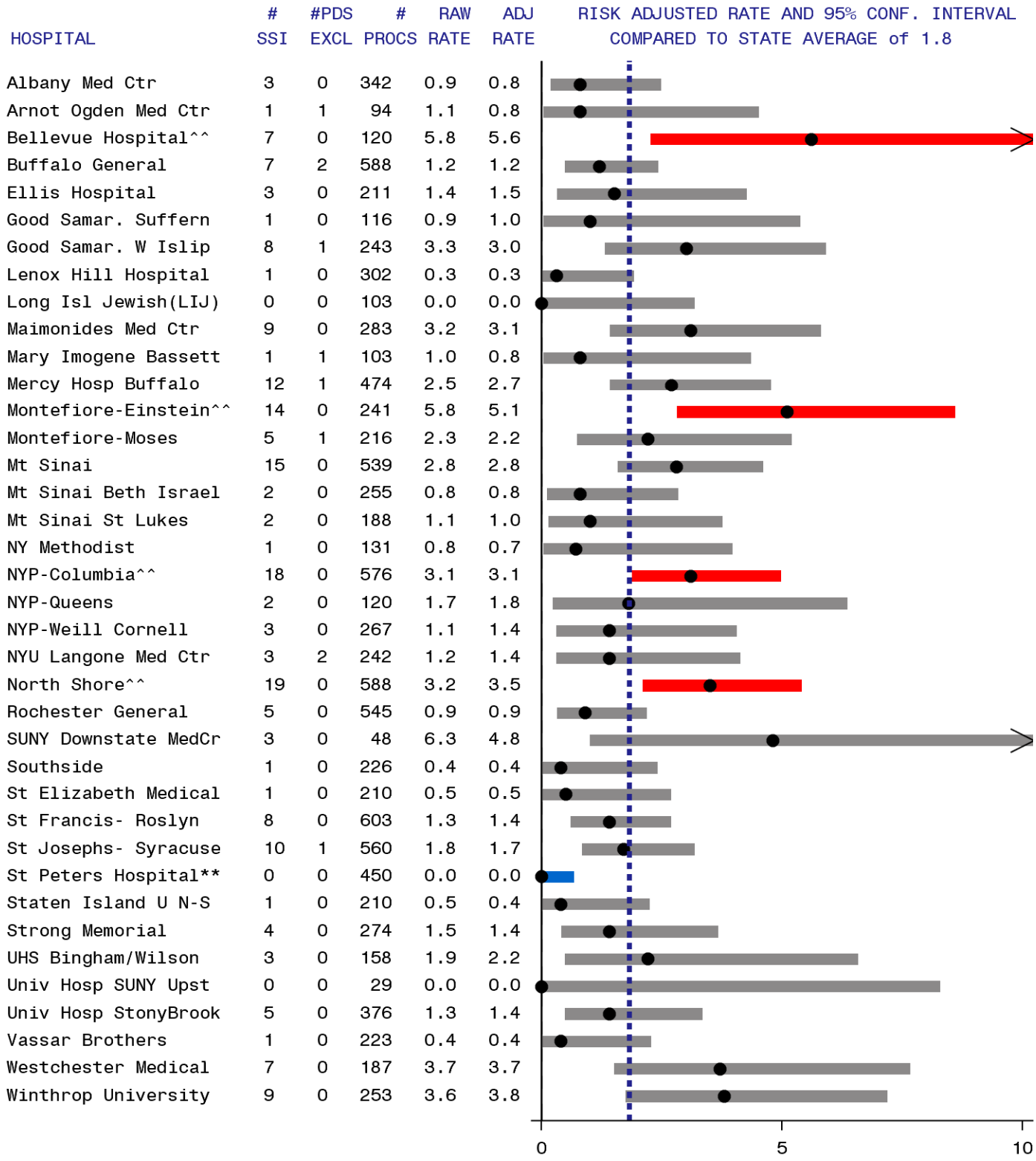
Hospital-Specific CABG Chest SSI Rates

Hospital-specific CABG chest SSI rates are provided in Figure 3.

In 2015, of the 38 reporting hospitals, four (11%) had a CABG chest SSI rate that was statistically higher than the state average. None of these hospitals were flagged high in the previous year.

One hospital (3%) was statistically lower than the state average. St Peters Hospital has had a rate statistically lower than the state average for three years in a row (2013-2015).

Figure 3. Coronary artery bypass graft chest site infection rates, New York 2015 (page 1 of 1)

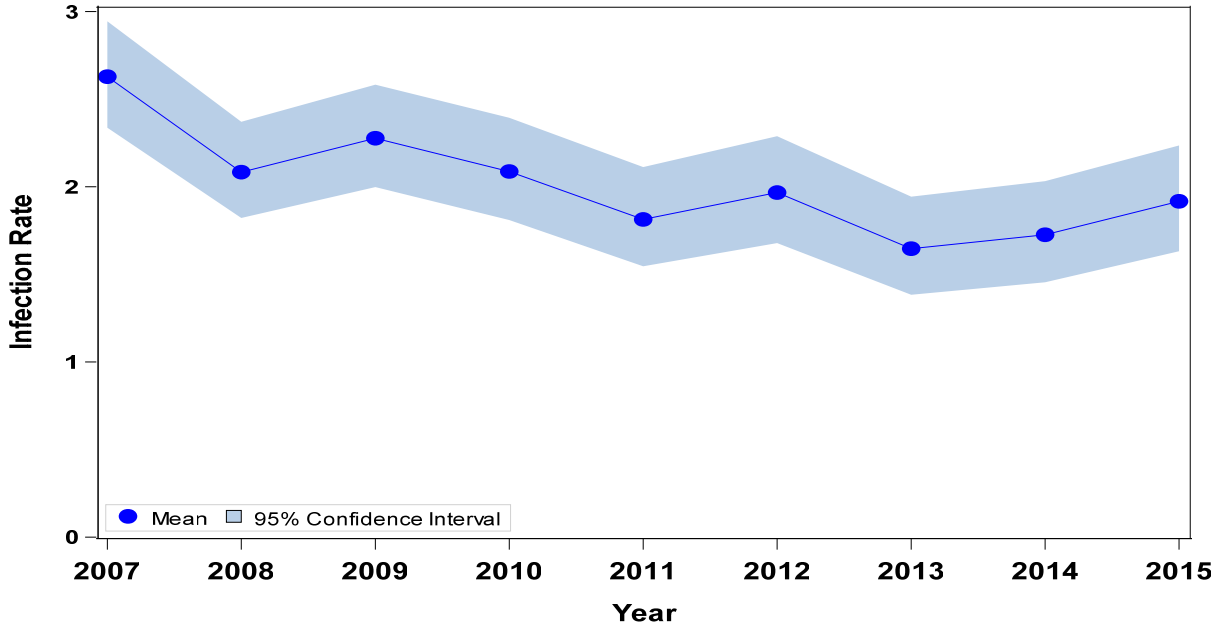


Data reported as of August 05, 2016. ┆State Average. ●Risk-adjusted Infection rate. ▬^^Signif. higher than state average. ▬**Significantly lower than state average. ▬Average. > Upper confidence limit exceeds graph area. NA: less than 20 procedures. SSI: surgical site infections, Procs: procedures. Rates are per 100 procedures. Adjusted using diabetes, body mass index, duration, and gender. Excludes SSIs present at time of surgery and non-readmitted cases identified using post discharge surveillance (PDS).

Time Trends in CABG Chest SSIs

Changes in the SSI protocol over time were summarized in Table 2. Trends in CABG chest SSI rates are summarized for informational purposes in Figure 4. Definition changes between 2014 and 2015 were minor, and CABG SSI rates in 2014 and 2015 were similar.

Figure 4. Trend in coronary artery bypass graft chest site surgical site infection rates, New York State 2007-2015



Year	# Hospitals	# Procedures	For statewide trend-excluded infections detected past 90 days[1]		For hospital comparisons[2]	
			# Infections	Infection Rate	# Infections excluding PDS	Infection Rate excluding PDS
2007	40	14,266	375	2.63	385	2.70
2008	40	13,967	291	2.08	301	2.16
2009	40	13,438	306	2.28	304	2.26
2010	39	12,409	259	2.09	275	2.22
2011	40	11,525	209	1.81	221	1.92
2012	39	10,728	211	1.97	218	2.03
2013	39	10,750	177	1.65	173	1.61
2014	38	10,602	183	1.73	173	1.63
2015	38	10,694	205	1.92	195	1.82

New York State data reported as of August 5, 2016. PDS=post-discharge surveillance.
Infection rate is the number of infections divided by the number of procedures, multiplied by 100.
[1]To assess trends, infections identified more than 90 days after the procedure were excluded from 2007-2012 data to match the 2013-2015 surveillance definition; this data is graphed in the figure.
[2] To assess hospital-specific performance, compare the hospital's rate to the state average in the same year. Beginning in 2008, SSIs detected by PDS and not readmitted were excluded, and beginning in 2015, SSIs and procedures classified as PATOS were excluded.

CABG Donor Site Infections

Among 9,548 CABG procedures that involved donor sites in 2015, 55 (0.5%) developed SSIs. Of these infections, 89% were superficial and 11% were deep (Table 9). The majority of the SSIs (67%) were detected during readmission to the same hospital, 7% were identified during the initial hospitalization, 15% involved readmission to another hospital, and 11% were detected in outpatient locations. The majority of infections detected in outpatient locations were superficial. Detection of SSIs in outpatient locations using PDS is labor intensive and is not standardized across hospitals; therefore, the NYSDOH did not include these 6 infections in hospital-specific comparisons. There were no PATOS SSIs.

Table 9. Method of detection for coronary artery bypass graft donor site infection by depth of infection, New York State 2015

	When Detected				
Extent (Row%) (Column%)	**Initial Hospitalization**	**Readmitted to the Same Hospital**	**Readmitted to Another Hospital**	**Post-Discharge Surveillance Not Readmitted**	**Total**
Superficial Incisional	4 (8.2%) (100.0%)	32 (65.3%) (86.5%)	7 (14.3%) (87.5%)	6 (12.2%) (100.0%)	49 (89.1%)
Deep Incisional	0 (0.0%) (0.0%)	5 (83.3%) (13.5%)	1 (16.7%) (12.5%)	0 (0.0%) (0.0%)	6 (10.9%)
Total	4 (7.3%)	37 (67.3%)	8 (14.6%)	6 (10.9%)	55

New York State data reported as of August 5, 2016.

Microorganisms Associated with CABG Donor Site SSIs

In NYS, the most common microorganisms associated with CABG donor site SSIs were *Klebsiella* spp., *Escherichia coli, Pseudomonas* spp., *and Staphylococcus aureus* (Table 10).

Table 10. Microorganisms identified in coronary artery bypass graft donor site infections, New York State 2015

Microorganism	Number of Isolates	Percent of Infections
Klebsiella spp.	13	23.6
Escherichia coli	9	16.4
Pseudomonas spp.	8	14.5
Staphylococcus aureus (MRSA)	8 (3)	14.5 (5.5)
Serratia spp.	7	12.7
Coagulase negative staphylococci	6	10.9
Enterococci	5	9.1
Other	9	16.4

New York State data reported as of August 5, 2016. Out of 55 infections. No microorganisms identified for 14 (25%) infections. MRSA: methicillin-resistant *Staphylococcus aureus;* spp: multiple species.

Risk Adjustment for CABG Donor Site SSIs

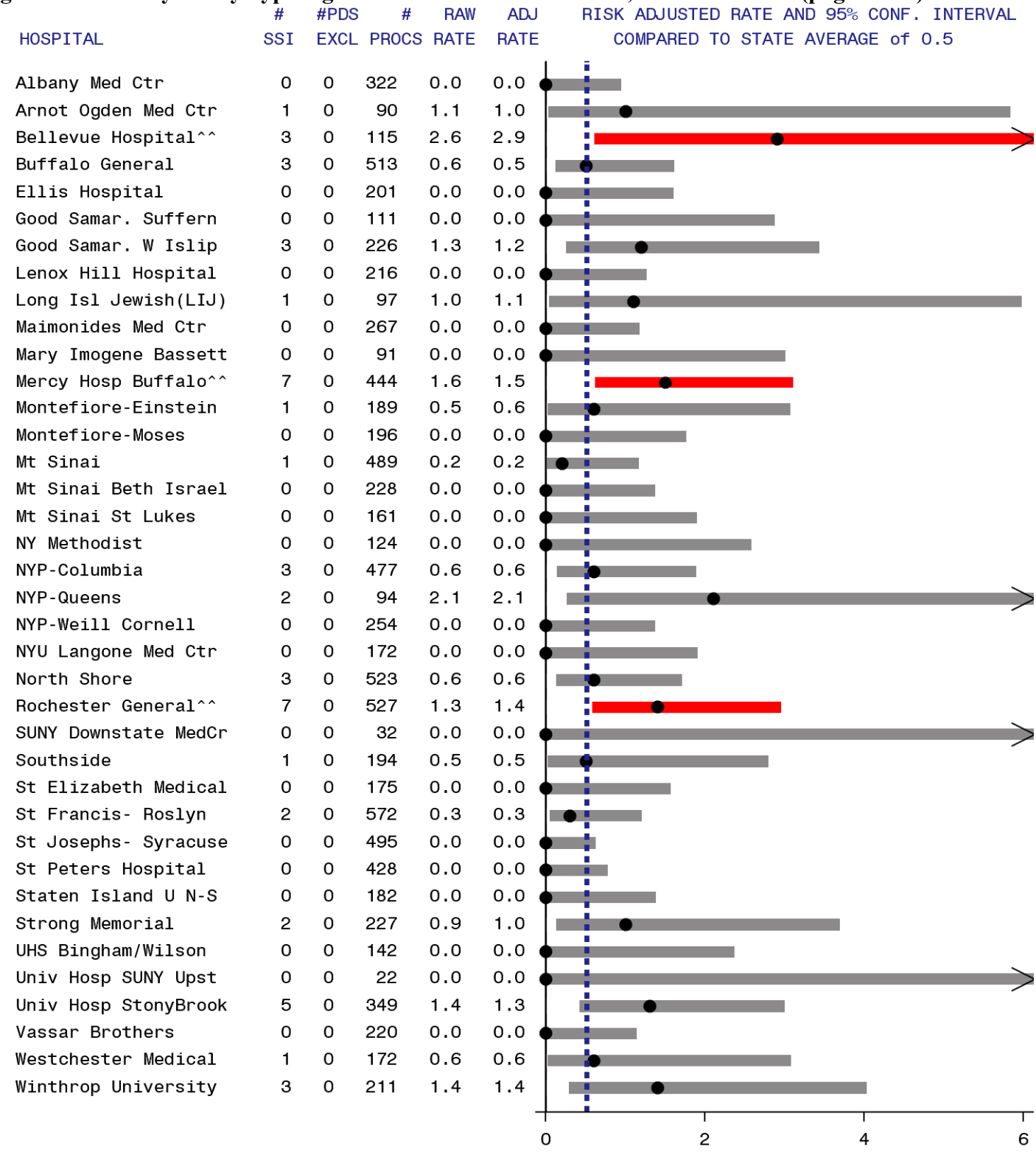
Certain patient and procedure-specific factors increased the risk of developing a donor site SSI following CABG surgery. In 2015, after excluding SSIs identified using PDS that did not result in hospitalization, the following risk factors were associated with SSI. These variables were used to risk-adjust hospital-specific rates:

- Obese patients (with BMI greater than 30) were 2.3 times more likely to develop an SSI than patients with BMI less than or equal to 30.
- Patients with diabetes were 1.7 times more likely to develop an SSI than patients without diabetes.
- Patients undergoing non-autologous intraoperative blood transfusion were 2.0 times more likely to develop an SSI than patients without this type of transfusion.

Hospital-Specific CABG Donor Site SSI rates

Hospital-specific CABG donor site SSI rates are provided in Figure 5. In 2015, three hospitals were flagged for having a rate statistically higher than the state average. One was high for two consecutive years.

Figure 5. Coronary artery bypass graft donor site infection rates, New York 2015 (page 1 of 1)



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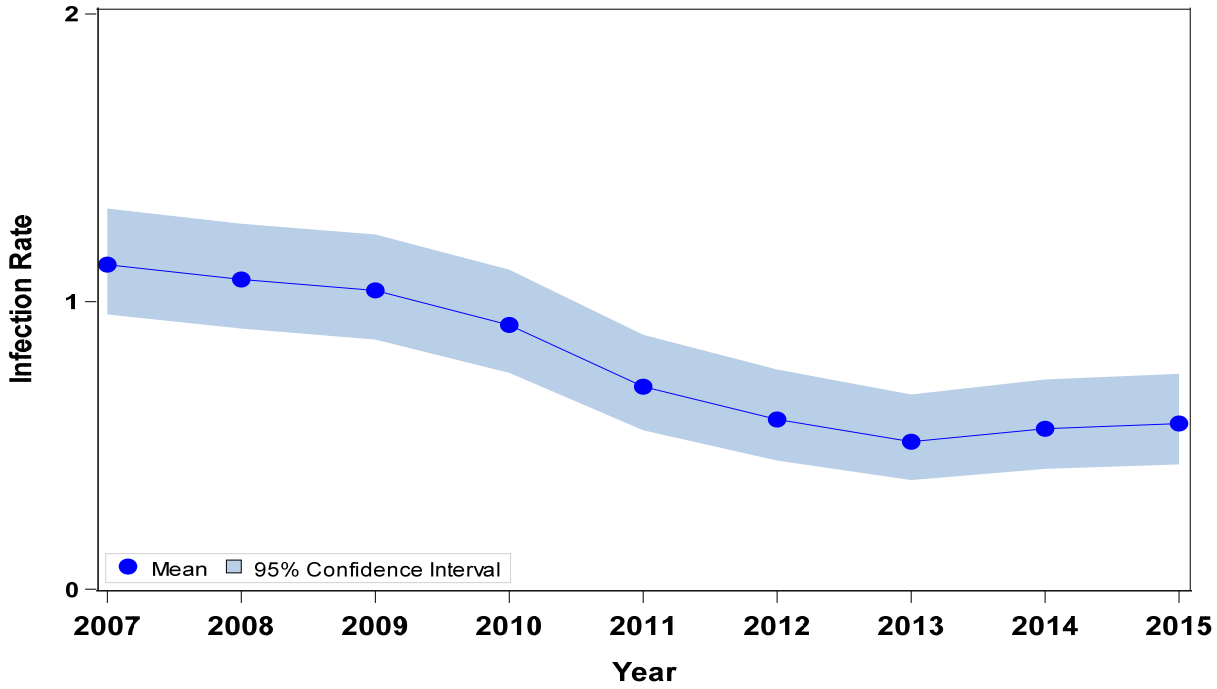
Time Trends in CABG Donor SSIs

Changes in the SSI protocol over time were summarized in Table 2. Trends in CABG donor SSI rates are summarized for informational purposes in Figure 5. Definition changes between 2014 and 2015 were minor, and CABG SSI donor rates in 2014 and 2015 were similar.

Figure 6. Trend in coronary artery bypass graft donor site infection rates, New York State 2007-2015



Year	# Hospitals	# Procedures	For Statewide Trend[1] # Infections	For Statewide Trend[1] Infection Rate	For Hospital Comparisons[2] # Infections excluding PDS	For Hospital Comparisons[2] Infection Rate excluding PDS
2007	40	13,203	149	1.13	148	1.12
2008	40	12,905	139	1.08	129	1.00
2009	40	12,416	129	1.04	109	0.88
2010	39	11,429	105	0.92	92	0.80
2011	40	10,364	73	0.70	66	0.64
2012	39	9,659	57	0.59	52	0.54
2013	39	9,555	49	0.51	45	0.47
2014	38	9,499	53	0.56	42	0.44
2015	38	9,548	55	0.58	49	0.51

New York State Data reported as of August 5, 2016. PDS=post-discharge surveillance.
Infection rate is the number of infections divided by the number of procedures, multiplied by 100.
[1]To assess trends, all NHSN data are included and graphed in the figure.
[2]To assess hospital-specific performance, compare the hospital's rate to the state average in the same year. Beginning in 2008, SSIs detected by PDS and not readmitted were excluded because PDS methods are not standardized across hospitals. No infections were present at time of admission (PATOS). Only one infection per procedure.

Hip Replacement/Revision Surgical Site Infections

Among 33,288 hip procedures performed in 2015, 359 (1.1%) developed SSIs within 90 days. Of these infections, 37% were superficial, 31% were deep, and 32% were organ/space (Table 11). The majority of the SSIs (79%) were detected upon readmission to the same hospital, 5% were identified during the initial hospitalization, 8% involved readmission to another hospital, and 9% were detected in outpatient settings. Detection of SSIs in outpatient locations is labor intensive and is not standardized across hospitals; therefore, the NYSDOH did not include these 31 infections for hospital-specific comparisons. The detection and depth of hip SSIs is consistent with previous published NYS HAI public reports.

Table 11. Method of detection of hip surgical site infection by depth of infection, New York State 2015

	When Detected				
Extent (Row%) (Column%)	**Initial Hospitalization**	**Readmitted to the Same Hospital**	**Readmitted to Another Hospital**	**Post-Discharge Surveillance Not Readmitted**	**Total**
Superficial Incisional	5 (3.7%) (26.3%)	95 (70.9%) (33.7%)	8 (6.0%) (29.6%)	26 (19.4%) (83.9%)	134 (37.3%)
Deep Incisional	9 (8.0%) (47.4%)	84 (75.0%) (29.8%)	14 (12.5%) (51.9%)	5 (4.5%) (16.1%)	112 (31.2%)
Organ/Space	5 (4.4%) (26.3%)	103 (91.2) (36.5%)	5 (4.4%) (18.5%)	0 (0.0%) (0.0%)	113 (31.5%)
Total	19 (5.3%)	282 (78.6%)	27 (7.5%)	31 (8.6%)	359

New York State data reported as of August 5, 2016

Microorganisms Associated with Hip SSIs

The most common microorganism associated with hip SSIs was *Staphylococcus aureus* (Table 12).

Table 12. Microorganisms identified in hip replacement surgical site infections, New York State 2015

Microorganism	Number of Isolates	Percent of Infections
Staphylococcus aureus	141	39.3
(MRSA)	(56)	(15.6)
Coagulase negative staphylococci	51	14.2
Enterococci	35	9.7
(VRE)	(7)	(1.9)
Pseudomonas spp.	22	6.1
Proteus spp.	20	5.6
Streptococci	20	5.6
Escherichia coli	19	5.3
Enterobacter spp.	17	4.7
Klebsiella spp.	14	3.9
(CephR-*Klebsiella*)	(3)	(0.8)
Serratia spp.	8	2.2
Peptostreptococci spp.	6	1.7
Acinetobacter spp.	1	0.3
Other	19	5.3

New York State data reported as of Aug 5, 2016. Out of 359 infections (includes post-discharge surveillance). No microorganisms identified for 63 (18%) infections. VRE: vancomycin-resistant enterococci; MRSA: methicillin-resistant *Staphylococcus aureus;* CephR: cephalosporin-resistant; spp: multiple species.

Of the 359 infections, 11 (3.1%) were classified as PATOS. These SSIs were predominantly (73%) Organ/Space infections. All wounds associated with these procedures were classified as contaminated or dirty. Reducing the risk of PATOS SSI is more difficult that reducing the risk of SSIs when there is no infection PATOS; therefore, the NYSDOH did not include these 11 infections/procedures in hospital-specific comparisons.

Risk Adjustment for Hip Surgical Site Infections

Certain patient and procedure-specific factors increased the risk of developing an SSI following hip surgery. In 2015, after excluding SSIs identified using PDS that did not result in hospitalization, and SSIs that were PATOS, the following risk factors were associated with SSIs. These variables were used to risk-adjust hospital-specific rates.

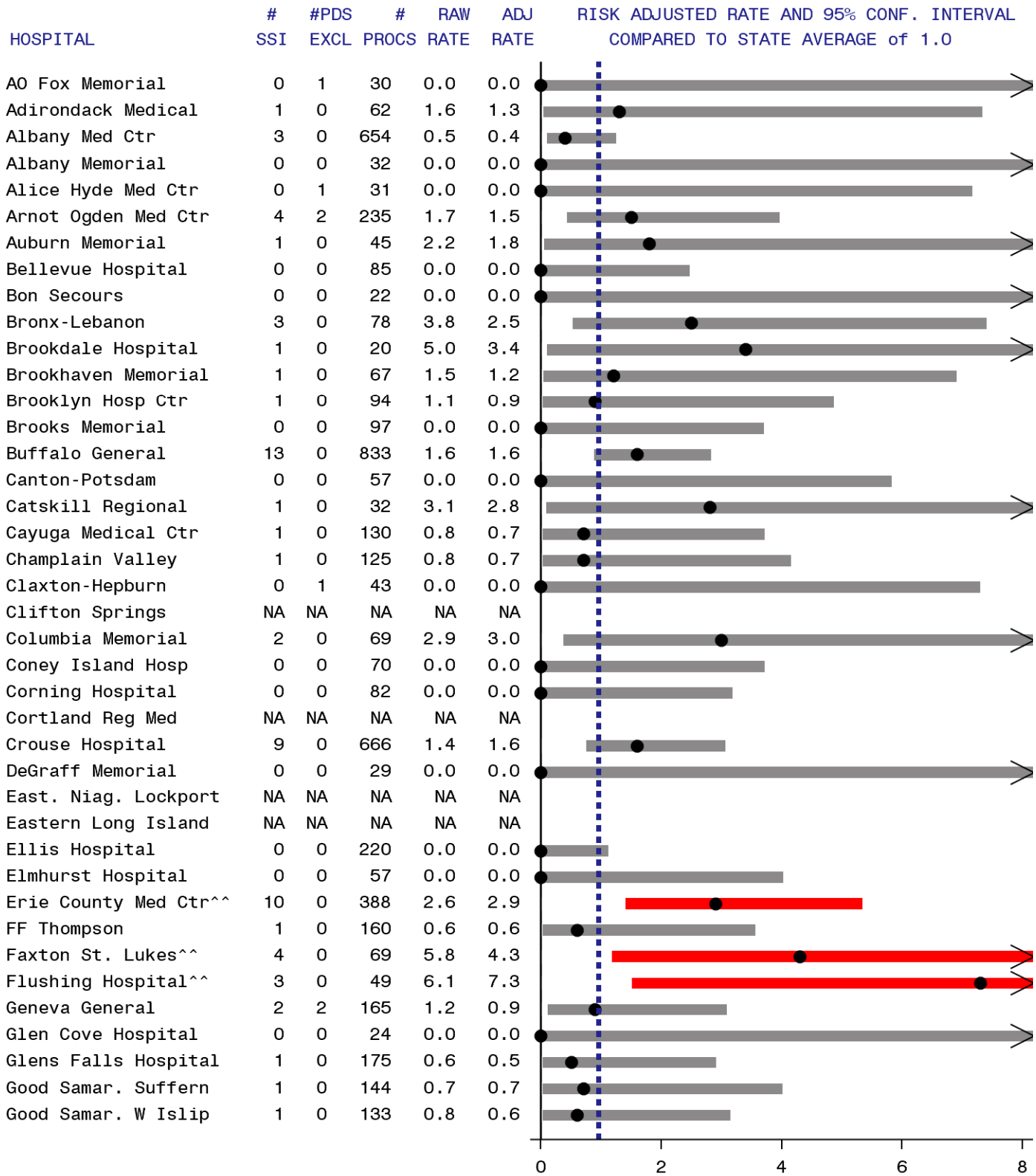
- Patients with severe systemic disease (ASA score of 3, 4, or 5) were 1.8 times more likely to develop an SSI than healthier patients (ASA score of 1 or 2).

- The risk of SSI varied by type of hip procedure. Compared to total and resurfacing primary hip replacement procedures (ICD-9 codes 00.85, 00.86, 00.87, 81.51), partial primary procedures (81.52) were 1.4 times more likely to result in an SSI, revisions (00.70-00.73, 81.53) with no prior infection at the joint were 3.3 times more likely to result in an SSI, and revisions with prior infection at the joint were 5.9 times more likely to result in an SSI.
- Procedures with duration longer than the 75th percentile (by type of hip procedure) were 1.9 times more likely to result in an SSI than procedures of shorter duration.
- Very obese patients (with BMI greater than or equal to 40) were 2.6 times more likely to develop an SSI, and obese patients (with BMI between 30 and 39) were 1.6 times more likely to develop an SSI than patients with BMI less than 30.
- Patients with diabetes were 1.3 times more likely to develop an SSI than patients without diabetes.

Hospital-Specific Hip SSI Rates

Hospital-specific hip SSI rates are provided in Figure 8. In 2015, six hospitals (4%) had hip SSI rates that were statistically higher than the state average. None were also high in the previous year. Two hospitals (1%) had an SSI rate significantly lower than the state average; Hospital for Special Surgery was significantly lower in each of the past eight years (2008-2015).

Figure 7. Hip replacement surgical site infection rates, New York 2015 (page 1 of 4)



Data reported as of August 05, 2016. ┆State Average. ●Risk-adjusted Infection rate. ▬^^Signif. higher than state average. ▬**Significantly lower than state average. ▬Average. > Upper confidence limit exceeds graph area. NA: less than 20 procedures.
SSI: surgical site infections, Procs: procedures. Rates are per 100 procedures. Adjusted using ASA score, procedure type, duration, obesity, and diabetes. Excludes SSIs present at time of surgery and cases identified using post discharge surveillance and not readmitted (PDS).

Figure 7. Hip replacement surgical site infection rates, New York 2015 (page 2 of 4)

HOSPITAL	# SSI	#PDS EXCL	# PROCS	RAW RATE	ADJ RATE
Harlem Hospital	NA	NA	NA	NA	NA
HealthAlli Broadway	1	0	29	3.4	3.4
HealthAlli MarysAve	1	0	158	0.6	0.7
Highland Hospital	10	2	936	1.1	1.2
Hosp for Spec Surg**	11	0	5347	0.2	0.3
Huntington Hospital	2	0	237	0.8	0.9
Interfaith Med Ctr	NA	NA	NA	NA	NA
Ira Davenport	NA	NA	NA	NA	NA
JT Mather Hospital	1	0	98	1.0	1.0
Jacobi Med Ctr	1	0	60	1.7	1.4
Jamaica Hospital	3	0	48	6.3	3.6
Jones Memorial	NA	NA	NA	NA	NA
Kenmore Mercy	7	0	508	1.4	1.7
Kings County Hosp	0	0	59	0.0	0.0
Kingsbrook Jewish MC	NA	NA	NA	NA	NA
LIJ at Forest Hills	0	0	96	0.0	0.0
LIJ at Valley Stream	0	0	97	0.0	0.0
Lenox Hill Hospital	4	0	685	0.6	0.6
Lincoln Med Ctr	2	0	42	4.8	4.3
Long Isl Jewish(LIJ)	1	0	331	0.3	0.3
Maimonides Med Ctr	2	0	190	1.1	0.9
Mary Imogene Bassett	4	1	210	1.9	1.3
Massena Memorial	NA	NA	NA	NA	NA
Memor SloanKettering	0	0	118	0.0	0.0
Mercy Hosp Buffalo	1	0	154	0.6	0.6
Mercy Med Ctr	2	0	89	2.2	1.6
Metropolitan Hosp^^	4	0	25	16.0	11.0
MidHudson Reg of WMC	2	0	90	2.2	2.0
Millard Fill. Suburb	1	1	481	0.2	0.2
Montefiore-Moses	2	0	95	2.1	1.4
Montefiore-Mt Vernon	NA	NA	NA	NA	NA
Montefiore-NewRochl	3	0	129	2.3	2.4
Montefiore-Wakefield	6	1	474	1.3	1.1
Mount St. Marys	1	0	95	1.1	0.7
Mt Sinai	3	0	376	0.8	0.5
Mt Sinai Beth Israel	3	0	418	0.7	0.7
Mt Sinai Brooklyn	0	0	45	0.0	0.0
Mt Sinai Queens	0	0	65	0.0	0.0
Mt Sinai St Lukes	2	0	74	2.7	2.2
Mt Sinai West	3	0	290	1.0	1.0

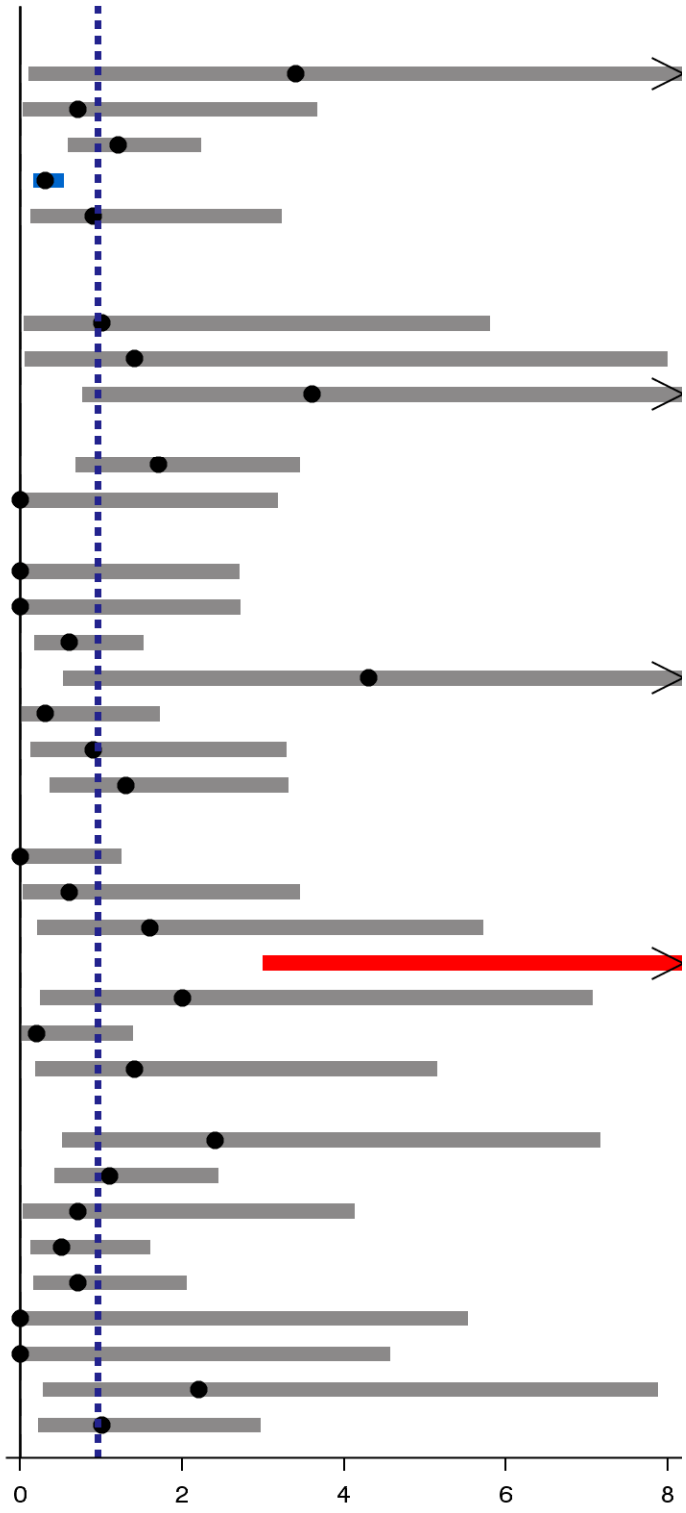


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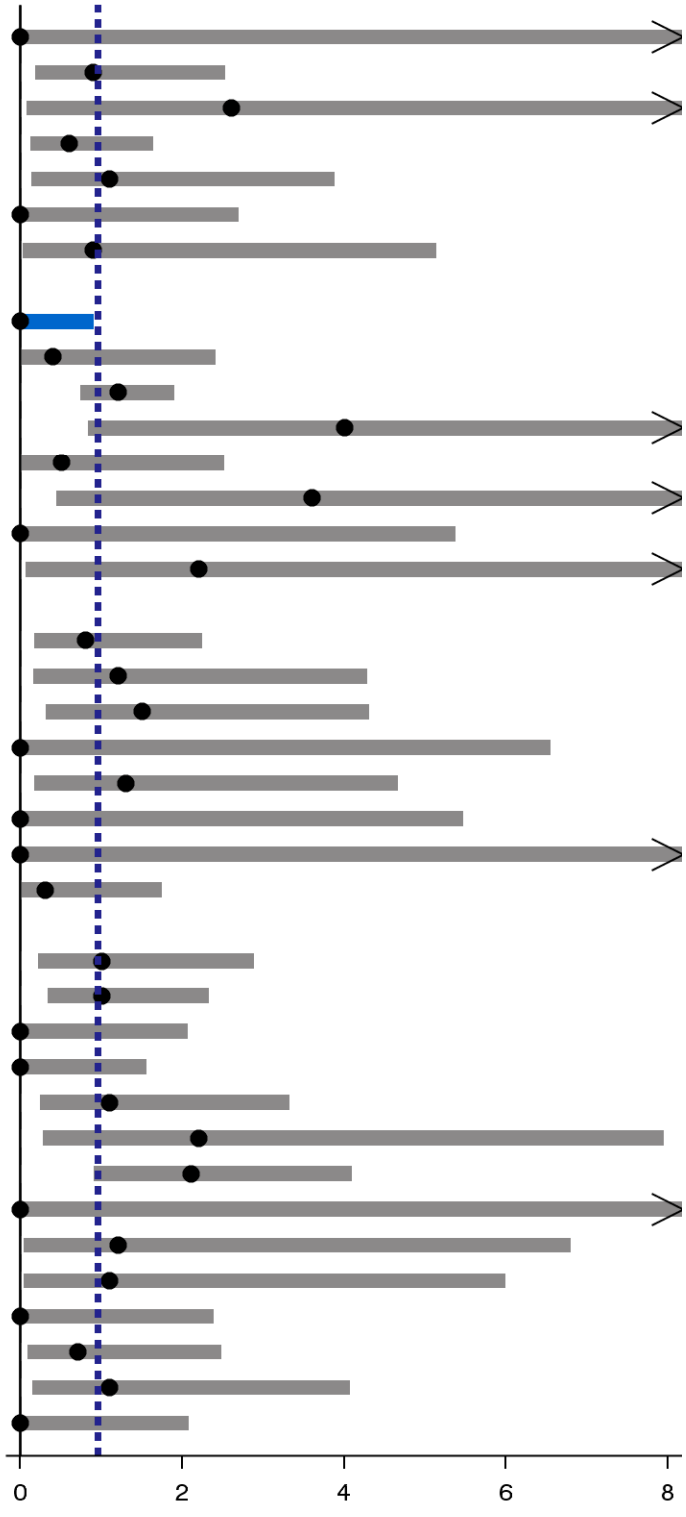
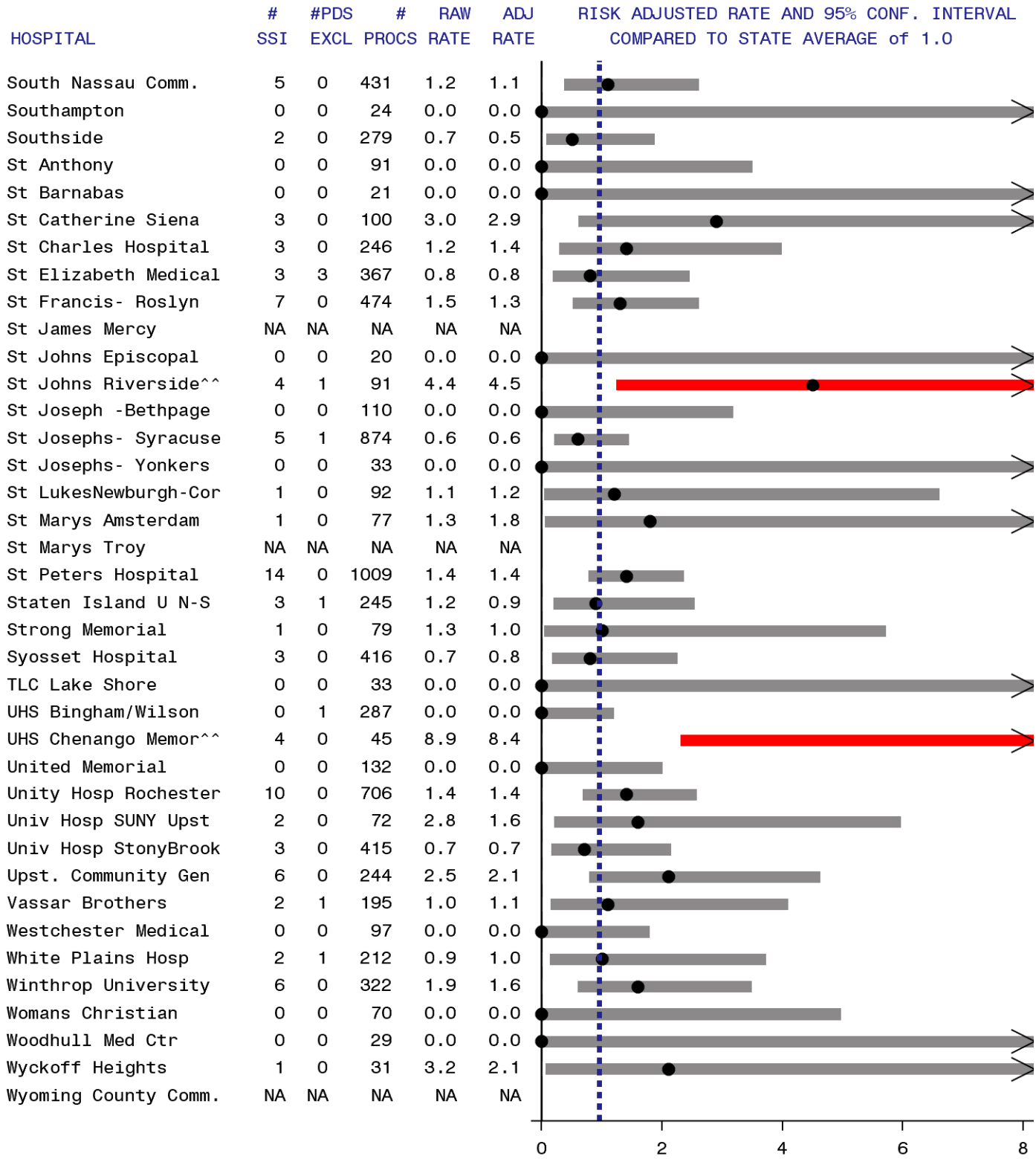
Figure 7. Hip replacement surgical site infection rates, New York 2015 (page 3 of 4)

HOSPITAL	# SSI	#PDS EXCL	# PROCS	RAW RATE	ADJ RATE
NY Community Hosp	0	0	20	0.0	0.0
NY Methodist	3	0	226	1.3	0.9
NYP-Allen	1	0	26	3.8	2.6
NYP-Columbia	3	0	391	0.8	0.6
NYP-Hudson Valley	2	0	142	1.4	1.1
NYP-Lawrence	0	0	123	0.0	0.0
NYP-Lower Manhattan	1	0	74	1.4	0.9
NYP-Morgan Stanley	NA	NA	NA	NA	NA
NYP-Queens**	0	0	276	0.0	0.0
NYP-Weill Cornell	1	0	146	0.7	0.4
NYU Joint Diseases	19	0	1585	1.2	1.2
NYU Langone Med Ctr	3	0	48	6.3	4.0
NYU Lutheran	1	0	188	0.5	0.5
Nassau University	2	0	43	4.7	3.6
Nathan Littauer	0	0	47	0.0	0.0
Newark Wayne	1	0	61	1.6	2.2
Niagara Falls	NA	NA	NA	NA	NA
North Shore	3	0	390	0.8	0.8
Northern Dutchess	2	0	245	0.8	1.2
Northern Westchester	3	0	239	1.3	1.5
Noyes Memorial	0	0	43	0.0	0.0
Nyack Hospital	2	0	155	1.3	1.3
Olean General	0	1	54	0.0	0.0
Oneida Healthcare	0	0	22	0.0	0.0
OrangeReg Goshen-Mid	1	0	265	0.4	0.3
Oswego Hospital	NA	NA	NA	NA	NA
Our Lady of Lourdes	3	0	271	1.1	1.0
Peconic Bay Medical	5	2	385	1.3	1.0
Phelps Memorial	0	1	216	0.0	0.0
Plainview Hospital	0	1	169	0.0	0.0
Putnam Hospital	3	1	350	0.9	1.1
Richmond Univ MC	2	1	69	2.9	2.2
Rochester General	8	0	433	1.8	2.1
Rome Memorial	0	1	23	0.0	0.0
SUNY Downstate MedCr	1	0	60	1.7	1.2
Samaritan- Troy	1	1	88	1.1	1.1
Samaritan- Watertown	0	0	136	0.0	0.0
Saratoga Hospital	2	1	323	0.6	0.7
Sisters of Charity	2	0	175	1.1	1.1
Sisters- St Joseph	0	0	174	0.0	0.0



Data reported as of August 05, 2016. ┆State Average. ●Risk-adjusted Infection rate. ▬^^Signif. higher than state average. ▬**Significantly lower than state average. ▬Average. > Upper confidence limit exceeds graph area. NA: less than 20 procedures. SSI: surgical site infections, Procs: procedures. Rates are per 100 procedures. Adjusted using ASA score, procedure type, duration, obesity, and diabetes. Excludes SSIs present at time of surgery and non-readmitted cases identified using post discharge surveillance (PDS).

Figure 7. Hip replacement surgical site infection rates, New York 2015 (page 4 of 4)



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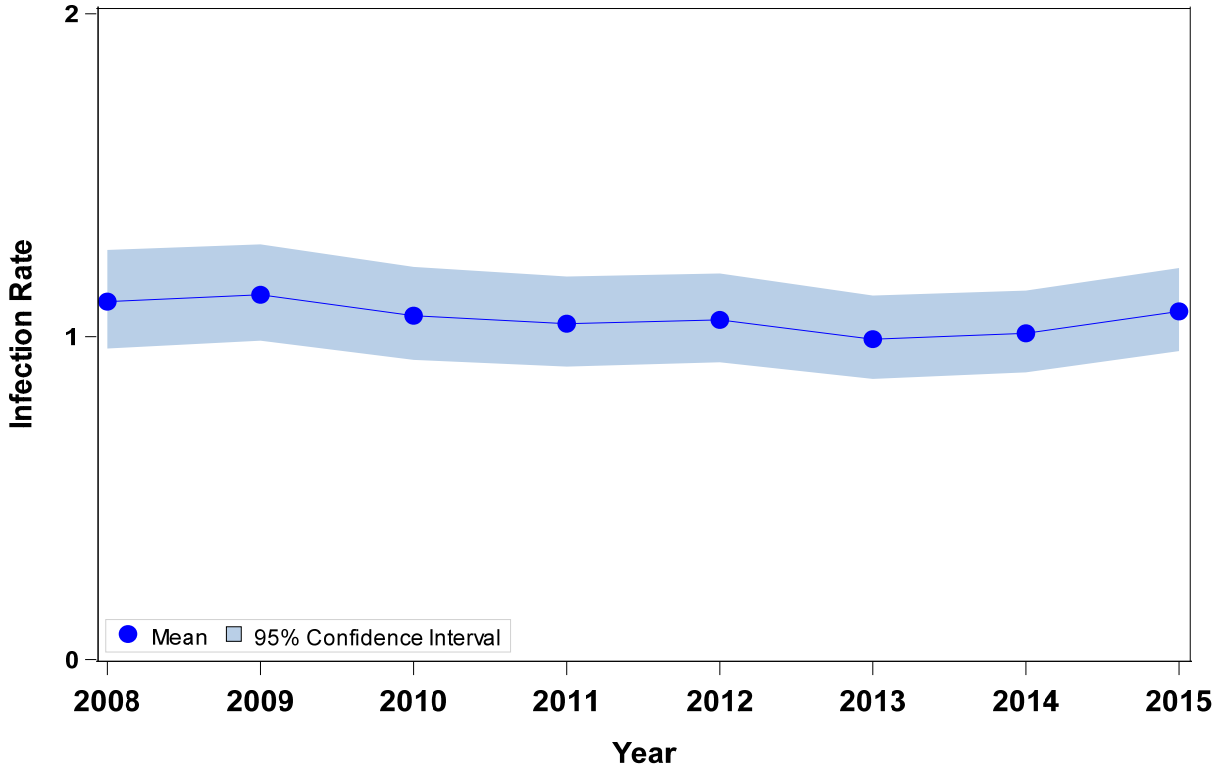
Time trends in Hip SSIs

Changes in the SSI protocol over time were summarized in Table 2. Trends in hip SSI rates are summarized for informational purposes in Figure 8. Definition changes between 2014 and 2015 were minor, and hip SSI rates in 2014 and 2015 were similar.

Figure 8. Trend in hip surgical site infection rates, New York State 2008-2015



Year	# Hospitals	# Procedures	For statewide trend- excluded infections detected past 90 days[1]		For hospital comparisons[2]	
			# Infections	Infection Rate	# Infections excluding PDS/PATOS	Infection Rate excluding PDS/PATOS
2008	172	24,357	270	1.11	273	1.12
2009	169	25,847	292	1.13	295	1.14
2010	167	26,290	280	1.07	290	1.10
2011	167	27,300	284	1.04	316	1.16
2012	165	28,424	299	1.05	310	1.09
2013	163	30,433	302	0.99	274	0.90
2014	160	32,164	325	1.01	307	0.95
2015	157	33,288/33,277[3]	359	1.08	317	0.95

New York State Data reported as of August 5, 2016. PDS=post-discharge surveillance. PATOS=present at time of admission. Infection rate is the number of infections divided by the number of procedures, multiplied by 100. [1]To assess trends, infections identified more than 90 days after the procedure were excluded from 2008-2012 data to match the 2013-5 surveillance definition; this data is graphed in the figure.[2]To assess hospital-specific performance, compare the hospital's rate to the state average in the same year. Beginning in 2008, SSIs detected by PDS and not readmitted were excluded, and beginning in 2015, SSIs and procedures[3] classified as PATOS were excluded.

Abdominal Hysterectomy Surgical Site Infections

Among 19,222 abdominal hysterectomy procedures performed in 2015, 324 (1.7%) developed SSIs. Of these infections, 42% were superficial, 13% were deep, and 45% were organ/space (Table 13). Half of the SSIs (52%) were detected upon readmission to the same hospital, 26% were detected in outpatient settings, 13% were identified during the initial hospitalization, and 9% involved readmission to another hospital. The majority of the infections detected in outpatient locations were superficial. Detection of SSIs in outpatient locations is labor intensive and is not standardized across hospitals; therefore, the NYSDOH did not include these 85 infections for hospital-specific comparisons.

Table 13. Method of detection of hysterectomy surgical site infection by depth of infection, New York State 2015

	When Detected				
Extent (Row%) (Column%)	**Initial Hospitalization**	**Readmitted to the Same Hospital**	**Readmitted to Another Hospital**	**Post-Discharge Surveillance Not Readmitted**	**Total**
Superficial Incisional	16 (11.8%) (38.1%)	41 (30.1%) (24.3%)	9 (6.6%) (32.1%)	70 (51.5%) (82.4%)	136 (42.0%)
Deep Incisional	6 (14.6%) (14.3%)	24 (58.5%) (14.2%)	6 (14.6%) (21.4%)	5 (12.2%) (5.9%)	41 (12.7%)
Organ/Space	20 (13.6%) (47.6%)	104 (70.7%) (61.5%)	13 (8.8%) (46.4%)	10 (6.8%) (11.8%)	147 (45.4%)
Total	42 (13.0%)	169 (52.2%)	28 (8.6%)	85 (26.2%)	324

New York State data reported as of August 5, 2016.

Present at time of surgery

Of the 324 infections, 6 (2%) were classified as PATOS. These SSIs were predominantly (83%) Organ/Space. At completion of the surgery all were primarily closed. Reducing the risk of PATOS SSI is more difficult that reducing the risk of SSIs when there is no infection PATOS; therefore, the NYSDOH did not include these 6 infections in hospital-specific comparisons.

Microorganisms Associated with Hysterectomy SSIs

The most common microorganisms associated with hysterectomy SSIs were Enterococci, *E. coli*, coagulase negative Staphylococci, and *Staphylococcus aureus,* and (Table 14).

Table 14. Microorganisms identified in hysterectomy surgical site infections, New York State 2015

Microorganism	Number of Isolates	Percent of Infections
Enterococci	49	15.1
(VRE)	(4)	(1.2)
Escherichia coli	42	13.0
Coagulase negative staphylococci	38	11.7
Staphylococcus aureus	31	9.6
(MRSA)	(12)	(3.7)
Streptococci	27	8.3
Klebsiella spp.	21	6.5
(CephR-*Klebsiella*)	(1)	(0.3)
Pseudomonas spp.	17	5.2
Bacteroides	16	4.9
Enterobacter spp.	13	4.0
Proteus spp.	12	3.7
Corynebacteria	9	2.8
Yeast	7	2.2
Prevotella spp.	6	1.9
Citrobacter spp.	5	1.5
Morganella morganii	5	1.5
Other	25	7.8

New York State data reported as of August 5, 2016. Out of 324 infections. No microorganisms identified for 109 (34%) infections. VRE: vancomycin-resistant enterococci; MRSA: methicillin-resistant *Staphylococcus aureus;* CephR: cephalosporin-resistant; spp: multiple species

Risk Adjustment for Hysterectomy Surgical Site Infections

Certain patient and procedure-specific factors increased the risk of developing an SSI following abdominal hysterectomy. In 2015, after excluding SSIs identified using PDS that did not result in hospitalization and SSIs that were PATOS, the following risk factors were associated with SSIs. These variables were used to risk-adjust hospital-specific rates.

- Patients with severe systemic disease (ASA score of 3, 4, or 5) were 2.5 times more likely to develop an SSI than healthier patients (ASA score of 1 or 2).
- Procedures with duration greater than three hours were 1.9 times more likely to result in SSI than procedures less than two hours. Procedures with duration between two and three hours were 1.3 times more like to result in SSI than procedures less than two hours.
- Procedures that involved traditional surgical incisions were 2.5 times more likely to result in SSI than procedures performed entirely with a laparoscopic instrument.

Hospital-Specific Hysterectomy SSI Rates

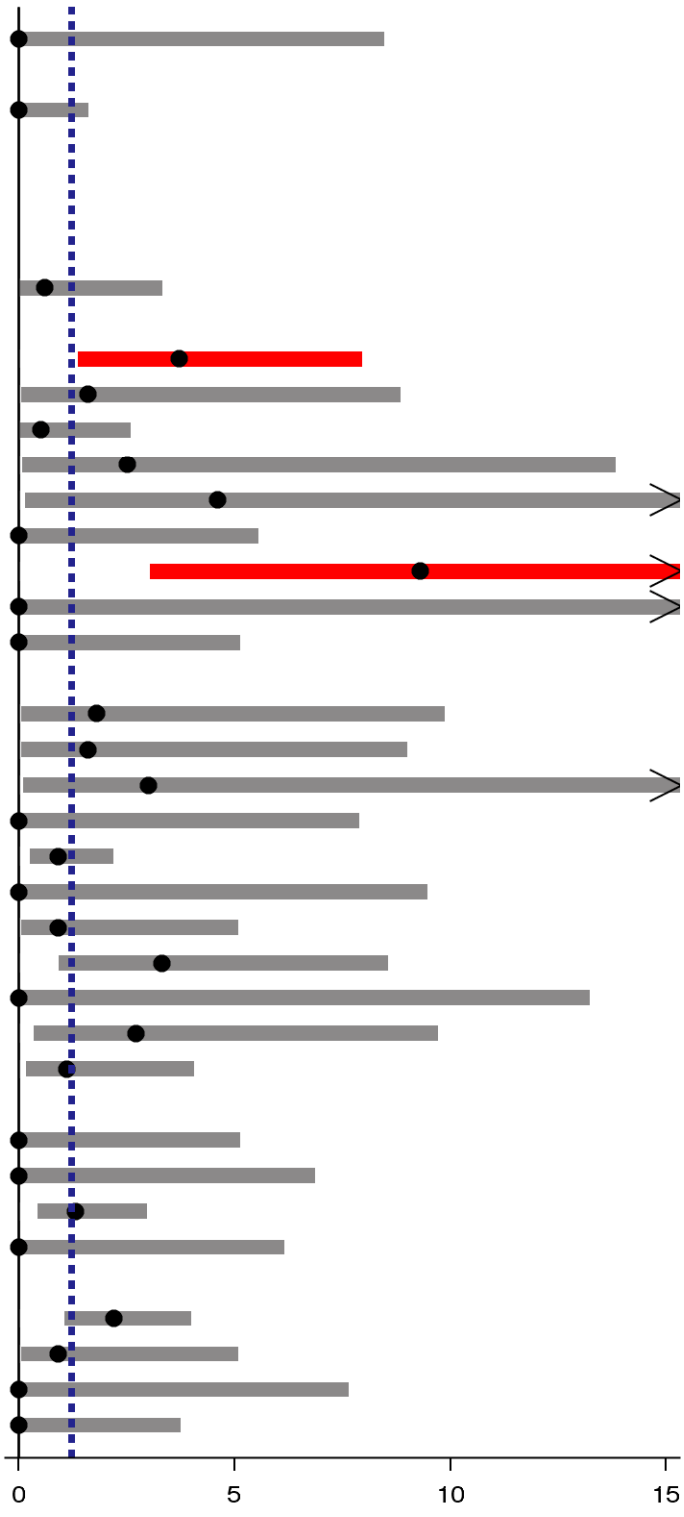
Hospital-specific hysterectomy SSI rates are provided in Figure 9.

In 2015, four hospitals (3%) had hysterectomy SSI rates that were statistically higher than the state average. None were also high in the previous year.

No hospitals had SSI rates that were significantly lower than the state average.

Figure 9. Abdominal hysterectomy surgical site infection rates, New York 2015 (page 1 of 4)

HOSPITAL	# SSI	#PDS EXCL	# PROCS	RAW RATE	ADJ RATE
AO Fox Memorial	0	0	31	0.0	0.0
Adirondack Medical	NA	NA	NA	NA	NA
Albany Med Ctr	0	0	178	0.0	0.0
Albany Memorial	NA	NA	NA	NA	NA
Alice Hyde Med Ctr	NA	NA	NA	NA	NA
Arnot Ogden Med Ctr	NA	NA	NA	NA	NA
Auburn Memorial	NA	NA	NA	NA	NA
Bellevue Hospital	1	1	142	0.7	0.6
Bon Secours	NA	NA	NA	NA	NA
Bronx-Lebanon^^	6	1	169	3.6	3.7
Brookdale Hospital	1	3	48	2.1	1.6
Brooklyn Hosp Ctr	1	0	233	0.4	0.5
Brooks Memorial	1	0	69	1.4	2.5
Buffalo General	1	1	27	3.7	4.6
Canton-Potsdam	0	2	50	0.0	0.0
Catskill Regional^^	5	0	55	9.1	9.3
Cayuga Medical Ctr	0	1	27	0.0	0.0
Champlain Valley	0	0	82	0.0	0.0
Claxton-Hepburn	NA	NA	NA	NA	NA
Columbia Memorial	1	1	97	1.0	1.8
Coney Island Hosp	1	0	39	2.6	1.6
Corning Hospital	1	0	34	2.9	3.0
Cortland Reg Med	0	0	65	0.0	0.0
Crouse Hospital	4	0	513	0.8	0.9
East. Niag. Lockport	0	1	36	0.0	0.0
Ellis Hospital	1	0	126	0.8	0.9
Elmhurst Hospital	4	1	85	4.7	3.3
FF Thompson	0	0	32	0.0	0.0
Faxton St. Lukes	2	1	56	3.6	2.7
Flushing Hospital	2	3	215	0.9	1.1
Glen Cove Hospital	NA	NA	NA	NA	NA
Glens Falls Hospital	0	1	51	0.0	0.0
Good Samar. Suffern	0	0	69	0.0	0.0
Good Samar. W Islip	5	0	453	1.1	1.3
Harlem Hospital	0	1	36	0.0	0.0
HealthAlli Broadway	NA	NA	NA	NA	NA
Highland Hospital	10	0	569	1.8	2.2
Huntington Hospital	1	0	224	0.4	0.9
Interfaith Med Ctr	0	0	27	0.0	0.0
JT Mather Hospital	0	0	73	0.0	0.0



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SSI: surgical site infections, Procs: procedures. Rates are per 100 procedures. Adjusted using ASA score, duration, and endoscope. Excludes SSIs present at time of surgery and non-readmitted cases identified using post discharge surveillance (PDS).

Figure 9. Abdominal hysterectomy surgical site infection rates, New York 2015 (page 2 of 4)

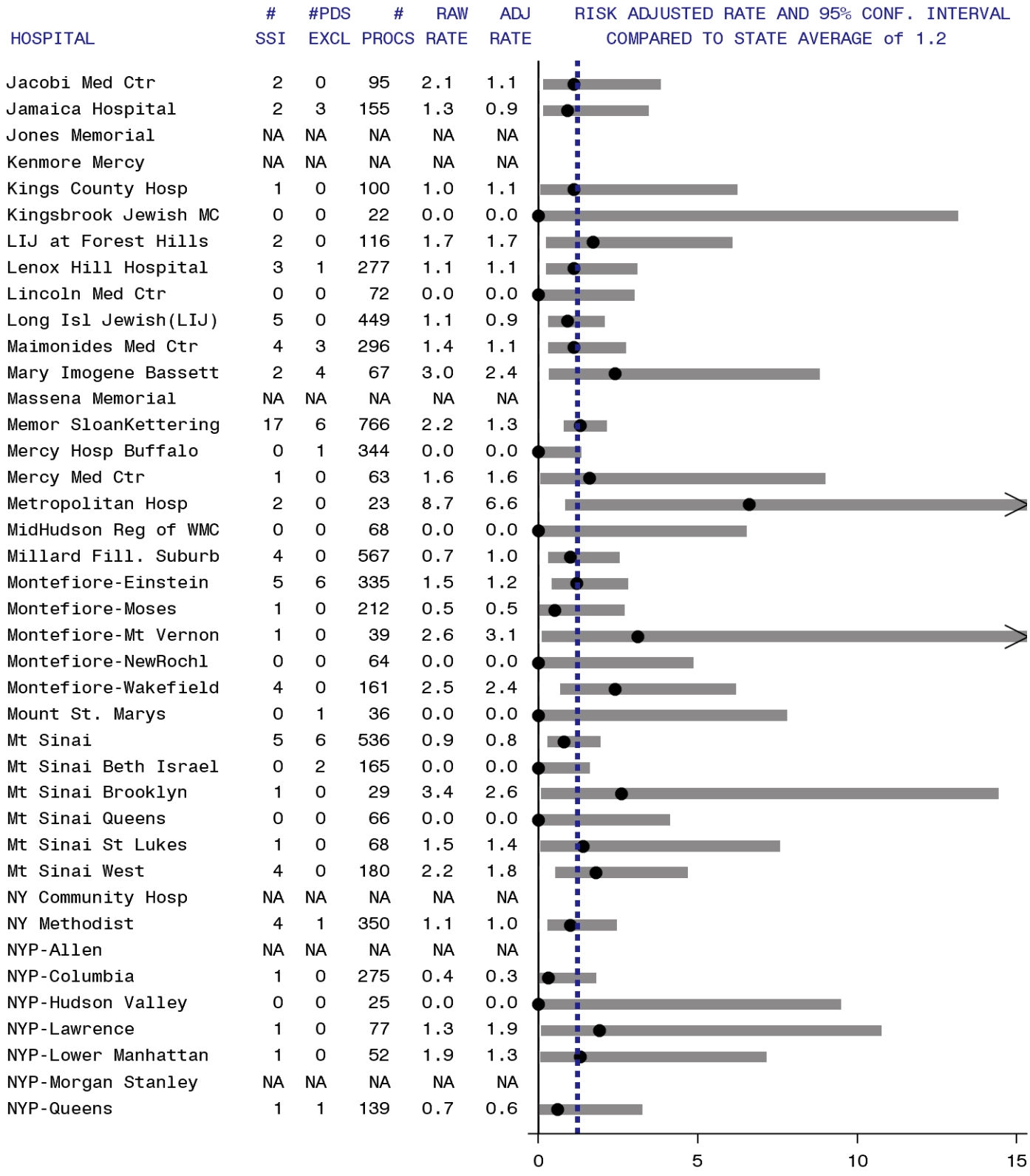

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Figure 9. Abdominal hysterectomy surgical site infection rates, New York 2015 (page 3 of 4)

HOSPITAL	# SSI	#PDS EXCL	# PROCS	RAW RATE	ADJ RATE
NYP-Weill Cornell	2	0	201	1.0	0.7
NYU Langone Med Ctr	3	1	234	1.3	1.0
NYU Lutheran	2	0	167	1.2	1.1
Nassau University	0	0	84	0.0	0.0
Nathan Littauer	NA	NA	NA	NA	NA
Newark Wayne	0	0	78	0.0	0.0
Niagara Falls	0	0	61	0.0	0.0
North Central Bronx	0	0	41	0.0	0.0
North Shore	8	0	502	1.6	1.3
Northern Dutchess^^	2	0	25	8.0	12.5
Northern Westchester	2	0	256	0.8	1.3
Noyes Memorial	0	0	45	0.0	0.0
Nyack Hospital	0	1	25	0.0	0.0
Olean General	1	3	68	1.5	1.9
Oneida Healthcare	2	2	97	2.1	4.6
OrangeReg Goshen-Mid	3	0	74	4.1	4.9
Oswego Hospital	0	0	48	0.0	0.0
Our Lady of Lourdes	0	1	72	0.0	0.0
Peconic Bay Medical	1	0	38	2.6	1.7
Phelps Memorial	0	0	47	0.0	0.0
Plainview Hospital	0	1	58	0.0	0.0
Putnam Hospital	0	0	54	0.0	0.0
Queens Hospital	0	1	91	0.0	0.0
Richmond Univ MC	3	4	306	1.0	1.4
Rochester General	4	0	498	0.8	1.0
Rome Memorial	NA	NA	NA	NA	NA
Roswell Park	5	9	244	2.0	1.7
SUNY Downstate MedCr	3	0	192	1.6	1.7
Samaritan- Troy	1	0	70	1.4	1.9
Samaritan- Watertown	0	0	107	0.0	0.0
Saratoga Hospital	NA	NA	NA	NA	NA
Sisters of Charity	5	0	369	1.4	1.8
Sisters- St Joseph	1	0	60	1.7	2.6
South Nassau Comm.	4	0	309	1.3	1.4
Southampton	0	0	62	0.0	0.0
Southside	3	0	275	1.1	1.4
St Anthony	0	0	52	0.0	0.0
St Barnabas	0	0	33	0.0	0.0
St Catherine Siena	1	0	69	1.4	2.1
St Charles Hospital	1	0	40	2.5	2.3

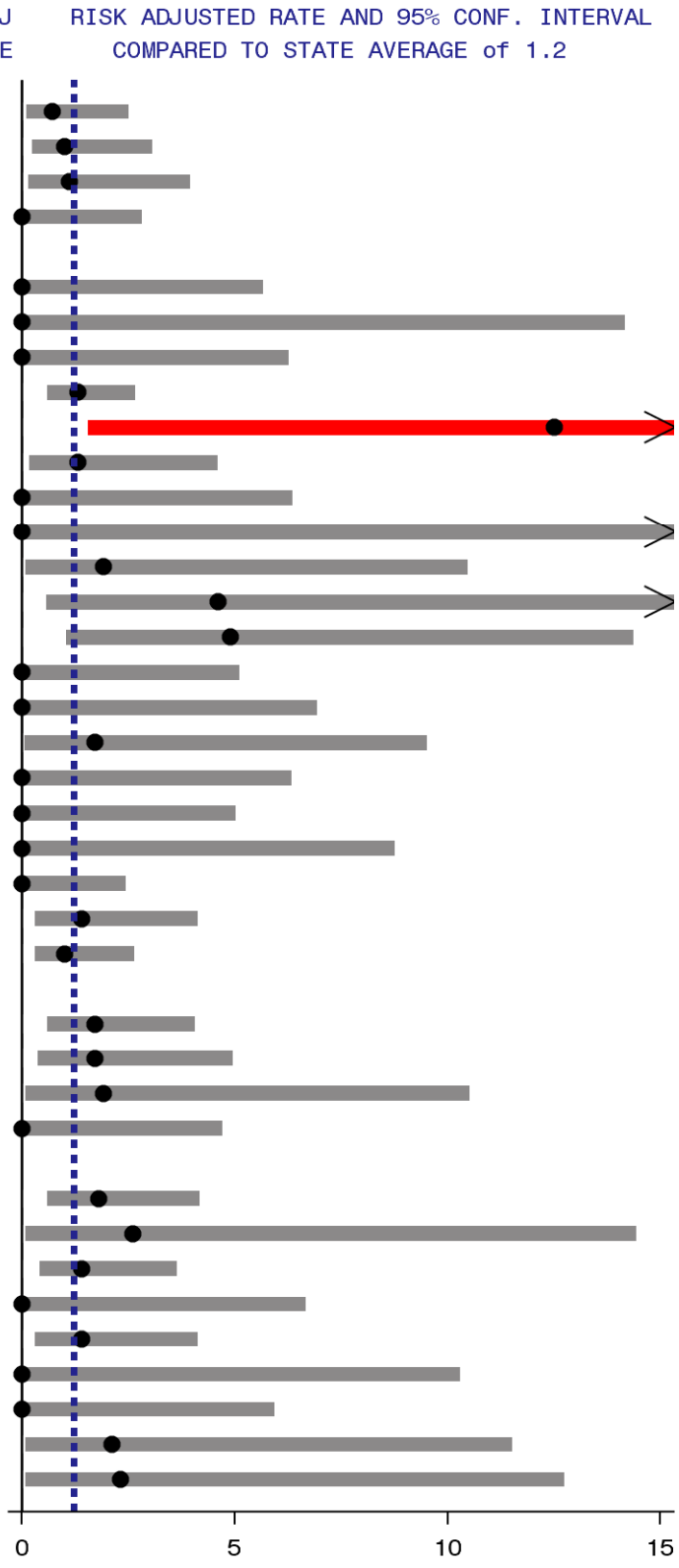

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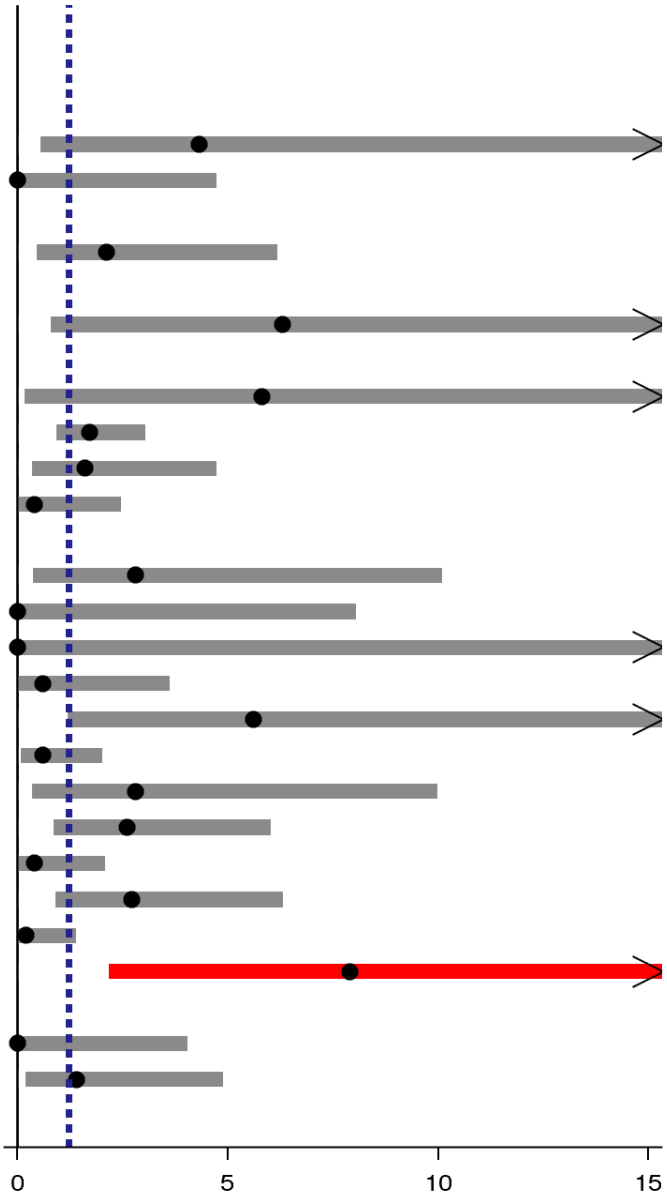
Figure 9. Abdominal hysterectomy surgical site infection rates, New York 2015 (page 4 of 4)

HOSPITAL	# SSI	#PDS EXCL	# PROCS	RAW RATE	ADJ RATE
St Elizabeth Medical	NA	NA	NA	NA	NA
St Francis- Roslyn	NA	NA	NA	NA	NA
St James Mercy	NA	NA	NA	NA	NA
St Johns Episcopal	2	0	33	6.1	4.3
St Johns Riverside	0	0	73	0.0	0.0
St Joseph -Bethpage	NA	NA	NA	NA	NA
St Josephs- Syracuse	3	0	212	1.4	2.1
St Josephs- Yonkers	NA	NA	NA	NA	NA
St LukesNewburgh-Cor	2	0	27	7.4	6.3
St Marys Amsterdam	NA	NA	NA	NA	NA
St Marys Troy	1	0	25	4.0	5.8
St Peters Hospital	12	0	832	1.4	1.7
Staten Island U N-S	3	2	145	2.1	1.6
Strong Memorial	1	0	285	0.4	0.4
Syosset Hospital	NA	NA	NA	NA	NA
UHS Bingham/Wilson	2	0	72	2.8	2.8
UHS Chenango Memor	0	0	31	0.0	0.0
United Memorial	0	0	21	0.0	0.0
Unity Hosp Rochester	1	0	237	0.4	0.6
Univ Hosp SUNY Upst	3	0	34	8.8	5.6
Univ Hosp StonyBrook	2	1	235	0.9	0.6
Upst. Community Gen	2	1	118	1.7	2.8
Vassar Brothers	5	0	313	1.6	2.6
Westchester Medical	1	1	171	0.6	0.4
White Plains Hosp	5	1	332	1.5	2.7
Winthrop University	1	0	307	0.3	0.2
Woman and Childrens^^	4	0	55	7.3	7.9
Womans Christian	NA	NA	NA	NA	NA
Woodhull Med Ctr	0	0	69	0.0	0.0
Wyckoff Heights	2	0	95	2.1	1.4
Wyoming County Comm.	NA	NA	NA	NA	NA



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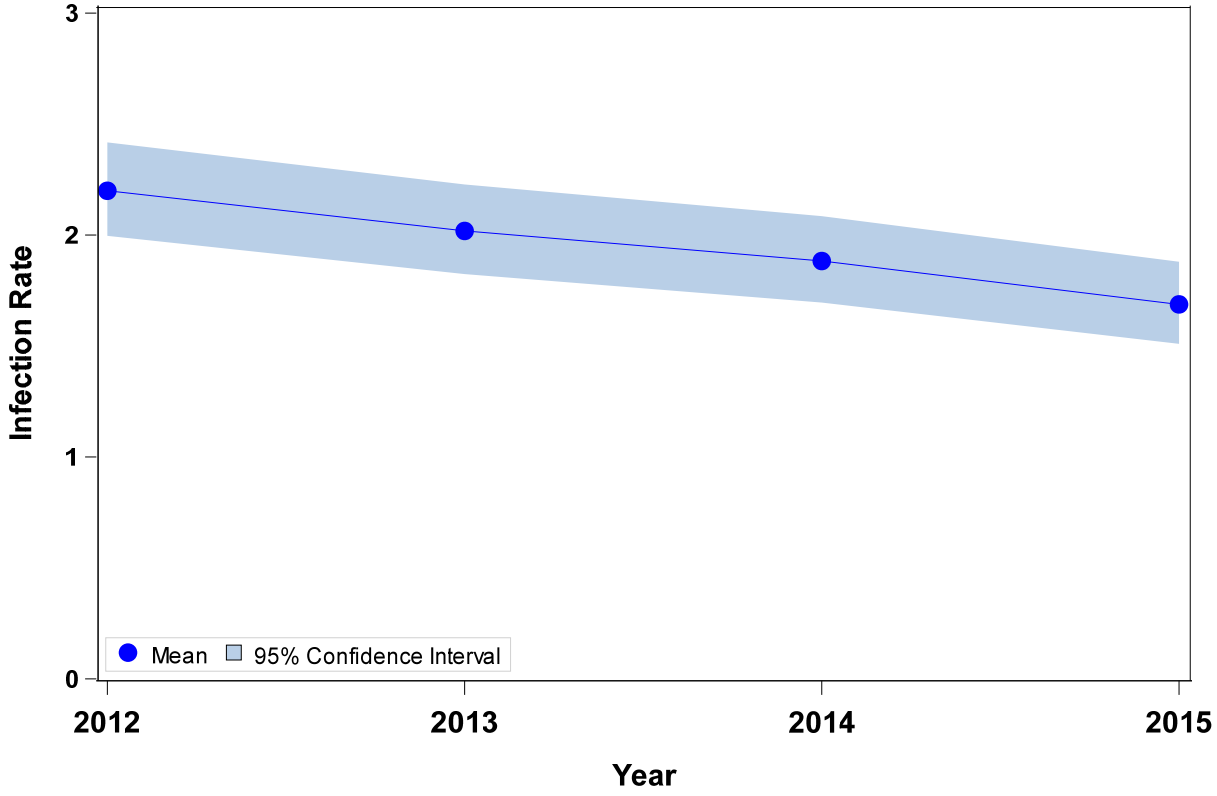
Time trends in Hysterectomy SSIs

Changes in the SSI protocol over time were summarized in Table 2. Trends in hysterectomy SSI rates are summarized for informational purposes in Figure 10. Definition changes between 2014 and 2015 were minor, and hysterectomy SSI rates in 2014 and 2015 were similar.

Figure 10. Trend in hysterectomy surgical site infection rates, New York State 2012-2015



Year	# Hospitals	# Procedures	For Statewide Trends[1]		For Hospital Comparisons[2]	
			Total # Infections	Total Infection Rate	# Infections excluding PDS and PATOS	Infection Rate excluding PDS and PATOS
2012	161	19,142	421	2.20	318	1.66
2013	157	19,175	387	2.02	298	1.55
2014	151	19,266	362	1.88	258	1.34
2015	150	19,222/19,216[3]	324	1.69	233	1.21

New York State Data reported as of August 5, 2016. PDS=post-discharge surveillance.
Infection rate is the number of infections divided by the number of procedures, multiplied by 100.
[1]To assess trends, all NHSN data are included and graphed in the figure. [2]To assess hospital-specific performance, compare the hospital's rate to the state average in the same year. SSIs detected by PDS and not readmitted were excluded beginning in 2012 because PDS methods are not standardized across hospitals. SSIs/procedures[3] that were related to infections present at time of surgery (PATOS) were excluding beginning in 2015.

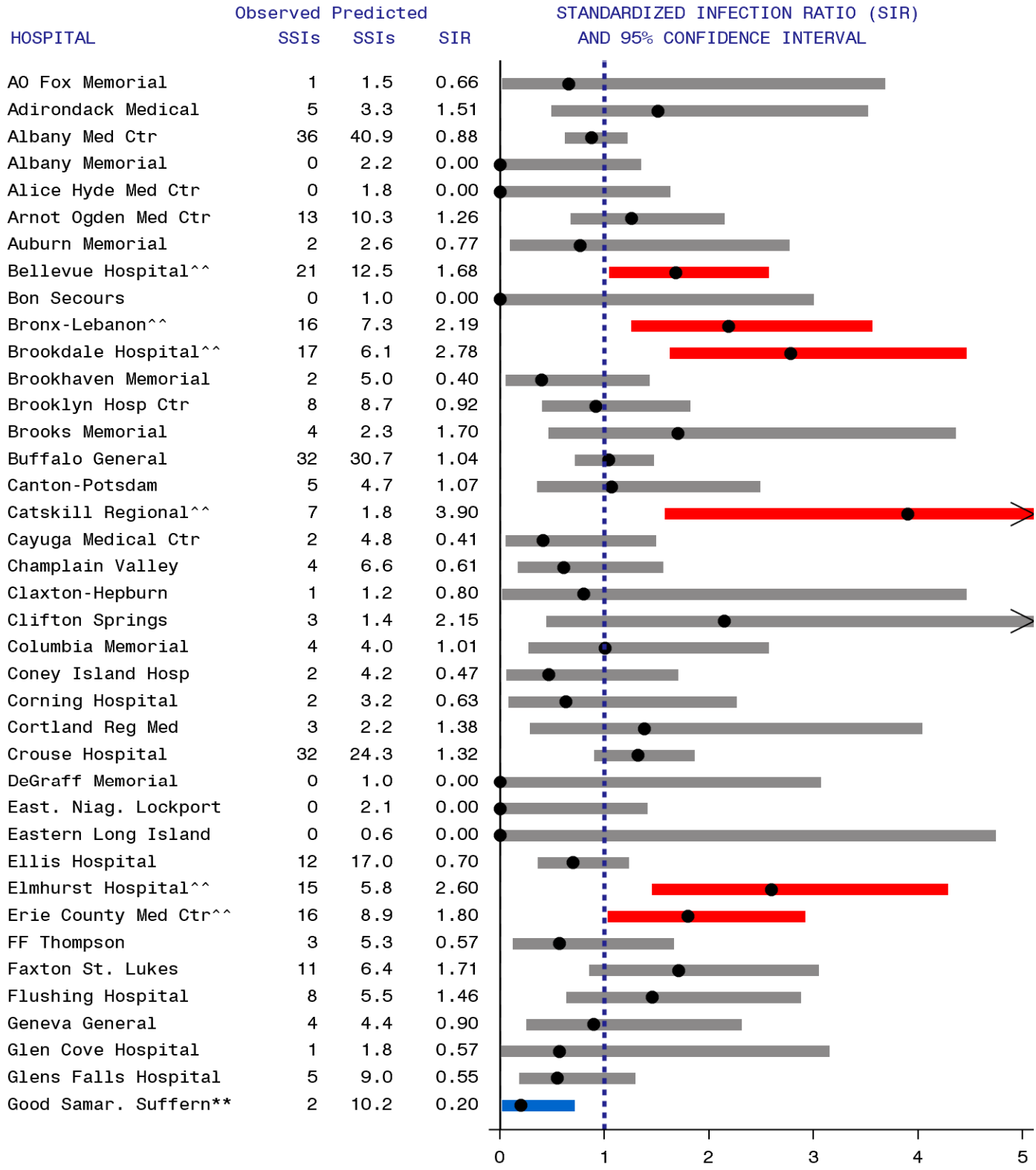
Summary across SSIs

The standardized infection ratio (SIR) is a summary measure used to compare infection data from one population to data from a "standard" population. When calculating hospital-specific SIRs in NYS reports, the standard population is patients who had reportable procedures at all NYS hospitals reporting data to NHSN in the current year. The SSI SIR is calculated by dividing the observed number of infections in the hospital by the statistically predicted number of infections, which is calculated using the risk adjustment models described for each type of SSI.

- 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. 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.

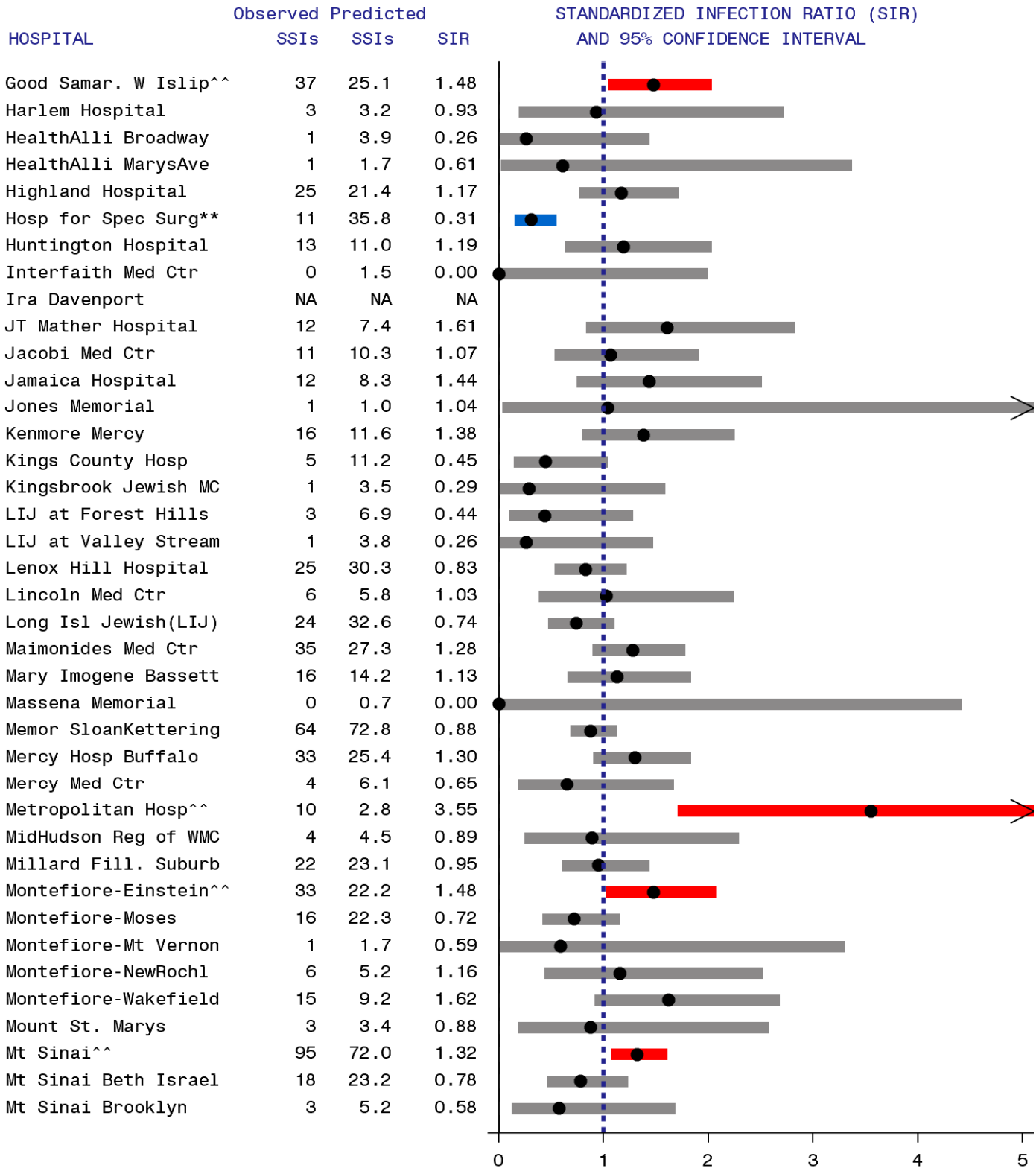
Figure 11 provides hospital-specific SSI SIRs for each hospital. The SSI SIRs combine results across the five different types of SSIs, showing the average performance of each hospital. In 2015, sixteen hospitals (10%) had high SIR flags, and seven hospitals had low SIR flags.

Figure 11. Surgical site infection (SSI) summary for colon, coronary artery bypass, hip, and hysterectomy procedures standardized infection ratio (SIR), New York 2015 (page 1 of 5)



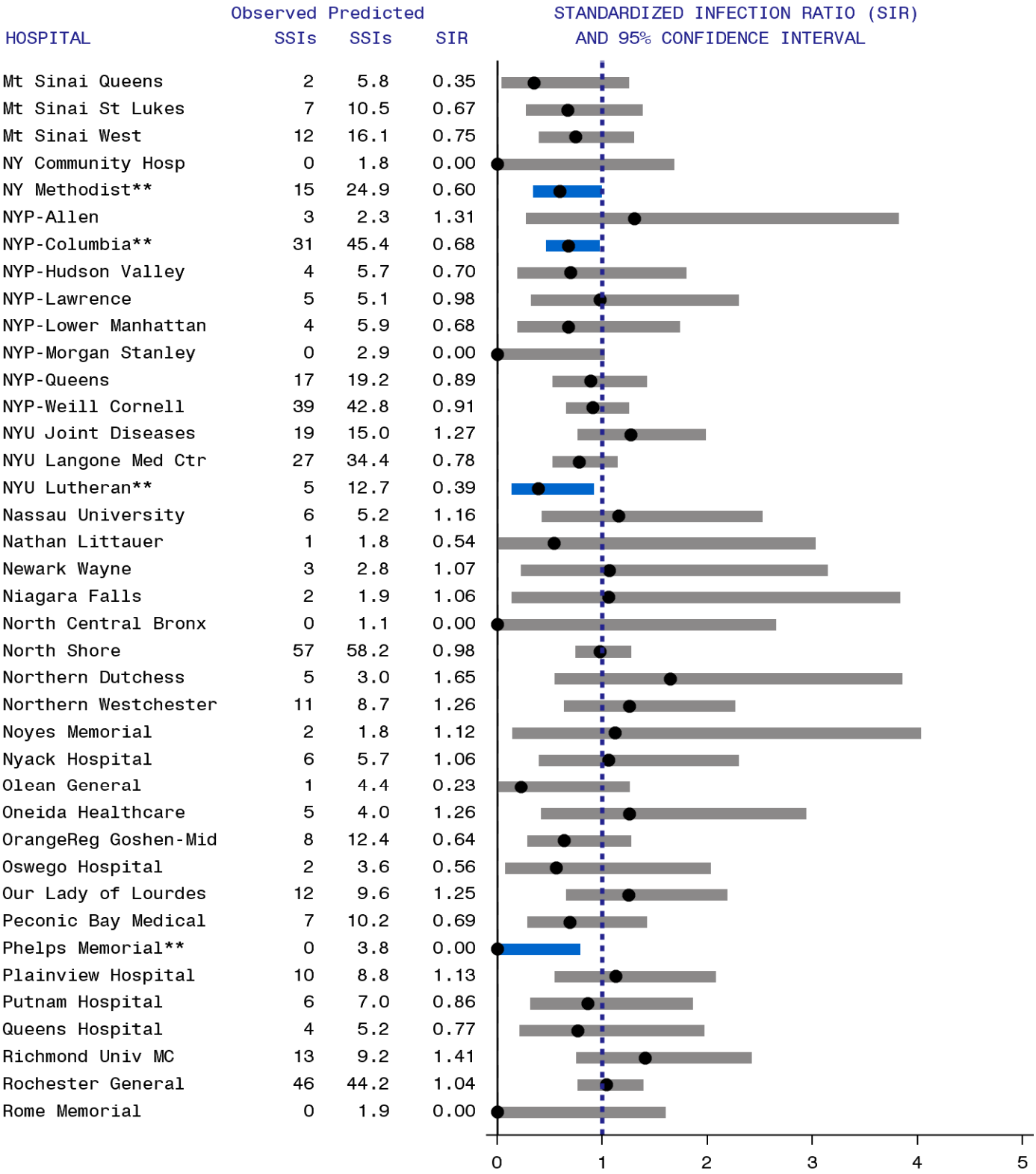
Data reported as of August 05, 2016. ┆State Average. ●Risk-adjusted Infection rate. ▬^^Signif. higher than state average. ▬**Significantly lower than state average. ▬Average. > Upper confidence limit exceeds graph area. NA: less than 20 procedures. SSI: surgical site infections. Predicted based on NYS 2015 average, after adjusting for patient risk factors. Excludes SSIs present at time of surgery and non-readmitted cases identified using post discharge surveillance (PDS).

Figure 11. Surgical site infection (SSI) summary for colon, coronary artery bypass, hip, and hysterectomy procedures standardized infection ratio (SIR), New York 2015 (page 2 of 5)



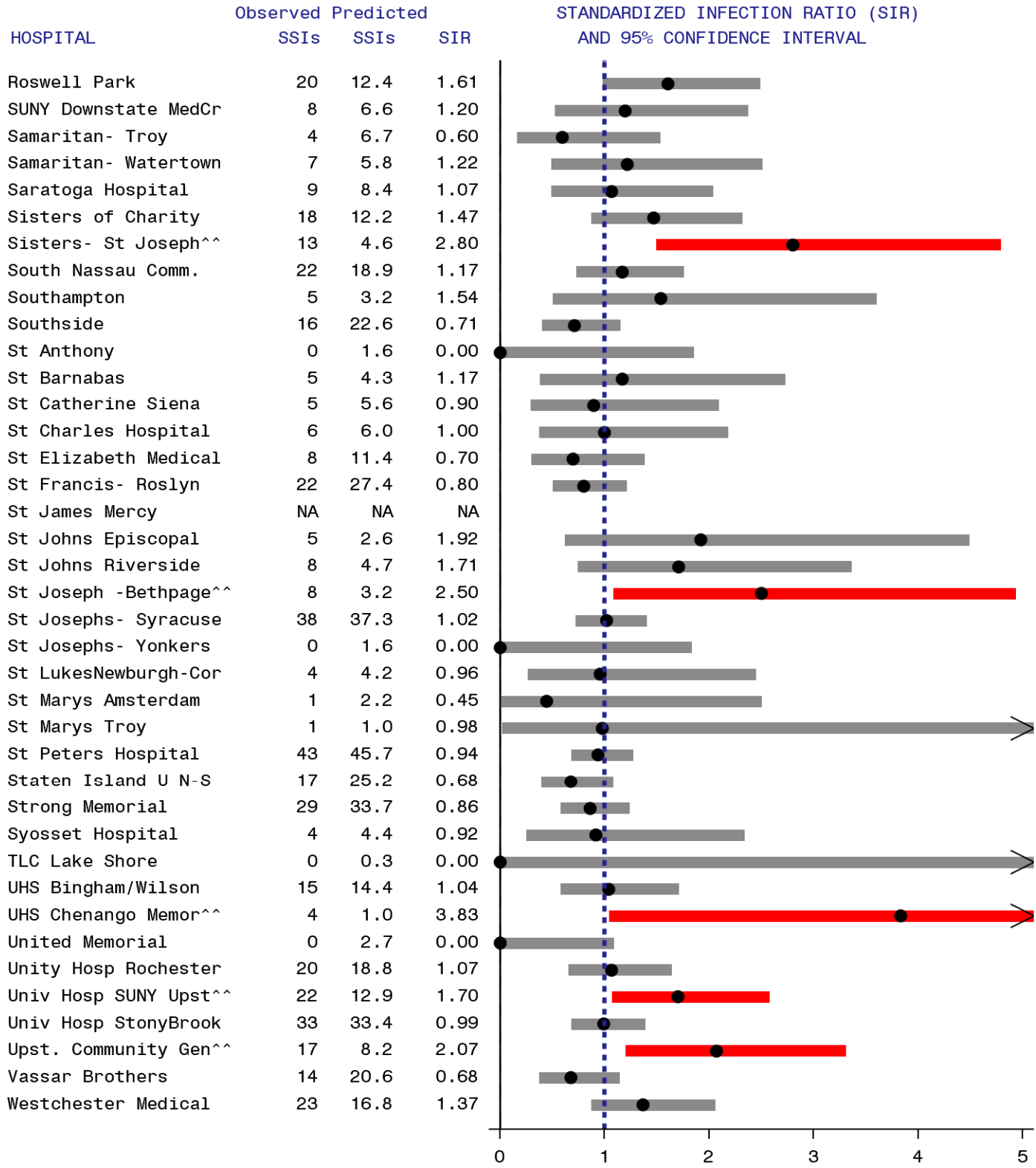
Data reported as of August 05, 2016. ┆State Average. ●Risk-adjusted Infection rate. ▬^^Signif. higher than state average. ▬**Significantly lower than state average. ▬Average. > Upper confidence limit exceeds graph area. NA: less than 20 procedures. SSI: surgical site infections. Predicted based on NYS 2015 average, after adjusting for patient risk factors. Excludes SSIs present at time of surgery and non-readmitted cases identified using post discharge surveillance (PDS).

Figure 11. Surgical site infection (SSI) summary for colon, coronary artery bypass, hip, and hysterectomy procedures standardized infection ratio (SIR), New York 2015 (page 3 of 5)



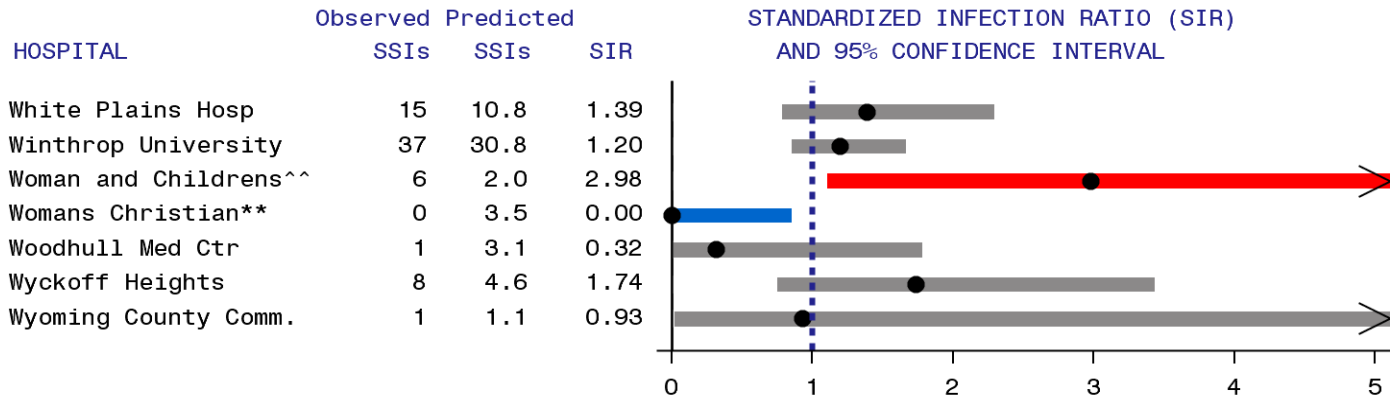
Data reported as of August 05, 2016. ¦State Average. ●Risk-adjusted Infection rate. —^^Signif. higher than state average. —**Significantly lower than state average. —Average. > Upper confidence limit exceeds graph area. NA: less than 20 procedures. SSI: surgical site infections. Predicted based on NYS 2015 average, after adjusting for patient risk factors. Excludes SSIs present at time of surgery and non-readmitted cases identified using post discharge surveillance (PDS).

Figure 11. Surgical site infection (SSI) summary for colon, coronary artery bypass, hip, and hysterectomy procedures standardized infection ratio (SIR), New York 2015 (page 4 of 5)



Data reported as of August 05, 2016. ┆State Average. ●Risk-adjusted Infection rate. ▬^^Signif. higher than state average. ▬**Significantly lower than state average. ▬Average. > Upper confidence limit exceeds graph area. NA: less than 20 procedures. SSI: surgical site infections. Predicted based on NYS 2015 average, after adjusting for patient risk factors. Excludes SSIs present at time of surgery and non-readmitted cases identified using post discharge surveillance (PDS).

Figure 11. Surgical site infection (SSI) summary for colon, coronary artery bypass, hip, and hysterectomy procedures standardized infection ratio (SIR), New York 2015 (page 5 of 5)



Data reported as of August 05, 2016. ┆State Average. ●Risk-adjusted Infection rate. ▬^^Signif. higher than state average. ▬**Significantly lower than state average. ▬Average. > Upper confidence limit exceeds graph area. NA: less than 20 procedures. SSI: surgical site infections. Predicted based on NYS 2015 average, after adjusting for patient risk factors. Excludes SSIs present at time of surgery and non-readmitted cases identified using post discharge surveillance (PDS).

Central Line-Associated Bloodstream Infections (CLABSIs)

In 2015, 1,644 CLABSIs were associated with 1,402,218 days of central line use, for an overall rate of 1.2 infections per 1,000 central line days. The 2015 CLABSI and device utilization data are summarized by location type in Table 15. CLABSI rates were highest in Level II/III neonatal ICUs, although device utilization was also lowest in this area.

Table 15. Central line-associated bloodstream infections by location, New York State 2015

Location	# Hospitals	# CLABSI	# Line days	CLABSI Rate	# Patient days	% Device utilization
Intensive Care Units (ICUs)						
Cardiothoracic	33	65	79,156	0.82	112,716	70.2
Coronary	40	49	46,783	1.05	122,535	38.2
Medical	55	162	121,410	1.33	251,632	48.2
Medical/Surgical	100	132	133,425	0.99	313,978	42.5
Neonatal- Level II/III	12	8	4,580	1.75	42,154	10.9
Neonatal- Level III	25	24	19,778	1.21	122,261	16.2
Neonatal- Regional Perinatal	17	62	57,463	1.08	222,358	25.8
Neurosurgical	12	16	17,781	0.90	49,593	35.9
Pediatric	28	53	33,478	1.58	86,240	38.8
Surgical	41	83	76,345	1.09	156,673	48.7
ALL ICUs	156	654	590,199	1.11	1,480,140	39.9
Wards						
Medical	84	347	284,052	1.22	2,290,710	12.4
Medical Surgical	140	374	317,630	1.18	2,813,921	11.3
Surgical	71	114	105,042	1.09	877,939	12.0
Step down unit	54	102	70,982	1.44	357,169	19.9
Pediatric medical/surgical	55	53	34,313	1.54	262,249	13.1
ALL wards	171	990	812,019	1.22	6,601,988	12.3
TOTAL ICUs and wards	174	1644	1,402,218	1.17	8,082,128	17.3

New York State data as of August 1, 2016. Rates are per 1,000 central line days.
Device utilization = 100* central line days/patient days.

New York State has two cancer hospitals with oncology ICUs: Memorial Sloan Kettering Cancer Center and Roswell Park Cancer Institute. Oncology CLABSIs are reported separately by line type (i.e. temporary or permanent). Combined results for the two hospitals are presented in Table 16.

Table 16. Central line-associated bloodstream infections in cancer hospitals, New York State 2015

		Temporary lines			Permanent lines			Overall	
ICU type	# Hospitals	#CLABSI	#Line Days	CLABSI rate	# CLABSI	# Line Days	CLABSI rate	# Patient Days	Device Utilization
Oncology ICU	2	7	6,670	1.05	2	2,121	0.94	10,342	85.0

New York State data as of August 1, 2016. Rates are per 1,000 central line days.
Device utilization = 100* central line days/patient days.

Microorganisms Associated with CLABSIs

The distribution of microorganisms associated with CLABSIs is presented by location in Tables 17, 18, and 19. A larger proportion of BSIs were associated with yeast in 2015 due to a definition change: urine cultures positive only for yeast no longer fit the CAUTI definition; therefore, yeast found in the blood may be classified as a CLABSI rather than BSI secondary to a CAUTI. Yeast was the most common organism in adult and pediatric ICUs, where very sick patients have been exposed to large amounts of antibiotics. Other common infecting organisms included Enterococci, coagulase-negative Staphylococci, *Staphylococcus aureus*, and *Klebsiella* spp.

Table 17. Microorganisms identified in central line-associated bloodstream infections, adult and pediatric intensive care units, New York State 2015

Microorganism	Number of Isolates	Percent of Infections
Yeast	158	28.2
Enterococci	103	18.4
(VRE)	(55)	(9.8)
Coagulase negative staphylococci	85	15.2
Staphylococcus aureus	54	9.6
(MRSA)	(25)	(4.5)
Klebsiella spp.	49	8.8
(CRE-*Klebsiella*)	(6)	(1.1)
CephR-*Klebsiella*)	(11)	(2.0)
Enterobacter spp.	30	5.4
Escherichia coli	17	3.0
(CRE-*E. coli*)	(2)	(0.4)
Pseudomonas spp.	17	3.0
Proteus spp.	11	2.0
Streptococci	11	2.0
Acinetobacter spp.	10	1.8

Microorganism	Number of Isolates	Percent of Infections
(MDR-*Acinetobacter*)	(4)	(0.7)
Serratia spp.	9	1.6
Stenotrophomonas spp.	9	1.6
Lactobacilli	6	1.1
Other	26	4.6

New York State data reported as of August 1, 2016. Out of 560 infections.
VRE: vancomycin-resistant enterococci; CRE: carbapenem-resistant Enterobacteriaceae; CephR: cephalosporin-resistant; MRSA: methicillin-resistant *Staphylococcus aureus;* MDRO: multi-drug resistant; spp: multiple species.

Table 18. Microorganisms associated with central line-associated bloodstream infections, neonatal intensive care units, New York State 2015

Microorganism	Number of Isolates	Percent of Infections
Coagulase negative staphylococci	32	34.0
Staphylococcus aureus	22	23.4
(MRSA)	(7)	(7.4)
Yeast	11	11.7
Escherichia coli	9	9.6
Enterococci	7	7.4
Klebsiella spp.	7	7.4
(CephR-*Klebsiella*)	(2)	(2.1)
Other	15	16.0

New York State data reported as of August 1, 2016. Out of 94 infections.
CephR: cephalosporin-resistant; MRSA: methicillin-resistant *Staphylococcus aureus;* spp: multiple species.

Table 19. Microorganisms associated with central line-associated bloodstream infections, medical and surgical wards and step-down units, New York State 2015

Microorganism	Number of Isolates	Percent of Infections
Staphylococcus aureus	187	18.9
(MRSA)	(91)	(9.2)
Yeast	185	18.7
Enterococci	168	17.0
(VRE)	(67)	(6.8)
Klebsiella spp.	142	14.3
(CRE-*Klebsiella*)	(16)	(1.6)
(CephR-*Klebsiella*)	(28)	(2.8)
Coagulase negative staphylococci	121	12.2
Escherichia coli	54	5.5
(CRE-*E. coli*)	(1)	(0.1)
Pseudomonas spp.	53	5.4
Enterobacter spp.	45	4.5
Acinetobacter spp.	35	3.5
(MDR-*Acinetobacter*)	(23)	(2.3)
Proteus spp.	21	2.1
Serratia spp.	21	2.1
Streptococci	21	2.1
Citrobacter spp.	12	1.2
Providencia spp.	9	0.9
Stenotrophomonas spp.	9	0.9
Bacteroides	6	0.6
Lactobacilli	5	0.5
Other	41	4.1

New York State data reported as of August 1, 2016. Out of 990 infections.
VRE: vancomycin-resistant enterococci; CRE: carbapenem-resistant Enterobacteriaceae; CephR: cephalosporin-resistant; MRSA: methicillin-resistant *Staphylococcus aureus;* MDRO: multi-drug resistant; spp: multiple species.

Mucosal Barrier Injury (MBI) Laboratory-Confirmed Bloodstream Infections

An MBI-CLABSI is a type of CLABSI that can occur in cancer patients who have had stem cell transplants or other patients with certain blood disorders. In these patients, BSIs are more likely the result of organisms that enter the bloodstream from the gut, rather than organisms that enter the bloodstream from the central line. HAI CLABSI surveillance is intended to capture BSIs that are associated with the central line itself.

In 2015, 64 MBIs were reported out of 1,644 CLABSIs in ICUs and wards. These MBIs have been excluded from 2015 hospital-specific CLABSI rate comparisons to make comparisons more fair based on differences in cancer patient populations (Table 20).

Table 20: Mucosal barrier injury central line-associated bloodstream infections, New York State 2015

Location	# MBI	#CLABSI	% MBI
Intensive Care Units	14	654	2.1%
Medical/Surgical/Step down Wards	50	990	5.1%

New York State data as of August 1, 2016.

Risk Factors for CLABSIs

Hospitals do not collect patient-specific risk factors for CLABSIs; NHSN requires reporting of only the total number of patient days and total number of central line days per month within each hospital location. CLABSI rates are stratified by type of location. For BSIs in NICUs, the data are collected by birth weight group because lower birth weight babies are more susceptible to CLABSIs than higher birth weight babies. As CLABSI rates decline, risk adjustment of NICU rates becomes more difficult. In 2015, no risk adjustment could be performed by birthweight group in Level II/III facilities because there were only 8 CLABSIs. Level III data were risk-adjusted using two birthweight groups divided at 1000 grams. RPC data were risk-adjusted by three birthweight groups, partitioned at 750 grams and 1000 grams.

Hospital-Specific, Location-Specific CLABSI Rates

Within NYS, hospital-specific CLABSI rates were compared to the state average by hospital location type. The CLABSI rates in Table 21 (ICUs) and Table 22 (wards) help hospital IPs target their CLABSI reduction efforts to specific locations. Thirty-one high flags will be addressed in CLABSI improvement plans by the affected hospitals.

Table 21. Central line-associated bloodstream infection rates by Intensive Care Unit, New York State 2015

	Coronary ICU		Cardiothoracic ICU		Medical ICU		Medical Surgical ICU		Surgical ICU		Neurosurgical ICU		Pediatric ICU		Neonatal ICU		
Hospital	CLABSI / CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI / CLDays	Rate	CLABSI / CLDays	Rate	CLABSI/ CLDays	Rate	NICU level	CLABSI/ CLDays	Adj rate
2015 State Average	1.05		0.81		1.25		0.97		1.09		0.90		1.55		1.05 (RPC); 1.35 (Lev 3); 1.75 (Lev 2/3)		
Adirondack Medical							0/ 254	0.0									
Albany Med Ctr	0/2091	0.0	2/3036	0.7	5/4116	1.2	0/1743	0.0	6/6307	1.0			1/2115	0.5	RPC	4/3214	1.3
Albany Memorial							3/ 702	4.3									
Alice Hyde Med Ctr							0/ 65	0.0									
Arnot Ogden Med Ctr							3/3471	0.9							L III	1/1348	1.3
Auburn Memorial							1/ 389	2.6									
Bellevue Hospital	2/1442	1.4	0/ 817	0.0	1/1325	0.8			1/2004	0.5	2/ 625	3.2	0/ 147	0.0	RPC	1/1668	0.5
Bon Secours							0/ 454	0.0									
Bronx-Lebanon	1/ 297	3.4					4/4681	0.9							L III	0/ 432	0.0
Brookdale Hospital	0/ 462	0.0			6/2403	2.5			3/ 844	3.6			NA	NA	L III	1/ 323	2.3
Brookhaven Memorial	1/1303	0.8			1/1413	0.7			6/1545	^^ 3.9							
Brooklyn Hosp Ctr					2/1246	1.6			6/1270	^^ 4.7			1/ 59	16.9	L III	1/1748	0.5
Brooks Memorial							3/ 382	^^ 7.9									
Buffalo General			2/3752	0.5	9/6930	1.3			1/1744	0.6	1/1683	0.6					
Canton-Potsdam							0/ 139	0.0									
Catskill Regional							1/ 608	1.6									
Cayuga Medical Ctr							0/1629	0.0									
Champlain Valley							0/1780	0.0									
Claxton-Hepburn							0/ 362	0.0									
Clifton Springs							0/ 353	0.0									
Columbia Memorial							0/ 631	0.0									
Coney Island Hosp	1/ 602	1.7			2/2113	0.9			5/1425	^^ 3.5							

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	Coronary ICU		Cardiothoracic ICU		Medical ICU		Medical Surgical ICU		Surgical ICU		Neurosurgical ICU		Pediatric ICU		Neonatal ICU		
Hospital	**CLABSI / CLDays**	**Rate**	**CLABSI/ CLDays**	**Rate**	**CLABSI/ CLDays**	**Rate**	**CLABSI/ CLDays**	**Rate**	**CLABSI / CLDays**	**Rate**	**CLABSI / CLDays**	**Rate**	**CLABSI/ CLDays**	**Rate**	**NICU level**	**CLABSI/ CLDays**	**Adj rate**
2015 State Average	**1.05**		**0.81**		**1.25**		**0.97**		**1.09**		**0.90**		**1.55**		**1.05 (RPC); 1.35 (Lev 3); 1.75 (Lev 2/3)**		
Corning Hospital							0/ 434	0.0									
Cortland Reg Med					0/ 497	0.0											
Crouse Hospital							3/3025	1.0							RPC	6/3913	1.5
DeGraff Memorial							0/ 134	0.0									
East. Niag. Lockport							2/ 345	5.8									
Eastern Long Island							0/ 62	0.0									
Ellis Hospital							2/5178	0.4									
Elmhurst Hospital	0/ 335	0.0			3/1062	2.8			3/1007	3.0					L II-II	1/ 256	3.9
Erie County Med Ctr					3/2237	1.3											
FF Thompson							1/ 776	1.3									
Faxton St. Lukes	1/1883	0.5					0/ 374	0.0									
Flushing Hospital	1/ 495	2.0			3/1117	2.7			1/ 449	2.2					L III	3/1153	3.2
Geneva General							2/1002	2.0									
Glen Cove Hospital							0/ 412	0.0									
Glens Falls Hospital	0/ 441	0.0					0/1592	0.0									
Good Samar. Suffern			3/ 876	3.4	3/1693	1.8			0/ 596	0.0							
Good Samar. W Islip			0/ 924	0.0	4/4025	1.0			0/1829	0.0			0/ 77	0.0	L III	1/ 873	1.0
Harlem Hospital	0/ 198	0.0					3/2107	1.4					0/ 87	0.0	L III	1/ 769	1.7
HealthAlli Broadway							0/1374	0.0									
HealthAlli MarysAve							NA	NA									
Highland Hospital							2/3221	0.6									
Hosp for Spec Surg							0/ 154	0.0									

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	Coronary ICU		Cardiothoracic ICU		Medical ICU		Medical Surgical ICU		Surgical ICU		Neurosurgical ICU		Pediatric ICU		Neonatal ICU		
Hospital	CLABSI / CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI / CLDays	Rate	CLABSI / CLDays	Rate	CLABSI/ CLDays	Rate	NICU level	CLABSI/ CLDays	Adj rate
2015 State Average	1.05		0.81		1.25		0.97		1.09		0.90		1.55		1.05 (RPC); 1.35 (Lev 3); 1.75 (Lev 2/3)		
Huntington Hospital	0/ 569	0.0					0/ 765	0.0									
Interfaith Med Ctr							3/1630	1.8									
JT Mather Hospital	1/ 797	1.3					1/1423	0.7									
Jacobi Med Ctr	3/ 490	^^ 6.1			1/1382	0.7			0/1022	0.0			NA	NA	RPC	1/ 662	1.2
Jamaica Hospital					6/1833	3.3			0/ 762	0.0					L III	1/ 620	1.3
Jones Memorial							0/ 322	0.0									
Kenmore Mercy							0/1481	0.0									
Kings County Hosp	1/1072	0.9			2/1409	1.4			2/1179	1.7	1/1064	0.9	NA	NA	L II-II	0/ 676	0.0
Kingsbrook Jewish MC							4/2746	1.5									
LIJ at Forest Hills					2/2641	0.8											
LIJ at Valley Stream							2/1002	2.0									
Lenox Hill Hospital	0/ 964	0.0	3/2050	1.5			3/2217	1.4	0/1129	0.0					L II-II	1/1358	0.7
Lincoln Med Ctr	2/ 868	2.3			3/1524	2.0			3/ 694	4.3			NA	NA	L III	4/ 703	4.9
Long Isl Jewish(LIJ)	1/ 625	1.6	0/ 542	0.0	2/1526	1.3			0/1062	0.0			1/2387	0.4	RPC	2/4793	0.4
Maimonides Med Ctr	0/ 976	0.0	4/2319	1.7	0/2063	0.0			0/1382	0.0			2/ 769	2.6	RPC	1/1648	0.5
Mary Imogene Bassett							2/1731	1.2									
Massena Memorial							NA	NA									
Mercy Hosp Buffalo	3/2428	1.2	0/1641	0.0			3/3455	0.9									
Mercy Med Ctr							2/1452	1.4							L III	0/ 312	0.0
Metropolitan Hosp					1/ 666	1.5			1/ 175	5.7					L II-II	0/ 184	0.0
MidHudson Reg of WMC							2/1470	1.4									
Millard Fill. Suburb							3/3577	0.8									

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	Coronary ICU		Cardiothoracic ICU		Medical ICU		Medical Surgical ICU		Surgical ICU		Neurosurgical ICU		Pediatric ICU		Neonatal ICU		
Hospital	CLABSI / CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI / CLDays	Rate	CLABSI / CLDays	Rate	CLABSI/ CLDays	Rate	NICU level	CLABSI/ CLDays	Adj rate
2015 State Average	1.05		0.81		1.25		0.97		1.09		0.90		1.55		1.05 (RPC); 1.35 (Lev 3); 1.75 (Lev 2/3)		
Montefiore-Einstein			2/2763	0.7	4/2632	1.5									RPC	3/2505	1.2
Montefiore-Moses	1/1864	0.5	2/3158	0.6	0/3068	** 0.0			0/1901	0.0			1/3359	0.3			
Montefiore-Mt Vernon							0/ 531	0.0									
Montefiore-NewRochl							1/1335	0.7							L III	0/ 68	0.0
Montefiore-Wakefield							0/2346	0.0							L II-II	2/ 538	3.7
Mount St. Marys					0/ 363	0.0											
Mt Sinai	0/2302	0.0	4/3823	1.0	1/3225	0.3			1/3704	0.3	4/1648	2.4	5/2509	2.0	RPC	9/2684	^^ 3.5
Mt Sinai Beth Israel	1/ 615	1.6	0/1276	0.0	5/1825	2.7			2/2006	1.0			0/ 70	0.0	L II-II	0/ 174	0.0
Mt Sinai Brooklyn							0/1105	0.0									
Mt Sinai Queens							0/1213	0.0									
Mt Sinai St Lukes	0/ 712	0.0	0/1436	0.0	0/1410	0.0			0/ 565	0.0							
Mt Sinai West							0/ 905	0.0			0/ 127	0.0			L III	0/1171	0.0
NY Community Hosp							2/ 583	3.4									
NY Methodist	1/ 762	1.3	1/1787	0.6			6/4463	1.3					NA	NA	L III	2/1537	1.0
NYP-Allen							2/ 575	3.5									
NYP-Columbia	5/5459	0.9	12/8761	1.4	17/6234	^^ 2.7			1/3400	0.3	1/2945	0.3					
NYP-Hudson Valley							0/ 539	0.0							L II-II	NA	NA
NYP-Lawrence					2/1398	1.4											
NYP-Lower Manhattan							1/2594	0.4									
NYP-Morgan Stanley													14/6865	2.0	RPC	12/7313	1.8
NYP-Queens	1/ 989	1.0	0/ 847	0.0	1/1738	0.6			3/1412	2.1					L III	0/ 317	0.0
NYP-Weill Cornell	7/3708	1.9	2/4322	0.5	5/3443	1.5			3/2725	1.1	3/2042	1.5	2/2284	0.9	RPC	3/3110	1.1

Table 21. Central line-associated bloodstream infection rates by Intensive Care Unit, New York State 2015

	Coronary ICU		Cardiothoracic ICU		Medical ICU		Medical Surgical ICU		Surgical ICU		Neurosurgical ICU		Pediatric ICU		Neonatal ICU		
Hospital	CLABSI / CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI / CLDays	Rate	CLABSI / CLDays	Rate	CLABSI/ CLDays	Rate	NICU level	CLABSI/ CLDays	Adj rate
2015 State Average	1.05		0.81		1.25		0.97		1.09		0.90		1.55		1.05 (RPC); 1.35 (Lev 3); 1.75 (Lev 2/3)		
NYU Joint Diseases																	
NYU Langone Med Ctr			1/ 873	1.1	2/2467	0.8			4/2619	1.5	0/ 649	0.0	3/3146	1.0	RPC	1/2697	0.4
NYU Lutheran					2/1793	1.1			3/1953	1.5							
Nassau University	0/ 629	0.0			0/1402	0.0			0/ 540	0.0			NA	NA	L III	0/ 266	0.0
Nathan Littauer							0/ 233	0.0									
Newark Wayne					1/1297	0.8											
Niagara Falls							2/ 995	2.0									
North Central Bronx							1/ 398	2.5									
North Shore	1/1280	0.8	1/3710	0.3	1/2295	0.4			2/2403	0.8	0/1147	0.0			RPC	1/1972	0.5
Northern Dutchess							0/ 373	0.0									
Northern Westchester							0/ 943	0.0							L III	NA	NA
Noyes Memorial							0/ 211	0.0									
Nyack Hospital					0/ 878	0.0			2/ 823	2.4							
Olean General							0/1460	0.0									
Oneida Healthcare							0/ 213	0.0									
OrangeReg Goshen-Mid							4/3105	1.3									
Oswego Hospital					0/ 362	0.0											
Our Lady of Lourdes							1/ 944	1.1									
Peconic Bay Medical							0/ 602	0.0									
Phelps Memorial							1/ 643	1.6									
Plainview Hospital							1/1471	0.7									
Putnam Hospital							3/ 693	4.3									

Table 21. Central line-associated bloodstream infection rates by Intensive Care Unit, New York State 2015

	Coronary ICU		Cardiothoracic ICU		Medical ICU		Medical Surgical ICU		Surgical ICU		Neurosurgical ICU		Pediatric ICU		Neonatal ICU		
Hospital	CLABSI / CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI / CLDays	Rate	CLABSI / CLDays	Rate	CLABSI/ CLDays	Rate	NICU level	CLABSI/ CLDays	Adj rate
2015 State Average	1.05		0.81		1.25		0.97		1.09		0.90		1.55		1.05 (RPC); 1.35 (Lev 3); 1.75 (Lev 2/3)		
Queens Hospital					2/1534	1.3									L III	1/ 540	1.5
Richmond Univ MC	0/ 332	0.0			2/2480	0.8			3/1362	2.2			0/ 62	0.0	L III	4/1513	2.5
Rochester General			0/3475	0.0	5/3473	1.4			2/2375	0.8							
Rome Memorial							0/ 571	0.0									
SUNY Downstate MedCr	2/ 493	4.1	3/ 784	3.8			11/1673	^^ 6.6					3/ 124	^^24.2	RPC	2/1100	1.6
Samaritan- Troy							2/ 972	2.1									
Samaritan- Watertown							1/ 805	1.2									
Saratoga Hospital					0/1091	0.0											
Sisters of Charity							0/1318	0.0							L III	1/1151	0.9
Sisters- St Joseph							1/ 978	1.0									
South Nassau Comm.							3/4905	0.6									
Southampton					2/ 977	2.0											
Southside			1/1450	0.7			1/1689	0.6									
St Anthony							0/ 405	0.0									
St Barnabas					4/1123	3.6			3/ 771	3.9					L II-II	2/ 407	4.9
St Catherine Siena	0/1001	0.0					1/1216	0.8									
St Charles Hospital					2/1975	1.0											
St Elizabeth Medical			0/1530	0.0			2/2590	0.8									
St Francis- Roslyn			3/4929	0.6	6/2849	2.1			0/2382	0.0							
St James Mercy																	
St Johns Episcopal	1/ 848	1.2			3/1202	2.5											
St Johns Riverside							1/1159	0.9									

Table 21. Central line-associated bloodstream infection rates by Intensive Care Unit, New York State 2015

	Coronary ICU		Cardiothoracic ICU		Medical ICU		Medical Surgical ICU		Surgical ICU		Neurosurgical ICU		Pediatric ICU		Neonatal ICU		
Hospital	CLABSI / CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI / CLDays	Rate	CLABSI / CLDays	Rate	CLABSI/ CLDays	Rate	NICU level	CLABSI/ CLDays	Adj rate
2015 State Average	1.05		0.81		1.25		0.97		1.09		0.90		1.55		1.05 (RPC); 1.35 (Lev 3); 1.75 (Lev 2/3)		
St Joseph -Bethpage							5/1875	2.7									
St Josephs- Syracuse					10/4265	2.3			5/5074	1.0					L II-II	0/ 183	0.0
St Josephs- Yonkers							0/ 866	0.0									
St LukesNewburgh-Cor							1/1336	0.7									
St Marys Amsterdam							0/ 320	0.0									
St Marys Troy							1/ 841	1.2									
St Peters Hospital	1/1082	0.9	3/1907	1.6	5/3130	1.6									L III	0/ 494	0.0
Staten Island U N-S			0/1795	0.0			2/7385	0.3					0/ 80	0.0	L III	0/ 376	0.0
Strong Memorial			6/3119	1.9	1/3178	0.3			3/2765	1.1			5/3552	1.4	RPC	6/8100	0.8
Syosset Hospital							1/ 802	1.2									
UHS Bingham/Wilson	3/1604	1.9	3/1802	1.7			0/ 264	0.0							L II-II	1/ 146	6.8
UHS Chenango Memor							0/ 125	0.0									
United Memorial							0/ 271	0.0									
Unity Hosp Rochester							1/3129	0.3									
Univ Hosp SUNY Upst			0/2197	0.0	2/6355	** 0.3			4/3620	1.1	3/2954	1.0	2/1013	2.0			
Univ Hosp StonyBrook	0/ 858	0.0	3/2597	1.2	1/2855	0.4			1/1710	0.6			0/ 670	0.0	RPC	6/3257	1.9
Upst. Community Gen							0/ 948	0.0									
Vassar Brothers	0/1732	0.0	0/ 974	0.0			5/2084	2.4							L II-II	0/ 323	0.0
Westchester Medical	2/1071	1.9	3/3884	0.8	1/2336	0.4			2/1180	1.7	0/1847	0.0	4/1802	2.2	RPC	4/7105	0.5
White Plains Hosp							7/2690	^^ 2.6							L III	0/ 182	0.0
Winthrop University					6/2612	2.3			1/4630	0.2	1/1050	1.0	1/ 410	2.4	RPC	1/1134	0.9
Woman and Childrens													7/1721	^^ 4.1	RPC	1/4028	0.3

Table 21. Central line-associated bloodstream infection rates by Intensive Care Unit, New York State 2015

	Coronary ICU		Cardiothoracic ICU		Medical ICU		Medical Surgical ICU		Surgical ICU		Neurosurgical ICU		Pediatric ICU		Neonatal ICU		
Hospital	CLABSI / CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI / CLDays	Rate	CLABSI / CLDays	Rate	CLABSI/ CLDays	Rate	NICU level	CLABSI/ CLDays	Adj rate
2015 State Average	1.05		0.81		1.25		0.97		1.09		0.90		1.55		1.05 (RPC); 1.35 (Lev 3); 1.75 (Lev 2/3)		
Womans Christian					0/ 924	0.0											
Woodhull Med Ctr							3/1506	2.0							L II-II	1/ 312	3.2
Wyckoff Heights	5/1104	^^ 4.5					1/ 991	1.0							L III	1/ 394	2.6
Wyoming County Comm.							0/ 100	0.0									

Data reported as of August 01, 2016 ^^Significantly higher than state average. **Significantly lower than state average. Average.

NA: Hospitals with <50 central line days. Rates are per 1000 central line days (CLDAYS). Excludes Mucosal Barrier Injury (MBI)-CLABSIs.

Table 22. Central line-associated bloodstream infection rates by ward type, New York State 2015

	Medical Wards		Medical Surgical Wards		Surgical Wards		Step Down Units		Pediatric Wards	
Hospital	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate
2015 State Average	1.15		1.12		1.08		1.42		1.19	
AO Fox Memorial	0/ 505	0.0	2/ 867	2.3	NA	NA				
Adirondack Medical			0/ 656	0.0						
Albany Med Ctr	17/ 14828	1.1	1/ 1249	0.8	10/ 7764	1.3			2/ 3485	0.6
Albany Memorial	1/ 1119	0.9			0/ 615	0.0				
Alice Hyde Med Ctr			0/ 223	0.0						
Arnot Ogden Med Ctr			7/ 5767	1.2						
Auburn Memorial			0/ 1087	0.0	0/ 140	0.0				
Bellevue Hospital	5/ 3929	1.3	1/ 499	2.0	0/ 646	0.0			1/ 120	8.3
Bon Secours			0/ 523	0.0	NA	NA				
Bronx-Lebanon	13/ 4985	^^ 2.6	6/ 2920	2.1					0/ 73	0.0
Brookdale Hospital	2/ 684	2.9	7/ 2492	^^ 2.8	4/ 572	^^ 7.0	2/ 274	7.3		
Brookhaven Memorial			13/ 3513	^^ 3.7			7/ 2644	2.6		
Brooklyn Hosp Ctr	10/ 2987	^^ 3.3	6/ 958	^^ 6.3			4/ 1044	3.8	1/ 732	1.4
Brooks Memorial			0/ 172	0.0						
Buffalo General	5/ 2440	2.0	2/ 3755	0.5	6/ 2048	2.9	13/ 5378	2.4		
Canton-Potsdam			2/ 1380	1.4						
Catskill Regional			0/ 468	0.0	1/ 314	3.2				
Cayuga Medical Ctr			1/ 2287	0.4						
Champlain Valley			2/ 5234	0.4			2/ 3246	0.6		
Claxton-Hepburn			2/ 1358	1.5						
Clifton Springs			1/ 1138	0.9						
Cobleskill Regional	0/ 58	0.0								

Table 22. Central line-associated bloodstream infection rates by ward type, New York State 2015

	Medical Wards		Medical Surgical Wards		Surgical Wards		Step Down Units		Pediatric Wards	
Hospital	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate
2015 State Average	1.15		1.12		1.08		1.42		1.19	
Columbia Memorial	2/ 291	6.9	1/ 1008	1.0						
Coney Island Hosp	13/ 6868	1.9	0/ 401	0.0	0/ 1600	0.0	0/ 335	0.0		
Corning Hospital	0/ 486	0.0			0/ 458	0.0				
Cortland Reg Med	0/ 132	0.0	0/ 723	0.0						
Crouse Hospital			9/ 12280	0.7						
DeGraff Memorial			0/ 605	0.0						
East. Niag. Lockport			1/ 485	2.1						
Eastern Long Island			0/ 172	0.0						
Ellis Hospital	0/ 3914	** 0.0			0/ 946	0.0	0/ 429	0.0		
Elmhurst Hospital	2/ 2492	0.8	4/ 1875	2.1	3/ 1945	1.5			NA	NA
Erie County Med Ctr	1/ 552	1.8	13/ 11135	1.2						
FF Thompson			1/ 1811	0.6						
Faxton St. Lukes			5/ 4179	1.2	0/ 1394	0.0	2/ 1203	1.7	NA	NA
Flushing Hospital			10/ 3589	^^ 2.8					NA	NA
Geneva General	0/ 756	0.0	0/ 722	0.0						
Glen Cove Hospital			0/ 382	0.0						
Glens Falls Hospital	0/ 2128	0.0	0/ 1473	0.0	0/ 858	0.0			NA	NA
Good Samar. Suffern			11/ 3419	^^ 3.2			8/ 1582	^^ 5.1		
Good Samar. W Islip	9/ 7054	1.3			3/ 2466	1.2			0/ 96	0.0
Harlem Hospital	5/ 1549	3.2			2/ 951	2.1			NA	NA
HealthAlli Broadway	0/ 2682	** 0.0	0/ 695	0.0	0/ 703	0.0				
HealthAlli MarysAve					0/ 450	0.0				

Table 22. Central line-associated bloodstream infection rates by ward type, New York State 2015

	Medical Wards		Medical Surgical Wards		Surgical Wards		Step Down Units		Pediatric Wards	
Hospital	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate
2015 State Average	1.15		1.12		1.08		1.42		1.19	
Highland Hospital	5/ 8667	0.6	0/ 2721	** 0.0	0/ 1878	0.0				
Hosp for Spec Surg			1/ 1987	0.5			0/ 339	0.0	0/ 70	0.0
Huntington Hospital	2/ 1059	1.9	1/ 842	1.2	0/ 315	0.0				
Interfaith Med Ctr			2/ 1023	2.0						
JT Mather Hospital			2/ 2913	0.7	0/ 1311	0.0	0/ 402	0.0		
Jacobi Med Ctr	1/ 1010	1.0	0/ 903	0.0	0/ 219	0.0	1/ 175	5.7	0/ 53	0.0
Jamaica Hospital			2/ 3682	0.5	1/ 526	1.9	0/ 1138	0.0		NA
Jones Memorial			0/ 808	0.0						
Kenmore Mercy			2/ 1547	1.3	0/ 409	0.0				
Kings County Hosp	7/ 2636	2.7	5/ 2868	1.7	0/ 858	0.0				
Kingsbrook Jewish MC	6/ 2038	2.9	1/ 742	1.3						
LIJ at Forest Hills	2/ 2245	0.9			2/ 422	4.7				
LIJ at Valley Stream			0/ 2246	0.0		NA				
Lenox Hill Hospital	5/ 2956	1.7	0/ 1315	0.0	0/ 329	0.0	1/ 1127	0.9		
Lincoln Med Ctr	0/ 1931	0.0			3/ 1411	2.1	8/ 2429	3.3		
Long Isl Jewish(LIJ)	6/ 5388	1.1	3/ 2151	1.4	2/ 2364	0.8			1/ 1520	0.7
Maimonides Med Ctr	16/ 7785	^^ 2.1					0/ 1727	0.0	2/ 736	2.7
Mary Imogene Bassett	0/ 1628	0.0	0/ 174	0.0	0/ 1276	0.0	0/ 727	0.0		
Massena Memorial			0/ 133	0.0				NA		
Mercy Hosp Buffalo			3/ 4236	0.7	4/ 1639	2.4				
Mercy Med Ctr	3/ 1212	2.5	0/ 611	0.0			2/ 866	2.3		
Metropolitan Hosp	1/ 455	2.2			0/ 339	0.0				

Table 22. Central line-associated bloodstream infection rates by ward type, New York State 2015

	Medical Wards		Medical Surgical Wards		Surgical Wards		Step Down Units		Pediatric Wards	
Hospital	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate
2015 State Average	1.15		1.12		1.08		1.42		1.19	
MidHudson Reg WMC			1/ 2169	0.5			1/ 1173	0.9		
Millard Fill. Suburb			16/ 8115	^^ 2.0						
Montefiore-Einstein	13/ 6961	1.9			0/ 1760	0.0				
Montefiore-Moses	19/ 15613	1.2	2/ 716	2.8	4/ 2884	1.4			11/ 6503	1.7
Montefiore-Mt Vernon			1/ 631	1.6			0/ 257	0.0		
Montefiore-NewRochl			0/ 723	0.0	1/ 313	3.2	1/ 589	1.7		
Montefiore-Wakefield	3/ 3522	0.9	0/ 501	0.0						
Mount St. Marys			0/ 1869	0.0						
Mt Sinai	14/ 9902	1.4	9/ 9905	0.9	2/ 2842	0.7	4/ 4178	1.0	1/ 1676	0.6
Mt Sinai Beth Israel	0/ 5951	** 0.0	2/ 1269	1.6	0/ 1047	0.0	2/ 1610	1.2	NA	NA
Mt Sinai Brooklyn	1/ 1136	0.9	2/ 2539	0.8						
Mt Sinai Queens			2/ 1732	1.2						
Mt Sinai St Lukes	3/ 2451	1.2	0/ 420	0.0	1/ 627	1.6				
Mt Sinai West			4/ 2659	1.5						
NY Community Hosp			1/ 203	4.9			1/ 497	2.0		
NY Methodist	3/ 2836	1.1	10/ 4936	2.0	3/ 1099	2.7				
NYP-Allen	0/ 1173	0.0	0/ 347	0.0						
NYP-Columbia	21/ 10066	^^ 2.1	10/ 8687	1.2	5/ 3178	1.6				
NYP-Hudson Valley			0/ 906	0.0			0/ 292	0.0		
NYP-Lawrence			5/ 3763	1.3					NA	NA
NYP-Lower Manhattan			0/ 1441	0.0						
NYP-Morgan Stanley									2/ 2706	0.7

Table 22. Central line-associated bloodstream infection rates by ward type, New York State 2015

	Medical Wards		Medical Surgical Wards		Surgical Wards		Step Down Units		Pediatric Wards	
Hospital	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate
2015 State Average	1.15		1.12		1.08		1.42		1.19	
NYP-Queens	16/ 6630	^^ 2.4			2/ 1082	1.8	0/ 253	0.0	NA	NA
NYP-Weill Cornell	5/ 4891	1.0	25/ 13364	^^ 1.9	6/ 3936	1.5			1/ 2546	0.4
NYU Joint Diseases			0/ 76	0.0			0/ 231	0.0		
NYU Langone Med Ctr	9/ 4545	2.0			3/ 4693	0.6	2/ 3038	0.7	3/ 2075	1.4
NYU Lutheran	1/ 1667	0.6	2/ 1056	1.9	3/ 1698	1.8	4/ 2168	1.8		
Nassau University	0/ 2004	0.0	0/ 167	0.0					NA	NA
Nathan Littauer			0/ 357	0.0					NA	NA
Niagara Falls					1/ 916	1.1	0/ 966	0.0		
North Central Bronx	1/ 743	1.3	0/ 69	0.0						
North Shore	3/ 5541	0.5	1/ 2163	0.5	1/ 4171	0.2				
Northern Dutchess			2/ 732	2.7						
Northern Westchester	2/ 2282	0.9			0/ 262	0.0	NA	NA	NA	NA
Noyes Memorial	0/ 250	0.0								
Nyack Hospital			1/ 1642	0.6			2/ 835	2.4	0/ 268	0.0
Olean General	1/ 869	1.2	4/ 947	^^ 4.2	0/ 433	0.0				
Oneida Healthcare			0/ 648	0.0						
OrangeReg Goshen-Mid	5/ 6512	0.8	3/ 1478	2.0						
Oswego Hospital			0/ 1216	0.0						
Our Lady of Lourdes	3/ 3405	0.9	0/ 305	0.0	1/ 1160	0.9	0/ 329	0.0		
Peconic Bay Medical			3/ 919	3.3						
Phelps Memorial	1/ 1413	0.7	0/ 564	0.0						
Plainview Hospital	2/ 1552	1.3			0/ 432	0.0				

Table 22. Central line-associated bloodstream infection rates by ward type, New York State 2015

	Medical Wards		Medical Surgical Wards		Surgical Wards		Step Down Units		Pediatric Wards	
Hospital	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate
2015 State Average	1.15		1.12		1.08		1.42		1.19	
Putnam Hospital			1/ 1091	0.9						
Queens Hospital	1/ 1441	0.7	3/ 706	4.2	0/ 342	0.0	0/ 280	0.0		
Richmond Univ MC	5/ 2953	1.7			0/ 577	0.0				
Rochester General	5/ 6179	0.8	5/ 4832	1.0	13/ 3782	^^ 3.4				
Rome Memorial	0/ 250	0.0					1/ 486	2.1		
SUNY Downstate MedCr	10/ 2146	^^ 4.7	6/ 3396	1.8			7/ 1342	^^ 5.2	0/ 247	0.0
Samaritan- Troy			1/ 3814	0.3						
Samaritan- Watertown			5/ 3116	1.6						
Saratoga Hospital	1/ 4717	0.2			0/ 116	0.0				
Sisters of Charity			4/ 3080	1.3	1/ 1904	0.5				
Sisters- St Joseph			1/ 2343	0.4	1/ 678	1.5				
South Nassau Comm.	0/ 3921	** 0.0	2/ 6436	** 0.3			1/ 1073	0.9	NA	NA
Southampton			0/ 564	0.0					2/ 680	2.9
Southside	0/ 409	0.0	5/ 2298	2.2			0/ 256	0.0		
St Anthony			1/ 617	1.6						
St Barnabas			3/ 1989	1.5			0/ 355	0.0		
St Catherine Siena	3/ 3260	0.9			1/ 340	2.9				
St Charles Hospital			4/ 1793	2.2						
St Elizabeth Medical			1/ 2687	0.4			1/ 2067	0.5		
St Francis- Roslyn			5/ 6886	0.7			0/ 1099	0.0		
St James Mercy			0/ 258	0.0						
St Johns Episcopal			8/ 3275	2.4						

Table 22. Central line-associated bloodstream infection rates by ward type, New York State 2015

	Medical Wards		Medical Surgical Wards		Surgical Wards		Step Down Units		Pediatric Wards	
Hospital	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate
2015 State Average	1.15		1.12		1.08		1.42		1.19	
St Johns Riverside	1/ 2712	0.4	0/ 431	0.0						
St Joseph -Bethpage			1/ 1227	0.8			0/ 345	0.0		
St Josephs- Elmira	0/ 235	0.0								
St Josephs- Syracuse			26/ 18128	1.4						
St Josephs- Yonkers			2/ 1054	1.9			0/ 314	0.0		
St LukesNewburgh-Cor			0/ 1939	0.0						
St Marys Amsterdam	0/ 258	0.0	0/ 729	0.0	0/ 838	0.0	0/ 227	0.0		
St Marys Troy	0/ 527	0.0	0/ 177	0.0			2/ 503	4.0		
St Peters Hospital	10/ 11242	0.9	2/ 7064	** 0.3			0/ 2857	** 0.0		
Staten Island U N-S			5/ 6348	0.8	2/ 2732	0.7			0/ 109	0.0
Strong Memorial	4/ 10098	** 0.4	1/ 1599	0.6	3/ 3917	0.8	4/ 6095	0.7	6/ 3863	1.6
Sunnyview Rehab Hosp			0/ 198	0.0						
Syosset Hospital	0/ 322	0.0			NA	NA				
UHS Bingham/Wilson			2/ 8324	** 0.2	NA	NA				
UHS Chenango Memor			1/ 168	6.0						
United Memorial	0/ 556	0.0			NA	NA				
Unity Hosp Rochester			5/ 10280	0.5						
Univ Hosp SUNY Upst	7/ 9409	0.7			5/ 4181	1.2	1/ 1289	0.8	2/ 1019	2.0
Univ Hosp StonyBrook	3/ 3177	0.9			8/ 8312	1.0	0/ 677	0.0	0/ 688	0.0
Upst. Community Gen	0/ 705	0.0	0/ 855	0.0						
Vassar Brothers	1/ 3456	0.3			3/ 4094	0.7	0/ 1079	0.0	0/ 63	0.0
Westchester Medical	2/ 2544	0.8	2/ 3755	0.5	1/ 1998	0.5	10/ 4927	2.0	3/ 3162	0.9

Table 22. Central line-associated bloodstream infection rates by ward type, New York State 2015

	Medical Wards		Medical Surgical Wards		Surgical Wards		Step Down Units		Pediatric Wards	
Hospital	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate
2015 State Average	1.15		1.12		1.08		1.42		1.19	
White Plains Hosp			4/ 4817	0.8			1/ 2900	0.3		
Winthrop University	7/ 9717	0.7	1/ 1498	0.7	1/ 1027	1.0			0/ 618	0.0
Woman and Childrens	3/ 1209	2.5							3/ 933	3.2
Womans Christian	0/ 1245	0.0	0/ 1074	0.0						
Woodhull Med Ctr			7/ 2624	2.7	0/ 389	0.0	6/ 1255	^^ 4.8		
Wyckoff Heights			7/ 3882	1.8						
Wyoming County Comm.			0/ 574	0.0						

Data reported as of August 01, 2016 ^^Significantly higher than state average. **Significantly lower than state average. Average.

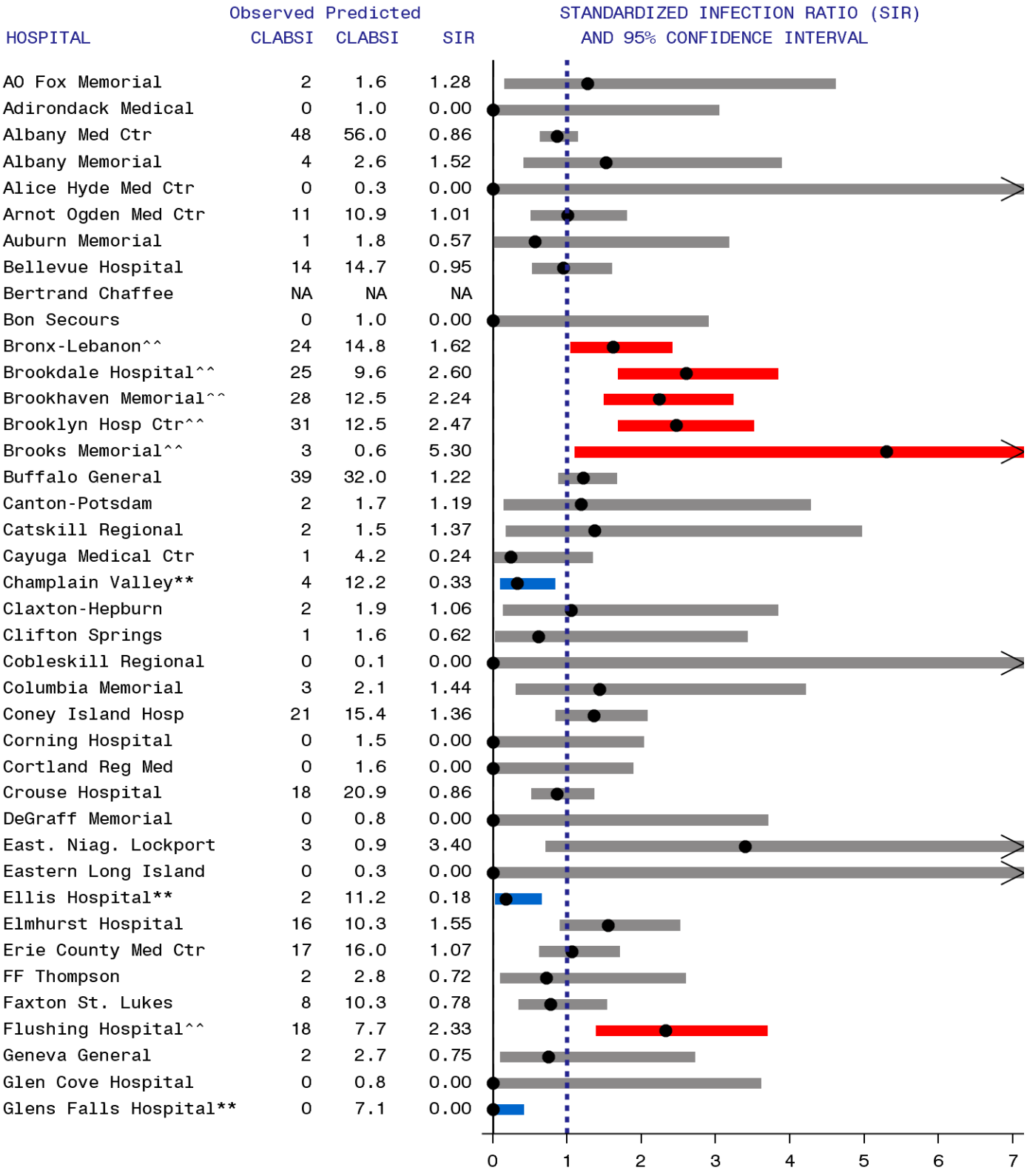
NA: Hospitals with <50 central line days. Rates are per 1000 central line days (CLDAYS). Excludes Mucosal Barrier Injury (MBI)-CLABSIs.

Hospital-Specific, CLABSI Standardized Infection Ratios

Figure 12 provides hospital-specific CLABSI SIRs for each hospital. Between 2008 and 2012, NYS hospital-specific comparisons excluded bloodstream events in which multiple blood cultures were obtained, only one blood specimen was positive for a single pathogen, and no treatment was given. In 2013, NYSDOH no longer deleted these contaminants to be more consistent with national reports. Beginning in 2014, NYSDOH deleted MBIs.

CLABSI SIRs combine results across the eight different types of ICUs and five types of wards to show the average performance of each hospital for CLABSIs. Ward data was included for the first time in 2015. Fourteen hospitals (9%) had high SIR flags in 2015; one was high for three consecutive years. Thirteen (8%) had low SIR flags.

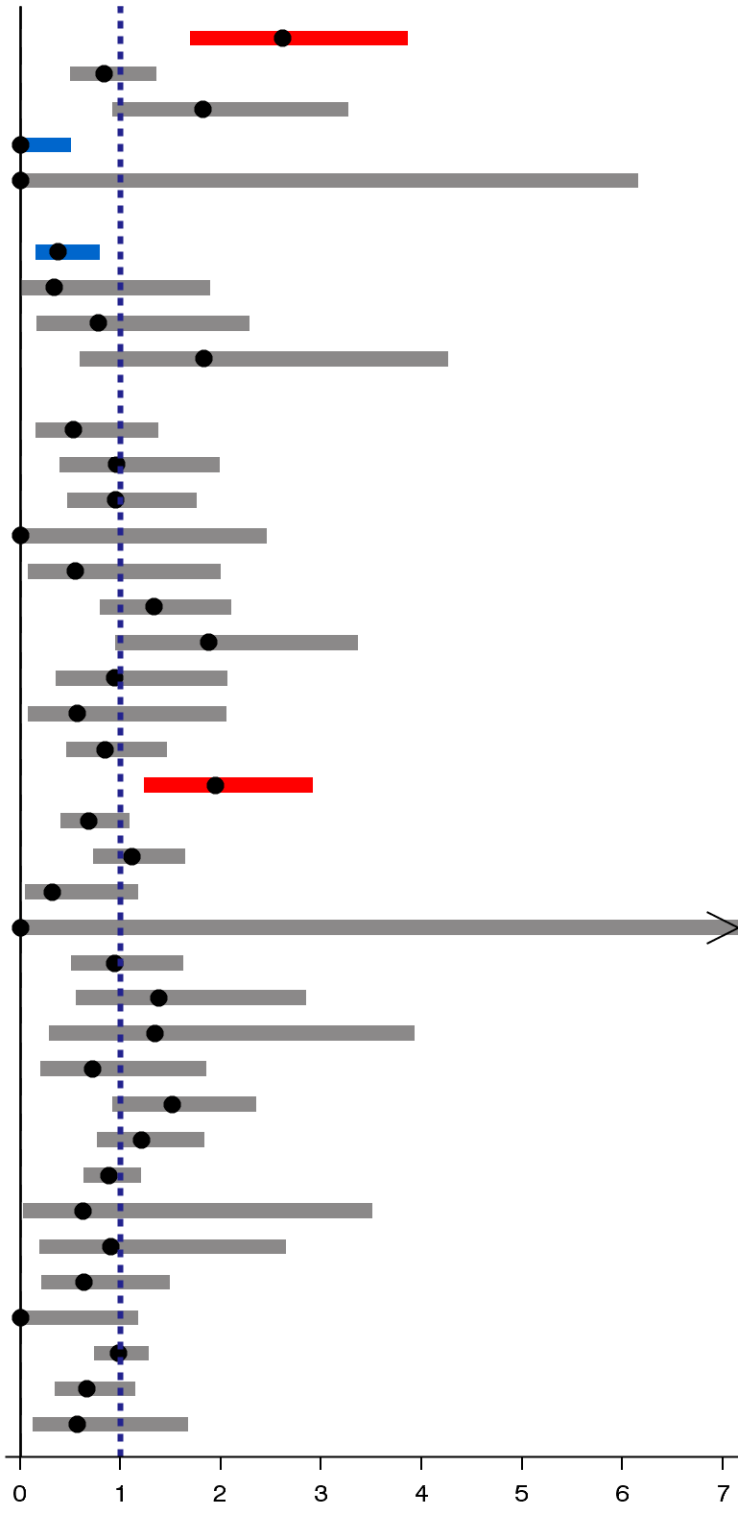
Figure 12. Central Line-Associated Bloodstream Infection Standardized Infection Ratios for Intensive Care Units and Medical/Surgical/Stepdown Wards: New York 2015 (page 1 of 5)



Data reported as of August 01, 2016. State Average. ●SIR. —^^Significantly higher than state average. —**Significantly lower than state average. —Average. > Upper confidence limit exceeds graph area. NA: less than 50 central line days. Predicted based on NYS 2015 average, adjusting for location and birthweight. Excludes mucosal barrier injury CLABSI.

Figure 12. Central Line-Associated Bloodstream Infection Standardized Infection Ratios for Intensive Care Units and Medical/Surgical/Stepdown Wards: New York 2015 (page 2 of 5)

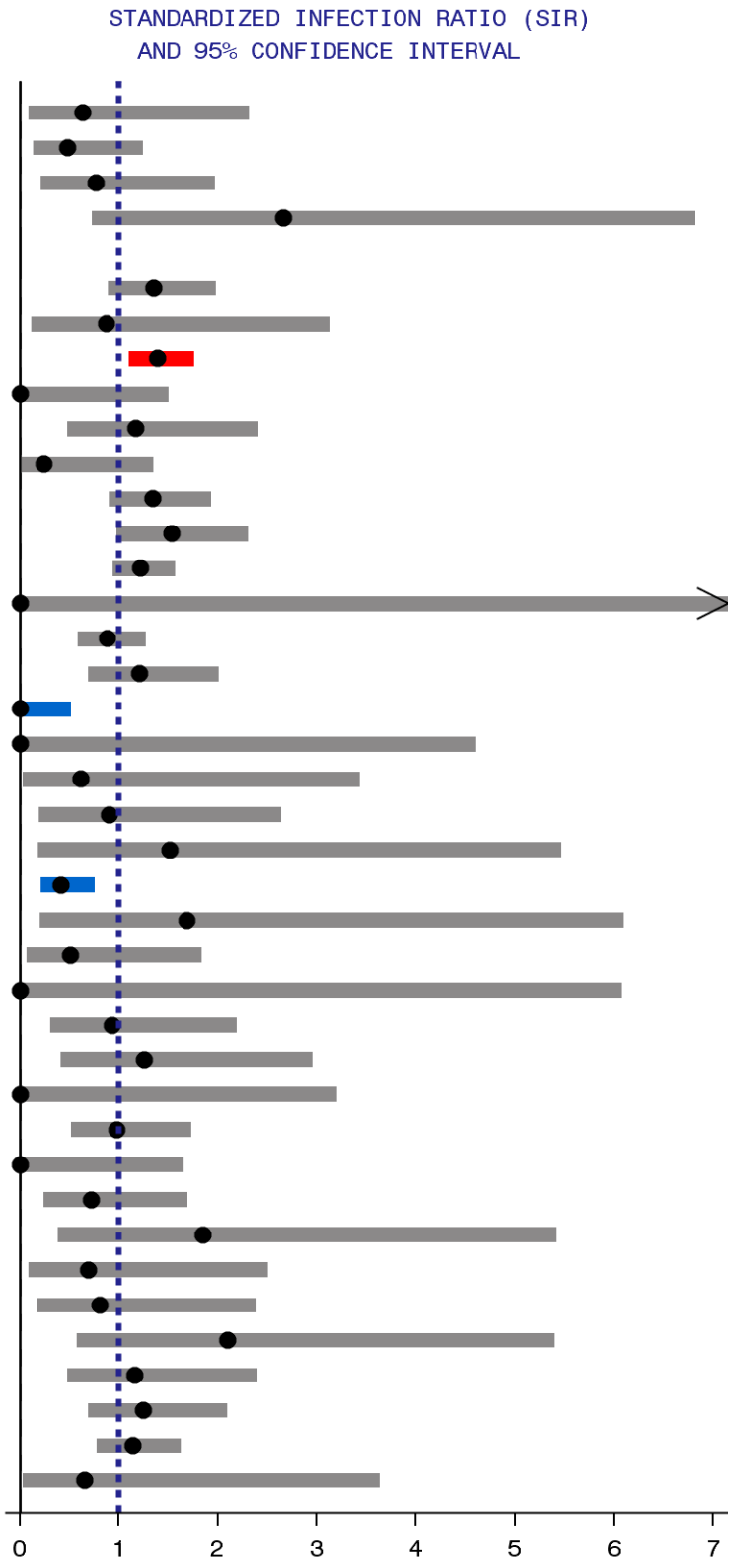
HOSPITAL	Observed CLABSI	Predicted CLABSI	SIR
Good Samar. Suffern^^	25	9.6	2.61
Good Samar. W Islip	17	20.2	0.84
Harlem Hospital	11	6.0	1.82
HealthAlli Broadway**	0	6.0	0.00
HealthAlli MarysAve	0	0.5	0.00
Helen Hayes Hospital	NA	NA	NA
Highland Hospital**	7	18.2	0.38
Hosp for Spec Surg	1	2.9	0.34
Huntington Hospital	3	3.8	0.78
Interfaith Med Ctr	5	2.7	1.83
Ira Davenport	NA	NA	NA
JT Mather Hospital	4	7.5	0.53
Jacobi Med Ctr	7	7.3	0.96
Jamaica Hospital	10	10.5	0.95
Jones Memorial	0	1.2	0.00
Kenmore Mercy	2	3.6	0.55
Kings County Hosp	18	13.6	1.33
Kingsbrook Jewish MC	11	5.9	1.88
LIJ at Forest Hills	6	6.4	0.94
LIJ at Valley Stream	2	3.5	0.57
Lenox Hill Hospital	13	15.3	0.85
Lincoln Med Ctr^^	23	11.9	1.94
Long Isl Jewish(LIJ)	18	26.4	0.68
Maimonides Med Ctr	25	22.4	1.11
Mary Imogene Bassett	2	6.2	0.32
Massena Memorial	0	0.2	0.00
Mercy Hosp Buffalo	13	13.8	0.94
Mercy Med Ctr	7	5.1	1.38
Metropolitan Hosp	3	2.2	1.34
MidHudson Reg of WMC	4	5.5	0.72
Millard Fill. Suburb	19	12.6	1.51
Montefiore-Einstein	22	18.2	1.21
Montefiore-Moses	40	45.3	0.88
Montefiore-Mt Vernon	1	1.6	0.63
Montefiore-NewRochl	3	3.3	0.90
Montefiore-Wakefield	5	7.9	0.64
Mount St. Marys	0	2.6	0.00
Mt Sinai	54	55.2	0.98
Mt Sinai Beth Israel	12	18.3	0.66
Mt Sinai Brooklyn	3	5.2	0.57



Data reported as of August 01, 2016. ┆State Average. ●SIR. —^^Significantly higher than state average. —**Significantly lower than state average. —Average. > Upper confidence limit exceeds graph area. NA: less than 50 central line days. Predicted based on NYS 2015 average, adjusting for location and birthweight. Excludes mucosal barrier injury CLABSI.

Figure 12. Central Line-Associated Bloodstream Infection Standardized Infection Ratios for Intensive Care Units and Medical/Surgical/Stepdown Wards: New York 2015 (page 3 of 5)

HOSPITAL	Observed CLABSI	Predicted CLABSI	SIR
Mt Sinai Queens	2	3.1	0.64
Mt Sinai St Lukes	4	8.3	0.48
Mt Sinai West	4	5.2	0.77
NY Community Hosp	4	1.5	2.66
NY Eye&Ear Mt Sinai	NA	NA	NA
NY Methodist	26	19.3	1.35
NYP-Allen	2	2.3	0.87
NYP-Columbia^^	72	51.8	1.39
NYP-Hudson Valley	0	2.0	0.00
NYP-Lawrence	7	6.0	1.17
NYP-Lower Manhattan	1	4.1	0.24
NYP-Morgan Stanley	28	20.9	1.34
NYP-Queens	23	15.0	1.53
NYP-Weill Cornell	62	50.9	1.22
NYU Joint Diseases	0	0.4	0.00
NYU Langone Med Ctr	28	31.8	0.88
NYU Lutheran	15	12.4	1.21
Nassau University**	0	5.9	0.00
Nathan Littauer	0	0.7	0.00
Newark Wayne	1	1.6	0.62
Niagara Falls	3	3.3	0.90
North Central Bronx	2	1.3	1.51
North Shore**	11	26.1	0.42
Northern Dutchess	2	1.2	1.69
Northern Westchester	2	4.0	0.51
Noyes Memorial	0	0.5	0.00
Nyack Hospital	5	5.3	0.93
Olean General	5	4.0	1.26
Oneida Healthcare	0	0.9	0.00
OrangeReg Goshen-Mid	12	12.2	0.98
Oswego Hospital	0	1.8	0.00
Our Lady of Lourdes	5	6.9	0.72
Peconic Bay Medical	3	1.6	1.85
Phelps Memorial	2	2.9	0.69
Plainview Hospital	3	3.7	0.81
Putnam Hospital	4	1.9	2.10
Queens Hospital	7	6.0	1.16
Richmond Univ MC	14	11.2	1.25
Rochester General	30	26.4	1.14
Rome Memorial	1	1.5	0.65



Data reported as of August 01, 2016. State Average. ●SIR. —^^Significantly higher than state average.
—**Significantly lower than state average. —Average. > Upper confidence limit exceeds graph area. NA: less than 50 central line days.
Predicted based on NYS 2015 average, adjusting for location and birthweight. Excludes mucosal barrier injury CLABSI.

Figure 12. Central Line-Associated Bloodstream Infection Standardized Infection Ratios for Intensive Care Units and Medical/Surgical/Stepdown Wards: New York 2015 (page 4 of 5)

HOSPITAL	Observed CLABSI	Predicted CLABSI	SIR
SUNY Downstate MedCr^^	44	12.8	3.43
Samaritan- Troy	3	5.2	0.57
Samaritan- Watertown	6	4.3	1.40
Saratoga Hospital**	1	6.9	0.14
Sisters of Charity	6	8.3	0.72
Sisters- St Joseph	3	4.3	0.70
South Nassau Comm.**	6	18.1	0.33
Southampton	4	2.7	1.50
Southside	7	6.2	1.12
St Anthony	1	1.1	0.92
St Barnabas^^	12	5.7	2.11
St Catherine Siena	5	6.4	0.79
St Charles Hospital	6	4.5	1.34
St Elizabeth Medical	4	9.7	0.41
St Francis- Roslyn	14	19.4	0.72
St James Mercy	0	0.3	0.00
St Johns Episcopal^^	12	6.1	1.98
St Johns Riverside	2	4.7	0.42
St Joseph -Bethpage	6	3.7	1.62
St Josephs- Elmira	0	0.3	0.00
St Josephs- Syracuse	41	31.6	1.30
St Josephs- Yonkers	2	2.5	0.81
St LukesNewburgh-Cor	1	3.5	0.29
St Marys Amsterdam	0	2.7	0.00
St Marys Troy	3	2.3	1.28
St Peters Hospital	21	32.1	0.66
Staten Island U N-S**	9	19.4	0.46
Strong Memorial**	39	53.8	0.72
Sunnyview Rehab Hosp	0	0.2	0.00
Syosset Hospital	1	1.2	0.85
UHS Bingham/Wilson	9	13.0	0.69
UHS Chenango Memor	1	0.3	3.22
United Memorial	0	1.0	0.00
Unity Hosp Rochester**	6	14.6	0.41
Univ Hosp SUNY Upst	26	36.3	0.72
Univ Hosp StonyBrook	22	27.2	0.81
Upst. Community Gen	0	2.7	0.00
Vassar Brothers	9	15.2	0.59
Westchester Medical	34	41.5	0.82
White Plains Hosp	12	12.3	0.97

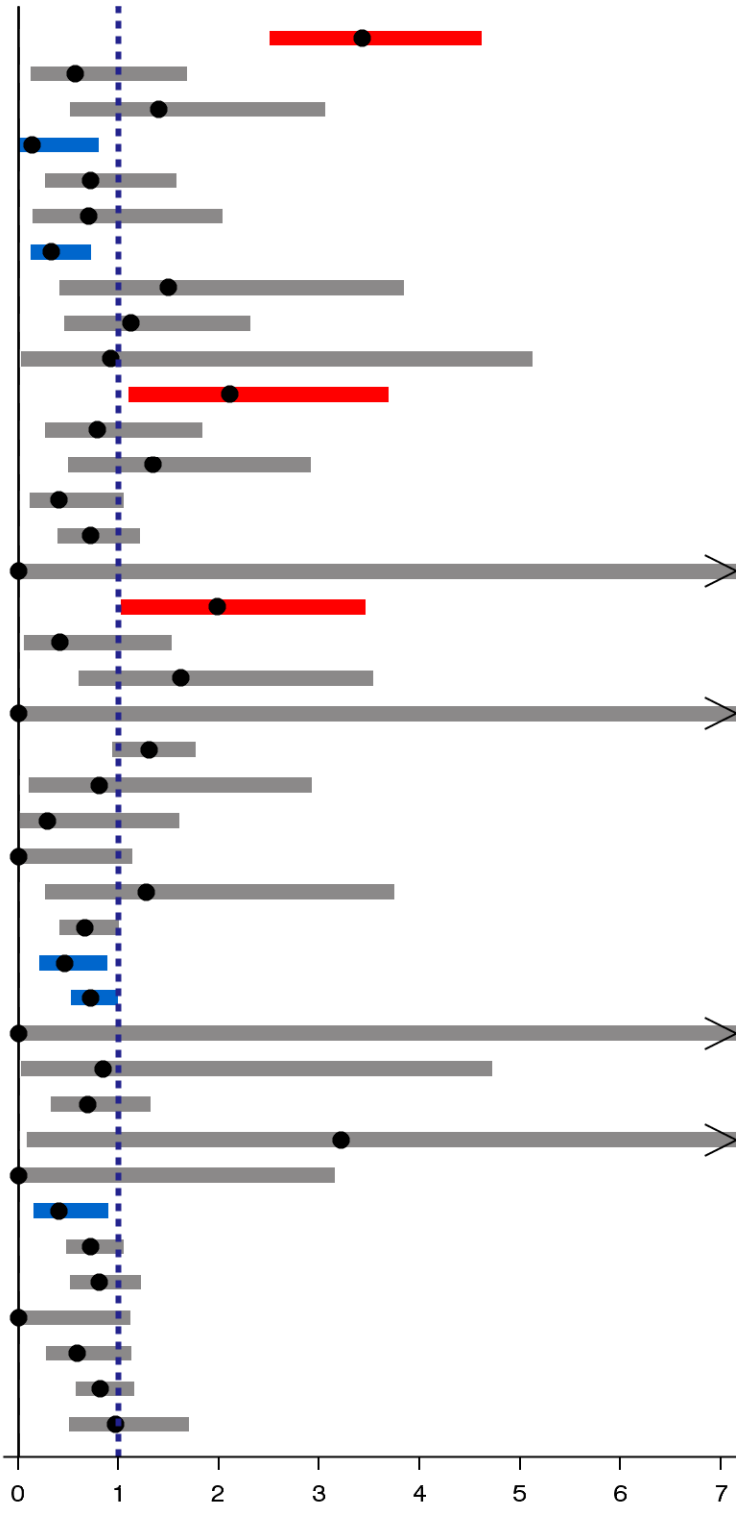


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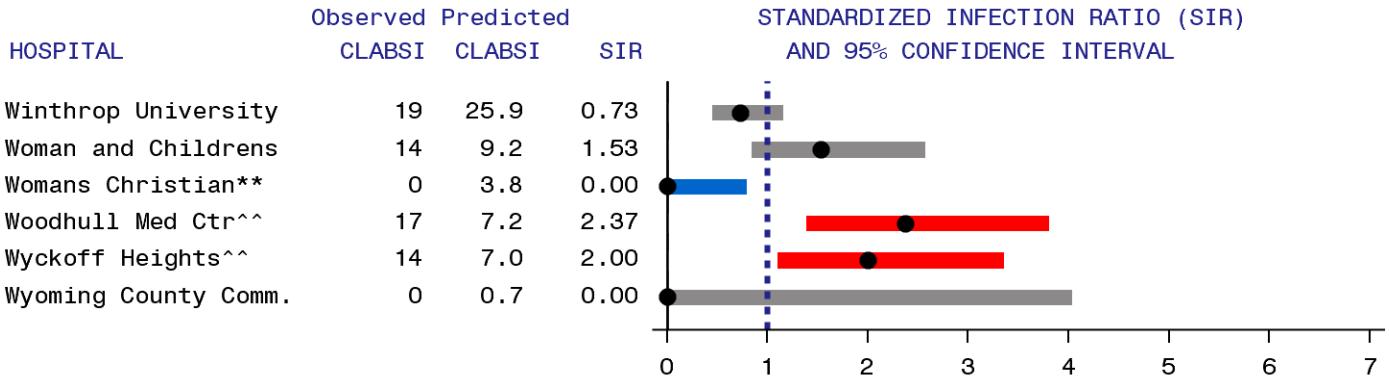
Figure 12. Central Line-Associated Bloodstream Infection Standardized Infection Ratios for Intensive Care Units and Medical/Surgical/Stepdown Wards: New York 2015 (page 5 of 5)



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Time Trends for Intensive Care Unit CLABSIs

The major changes in the CLABSI surveillance protocol over time are summarized in Table 23.

Table 23: CLABSI definition changes

Year	Description
2007	CDC defines a CLABSI as recovery of a pathogen from a blood culture (a single blood culture for organisms not commonly present on the skin and two or more blood cultures for organisms commonly present on the skin) in a patient who had a central line at the time of infection or within the 48-hour period before development of infection. The infection cannot be related to any other infection the patient might have and must not have been present or incubating when the patient was admitted to the facility. • Identified only during the original hospitalization in an 'inpatient location'. • CLABSIs that occur within 48 hours of admission to an ICU but the central line (CL) was inserted in a non-inpatient location are to be reported in NHSN as ICU associated CLABSIs.
2008	• Revised laboratory-confirmed bloodstream infection (LCBI) definition: no longer includes criteria "common skin contaminant is cultured from at least one blood culture from a patient with an intravascular line, and the physician institutes appropriate antimicrobial therapy". • NYS specific instruction: NYS hospitals use a custom field to track contaminants (multiple blood cultures were obtained, only one blood specimen was positive for a single pathogen, and no treatment was given).
2009	No significant changes.
2010	No significant changes.
2011	• Culture results obtained from multiple lumens of the same central catheter may be used as documentation of LCBI criterion 2 (two or more blood cultures drawn on separate occasions). • Antibiograms of the blood and primary site isolates do not have to match exactly.
2012	A CLABSI could be reportable if it occurred the same day as the central line insertion, on day of admission, and within 48 hours of removal. The location of attribution was the inpatient location assigned on the date of the first clinical evidence or the date of the specimen collection used to meet BSI criteria. • Inclusion of Secondary Bloodstream Infection Guide • Addition of Hemodialysis Reliable Outflow dialysis catheter as possible central line. • Removal of requirement for counting umbilical line catheters separately as a denominator for NICU locations.
2013	Significant changes to method of defining HAIs, which NYS estimated to reduce CLABSI rates by 16%. To be considered a CLABSI, the CL must be in place more than 2 calendar days on the date of event, and the CL must be in place on the date of event or the day before. • New "2-day calendar" rules and definitions added for the determination of healthcare-associated infection, device-associated infection, location of attribution, and transfer rule. • LCBI 2 and 3 criteria change - Common commensals: Blood cultures must be collected on the same or consecutive calendar days • Date of Event: For an HAI the date of event is the date when the last element used to meet the CDC/NHSN site-specific infection criterion occurred. • New criteria added for the optional specification of Mucosal Barrier Injury (MBI) • NHSN Organisms Lists updated and new lists added (i.e., uropathogens and organisms for mucosal barrier injury reporting)

	• New Oncology locations added to NHSN for use by cancer hospitals as well as general acute care facilities. • CMS requires applicable cancer hospitals to report CLABSIs to NHSN as part of PCHQR program. New York State has two cancer hospitals. These hospitals report CLABSIs separately by line type, i.e. temporary or permanent line, and are no longer included in hospital comparisons.
2014	• Reporting of Mucosal Barrier Injury-Laboratory Confirmed BSI events is required • Definition of neutropenia expanded to include the 3 calendar days after the positive blood culture – total 7 day time frame: o Includes date of +BC o 3 calendar days before o 3 calendar days after • Date admitted to facility: Added instructions to record previous admission date when patient admitted with LCBI attributed to previous admission.
2015	Significant changes to method of defining HAIs: • Date of Event: the date that the first element used to meet the infection criterion occurs for the first time within the infection window period. • NHSN Infection Window Period: 3 days before diagnostic test, day of test, 3 days after for a total of 7 days. • Repeat Infection Timeframe: 14 day period during which repeat infections of the same type will not be reported. • Secondary Bloodstream Infection Attribution Period: Time period during which a BSI can be attributed as secondary to another site. • Core temperatures no longer required to document infant fevers. • Changes in 2015 CAUTI definition (i.e., urine cultures that are positive only for yeast have been excluded) may lead to an increase in the number of CLABSIs, as such events would no longer be considered secondary to CAUTIs previously identified.

Because trends in HAI rates are of interest to readers of this report, trends in raw rates are shown in Figures 13 and 14 for informational purposes only. These plots cannot be used to assess improvement in HAI rates over time due to the definition changes.

Figure 13. Trend in central line-associated bloodstream infection rates in adult and pediatric intensive care units, New York State 2007-2015

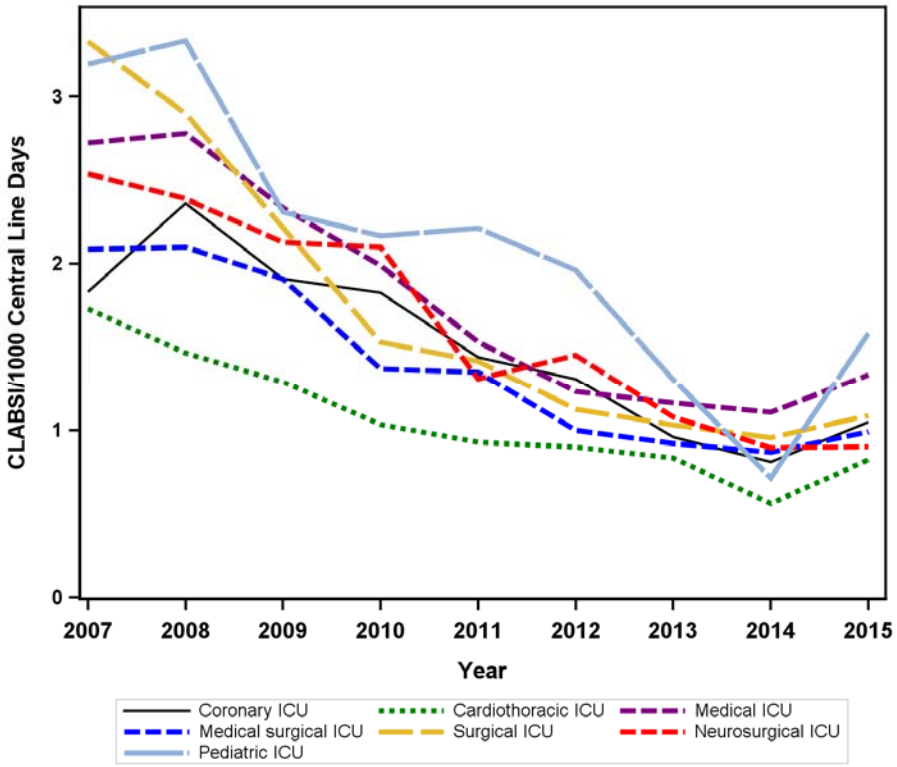
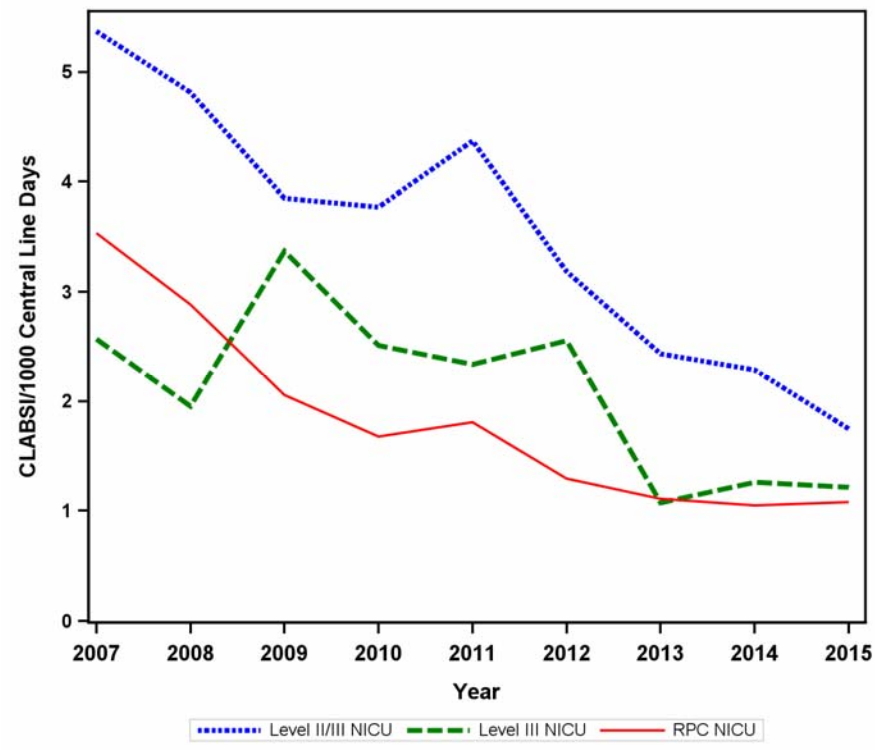


Figure 14. Trend in central line-associated bloodstream infection rates in neonatal intensive care units, New York State 2007-2015



Catheter-Associated Urinary Tract Infections (CAUTIs)

In order to determine if a patient has a healthcare-associated CAUTI, the CDC developed surveillance definitions based on catheter usage, symptoms, and laboratory results. These definitions are used by all facilities entering data into NHSN. Hospitals track the number of CAUTIs, the number of urinary catheter days, and the number of patient days per month.

The CMS IQR Program required CAUTI reporting in adult and pediatric ICUs and inpatient rehabilitation facilities starting in January 2012. CMS expanded the IQR program to include medical, surgical, and medical-surgical wards in January 2015. While CAUTI reporting is not required by NYSDOH, the data are available via the CDC-NYS DUA. This DUA prohibits NYSDOH from publishing hospital-specific rates. NYSDOH does not audit this data.

Catheters were used 55% of the time in ICU patients, 13% of the time in the medical and surgical wards, and 6% of the time in rehabilitation units. CAUTI rates were highest in the rehabilitation patients, occurring at a rate of 2.1 infections per 1,000 catheter days (Table 24).

Table 24. Catheter-associated urinary tract infections, New York State 2015

Location	# Hospitals	# Catheter-associated urinary tract infections	# Urinary catheter days	Catheter-associated urinary tract infection rate[1]	Number of patient days	Device Utilization (%)
Intensive Care Units	157	904	642,039	1.41	1,174,311	54.7
Medical and Surgical Wards	167	986	801,696	1.23	6,240,196	12.8
Inpatient Rehab	58	50	23,864	2.10	416,788	5.7
Total	170	1,940	1,467,599	1.32	7,831,295	18.7

[1] Infection rate is the number of infections divided by the number of catheter days, multiplied by 1,000.
Data downloaded from National Healthcare Safety Network September 16, 2016.

Microorganisms Associated with CAUTIs

The most common microorganisms identified in CAUTIs in intensive care units, wards, and rehabilitation units were *E. coli*, Enterococci, *Klebsiella*, and *Pseudomonas* spp. (Table 25).

Table 25. Microorganisms identified in catheter-associated urinary tract infections, New York State 2015

Microorganism	Number of Isolates	Percent of Infections
Escherichia coli	617	31.8
(CRE-*E. coli*)	(9)	(0.5)
Enterococci	413	21.3
(VRE)	(122)	(6.3)
Klebsiella spp.	332	17.1
(CRE-*Klebsiella*)	(50)	(2.6)
(CephR-*Klebsiella*)	(65)	(3.4)
Pseudomonas spp.	309	15.9
Proteus spp.	137	7.1
Enterobacter spp.	93	4.8
Coagulase negative staphylococci	57	2.9
Staphylococcus aureus	40	2.1
(MRSA)	(22)	(1.1)
Citrobacter spp.	35	1.8
Morganella morganii	31	1.6
Streptococci	25	1.3
Acinetobacter spp.	22	1.1
(MDRO-A*cinetobacter*)	(13)	(0.7)
Serratia spp.	17	0.9
Providencia spp.	15	0.8
Other	25	1.3

New York State data reported as of September 16, 2016. Out of 1,940 infections.
CephR: cephalosporin-resistant; CRE: carbapenem-resistant Enterobacteriaceae;
MDR: multidrug resistant; MRSA: methicillin-resistant *Staphylococcus aureus;*
VRE: vancomycin-resistant Enterococci; spp: multiple species

Infections from *Clostridium difficile* and Multidrug Resistant Organisms (MDROs)

Microbes are extremely small living organisms (e.g. bacteria, fungi) that can only be seen with a microscope. Antimicrobials are drugs used to kill or inhibit the growth of microbes. Antimicrobial resistance is the ability of microbes to resist the effect of these drugs. Infections caused by resistant organisms are difficult to cure, leading to increased sickness and death, increased costs, and increased side effects from multiple drug treatments.

NYS requires hospitals to track *Clostridium difficile* infections (CDI) and carbapenem-resistant Enterobacteriaceae (CRE) infections. CMS programs require hospitals to report methicillin-resistant *Staphylococcus aureus* (MRSA). Some hospitals voluntarily report vancomycin-resistant Enterococci (VRE) and multidrug resistant *Acinetobacter* spp. (MDR-Acinetobacter).

CDI and MDROs are reported following NHSN's "Laboratory-Identified (LabID) Event Reporting" protocol (http://www.cdc.gov/nhsn/pdfs/pscmanual/12pscmdro_cdadcurrent.pdf). The LabID surveillance method is a simple approach where cases are identified based on laboratory testing and hospital admission and discharge data, rather than by clinical chart review. Only specimens collected for clinical purposes are included (i.e. this excludes active surveillance testing on asymptomatic patients).

LabID numerator data (e.g. admission date and specimen date) and denominator data (e.g. number of outpatient encounters, inpatient admissions and patient days) are reported based on the location of the specimen collection. Because CMS reporting programs are specific to certain types of locations, hospitals' inpatient areas are split for NHSN reporting purposes when they have specific Centers for Medicaid and Medicare Services Certification Numbers (CCNs). The NHSN reporting areas are:

- Outpatient (OP)
    - Emergency department (ED)
    - Observation units (OBS) – *Location used to evaluate whether patients require an inpatient stay. Decision is typically made within 24 hours.*
- Inpatient rehabilitation facilities or units (IRF) - *These units care for patients following traumatic physical injuries (e.g. joint replacement surgery), neurological problems (e.g. stroke, traumatic brain injury and spinal cord injury), and cardiopulmonary illness (e.g. ventilator weaning).*
- Inpatient psychiatric facilities or units (IPF) - *These units cover multiple behavioral health issues including mental illness and alcohol/drug addiction. If the units don't have a separate CMS certification number from the hospital, they are reported as FWI; this occurred for approximately 15% of acute care hospital patient days (based on a comparison of NHSN and SPARCS data).*
- Facility-wide inpatient (FWI) – *all inpatient areas excluding IRF and IPFs. For CDI reporting, well baby nurseries and neonatal ICUs are also excluded from surveillance because babies may carry Clostridium difficile naturally.*

LabID cases are categorized based on when the specimen is collected in relation to the admission date. In this report,

- Cases termed "outpatient" are cases in which the positive stool sample was obtained in the ED/OBS unit and the patient was not admitted the same day.

- Cases termed "admission prevalent" are cases in which the positive stool sample was obtained during the first three days of the patient's inpatient stay. (This includes cases identified in the ED/OBS and admitted the same day).

    - Cases termed "community onset- possibly my hospital (CO-PMH)" are admission prevalent cases in which the patient was discharged as an inpatient from the same hospital within the previous 4 weeks.

    - Cases termed "community onset- not my hospital (CO-NMH)" are admission prevalent cases in which the patient was not discharged from the same hospital within the previous 4 weeks.

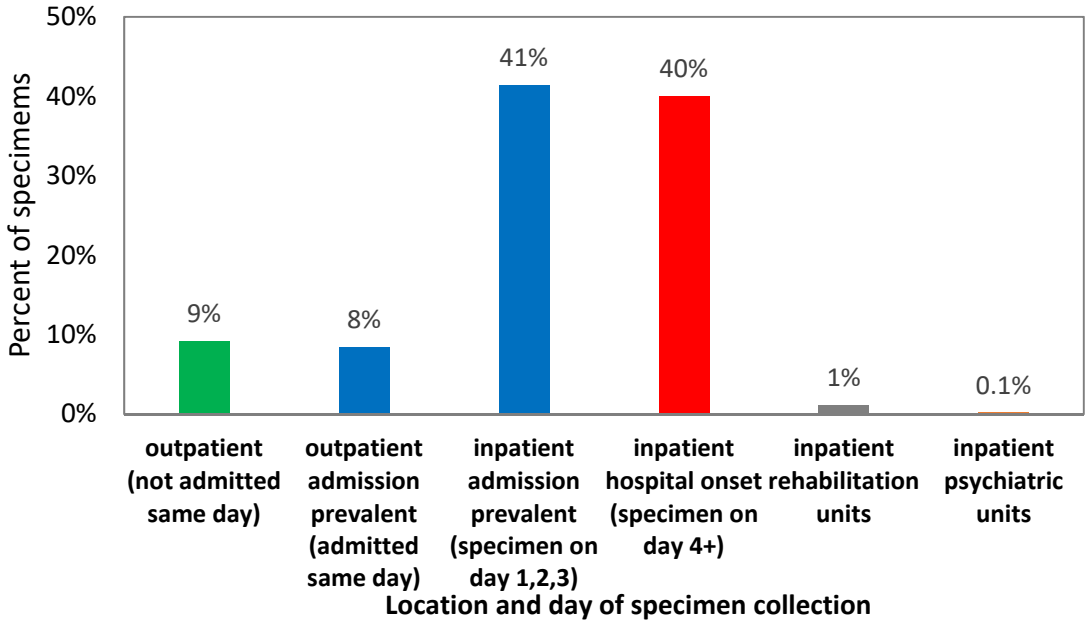
- Cases termed "hospital-onset (HO)" are cases in which the positive stool sample was obtained on day four or later during the hospital stay.

These definitions are slightly different than the ones used in CDC/CMS reports. Admission date is optional in NHSN for ED/OBS reports; however, NYS requires hospitals to enter the admission date if it occurs on the same calendar day as the specimen date (to match the 2014 surveillance definition). In the situation where a specimen is obtained in ED/OBS and the patient is admitted the same day, the case is counted in the admission prevalence rate by NYS.

Clostridium difficile Infections (CDI)

In 2015, 20,868 CDI events were reported by acute care hospitals: 9% were identified in ED/OBS units among patients who were not admitted the same day, 8% were identified in ED/OBS units among patients who were admitted the same day, 41% were identified in the FWI area during the first three days of hospitalization, and 40% were identified in the FWI area after the first three days of inpatient stay (Figure 15). Few events were identified in IRF or IPF units.

Figure 15. *Clostridium difficile* onset, New York State, 2015



Overall inpatient prevalence

The overall CDI inpatient prevalence rate is the number of number of first events per patient per month per facility (e.g. admission prevalent or hospital onset), divided by the number of patient admissions to the hospital x 100 (Table 26).

Table 26. *Clostridium difficile* inpatient prevalence rates by location, New York State 2015

Location	# hospitals	# cases	# admissions	prevalence rate
Inpatient areas excluding rehabilitation units and most* behavioral health units (FWI)	175	18,646	2,039,986	0.91
Inpatient rehabilitation units (IRF)	57	231	29,021	0.80
Inpatient behavioral health units (IPF)	81	38	88,692	0.04

Data reported as of October 7, 2016. * Behavioral health units with the same CMS certification number as the rest of the hospital (15%) are included in this category.

Hospital onset CDI rates

The HO CDI rate is the primary focus of this report because HO cases can be prevented or reduced in the hospital by appropriate antibiotic prescribing and following infection prevention guidelines for hand washing, use of gowns and gloves, and equipment/environmental cleaning. The longer a person stays in the hospital, the higher the total risk of acquiring an infection in the hospital, so the HO incidence rate is reported using a denominator of patient days. The HO rate is defined as the number of incident events identified more than three days after hospital admission, per 10,000 patient days, where an incident event is the first event for that patient in the same hospital or one that has been obtained more than 8 weeks after the most recent event for that patient in the same hospital. CDI HO rates by location are summarized in Table 27.

Table 27. Incident Hospital Onset *Clostridium difficile* rates by location, New York State 2015

Location	# hospitals	# cases	# Patient days	Hospital onset rate
Inpatient areas excluding rehabilitation units and most[1] behavioral health units (FWI)	175	7,855	10,628,375	7.4
Inpatient rehabilitation units (IRF)[2]	57	173	416,485	4.2
Inpatient behavioral health units (IPF)	81	0	1,214,755	0.0

Data reported as of October 7, 2016. [1] Behavioral health units with the same CMS certification number as the rest of the hospital (15%) are included in this category. [2]A challenge to interpreting HO rates associated with IRF patients is that a little over half of these patients are receiving continued care from the same hospital (and events occurring on the first 3 days in the IRF should be considered hospital onset), while the others have been transferred from a different hospital (and the first 3 days in the IRF should be considered community onset). In the table above, the first 3 days were always considered community onset.

Data on the IRFs and IPFs were included in this report for informational purposes, to show the magnitude of patient days and cases in these locations that are now excluded from FWI data. Future reports will focus on FWI patients.

Risk Adjustment

The following risk factors were associated with FWI HO CDI rates and included in the risk adjustment (negative binomial regression) model.

- Laboratory test method – Testing method was obtained from quarterly NHSN rate tables and expressed as the fraction of the year that a more sensitive test (e.g. nucleic acid amplification tests (NAAT) or multistep screening with confirmation with NAAT) was used. Consistent with previous NYS HAI reports, the HO rate for hospitals performing more sensitive tests was set to 1.5 times higher than hospitals performing less sensitive tests like EIA.

- Hospital CO-NMH prevalence rate – As the CO-NMH rate increased from 0 to 1 case per 100 admissions, the HO rate increased by a factor of 2.6.

- Hospital bed size, as reported in 2015 NHSN survey – The HO rate at hospitals with 100 to 399 beds was 1.3 times higher than the rate at hospitals with less than 100 beds, and the HO rate at hospitals with greater than 400 beds was 1.5 times higher than the rate at hospitals with less than 100 beds.

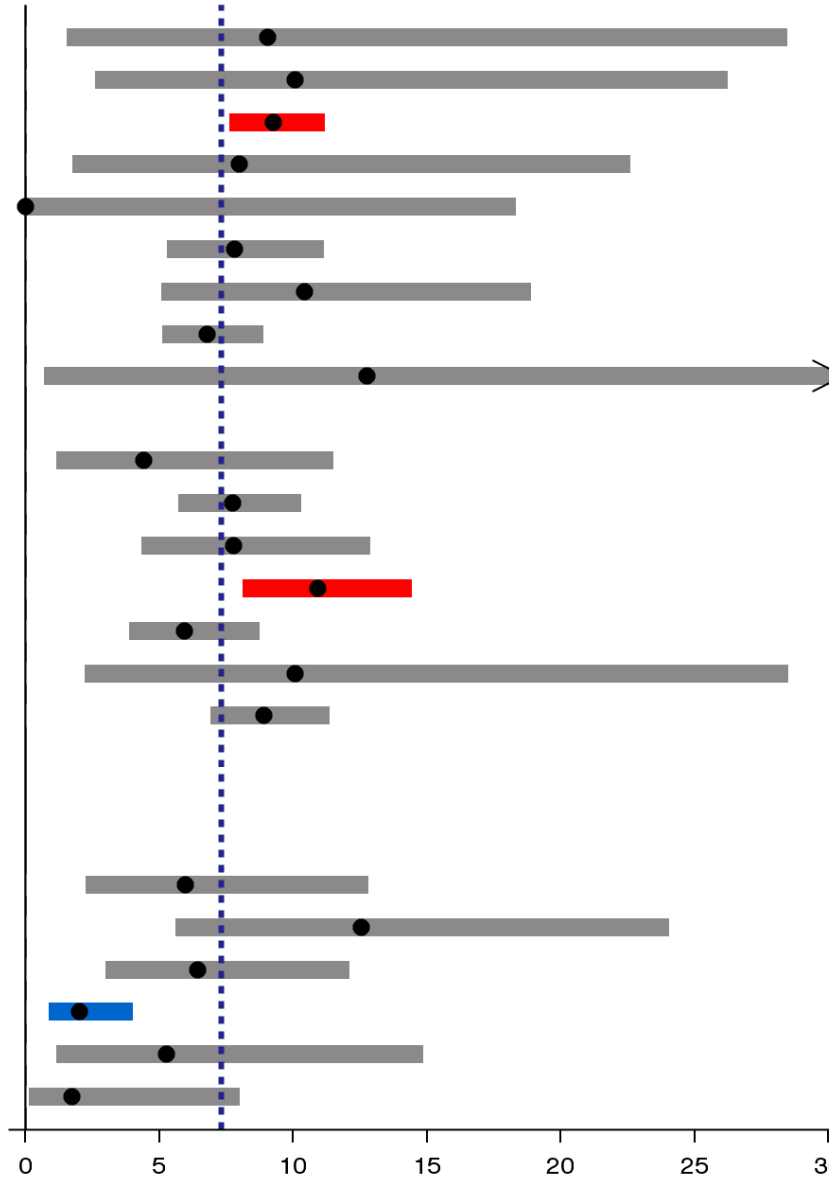
Hospital-specific FWI HO CDI rates are summarized in Figure 16. Fifteen specialty hospitals (e.g. children's, maternity, orthopedic/surgical, oncology, long term acute care, and freestanding rehabilitation) were excluded from the risk adjustment model because there was insufficient data to compare the hospital rates. These facilities will be compared to the new 2015 national baseline when it becomes available.

In the previous two annual reports, NYS risk adjusted CDI HO rates based on test method (from NHSN) and the average patient risk for developing CDI at each hospital (from the previous year's SPARCS discharge diagnosis codes). NYS discontinued this method because the 2015 NHSN MDRO indicators are focused on the FWI population, and it was not possible to determine which specific SPARCS discharges were FWI as compared to IPF locations designated as having different CCNs in NHSN. The simpler NHSN-data-only approach was selected for this report because it can be more easily calculated and is more consistent with the data used in CDC/CMS reports.

Hospitals were flagged as having adjusted rates significantly higher or lower than the state average if the 99% confidence interval excluded the state average HO rate. The more conservative 99% confidence interval was selected for this indicator due to the previously mentioned model limitations. In 2015, 12 hospitals (7%) were flagged with adjusted rates significantly higher than the state average, and 15 hospitals (9%) were flagged significantly lower than average (Figure 18). Three hospitals were high for three consecutive years, and four hospitals were low for three consecutive years. There were no statistically significant differences in HO IRF incidence rates, and these data are not shown.

Figure 16. Hospital onset facility-wide inpatient *C. difficile* rates, New York State 2015 (Page 1 of 7)

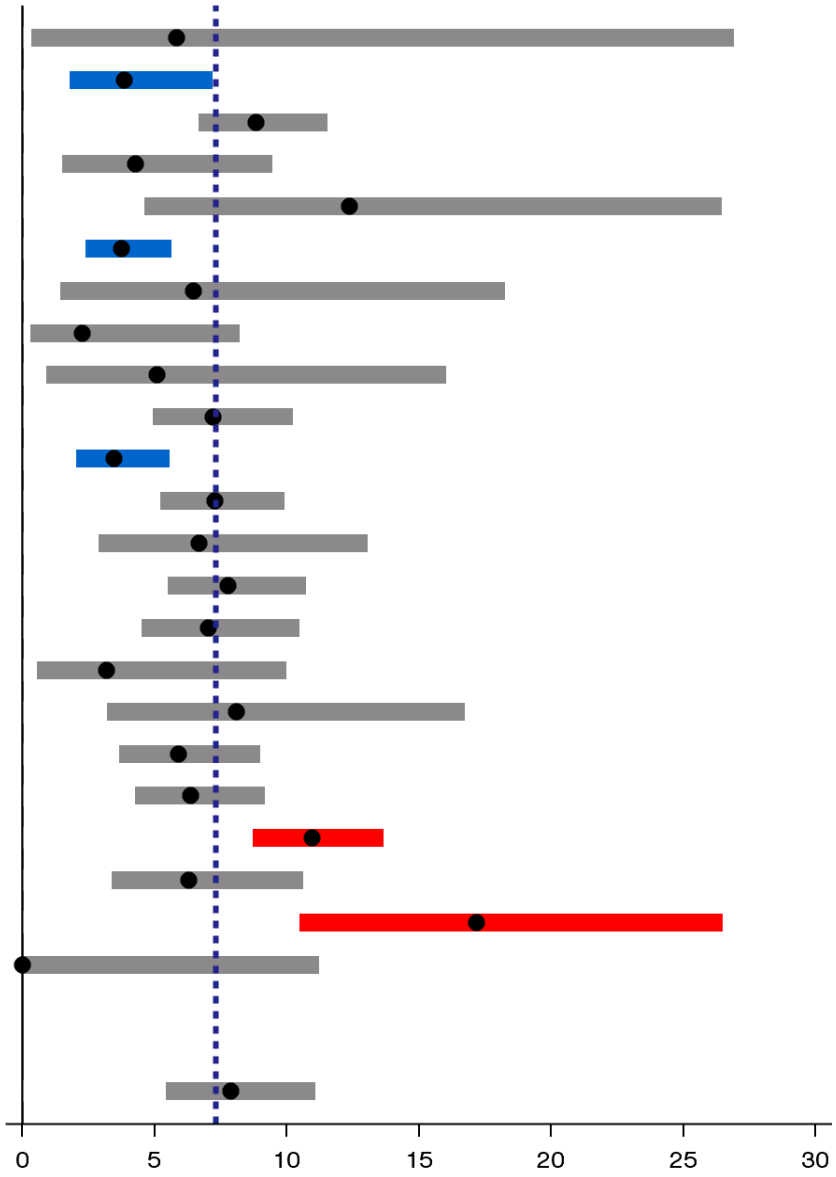
HOSPITAL	TEST METH	# OP	# CO-NMH	# CO-PMH	# HO	# PATDAYS	RAW HO RATE	ADJ HO RATE
AO Fox Memorial	N	4	5	4	4	11,415	3.5	9.0
Adirondack Medical	S	5	9	2	6	8,139	7.4	10.0
Albany Med Ctr^	S	16	125	58	182	184,525	9.9	9.2
Albany Memorial	N	1	7	2	5	16,703	3.0	8.0
Alice Hyde Med Ctr	N	0	3	0	0	7,206	0.0	0.0
Arnot Ogden Med Ctr	S	15	84	14	50	44,154	11.3	7.8
Auburn Memorial	S	3	27	10	17	19,330	8.8	10.4
Bellevue Hospital	S	6	42	17	89	125,459	7.1	6.8
Bertrand Chaffee	N	0	4	2	2	3,724	5.4	12.7
Blythedale Childrens	N	0	1	0	2	27,294	0.7	NA
Bon Secours	S	1	22	10	6	15,305	3.9	4.4
Bronx-Lebanon	S	3	62	19	79	109,081	7.2	7.7
Brookdale Hospital	N	0	11	1	24	67,252	3.6	7.8
Brookhaven Memorial^	S	57	62	18	83	73,752	11.3	10.9
Brooklyn Hosp Ctr	S	5	47	5	42	80,736	5.2	5.9
Brooks Memorial	S	1	6	3	5	8,017	6.2	10.1
Buffalo General	S	32	87	33	111	126,473	8.8	8.9
Burdett Care Center	N	0	0	0	0	2,551	0.0	NA
Burke Rehab Hosp	N	0	0	0	0	2,460	0.0	NA
Calvary Hospital	N	0	1	0	11	76,609	1.4	NA
Canton-Potsdam	S	9	32	7	10	17,624	5.7	6.0
Catskill Regional	S	4	18	3	14	13,737	10.2	12.5
Cayuga Medical Ctr	S	8	29	7	15	21,551	7.0	6.4
Champlain Valley**	S	12	46	13	12	56,997	2.1	2.0
Claxton-Hepburn	S	7	10	2	5	10,875	4.6	5.2
Clifton Springs	S	11	13	2	2	14,528	1.4	1.7



Data reported as of October 7, 2016. ┆ State Average. ●Risk-adjusted Infection rate. —^^Significantly higher than state average. —**Significantly lower than state average. – Average. > Upper confidence limit exceeds graph area. Test method: N= less sensitive test (e.g. enzyme immunoassay), S= more sensitive test (e.g. nucleic acid amplification test). OP: Outpatient not admitted, CO-NMH: community onset-not my hospital, CO-PMH: community onset-possibly my hospital, HO: hospital onset, rate is per 10,000 patient days. HO rate adjusted using test method, CO-NMH rate, and number of beds. Rehabilitation and behavioral health units excluded.

Figure 16. Hospital onset facility-wide inpatient *C. difficile* rates, New York State 2015 (Page 2 of 7)

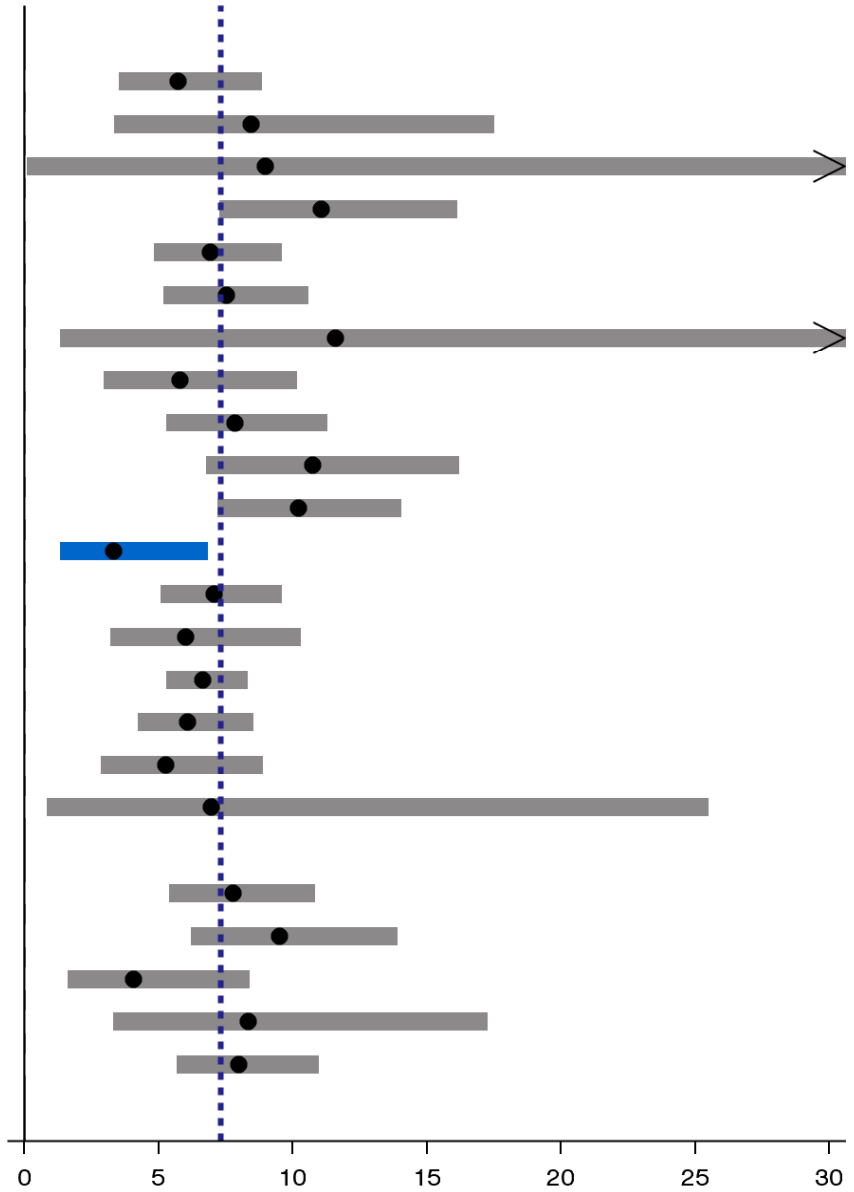
HOSPITAL	TEST METH	# OP	# CO-NMH	# CO-PMH	# HO	# PATDAYS	RAW HO RATE	ADJ HO RATE
Cobleskill Regional	S	0	3	0	2	4,681	4.3	5.8
Columbia Memorial**	S	14	39	11	15	32,500	4.6	3.8
Coney Island Hosp	S	2	79	18	92	92,213	10.0	8.8
Corning Hospital	S	18	48	7	9	15,269	5.9	4.2
Cortland Reg Med	N	4	8	4	10	15,111	6.6	12.3
Crouse Hospital**	S	20	94	18	37	83,206	4.4	3.7
DeGraff Memorial	S	6	15	0	5	7,583	6.6	6.4
East. Niag. Lockport	N	0	4	2	3	29,075	1.0	2.2
Eastern Long Island	S	0	5	0	4	13,014	3.1	5.1
Ellis Hospital	S	21	83	27	52	86,290	6.0	7.2
Elmhurst Hospital**	S	3	23	4	28	94,938	2.9	3.5
Erie County Med Ctr	S	7	38	17	67	94,596	7.1	7.3
FF Thompson	S	24	37	10	13	22,746	5.7	6.7
Faxton St. Lukes	S	14	96	28	62	69,821	8.9	7.8
Flushing Hospital	S	1	27	6	39	73,270	5.3	7.0
Geneva General	N	4	17	5	4	17,577	2.3	3.2
Glen Cove Hospital	S	5	11	2	11	15,686	7.0	8.1
Glens Falls Hospital	S	14	57	15	35	59,367	5.9	5.9
Good Samar. Suffern	S	3	88	15	48	53,206	9.0	6.4
Good Samar. W Islip^	S	32	108	31	135	127,298	10.6	11.0
Harlem Hospital	S	1	22	2	22	45,037	4.9	6.3
HealthAlli Broadway^	N	2	17	12	33	36,956	8.9	17.2
HealthAlli MarysAve	N	0	1	0	0	9,269	0.0	0.0
Helen Hayes Hospital	S	0	0	0	1	2,882	3.5	NA
Henry J. Carter	S	0	1	1	49	54,458	9.0	NA
Highland Hospital	S	63	50	9	55	80,800	6.8	7.9



Data reported as of October 7, 2016. ┆ State Average. ●Risk-adjusted Infection rate. —^^Significantly higher than state average. —**Significantly lower than state average.
– Average. > Upper confidence limit exceeds graph area. Test method: N= less sensitive test (e.g. enzyme immunoassay), S= more sensitive test (e.g. nucleic acid amplification test).
OP: Outpatient not admitted, CO-NMH: community onset-not my hospital, CO-PMH: community onset-possibly my hospital, HO: hospital onset, rate is per 10,000 patient days.
HO rate adjusted using test method, CO-NMH rate, and number of beds. Rehabilitation and behavioral health units excluded.

Figure 16. Hospital onset facility-wide inpatient *C. difficile* rates, New York State 2015 (Page 3 of 7)

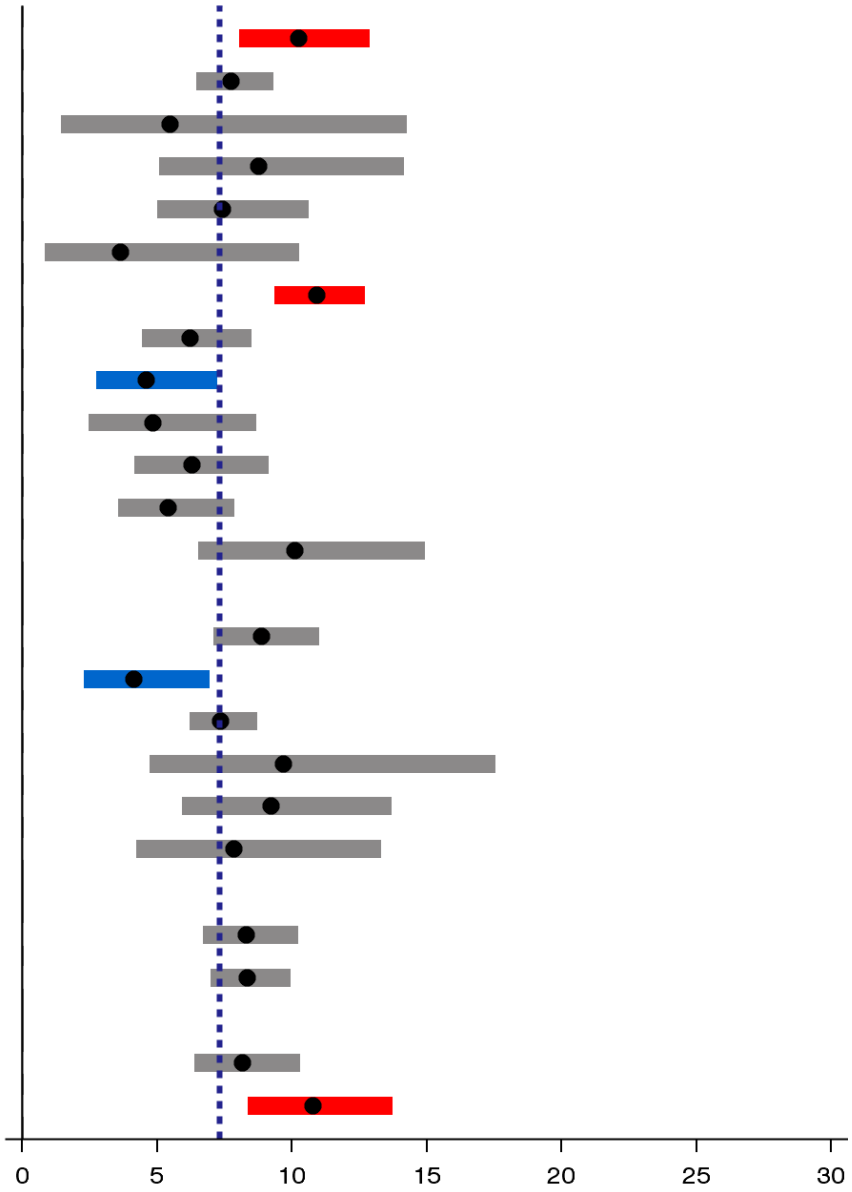
HOSPITAL	TEST METH	# OP	# CO-NMH	# CO-PMH	# HO	# PATDAYS	RAW HO RATE	ADJ HO RATE
Hosp for Spec Surg	S	0	7	2	26	53,757	4.8	NA
Huntington Hospital	S	25	48	14	33	67,136	4.9	5.7
Interfaith Med Ctr	N	0	4	4	11	29,408	3.7	8.4
Ira Davenport	S	0	0	0	1	2,340	4.3	9.0
JT Mather Hospital	N	2	52	19	44	58,047	7.6	11.1
Jacobi Med Ctr	S	6	43	10	59	88,320	6.7	6.9
Jamaica Hospital	S	1	43	20	55	87,778	6.3	7.5
Jones Memorial	N	1	3	0	3	6,449	4.7	11.6
Kenmore Mercy	S	13	34	10	19	34,202	5.6	5.8
Kings County Hosp	N	7	20	7	48	110,663	4.3	7.8
Kingsbrook Jewish MC	S	0	27	7	37	39,983	9.3	10.7
LIJ at Forest Hills	S	27	43	12	62	73,929	8.4	10.2
LIJ at Valley Stream**	S	2	18	4	11	43,555	2.5	3.3
Lenox Hill Hospital	S	16	42	16	67	110,771	6.0	7.0
Lincoln Med Ctr	N	3	6	2	21	80,311	2.6	6.0
Long Isl Jewish(LIJ)	S	34	161	48	131	208,800	6.3	6.6
Maimonides Med Ctr	N	17	48	20	56	161,392	3.5	6.1
Mary Imogene Bassett	S	0	34	9	22	46,521	4.7	5.2
Massena Memorial	N	1	12	2	3	9,348	3.2	7.0
Memor SloanKettering	S	8	118	79	247	145,775	16.9	NA
Mercy Hosp Buffalo	S	26	44	12	57	91,376	6.2	7.7
Mercy Med Ctr	S	3	53	12	43	43,060	10.0	9.5
Metropolitan Hosp	S	1	8	4	11	39,809	2.8	4.0
MidHudson Reg of WMC	N	3	14	1	11	21,930	5.0	8.3
Millard Fill. Suburb	S	25	105	22	63	61,878	10.2	8.0
Monroe Community	S	NA	NA	NA	NA	16	NA	NA



Data reported as of October 7, 2016. ┆ State Average. ●Risk-adjusted Infection rate. –^^Significantly higher than state average. –**Significantly lower than state average. – Average. > Upper confidence limit exceeds graph area. Test method: N= less sensitive test (e.g. enzyme immunoassay), S= more sensitive test (e.g. nucleic acid amplification test). OP: Outpatient not admitted, CO-NMH: community onset-not my hospital, CO-PMH: community onset-possibly my hospital, HO: hospital onset, rate is per 10,000 patient days. HO rate adjusted using test method, CO-NMH rate, and number of beds. Rehabilitation and behavioral health units excluded.

Figure 16. Hospital onset facility-wide inpatient *C. difficile* rates, New York State 2015 (Page 4 of 7)

HOSPITAL	TEST METH	# OP	# CO-NMH	# CO-PMH	# HO	# PATDAYS	RAW HO RATE	ADJ HO RATE
Montefiore-Einstein^	S	15	106	28	123	129,533	9.5	10.2
Montefiore-Moses	S	2	148	49	199	250,694	7.9	7.7
Montefiore-Mt Vernon	S	3	11	2	6	15,658	3.8	5.5
Montefiore-NewRochl	S	4	28	7	27	32,934	8.2	8.8
Montefiore-Wakefield	S	4	60	12	49	71,078	6.9	7.4
Mount St. Marys	N	2	17	5	5	23,503	2.1	3.6
Mt Sinai^	S	24	180	44	286	258,757	11.1	10.9
Mt Sinai Beth Israel	S	8	50	34	66	117,446	5.6	6.2
Mt Sinai Brooklyn**	S	2	55	10	30	63,630	4.7	4.6
Mt Sinai Queens	S	6	25	10	18	44,115	4.1	4.8
Mt Sinai St Lukes	S	2	57	12	45	74,829	6.0	6.3
Mt Sinai West	S	2	42	11	44	89,192	4.9	5.4
NY Community Hosp	S	3	37	12	41	39,056	10.5	10.1
NY Eye&Ear Mt Sinai	S	0	0	0	0	839	0.0	NA
NY Methodist	S	15	89	26	140	166,794	8.4	8.9
NYP-Allen**	S	1	65	13	23	44,858	5.1	4.1
NYP-Columbia	S	20	177	56	235	215,910	10.9	7.4
NYP-Hudson Valley	N	2	22	7	17	31,389	5.4	9.7
NYP-Lawrence	S	21	38	8	40	47,933	8.3	9.2
NYP-Lower Manhattan	S	1	17	2	22	39,135	5.6	7.8
NYP-Morgan Stanley	S	9	46	17	48	63,498	7.6	NA
NYP-Queens	S	59	141	27	153	149,296	10.2	8.3
NYP-Weill Cornell	S	52	137	45	217	239,712	9.1	8.3
NYU Joint Diseases	S	0	1	0	5	17,809	2.8	NA
NYU Langone Med Ctr	S	62	127	30	119	123,435	9.6	8.2
NYU Lutheran^	S	13	70	12	111	99,254	11.2	10.8



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HO rate adjusted using test method, CO-NMH rate, and number of beds. Rehabilitation and behavioral health units excluded.

Figure 16. Hospital onset facility-wide inpatient *C. difficile* rates, New York State 2015 (Page 5 of 7)

HOSPITAL	TEST METH	# OP	# CO-NMH	# CO-PMH	# HO	# PATDAYS	RAW HO RATE	ADJ HO RATE
Nassau University**	N	0	11	0	12	66,830	1.8	3.4
Nathan Littauer	N	0	6	3	3	9,571	3.1	7.9
Newark Wayne**	S	7	42	10	13	21,973	5.9	3.6
Niagara Falls	S	2	10	6	19	25,715	7.4	9.6
North Central Bronx**	S	4	22	1	5	23,116	2.2	2.5
North Shore	S	6	136	65	150	253,414	5.9	6.2
Northern Dutchess^	S	4	29	8	19	14,023	13.5	14.7
Northern Westchester	S	5	39	15	35	38,169	9.2	9.3
Noyes Memorial	S	0	8	1	3	7,720	3.9	5.8
Nyack Hospital**	S	20	69	17	30	60,912	4.9	4.2
Olean General	S	21	28	6	18	29,835	6.0	6.6
Oneida Healthcare	S	8	13	4	5	9,922	5.0	6.8
OrangeReg Goshen-Mid^	S	9	106	37	114	92,604	12.3	12.1
Oswego Hospital**	S	6	29	5	2	16,255	1.2	1.2
Our Lady of Lourdes	S	13	70	17	43	49,250	8.7	7.3
Peconic Bay Medical	S	0	27	6	34	31,948	10.6	11.9
Phelps Memorial	S	4	39	17	22	39,761	5.5	4.8
Plainview Hospital	S	11	39	10	35	40,977	8.5	8.7
Putnam Hospital	S	8	44	11	23	26,294	8.7	7.3
Queens Hospital	S	1	12	6	18	52,467	3.4	4.9
Richmond Univ MC	S	14	49	8	52	66,109	7.9	8.3
Rochester General**	S	45	112	48	128	195,491	6.5	5.6
Rome Memorial^	S	7	35	4	20	14,167	14.1	14.7
Roswell Park	N	0	9	6	32	38,736	8.3	NA
SUNY Downstate MedCr	S	3	54	19	61	69,135	8.8	9.3
Samaritan- Troy	N	2	16	5	7	29,431	2.4	4.6

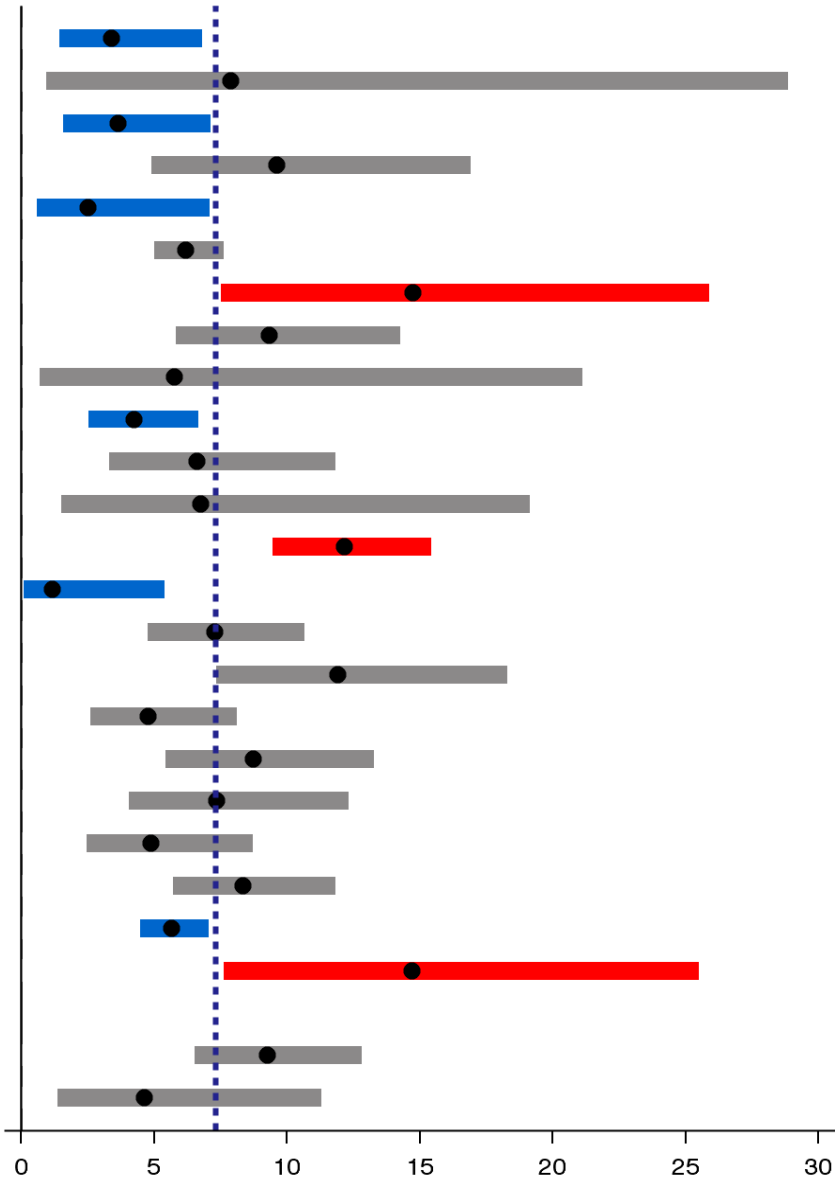

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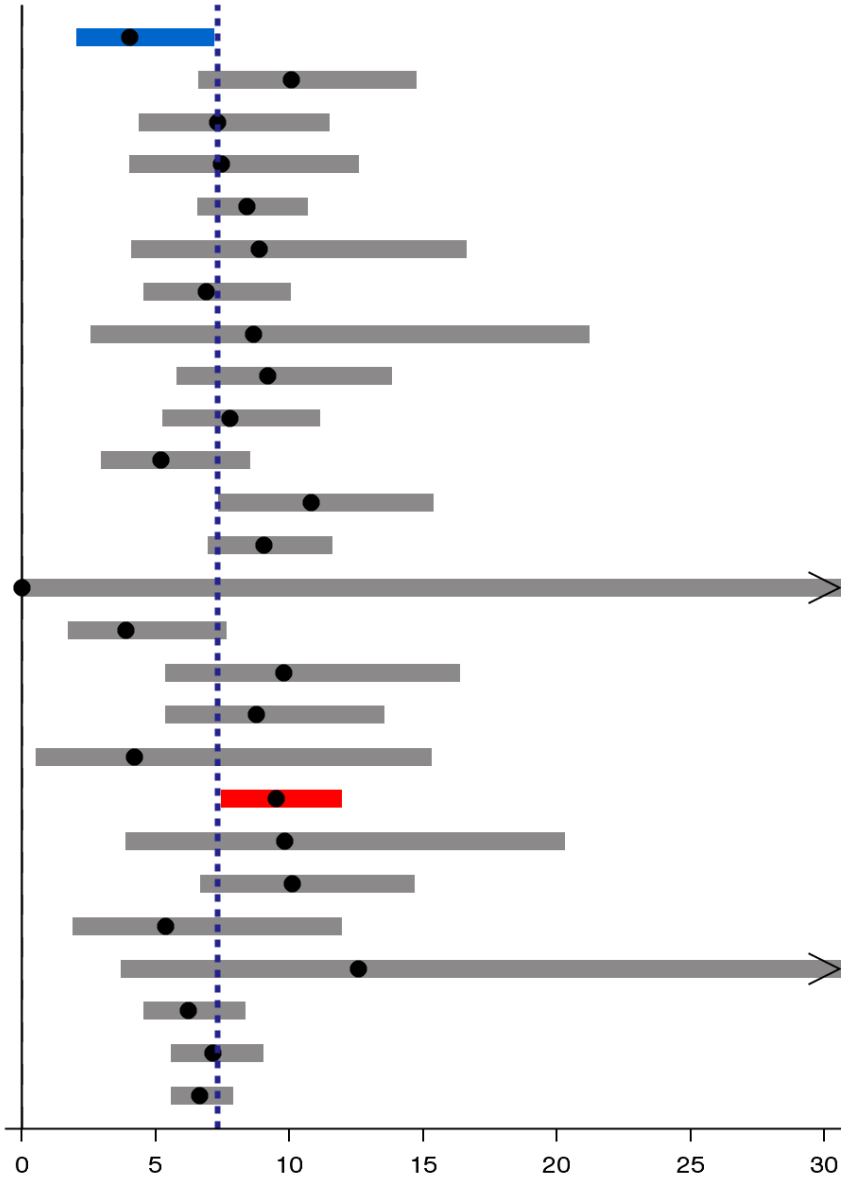
Figure 16. Hospital onset facility-wide inpatient *C. difficile* rates, New York State 2015 (Page 6 of 7)

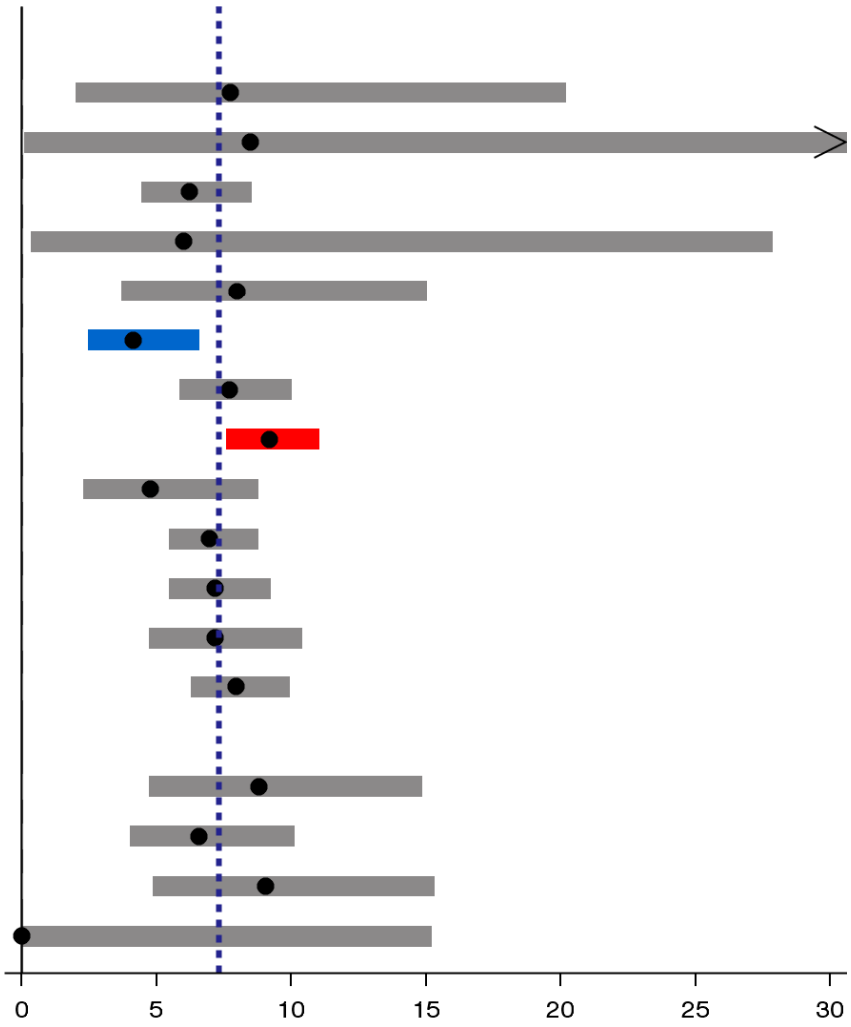
HOSPITAL	TEST METH	# OP	# CO-NMH	# CO-PMH	# HO	# PATDAYS	RAW HO RATE	ADJ HO RATE
Samaritan- Watertown**	S	9	46	6	18	34,402	5.2	4.0
Saratoga Hospital	S	18	33	9	43	50,144	8.6	10.1
Sisters of Charity	S	7	33	15	30	48,384	6.2	7.3
Sisters- St Joseph	S	5	29	2	22	22,575	9.7	7.4
South Nassau Comm.	S	32	156	22	114	97,356	11.7	8.4
Southampton	S	13	20	11	15	18,438	8.1	8.8
Southside	S	14	49	12	44	77,703	5.7	6.9
St Anthony	S	3	15	3	7	9,111	7.7	8.7
St Barnabas	N	1	27	6	37	59,999	6.2	9.2
St Catherine Siena	S	0	66	17	49	49,053	10.0	7.8
St Charles Hospital	S	2	41	5	25	48,187	5.2	5.2
St Elizabeth Medical	S	28	40	18	51	46,202	11.0	10.8
St Francis- Roslyn	S	11	96	16	103	98,707	10.4	9.0
St James Mercy	N	3	2	1	0	2,611	0.0	0.0
St Johns Episcopal	S	3	10	5	13	47,406	2.7	3.9
St Johns Riverside	N	2	15	3	23	49,416	4.7	9.8
St Joseph -Bethpage	S	8	39	8	33	32,419	10.2	8.8
St Josephs- Elmira	S	0	7	1	3	7,848	3.8	4.2
St Josephs- Syracuse^	S	127	85	21	121	134,206	9.0	9.5
St Josephs- Yonkers	N	0	7	1	11	22,633	4.9	9.8
St LukesNewburgh-Cor	S	1	56	27	45	44,176	10.2	10.1
St Marys Amsterdam	N	1	13	7	9	32,802	2.7	5.4
St Marys Troy	N	7	7	4	7	14,367	4.9	12.6
St Peters Hospital	S	41	85	27	74	117,511	6.3	6.2
Staten Island U N-S	S	56	104	33	117	187,468	6.2	7.1
Strong Memorial	S	68	149	46	217	225,367	9.6	6.6



Data reported as of October 7, 2016. ┆ State Average. ●Risk-adjusted Infection rate. –^^Significantly higher than state average. –**Significantly lower than state average. – Average. > Upper confidence limit exceeds graph area. Test method: N= less sensitive test (e.g. enzyme immunoassay), S= more sensitive test (e.g. nucleic acid amplification test). OP: Outpatient not admitted, CO-NMH: community onset-not my hospital, CO-PMH: community onset-possibly my hospital, HO: hospital onset, rate is per 10,000 patient days. HO rate adjusted using test method, CO-NMH rate, and number of beds. Rehabilitation and behavioral health units excluded.

Figure 16. Hospital onset facility-wide inpatient *C. difficile* rates, New York State 2015 (Page 7 of 7)

HOSPITAL	TEST METH	# OP	# CO-NMH	# CO-PMH	# HO	# PATDAYS	RAW HO RATE	ADJ HO RATE
Sunnyview Rehab Hosp	S	0	0	0	3	3,791	7.9	NA
Syosset Hospital	S	5	5	4	6	14,286	4.2	7.7
TLC Lake Shore	S	1	2	0	1	2,093	4.8	8.5
UHS Bingham/Wilson	S	13	91	27	65	103,708	6.3	6.2
UHS Chenango Memor	S	1	6	1	2	5,166	3.9	6.0
United Memorial	S	7	28	5	15	13,204	11.4	8.0
Unity Hosp Rochester**	S	28	49	14	29	77,923	3.7	4.1
Univ Hosp SUNY Upst	S	2	73	31	94	115,492	8.1	7.7
Univ Hosp StonyBrook^	S	75	162	37	194	171,819	11.3	9.2
Upst. Community Gen	S	5	31	5	16	34,728	4.6	4.7
Vassar Brothers	S	6	182	53	122	89,683	13.6	6.9
Westchester Medical	S	4	53	22	100	142,027	7.0	7.2
White Plains Hosp	S	8	62	19	45	67,047	6.7	7.1
Winthrop University	S	35	115	32	129	151,363	8.5	7.9
Woman and Childrens	S	11	17	5	6	33,907	1.8	NA
Womans Christian	S	22	40	18	22	23,901	9.2	8.8
Woodhull Med Ctr	S	0	21	4	33	65,165	5.1	6.6
Wyckoff Heights	N	1	12	9	22	52,769	4.2	9.0
Wyoming County Comm.	N	2	2	1	0	8,800	0.0	0.0



Data reported as of October 7, 2016. ┆ State Average. ●Risk-adjusted Infection rate. ─^^Significantly higher than state average. ─**Significantly lower than state average. ─ Average. > Upper confidence limit exceeds graph area. Test method: N= less sensitive test (e.g. enzyme immunoassay), S= more sensitive test (e.g. nucleic acid amplification test). OP: Outpatient not admitted, CO-NMH: community onset-not my hospital, CO-PMH: community onset-possibly my hospital, HO: hospital onset, rate is per 10,000 patient days. HO rate adjusted using test method, CO-NMH rate, and number of beds. Rehabilitation and behavioral health units excluded.

Time Trends for CDI

The annual changes in the LabID CDI protocol are summarized in Table 28.

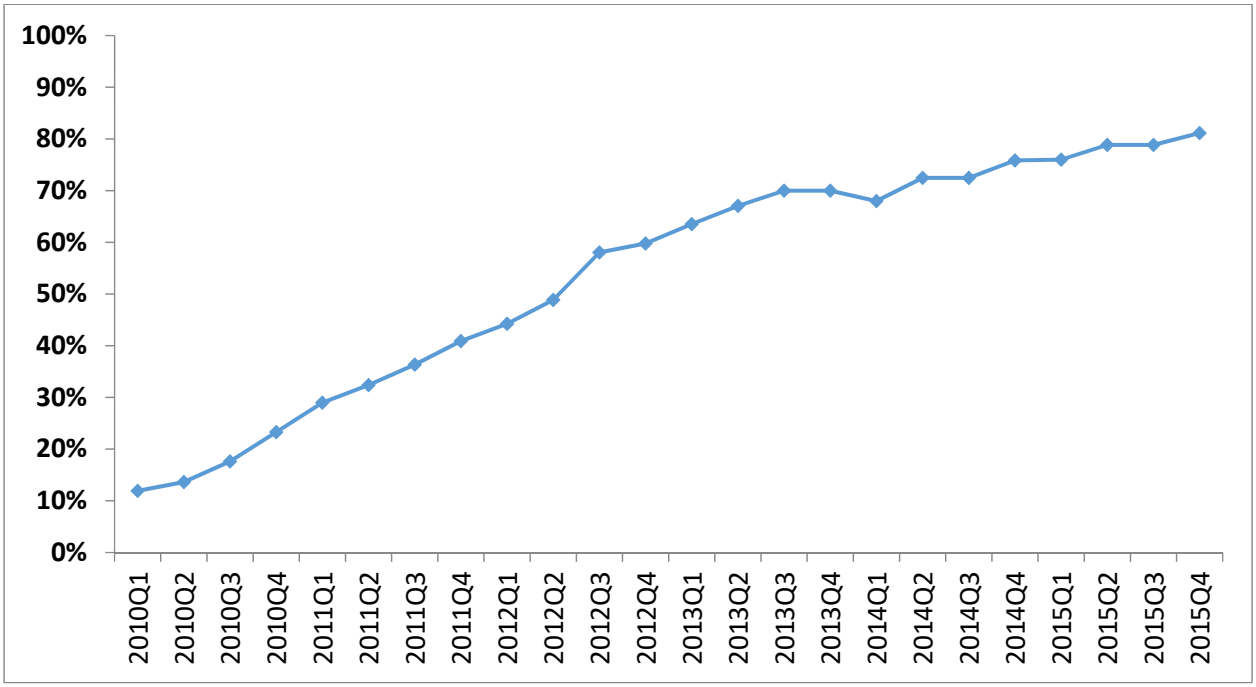
Table 28. CDI LabID surveillance definition changes

Year	Description
2009 (pilot phase begins in NYS in July 2009)	LabID CDI is "a positive result for a laboratory assay for *C. difficile* toxin A and/or B, OR a toxin-producing *C. difficile* organism detected in the stool sample by culture or other laboratory means…where *C. difficile* testing in the laboratory is performed routinely only on unformed (i.e. conforming to the shape of the container) stool samples."
2010	In June 2010 a patch for NHSN was released to allow specific CDI denominators as distinct from MDRO denominators, because CDI surveillance is not performed in neonatal ICUs or well-baby nurseries. Clarification that specimens collected in the ED are entered as inpatient if admitted the same day.
2011	No major changes.
2012	Required to specify if IRF unit has a separate CCN.
2013	First year CDI risk adjusted rates are published by NYS and used in NYSDOH policy for hospitals with high rates. Clarification: "The CMS Certification Number (CCN) alone should not determine whether or not a unit's data gets included for LabID Event reporting… If the location is staffed by acute care facility workers, follows the acute care infection control policies, and answers to the acute care administration, then that location should be included as an acute care facility inpatient location... If the facility is treating the IRF as a location within the acute care facility for FacWideIn counts, then the movement between the acute care facility and IRF should NOT be counted as a separate discharge."
2014	Clarification that date of admission is date patient arrived on inpatient location. CDI test method collected by NHSN quarterly.
2015	Continued to clarify that stool sample must be unformed: "A positive laboratory test result for *C. difficile* toxin A and/or B, (includes molecular assays [PCR] and/or toxin assays) tested on an unformed stool specimen (must conform to the container) *OR* A toxin-producing *C. difficile* organism detected by culture or other laboratory means performed on an unformed stool sample (must conform to the container)." Require reporting in emergency department (ED) and observation (OBS) units, which will slightly decrease the HO rate by capturing more cases classified as recurrent than incident. Specimens collected in the ED are only assigned to the ED (not to the first inpatient location if admitted the same day), though NYS requires that reporters also enter the admission date if admitted the same day.

	IRFs and IPFs with different CCNs are reported as separate facilities, where hospital onset IRF rates are based on transfer date, not date originally admitted to facility. Clarification to exclude skilled nursing units from FWI. Mid-year clarification: Geographically-separate hospital campuses required to enroll separately.

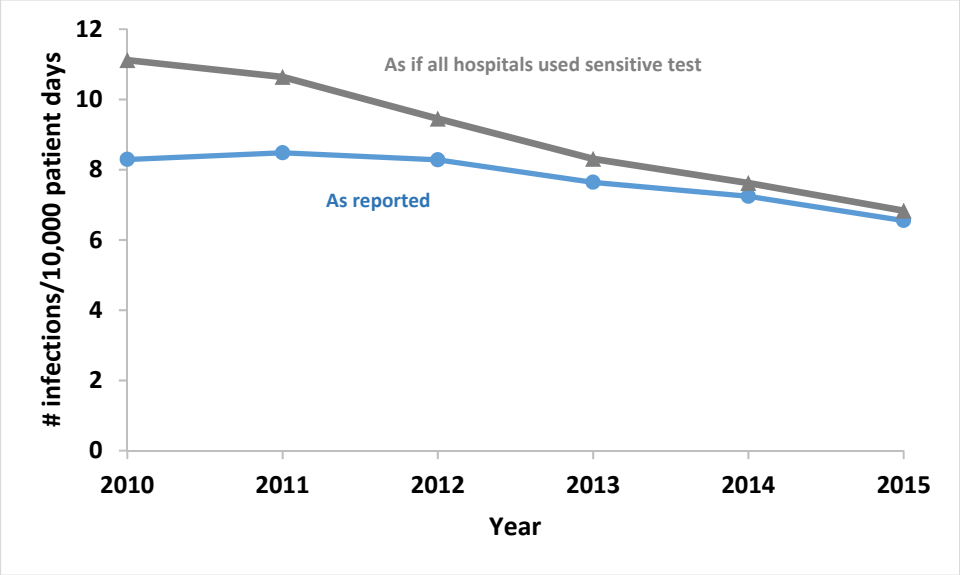
Several CDI laboratory testing methods are available. The methods vary in sensitivity (ability to detect a true positive), specificity (ability to detect a true negative), timeliness, and cost. Testing methods may have a large impact on observed CDI rates, with an increased number of cases detected with a change to a more sensitive test. Hospitals report CDI test method quarterly to NHSN. Between January 2010 and December 2015, the percentage of hospitals using more sensitive tests (i.e. nucleic acid amplification tests (NAAT) or multistep screening with confirmation with NAAT) steadily increased from 12% to 81% (Figure 14).

Figure 17. Percentage of hospitals using sensitive laboratory test method for *C. difficile*



Trends in the incidence of HO CDI are summarized in Figure 18. The blue curve shows the actual rate reported by hospitals, and the grey curve estimates what the rate would have been if all hospitals had used a sensitive test. Both curves were corrected to include all hospital inpatient locations (FWI, IRF, IPF), but there were other definition changes and clarifications during the time period. After adjusting for test method changes, the HO CDI rate declined roughly 39% between 2010 and 2015.

Figure 18. Trend in incidence of hospital onset *C. difficile*, New York State 2010-2015



Year	# hospitals	# patient days	# hospital onset infections observed[1]	hospital onset rate observed[1]	# hospital onset infections if all hospitals used sensitive test[2]	hospital onset rate if all hospitals used sensitive test[2]
2010	176	12,290,750	10,186	8.29	13,671	11.12
2011	176	12,243,421	10,388	8.48	13,022	10.64
2012	174	11,962,739	9,902	8.28	11,309	9.45
2013	170	12,235,452	9,347	7.64	10,163	8.31
2014	178	12,277,374	8,892	7.24	9,352	7.62
2015	175	12,259,615	8,034	6.55	8,369	6.83

Data reported as of October 7, 2016.

[1] Facility-wide inpatient (FWI), inpatient rehabilitation facility (IRF), and inpatient psychiatric facility (IPF) data were included in all years.

[2]Assumption was that more sensitive tests (i.e. nucleic acid amplification test (NAAT) or multistep screening with confirmation by NAAT or culture) detect approximately 50% more cases than less sensitive tests. The observed number of infections was multiplied by (proportion of year less sensitive test was used times 1.5).

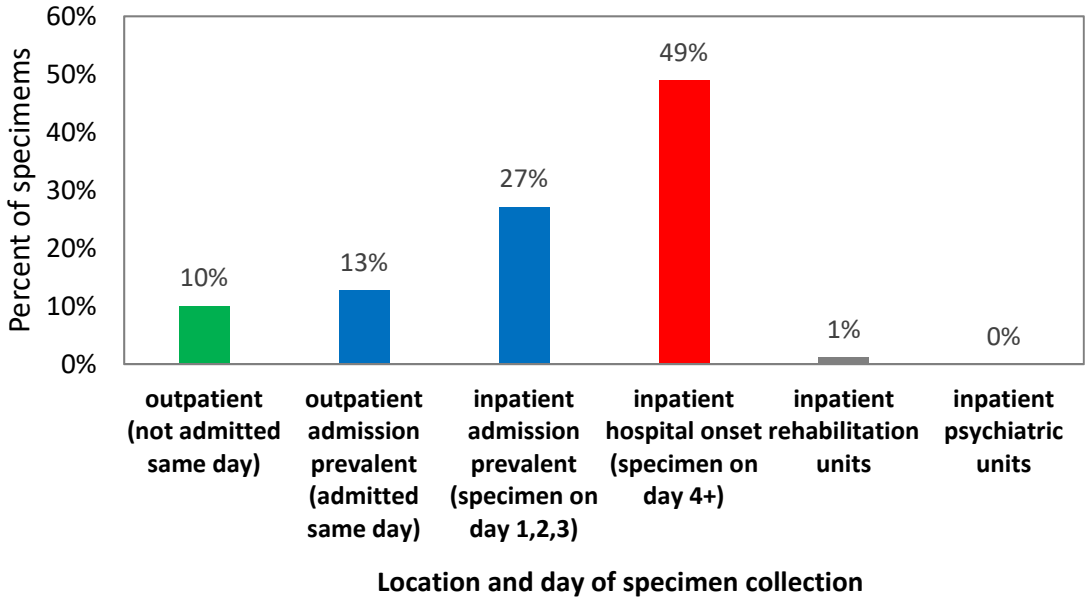
Carbapenem-resistant Enterobacteriaceae (CRE) Infections

The 2015 NHSN LabID CRE surveillance definition is:

> Any *Escherichia coli*, *Klebsiella oxytoca, Klebsiella pneumoniae*, or *Enterobacter* spp. testing resistant to imipenem, meropenem, doripenem, or ertapenem by standard susceptibility testing methods (i.e., minimum inhibitory concentrations of ≥4 mcg/mL for doripenem, imipenem and meropenem or ≥2 mcg/mL for ertapenem) OR by production of a carbapenemase demonstrated using a recognized test.

In 2015, 3,618 CRE cases were reported: 9% were identified in ED/OBS units among patients who were not admitted the same day, 13% were identified in ED/OBS units among patients who were admitted the same day, 27% were identified in the FWI area during the first three days of hospitalization, and 49% were identified in the FWI area after the first three days of inpatient stay (Figure 19). Few events were identified in IRF units.

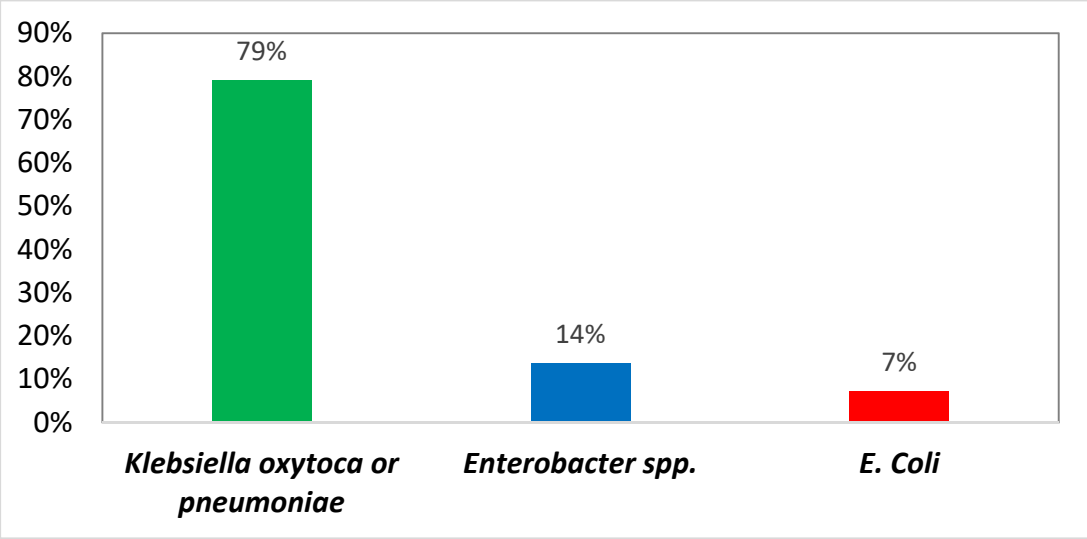
Figure 19. Carbapenem-resistant Enterobacteriaceae Infection Onset, New York State 2015



Data reported as of October 7, 2016.

The majority of the CRE cases were CRE-*Klebsiella* spp. (79%) (Figure 20). A small percentage (3%) of patients harbored more than one type of organism.

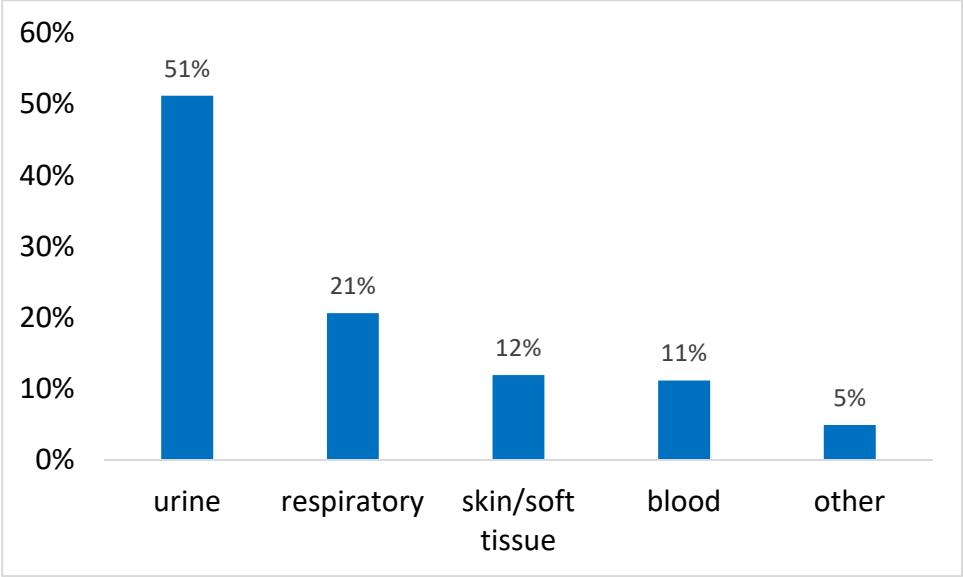
Figure 20. Carbapenem-resistant Enterobacteriaceae by species, NYS 2015



Data reported as of October 7, 2016.

The most common specimen site was the urinary tract (51%), followed by the respiratory tract (21%, Figure 21).

Figure 21. Carbapenem-resistant Enterobacteriaceae by specimen site, NYS 2015



Data reported as of October 7, 2016.

Facility-wide inpatient prevalence and incidence rates are summarized for the facility-wide inpatient population in Table 29.

Table 29. Facility-wide Inpatient Carbapenem-Resistant Enterobacteriaceae Infection Rates, NYS 2015

Name	Description	Numerator	Denominator	Rate
Bloodstream Infection Admission Prevalence Rate	Number of all unique blood source LabID Events per patient per month identified ≤3 days after admission to the hospital / Number of patient admissions to the hospital x 1000	134	2,261,918	0.06
All Specimen Admission Prevalence Rate	Number of first LabID events per patient per month identified during the first three days of hospital admission / Number of patient admissions to the hospital x 1000	1,441	2,261,918	0.64
Bloodstream Infection Incidence Rate	Number of all unique blood source LabID Events per patient per month identified >3 days after admission to the hospital / Number of patient days x 10,000	222	11,522,638	0.19
All Specimen Infection/Colonization[1] Incidence Rate	Number of first LabID Events per patient among those with no event with this specific organism type reported in a previous month at this hospital, and identified >3 days after admission to the hospital / Number of patient days x 10,000	1,310	11,522,638	1.14
Overall Patient Prevalence Rate	Number of first LabID Events per patient per month (e.g. admission prevalent or hospital onset) / Number of patient admissions to the hospital x 1000	3,149	2,261,918	1.39

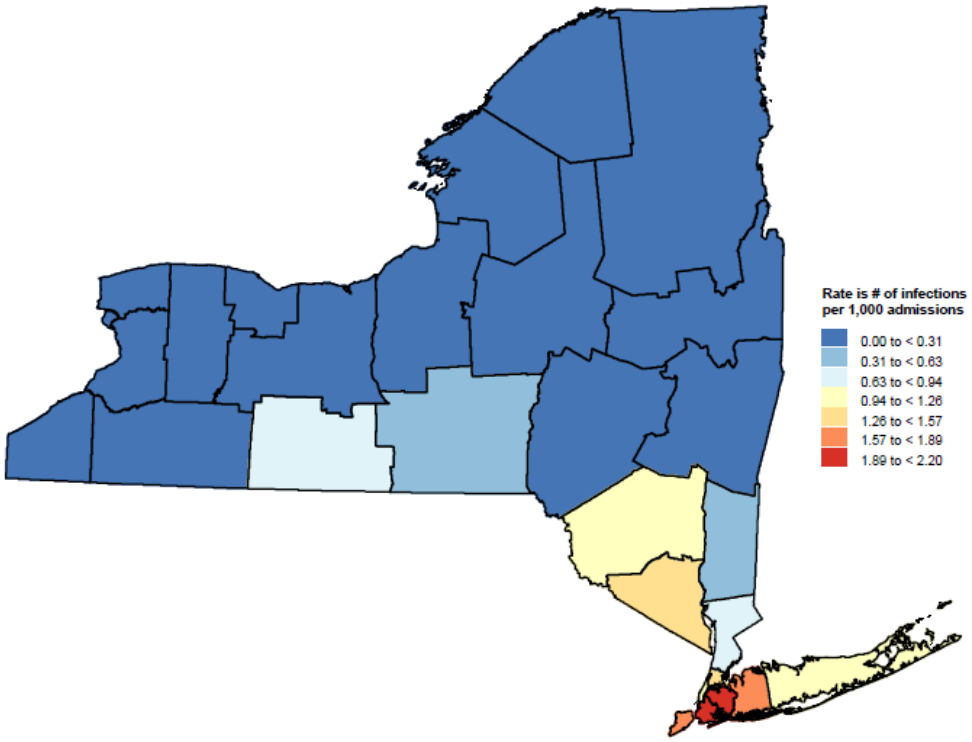
Data reported as of October 7, 2016. Inpatient rehab and pychiatric facility data excluded.

[1]Laboratory-identified surveillance does not differentiate between infection and colonization.

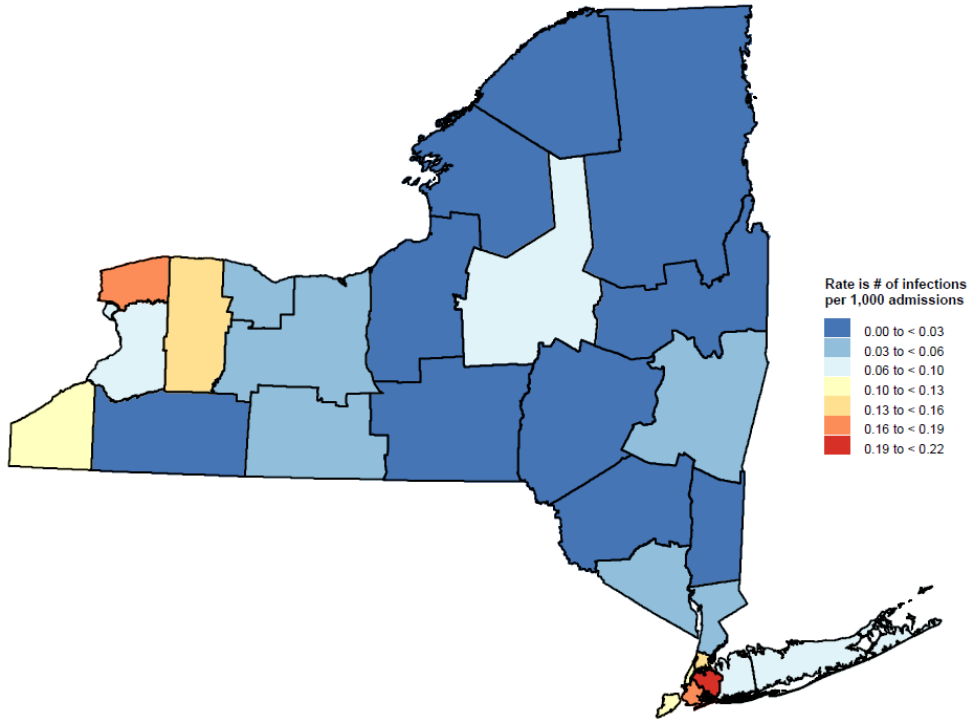
Figures 22 (a,b,c) show the FWI CRE patient prevalence rate by species and county (or merged county for those with no hospitals). FWI CRE-Klebsiella patient prevalence rates continue to be highest in the New York City area. FWI CRE-E. coli and CRE-Enterobacter rates are based on smaller numbers, and the maps show greater variability throughout the state. If the CRE-E. coli map used the same scale as the CRE-Klebsiella map, it would be entirely dark blue.

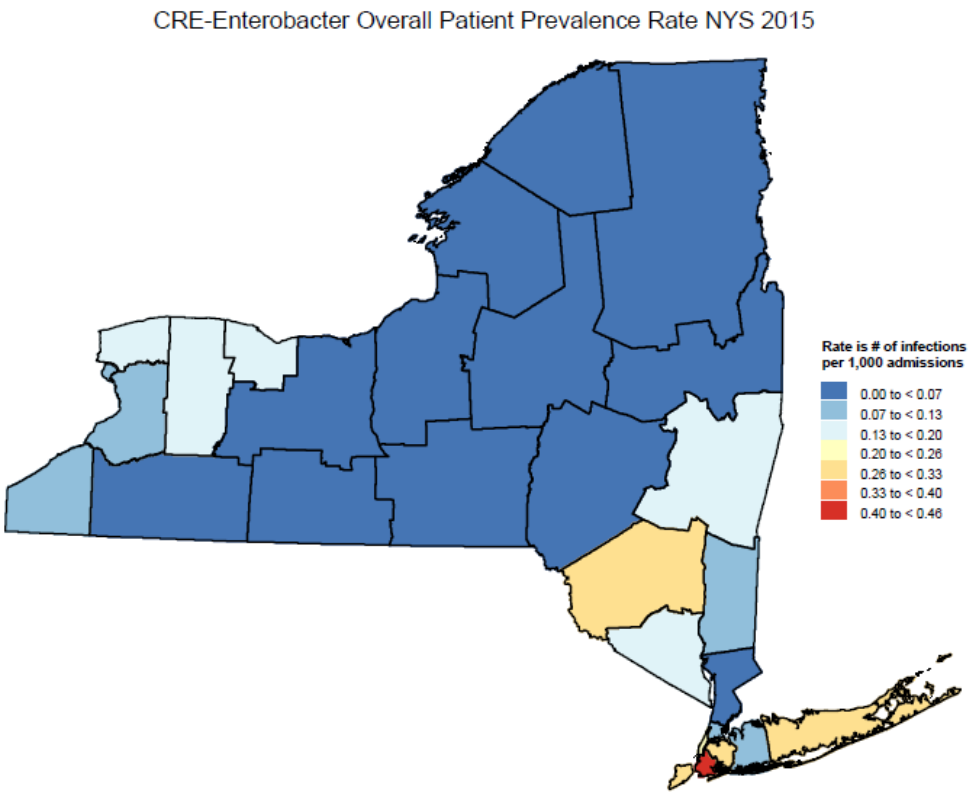
Figure 22 (a-c). Facility-wide Inpatient Carbapenem-resistant Enterobacteriaceae Patient Prevalence Rates, New York State 2015

CRE-Klebsiella Overall Patient Prevalence Rate NYS 2015



CRE-E. coli Overall Patient Prevalence Rate NYS 2015





Data reported as of October 7, 2016. Small counties have been merged.

Laboratory Testing Methods

All hospitals completed an NHSN survey summarizing their 2015 surveillance and testing methods at the beginning of 2016.

Breakpoints for determining whether an organism is susceptible, intermediate, or resistant to an antibiotic are published by the Clinical Laboratory Standards Institute (CLSI). However, the CLSI breakpoints are updated more frequently than they can be adopted by manufacturers of susceptibility testing systems because of additional approvals required by the Food and Drug Administration. According to the NHSN survey, 83% of facilities used the newer more sensitive (M22 or M23) breakpoints in 2015, while 17% continued to use the old breakpoints. The facilities using the older breakpoints may follow screening algorithms that incorporate additional testing to approximate the newer breakpoints. Identification of carbapenemases (enzymes that bacteria produce that destroy carbapenems), can also be used to meet the CRE LabID definition. Fifty percent of New York hospitals reported that they identify CRE cases by detecting the presence of a carbapenemase. Facilities using the older breakpoints or not detecting carbapenemases may be undercounting CRE, and testing differences may reduce the comparability of CRE rates between facilities.

There may also be variation in the extent to which facilities identify and perform susceptibility testing of non-sterile specimens. Laboratory identification of CRE can be achieved through several methods, all of which have benefits and drawbacks. There is no standardization for which method should be used in individual health care facility laboratories. As such, hospital-specific CRE rates, particularly in non-blood specimens, may vary based on testing methods.

Hospital-specific CRE rates

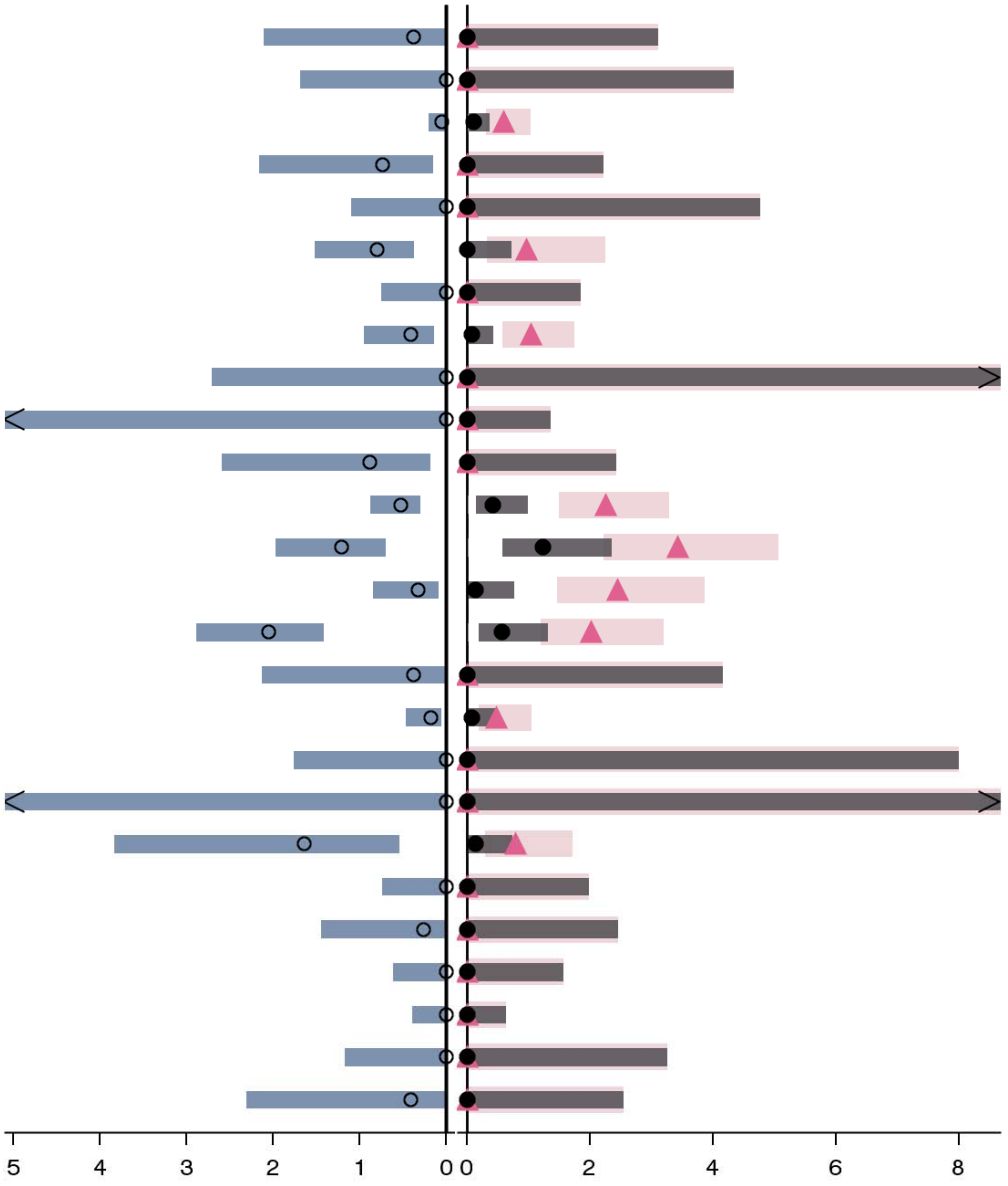
The primary HAI indicator of interest for evaluating hospital performance is the hospital onset BSI rate, because 1) blood specimens are more consistently screened by laboratories across the state; 2) bloodstream infections are very serious and more likely reflect clinical disease than infections detected from nonsterile body sites such as wounds[1]. The prevalence of CRE among patients newly admitted to facilities is also reported because this burden of admission prevalent cases is related to the risk of spread within the facility. The 2015 rates have not been risk adjusted because insufficient historical data was available to assess the models and because of concern about differences in testing. Therefore, no hospitals have been flagged (Figure 23).

Hospitals should review their HO BSI rates in relation to their admission prevalence rates as shown in this figure, e.g. hospitals with high HO rates and low admission prevalence rates should examine whether they are testing patients promptly (days 1-3) and if their cases were clustered. With respect to interpreting the all-site rates, note there are variations in the types of specimens reported among hospitals, e.g. some hospitals have a reported a very large proportion of urinary tract infections/colonizations, others reported a very large proportion of skin or respiratory infections/colonizations. More research is needed on CRE risk adjustment to balance the importance of accuracy and fairly comparing rates with the need for having a measure to identify hospitals with higher than predicted rates for public health assistance and quality improvement programs.

Hospitals should also continue to evaluate their infection prevention and control practices in relation to CDC recommendations. Challenges include imperfect compliance with handwashing, delays and/or variations in implementing contact precautions and appropriately cohorting patients, delays in discontinuing devices when they are no longer needed, and lack of established protocols to screen epidemiologically linked contacts and perform active surveillance testing in high-risk areas. In addition, the pressures of broad-spectrum antibiotic usage along with the interdependence of acute and long-term care facilities in the spread and transmission of CRE[2] and challenges promptly communicating infection control issues at the time of inter-facility transfer compound the complexity of CRE containment and prevention.

Figure 23. Hospital Carbapenem-Resistant Enterobacteriaceae Infection Rates, NYS 2015 (Page 1 of 7)

Hospital Name	# All AdmPrev	# Adms	AdmPrev Rate	HO-All Rate	HO-BSI Rate	# Patdays	# All	# BSI
AO Fox Memorial	1	2648	0.4	0.0	0.0	11927	0	0
Adirondack Medical	0	2190	0.0	0.0	0.0	8521	0	0
Albany Med Ctr	2	35851	0.1	0.6	0.1	204560	12	2
Albany Memorial	3	4063	0.7	0.0	0.0	16703	0	0
Alice Hyde Med Ctr	0	3376	0.0	0.0	0.0	7745	0	0
Arnot Ogden Med Ctr	9	11235	0.8	1.0	0.0	52003	5	0
Auburn Memorial	0	4957	0.0	0.0	0.0	20129	0	0
Bellevue Hospital	5	12275	0.4	1.0	0.1	135119	14	1
Bertrand Chaffee	0	1364	0.0	0.0	0.0	3724	0	0
Blythedale Childrens	0	626	0.0	0.0	0.0	27294	0	0
Bon Secours	3	3376	0.9	0.0	0.0	15305	0	0
Bronx-Lebanon	15	28314	0.5	2.2	0.4	120145	27	5
Brookdale Hospital	16	13174	1.2	3.4	1.2	73012	25	9
Brookhaven Memorial	4	12168	0.3	2.4	0.1	73752	18	1
Brooklyn Hosp Ctr	33	16080	2.1	2.0	0.6	89450	18	5
Brooks Memorial	1	2622	0.4	0.0	0.0	8876	0	0
Buffalo General	4	22012	0.2	0.5	0.1	126473	6	1
Burdett Care Center	0	2101	0.0	0.0	0.0	4618	0	0
Burke Rehab Hosp	0	317	0.0	0.0	0.0	2460	0	0
Calvary Hospital	5	3039	1.6	0.8	0.1	76609	6	1
Canton-Potsdam	0	4969	0.0	0.0	0.0	18781	0	0
Catskill Regional	1	3850	0.3	0.0	0.0	15086	0	0
Cayuga Medical Ctr	0	6007	0.0	0.0	0.0	23699	0	0
Champlain Valley	0	9448	0.0	0.0	0.0	59008	0	0
Claxton-Hepburn	0	3144	0.0	0.0	0.0	11366	0	0
Clifton Springs	1	2417	0.4	0.0	0.0	14528	0	0



Data reported as of 10/07/2016. Facility-wide inpatient only, rehab and behavioral health units excluded

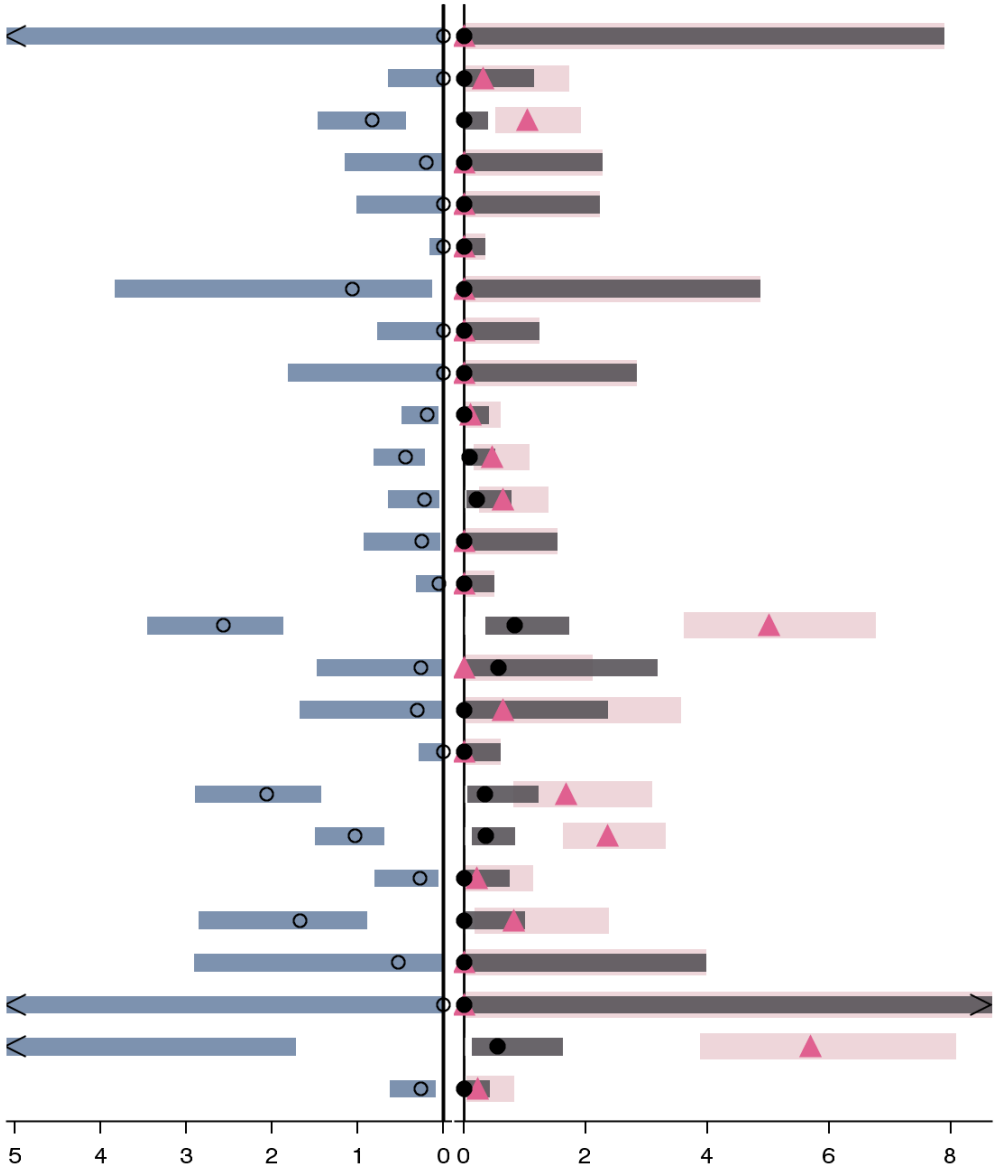
HO-All: hospital onset CRE incidence rate all sites per 10,000 patient days and 95% confidence interval (state average=1.1)

HO-BSI: hospital onset CRE blood incidence rate per 10,000 patient days and 95% confidence interval (state average=0.2)

All-Admprev: all body site CRE admissions prevalence rate per 1,000 admissions and 95% confidence interval (state average=0.6)

Figure 23. Hospital Carbapenem-Resistant Enterobacteriaceae Infection Rates, NYS 2015 (Page 2 of 7)

Hospital Name	# All AdmPrev	# Adms	AdmPrev Rate	HO-All Rate	HO-BSI Rate	# Patdays	# All	# BSI
Cobleskill Regional	0	663	0.0	0.0	0.0	4681	0	0
Columbia Memorial	0	5784	0.0	0.3	0.0	32500	1	0
Coney Island Hosp	12	14325	0.8	1.0	0.0	96069	10	0
Corning Hospital	1	4866	0.2	0.0	0.0	16305	0	0
Cortland Reg Med	0	3635	0.0	0.0	0.0	16610	0	0
Crouse Hospital	0	23513	0.0	0.0	0.0	109804	0	0
DeGraff Memorial	2	1883	1.1	0.0	0.0	7583	0	0
East. Niag. Lockport	0	4772	0.0	0.0	0.0	29902	0	0
Eastern Long Island	0	2031	0.0	0.0	0.0	13018	0	0
Ellis Hospital	4	21224	0.2	0.1	0.0	93820	1	0
Elmhurst Hospital	10	22700	0.4	0.5	0.1	109259	5	1
Erie County Med Ctr	3	13736	0.2	0.6	0.2	94596	6	2
FF Thompson	2	7806	0.3	0.0	0.0	24170	0	0
Faxton St. Lukes	1	17521	0.1	0.0	0.0	75802	0	0
Flushing Hospital	44	17115	2.6	5.0	0.8	83940	42	7
Geneva General	1	3773	0.3	0.0	0.6	17577	0	1
Glen Cove Hospital	1	3323	0.3	0.6	0.0	15686	1	0
Glens Falls Hospital	0	13102	0.0	0.0	0.0	62526	0	0
Good Samar. Suffern	33	15976	2.1	1.7	0.3	59538	10	2
Good Samar. W Islip	28	27078	1.0	2.4	0.4	140127	33	5
Harlem Hospital	3	10955	0.3	0.2	0.0	49668	1	0
HealthAlli Broadway	13	7780	1.7	0.8	0.0	36956	3	0
HealthAlli MarysAve	1	1914	0.5	0.0	0.0	9269	0	0
Helen Hayes Hospital	0	455	0.0	0.0	0.0	2882	0	0
Henry J. Carter	3	360	8.3	5.7	0.6	54458	31	3
Highland Hospital	5	18610	0.3	0.2	0.0	88317	2	0



Data reported as of 10/07/2016. Facility-wide inpatient only, rehab and behavioral health units excluded

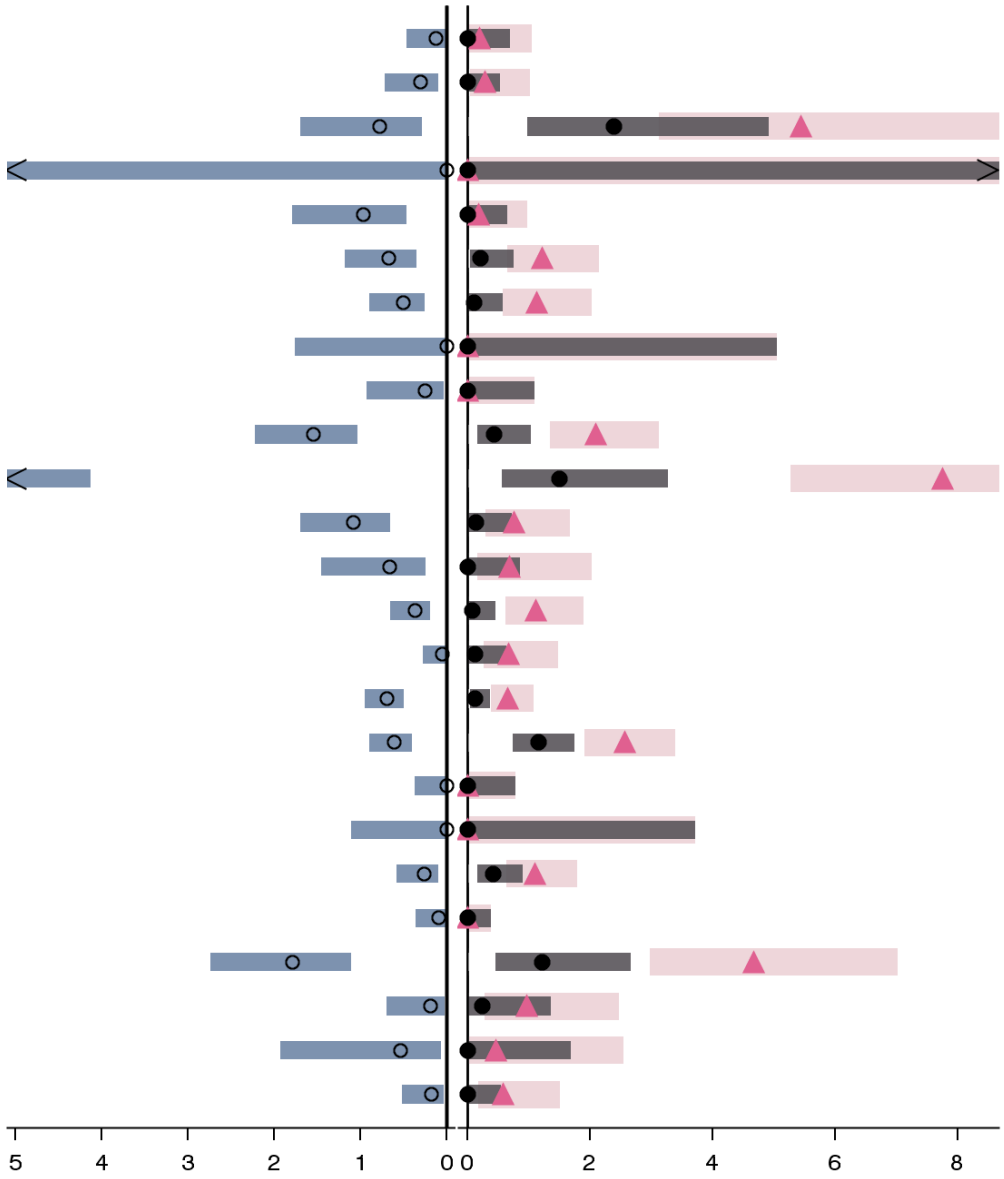
HO-All: hospital onset CRE incidence rate all sites per 10,000 patient days and 95% confidence interval (state average=1.1)

HO-BSI: hospital onset CRE blood incidence rate per 10,000 patient days and 95% confidence interval (state average=0.2)

All-Admprev: all body site CRE admissions prevalence rate per 1,000 admissions and 95% confidence interval (state average=0.6)

Figure 23. Hospital Carbapenem-Resistant Enterobacteriaceae Infection Rates, NYS 2015 (Page 3 of 7)

Hospital Name	# All AdmPrev	# Adms	AdmPrev Rate	HO-All Rate	HO-BSI Rate	# Patdays	# All	# BSI
Hosp for Spec Surg	2	15724	0.1	0.2	0.0	53757	1	0
Huntington Hospital	5	16391	0.3	0.3	0.0	71858	2	0
Interfaith Med Ctr	6	7677	0.8	5.4	2.4	29408	16	7
Ira Davenport	0	599	0.0	0.0	0.0	2340	0	0
JT Mather Hospital	10	10261	1.0	0.2	0.0	58047	1	0
Jacobi Med Ctr	12	17791	0.7	1.2	0.2	98370	12	2
Jamaica Hospital	11	21847	0.5	1.1	0.1	97620	11	1
Jones Memorial	0	2102	0.0	0.0	0.0	7317	0	0
Kenmore Mercy	2	7769	0.3	0.0	0.0	34202	0	0
Kings County Hosp	29	18722	1.5	2.1	0.4	114884	24	5
Kingsbrook Jewish MC	37	6310	5.9	7.8	1.5	39983	31	6
LIJ at Forest Hills	19	17514	1.1	0.8	0.1	78703	6	1
LIJ at Valley Stream	6	8987	0.7	0.7	0.0	43555	3	0
Lenox Hill Hospital	12	32078	0.4	1.1	0.1	125159	14	1
Lincoln Med Ctr	1	20660	0.0	0.7	0.1	89374	6	1
Long Isl Jewish(LIJ)	40	57726	0.7	0.7	0.1	243706	16	3
Maimonides Med Ctr	26	42418	0.6	2.6	1.1	191442	49	22
Mary Imogene Bassett	0	10035	0.0	0.0	0.0	48044	0	0
Massena Memorial	0	3347	0.0	0.0	0.0	9937	0	0
Memor SloanKettering	6	22471	0.3	1.1	0.4	145775	16	6
Mercy Hosp Buffalo	2	20015	0.1	0.0	0.0	98853	0	0
Mercy Med Ctr	21	11714	1.8	4.7	1.2	49188	23	6
Metropolitan Hosp	2	10331	0.2	1.0	0.2	41511	4	1
MidHudson Reg of WMC	2	3751	0.5	0.5	0.0	21930	1	0
Millard Fill. Suburb	3	17013	0.2	0.6	0.0	68320	4	0



Data reported as of 10/07/2016. Facility-wide inpatient only, rehab and behavioral health units excluded

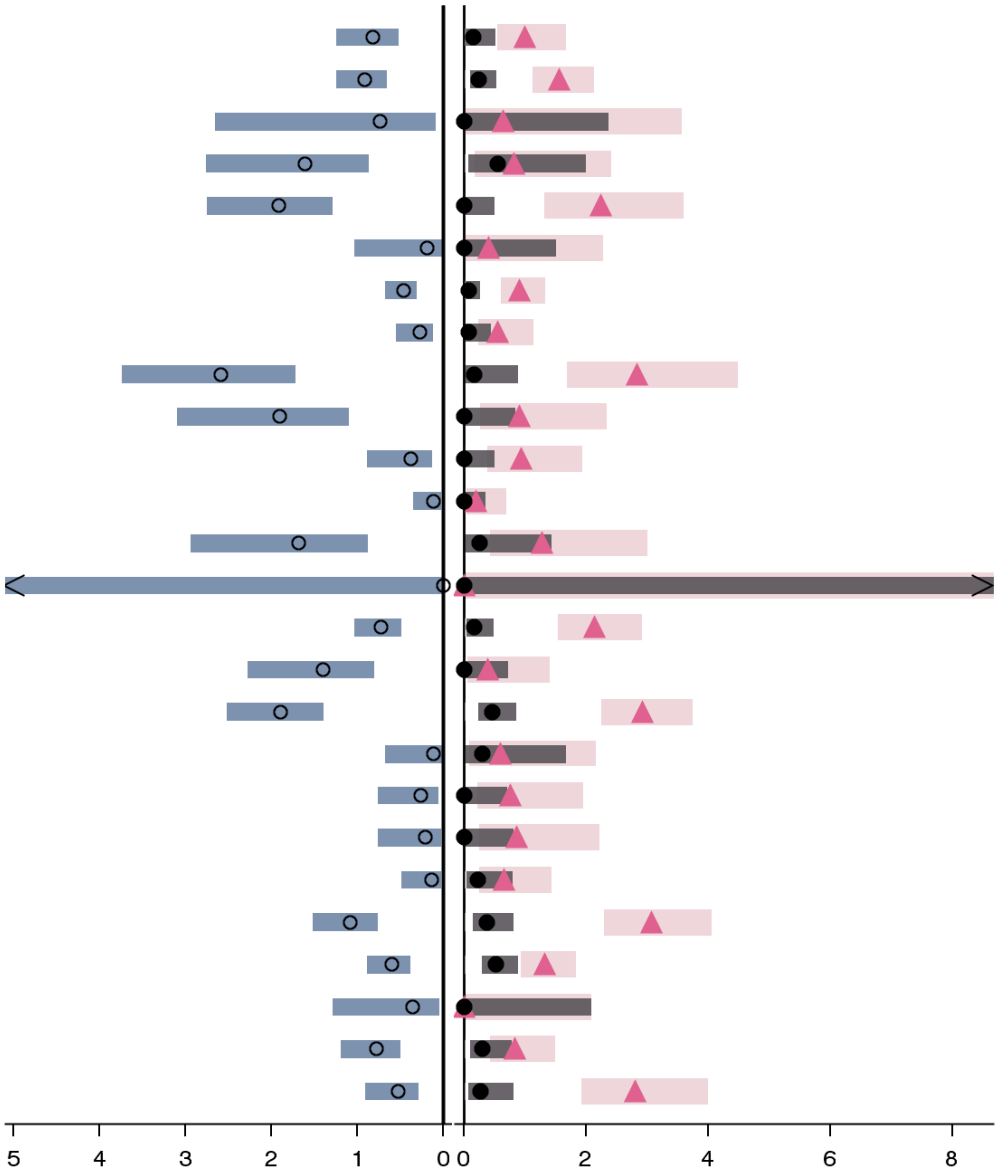
HO-All: hospital onset CRE incidence rate all sites per 10,000 patient days and 95% confidence interval (state average=1.1)

HO-BSI: hospital onset CRE blood incidence rate per 10,000 patient days and 95% confidence interval (state average=0.2)

All-Admprev: all body site CRE admissions prevalence rate per 1,000 admissions and 95% confidence interval (state average=0.6)

Figure 23. Hospital Carbapenem-Resistant Enterobacteriaceae Infection Rates, NYS 2015 (Page 4 of 7)

Hospital Name	# All AdmPrev	# Adms	AdmPrev Rate	HO-All Rate	HO-BSI Rate	# Patdays	# All	# BSI
Montefiore-Einstein	22	26786	0.8	1.0	0.1	141627	14	2
Montefiore-Moses	41	44740	0.9	1.6	0.2	250958	39	6
Montefiore-Mt Vernon	2	2724	0.7	0.6	0.0	15658	1	0
Montefiore-NewRochl	13	8055	1.6	0.8	0.5	36466	3	2
Montefiore-Wakefield	29	15163	1.9	2.2	0.0	75820	17	0
Mount St. Marys	1	5395	0.2	0.4	0.0	24582	1	0
Mt Sinai	26	56395	0.5	0.9	0.1	287976	26	2
Mt Sinai Beth Israel	8	28644	0.3	0.5	0.1	128654	7	1
Mt Sinai Brooklyn	28	10821	2.6	2.8	0.2	63630	18	1
Mt Sinai Queens	16	8384	1.9	0.9	0.0	44115	4	0
Mt Sinai St Lukes	5	13136	0.4	0.9	0.0	74829	7	0
Mt Sinai West	3	25539	0.1	0.2	0.0	106695	2	0
NY Community Hosp	12	7119	1.7	1.3	0.3	39056	5	1
NY Eye&Ear Mt Sinai	0	410	0.0	0.0	0.0	839	0	0
NY Methodist	30	41522	0.7	2.1	0.2	187317	40	3
NYP-Allen	16	11410	1.4	0.4	0.0	51963	2	0
NYP-Columbia	47	24772	1.9	2.9	0.5	215910	63	10
NYP-Hudson Valley	1	8293	0.1	0.6	0.3	33689	2	1
NYP-Lawrence	3	11519	0.3	0.8	0.0	52763	4	0
NYP-Lower Manhattan	2	9553	0.2	0.9	0.0	46227	4	0
NYP-Morgan Stanley	2	14958	0.1	0.7	0.2	91423	6	2
NYP-Queens	34	31225	1.1	3.1	0.4	163078	50	6
NYP-Weill Cornell	24	40196	0.6	1.3	0.5	266549	35	14
NYU Joint Diseases	2	5630	0.4	0.0	0.0	17809	0	0
NYU Langone Med Ctr	22	28064	0.8	0.8	0.3	132162	11	4
NYU Lutheran	13	24576	0.5	2.8	0.3	110459	31	3



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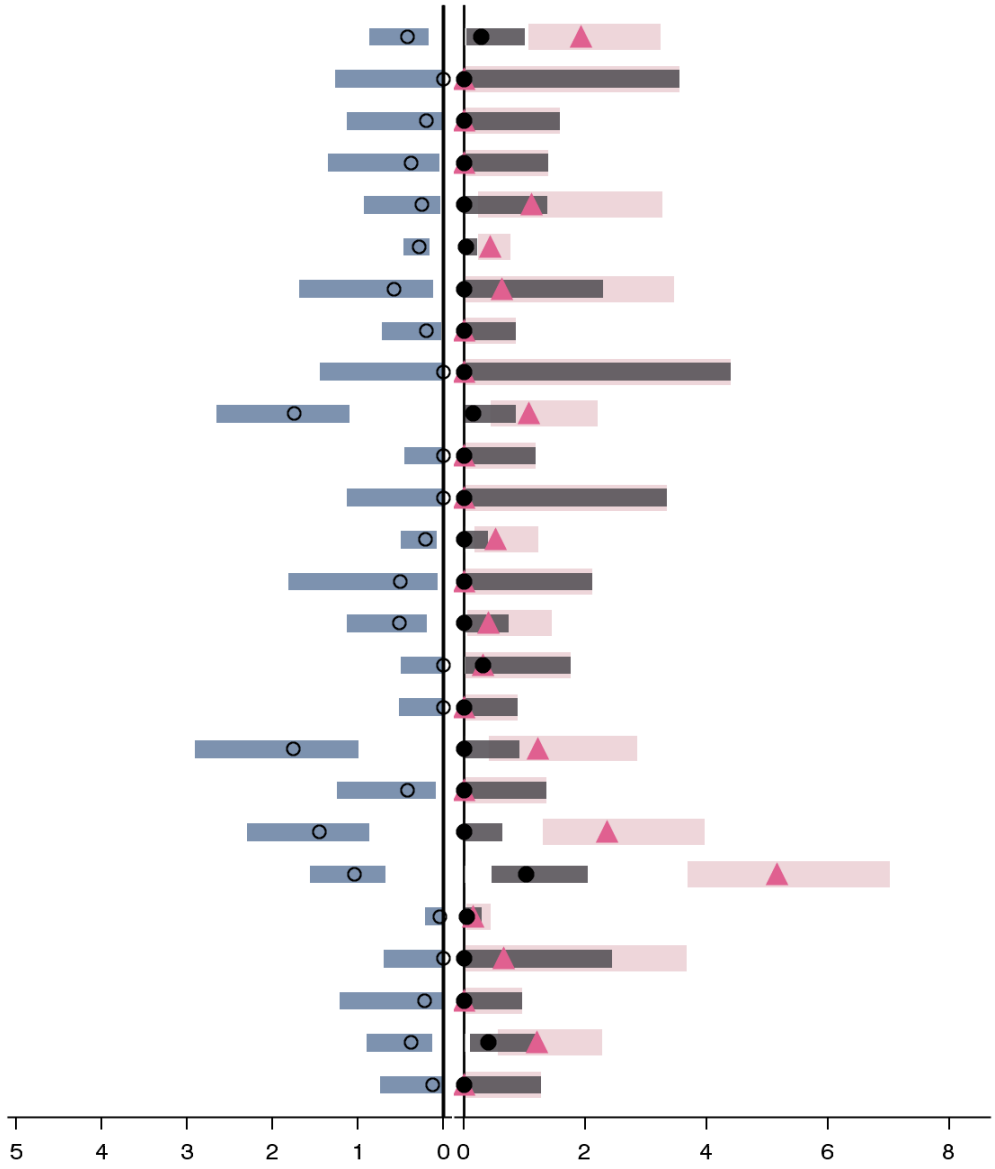
HO-BSI: hospital onset CRE blood incidence rate per 10,000 patient days and 95% confidence interval (state average=0.2)

All-Admprev: all body site CRE admissions prevalence rate per 1,000 admissions and 95% confidence interval (state average=0.6)

Figure 23. Hospital Carbapenem-Resistant Enterobacteriaceae Infection Rates, NYS 2015 (Page 5 of 7)

Hospital Name	# All AdmPrev	# Adms	AdmPrev Rate	HO-All Rate	HO-BSI Rate	# Patdays	# All	# BSI
Nassau University	7	16660	0.4	1.9	0.3	72683	14	2
Nathan Littauer	0	2928	0.0	0.0	0.0	10400	0	0
Newark Wayne	1	4936	0.2	0.0	0.0	23415	0	0
Niagara Falls	2	5336	0.4	0.0	0.0	26657	0	0
North Central Bronx	2	7749	0.3	1.1	0.0	26914	3	0
North Shore	15	52899	0.3	0.4	0.0	277787	12	1
Northern Dutchess	3	5185	0.6	0.6	0.0	16110	1	0
Northern Westchester	2	10048	0.2	0.0	0.0	43325	0	0
Noyes Memorial	0	2562	0.0	0.0	0.0	8397	0	0
Nyack Hospital	22	12568	1.8	1.1	0.2	65942	7	1
Olean General	0	8075	0.0	0.0	0.0	31418	0	0
Oneida Healthcare	0	3280	0.0	0.0	0.0	11062	0	0
OrangeReg Goshen-Mid	5	23504	0.2	0.5	0.0	95503	5	0
Oswego Hospital	2	3975	0.5	0.0	0.0	17474	0	0
Our Lady of Lourdes	6	11540	0.5	0.4	0.0	50392	2	0
Peconic Bay Medical	0	7499	0.0	0.3	0.3	31948	1	1
Phelps Memorial	0	7094	0.0	0.0	0.0	42185	0	0
Plainview Hospital	15	8514	1.8	1.2	0.0	40977	5	0
Putnam Hospital	3	7077	0.4	0.0	0.0	27470	0	0
Queens Hospital	18	12358	1.5	2.4	0.0	59336	14	0
Richmond Univ MC	24	22969	1.0	5.2	1.0	77648	40	8
Rochester General	1	26775	0.0	0.1	0.0	202831	3	1
Rome Memorial	0	5332	0.0	0.7	0.0	15200	1	0
Roswell Park	1	4592	0.2	0.0	0.0	38736	0	0
SUNY Downstate MedCr	5	13068	0.4	1.2	0.4	75199	9	3
Samaritan- Troy	1	7592	0.1	0.0	0.0	29431	0	0



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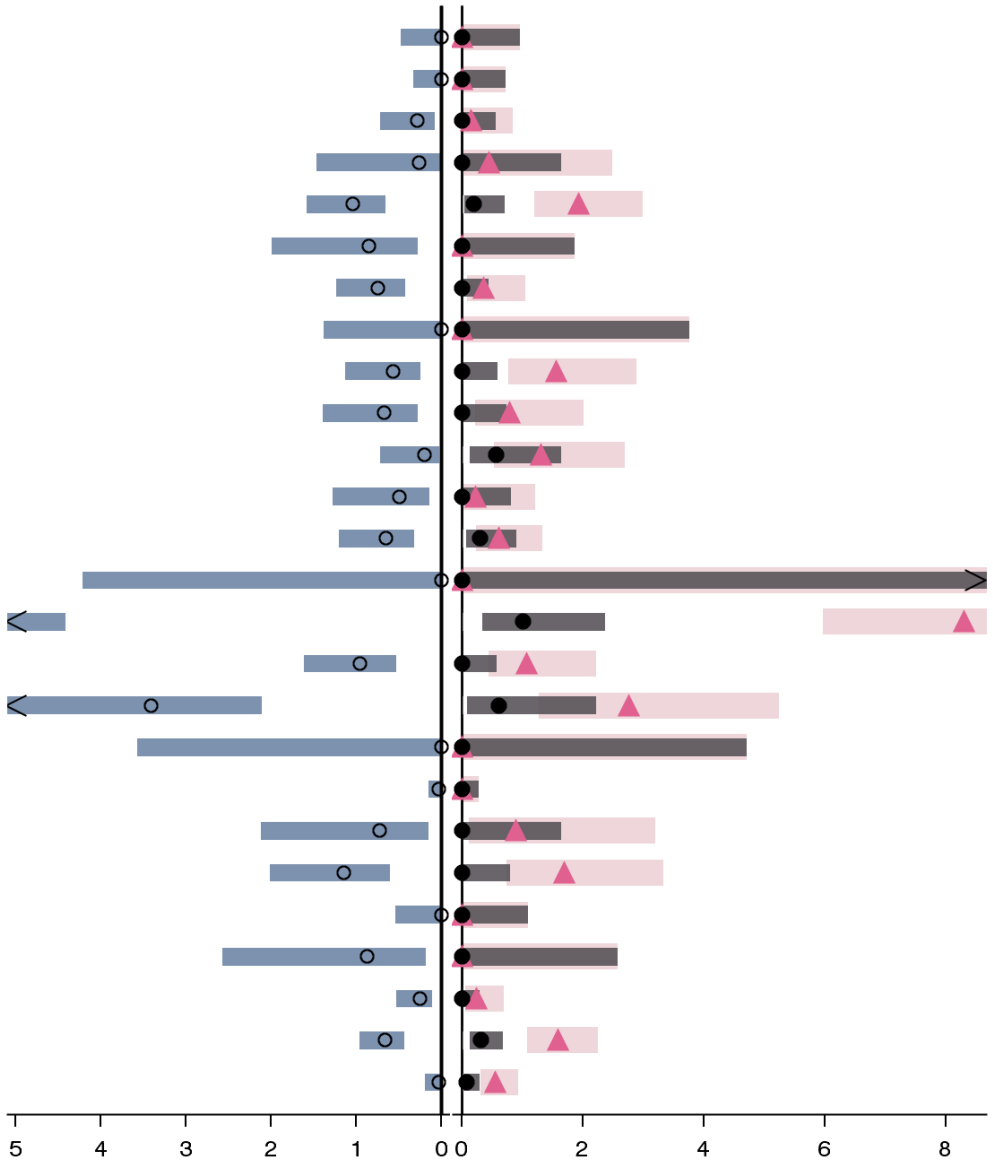
HO-All: hospital onset CRE incidence rate all sites per 10,000 patient days and 95% confidence interval (state average=1.1)

HO-BSI: hospital onset CRE blood incidence rate per 10,000 patient days and 95% confidence interval (state average=0.2)

All-Admprev: all body site CRE admissions prevalence rate per 1,000 admissions and 95% confidence interval (state average=0.6)

Figure 23. Hospital Carbapenem-Resistant Enterobacteriaceae Infection Rates, NYS 2015 (Page 6 of 7)

Hospital Name	# All AdmPrev	# Adms	AdmPrev Rate	HO-All Rate	HO-BSI Rate	# Patdays	# All	# BSI
Samaritan- Watertown	0	7821	0.0	0.0	0.0	39049	0	0
Saratoga Hospital	0	11334	0.0	0.0	0.0	51782	0	0
Sisters of Charity	4	14235	0.3	0.1	0.0	67120	1	0
Sisters- St Joseph	1	3813	0.3	0.4	0.0	22575	1	0
South Nassau Comm.	22	21037	1.0	1.9	0.2	103609	20	2
Southampton	5	5847	0.9	0.0	0.0	19975	0	0
Southside	15	20127	0.7	0.4	0.0	84724	3	0
St Anthony	0	2679	0.0	0.0	0.0	9846	0	0
St Barnabas	8	14009	0.6	1.6	0.0	63966	10	0
St Catherine Siena	7	10333	0.7	0.8	0.0	51087	4	0
St Charles Hospital	2	10065	0.2	1.3	0.6	53809	7	3
St Elizabeth Medical	4	8018	0.5	0.2	0.0	46202	1	0
St Francis- Roslyn	10	15265	0.7	0.6	0.3	98707	6	3
St James Mercy	0	876	0.0	0.0	0.0	2611	0	0
St Johns Episcopal	56	9583	5.8	8.3	1.0	49435	41	5
St Johns Riverside	14	14557	1.0	1.1	0.0	65450	7	0
St Joseph -Bethpage	21	6158	3.4	2.8	0.6	32689	9	2
St Josephs- Elmira	0	1032	0.0	0.0	0.0	7848	0	0
St Josephs- Syracuse	1	36563	0.0	0.0	0.0	141142	0	0
St Josephs- Yonkers	3	4147	0.7	0.9	0.0	22633	2	0
St LukesNewburgh-Cor	12	10411	1.2	1.7	0.0	47370	8	0
St Marys Amsterdam	0	6930	0.0	0.0	0.0	33929	0	0
St Marys Troy	3	3412	0.9	0.0	0.0	14367	0	0
St Peters Hospital	7	27395	0.3	0.2	0.0	128738	3	0
Staten Island U N-S	27	40806	0.7	1.6	0.3	196061	31	6
Strong Memorial	1	30180	0.0	0.5	0.1	256405	14	2



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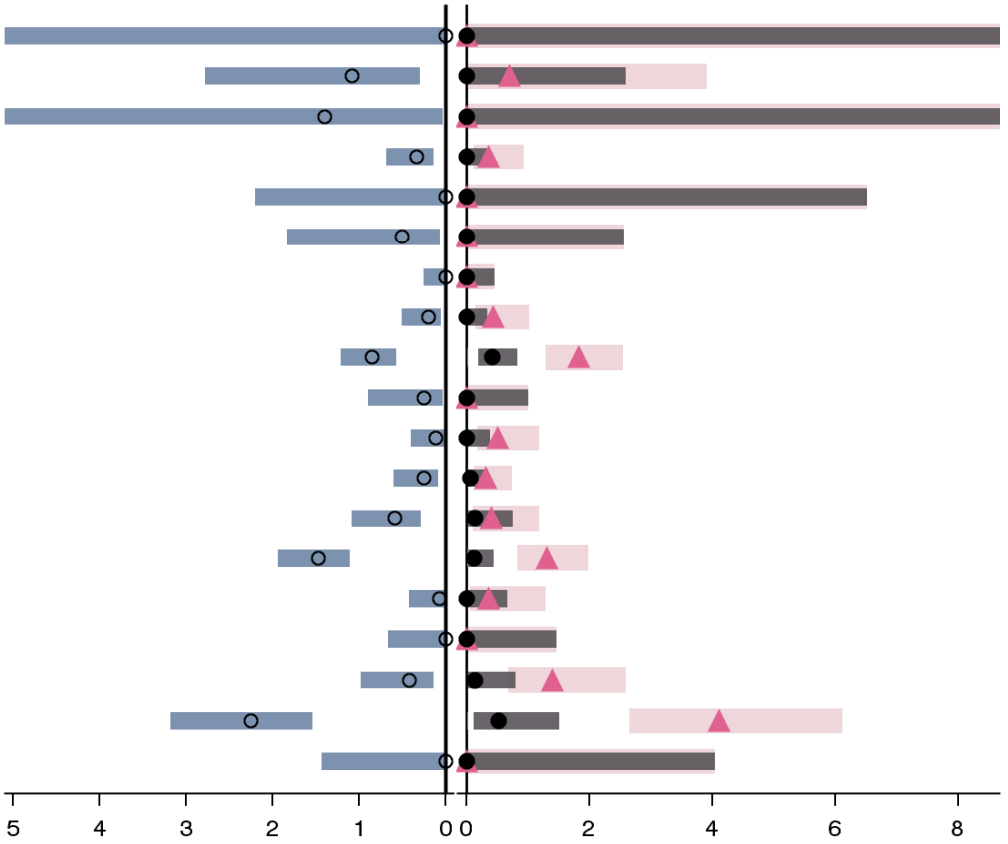
HO-BSI: hospital onset CRE blood incidence rate per 10,000 patient days and 95% confidence interval (state average=0.2)

All-Admprev: all body site CRE admissions prevalence rate per 1,000 admissions and 95% confidence interval (state average=0.6)

Figure 23. Hospital Carbapenem-Resistant Enterobacteriaceae Infection Rates, NYS 2015 (Page 7 of 7)

Hospital Name	# All AdmPrev	# Adms	AdmPrev Rate	HO-All Rate	HO-BSI Rate	# Patdays	# All	# BSI
Sunnyview Rehab Hosp	0	512	0.0	0.0	0.0	3791	0	0
Syosset Hospital	4	3688	1.1	0.7	0.0	14286	1	0
TLC Lake Shore	1	713	1.4	0.0	0.0	2093	0	0
UHS Bingham/Wilson	7	21004	0.3	0.4	0.0	110780	4	0
UHS Chenango Memor	0	1677	0.0	0.0	0.0	5668	0	0
United Memorial	2	3950	0.5	0.0	0.0	14471	0	0
Unity Hosp Rochester	0	14628	0.0	0.0	0.0	81757	0	0
Univ Hosp SUNY Upst	4	20173	0.2	0.4	0.0	115492	5	0
Univ Hosp StonyBrook	30	35263	0.9	1.8	0.4	192062	35	8
Upst. Community Gen	2	8036	0.2	0.0	0.0	37139	0	0
Vassar Brothers	2	17877	0.1	0.5	0.0	99841	5	0
Westchester Medical	5	19488	0.3	0.3	0.1	161980	5	1
White Plains Hosp	10	16925	0.6	0.4	0.1	74476	3	1
Winthrop University	52	35130	1.5	1.3	0.1	168856	22	2
Woman and Childrens	1	13104	0.1	0.4	0.0	56415	2	0
Womans Christian	0	5551	0.0	0.0	0.0	25451	0	0
Woodhull Med Ctr	5	11862	0.4	1.4	0.1	71420	10	1
Wyckoff Heights	32	14207	2.3	4.1	0.5	58429	24	3
Wyoming County Comm.	0	2577	0.0	0.0	0.0	9153	0	0



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All-Admprev: all body site CRE admissions prevalence rate per 1,000 admissions and 95% confidence interval (state average=0.6)

Trends in CRE

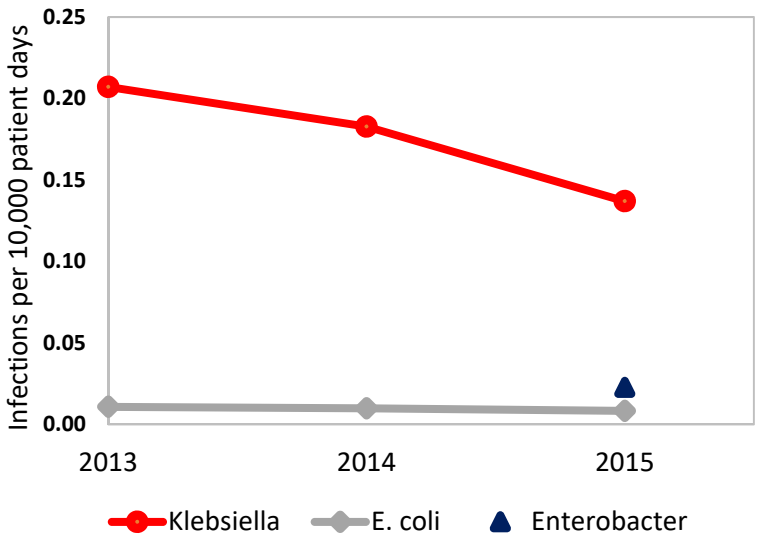
The annual changes in the LabID CDI protocol are summarized in Table 30.

Table 30. CRE LabID surveillance definition changes

Year	Description
2013	CRE is defined as any *E. coli* or *Klebsiella* species testing resistant or intermediate to doripenem, imipenem or meropenem in any inpatient location.
2014	Clarification – date of admission is date patient arrived on inpatient location
2015	Addition of *Enterobacter* species, specify only *K. pneumoniae* and *K. oxytoca* species (exclude reporting of other *Klebsiella spp*), change in definition of carbapenem resistance (add ertapenem and drop intermediate susceptibility), addition of any Emergency department location and Observation unit locations for Facility-wide-In reporting, separate reporting of IRF and IPF numerator and denominator data if different CCN.

Trends in the BSI Incidence rates by species are shown for informational purposes in Figure 24. The amount of improvement cannot be quantified due to significant definition changes.

Figure 24. Trend in Carbapenem-Resistant Enterobacteriaceae Bloodstream Infection Incidence Rate by Species



Data reported as of October 7, 2016. 2015 FWI, IRF and IPF data were combined for consistency with previous years. Enterobacter reporting began in 2015.

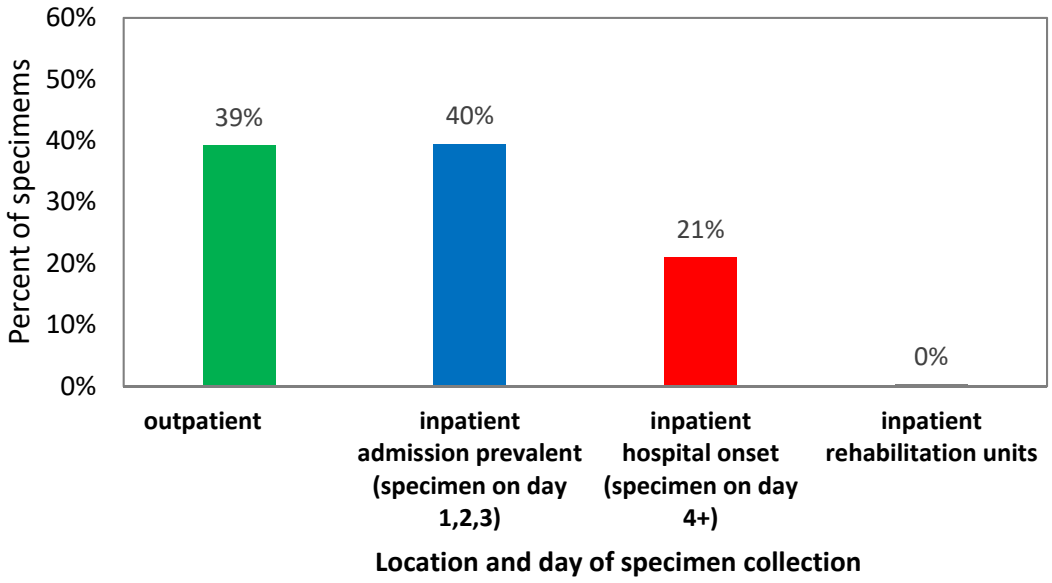
Other LabID MDROs

Methicillin-resistant *Staphylococcus aureus* (MRSA) Infections

LabID MRSA infections are resistant to oxacillin, cefoxitin, or methicillin. In 2015, 174 hospitals reported MRSA BSIs for participation in CMS incentive programs. MRSA is not a NYS indicator because the majority of cases are not hospital onset.

In 2015, approximately 39% of MRSA BSIs were identified in ED/OBS units, 40% were identified in FWI areas during the first three days of hospitalization, and 21% were identified in FWI areas after the first three days of inpatient stay (Figure 25). Only a quarter of a percent were identified in rehabilitation units.

Figure 25. Methicillin-resistant Staphylococcus aureus bloodstream infection onset, New York State, 2015



A total of 775 HO MRSA BSIs occurred in 11,541,712 FWI patient days, giving a hospital onset MRSA BSI incidence rate of 0.67 per 10,000 patient days.

Consistent with the NHSN definition changes described for CDI and CRE, the 2015 MRSA surveillance definition changed to exclude certain parts of the hospital from the "facility-wide inpatient" area and to add reporting of specimens collected in emergency rooms. It was not possible to adjust for this trend because the hospitals did not track MRSA in IPFs as they did for CDI and CRE. Crude trends in the MRSA BSI incidence rates are shown for informational purposes in Table 31, but conclusions on progress in 2015 cannot be deduced.

Table 31. MRSA bloodstream infections, New York State 2013-2015

Year	# Hosp	# Hospital Onset Infections	# Patient Days	Hospital Onset Incidence Rate[2] (per 10,000 patient days)
2013	176	856	13,056,440	0.656
2014	174	867	12,930,231	0.671
2015	174	775	11,541,712	0.671

New York State data reported as of September 23, 2016. 2013 data annualized to the number of cases expected in the full year because data use agreement was implemented in May 2013. Beginning in 2015, data from inpatient rehabilitation units (IRF) and inpatient psychiatric units (IPF) with the same CMS certification number as the rest of the hospital were excluded.

Vancomycin-resistant Enterococci (VRE)

Enterococci are bacteria normally found in the human intestines. These bacteria sometimes cause infections in people who take antibiotics for a long time, have weakened immune systems, are hospitalized, or use catheters. When enterococci are resistant to the antibiotic vancomycin, they are called VRE. If a person has an infection caused by VRE it may be more difficult to treat.

A group of 26 hospitals in NYS (15 in NYC, 11 Upstate/Long Island) voluntarily performed VRE surveillance using NHSN in 2015. A total of 528 cases were reported among 242,150 FWI admissions. The majority (57%) were urinary tract infections, while 22% were skin/soft tissue infections, 11% were bloodstream infections, and 4% were digestive system infections. Cases were hospital-onset 50% of the time. A total of 29 incident hospital onset BSIs and 29 admission prevalent BSIs were reported in the inpatient (non-ED) sample, for a HO BSI incidence rate of 0.25 per 10,000 patient days. Extrapolating this small sample by region we would have expected a total of approximately 265 HO VRE BSIs if all hospitals had reported. However, the hospitals that voluntarily report may not be representative of all NYS hospitals.

Multi-drug resistant Acinetobacter (MDR- Acinetobacter)

Acinetobacter is a type of bacteria commonly found in soil and water and sometimes on the skin. These bacteria sometimes cause infections such as pneumonia, and patients on ventilators are particularly at risk. When Acinetobacter are non-susceptible to at least one agent in at least three of the following antimicrobial classes (beta-lactams, aminoglycosides, carbapenems, fluoroquinolones, cephalosporins, sulbactam), they are called MDR-Acinetobacter. If a person has an infection caused by MDR-Acinetobacter it may be more difficult to treat.

A group of 30 hospitals in NYS (16 in NYC, 14 Upstate/Long Island) voluntarily performed MDR-Acinetobacter surveillance using NHSN in 2015. A total of 298 cases were reported

among 258,826 FWI admissions. The majority (53%) were respiratory tract infections, while 21% were skin/soft tissue infections, 14% were urinary tract infections, and 8% were bloodstream infections. Inpatient (non-ED) cases were hospital-onset 62% of the time. A total of 21 incident BSIs were reported in the sample, for a HO BSI incidence rate of 0.18 per 10,000 patient days. Extrapolating this small sample by region, we would have expected a total of approximately 183 hospital onset MDR-Acinetobacter BSIs if all hospitals had reported. Again, these hospitals may not be representative of all NYS hospitals.

Mortality related to CDI and MDROs

NHSN does not collect data on mortality associated with CDI/MDROs. However, by applying information published in the scientific literature to the NYS population, it is possible to estimate the number of deaths associated with these infections in NYS.

The attributable mortality rate is the death rate among a group of people with the infection minus the death rate among a similar (matched) group of people without the infection. The attributable death rates for five types of infections are summarized in Table 32. CRE BSIs have the highest attributable death rate due to the severity of bloodstream infections and the difficulty in treating this particular organism with a safe and effective antibiotic. More details on the derivation of these rates are provided in Appendix 2.

To estimate how many deaths were attributable to these infections in NYS, the derived attributable mortality rate was multiplied by the total number of reported infections. Only bloodstream infections were counted for CRE, VRE, and MDR-Acinetobacter. Based on this analysis, CDI resulted in the largest number of deaths; even though the attributable death rate is relatively low, the number of people with CDI is very large. MRSA resulted in the second largest number of deaths. The total number of estimated CDI, MRSA, VRE, and MDR-Acinetobacter deaths greatly exceeds the number of deaths due to other well-known infections such as AIDS (628), influenza (170), and tuberculosis (42) reported in NYS in 2014.[3]

Table 32. New York State hospital mortality estimates, 2015

Infection	% Attributable Deaths[3]	# Cases Total[4]	# Hospital Onset Cases	# Deaths Total	# Deaths from Hospital Onset Cases
Clostridium difficile[1]	6%	18,712	7,855	1,123	471
MRSA BSI	20%	2,233	775	447	155
CRE BSI[1]	38%	356	222	135	84
VRE BSI[2]	28%	510	265	143	74
MDR-Acinetobacter BSI[2]	22%	214	183	47	40
Total		22,025	9,300	1,895	824

NHSN facility-wide inpatient data downloaded 10/07/2015 for CDI, CRE, or 9/23/2016 for MRSA, VRE, and MDR- Acinetobacter. BSI=bloodstream infection.

[1] Only counting one infection per person.

[2] Based on small sample of voluntary reporters

[3] Based on estimations from scientific literature, see Appendix 2

[4] Total cases = community and hospital onset.

MDRO Prevention Practices

NHSN requires all facilities to submit an annual survey. Table 33 summarizes the self-reported 2015 survey results related to MDRO prevention practices.

Table 33. MDRO Prevention Practice Survey, New York State Hospitals 2015

Does the facility routinely place patients infected or colonized with CRE on contact precautions?	
Yes, all infected or colonized patients	93%
Yes, only all infected patients	3%
Yes, only those with high-risk for transmission	4%
No	0%
Facility routinely performs screening cultures for CRE?	11%
Facility uses chlorhexidine bathing to prevent transmission of MDROs?	61%
How often your facility received information from the transferring facility about their MDRO status	
All of the time	15%
More than half of the time	47%
About half of the time	21%
Less than half of the time	11%
Never	5%
Not applicable	1%

National Healthcare Safety Network 2015 Survey, downloaded 7/7/2016. Results are out of 175 hospitals.

Results from the 2015 were very similar to results reported in 2014. Although 93% of facilities responded that they put colonized and/or infected patients on contact precautions, this data should be interpreted cautiously, especially in areas of high CRE prevalence and incidence. The implementation of "Contact Precautions", i.e., the donning of personal protective equipment (PPE - gowns, gloves, and in some cases masks), has many variations between facilities and even within facilities. Some policies require all persons, i.e. healthcare workers and visitors, who enter a contact isolation room to don PPE; others exclude visitors from wearing PPE.

The last survey question highlights the need to more fully involve LTCFs in surveillance and reporting of CRE, particularly in communicating CRE information to the receiving (acute care) facility. In September 2016 CMS finalized a new rule that revises the Conditions of Participation for LTCFs, requiring LTCFs to have an infection prevention and control officer and an antibiotic stewardship program that includes antibiotic use protocols and a system to monitor antibiotic use.

Antimicrobial Stewardship

Healthcare providers and public health officials have a common interest in ensuring antibiotics are used appropriately in order to reduce the development of antibiotic resistant organisms and to address patient safety concerns associated with overuse. In March 2015, the National Action Plan for Combating Antibiotic-Resistant Bacteria (CARB) was published and includes detailed, national actions to address antimicrobial resistance (AR) across multiple settings. Specific actions were proposed to address AR in health care including: changes to regulatory requirements, measures to support the use of NHSN in monitoring antibiotic use, support for prevention activities to help identify and limit the spread of AR organisms, and actions to support the judicious use of antimicrobial agents, including antimicrobial stewardship programs (ASPs). The CARB Plan identified the specific goal of having ASPs in all acute healthcare settings.[4]

Hospital ASPs help ensure that each patient receives "the right antibiotic, at the right dose, at the right time, and for the right duration".[5] Guidelines on implementing ASPs in acute care settings are available from professional societies and from the CDC.[6, 7, 8] ASPs have been shown to improve patient health. For example, use of antibiotics is the biggest risk factor for CDI. Improved prescribing of antibiotics reduces CDI.[9, 10, 11] ASPs also decrease the risk of developing resistant infections.[12, 13] People infected with resistant organisms require more complicated treatment and may have longer hospital stays. By decreasing antimicrobial use and improving patient outcomes, comprehensive ASPs have reduced healthcare costs in both large academic hospitals and small community hospitals. [14]

Information on 2014 and 2015 stewardship programs was obtained from the NHSN annual survey. Overall, the percentage of hospitals which report having an ASP with all seven Core Elements has increased (Table 34). Acute care hospitals are encouraged to review their antimicrobial stewardship efforts against CDC guidelines and take action to implement programs concordant with these guidelines. Involvement and engagement of clinical leadership and technical experts are critical to establishing a successful stewardship program. NYSDOH strongly recommends that hospitals measure antibiotic use using the NHSN established definitions to create baseline data and identify opportunities for targeted interventions. When barriers such as gaps in infectious disease or clinical pharmacy expertise are identified, hospitals may consider innovative approaches, such as telemedicine, as potential options to explore. Additionally, opportunities for participation in collaborative activities to support antimicrobial stewardship are available across the state. Professional associations in NYS have offered in-person and web-based training opportunities for clinicians to improve knowledge and understanding of antimicrobial stewardship among potential ASP leaders. Antimicrobial stewardship is also included as part of ongoing quality improvement projects being conducted by NYS's CMS Quality Improvement Organization (QIO).

Table 34. Antimicrobial stewardship programs in NYS hospitals, 2014 and 2015 surveys

CDC Core Elements of antimicrobial stewardship program	2014	2015
	% hospitals with element (n=178)	% hospitals with element (n=175)
1. Hospital Leadership Commitment	**66.9%**	**80.0%**
Hospital has a written statement of support from leadership that supports efforts to improve antibiotic use.	62.9%	74.3%
Hospital financially supports antibiotic stewardship activities.	34.3%	43.4%
2. Program Leadership (Accountability)	**77.0%**	**88.6%**
A leader is responsible for program outcomes of stewardship activities.		
3. Drug Expertise	**92.1%**	**91.4%**
A pharmacist leader is responsible improving antibiotic use.		
4. Action (Implementing recommended interventions)	**87.6%**	**86.9%**
Hospital has a policy that requires prescribers to document an indication for all antibiotic prescriptions in the medical record or during order entry.	42.1%	49.1%
Hospital has facility-specific treatment recommendations, based on national guidelines and local susceptibility, to assist with antibiotic selection for common clinical conditions.	79.8%	78.9%
There is a formal procedure for all clinicians to review the appropriateness of all antibiotics 48 hours after the initial orders (e.g. antibiotic time out).	35.4%	34.3%
5. Tracking	**91.6%**	**94.9%**
Hospital monitors antibiotic use at the unit, service, and/or facility wide level.	78.7%	82.9%
Specified antibiotic agents need to be approved by a physician or pharmacist prior to dispensing (i.e. pre-authorization).	78.7%	81.7%
6. Reporting	**81.5%**	**87.4%**
A physician or pharmacist reviews courses of therapy for specified antibiotic agents (i.e. audit with feedback).	78.1%	83.4%
Prescribers receive feedback by the stewardship program about how they can improve their antibiotic prescribing.	63.5%	73.7%
7. Education	**70.2%**	**74.9%**
Stewardship program provides education to clinicians and other relevant staff on improving antibiotic prescribing.		
Total: Meet all 7 Core Elements above	**48.9%**	**58.3%**

Based on NHSN survey data downloaded July 07, 2016.

Implementation of the Core Elements varies by hospital size. Stewardship programs reporting antimicrobial stewardship programs with all seven Core Elements are more common in larger hospitals (Table 35).

Table 35. Relationship between hospital size and antimicrobial stewardship programs, New York State 2015

Number of beds	Number of hospitals	% hospitals with all 7 core elements
1-100	43	37%
101-200	36	53%
201-400	57	65%
400+	39	77%

Based on NHSN survey data downloaded July 07, 2016.

Antibiotic stewardship should be incorporated into all healthcare settings. Hospitals with mature ASPs may wish to share their expertise with healthcare providers practicing in settings such as long-term care facilities, ambulatory surgery centers, and outpatient clinics. Guidelines have recently been published by CDC for use by long term care facilities.[15] National programs, such as CDC's Get Smart: Know when Antibiotics Work, provide educational materials for both clinicians and patients, with particular emphasis on outpatient settings.[16] NYSDOH receives funding from CDC to conduct outreach using Get Smart materials to increase awareness of appropriate use of antibiotics in ambulatory care settings.

Education and engagement of patients to understand the consequences of antibiotic overuse and misuse is an integral piece in the judicious use of antibiotics. Patients should understand the potential risks associated with taking antibiotics when they are not necessary, including antibiotic resistant infections that are difficult to treat, altering the bacteria in the gut and increasing the risk of infection with *Clostridium difficile*, and adverse reactions to the medication.[17] CDC's Get Smart: Know When Antibiotics Work campaign contains patient-centered education to address patient concerns and provide information about appropriate use of antibiotics.[18]

Comparison of NYS HAI Rates with National HAI Rates

Approximate comparisons of state and national HAI rates are available in annual progress reports published by CDC.[19] The latest report compares 2014 state and national rates to historical benchmarks. The following summary (Table 36) is extracted from the CDC report for easy reference.

Table 36. Comparison of New York and national hospital-acquired infections for 2014

Type of Hospital-Acquired Infection	New York Standardized Infection Ratio*	National Standardized Infection Ratio*
Central-line associated bloodstream infections (CLABSIs)	0.50	0.50
Catheter-associated urinary tract infections (CAUTI)	1.15	1.00
Colon surgical site infections (SSIs)	1.24	0.98
Abdominal hysterectomy SSIs	0.97	0.83
MRSA bacteremia	0.93	0.87
Clostridium difficile infections (CDI)	0.89	0.92

Source of data: CDC's National and State HAI Progress Report, March 2016[30]

* Standard population for CLABSI and SSI was United States hospitals that reported data to NHSN in 2006-2008.
Standard population for CAUTI was United States hospitals that reported data to NHSN in 2009.
Standard population for MRSA and CDI was United States hospitals that reported data to NHSN in 2011.

While CDC did not directly compare state and national data for the same year, the parallel comparison of state and national rates to the historical baseline suggests that NY HAI rates are higher than national HAI rates. There are several limitations to CDC's methods, including changes in the indirectly compared populations over time[20], changes in surveillance definitions, and lack of consideration for the impact of auditing on reported rates.[21]

The intensity of the auditing performed by NYSDOH exceeds the intensity of auditing performed by other states and CMS in terms of the number of hospitals audited, the number of records audited in each hospital, and the methods used to efficiently target the records most likely to have errors. According to the CDC Progress Report, only 13% of states audited SSI data, 21% of states audited CLABSI data, and 13% of states audited CDI data for 2014. The data validation process is likely to increase HAI rates because missed infections are identified and entered into the NHSN, and training efforts increase the skills of the hospital IPs, leading to better identification of HAIs. Additionally, the presence of a validation process in a state might encourage increased care and thoroughness in reporting, which might result in higher pre-audit HAI rates. States with data validation programs might appear to have higher rates because of their validation efforts, because they truly have a higher rate, or both.

HAI Prevention Projects

NYSDOH Funded Prevention Projects

NYSDOH funds HAI Prevention Projects with non-profit health care organizations to develop, implement, and evaluate strategies to reduce or eliminate targeted HAIs. A Request for Applications (RFA) for 2013-2018 was issued on October 17th, 2012. Three projects were funded for five years. In addition, two projects were funded for shorter time periods.

University of Rochester Medical Center, Year 3 of 5: April 2015-March 2016, $190,000

This is the third year of the five-year prospective cohort study of a collaborative antimicrobial stewardship initiative for the prevention of CDI in long term care facilities (LTCFs). During the 3rd year of the project, interventions were implemented at all seven of the project LTCFs. Although each facility is at a different stage of intervention, successes included having three LTCFs consistently entering their CDI data into NHSN, receiving antibiotic data from multiple facilities on a regular basis to allow comparison within and among LTCFs, and forming and maintaining relationships with several consultant pharmacists and dispensing pharmacies. Teams were formed at several of the facilities that include infection prevention, pharmacy, nurse managers and educators working together on a daily basis, rather than in silos. Team members now compare data and develop intervention ideas together, making it more likely that this collaborative has effected sustainable culture change. In addition, facility medical directors are now meeting regularly and forming sub-groups to tackle difficult clinical issues.

Westchester County Healthcare Corporation (WCHC), Year 3 of 5: April 2015-March 2016, $196,635

The purpose of this project is to define the clinical features and molecular epidemiology of hospital-onset CDI and use data to guide a stringent enhanced environmental disinfection initiative. In Year 3 of this project, WCHC has implemented different methods of environmental disinfection (i.e. ultraviolet light, non-bleach chemicals, etc.) and continues to monitor CDI rates to determine their effectiveness in reducing transmission. In addition, one facility is utilizing black light inspections to validate completeness of cleaning. Participating facilities continue to conduct DNA testing of specimens to determine similarities and differences in the bacterial strains infecting patients. In addition, several facilities are determining rates of CDI colonization through the collection and testing of perianal swabs.

Weill Medical College (WMC), Year 3 of 5: April 2015-March 2016, $231,565

The principal objective of this project is to reduce CDI and MDRO infection rates through the development and implementation of strategies to enhance environmental cleaning, increase cross-disciplinary education about basic infection control practices, and promote optimal antimicrobial use. During Year 3 of this project, educational content for housekeepers was drafted and meetings with Environmental Services leadership were held to review and discuss the educational content and scripting to address common barriers faced by housekeepers. A workgroup was established to review all of the content in depth prior to program roll-out in Year 4. Using Clean-Trace Relative Light Unit values as a proxy for cleanliness, institution-wide efforts to track cleanliness of shared noncritical patient care equipment were initiated. While this monitoring initially focused on shared patient care equipment, additional focus was placed on monitoring the cleanliness of occupied patient rooms. WMC drafted a checklist of all surfaces that should be cleaned and disinfected in occupied patient rooms on a daily basis. Compliance with the checklist will be assessed as part of the 2016 hospital goals. WMC developed and administered a survey to assess nursing knowledge, attitudes, and practice related to antimicrobial prescribing. Results of this survey will be utilized to guide future interventions.

Mount Sinai Beth Israel Medical Center (MSBI), Year 1 of 1: May 2015-September 2015, $132,754

The ultimate goal of this project was to determine if procalcitonin (a serum inflammatory marker) measurements could be used to guide the initiation and use of antibiotic therapy, decreasing the use of antibiotics without impacting patient outcomes. The target population was patients receiving specific broad-spectrum antimicrobial agents at MSBI, an 800 bed tertiary care medical center in New York City. Given that only five months of funding were available, baseline data was collected on only 85 patients. MSBI hospital information technology staff created a program that will allow calculation of daily doses of each target agent per time unit. Finally, the hospital laboratory infrastructure was enhanced and laboratory personnel were trained to enable the pathology department to perform all procalcitonin tests in-house. The team plans to continue the study with other funding.

Montefiore Medical Center, Year 1 of 1: July 2014-September 2015, $187,500

This project aimed to identify and describe patients with advanced stage pressure ulcers across five facilities in Bronx, NY during a five-month pilot study. Multiple data sources were identified and evaluated. Documentation of pressure ulcer stage from nursing and physician notes tended to be of poor quality compared to the determinations of the Wound Consult Service. Antibiotic use, comorbidities, and infection complications were high in this population. Patients who received wound consults were more likely to receive an appropriate mattress, nutrition consult, and debridement than those not seen by the Wound Consult Service, but their health outcomes were not better. The results of this pilot will be used to improve documentation and additional quality improvement initiatives.

CDC Funded HAI Prevention Projects

Epidemiology and Laboratory Capacity (ELC) for Infectious Diseases Grant (Aug 2014-July 2019)

New York State Long Term Care *C. difficile* Collaborative

DOH continued its efforts to reduce CDI rates in LTCFs with a project that focused on improvement in infection prevention during LTCF and hospital care transitions. A total of 18 hospitals and 40 LTCFs joined the project and participated at varying levels for the project year (July 1, 2015 to June 30, 2016). The LTCF participants were asked to report CDI events using NHSN. In addition, the LTCFs maintained a log of all CDI patients transferring to/from other healthcare facilities, noting the use of transfer forms and contact precautions. Several educational webinar presentations were offered on topics including antimicrobial stewardship in LTCFs, communication at care transitions, CRE in LTCFs, and CDI diagnostics. Information on infection control practices and communication at the time of patient care transitions was collected through surveys issued at the beginning and end of the project year.

Carbapenem-resistant Enterobacteriaceae (CRE)

An Antimicrobial Resistance/CRE Workgroup was established in 2015 with the intent of creating a statewide CRE/MDRO surveillance and response plan. This group held several conference calls throughout the year to discuss strategies for the timely identification of CRE-colonized patients and prevention measures to control its spread in both acute and long-term care settings. In February 2016, a statewide CRE webinar was conducted, with over 525 call-in attendees, which provided NYS healthcare facilities with updated information regarding hospital, regional and statewide CRE rates as well as CRE prevention resources. Several facilities with higher-than-state-average CRE rates were contacted and on-site visits were conducted. These visits included robust discussions on a variety of topics including facility-wide CRE surveillance and prevention practices, barriers to implementation, antibiotic stewardship activities, inter-facility transfer information between acute and long term care/nursing home facilities, and other

strategies intended to reduce facility incidence rates. Future CRE- prevention efforts and education will target long-term care and nursing home settings.

Educational Efforts to Promote Appropriate Antibiotic Use: Get Smart

NYSDOH analyzed adult outpatient Medicaid claims data from 2013 and identified counties with high rates of potentially avoidable antibiotic prescribing for upper respiratory tract infections. In July 2015, NYSDOH contacted all potential outpatient antibiotic prescribers in these counties, provided educational materials on appropriate antibiotic prescribing, and invited volunteers to serve as local opinion leaders who could spread the word to peers about appropriate antibiotic prescribing. County level data was a useful tool to engage local health departments in promoting the Get Smart messages and ultimately motivated some to start their own Get Smart campaigns. Efforts to educate the public have included collaboration with regional and statewide school nurse associations. Get Smart messages and materials have been incorporated into school nurse training programs as tools available for helping educate students and parents on appropriate use of antibiotics. Additionally, NYSDOH co-hosted a Get Smart Week event with SUNY Albany School of Public Health to highlight the need for appropriate use of antibiotics in outpatient care settings.

Domestic Ebola

The response to the Ebola virus disease (EVD) outbreak has brought to light many opportunities for improvement and enhancement of hospitals' infection control capabilities. NYSDOH is instituting a plan for comprehensive improvements in the State's infection control infrastructure. The State HAI advisory group was expanded to include emergency preparedness experts and the HAI plan was revised to ensure maintenance of readiness of Ebola assessment and treatment hospitals and expanded infection control capabilities in a variety of healthcare settings. Infection control assessments are on-going in hospitals, long-term care facilities, dialysis centers, and other healthcare settings.

Summary

Table 37 summarizes the total number of each type of HAI for NYS in 2015. The table is sorted from most common to least common.

Table 37. Inpatient infections reported by New York State hospitals in 2015

Type of infection	Number	Rate
Hospital onset *Clostridium difficile* infections (CDIs)	7,855	7.4/10,000 patient days
Surgical site infections (SSIs) following		
Colon surgery[B]	1,381	7.3/100 procedures
Hip replacement or revision surgery[N]	359	1.1/100 procedures
Abdominal hysterectomy surgery[B]	324	1.7/100 procedures
Coronary artery bypass graft (CABG) - chest site[N]	205	1.9/100 procedures
CABG - donor site[N]	55	0.6/100 procedures
Catheter-associated urinary tract infections (CAUTIs) in intensive care units, and medical/surgical wards	1,890	1.3/1,000 catheter days
Central line-associated bloodstream infections (CLABSIs) in intensive care units and medical and surgical wards[B] and step down units[N]	1,644	1.2/1,000 line days
Hospital onset methicillin-resistant *Staphylococcus aureus* (MRSA) bloodstream infections[C]	775	0.67/10,000 patient days
Hospital onset carbapenem-resistant *Klebsiella, E. coli,* and *Enterobacter* (CRE) bloodstream infections[N]	222	0.19/10,000 patient days

N=required by NYS, C=required by Centers for Medicare and Medicaid Services (CMS; these data are accessible through a data use agreement but cannot be used for public reporting or regulatory action), B=required by both NYS and CMS. CDI, CRE, and MRSA events are from facility-wide inpatient location only. Data reported as of 8/1/16 (CLABSI), 8/5/16 (SSI), 9/16/16 (MRSA, CAUTI), 10/7/16 (CDI, CRE)

Recommendations and Next Steps

NYSDOH will continue to monitor and report hospital HAI rates to encourage continued reduction in HAIs. Following the NYSDOH HAI Program's policy on hospitals that have significantly high rates (available at http://www.health.ny.gov/statistics/facilities/hospital/hospital_acquired_infections/), NYSDOH will continue to work with hospitals that are underperforming to ensure that they implement effective improvement plans and show progress in decreasing rates. NYSDOH will also continue to notify hospitals of current issues in surveillance and infection prevention practices through email communication and webinars.

NYSDOH will continue to work with the HAI Technical Advisory Workgroup (TAW) to seek guidance on the selection of reporting indicators, methods of risk adjustment, presentation of hospital-identified data, and overall planning for the reduction in HAIs in NYS.

NYSDOH will continue to conduct medical record audits to verify appropriate use of surveillance definitions and accurate reporting by hospitals. Valid data are important for the analysis HAI rates within the state, as well for the analysis of NYS rates in comparison with other states' rates. Differences in audit coverage and thoroughness across the country currently result in inequitable comparisons of hospital and state average rates. NYSDOH will continue to discuss audit methodology with CDC and advocate that information on auditing be incorporated into performance evaluations.

In July 2016, Governor Andrew M. Cuomo and NYS Commissioner of Health Dr. Howard A. Zucker created an Antimicrobial Resistance Prevention and Control Task Force involving multiple federal, state, and local agencies to improve coordination and collaboration of antimicrobial resistance (AR) related activities across the health care spectrum and to develop new initiatives aimed at the prevention and control of AR in NYS.

NYSDOH strongly recommends that hospitals measure antibiotic use to create baseline data and to identify opportunities for targeted interventions. Progress on hospital implementation of antimicrobial stewardship will be monitored through annual NHSN surveys.

Because CDI impacts the greatest number of people in NYS of all reportable HAIs, reducing CDI rates continues to be a high priority. NYSDOH will continue to monitor the improvement plans of the hospitals flagged with high CDI rates to encourage improvement and provide assistance as requested. NYSDOH will continue to promote stewardship programs in LTCFs and hospitals by engaging IPs, medical and nursing directors, pharmacists, and lab staff in a collaborative involving implementation of stewardship elements.

Efforts to combat the spread of CRE in NYS healthcare facilities will continue. NYSDOH will continue to visit hospitals and LTCFs to discuss CRE surveillance and prevention practices, barriers to implementation, antibiotic stewardship activities, and other strategies intended to reduce facility incidence rates.

NYSDOH will continue to monitor HAI prevention projects for compliance with program objectives, fiscal responsibility, and potential applicability to other hospitals or healthcare settings.

Appendix 1: List of Abbreviations

AR – Antimicrobial resistance
ASA – American Society of Anesthesiologists' classification of physical status
ASP – Antimicrobial stewardship program
AU – Antimicrobial Use
BMI – Body mass index
BSI – Bloodstream infection
CABG – Coronary artery bypass graft surgery
CARB - Combating Antibiotic-Resistant Bacteria
CAUTI – Catheter-associated urinary tract infection
CCN – CMS certification number
CDC – Centers for Disease Control and Prevention
CDI – *Clostridium difficile* infection
C. difficile – Clostridium difficile
Ceph – Cephalosporin
CI – Confidence interval
CL – Central line
CLABSI – Central line-associated bloodstream infection
CLSI - Clinical Laboratory Standards Institute
CMS – Centers for Medicare and Medicaid Services
CO – Community onset
CO-NMH – Community onset-not my hospital
CO-PMH – Community onset-possibly my hospital
CRE – Carbapenem-resistant Enterobacteriaceae
CSRS – Cardiac Surgery Reporting System
DOH –Department of Health
DU– Device utilization
DUA – Data use agreement
ED – Emergency department
EIA – Enzyme immunoassay
ELC – Epidemiology and Laboratory Capacity
EVD – Ebola virus disease
FWI – Facility-wide inpatient
HAI – Hospital-acquired infection
HO – Hospital onset
ICD-9 – International Classification of Diseases, Ninth Revision
ICU – Intensive care unit
IP – Infection preventionist
IPF – Inpatient psychiatric facility
IQR – Inpatient quality reporting
IRF – Inpatient rehabilitation facility
LabID – Laboratory identified
LCBI – Laboratory-confirmed bloodstream infection
LTCF – Long term care facility

MBI – Mucosal barrier injury
MDR – Multidrug resistant
MDRO – Multidrug resistant organism
MRSA – Methicillin-resistant *Staphylococcus aureus*
NAAT – Nucleic acid amplification test
NICU – Neonatal intensive care unit
NHSN – National Healthcare Safety Network
NYS – New York State
NYSDOH – New York State Department of Health
OBS – Observation unit
OP – Outpatient
OR – Operating room
OS – Organ/space infection
PATOS – Present at time of surgery
PDS – Post-discharge surveillance
PPE – Personal protective equipment
QIO – Quality Improvement Organization
PHL – Public health law
RFA – Request for applications
RPC – Regional Perinatal Center
SIR – Standardized infection ratio
SPARCS – Statewide Planning and Research Cooperative System
spp – Species (plural)
SSI – Surgical site infection
TAW – Technical Advisory Workgroup
UTI – Urinary tract infection
VRE – Vancomycin-resistant Enterococci

Appendix 2: Glossary of Terms

ASA score: This is a scale used by the anesthesiologist to classify the patient's physical condition prior to surgery. It uses the American Society of Anesthesiologist (ASA) Classification of Physical Status. It is one of the factors that help determine a patient's risk of possibly developing a SSI. Here is the ASA scale:
1 - Normally healthy patient
2 - Patient with mild systemic disease
3 - Patient with severe systemic disease
4 - Patient with an incapacitating systemic disease that is a constant threat to life
5 -A patient who is not expected to survive with or without the operation.

Admission prevalence rate: The percent of patients that are admitted to the hospital already carrying an infection. This is calculated as the number of admission prevalent cases divided by the number of admissions.

Birth weight categories: Birth weight refers to the weight of the infant at the time of birth. Infants remain in their birth weight category even if they gain weight. Birth weight category is important because the lower the birth weight, the higher the risk of developing an infection.

Body mass index (BMI): BMI is a measure of the relationship between a person's weight and their height. It is calculated with the following formula: kg/m^2.

Catheter-associated urinary tract infection (CAUTI): A CAUTI is an infection of the bladder or kidneys associated with the use of a urinary catheter. Hospitalized patients may have a urinary catheter, a thin tube inserted into the bladder through the urethra, to drain urine when they cannot urinate on their own.

Carbapenem: There are four carbapenem antibiotics: ertapenem, meropenem, doripenem, and imipenem. Carbapenems are considered antibiotics of near last resort by medical professionals.

Carbapenem-resistant Enterobacteriaceae infection (CRE): Bacteria in the Enterobacteriaceae family that are resistant to carbapenems are called CRE.

Central line: A central line is a long thin tube that is placed into a large vein, usually in the neck, chest, arm, groin or umbilical cord. The tube is threaded through this vein until it reaches a large vein near the heart. A central line is used to give fluids or medication, withdraw blood, and monitor the patient's condition.

Central line-associated bloodstream infection (CLABSI): A bloodstream infection can occur when microorganisms travel around and through a central line or umbilical catheter and then enter the blood.

Central line-associated bloodstream infection (CLABSI) rate: To get this rate, divide the total number of central line-associated bloodstream infections by the number of central line days. That result is then multiplied by 1,000. Lower rates are better.

Central line days (device days): This is the total number of days a central line is used. A daily count of patients with a central line in place is performed at the same time each day. Each patient with one or more central lines at the time the daily count is performed is counted as one central line day.

Central line device 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.

***Clostridium difficile*:** A bacterium that naturally resides in the bowels of some people without symptoms of infection but which can cause infections in some situations**.** Overgrowth of *C. difficile* in the bowel sometimes occurs after a patient takes antibiotics, which can kill good bacteria in the bowel. Sometimes people become infected with *C. difficile* from touching their mouth after coming in contact with contaminated environmental surfaces or patient care items. Symptoms range from mild to severe diarrhea; in some instances death can occur.

Colon surgery: Colon surgery is a procedure performed on the lower part of the digestive tract also known as the large intestine or colon.

Community onset (CO): Documented infection occurring within 3 days of hospital admission.

Community onset - not my hospital (CO-NMH): Documented infection occurring within 3 days of hospital admission and more than 4 weeks after discharge from the same hospital.

Community onset – possibly my hospital (CO-PMH): Documented infection occurring within three days of readmission to the same hospital when a discharge from the same hospital occurred within the last four weeks.

Confidence interval (CI): The confidence interval is the range around a measurement that conveys how precise the measurement is. A 95% CI means that we can be 95% confident that the true measurement falls within the interval. If hospital A reports 1 infection out of 20 procedures (i.e. 5%, with 95% CI: 0% to 25%), and hospital B reports 10 infections out of 200 procedures (i.e. 5% with 95% CI: 2% to 9%), we can see that both hospitals have the same rate, but we are less confident that the rate is truly 5% at hospital A because it was based on only 1 infection.

Coronary artery bypass graft (CABG) surgery: A treatment for heart disease in which a vein or artery from another part of the body is used to create an alternate path for blood to flow to the heart, bypassing a blocked artery.

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 as described in the NHSN Patient Safety Manual.

Diabetes: A disease in which the body does not produce or properly use insulin. Insulin is needed to control the amount of sugar normally released into the blood.

Donor incision site for coronary artery bypass graft (CABG): CABG surgery with a chest incision and donor site incisions (donor sites include the patient's leg or arm) from which a blood vessel is removed to create a new path for blood to flow to the heart. CABG surgical incision site infections involving the donor incision site are reported separately from CABG surgical chest incision site infections.

Duration: The duration of an operation is the time between skin incision and stitching or stapling the skin closed. In the NHSN protocol, if a person has another operation through the same incision within 24 hours of the end of the original procedure, only one procedure is entered into NHSN and the total duration of the procedure is assigned as the sum of the two durations. Infection risk tends to increase with duration of surgery.

Higher than state average: The risk adjusted rate for each hospital is compared to the state average to determine if it is significantly higher or lower than the state average. A rate is significantly higher than the state average if the confidence interval around the risk adjusted rate falls entirely above the state average.

Hip replacement surgery: Hip replacement surgery involves removing damaged cartilage and bone from the hip joint and replacing them with new, man-made parts.

Hospital-acquired infection (HAI): A hospital acquired infection is an infection that occurs in a patient as a result of being in a hospital setting after having medical or surgical treatments.

Hospital Onset (HO): Documented infection occurring after the third day of hospital admission.

Hysterectomy: The surgical removal of a woman's uterus.

Infection control/prevention processes: These are routine measures to prevent infections that can be used in all healthcare settings. Some hospitals make the processes mandatory. Examples include:

- Complete and thorough hand washing.
- 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 central lines in patients. The list reminds healthcare workers to clean their hands thoroughly; clean the patient's skin before insertion with the right type of skin cleanser; wear the recommended sterile gown, gloves and mask; and place sterile barriers around the insertion site, etc.
- Monitoring to ensure that employees, doctors and visitors are following the proper infection prevention procedures.

Infection preventionist (IP): Health professional that has special training in infection prevention and monitoring.

Intensive care unit (ICU): Intensive care units are hospital units that provide intensive observation and treatment for patients (adult, pediatric, or newborn) either suffering from, or at risk of developing life threatening problems. ICUs are described by the types of patients cared

for. Many hospitals care for patients with both medical and surgical conditions in a combined medical/surgical ICU, while others have separate ICUs for medical, surgical and other specialties based on the patient care services provided by the hospital.

Lower than state average: The risk adjusted rate for each hospital is compared to the state average to determine if it is significantly higher or lower than the state average. A rate is significantly lower than the state average if the confidence interval around the risk adjusted rate falls entirely below the state average.

Methicillin-resistant *Staphylococcus aureus* (MRSA): *Staphylococcus aureus* (SA) is a common bacterium normally found on the skin or in the nose of 20 to 30 percent of healthy individuals. When SA is resistant to the antibiotics oxacillin, cefoxitin, or methicillin, it is defined as MRSA for surveillance purposes.

National Healthcare Safety Network (NHSN): This is a secure, internet-based national data reporting system that NYS hospitals must use to report HAIs. The NHSN is managed by the CDC's Division of Healthcare Quality Promotion.

Neonatal intensive care units: Patient care units that provide care to newborns.

- **Level II/III Units**: provide care to newborns at Level II (moderate risk) and Level III (requiring increasingly complex care).
- **Level III Units:** provide highly specialized care to newborns with serious illness, including premature birth and low birth weight.
- **Regional Perinatal Centers (RPC):** Level IV units, providing all the services and expertise required by the most acutely sick or at-risk pregnant women and newborns. RPCs provide or coordinate maternal-fetal and newborn transfers of high-risk patients from their affiliate hospitals to the RPC and are responsible for support, education, consultation and improvements in the quality of care in the affiliate hospitals within their region.

Obesity: Obesity is a condition in which a person has too much body fat that can lower the likelihood of good health. It is commonly defined as a body mass index (BMI) of 30 kg/m^2 or higher.

Organ/space SSI: A surgical site infection that involves a part of the body, excluding the skin incision, fascia, or muscle layers, that is opened or manipulated during the operative procedure.

Patient day: Patient days are the number of hospitalizations multiplied by the length of stay of each hospitalization. One patient hospitalized for 6 days will contribute 6 patient days to the hospital total, as will two patients each hospitalized for 3 days.

Post discharge surveillance: This is the process IPs use to seek out infections after patients have been discharged from the hospital. It includes screening a variety of data sources, including re-admissions, emergency department visits and/or contacting the patient's doctor.

Raw rate: Raw rates are not adjusted to account for differences in the patient populations.

- **Bloodstream infections:** Raw rate is the number of infections (the numerator) divided by the number of line days (the denominator) then multiplied by 1000 to give the number of infections per 1000 line days.
- **Surgical site infections:** Raw rate is the number of infections (the numerator) divided by the number of procedures (the denominator) then multiplied by 100 to give the number of infections per 100 operative procedures.
- **Admission Prevalent infection:** Raw rate is the number of infections (the numerator) divided by the number of admissions (the denominator) then multiplied by 100 to give the number of infections per 100 admissions.
- **Hospital onset infection:** Raw rate is the number of infections (the numerator) divided by the number of patient days (the denominator) then multiplied by 10,000 to give the number of infections per 10,000 patient days.

Risk adjustment: Risk adjustment accounts for differences in patient populations and allows hospitals to be compared. 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.

Risk-adjusted rate: The risk-adjusted rate is based on a comparison of the actual (observed) rate and the rate that would be predicted if, statewide, the patients had the same distribution of risk factors as the hospital.

SPARCS: The Statewide Planning and Research Cooperative System (SPARCS) is a comprehensive data reporting system established in 1979 as a result of cooperation between the health care industry and government. Initially created to collect information on discharges from hospitals, SPARCS currently collects patient level detail on patient characteristics, diagnoses and treatments, services, and charges for every hospital discharge, ambulatory surgery procedure and emergency department admission in NYS.

Standardized infection ratio (SIR): The SIR compares infection rates in a smaller population with infection rates in a larger standard population, after adjusting for risk factors that might affect the chance of developing an infection. In this report, the SIR is most often used to compare each hospital's rate to the NYS standard. Sometimes the SIR is also used to compare NYS to the National standard. In both cases, the SIR is calculated by dividing the actual number of infections in the smaller group by the number of infections that would be statistically predicted if the standard population had the same risk distribution as the observed population.

- 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. 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 NHSN criteria as described in the NHSN Patient Safety Protocol.

Surgical site infection (SSI): An infection that occurs after the operation in the part of the body where the surgery took place (incision).

Validation: A way of making sure the HAI data reported to NYS are complete and accurate. Complete reporting of HAIs, total numbers of surgical procedures performed, central line days, and patient information to assign risk scores must all be validated. The accuracy of reporting is evaluated by visiting hospitals and reviewing patient records. The purpose of the validation visits is to:

- Assess the accuracy and quality of the data submitted to NYS.
- Provide hospitals with information to help them use the data to improve and decrease HAIs.
- Provide education to the IPs and other hospital employees and doctors, to improve reporting accuracy and quality.
- Look for unreported HAIs.
- Make recommendations for improving data accuracy and/or patient care quality issues.

Wound class: An assessment of how clean or dirty the operation body site is at the time of the operation. Wounds are divided into four classes:

- **Clean:** Operation body sites in which no infection or inflammation is encountered and the respiratory, digestive, genital, or uninfected urinary tracts are not entered.
- **Clean-contaminated:** Operation body sites in which the respiratory, digestive, genital or urinary tracts are entered under controlled conditions and without unusual contamination.
- **Contaminated:** Operation body sites that have recently undergone trauma, operations with major breaks in sterile technique (e.g., open cardiac massage) or gross spillage from the gastrointestinal tract.
- **Dirty or infected:** Includes old traumatic wounds with retained dead tissue and those that involve existing infection or perforated intestines.

Appendix 3: Methods

For more details on the HAI surveillance protocols used to collect this data, please see the NHSN website at http://www.cdc.gov/nhsn/. This section of the report focuses on NYS-specific methods and provides additional information helpful for interpreting the results.

Data Validation

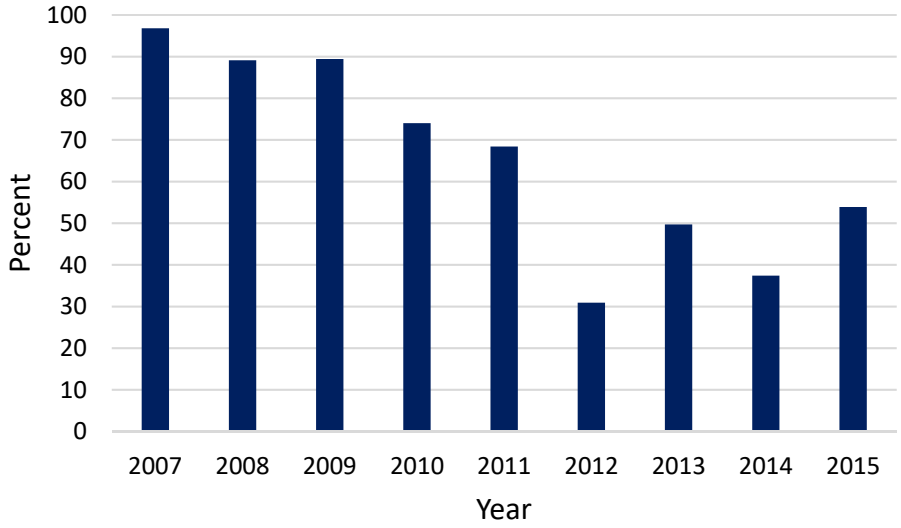
Data reported to the NHSN are validated by the NYSDOH using a number of methods.

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

Monthly checks for internal consistency – Every other month, NYS HAI staff download the data from the NHSN and run it through a computerized data validation code. Data that are missing, unusual, inconsistent, or duplicate are identified and investigated through email or telephone communication with hospital staff. Hospitals are given the opportunity to verify and/or correct the data.

Audits – Audits of a sample of medical records are conducted by the NYSDOH to assess compliance with reporting requirements. In addition, the purposes of the audit are to enhance the reliability and consistency of applying the surveillance definitions; evaluate the adequacy of surveillance methods to detect infections; and evaluate intervention strategies designed to reduce or eliminate specific infections. Audits have been an important component of the NYSDOH program since its inception in 2007, and have been conducted continuously through the years. Figure 26 summarizes the percentage of hospitals audited each year. A hospital was more likely to be audited in a given year if it had significantly high or low rates in the previous year, was not audited the previous year, performed poorly during the previous audit, hired new hospital staff, or was located in a region covered by an HAI staff member or offered electronic medical record access.

Figure 26. Percent of hospitals audited each year, New York State



For CLABSI audits, staff reviewed the medical records of patients identified as having a positive blood culture during a specified time period. For CDI and CRE audits, staff reviewed a laboratory list of positive laboratory reports during a specified time period. For SSI audits, staff reviewed a targeted selection of medical records in an attempt to efficiently identify under reporting. Specifically, the SPARCS database was used to preferentially select patients with an infection reported to the SPARCS billing database but not NHSN.

The 2015 audit results will be summarized in the next annual report. In 2014, NYSDOH staff reviewed 4,668 records and agreed with the hospital-reported infection status 93% of the time. Disagreements were discussed with the IPs and corrected in NHSN. Table 38 summarizes the number of inconsistencies in reporting infections out of the total number of qualified records reviewed. The number of unqualified records (e.g. bloodstream infections with no central lines (for CLABSI auditing) and procedures that should not have been reported (for SSI auditing)) that underwent partial review are not included in the summary. Hospitals are more likely to under report than over report infections. The overall agreement rates for this sample should not be used to infer the overall agreement for NYS data because 1) hospitals were not randomly selected for audit 2) the sample of records within each hospital was not random.

Table 38. Brief summary of 2014 HAI audit

Type of infection	# qualified[1] records reviewed	hospital said HAI=Y; auditor agreed	hospital said HAI=Y; auditor disagreed	hospital said HAI=N; auditor agreed	hospital said HAI=N; auditor disagreed	overall % agreement
Colon SSI	567	101	2	396	68	87.7%
CABG SSI	150	22	0	124	4	97.3%
HYST	504	43	4	443	14	96.4%
Hip SSI	556	52	0	491	13	97.7%
CLABSI	569	42	2	492	33	93.8%
CDI	1,787	1,726	10	0	51	96.6%
CRE	535	432	27	0	76	80.7%
TOTAL	**4,668**	**2,418**	**45**	**1,946**	**259**	93.5%

The 2014 audit was conducted between July 2014 and June 2015, and predominantly covered 2014 data.
SSI=surgical site infection; CLABSI=central line associated bloodstream infection; CDI=*Clostridium difficile* infection; CRE=carbapenem resistant Enterobacteriaceae.
[1] Unqualified records are not shown; these included patients with no central lines (for CLABSI auditing) and procedures that should not have been reported (for SSI auditing).

In addition to formal audits, a few hospitals that had significantly low preliminary HAI rates but were not audited during the year were selected to participate in a partial-self-audit. HAI staff securely emailed each hospital a list of records that had indications of infection in SPARCS but no infection in NHSN. The hospital IPs reviewed the medical records associated with these charts and self-reported whether these records met the NHSN surveillance criteria. The CDI and CRE laboratory results were directly reviewed by HAI staff. In 2014, 4 hospitals participated in the partial-self-audit. The 2014 self-audit results are summarized in Table 39.

Table 39. Brief Summary of 2014 partial self-audit

Type of Infection	# Records Reviewed	# Under reported	% Under reported
SSI	73	17	23.3%
C. difficile	118	2	1.7%
CRE	42	6	14.3%
TOTAL	**233**	**25**	**10.7%**

Cross-checks for completeness and accuracy in reporting - NYS HAI staff match the NHSN data to other NYSDOH data sets to aid in evaluating the completeness and accuracy of the data reported to the NHSN.

- NHSN CABG data are linked to the Cardiac Surgery Reporting System[22] (CSRS) database. The cardiac services program collects and analyzes risk factor information for

patients undergoing cardiac surgery and uses the information to monitor and report hospital and physician-specific mortality rates.

- NHSN colon, hip, hysterectomy, CDI, and CRE data are linked to the Statewide Planning and Research Cooperative System (SPARCS) database. SPARCS is an administrative billing database that contains details on patient diagnoses and treatments, services, and charges for every hospital discharge in NYS.

Thresholds for Reporting Hospital-Specific Infection Rates

This report contains data from 175 hospitals reporting complete data for 2015. Hospitals that perform very few procedures or have ICUs with very few patients with central lines have infection rates that fluctuate greatly over time. This is because even a few cases of infection will yield a numerically high rate in the rate calculation when the denominator is small. To assure a fair and representative set of data, the NYSDOH adopted minimum thresholds.

- For surgical site infections there must be a minimum of 20 patients undergoing a surgical procedure.
- For CLABSIs there must be a minimum of 50 central line days. Central line days are the total number of days central lines are used for each patient in an ICU over a given period of time.
- For CDI and CRE there must be a minimum of 50 patient days.

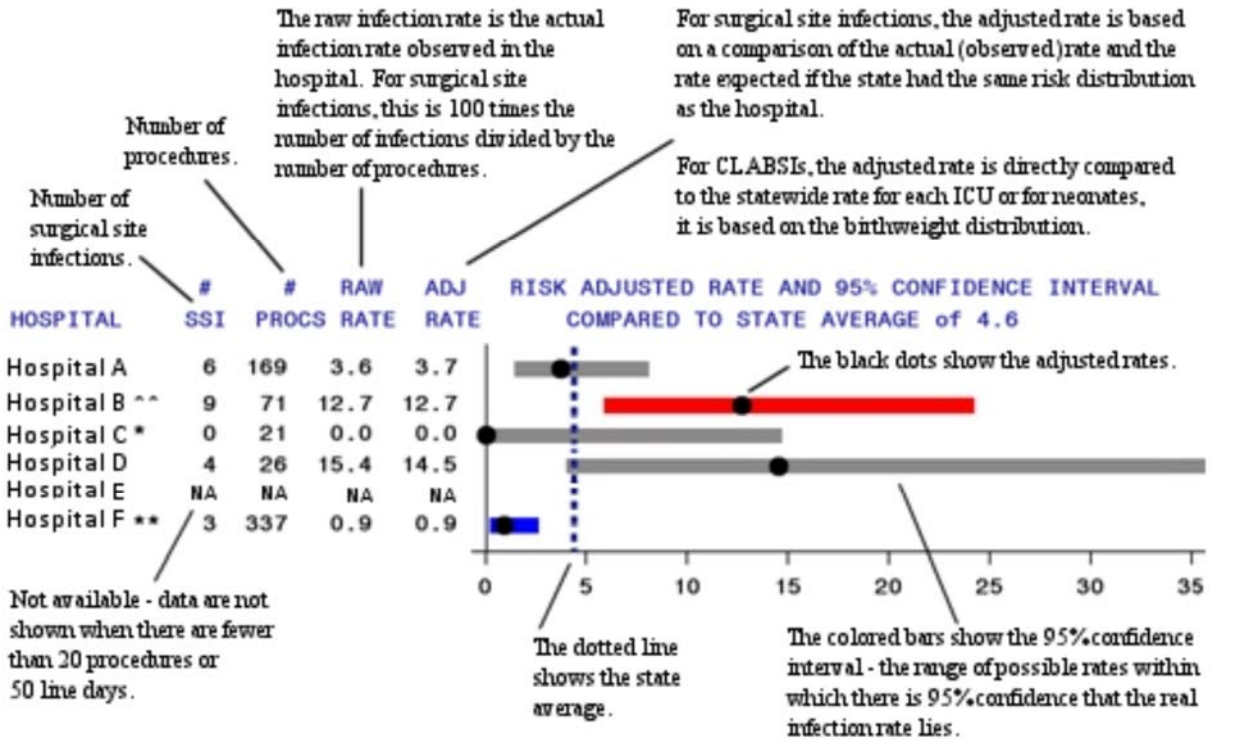
Risk Adjustment

Risk adjustment is a statistical technique that allows hospitals to be more fairly compared. The adjustment takes into account the differences in patient populations related to severity of illness and other factors that may affect the risk of developing an HAI. A hospital that performs a large number of complex procedures on very sick patients would be expected to have a higher infection rate than a hospital that performs more routine procedures on healthier patients. Therefore, before comparing the infection rates of hospitals, it is important to adjust for the proportion of high and low risk patients.

Risk-adjusted infection rates for SSIs in each hospital were calculated using a two-step method. First, all the data for the state were pooled to develop a logistic regression model predicting the risk of infection based on patient-specific risk factors. Second, that model was used to calculate the predicted number of infections for each hospital. The observed infection rate was then divided by the hospital's predicted infection rate. If the resulting ratio is larger than one, the hospital has a higher infection rate than expected on the basis of its patient mix. If it is smaller than one, the hospital has a lower infection rate than expected from its patient mix. For each hospital, the ratio is then multiplied by the overall statewide infection rate to obtain the hospital's risk-adjusted rate. This method of risk adjustment is called "indirect adjustment." Hospitals with

risk-adjusted rates significantly higher or lower than the state average were identified using exact two-sided 95% Poisson confidence intervals. The Poisson distribution is used for rates based on rare events. All data analyses were performed using SAS version 9.3 (SAS Institute, Cary NC). Figure 27 provides an example of how to interpret the hospital-specific SSI and CLABSI infection rate tables.

Figure 27. How to read hospital-specific SSI and CLABSI infection rate



Hospital A had an adjusted infection rate very similar to the state average. The grey bar (95% confidence interval) goes over the dotted line representing the state average, indicating no statistical difference in the rates.

Hospital B has an adjusted infection rate that is significantly higher than the state average, because the red bar is entirely to the right (representing higher rates) of the dotted line.

Hospital C had zero infections, but this was not considered to be statistically lower than the state average because the grey bar goes over the dotted line. All hospitals that observed zero infections get a *, because they do deserve acknowledgement for achieving zero infections.

Hospital D had the highest infection rate, but this was not statistically higher than the state average.

Hospital E - The data are not shown because the hospital performed fewer than 20 procedures, and therefore the rates are not stable enough to be reported.

Hospital F had an adjusted infection rate that is statistically lower than the state average, because the blue bar is entirely to the left (representing lower rates) of the dotted line

Attributable Mortality of CDI/MDROs

Attributable mortality rates were calculated using the data in Table 40. The attributable mortality rate for each indicator was calculated as the average attributable mortality rate over the relevant journal articles, weighted by the number of MDROs considered in each analysis.

Table 40. Attributable mortality estimates from literature review

MDRO	Reference	# MDROs	% Deaths MDROs	% Deaths controls	Attributable Mortality %
CDI	Dodek 2013[23]	227	29	27	2.0
	Gravel 2009[24]	1430	N/A	N/A	5.7
	Kenneally 2007[25]	278	36.7	30.6	6.1
	Loo 2005[26]	1703	N/A	N/A	6.9
	Pepin 2005[27]	161	23	7	16.0
	Tabak 2013[28]	255	11.8	7.3	4.5
	Weighted average				**6**
CRE	Borer 2009[11]	32	71.9	21.9	50.0
	Mouloudi 2014[12]	37	NA	NA	27.0
	Weighted average				**38**
MRSA	Harbarth 1998[29]	39	36	28	8.0
	DeKraker 2011[30]	242	30.6	8.4	22.2
	Weighted average				**20**
VRE	Carmeli 2002[31]	21	NA	NA	25.0
	Edmond 1996[32]	27	66.7	29.6	37.0
	Song 2003[33]	159	50.3	27.7	22.6
	Stosor 1998[34]	21	NA	NA	61.9
	Weighted average				**28**
MDR Acinetobacter	Blot 2003[35]	45	42.2	34.4	7.8
	Grupper 2007[36]	52	55.8	19.2	36.5
	Wisplinghoff 1999[37]	29	31.0	13.8	17.2
	Weighted average				**22**

Comparison of NYS and CMS HAI Reporting

In addition to the indicators required by NYS law, hospitals are encouraged by the Centers for Medicaid and Medicare Services (CMS) to report HAI data. The CMS Hospital Inpatient Quality Reporting Program offers financial incentives to hospitals that report HAI data and publishes the nationwide data on the Hospital Compare website (http://www.hospitalcompare.hhs.gov). The CMS website compares hospital-specific CLABSI, CAUTI, colon SSI, hysterectomy SSI, MRSA bloodstream infection, and CDI infection rates to historical national benchmarks.

The HAI rates reported by NYS and CMS may differ. Table 41 summarizes the reasons for these differences.

Table 41. Comparison of New York State and Hospital Compare data

	NYSDOH HAI Report	**CMS Hospital Compare**
Question answered	How did each hospital perform in 2015 compared to the NYS 2015 average?	How did each hospital perform in 2015 compared to the National baseline (2015)?
Surveillance system	NHSN	NHSN
2015 measures	CLABSI, SSI (colon, hip, CABG, hysterectomy), CDI, CRE	CLABSI, SSI (colon, hysterectomy), CAUTI, CDI, MRSA
Time period	Calendar year	Rolling year (updated quarterly)
Hospital	Reported by unique NHSN number	Reported by unique CMS number (may contain more than one NHSN number)
Intensive care units (ICUs)	8 types of ICUs (cardiothoracic, coronary, medical, medical-surgical, surgical, neurosurgical, pediatric, neonatal)	The 8 ICUs tracked by NYS plus other adult and pediatric ICUs (e.g. burn, trauma)
Wards	Medical, surgical, medical/surgical, and stepdown units	Medical, surgical, and medical/surgical
SSI Exclusions	SSIs detected using post discharge surveillance and not readmitted to any hospital, PATOS	Patients with outlying risk adjustment variables, superficial infections, PATOS
Displayed outcomes	Raw rates, risk-adjusted rates, and standardized infection ratios	Standardized infection ratios
Risk adjustment variables	Vary by indicator	Vary by indicator

Appendix 4: List of Hospitals by County

This table lists the hospitals individually identified in this report. Additional information on the hospitals can be obtained from the NYSDOH Hospital Profile at http://hospitals.nyhealth.gov/.

County	PFI	CMS ID	Hospital Name
Albany	0001	330013	Albany Med Ctr
	0004	330003	Albany Memorial
	0005	330057	St Peters Hospital
Allegany	0039	330096	Jones Memorial
Bronx	1178	330009	Bronx-Lebanon
	1175	332006	Calvary Hospital
	1165	330127	Jacobi Med Ctr
	1172	330080	Lincoln Med Ctr
	3058	330059	Montefiore-Einstein
	1169	330059	Montefiore-Moses
	1168	330059	Montefiore-Wakefield
	1186	330385	North Central Bronx
	1176	330399	St Barnabas
Broome	0043	330011	Our Lady of Lourdes
	0042/0058	330394	UHS Bingham/Wilson
Cattaraugus	0066	330103	Olean General
Cayuga	0085	330235	Auburn Memorial
Chautauqua	0098	330229	Brooks Memorial
	0114	330132	TLC Lake Shore
	0103	330239	Womans Christian
Chemung	0116	330090	Arnot Ogden Med Ctr
	0118	330108	St Josephs- Elmira
Chenango	0128	330033	UHS Chenango Memor
Clinton	0135	330250	Champlain Valley
Columbia	0146	330094	Columbia Memorial
Cortland	0158	330175	Cortland Reg Med
Dutchess	0180	330234	MidHudson Reg of WMC
	0192	330049	Northern Dutchess
	0181	330023	Vassar Brothers

County	PFI	CMS ID	Hospital Name
Erie	0280	330111	Bertrand Chaffee
	0207	330005	Buffalo General
	0210	330219	Erie County Med Ctr
	0267	330102	Kenmore Mercy
	0213	330279	Mercy Hosp Buffalo
	3067	330005	Millard Fill. Suburb
	0216	330354	Roswell Park
	0218	330078	Sisters of Charity
	0292	330078	Sisters- St Joseph
	0208	333562	Woman and Childrens
Franklin	0324	330079	Adirondack Medical
	0325	330084	Alice Hyde Med Ctr
Fulton	0330	330276	Nathan Littauer
Genesee	0339	330073	United Memorial
Jefferson	0367	330157	Samaritan- Watertown
Kings	1286	330233	Brookdale Hospital
	1288	330056	Brooklyn Hosp Ctr
	1294	330196	Coney Island Hosp
	1309	330397	Interfaith Med Ctr
	1301	330202	Kings County Hosp
	1315	330201	Kingsbrook Jewish MC
	1305	330194	Maimonides Med Ctr
	1324	330169	Mt Sinai Brooklyn
	1293	330019	NY Community Hosp
	1306	330236	NY Methodist
	1304	330306	NYU Lutheran
	1320	330350	SUNY Downstate MedCr
	1692	330396	Woodhull Med Ctr
	1318	330221	Wyckoff Heights
Livingston	0393	330238	Noyes Memorial
Madison	0397	330115	Oneida Healthcare
Monroe	0409	330164	Highland Hospital
	0414	330403	Monroe Community
	0411	330125	Rochester General
	0413	330285	Strong Memorial
	0471	330226	Unity Hosp Rochester
Montgomery	0484	330047	St Marys Amsterdam

County	PFI	CMS ID	Hospital Name
Nassau	0490	330181	Glen Cove Hospital
	0518	330372	LIJ at Valley Stream
	0513	33T259	Mercy Med Ctr
	0528	330027	Nassau University
	0541	330106	North Shore
	0552	330331	Plainview Hospital
	0527	330198	South Nassau Comm.
	0563	330182	St Francis- Roslyn
	0551	330332	St Joseph -Bethpage
	0550	330106	Syosset Hospital
	0511	330167	Winthrop University
New York	1438	330204	Bellevue Hospital
	1445	330240	Harlem Hospital
	1486	332008	Henry J. Carter
	1447	330270	Hosp for Spec Surg
	1450	330119	Lenox Hill Hospital
	1453	330154	Memor SloanKettering
	1454	33T199	Metropolitan Hosp
	1456	330024	Mt Sinai
	1439	330169	Mt Sinai Beth Israel
	1469	330046	Mt Sinai St Lukes
	1466	330046	Mt Sinai West
	1460	330100	NY Eye&Ear Mt Sinai
	3975	330101	NYP-Allen
	1464	330101	NYP-Columbia
	1437	330101	NYP-Lower Manhattan
	1464	330101	NYP-Morgan Stanley
	1458	330101	NYP-Weill Cornell
	1446	330214	NYU Joint Diseases
	1463/3297	330214	NYU Langone Med Ctr
Niagara	0581	330005	DeGraff Memorial
	0565	330163	East. Niag. Lockport
	0583	330188	Mount St. Marys
	0574	330065	Niagara Falls
Oneida	0599	330044	Faxton St. Lukes
	0589	330215	Rome Memorial
	0598	330245	St Elizabeth Medical
Onondaga	0636	330203	Crouse Hospital
	0630	330140	St Josephs- Syracuse
	0635	330241	Univ Hosp SUNY Upst
	0628	330241	Upst. Community Gen

County	PFI	CMS ID	Hospital Name
Ontario	0676	330265	Clifton Springs
	0678	330074	FF Thompson
	0671	330058	Geneva General
Orange	0708	330135	Bon Secours
	0686/0699	330126	OrangeReg Goshen-Mid
	0704	330205	St Anthony
	0694/0698	330264	St LukesNewburgh-Cor
Oswego	0727	330218	Oswego Hospital
Otsego	0739	330085	AO Fox Memorial
	0746	330136	Mary Imogene Bassett
Putnam	0752	330273	Putnam Hospital
Queens	1626	330128	Elmhurst Hospital
	1628	330193	Flushing Hospital
	1629	330014	Jamaica Hospital
	1638	330353	LIJ at Forest Hills
	1630/3376	330195	Long Isl Jewish(LIJ)
	1639	330024	Mt Sinai Queens
	1637	330055	NYP-Queens
	1633	330231	Queens Hospital
	1635	330395	St Johns Episcopal
Rensselaer	9250	330409	Burdett Care Center
	0756	330180	Samaritan- Troy
	0755	330232	St Marys Troy
Richmond	1738	330028	Richmond Univ MC
	1737/1740	330160	Staten Island U N-S
Rockland	0779	330158	Good Samar. Suffern
	0775	330405	Helen Hayes Hospital
	0776	330104	Nyack Hospital
Saratoga	0818	330222	Saratoga Hospital
Schenectady	0829/0848	330153	Ellis Hospital
	0831	330406	Sunnyview Rehab Hosp
Schoharie	0851	330268	Cobleskill Regional
St.Lawrence	0815	330197	Canton-Potsdam
	0798	330211	Claxton-Hepburn
	0804	330223	Massena Memorial
Steuben	0866	330277	Corning Hospital
	0873	330144	Ira Davenport
	0870	330151	St James Mercy

County	PFI	CMS ID	Hospital Name
Suffolk	0885	330141	Brookhaven Memorial
	0891	330088	Eastern Long Island
	0925	330286	Good Samar. W Islip
	0913	330045	Huntington Hospital
	0895	330185	JT Mather Hospital
	0938	330107	Peconic Bay Medical
	0889	330340	Southampton
	0924	330043	Southside
	0943	330401	St Catherine Siena
	0896	330246	St Charles Hospital
	0245	330393	Univ Hosp StonyBrook
Sullivan	0971	330386	Catskill Regional
Tompkins	0977	330307	Cayuga Medical Ctr
Ulster	0990	330004	HealthAlli Broadway
	0989	330224	HealthAlli MarysAve
Warren	1005	330191	Glens Falls Hospital
Wayne	1028	330030	Newark Wayne
Westchester	1138	333301	Blythedale Childrens
	1046	33T404	Burke Rehab Hosp
	1061	330086	Montefiore-Mt Vernon
	1072	330184	Montefiore-NewRochl
	1039	330267	NYP-Hudson Valley
	1122	330061	NYP-Lawrence
	1117	330162	Northern Westchester
	1129	330261	Phelps Memorial
	1097/1124	330208	St Johns Riverside
	1098	330006	St Josephs- Yonkers
	1139	330234	Westchester Medical
	1045	330304	White Plains Hosp
Wyoming	1153	330008	Wyoming County Comm.

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