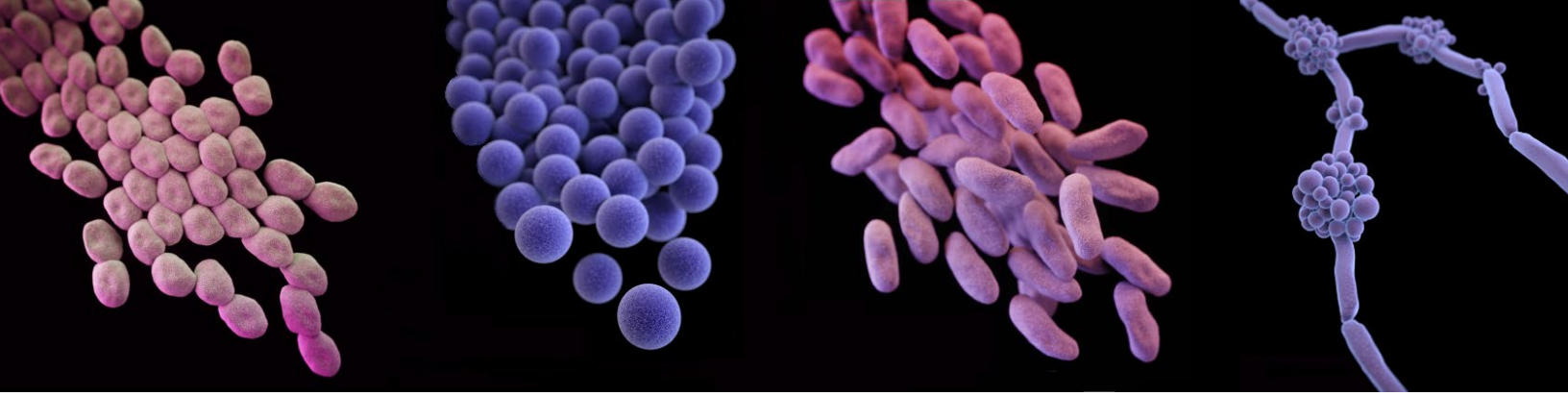

Hospital-Acquired Infections in New York State, 2017

Part 2: Technical Report

NEW YORK STATE | Department of Health

October 2018

(correction to page 68, November 2018)

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Introduction

In accordance with Public Health Law 2819, New York State (NYS) has been tracking hospital-acquired infections (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.

The NYS Department of Health (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 addition to reporting the HAI data mandated by NYS, hospitals enter data into NHSN for federal programs (e.g. Centers for Medicare and Medicaid Services [CMS]), regional collaboratives, and local surveillance. NYSDOH can access this other data (i.e. data not mandated by NYS) through a data use agreement (DUA) with the Centers for Disease Control and Prevention (CDC). The DUA specifies that DOH may only use this other data for surveillance or prevention purposes, not for public reporting of facility-specific data or for regulatory action. NYSDOH does not audit this data. The data are only reported in aggregate. More information about the DUA is available on the CDC website at http://www.cdc.gov/hai/pdfs/stateplans/New-York_DUA.pdf.

Table 1 summarizes the progression of NYS reporting requirements through 2017 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	2015-2017
Central line-associated bloodstream infections in ICUs	P[1]	✓	✓	✓	✓	✓	✓	✓
Colon surgical site infections	P[1]	✓	✓	✓	✓	✓	✓	✓
Coronary artery bypass graft surgical site infections	P[1]	✓	✓	✓	✓	✓	✓	✓
Hip replacement surgical site infections		✓	✓	✓	✓	✓	✓	✓
Clostridium difficile infections			P[2]	✓	✓	✓	✓	✓
Abdominal hysterectomy surgical site infections					✓	✓	✓	✓
Carbapenem-resistant Enterobacteriaceae infections						P[2]	✓	✓
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)
P[1] = pilot reporting full year (do not publish hospital-specific rates)
P[2] = 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 programs visible through data use agreement between CDC and NYS beginning May 2013.

This report focuses on HAI rates in NYS hospitals in 2017. 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".

Because of substantive changes to HAI surveillance definitions that occurred between 2007 and 2015, state and federal agencies designated 2015 as the "baseline" for assessment of trends. This baseline will be used until surveillance definitions change such that the comparisons are no longer valid, or until policy changes require a new baseline. This report will assess trends between 2015 and 2017. For information on HAI rates prior to 2015, please see the 2015 NYS HAI Report.

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 excluded from hospital-specific comparisons in this report so as not to penalize facilities with the best surveillance systems.

If there is evidence of clinical infection or abscess at the time a surgical procedure is performed, any resulting SSI will be designated as "present at time of surgery" (PATOS). 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.

Colon Surgical Site Infections

In 2017, 162 hospitals reported a total of 1,232 colon SSIs out of 19,782 procedures, a rate of 6.2 infections per 100 procedures. NYSDOH excludes some of these SSIs and procedures from SSI rates before evaluating time trends and comparing hospital performance, as described below.

Of the 1,232 infections, 255 (20.7%) were classified as PATOS. The PATOS SSIs were predominantly (84%) Organ/Space. At completion of the surgery 75% were primarily closed. PATOS SSIs/procedures were excluded from the final SSI rate because these infections are more difficult to prevent. However, to encourage hospitals to continue to implement prevention efforts for these types of procedures, the number of excluded PATOS are listed in the hospital-specific colon SSI rate plots at the end of the section.

Of the remaining 977 infections, 43% were superficial, 10% were deep, and 47% were organ/space (Table 2). Most of the SSIs (54%) were detected during the initial hospitalization; 31% were identified upon readmission to the same hospital; 3% involved readmission to another hospital; and 12% 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 114 PDS infections in the final SSI rate so as not to penalize facilities with the best surveillance systems.

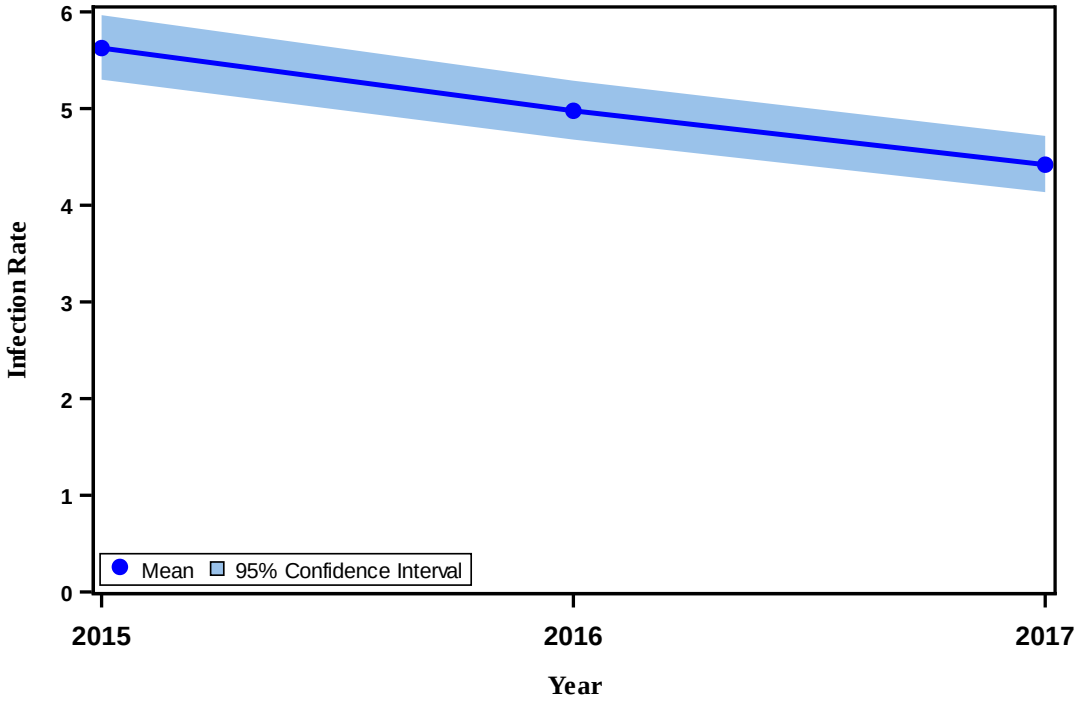
Table 2. Method of detection of colon surgical site infection by depth of infection, New York State 2017

	When Detected				
Extent (Row%) (Column%)	**Initial Hospitalization**	**Readmitted to the Same Hospital**	**Readmitted to Another Hospital**	**Post-Discharge Surveillance Not Readmitted**	**Total**
Superficial Incisional	202 (47.9%) (38.3%)	108 (25.6%) (35.2%)	8 (1.9%) (27.6%)	104 (24.6%) (91.2%)	422 (43.2%)
Deep Incisional	51 (53.1%) (9.7%)	35 (36.5%) (11.4%)	4 (4.2%) (13.8%)	6 (6.3%) (5.3%)	96 (9.8%)
Organ/Space	274 (59.7%) (52.0%)	164 (35.7%) (53.4%)	17 (3.7%) (58.6%)	4 (0.9%) (3.5%)	459 (47.0%)
Total	527 (53.9%)	307 (31.4%)	29 (3.0%)	114 (11.7%)	977

New York State data reported as of June 25, 2018. Excludes infections present at time of surgery.

Trends in colon SSI rates after deleting PATOS and PDS infections are show in Figure 1. Between 2015 and 2017, the colon surgical site infection rate significantly declined 21%, from 5.63 infections per 100 procedures in 2015, to 4.42 infections per 100 procedures in 2017.

Figure 1: Trend in colon surgical site infection rates, New York State 2015-2017
Excluding infections present at time of surgery and detected in outpatient settings without readmission



Year	# Hospitals	# Infections	# Procedures	Infection Rate (95% Confidence Interval)
2015	160	1,047	18,611	5.63 (5.30, 5.97)
2016	161	991	19,912	4.98 (4.68, 5.29)
2017	162	863	19,527	4.42 (4.14, 4.72)

New York State data reported as of June 25, 2018. Infection rate is the number of infections divided by the number of procedures, multiplied by 100.

The most common microorganisms associated with colon SSIs were Enterococci and *Escherichia coli* (Table 3).

Table 3. Microorganisms identified in colon surgical site infections, New York State 2017

Microorganism	Number of Isolates	Percent of Infections
Enterococci	401	32.5
(VRE)	(79)	(6.4)
Escherichia coli	340	27.6
(CRE-*E. coli*)	(1)	(0.1)
Yeast	102	8.3
Pseudomonas spp.	97	7.9
Staphylococcus aureus	91	7.4
(MRSA)	(52)	(4.2)
Klebsiella spp.	90	7.3
(CRE-*Klebsiella*)	(9)	(0.7)
Bacteroides spp.	89	7.2
Streptococci	88	7.1
Coagulase negative staphylococci	56	4.5
Enterobacter spp.	49	4.0
(CRE-*Enterobacter*)	(1)	(0.1)
Proteus spp.	34	2.8
Citrobacter spp.	26	2.1
Clostridium spp.	23	1.9
Morganella morganii	19	1.5
Lactobacilli	11	0.9
Prevotella spp.	9	0.7
Corynebacteria	7	0.6
Serratia spp.	5	0.4
Stenotrophomonas spp.	5	0.4
Acinetobacter spp.	3	0.2
(MDR-*Acinetobacter*)	(2)	(0.2)
Other	51	4.1

New York State data reported as of June 25, 2018. Out of 1,232 infections, no microorganisms identified for 289 (23%) infections. VRE: vancomycin-resistant enterococci; CRE: carbapenem-resistant Enterobacteriaceae; MRSA: methicillin-resistant *Staphylococcus aureus; MDR:* multidrug resistant; spp: multiple species

Risk-Adjustment for Colon SSIs

The following risk factors were associated with these SSIs and included in the risk-adjustment model:

- For each increase in American Society of Anesthesiologists (ASA) score (1, 2, 3/4/5), a measure of systemic disease, patients were 1.4 times more likely to develop an SSI.
- Procedures that used traditional surgical incisions were 2.0 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.
- Procedures with duration greater than four hours were 2.3 times more likely to result in SSI than procedures less than two hours. Procedures with duration between two and four hours were 1.5 times more likely to result in SSI than procedures less than two hours.
- Patients who experienced trauma (i.e. a blunt or penetrating injury) prior to the procedure were 1.5 times more likely to develop an SSI than other patients.

Hospital-Specific Colon SSI Rates

Hospital-specific colon SSI rates are provided in Figure 2. Of the 134 hospitals that reported more than twenty procedures, six hospitals (4%) had colon SSI rates that were statistically higher than the state average. All six hospitals will submit improvement plans following the NYSDOH HAI Reporting Program's Policy for Facilities with Consecutive Years of High HAI Rates. Seven hospitals (5%) had rates that were statistically lower than the state average. No hospitals were significantly high or low for more than two consecutive years.

Figure 2: Colon Surgical Site Infection Rates, New York 2017 (page 1 of 4)

Hospital	# SSI	#PATOS excl.	#PDS excl.	# Procs	Raw Rate	Adj Rate
AO Fox Memorial	1	0	0	20	5.0	5.1
Adirondack Medical	1	1	0	55	1.8	3.2
Albany Med Ctr	29	6	5	470	6.2	6.5
Albany Memorial	2	0	0	37	5.4	4.9
Alice Hyde Med Ctr	NA	NA	NA	NA	NA	NA
Arnot Ogden Med Ctr	3	0	1	79	3.8	3.2
Auburn Memorial	2	0	2	50	4.0	3.7
Bellevue Hospital	4	2	0	98	4.1	4.3
Bertrand Chaffee	NA	NA	NA	NA	NA	NA
Bon Secours	NA	NA	NA	NA	NA	NA
Bronx-Lebanon	1	0	0	69	1.4	1.7
Brookdale Hospital	8	3	0	63	12.7	9.7
Brookhaven Memorial	2	2	0	96	2.1	2.2
Brooklyn Hosp Ctr	1	2	0	63	1.6	1.6
Brooks Memorial	NA	NA	NA	NA	NA	NA
Buffalo General	5	0	0	111	4.5	3.7
Canton-Potsdam	3	1	0	56	5.4	4.8
Catskill Regional	NA	NA	NA	NA	NA	NA
Cayuga Medical Ctr	1	0	0	40	2.5	2.6
Champlain Valley	3	0	2	112	2.7	2.5
Claxton-Hepburn	NA	NA	NA	NA	NA	NA
Clifton Springs	NA	NA	NA	NA	NA	NA
Columbia Memorial	3	2	0	60	5.0	4.6
Coney Island Hosp	0	0	0	49	0.0	0.0
Corning Hospital	1	0	0	27	3.7	3.5
Cortland Reg Med	0	0	2	27	0.0	0.0
Crouse Hospital	15	7	0	241	6.2	5.8
DeGraff Memorial	NA	NA	NA	NA	NA	NA
East. Niag. Lockport	3	0	0	34	8.8	9.0
Eastern Long Island	NA	NA	NA	NA	NA	NA
Ellis Hospital	11	1	0	170	6.5	7.3
Elmhurst Hospital^^	9	2	0	79	11.4	10.8
Erie County Med Ctr	4	0	0	83	4.8	3.8
FF Thompson	2	0	1	63	3.2	4.4
Faxton St. Lukes	3	0	0	96	3.1	3.1
Flushing Hospital	4	3	1	39	10.3	12.6
Geneva General	1	0	0	75	1.3	1.7
Glen Cove Hospital	1	0	0	30	3.3	2.6
Glens Falls Hospital	3	2	0	178	1.7	2.1
Good Samar. Suffern	6	2	1	143	4.2	4.9

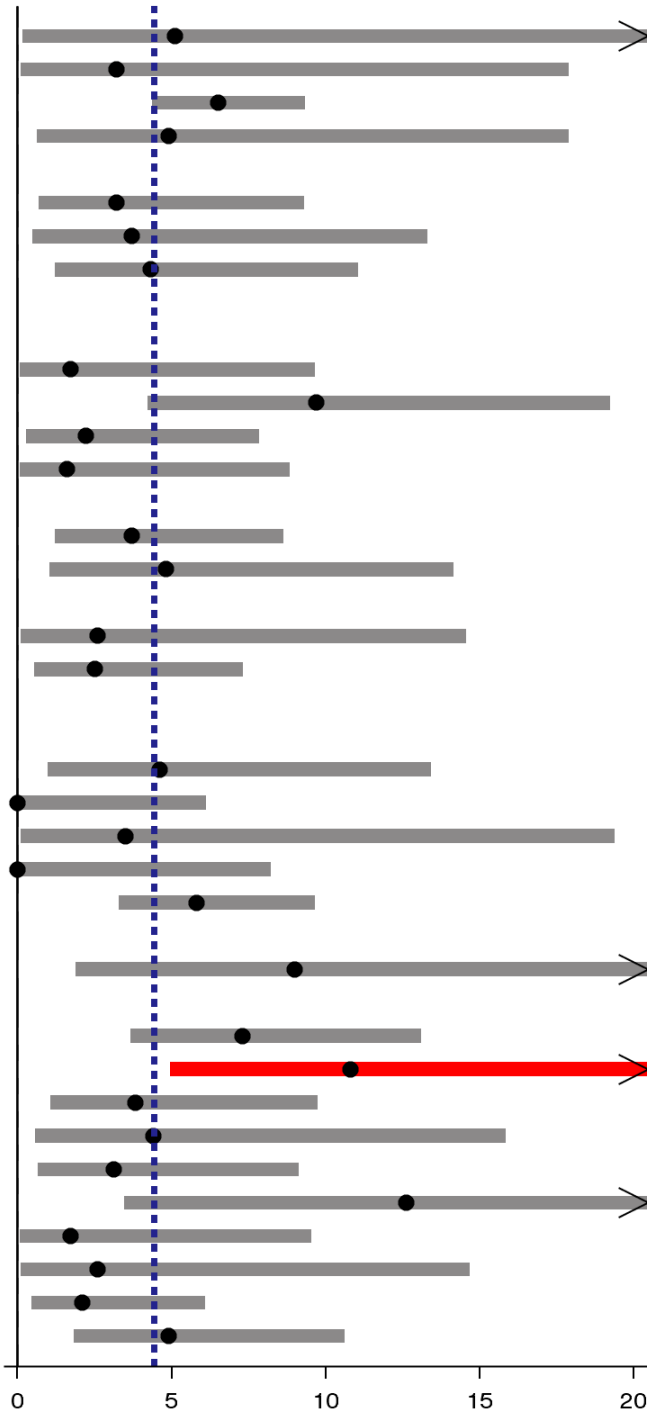


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Figure 2: Colon Surgical Site Infection Rates, New York 2017 (page 2 of 4)

Hospital	# SSI	#PATOS excl.	#PDS excl.	# Procs	Raw Rate	Adj Rate
Good Samar. W Islip	9	4	4	263	3.4	4.1
Harlem Hospital	2	0	0	36	5.6	5.5
HealthAlli Broadway	1	0	0	44	2.3	2.0
HealthAlli MarysAve	NA	NA	NA	NA	NA	NA
Highland Hospital	5	5	0	153	3.3	3.5
Huntington Hospital	3	3	0	214	1.4	1.7
Interfaith Med Ctr	NA	NA	NA	NA	NA	NA
JT Mather Hospital	10	3	0	118	8.5	8.6
Jacobi Med Ctr	7	1	3	105	6.7	4.9
Jamaica Hospital	3	1	0	63	4.8	3.8
Jones Memorial	NA	NA	NA	NA	NA	NA
Kenmore Mercy	7	0	0	145	4.8	5.2
Kings County Hosp	4	0	0	139	2.9	2.3
Kingsbrook Jewish MC	5	0	0	39	12.8	10.1
LIJ at Forest Hills	4	2	0	93	4.3	4.7
LIJ at Valley Stream	4	0	0	47	8.5	7.7
Lenox Hill Hospital	9	2	1	247	3.6	3.2
Lincoln Med Ctr	7	0	0	88	8.0	5.8
Long Isl Jewish(LIJ)**	8	5	0	440	1.8	1.6
Maimonides Med Ctr	15	8	1	238	6.3	6.5
Mary Imogene Bassett	16	5	5	188	8.5	7.6
Massena Memorial	NA	NA	NA	NA	NA	NA
Memor SloanKettering	70	7	17	1151	6.1	4.9
Mercy Hosp Buffalo	6	6	2	257	2.3	2.7
Mercy Med Ctr	1	1	0	48	2.1	2.1
Metropolitan Hosp	2	0	0	32	6.3	4.7
MidHudson Reg of WMC	1	0	0	52	1.9	1.7
Millard Fill. Suburb	8	2	0	304	2.6	3.0
Montefiore-Einstein	8	2	6	209	3.8	3.3
Montefiore-Moses	11	1	3	260	4.2	3.5
Montefiore-Mt Vernon	0	1	0	25	0.0	0.0
Montefiore-NewRochl	3	2	0	31	9.7	9.1
Montefiore-Nyack	3	1	0	71	4.2	3.9
Montefiore-Wakefield	4	0	1	29	13.8	11.4
Mount St. Marys	3	0	0	33	9.1	8.7
Mt Sinai^^	46	11	14	933	4.9	6.4
Mt Sinai Beth Israel^^	17	6	2	218	7.8	9.8
Mt Sinai Brooklyn	2	2	0	40	5.0	4.2
Mt Sinai Queens	3	1	0	73	4.1	4.6
Mt Sinai St Lukes	3	3	2	76	3.9	3.3

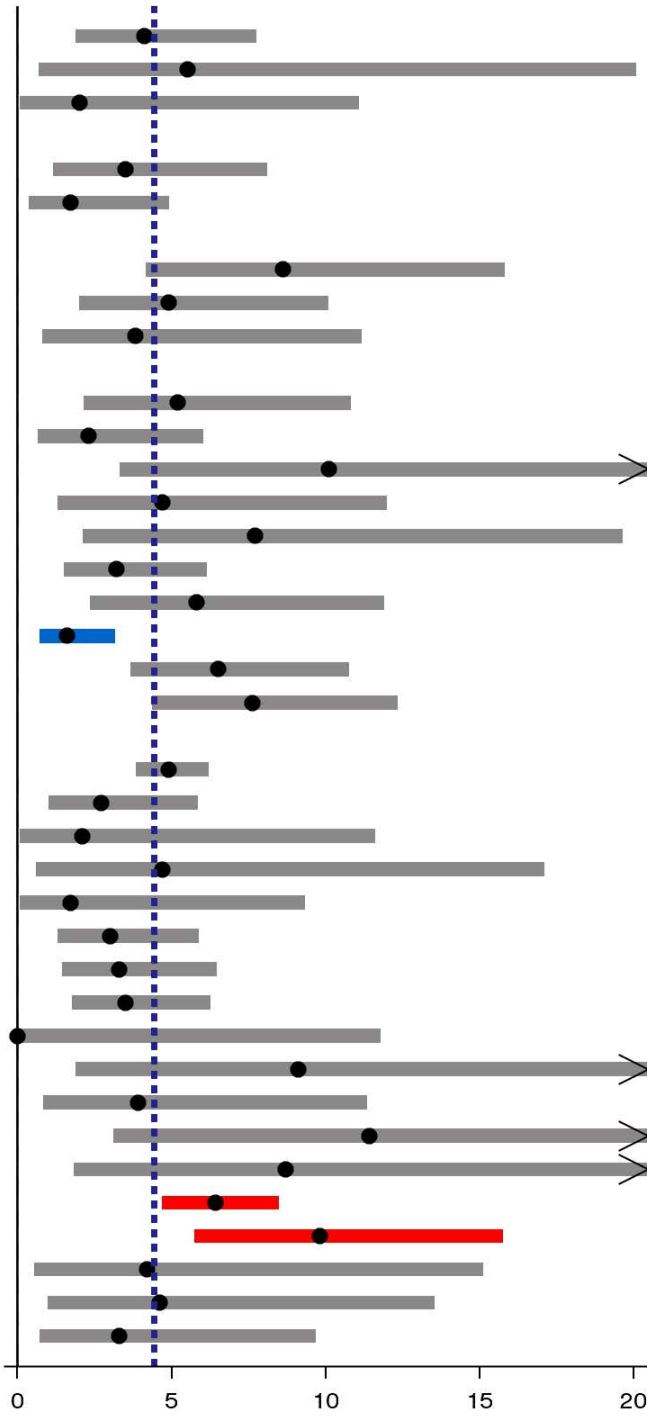

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Figure 2: Colon Surgical Site Infection Rates, New York 2017 (page 3 of 4)

Hospital	# SSI	#PATOS excl.	#PDS excl.	# Procs	Raw Rate	Adj Rate
Mt Sinai West	7	1	0	154	4.5	3.9
NY Community Hosp	2	1	0	21	9.5	8.7
NYP-Allen	NA	NA	NA	NA	NA	NA
NYP-Brklyn Methodist	7	2	0	171	4.1	3.3
NYP-Columbia	11	1	0	458	2.4	2.6
NYP-Hudson Valley	4	4	0	53	7.5	7.9
NYP-Lawrence	3	1	0	43	7.0	7.9
NYP-Lower Manhattan	2	0	0	46	4.3	5.0
NYP-Morgan Stanley	1	0	0	33	3.0	2.7
NYP-Queens	3	5	1	196	1.5	1.5
NYP-Weill Cornell	13	6	0	470	2.8	3.1
NYU Langone Brooklyn^^	16	0	0	148	10.8	8.7
NYU Tisch	17	3	2	595	2.9	2.8
NYU Winthrop	14	4	0	361	3.9	3.9
Nassau University	1	1	0	43	2.3	1.7
Nathan Littauer	NA	NA	NA	NA	NA	NA
Newark Wayne	2	0	0	28	7.1	7.8
Niagara Falls	2	0	0	29	6.9	8.0
North Central Bronx	NA	NA	NA	NA	NA	NA
North Shore**	15	12	0	575	2.6	2.5
Northern Dutchess	1	1	0	26	3.8	3.3
Northern Westchester	3	0	1	118	2.5	3.6
Noyes Memorial	NA	NA	NA	NA	NA	NA
Oishei Childrens	0	0	1	24	0.0	0.0
Olean General	6	1	0	88	6.8	9.0
Oneida Healthcare	3	1	0	112	2.7	4.2
Orange Regional	5	1	0	200	2.5	2.9
Oswego Hospital	4	0	2	29	13.8	10.9
Our Lady of Lourdes**	0	3	2	138	0.0	0.0
Peconic Bay Medical	2	0	0	58	3.4	3.1
Phelps Memorial	0	0	0	37	0.0	0.0
Plainview Hospital	1	2	0	89	1.1	1.1
Putnam Hospital	5	1	0	93	5.4	7.0
Queens Hospital	3	0	0	55	5.5	4.4
Richmond Univ MC^^	14	2	0	102	13.7	12.5
Rochester General	19	6	0	406	4.7	4.9
Rome Memorial	NA	NA	NA	NA	NA	NA
Roswell Park^^	16	2	1	165	9.7	9.7
SUNY Downstate MedCr	3	0	0	62	4.8	3.9
Samaritan- Troy	5	0	1	88	5.7	6.9

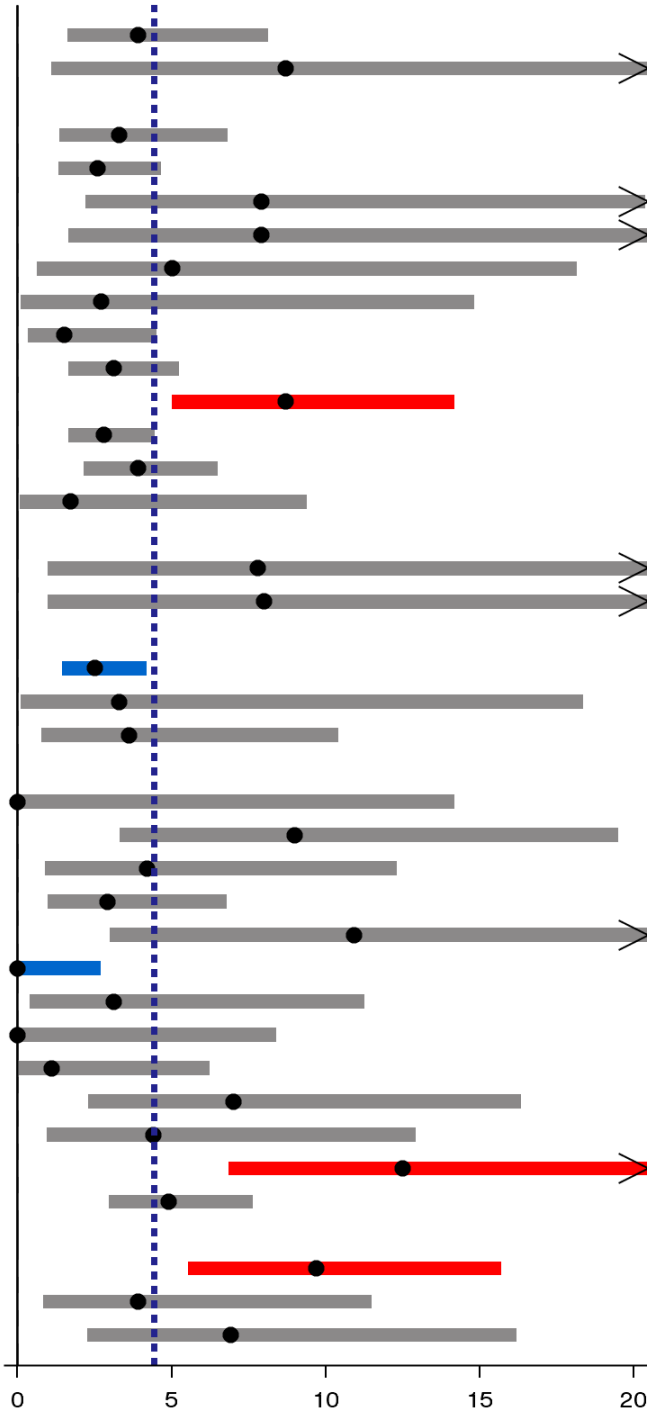

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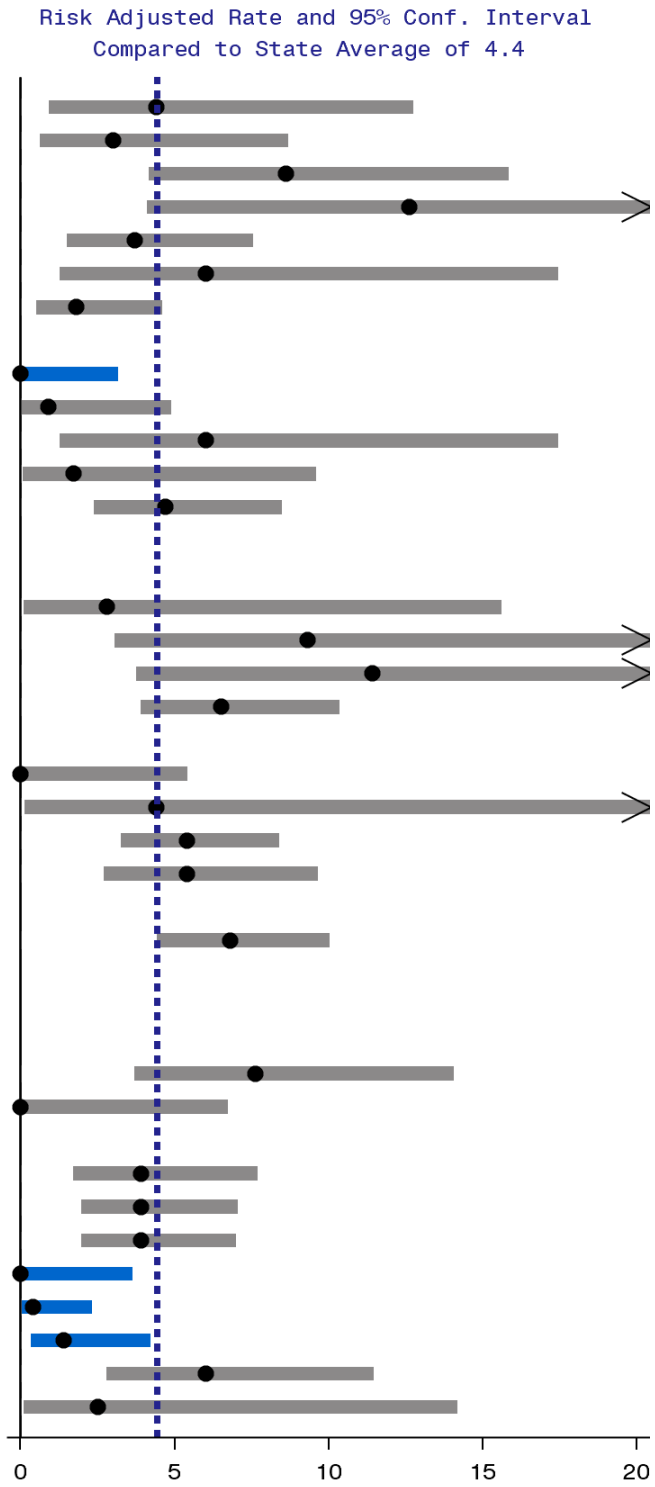
Figure 2: Colon Surgical Site Infection Rates, New York 2017 (page 4 of 4)

Hospital	# SSI	#PATOS excl.	#PDS excl.	# Procs	Raw Rate	Adj Rate
Samaritan- Watertown	3	0	0	79	3.8	4.4
Saratoga Hospital	3	6	1	122	2.5	3.0
Sisters of Charity	10	5	0	118	8.5	8.6
Sisters- St Joseph	5	3	0	43	11.6	12.6
South Nassau Comm.	7	3	0	188	3.7	3.7
Southampton	3	0	1	46	6.5	6.0
Southside	4	4	0	210	1.9	1.8
St Anthony	NA	NA	NA	NA	NA	NA
St Barnabas**	0	1	0	74	0.0	0.0
St Catherine Siena	1	0	0	111	0.9	0.9
St Charles Hospital	3	0	0	46	6.5	6.0
St Elizabeth Medical	1	2	2	60	1.7	1.7
St Francis- Roslyn	11	3	0	227	4.8	4.7
St James Mercy	NA	NA	NA	NA	NA	NA
St Johns Dobbs Ferry	NA	NA	NA	NA	NA	NA
St Johns Episcopal	1	0	0	28	3.6	2.8
St Johns Riverside	5	3	0	53	9.4	9.3
St Joseph- Bethpage	5	4	0	40	12.5	11.4
St Josephs- Syracuse	18	3	5	329	5.5	6.5
St Josephs- Yonkers	NA	NA	NA	NA	NA	NA
St Lukes Cornwall	0	3	0	63	0.0	0.0
St Marys Amsterdam	1	0	1	41	2.4	4.4
St Peters Hospital	19	6	3	438	4.3	5.4
Staten Island U N	11	3	4	179	6.1	5.4
Staten Island U S	NA	NA	NA	NA	NA	NA
Strong Memorial	25	2	1	388	6.4	6.8
Syosset Hospital	NA	NA	NA	NA	NA	NA
TLC Lake Shore	NA	NA	NA	NA	NA	NA
UHS Chenango Memor	NA	NA	NA	NA	NA	NA
UHS Wilson	10	2	0	184	5.4	7.6
UPMC Chautauqua WCA	0	0	0	54	0.0	0.0
United Memorial	NA	NA	NA	NA	NA	NA
Unity Hosp Rochester	8	1	0	227	3.5	3.9
Univ Hosp SUNY Upst	11	8	4	216	5.1	3.9
Univ Hosp StonyBrook	11	4	0	240	4.6	3.9
Upst. Community Gen**	0	0	0	75	0.0	0.0
Vassar Brothers**	1	1	0	285	0.4	0.4
Westchester Medical**	3	2	0	166	1.8	1.4
White Plains Hosp	9	3	2	201	4.5	6.0
Woodhull Med Ctr	1	0	0	36	2.8	2.5



Data reported as of June 25, 2018. ┆State Average. ●Risk-adjusted Infection rate. ▬^^Significantly 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, trauma, and endoscope. Excludes SSIs present at time of surgery and non-readmitted cases identified using post discharge surveillance.

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

In 2017, 36 hospitals reported a total of 178 CABG chest surgical site infections out of 10,849 procedures, a rate of 1.6 infections per 100 procedures. NYSDOH excludes some of these SSIs and procedures from SSI rates before evaluating time trends and comparing hospital performance, as described below.

Of the 178 infections, none were classified as PATOS, and 30% were superficial, 34% were deep, and 36% were organ/space (Table 4). Most of the SSIs (66%) were detected upon readmission to the same hospital; 19% were identified during the initial hospitalization; 10% involved readmission to another hospital; and 6% were detected using PDS and not readmitted. Detection of SSIs in outpatient locations is labor intensive and is not standardized across hospitals; therefore, the NYSDOH did not include these 10 PDS infections in the final SSI rate so as not to penalize facilities with the best surveillance systems.

Table 4. Method of detection of coronary artery bypass graft chest-site surgical site infection by depth of infection, New York State 2017

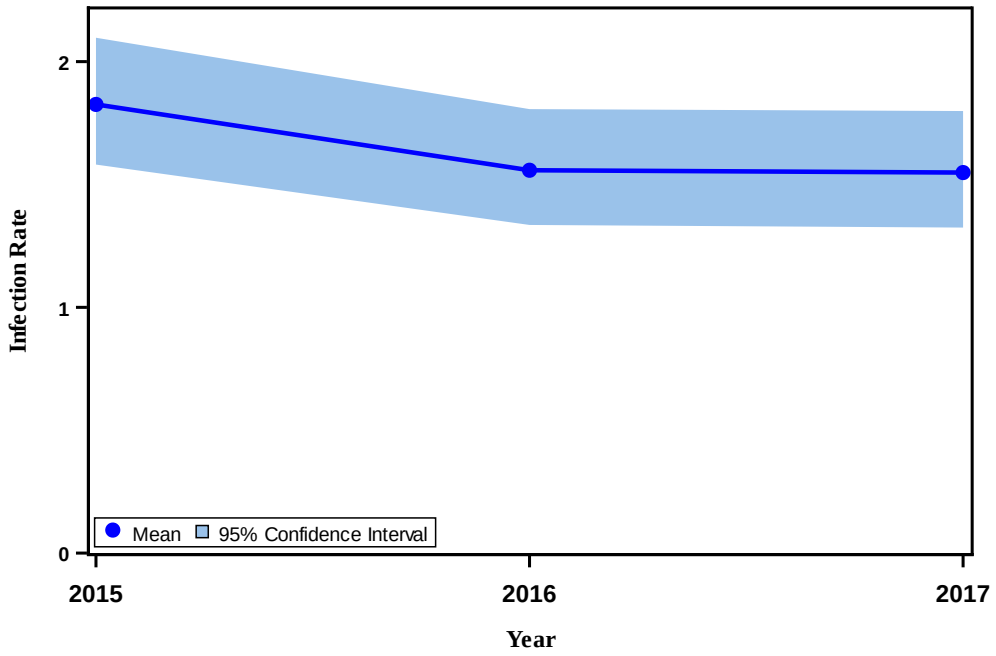
Extent (Row%) (Column%)	When Detected				
	Initial Hospitalization	Readmitted to the Same Hospital	Readmitted to Another Hospital	Post-Discharge Surveillance Not Readmitted	Total
Superficial Incisional	8 (15.1%) (23.5%)	29 (54.7%) (24.8%)	7 (13.2%) (41.2%)	9 (17.0%) (90.0%)	53 (29.8%)
Deep Incisional	8 (13.1%) (23.5%)	45 (73.8%) (38.5%)	7 (11.5%) (41.2%)	1 (1.6%) (10.0%)	61 (34.3%)
Organ/Space	18 (28.1%) (52.9%)	43 (67.2%) (36.8%)	3 (4.7%) (17.6%)	0 (0%) (0%)	64 (36.0%)
Total	34 (19.1%)	117 (65.7%)	17 (9.6%)	10 (5.6%)	178

New York State data reported as of June 25, 2018. Excludes infections present at time of surgery.

Trends in CABG chest SSI rates after deleting PATOS and PDS infections are shown in Figure 3. Between 2015 and 2017, the total number of CABG chest SSIs declined 15%, with 1.83 infections per 100 procedures in 2015, and 1.55 infections per 100 procedures in 2017.

Figure 3: Trend in coronary artery bypass graph chest site surgical site infection rates, New York State 2015-2017

Excluding infections present at time of surgery and detected in outpatient settings without readmission



Year	# Hospitals	# Infections	# Procedures	Infection Rate (95% Confidence Interval)
2015	38	196	10,735	1.83 (1.58, 2.10)
2016	37	172	11,040	1.56 (1.34, 1.81)
2017	36	168	10,849	1.55 (1.32, 1.80)

New York State data reported as of June 25, 2018.
Infection rate is the number of infections divided by the number of procedures, multiplied by 100.

In NYS, the most common microorganisms associated with CABG chest SSIs were *Staphylococcus aureus* and coagulase-negative staphylococci (Table 5).

Table 5. Microorganisms identified in coronary artery bypass graft chest site infections, New York State 2017

Microorganism	Number of Isolates	Percent of Infections
Staphylococcus aureus	57	32.0
(MRSA)	(18)	(10.1)
Coagulase negative staphylococci	30	16.9
Pseudomonas spp.	15	8.4
Enterobacter spp.	13	7.3
Escherichia coli	11	6.2
Klebsiella spp.	11	6.2
Proteus spp.	9	5.1
Serratia spp.	8	4.5
Enterococci	7	3.9
(VRE)	(5)	(2.8)
Streptococci	7	3.9
Propionibacterium spp.	5	2.8
Yeast	5	2.8
Acinetobacter spp.	1	0.6
Other	9	5.1

New York State data reported as of June 25, 2018. Out of 178 infections. No microorganisms identified for 28 (16%) infections. VRE: vancomycin-resistant enterococci; MRSA: methicillin-resistant *Staphylococcus aureus*

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 2017, the following risk factors were associated with SSIs and were included in the risk-adjustment:

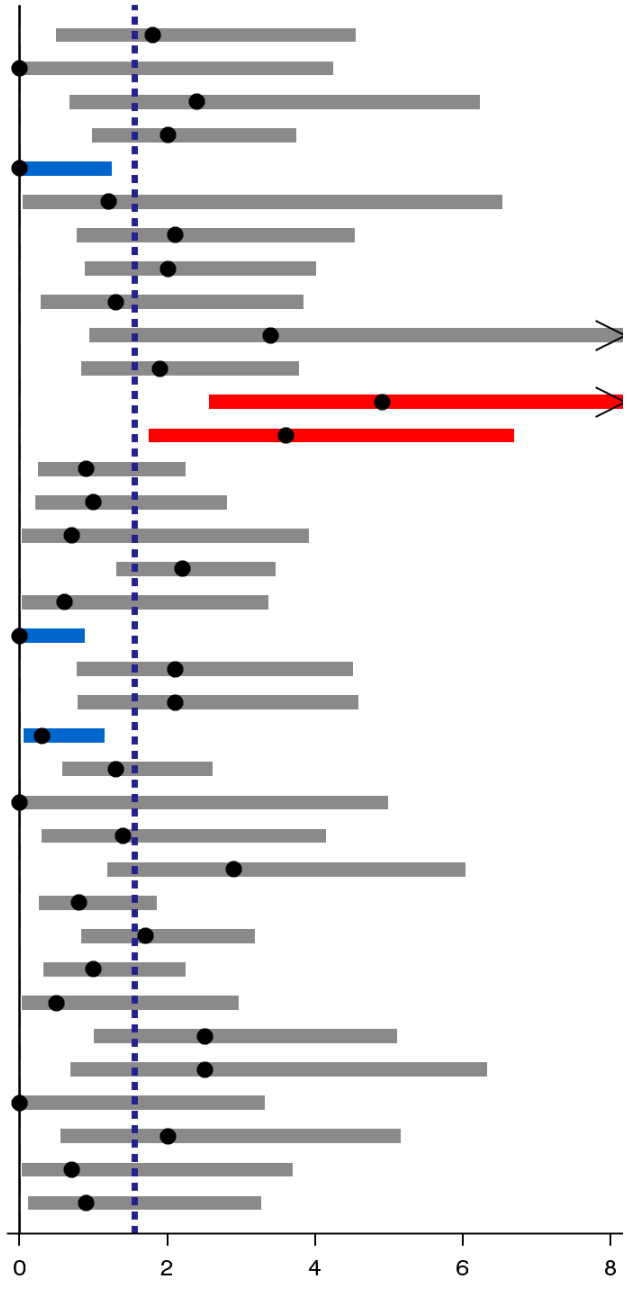
- Patients with diabetes were 2.1 times more likely to develop an SSI than patients without diabetes.
- Obese patients (with body mass index [BMI] greater than or equal to 30) were 2.2 times more likely to develop an SSI than patients with BMI less than 30.
- Females were 2.8 times more likely to develop an SSI than males.
- Patients who experienced trauma (i.e. a blunt or penetrating injury) prior to the procedure were 2.6 times more likely to develop an SSI than other patients.

Hospital-Specific CABG Chest SSI Rates

Hospital-specific CABG chest SSI rates are provided in Figure 4. In 2017, of the 36 reporting hospitals, two (6%) had a CABG chest SSI rate that was statistically higher than the state average. These hospitals will submit improvement plans following the NYSDOH HAI Reporting Program's Policy for Facilities with Consecutive Years of High HAI Rates. Three hospitals (8%) were statistically lower than the state average. No hospitals were flagged high or low for more than two consecutive years.

Figure 4. Coronary artery bypass graft chest site infection rates, New York 2017

Hospital	# SSI	#PATOS excl.	#PDS excl.	# Procs	Raw Rate	Adj Rate
Albany Med Ctr	4	0	1	283	1.4	1.8
Arnot Ogden Med Ctr	0	0	1	61	0.0	0.0
Bellevue Hospital	4	0	1	192	2.1	2.4
Buffalo General	10	0	0	518	1.9	2.0
Ellis Hospital**	0	0	1	231	0.0	0.0
Good Samar. Suffern	1	0	0	74	1.4	1.2
Good Samar. W Islip	6	0	0	279	2.2	2.1
Lenox Hill Hospital	8	0	0	397	2.0	2.0
Maimonides Med Ctr	3	0	0	234	1.3	1.3
Mary Imogene Bassett	4	0	1	101	4.0	3.4
Mercy Hosp Buffalo	8	0	0	401	2.0	1.9
Montefiore-Einstein^^	12	0	2	221	5.4	4.9
Montefiore-Moses^^	10	0	0	256	3.9	3.6
Mt Sinai	4	0	2	489	0.8	0.9
Mt Sinai St Lukes	3	0	0	310	1.0	1.0
NYP-Brklyn Methodist	1	0	0	146	0.7	0.7
NYP-Columbia	18	0	0	608	3.0	2.2
NYP-Queens	1	0	0	182	0.5	0.6
NYP-Weill Cornell**	0	0	0	270	0.0	0.0
NYU Tisch	6	0	1	309	1.9	2.1
NYU Winthrop	6	0	0	299	2.0	2.1
North Shore**	2	0	0	697	0.3	0.3
Rochester General	8	0	0	577	1.4	1.3
SUNY Downstate MedCr	0	0	0	66	0.0	0.0
Southside	3	0	0	234	1.3	1.4
St Elizabeth Medical	7	0	0	209	3.3	2.9
St Francis- Roslyn	5	0	0	701	0.7	0.8
St Josephs- Syracuse	10	0	0	601	1.7	1.7
St Peters Hospital	5	0	0	520	1.0	1.0
Staten Island U N	1	0	0	208	0.5	0.5
Strong Memorial	7	0	0	277	2.5	2.5
UHS Wilson	4	0	0	172	2.3	2.5
Univ Hosp SUNY Upst	0	0	0	89	0.0	0.0
Univ Hosp StonyBrook	4	0	0	223	1.8	2.0
Vassar Brothers	1	0	0	161	0.6	0.7
Westchester Medical	2	0	0	253	0.8	0.9



Data reported as of June 25, 2018. ┆State Average. ●Risk-adjusted Infection rate. ▬^^Significantly 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, obesity, gender, and trauma. Excludes SSIs present at time of surgery (PATOS) and non-readmitted cases identified using post discharge surveillance (PDS).

CABG Donor Site Infections

In 2017, 36 hospitals reported a total of 45 CABG donor site infections out of 9,558 procedures, a rate of 0.47 infections per 100 procedures. None of the infections were classified as PATOS.

Of the 45 infections, 76% were superficial and 24% were deep (Table 6). Most of the SSIs (73%) were detected upon readmission to the same hospital; 16% were identified during the initial hospitalization; 11% involved readmission to another hospital.

Table 6: Method of detection for coronary artery bypass graft donor site infection by depth of infection, New York State 2017

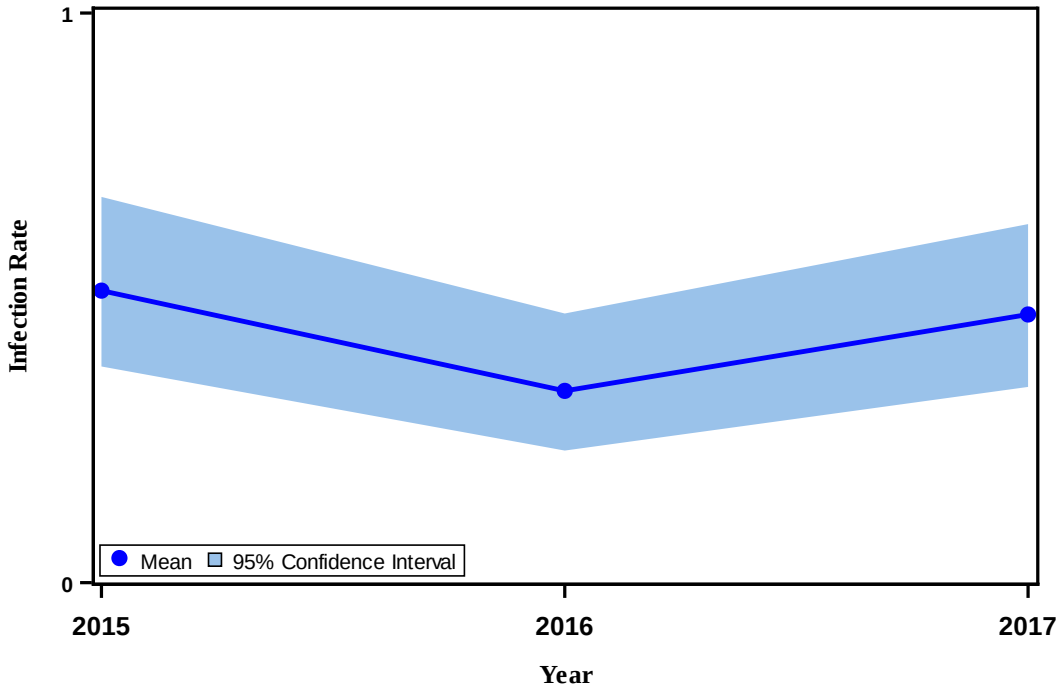
	When Detected				
Extent (Row%) (Column%)	**Initial Hospitalization**	**Readmitted to the Same Hospital**	**Readmitted to Another Hospital**	**Post-Discharge Surveillance Not Readmitted**	**Total**
Superficial Incisional	6 (17.6%) (85.7%)	23 (67.6%) (69.7%)	5 (14.7%) (100.0%)	0 (0%) (0%)	34 (75.6%)
Deep Incisional	1 (9.1%) (14.3%)	10 (90.9%) (30.3%)	0 (0%) (0%)	0 (0%) (0%)	11 (24.4%)
Total	7 (15.6%)	33 (73.3%)	5 (11.1%)	0 (0%)	45

New York State data reported as of June 25, 2018. Excludes infections present at time of surgery.

Trends in CABG SSI rates are shown in Figure 5. Between 2015 and 2017, the total number of CABG donor site infection rate decreased 8%, from 0.51 infections per 100 procedures in 2015, to 0.47 infections per 100 procedures in 2017.

Figure 5: Trend in coronary artery bypass graft donor site surgical site infection rates, New York State 2015-2017

Excluding infections present at time of surgery and detected in outpatient settings without readmission



Year	# Hospitals	# Infections	# Procedures	Infection Rate (95% Confidence Interval)
2015	38	49	9,558	0.51 (0.38, 0.68)
2016	37	33	9,801	0.34 (0.23, 0.47)
2017	36	45	9,558	0.47 (0.34, 0.63)

New York State data reported as of June 25, 2018.
Infection rate is the number of infections divided by the number of procedures, multiplied by 100.

Enterococci, *Pseudomonas* spp., and *Staphylococcus aureus* were the most common microorganisms associated with CABG donor site SSIs. (Table 7).

Table 7. Microorganisms identified in coronary artery bypass graft donor site infections, New York State 2017

Microorganism	Number of Isolates	Percent of Infections
Enterococci	8	17.8
(VRE)	(1)	(2.2)
Pseudomonas spp.	8	17.8
Staphylococcus aureus	7	15.6
(MRSA)	(3)	(6.7)
Escherichia coli	6	13.3
Klebsiella spp.	6	13.3
Proteus spp.	6	13.3
Enterobacter spp.	3	6.7
Acinetobacter spp.	1	2.2
Other	9	20.0

New York State data reported as of June 25, 2018. Out of 45 infections. No microorganisms identified for 14 (31%) infections. MRSA: methicillin-resistant *Staphylococcus aureus;* VRE: vancomycin-resistant enterococci; 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 2017, 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:

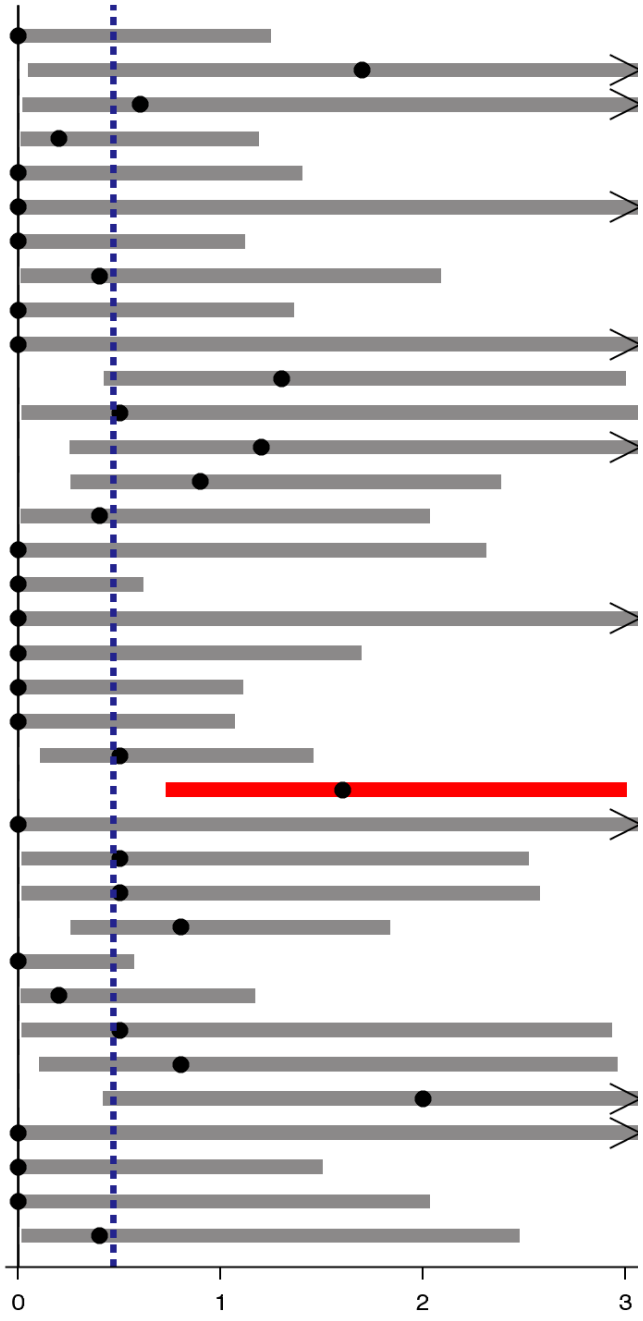
- Obese patients (with BMI at least 30) were 1.6 times more likely to develop an SSI than patients with BMI less than 30.
- Patients with diabetes were 2.0 times more likely to develop an SSI than patients without diabetes.

Hospital-Specific CABG Donor Site SSI rates

Hospital-specific CABG donor site SSI rates are provided in Figure 6. In 2017, one hospital (3%) was flagged for having a significantly high rate. The hospital will submit an improvement plan following the NYSDOH HAI Reporting Program's Policy for Facilities with Consecutive Years of High HAI Rates. No hospital was statistically lower than the state average. No hospitals were flagged high or low for more than two consecutive years.

Figure 6. Coronary artery bypass graft donor site infection rates, New York 2017

Hospital	# SSI	#PATOS excl.	#PDS excl.	# Procs	Raw Rate	Adj Rate
Albany Med Ctr	0	0	0	261	0.0	0.0
Arnot Ogden Med Ctr	1	0	0	56	1.8	1.7
Bellevue Hospital	1	0	0	185	0.5	0.6
Buffalo General	1	0	0	478	0.2	0.2
Ellis Hospital	0	0	0	209	0.0	0.0
Good Samar. Suffern	0	0	0	73	0.0	0.0
Good Samar. W Islip	0	0	0	262	0.0	0.0
Lenox Hill Hospital	1	0	0	258	0.4	0.4
Maimonides Med Ctr	0	0	0	223	0.0	0.0
Mary Imogene Bassett	0	0	0	87	0.0	0.0
Mercy Hosp Buffalo	5	0	0	377	1.3	1.3
Montefiore-Einstein	1	0	0	175	0.6	0.5
Montefiore-Moses	3	0	0	243	1.2	1.2
Mt Sinai	4	0	0	433	0.9	0.9
Mt Sinai St Lukes	1	0	0	264	0.4	0.4
NYP-Brklyn Methodist	0	0	0	144	0.0	0.0
NYP-Columbia	0	0	0	503	0.0	0.0
NYP-Queens	0	0	0	63	0.0	0.0
NYP-Weill Cornell	0	0	0	199	0.0	0.0
NYU Tisch	0	0	0	271	0.0	0.0
NYU Winthrop	0	0	0	277	0.0	0.0
North Shore	3	0	0	604	0.5	0.5
Rochester General^^	9	0	0	549	1.6	1.6
SUNY Downstate MedCr	0	0	0	57	0.0	0.0
Southside	1	0	0	224	0.4	0.5
St Elizabeth Medical	1	0	0	189	0.5	0.5
St Francis- Roslyn	5	0	0	660	0.8	0.8
St Josephs- Syracuse	0	0	0	529	0.0	0.0
St Peters Hospital	1	0	0	464	0.2	0.2
Staten Island U N	1	0	0	192	0.5	0.5
Strong Memorial	2	0	0	242	0.8	0.8
UHS Wilson	3	0	0	152	2.0	2.0
Univ Hosp SUNY Upst	0	0	0	75	0.0	0.0
Univ Hosp StonyBrook	0	0	0	207	0.0	0.0
Vassar Brothers	0	0	0	146	0.0	0.0
Westchester Medical	1	0	0	227	0.4	0.4



Data reported as of June 25, 2018. ┆State Average. ●Risk-adjusted Infection rate. ▬^^Significantly 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 obesity and diabetes. Excludes SSIs present at time of surgery (PATOS) and post discharge surveillance non–readmitted cases (PDS).

Hip Replacement/Revision Surgical Site Infections

In 2017, 157 hospitals reported a total of 338 hip replacement/revision surgical site infections out of 34,867 procedures, a rate of 1.0 infections per 100 procedures. NYSDOH excludes some of these SSIs and procedures from SSI rates before evaluating time trends and comparing hospital performance, as described below.

Of the 338 infections, five were classified as PATOS and excluded from further analysis, because PATOS infections are more difficult to prevent.

Of the remaining 333 infections, 28% were superficial, 35% were deep, and 37% were organ/space (Table 8). Most of the SSIs (78%) were detected upon readmission to the same hospital; 6% were identified during the initial hospitalization; 11% involved readmission to another hospital; and 5% were detected using PDS and not readmitted. The majority (83%) 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 18 PDS infections in the final SSI rate so as not to penalize facilities with the best surveillance systems.

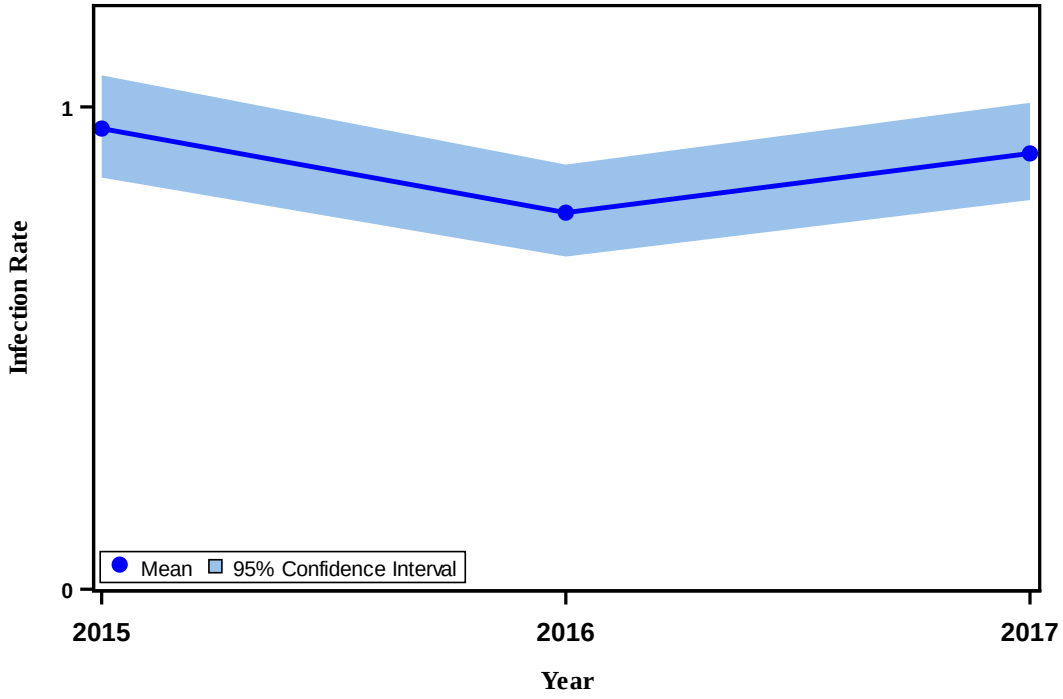
Table 8. Method of detection of hip surgical site infection by depth of infection, New York State 2017

	When Detected				
Extent (Row%) (Column%)	**Initial Hospitalization**	**Readmitted to the Same Hospital**	**Readmitted to Another Hospital**	**Post-Discharge Surveillance Not Readmitted**	**Total**
Superficial Incisional	10 (10.6%) (47.6%)	61 (64.9%) (23.6%)	8 (8.5%) (22.9%)	15 (16.0%) (83.3%)	94 (28.2%)
Deep Incisional	7 (6.1%) (33.3%)	89 (77.4%) (34.4%)	16 (13.9%) (45.7%)	3 (2.6%) (16.7%)	115 (34.5%)
Organ/Space	4 (3.2%) (19.0%)	109 (87.9) (42.1%)	11 (8.9%) (31.4%)	0 (0%) (0 %)	124 (37.2%)
Total	21 (6.3%)	259 (77.8%)	35 (10.5%)	18 (5.4%)	333

New York State data reported as of June 25, 2018. Excludes infections present at time of surgery.

Trends in hip SSI rates after deleting PATOS and PDS infections are shown in Figure 7. Between 2015 and 2017, the total number of hip surgical site infections decreased 5%, from 0.955 infections per 100 procedures in 2015, to 0.904 infections per 100 procedures in 2017.

Figure 7: Trend in hip surgical site infection rates, New York State 2015-2017
Excluding infections present at time of surgery and detected in outpatient settings without readmission



Year	# Hospitals	# Infections	# Procedures	Infection Rate (95% Confidence Interval)
2015	158	318	33,294	0.955 (0.85, 1.07)
2016	157	264	33,813	0.781 (0.69, 0.88)
2017	157	315	34,862	0.904 (0.81, 1.01)

New York State Data reported as of June 25, 2018.
Infection rate is the number of infections divided by the number of procedures, multiplied by 100.

Microorganisms Associated with Hip SSIs

The most common microorganism associated with hip SSIs was *Staphylococcus aureus* (Table 9).

Table 9. Microorganisms identified in hip replacement surgical site infections, New York State 2017

Microorganism	Number of Isolates	Percent of Infections
Staphylococcus aureus	132	39.1
(MRSA)	(53)	(15.7)
Coagulase negative staphylococci	43	12.7
Enterococci	38	11.2
(VRE)	(4)	(1.2)
Pseudomonas spp.	33	9.8
Escherichia coli	27	8.0
Klebsiella spp.	22	6.5
(CRE-*Klebsiella*)	(1)	(0.3)
Enterobacter spp.	18	5.3
Proteus spp.	16	4.7
Streptococci	15	4.4
Corynebacteria	8	2.4
Serratia spp.	8	2.4
Morganella morganii	7	2.1
Acinetobacter spp.	6	1.8
(MDR-*Acinetobacter*)	(2)	(0.6)
Other	19	5.6

New York State data reported as of June 25, 2018. Out of 338 infections. No microorganisms identified for 29 (9%) infections. CRE: carbapenem-resistant Enterobacteriaceae; VRE: vancomycin-resistant enterococci; MRSA: methicillin-resistant *Staphylococcus aureus; MDR:* multidrug resistant; spp: multiple species.

Risk Adjustment for Hip Surgical Site Infections

Certain patient and procedure-specific factors increased the risk of developing an SSI following hip surgery. In 2017, 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 2.3 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, partial primary procedures were 1.9 times more likely to result in an SSI, revisions with no prior infection at the joint were 3.5 times more likely to result in an SSI, and revisions with prior infection at the joint were 3.9 times more likely to result in an SSI.
- Very obese patients (with BMI greater than or equal to 40) were 4.2 times more likely to develop an SSI, and obese patients (with BMI between 30 and 39) were 1.8 times more likely to develop an SSI than patients with BMI less than 30.

Hospital-Specific Hip SSI Rates

Hospital-specific hip SSI rates are provided in Figure 8. Of the 136 hospitals that reported more than twenty hip procedures in 2017, three hospitals (2%) had hip SSI rates that were statistically higher than the state average. None were also high in the previous two years. All three hospitals will submit improvement plans following the NYSDOH HAI Reporting Program's Policy for Facilities with Consecutive Years of High HAI Rates. Three hospitals (2%) had an SSI rate significantly lower than the state average; Hospital for Special Surgery was significantly lower in each of the past ten years (2008-2017).

Figure 8. Hip replacement surgical site infection rates, New York 2017 (page 1 of 4)

Hospital	# SSI	#PATOS excl.	#PDS excl.	# Procs	Raw Rate	Adj Rate
AO Fox Memorial	0	0	0	32	0.0	0.0
Adirondack Medical	1	0	0	77	1.3	1.2
Albany Med Ctr	7	1	0	829	0.8	0.8
Albany Memorial	NA	NA	NA	NA	NA	NA
Alice Hyde Med Ctr	1	0	0	40	2.5	2.5
Arnot Ogden Med Ctr	2	0	0	237	0.8	0.7
Auburn Memorial	0	0	0	38	0.0	0.0
Bellevue Hospital	2	0	0	109	1.8	2.4
Bon Secours	NA	NA	NA	NA	NA	NA
Bronx-Lebanon	2	0	0	66	3.0	2.6
Brookdale Hospital	1	0	0	23	4.3	3.9
Brookhaven Memorial	0	0	0	71	0.0	0.0
Brooklyn Hosp Ctr	2	0	1	113	1.8	1.7
Brooks Memorial	1	0	0	114	0.9	0.8
Buffalo General	3	0	0	860	0.3	0.4
Canton-Potsdam	1	0	0	68	1.5	1.3
Catskill Regional	NA	NA	NA	NA	NA	NA
Cayuga Medical Ctr	1	0	0	189	0.5	0.6
Champlain Valley	0	0	1	96	0.0	0.0
Claxton-Hepburn	1	0	1	28	3.6	2.5
Columbia Memorial	0	0	0	98	0.0	0.0
Coney Island Hosp	0	0	0	70	0.0	0.0
Corning Hospital	2	0	0	115	1.7	1.7
Cortland Reg Med	1	0	0	30	3.3	2.4
Crouse Hospital	4	0	0	760	0.5	0.6
DeGraff Memorial	NA	NA	NA	NA	NA	NA
East. Niag. Lockport	NA	NA	NA	NA	NA	NA
Eastern Long Island	NA	NA	NA	NA	NA	NA
Ellis Hospital	3	0	0	255	1.2	1.0
Elmhurst Hospital	0	0	0	65	0.0	0.0
Erie County Med Ctr	6	0	0	550	1.1	1.0
FF Thompson	0	0	0	176	0.0	0.0
Faxton St. Lukes^^	3	0	0	52	5.8	4.7
Flushing Hospital	1	0	0	57	1.8	1.8
Geneva General	1	0	0	142	0.7	0.7
Glen Cove Hospital	NA	NA	NA	NA	NA	NA
Glens Falls Hospital	1	0	0	165	0.6	0.6
Good Samar. Suffern	2	0	0	154	1.3	1.1
Good Samar. W Islip	3	0	0	167	1.8	1.6
Harlem Hospital	NA	NA	NA	NA	NA	NA

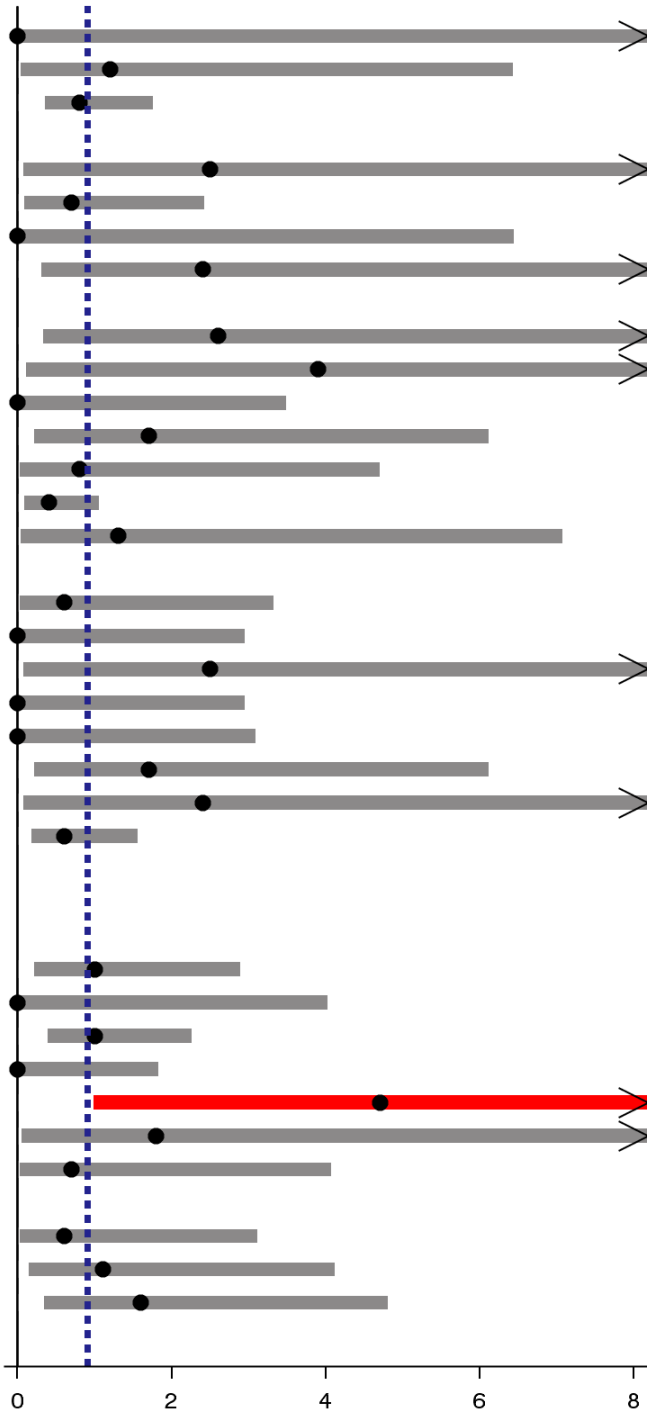


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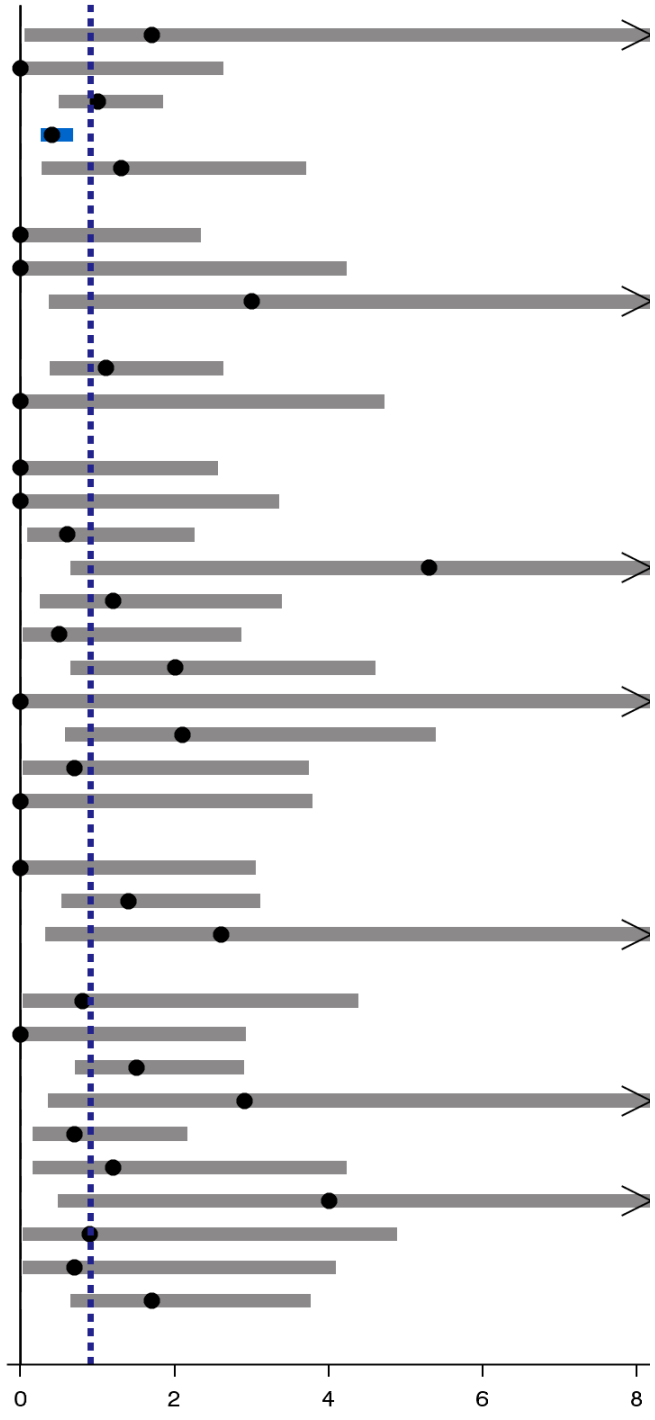
Figure 8. Hip replacement surgical site infection rates, New York 2017 (page 2 of 4)

Hospital	# SSI	#PATOS excl.	#PDS excl.	# Procs	Raw Rate	Adj Rate
HealthAlli Broadway	1	0	0	40	2.5	1.7
HealthAlli MarysAve	0	0	0	113	0.0	0.0
Highland Hospital	10	0	1	1143	0.9	1.0
Hosp for Spec Surg**	17	1	0	5159	0.3	0.4
Huntington Hospital	3	0	0	239	1.3	1.3
Interfaith Med Ctr	NA	NA	NA	NA	NA	NA
JT Mather Hospital	0	0	0	121	0.0	0.0
Jacobi Med Ctr	0	0	0	54	0.0	0.0
Jamaica Hospital	2	0	0	50	4.0	3.0
Jones Memorial	NA	NA	NA	NA	NA	NA
Kenmore Mercy	5	0	0	478	1.0	1.1
Kings County Hosp	0	0	0	50	0.0	0.0
Kingsbrook Jewish MC	NA	NA	NA	NA	NA	NA
LIJ at Forest Hills	0	0	0	101	0.0	0.0
LIJ at Valley Stream	0	0	0	93	0.0	0.0
Lenox Hill Hospital	2	0	0	438	0.5	0.6
Lincoln Med Ctr	2	0	0	31	6.5	5.3
Long Isl Jewish(LIJ)	3	0	0	345	0.9	1.2
Maimonides Med Ctr	1	0	0	167	0.6	0.5
Mary Imogene Bassett	5	0	5	231	2.2	2.0
Massena Memorial	0	0	0	21	0.0	0.0
Memor SloanKettering	4	0	0	124	3.2	2.1
Mercy Hosp Buffalo	1	0	0	129	0.8	0.7
Mercy Med Ctr	0	0	0	85	0.0	0.0
Metropolitan Hosp	NA	NA	NA	NA	NA	NA
MidHudson Reg of WMC	0	0	0	98	0.0	0.0
Millard Fill. Suburb	6	0	0	495	1.2	1.4
Montefiore-Moses	2	0	0	64	3.1	2.6
Montefiore-Mt Vernon	NA	NA	NA	NA	NA	NA
Montefiore-NewRochl	1	0	0	156	0.6	0.8
Montefiore-Nyack	0	0	0	114	0.0	0.0
Montefiore-Wakefield	9	1	1	554	1.6	1.5
Mount St. Marys	2	0	0	65	3.1	2.9
Mt Sinai	3	1	0	405	0.7	0.7
Mt Sinai Beth Israel	2	0	0	195	1.0	1.2
Mt Sinai Brooklyn	2	0	0	42	4.8	4.0
Mt Sinai Queens	1	0	0	97	1.0	0.9
Mt Sinai St Lukes	1	0	0	113	0.9	0.7
Mt Sinai West	6	0	0	426	1.4	1.7
NY Community Hosp	NA	NA	NA	NA	NA	NA



Data reported as of June 25, 2018. ┆State Average. ●Risk-adjusted Infection rate. ▬^^Significantly 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, and obesity. Excludes SSIs present at time of surgery and non-readmitted cases identified using post discharge surveillance.

Figure 8. Hip replacement surgical site infection rates, New York 2017 (page 3 of 4)

Hospital	# SSI	#PATOS excl.	#PDS excl.	# Procs	Raw Rate	Adj Rate
NYP-Allen	NA	NA	NA	NA	NA	NA
NYP-Brklyn Methodist	2	0	0	264	0.8	0.7
NYP-Columbia	5	0	0	422	1.2	1.5
NYP-Hudson Valley	3	0	0	171	1.8	1.4
NYP-Lawrence	0	0	0	129	0.0	0.0
NYP-Lower Manhattan	0	0	0	55	0.0	0.0
NYP-Morgan Stanley	NA	NA	NA	NA	NA	NA
NYP-Queens	2	0	0	311	0.6	0.6
NYP-Weill Cornell	0	0	0	149	0.0	0.0
NYU Langone Brooklyn	4	0	0	202	2.0	1.8
NYU Orthopedic Hosp	22	0	0	1849	1.2	1.2
NYU Tisch	0	0	0	77	0.0	0.0
NYU Winthrop	5	0	0	337	1.5	1.3
Nassau University	1	0	0	44	2.3	1.8
Nathan Littauer	0	0	0	49	0.0	0.0
Newark Wayne	2	0	0	87	2.3	2.0
Niagara Falls	2	0	0	21	9.5	6.2
North Shore	4	0	0	529	0.8	0.7
Northern Dutchess	4	0	0	278	1.4	1.6
Northern Westchester	1	0	1	319	0.3	0.4
Noyes Memorial	1	0	0	49	2.0	1.7
Olean General	0	0	0	77	0.0	0.0
Oneida Healthcare	NA	NA	NA	NA	NA	NA
Orange Regional**	0	0	0	327	0.0	0.0
Oswego Hospital	0	0	0	30	0.0	0.0
Our Lady of Lourdes**	0	0	0	289	0.0	0.0
Peconic Bay Medical	4	0	0	410	1.0	1.0
Phelps Memorial	1	0	2	261	0.4	0.5
Plainview Hospital	2	0	0	142	1.4	1.3
Putnam Hospital	3	0	0	331	0.9	0.9
Richmond Univ MC^^	4	0	0	45	8.9	6.3
Rochester General	6	0	0	446	1.3	1.2
Rome Memorial	0	0	0	35	0.0	0.0
SUNY Downstate MedCr	0	0	0	58	0.0	0.0
Samaritan- Troy^^	5	0	0	99	5.1	4.1
Samaritan- Watertown	3	0	0	100	3.0	2.8
Saratoga Hospital	4	0	0	437	0.9	0.8
Sisters of Charity	0	0	0	148	0.0	0.0
Sisters- St Joseph	2	0	0	199	1.0	0.9
South Nassau Comm.	2	0	0	395	0.5	0.6

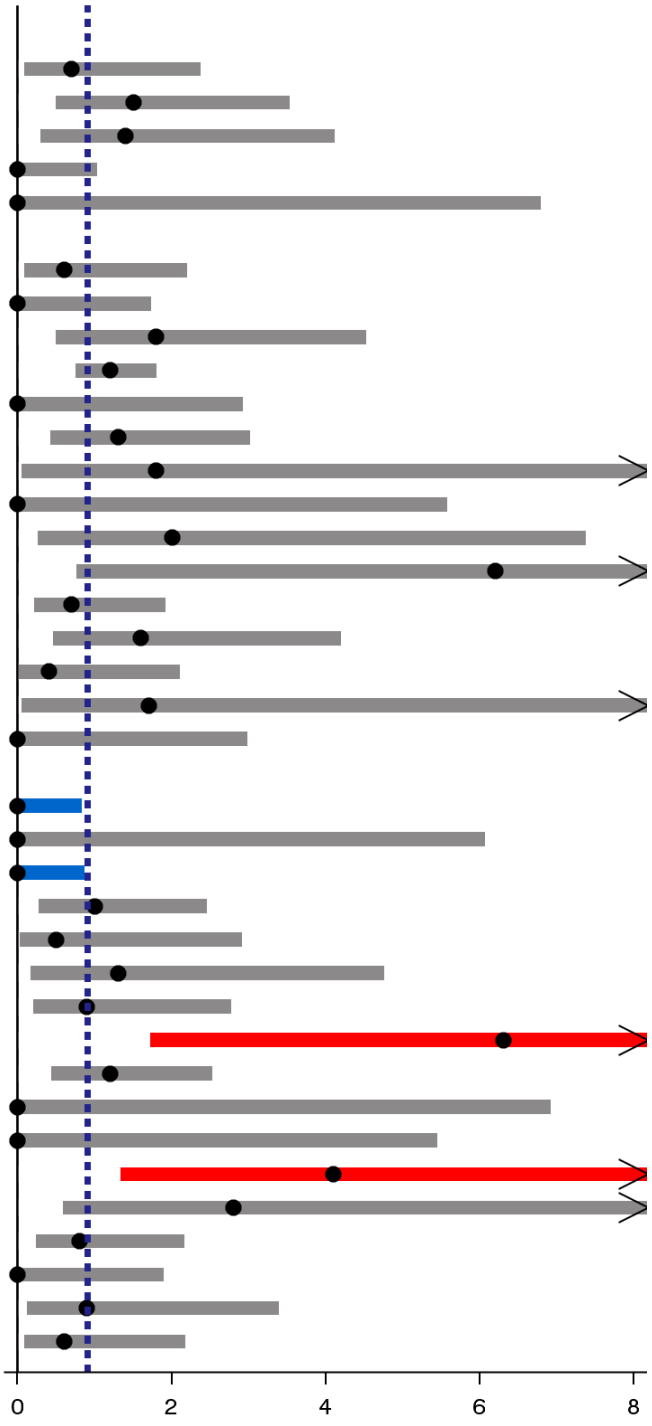


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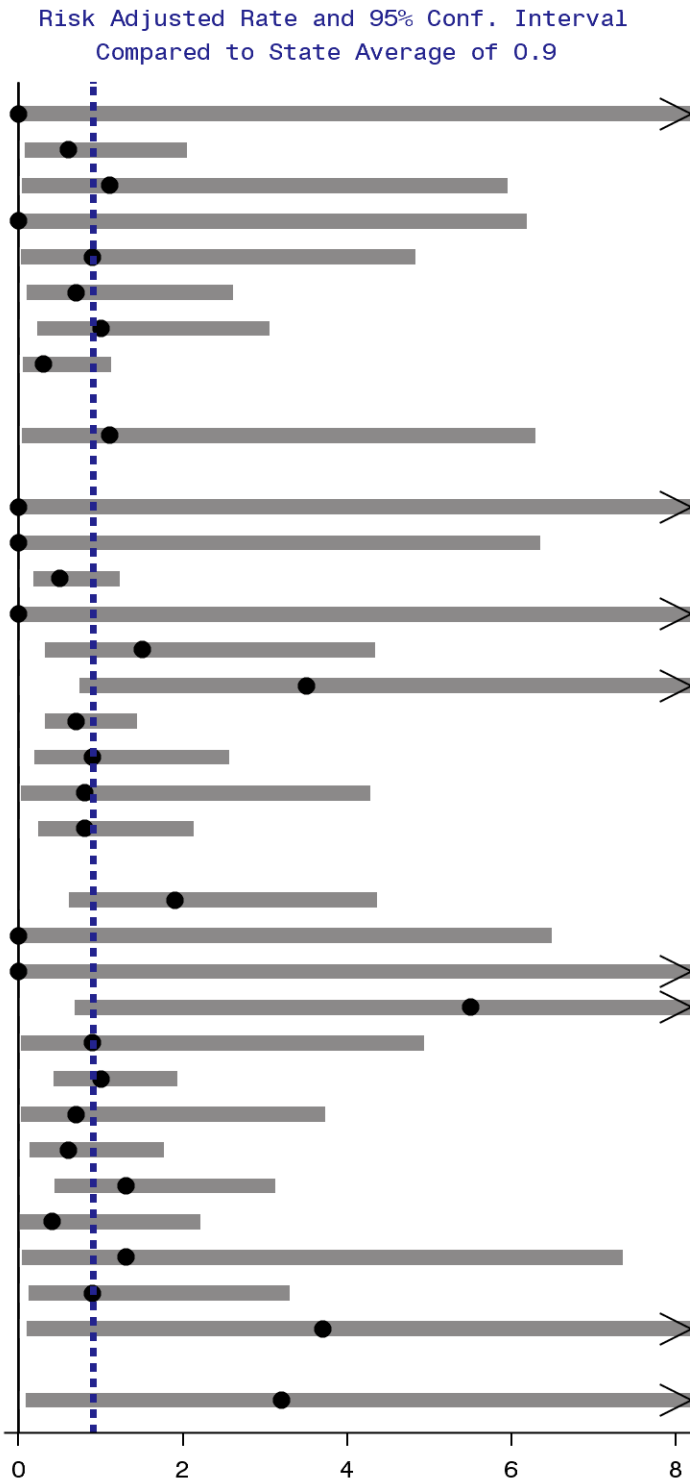
Figure 8. Hip replacement surgical site infection rates, New York 2017 (page 4 of 4)

Hospital	# SSI	#PATOS excl.	#PDS excl.	# Procs	Raw Rate	Adj Rate
Southampton	0	0	0	21	0.0	0.0
Southside	2	0	0	338	0.6	0.6
St Anthony	1	0	0	93	1.1	1.1
St Barnabas	0	0	0	41	0.0	0.0
St Catherine Siena	1	0	0	100	1.0	0.9
St Charles Hospital	2	0	0	249	0.8	0.7
St Elizabeth Medical	3	0	1	256	1.2	1.0
St Francis- Roslyn	2	0	0	594	0.3	0.3
St James Mercy	NA	NA	NA	NA	NA	NA
St Johns Dobbs Ferry	1	0	0	100	1.0	1.1
St Johns Episcopal	NA	NA	NA	NA	NA	NA
St Johns Riverside	0	0	0	21	0.0	0.0
St Joseph- Bethpage	0	0	0	50	0.0	0.0
St Josephs- Syracuse	5	1	0	926	0.5	0.5
St Josephs- Yonkers	0	0	0	27	0.0	0.0
St Lukes Cornwall	3	0	0	198	1.5	1.5
St Marys Amsterdam	3	0	1	94	3.2	3.5
St Peters Hospital	8	0	0	994	0.8	0.7
Staten Island U N	3	0	1	299	1.0	0.9
Strong Memorial	1	0	0	95	1.1	0.8
Syosset Hospital	4	0	0	473	0.8	0.8
TLC Lake Shore	NA	NA	NA	NA	NA	NA
UHS Binghamton	5	0	0	250	2.0	1.9
UHS Chenango Memor	0	0	0	35	0.0	0.0
UHS Wilson	0	0	0	29	0.0	0.0
UPMC Chautauqua WCA	2	0	0	25	8.0	5.5
United Memorial	1	0	0	94	1.1	0.9
Unity Hosp Rochester	8	0	1	712	1.1	1.0
Univ Hosp SUNY Upst	1	0	0	93	1.1	0.7
Univ Hosp StonyBrook	3	0	0	439	0.7	0.6
Upst. Community Gen	5	0	1	320	1.6	1.3
Vassar Brothers	1	0	0	222	0.5	0.4
Westchester Medical	1	0	0	56	1.8	1.3
White Plains Hosp	2	0	0	223	0.9	0.9
Woodhull Med Ctr	1	0	0	34	2.9	3.7
Wyckoff Heights	NA	NA	NA	NA	NA	NA
Wyoming County Comm.	1	0	0	40	2.5	3.2



Data reported as of June 25, 2018. ┆State Average. ●Risk-adjusted Infection rate. ▬^^Significantly 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, and obesity. Excludes SSIs present at time of surgery and non-readmitted cases identified using post discharge surveillance.

Abdominal Hysterectomy Surgical Site Infections

In 2017, 149 hospitals reported a total of 282 hysterectomy surgical site infections out of 16,918 procedures, a rate of 1.7 infections per 100 procedures. NYSDOH excludes some of these SSIs and procedures from SSI rates before evaluating time trends and comparing hospital performance, as described below.

Of the 282 infections, three were classified as PATOS. PATOS SSIs/procedures were excluded from the final SSI rate because these infections are more difficult to prevent. Of the remaining 279 infections, 49% were superficial, 7% were deep, and 43% were organ/space (Table 10). Most of the SSIs (58%) were detected upon readmission to the same hospital; 9% were identified during the initial hospitalization; 6% involved readmission to another hospital; and 27% were detected using post-discharge surveillance and not readmitted. Most (89%) 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 76 PDS infections in the final SSI rate so as not to penalize facilities with the best surveillance systems.

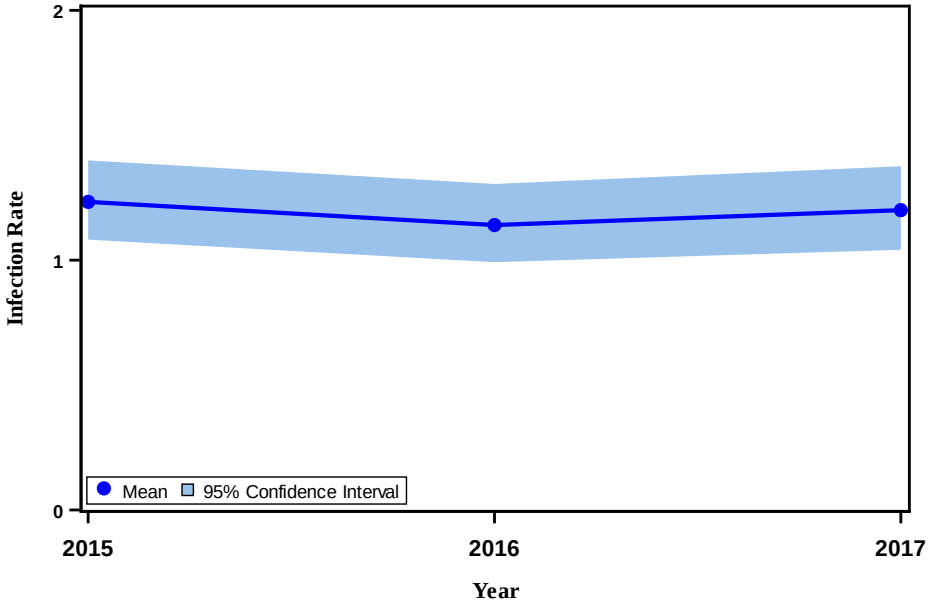
Table 10. Method of detection of hysterectomy surgical site infection by depth of infection, New York State 2017

Extent (Row%) (Column%)	When Detected				
	Initial Hospitalization	Readmitted to the Same Hospital	Readmitted to Another Hospital	Post-Discharge Surveillance Not Readmitted	Total
Superficial Incisional	11 (7.9%) (44.0%)	54 (38.8%) (33.3%)	6 (4.3%) (37.5%)	68 (48.9%) (89.5%)	139 (49.8%)
Deep Incisional	2 (10.0%) (8.0%)	13 (65.0%) (8.0%)	2 (10.0%) (12.5%)	3 (15.0%) (3.9%)	20 (7.2%)
Organ/Space	12 (10.0%) (48.0%)	95 (79.2) (58.6%)	8 (6.7%) (50.0%)	5 (4.2%) (6.6%)	120 (43.0%)
Total	25 (9.0%)	162 (58.1%)	16 (5.7%)	76 (27.2%)	279

New York State data reported as of June 25, 2018. Excludes infections present at time of surgery.

Trends in hysterectomy SSI rates after deleting PATOS and PDS infections are shown in Figure 9. Between 2015 and 2017 the total number of hysterectomy surgical site infections decreased 2%, from 1.23 infections per 100 procedures in 2015, to 1.20 infections per 100 procedures in 2017. The number of reported procedures decreased 8%, which may be due to a shift between inpatient and outpatient procedures, or a shift in the types of procedures performed.

Figure 9: Trend in hysterectomy surgical site infection rates, New York State 2015-2017
Excluding infections present at time of surgery and detected in outpatient settings without readmission



Year	# Hospitals	# Infections	# Procedures	Infection Rate (95% Confidence Interval)
2015	151	237	19,216	1.23 (1.08, 1.40)
2016	148	209	18,325	1.14 (0.99, 1.30)
2017	149	203	16,915	1.20 (1.04, 1.38)

New York State data reported as of June 25, 2018.
Infection rate is the number of infections divided by the number of procedures, multiplied by 100.

Microorganisms Associated with Hysterectomy SSIs

The most common microorganisms associated with hysterectomy SSIs were Enterococci and *E. coli* (Table 11).

Table 11. Microorganisms identified in hysterectomy surgical site infections, New York State 2017

Microorganism	Number of Isolates	Percent of Infections
Enterococci	42	14.9
(VRE)	(2)	(0.7)
Escherichia coli	40	14.2
Streptococci	31	11.0
Staphylococcus aureus	29	10.3
(MRSA)	(10)	(3.5)
Coagulase negative staphylococci	22	7.8
Pseudomonas spp.	19	6.7
Bacteroides spp.	18	6.4
Proteus spp.	17	6.0
Klebsiella spp.	16	5.7
Prevotella spp.	11	3.9
Enterobacter spp.	8	2.8
Morganella morganii	5	1.8
Acinetobacter spp.	2	0.7
(MDR-*Acinetobacter*)	(1)	(0.4)
Other	30	10.6

New York State data reported as of June 25, 2018. Out of 282 infections. No microorganisms identified for 96 (34%) infections. MRSA: methicillin-resistant *Staphylococcus aureus;* MDR: multidrug resistant; VRE: vancomycin-resistant enterococci; 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 2017, 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.

- For each unit increase in ASA score (1, 2, 3, 4/5), a measure of systemic disease, patients were 1.5 times more likely to develop an SSI.
- Procedures that involved traditional surgical incisions were 2.0 times more likely to result in SSI than procedures performed entirely with a laparoscopic instrument.
- Patients with diabetes were 1.2 times more likely to develop an SSI than patients without diabetes.
- Obese patients (with body mass index [BMI] greater than 30) were 1.4 times more likely to develop an SSI than patients with BMI less than or equal to 30.
- 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 1.6 times more likely to result in SSI than procedures less than two hours.

Hospital-Specific Hysterectomy SSI Rates

Hospital-specific hysterectomy SSI rates are provided in Figure 10. Of the 119 hospitals that reported more than twenty procedures in 2017, three hospitals (3%) had a hysterectomy SSI rate that was statistically higher than the state average. These three hospitals will submit improvement plans following the NYSDOH HAI Reporting Program's Policy for Facilities with Consecutive Years of High HAI Rates. One hospital (1%) had an SSI rate that was significantly lower than the state average. No hospitals were flagged high or low for more than two consecutive years.

Figure 10. Abdominal hysterectomy surgical site infection rates, New York 2017 (page 1 of 4)

Hospital	# SSI	#PATOS excl.	#PDS excl.	# Procs	Raw Rate	Adj Rate
AO Fox Memorial	NA	NA	NA	NA	NA	NA
Adirondack Medical	NA	NA	NA	NA	NA	NA
Albany Med Ctr	4	0	0	280	1.4	1.4
Albany Memorial	0	0	0	23	0.0	0.0
Alice Hyde Med Ctr	NA	NA	NA	NA	NA	NA
Arnot Ogden Med Ctr	2	0	0	21	9.5	7.5
Auburn Memorial	0	0	0	22	0.0	0.0
Bellevue Ellis	0	0	0	35	0.0	0.0
Bellevue Hospital	0	0	0	94	0.0	0.0
Bon Secours	NA	NA	NA	NA	NA	NA
Bronx-Lebanon	0	0	0	88	0.0	0.0
Brookdale Hospital	2	0	0	57	3.5	2.9
Brooklyn Hosp Ctr	1	0	0	240	0.4	0.4
Brooks Memorial	0	0	0	26	0.0	0.0
Buffalo General	2	0	0	47	4.3	4.3
Canton-Potsdam^^	3	0	0	44	6.8	8.9
Catskill Regional	1	0	0	46	2.2	1.7
Cayuga Medical Ctr	NA	NA	NA	NA	NA	NA
Champlain Valley	0	0	0	42	0.0	0.0
Claxton-Hepburn	NA	NA	NA	NA	NA	NA
Columbia Memorial	1	0	0	87	1.1	1.4
Coney Island Hosp	0	0	0	20	0.0	0.0
Corning Hospital	0	0	1	34	0.0	0.0
Cortland Reg Med	0	0	0	30	0.0	0.0
Crouse Hospital	6	0	0	513	1.2	1.5
East. Niag. Lockport	NA	NA	NA	NA	NA	NA
Ellis Hospital	0	0	0	82	0.0	0.0
Elmhurst Hospital	2	0	4	100	2.0	1.8
FF Thompson	1	0	0	40	2.5	3.3
Faxton St. Lukes^^	4	0	1	66	6.1	5.9
Flushing Hospital	4	0	5	218	1.8	2.7
Glens Falls Hospital	0	0	0	53	0.0	0.0
Good Samar. Suffern	0	0	0	30	0.0	0.0
Good Samar. W Islip	3	0	1	381	0.8	0.9
Harlem Hospital	0	0	0	24	0.0	0.0
HealthAlli Broadway	NA	NA	NA	NA	NA	NA
Highland Hospital**	0	0	0	545	0.0	0.0
Huntington Hospital	2	0	1	214	0.9	1.9
Interfaith Med Ctr	NA	NA	NA	NA	NA	NA
JT Mather Hospital	2	0	0	84	2.4	2.8

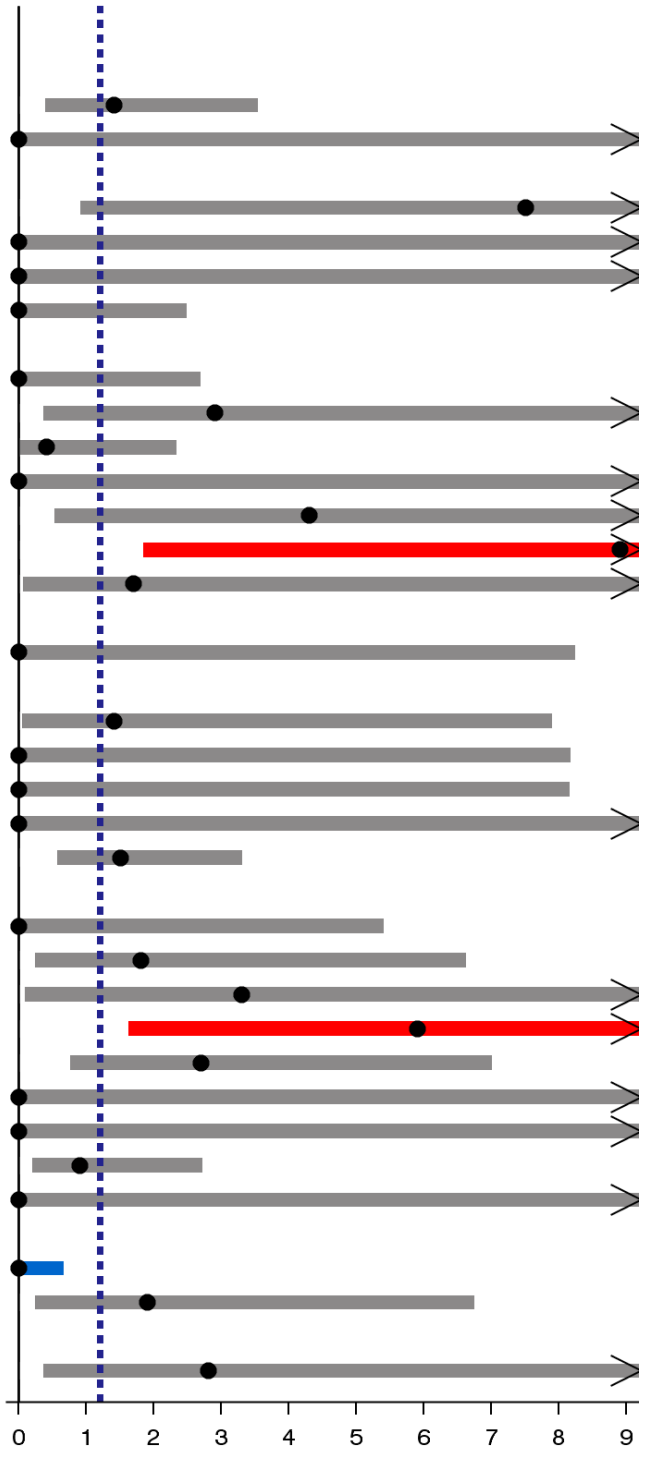


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Figure 10. Abdominal hysterectomy surgical site infection rates, New York 2017 (page 2 of 4)

Hospital	# SSI	#PATOS excl.	#PDS excl.	# Procs	Raw Rate	Adj Rate
Jacobi Med Ctr	3	0	2	78	3.8	2.1
Jamaica Hospital	3	0	0	108	2.8	2.0
Jones Memorial	0	0	0	24	0.0	0.0
Kenmore Mercy	NA	NA	NA	NA	NA	NA
Kings County Hosp	1	0	0	91	1.1	0.7
Kingsbrook Jewish MC	NA	NA	NA	NA	NA	NA
LIJ at Forest Hills	1	0	0	110	0.9	1.1
LIJ at Valley Stream	NA	NA	NA	NA	NA	NA
Lenox Hill Hospital	2	0	0	251	0.8	0.8
Lincoln Med Ctr	0	0	1	40	0.0	0.0
Long Isl Jewish(LIJ)	10	1	0	561	1.8	1.3
Maimonides Med Ctr	7	0	2	297	2.4	1.8
Mary Imogene Bassett	1	0	0	72	1.4	1.3
Massena Memorial	NA	NA	NA	NA	NA	NA
Memor SloanKettering	17	0	17	1010	1.7	1.3
Mercy Hosp Buffalo	1	0	0	234	0.4	0.6
Mercy Med Ctr	0	0	0	40	0.0	0.0
Metropolitan Hosp	0	0	0	29	0.0	0.0
MidHudson Reg of WMC	0	0	0	76	0.0	0.0
Millard Fill. Suburb	3	0	1	552	0.5	0.7
Montefiore-Einstein	7	1	8	326	2.1	1.5
Montefiore-Moses	3	0	3	153	2.0	1.8
Montefiore-Mt Vernon	0	0	1	39	0.0	0.0
Montefiore-NewRochl	0	0	0	49	0.0	0.0
Montefiore-Nyack	0	0	0	36	0.0	0.0
Montefiore-Wakefield	1	0	0	57	1.8	1.7
Mount St. Marys	NA	NA	NA	NA	NA	NA
Mt Sinai	11	1	6	466	2.4	2.2
Mt Sinai Beth Israel	2	0	0	77	2.6	2.8
Mt Sinai Brooklyn	1	0	0	44	2.3	2.9
Mt Sinai Queens	2	0	0	38	5.3	6.9
Mt Sinai St Lukes	0	0	0	65	0.0	0.0
Mt Sinai West	1	0	1	116	0.9	0.7
NY Community Hosp	NA	NA	NA	NA	NA	NA
NYP-Allen	NA	NA	NA	NA	NA	NA
NYP-Brklyn Methodist	1	0	0	286	0.3	0.3
NYP-Columbia	4	0	0	204	2.0	1.6
NYP-Hudson Valley	NA	NA	NA	NA	NA	NA
NYP-Lawrence	NA	NA	NA	NA	NA	NA
NYP-Lower Manhattan	0	0	0	41	0.0	0.0

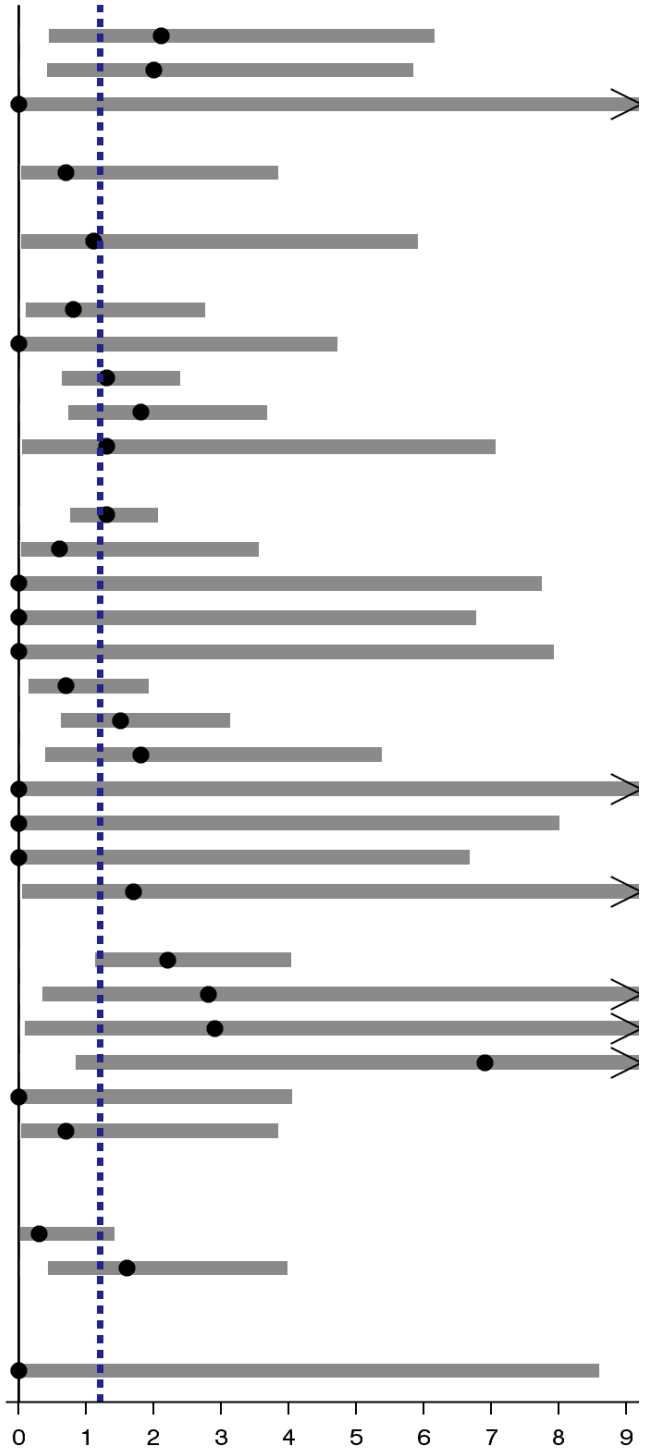

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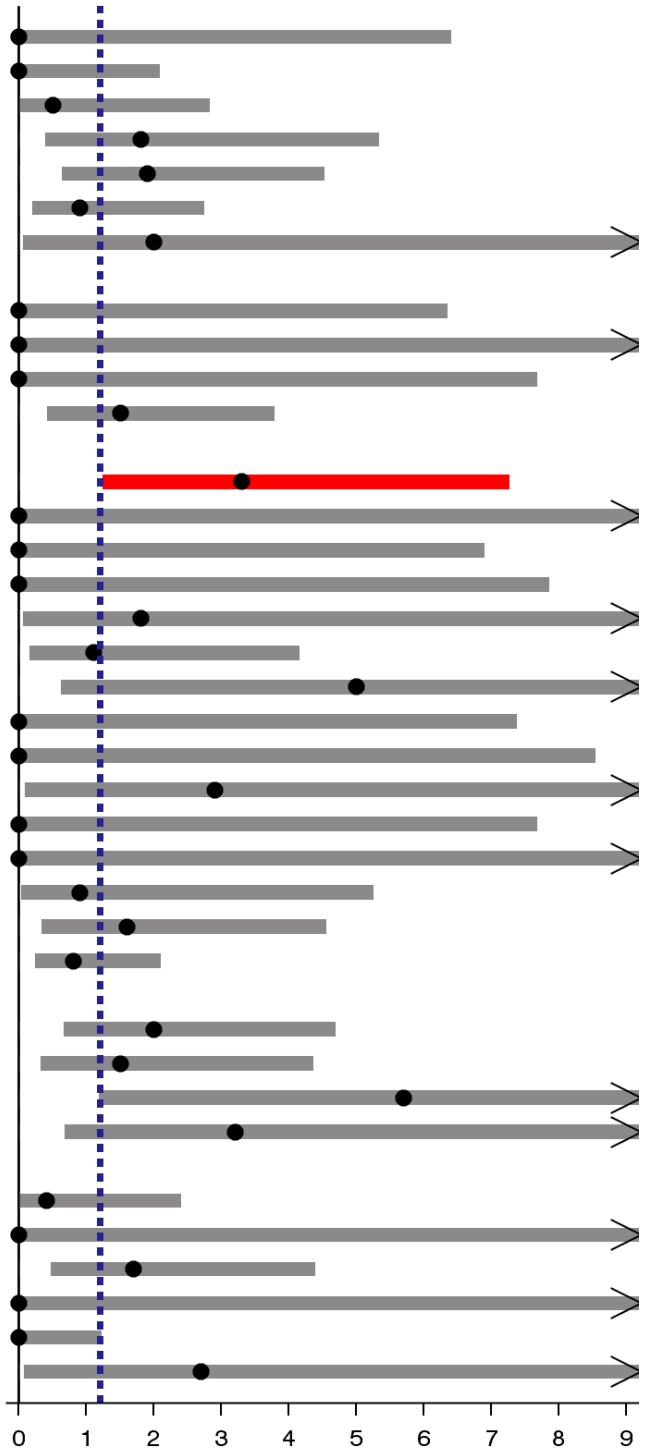
Figure 10. Abdominal hysterectomy surgical site infection rates, New York 2017 (page 3 of 4)

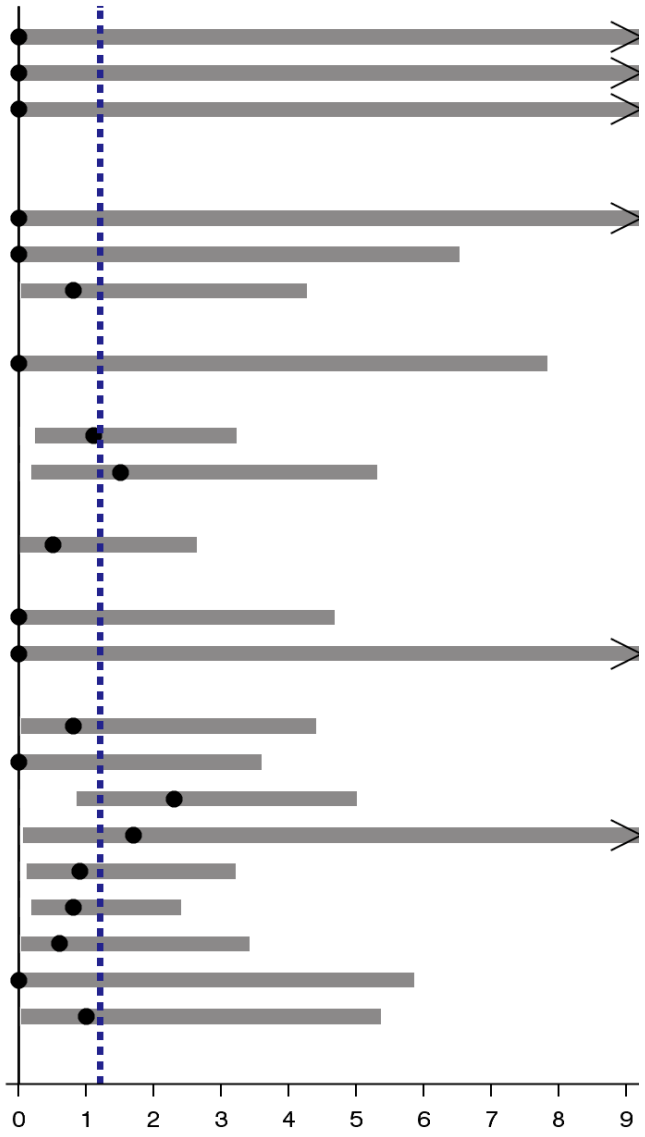
Hospital	# SSI	#PATOS excl.	#PDS excl.	# Procs	Raw Rate	Adj Rate
NYP-Morgan Stanley	0	0	0	20	0.0	0.0
NYP-Queens	0	0	2	128	0.0	0.0
NYP-Weill Cornell	1	0	0	178	0.6	0.5
NYU Langone Brooklyn	3	0	0	150	2.0	1.8
NYU Tisch	5	0	0	210	2.4	1.9
NYU Winthrop	3	0	1	277	1.1	0.9
Nassau University	1	0	0	39	2.6	2.0
Nathan Littauer	NA	NA	NA	NA	NA	NA
Newark Wayne	0	0	0	83	0.0	0.0
Niagara Falls	0	0	0	51	0.0	0.0
North Central Bronx	0	0	1	30	0.0	0.0
North Shore	4	0	0	249	1.6	1.5
Northern Dutchess	NA	NA	NA	NA	NA	NA
Northern Westchester^^	6	0	0	287	2.1	3.3
Noyes Memorial	0	0	0	21	0.0	0.0
Oishei Childrens	0	0	0	32	0.0	0.0
Olean General	0	0	1	59	0.0	0.0
Oneida Healthcare	1	0	0	119	0.8	1.8
Orange Regional	2	0	0	180	1.1	1.1
Oswego Hospital	2	0	0	43	4.7	5.0
Our Lady of Lourdes	0	0	0	60	0.0	0.0
Peconic Bay Medical	0	0	0	24	0.0	0.0
Phelps Memorial	1	0	0	30	3.3	2.9
Plainview Hospital	0	0	0	43	0.0	0.0
Putnam Hospital	0	0	0	44	0.0	0.0
Queens Hospital	1	0	1	74	1.4	0.9
Richmond Univ MC	3	0	2	262	1.1	1.6
Rochester General	4	0	0	523	0.8	0.8
Rome Memorial	NA	NA	NA	NA	NA	NA
Roswell Park	5	0	3	323	1.5	2.0
SUNY Downstate MedCr	3	0	0	133	2.3	1.5
Samaritan- Troy	3	0	0	69	4.3	5.7
Samaritan- Watertown	3	0	0	155	1.9	3.2
Saratoga Hospital	NA	NA	NA	NA	NA	NA
Sisters of Charity	1	0	1	249	0.4	0.4
Sisters- St Joseph	0	0	1	55	0.0	0.0
South Nassau Comm.	4	0	0	254	1.6	1.7
Southampton	0	0	0	41	0.0	0.0
Southside	0	0	0	339	0.0	0.0
St Anthony	1	0	0	53	1.9	2.7



Data reported as of June 25, 2018. State Average. ●Risk-adjusted Infection rate. ^^Significantly 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, duration, diabetes, obesity, and endoscope. Excludes SSIs present at time of surgery (PATOS) and non-readmitted cases identified using post discharge surveillance (PDS).

Figure 10. Abdominal hysterectomy surgical site infection rates, New York 2017 (page 4 of 4)

Hospital	# SSI	#PATOS excl.	#PDS excl.	# Procs	Raw Rate	Adj Rate
St Barnabas	0	0	0	22	0.0	0.0
St Catherine Siena	0	0	0	35	0.0	0.0
St Charles Hospital	0	0	0	33	0.0	0.0
St Elizabeth Medical	NA	NA	NA	NA	NA	NA
St Francis- Roslyn	NA	NA	NA	NA	NA	NA
St Johns Episcopal	0	0	0	26	0.0	0.0
St Johns Riverside	0	0	0	60	0.0	0.0
St Josephs- Syracuse	1	0	0	182	0.5	0.8
St Josephs- Yonkers	NA	NA	NA	NA	NA	NA
St Lukes Cornwall	0	0	0	40	0.0	0.0
St Marys Amsterdam	NA	NA	NA	NA	NA	NA
St Peters Hospital	3	0	0	287	1.0	1.1
Staten Island U N	2	0	0	107	1.9	1.5
Staten Island U S	NA	NA	NA	NA	NA	NA
Strong Memorial	1	0	0	238	0.4	0.5
UHS Chenango Memor	NA	NA	NA	NA	NA	NA
UHS Wilson	0	0	0	71	0.0	0.0
UPMC Chautauqua WCA	0	0	2	29	0.0	0.0
United Memorial	NA	NA	NA	NA	NA	NA
Unity Hosp Rochester	1	0	0	158	0.6	0.8
Univ Hosp SUNY Upst	0	0	1	67	0.0	0.0
Univ Hosp StonyBrook	6	0	0	190	3.2	2.3
Upst. Community Gen	1	0	0	81	1.2	1.7
Vassar Brothers	2	0	0	356	0.6	0.9
Westchester Medical	3	0	1	200	1.5	0.8
White Plains Hosp	1	0	1	286	0.3	0.6
Woodhull Med Ctr	0	0	0	41	0.0	0.0
Wyckoff Heights	1	0	1	98	1.0	1.0
Wyoming County Comm.	NA	NA	NA	NA	NA	NA



Data reported as of June 25, 2018. State Average. ●Risk-adjusted Infection rate. ^^Significantly 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, duration, diabetes, obesity, and endoscope. Excludes SSIs present at time of surgery (PATOS) and non-readmitted cases identified using post discharge surveillance (PDS).

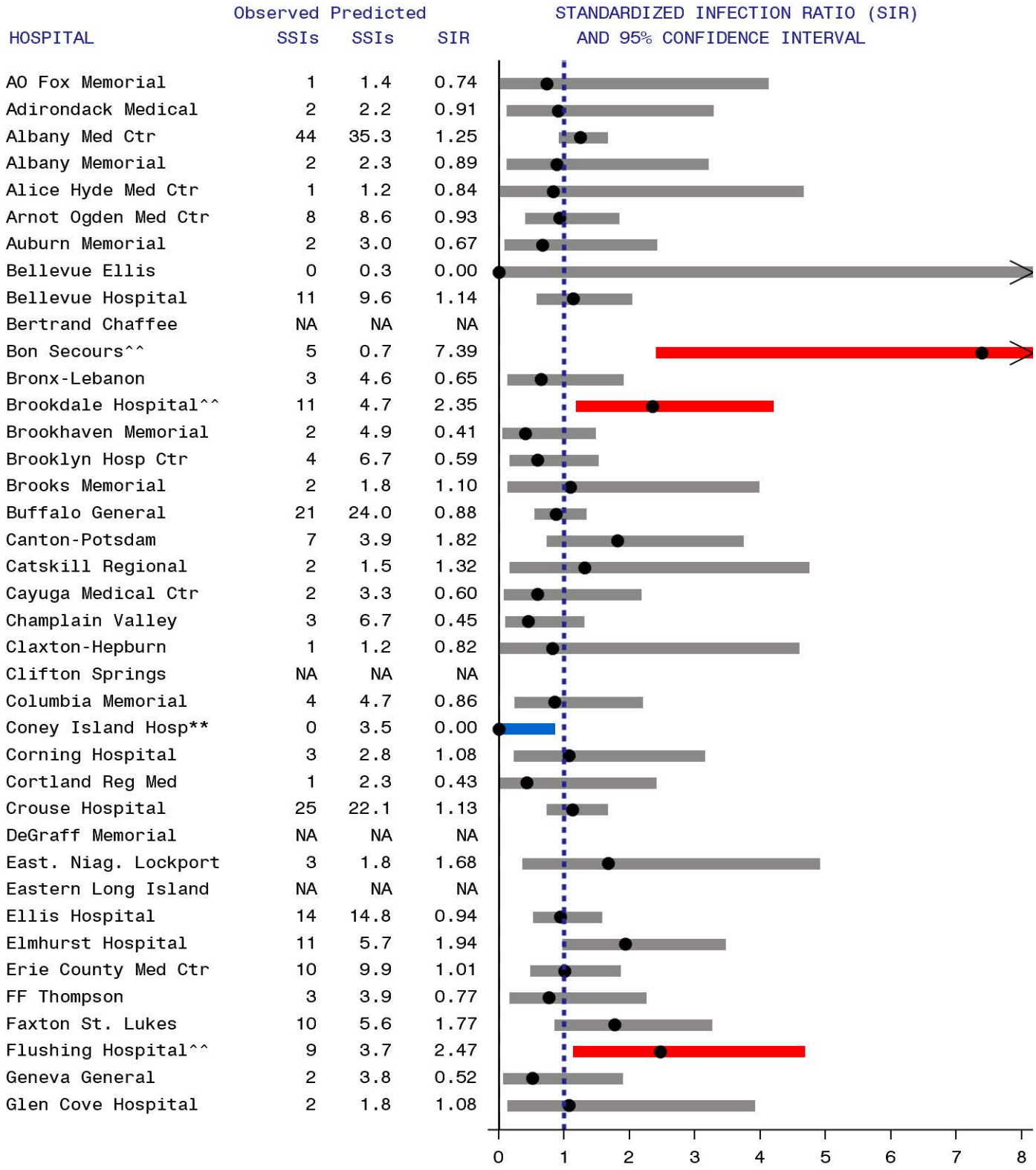
Summary across SSIs

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. Of the 135 hospitals that reported at least 20 procedures in 2017, twelve hospitals (8%) had high SIR flags. Brookdale hospital was flagged high for three consecutive years. The twelve hospitals will submit improvement plans following the NYSDOH HAI Reporting Program's Policy for Facilities with Consecutive Years of High HAI Rates. Twelve hospitals (8%) had low SIR flags. Hospital for Special Surgery was flagged low for 10 consecutive years. (This hospital only reports hip surgery so the overall SSI SIR is the same as the Hip SSI SIR).

Figure 11. Surgical site infection (SSI) summary for colon, coronary artery bypass, hip, and hysterectomy procedures standardized infection ratio (SIR), New York 2017 (page 1 of 5)



Data reported as of June 25, 2018. State Average. ●Risk-adjusted Infection rate. —^^Significantly 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 2017 average, after adjusting for patient risk factors. Excludes SSIs present at time of surgery (PATOS) 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 2017 (page 2 of 5)

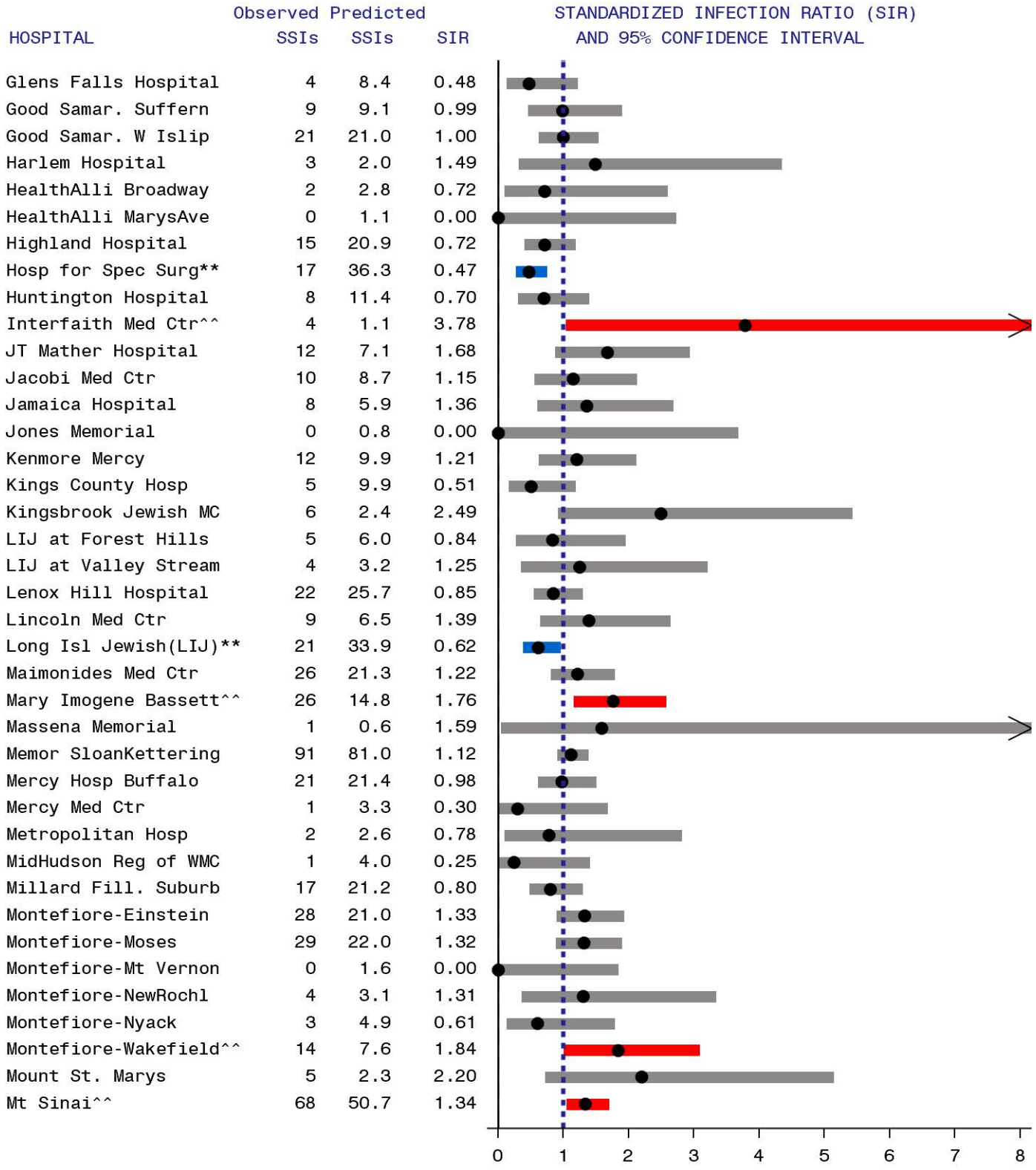


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Figure 11. Surgical site infection (SSI) summary for colon, coronary artery bypass, hip, and hysterectomy procedures standardized infection ratio (SIR), New York 2017 (page 3 of 5)

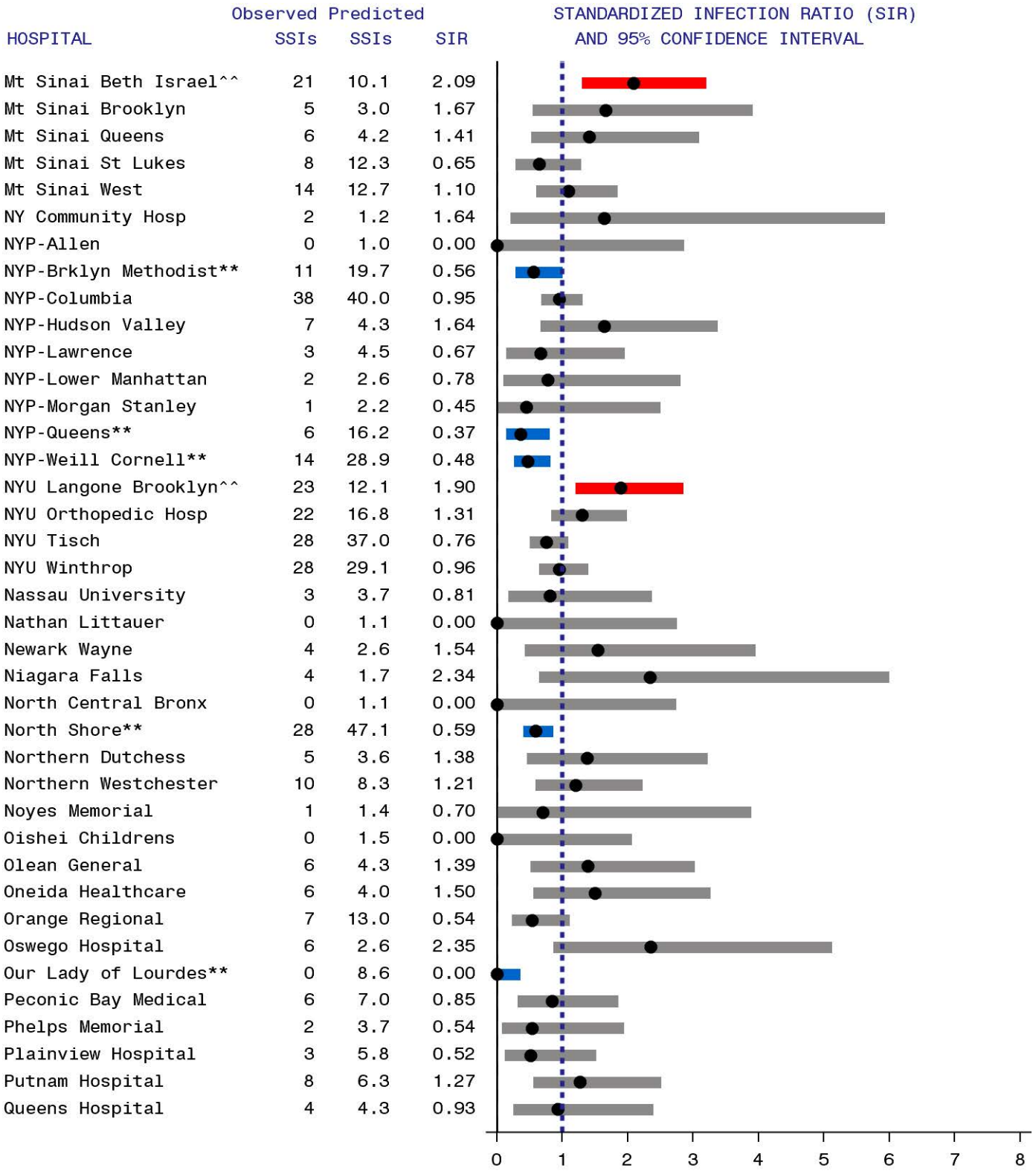

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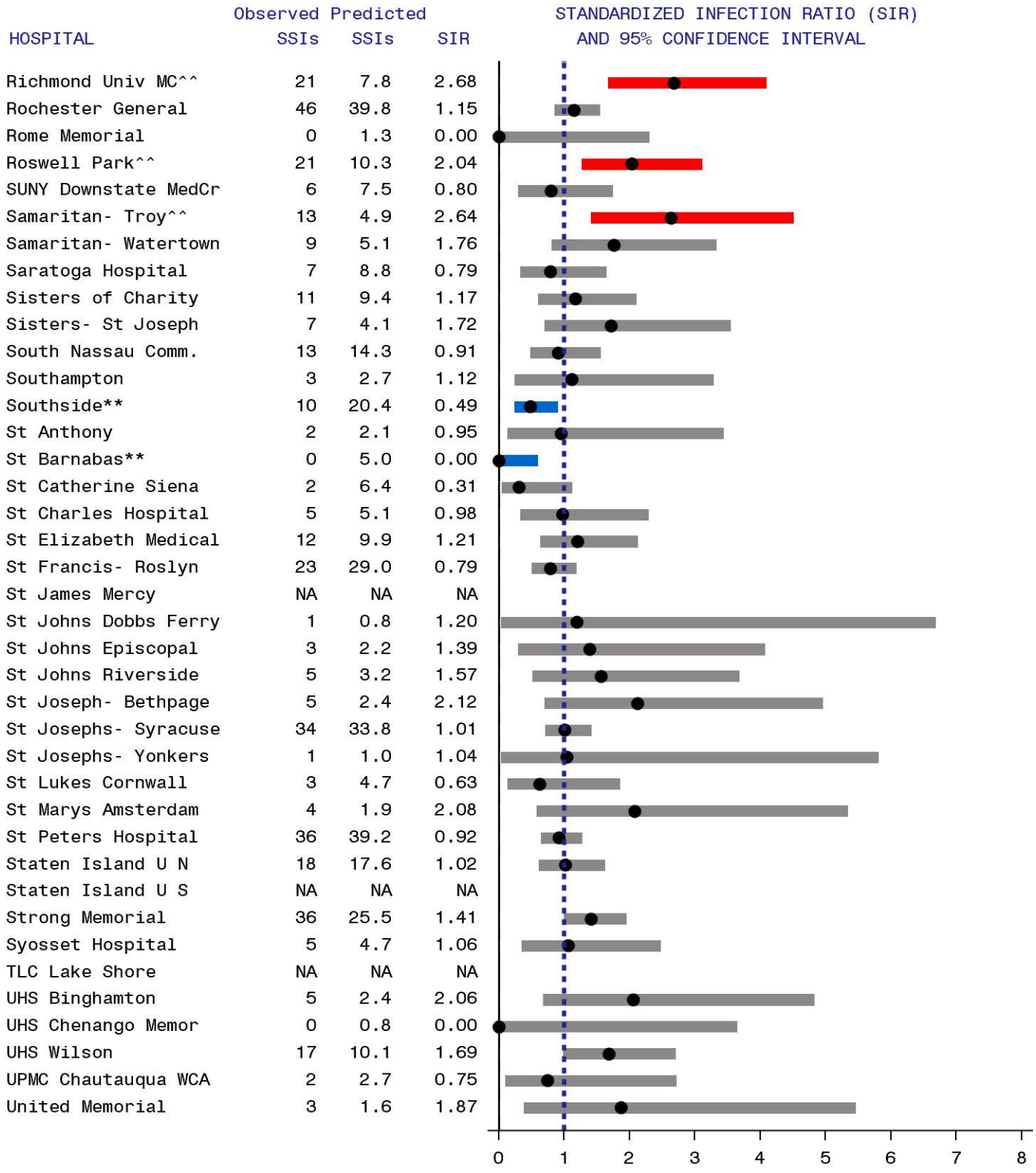
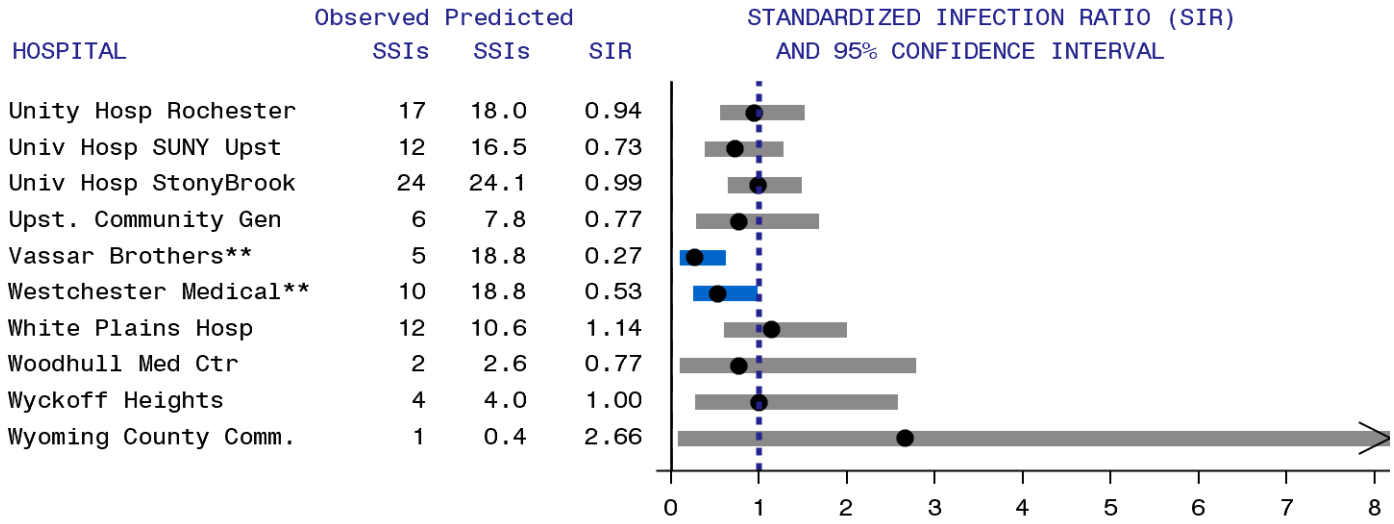
Figure 11. Surgical site infection (SSI) summary for colon, coronary artery bypass, hip, and hysterectomy procedures standardized infection ratio (SIR), New York 2017 (page 4 of 5)



Data reported as of June 25, 2018. State Average. ●Risk-adjusted Infection rate. ^^Significantly 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 2017 average, after adjusting for patient risk factors. Excludes SSIs present at time of surgery (PATOS) 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 2017 (page 5 of 5)

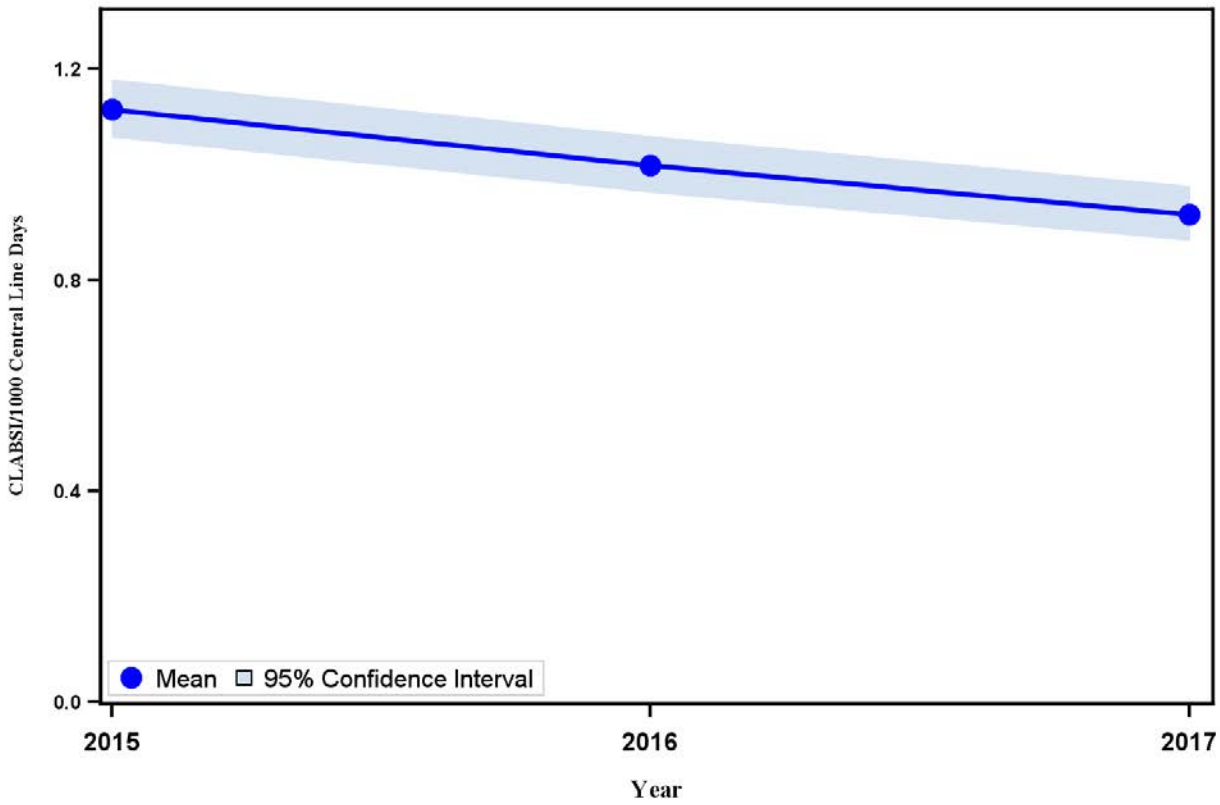


Data reported as of June 25, 2018. ┆State Average. ●Risk-adjusted Infection rate. ▬^^Significantly higher than state average. ▬**Significantly lower than state average. ▬Average. > Upper confidence limit exceeds graph area. NA: less than 20 procedures. SSI: surgical site infections. Predicted based on NYS 2017 average, after adjusting for patient risk factors. Excludes SSIs present at time of surgery (PATOS) and non-readmitted cases identified using post discharge surveillance (PDS).

Central Line-Associated Bloodstream Infections (CLABSIs)

In 2017, a total of 1,226 CLABSIs were associated with 1,325,611 days of central line use, for an overall rate of 0.92 infections per 1,000 central line days in selected ICUs and wards. In addition, a total of 97 mucosal barrier injury (MBI)-CLABSIs were reported. 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, so MBI-CLABSI were excluded from CLABSI rates. The 2015-2017 CLABSI, MBI, and device utilization data are summarized by location type in Figure 12. Between 2015 and 2017, the CLABSI rate significantly declined 18%, from 1.12 infections per 1,000 central line days in 2015, to 0.92 infections per 1,000 central line days in 2017.

Figure 12. Central line-associated bloodstream infection (CLABSI) rates, New York State 2015-2017



Year	# Hospitals	# CLABSI (excluding MBI)	# Central Line Days	CLABSI Rate	# MBI	Percent MBI	# Patient Days	Device Utilization ratio
Cardiothoracic-Surgical ICU								
2015	33	64	79,156	0.81	1	1.54%	112,709	70.2
2016	32	65	79,411	0.82	1	1.52%	111,186	71.4
2017	31	44	78,437	0.56	0	0%	114,241	68.7
Coronary ICU								
2015	39	48	45,986	1.04	0	0%	120,051	38.3
2016	35	64	42,059	1.52	0	0%	112,486	37.4
2017	34	55	37,965	1.45	0	0%	111,086	34.2
Medical ICU								
2015	55	153	121,410	1.26	10	6.13%	251,564	48.3
2016	61	127	132,405	0.96	10	7.3%	275,727	48.0
2017	62	117	126,843	0.92	13	10%	275,208	46.1
Medical/surgical ICU								
2015	100	130	134,545	0.97	2	1.52%	316,748	42.5
2016	95	97	119,493	0.81	2	2.02%	291,443	41.0
2017	99	93	120,711	0.77	10	9.71%	291,742	41.4
Neurosurgical ICU								
2015	12	16	17,781	0.90	0	0%	49,593	35.9
2016	12	14	18,588	0.75	0	0%	51,259	36.3
2017	13	15	18,093	0.83	0	0%	52,030	34.8
Pediatric ICU								
2015	28	52	33,541	1.55	1	1.89%	86,747	38.7
2016	28	46	32,813	1.40	0	0%	90,030	36.4
2017	28	50	34,885	1.43	3	5.66%	90,417	38.6
Surgical ICU								
2015	41	81	76,345	1.06	0	0%	156,625	48.7
2016	41	81	74,301	1.09	0	0%	158,236	47.0
2017	41	72	69,621	1.03	2	2.7%	156,851	44.4
---Subtotal Adult/Pediatric ICUs---								
2015	156	544	508,764	1.07	14	2.51%	1,094,037	46.5
2016	158	494	499,070	0.99	13	2.56%	1,090,367	45.8
2017	159	446	486,555	0.92	28	5.91%	1,091,575	44.6
Neonatal- Level II/III ICU								
2015	12	8	4,580	1.75	0	0%	42,092	10.9
2016	12	8	4,593	1.74	0	0%	39,549	11.6
2017	13	11	4,372	2.52	0	0%	38,249	11.4
Neonatal- Level III ICU								
2015	24	23	17,000	1.35	0	0%	112,246	15.1
2016	24	19	15,635	1.22	0	0%	106,830	14.6
2017	24	11	16,063	0.68	0	0%	111,163	14.4

Year	# Hospitals	# CLABSI (excluding MBI)	# Central Line Days	CLABSI Rate	# MBI	Percent MBI	# Patient Days	Device Utilization ratio
Neonatal- Regional Perinatal ICU								
2015	17	63	60,702	1.04	0	0%	233,570	26.0
2016	17	48	60,254	0.80	1	2.04%	240,354	25.1
2017	17	74	62,341	1.19	0	0%	250,151	24.9
---Subtotal Neonatal ICUs---								
2015	53	94	82,282	1.14	0	0%	387,908	21.2
2016	53	75	80,482	0.93	1	1.32%	386,733	20.8
2017	54	96	82,776	1.16	0	0%	399,563	20.7
Medical/surgical ward								
2015	136	356	315,134	1.13	17	4.56%	2,812,762	11.2
2016	138	310	297,366	1.04	14	4.32%	2,763,064	10.8
2017	137	221	264,349	0.84	11	4.74%	2,657,876	9.9
Medical ward								
2015	86	338	294,117	1.15	19	5.32%	2,334,804	12.6
2016	88	333	292,615	1.14	17	4.86%	2,380,946	12.3
2017	89	293	289,958	1.01	32	9.85%	2,403,702	12.1
Pediatric ward								
2015	57	41	34,275	1.20	12	22.6%	267,238	12.8
2016	59	38	34,287	1.11	16	29.6%	272,971	12.6
2017	57	40	36,202	1.10	23	36.5%	294,772	12.3
Step down unit								
2015	56	99	67,484	1.47	1	1%	359,515	18.8
2016	57	68	65,829	1.03	0	0%	366,761	17.9
2017	60	50	60,786	0.82	1	1.96%	367,760	16.5
Surgical ward								
2015	71	118	113,102	1.04	1	0.84%	913,475	12.4
2016	73	85	109,071	0.78	0	0%	906,607	12.0
2017	74	80	104,985	0.76	2	2.44%	917,616	11.4
---Subtotal wards/step down---								
2015	167	952	824,112	1.16	50	4.99%	6,687,794	12.3
2016	170	834	799,168	1.04	47	5.33%	6,690,349	11.9
2017	170	684	756,280	0.90	69	9.16%	6,641,726	11.4
----------Grand Total----------								
2015	167	1,590	1,415,158	1.12	64	3.87%	8,169,739	17.3
2016	170	1,403	1,378,720	1.02	61	4.17%	8,167,449	16.9
2017	172	1,226	1,325,611	0.92	97	7.33%	8,132,864	16.3

New York State data reported as of June 25, 2018. CLABSI rate is per 1,000 central line days. MBI = mucosal barrier injury; ICU = intensive care unit; Device utilization = 100* central line days/patient days.
Beginning in 2017, ICU data from the two cancer hospitals: Memorial Sloan Kettering Cancer Center and Roswell Park Cancer Institute was added to this table.

Microorganisms Associated with CLABSIs

The distribution of microorganisms associated with CLABSIs is presented by location in Tables 12 and 13. Yeast was the most common organism in adult and pediatric ICUs and wards. Other common infecting organisms included Enterococci, *Staphylococcus aureus*, and *Klebsiella* spp. The most common organism in neonatal ICUs was *Staphylococcus aureus.*

Table 12. Microorganisms identified in central line-associated bloodstream infections, adult and pediatric intensive care units and wards, New York State 2017

Microorganism	Number of Isolates	Percent of Infections
Yeast	335	27.3
(*Candida auris*)	(11)	(0.9)
Enterococci	241	19.6
(VRE)	(116)	(9.5)
Staphylococcus aureus	163	13.3
(MRSA)	(72)	(5.9)
Klebsiella spp.	154	12.6
(CRE-*Klebsiella*)	(18)	(1.5)
Coagulase negative staphylococci	137	11.2
Escherichia coli	86	7.0
(CRE-*E. coli*)	(2)	(0.2)
Enterobacter spp.	53	4.3
(CRE-*Enterobacter*)	(2)	(0.2)
Pseudomonas spp.	40	3.3
Streptococci	27	2.2
Proteus spp.	22	1.8
Serratia spp.	19	1.5
Stenotrophomonas spp.	18	1.5
Acinetobacter spp.	16	1.3
(MDR-*Acinetobacter*)	(7)	(0.6)
Bacteroides spp.	15	1.2
Lactobacillus spp.	8	0.7
Citrobacter spp.	6	0.5
Clostridium spp.	6	0.5
Granulicatella spp.	5	0.4
Providencia spp.	5	0.4
Other	41	3.3

New York State data reported as of June 25, 2018. Out of 1,227 infections (includes mucosal barrier injury infections). VRE: vancomycin-resistant enterococci; CRE: carbapenem-resistant Enterobacteriaceae; MRSA: methicillin-resistant *Staphylococcus aureus;* MDR: multi-drug resistant; spp: multiple species.

Table 13. Microorganisms associated with central line-associated bloodstream infections, neonatal intensive care units, New York State 2017

Microorganism	Number of Isolates	Percent of Infections
Staphylococcus aureus	29	30.2
(MRSA)	(9)	(9.4)
Coagulase negative staphylococci	18	18.8
Enterococci	12	12.5
Yeast	12	12.5
Escherichia coli	9	9.4
Klebsiella spp.	8	8.3
Streptococci	5	5.2
Acinetobacter spp.	3	3.1
Enterobacter spp.	1	1.0
Other	3	3.1

New York State data reported as of June 25, 2018. Out of 96 infections (includes mucosal barrier injury infections). MRSA: methicillin-resistant *Staphylococcus aureus;* spp: multiple species.

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 CLABSIs in neonatal intensive care units (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. No risk adjustment is performed by birthweight group in Level II/III facilities. 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 14 (ICUs) and Table 15 (wards) help hospital IPs target their CLABSI reduction efforts to specific locations. Overall, twenty-eight high flags will be addressed in CLABSI improvement plans by the twenty-five affected hospitals.

Table 14. Central line-associated bloodstream infection rates by ward type, New York State 2017

	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**
State average rate	**1.45**		**0.56**		**0.92**		**0.77**		**1.03**		**0.83**		**1.43**		**RPC 1.19/L3 0.68/L23 2.52**		
Adirondack Medical							0/229	0.0									
Albany Med Ctr	2/1590	1.3	2/3244	0.6	12/3395	^ 3.5			5/4880	1.0			0/1825	0.0	RPC	2/3775	0.6
Albany Memorial							0/313	0.0									
Alice Hyde Med Ctr							1/70	14.3									
Arnot Ogden Med Ctr							1/2320	0.4							Lev 3	1/1162	1.0
Auburn Memorial							3/427	^ 7.0									
Bellevue Hospital	2/1596	1.3	0/876	0.0	4/1501	2.7			4/1744	2.3	2/552	3.6	NA	NA	RPC	6/1697	2.9
Bon Secours							0/375	0.0									
Bronx-Lebanon	0/1001	0.0			3/3245	0.9							0/64	0.0	Lev 3	1/730	1.2
Brookdale Hospital	0/438	0.0			0/1906	0.0			1/811	1.2			NA	NA	Lev 3	0/420	0.0
Brookhaven Memorial	3/919	3.3			4/1013	^ 3.9			3/1009	3.0							
Brooklyn Hosp Ctr					1/1981	0.5			0/929	0.0			0/128	0.0	Lev 3	0/1129	0.0
Brooks Memorial							0/388	0.0									
Buffalo General			1/3339	0.3	3/7578	0.4			7/2441	^ 2.9	1/2256	0.4					
Canton-Potsdam							1/350	2.9									
Catskill Regional							0/483	0.0									
Cayuga Medical Ctr							0/622	0.0									
Champlain Valley							0/1808	0.0									
Claxton-Hepburn							1/479	2.1									
Clifton Springs					0/314	0.0											
Cohens Childrens													3/2594	1.2	RPC	6/4753	1.3
Columbia Memorial							3/595	^ 5.0									
Coney Island Hosp	0/525	0.0			3/2297	1.3			1/1636	0.6							
Corning Hospital							0/501	0.0									
Cortland Reg Med					0/573	0.0											
Crouse Hospital							0/1524	0.0							RPC	12/4509	^ 2.5
DeGraff Memorial							0/138	0.0									
East. Niag. Lockport							0/177	0.0									
Eastern Long Island							1/86	11.6									
Ellis Hospital							5/6284	0.8									
Elmhurst Hospital	0/384	0.0			1/1124	0.9			2/704	2.8					Lev 2/3	3/528	5.7

Table 14. Central line-associated bloodstream infection rates by ward type, New York State 2017

	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**
State average rate	**1.45**		**0.56**		**0.92**		**0.77**		**1.03**		**0.83**		**1.43**		**RPC 1.19/L3 0.68/L23 2.52**		
Erie County Med Ctr					5/2608	1.9											
FF Thompson					0/848	0.0											
Faxton St. Lukes							1/2343	0.4									
Flushing Hospital					0/1820	0.0	1/625	1.6							Lev 3	0/1281	0.0
Geneva General							0/1104	0.0									
Glen Cove Hospital							0/533	0.0									
Glens Falls Hospital							0/1484	0.0									
Good Samar. Suffern			0/570	0.0	1/1534	0.7	NA	NA	0/697	0.0							
Good Samar. W Islip			0/1061	0.0	0/3848	** 0.0			0/2313	0.0	NA	NA	0/90	0.0	Lev 3	0/713	0.0
Harlem Hospital	0/346	0.0					3/2444	1.2					NA	NA	Lev 3	0/977	0.0
HealthAlli Broadway							2/850	2.4									
Highland Hospital							0/2095	0.0									
Hosp for Spec Surg							0/148	0.0									
Huntington Hospital	1/404	2.5					0/462	0.0									
Interfaith Med Ctr							2/1486	1.3									
JT Mather Hospital							1/2475	0.4									
Jacobi Med Ctr	3/458	6.6			0/1105	0.0			2/702	2.8			NA	NA	Lev 3	2/1461	1.2
Jamaica Hospital					0/1545	0.0			0/865	0.0					Lev 3	1/621	1.6
Jones Memorial							0/356	0.0									
Kenmore Mercy							0/1095	0.0									
Kings County Hosp	1/787	1.3			1/783	1.3			1/932	1.1	2/1091	1.8	0/113	0.0	Lev 2/3	2/893	2.2
Kingsbrook Jewish MC							7/2422	^ 2.9									
LIJ at Forest Hills					0/1652	0.0											
LIJ at Valley Stream							1/684	1.5									
Lenox Hill Hospital	2/820	2.4	0/2474	0.0	1/1614	0.6			0/1016	0.0					Lev 2/3	0/843	0.0
Lincoln Med Ctr	0/1152	0.0			1/2024	0.5			1/746	1.3					Lev 3	0/629	0.0
Long Isl Jewish(LIJ)	1/339	2.9			1/1472	0.7	0/548	0.0	0/1212	0.0							
Maimonides Med Ctr	5/1215	4.1	4/2360	1.7	0/1575	0.0			2/1465	1.4			0/565	0.0	RPC	1/2114	0.4
Mary Imogene Bassett							1/2870	0.3									
Massena Memorial							NA	NA									
Memor SloanKettering							7/5006	1.4					1/1115	0.9			

Table 14. Central line-associated bloodstream infection rates by ward type, New York State 2017

	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**
State average rate	**1.45**		**0.56**		**0.92**		**0.77**		**1.03**		**0.83**		**1.43**		**RPC 1.19/L3 0.68/L23 2.52**		
Mercy Hosp Buffalo	3/2036	1.5	0/1263	0.0			1/3134	0.3									
Mercy Med Ctr							0/1246	0.0							Lev 3	0/337	0.0
Metropolitan Hosp					1/211	4.7	0/868	0.0	0/154	0.0					Lev 2/3	0/249	0.0
MidHudson Reg of							1/1428	0.7									
Millard Fill. Suburb							3/3078	1.0									
Montefiore-Einstein			0/3158	0.0	0/3340	** 0.0									RPC	3/2797	1.0
Montefiore-Moses	3/2072	1.4	1/3008	0.3	2/4030	0.5			1/1690	0.6			7/3184	2.2			
Montefiore-Mt Vernon							3/386	^ 7.8									
Montefiore-NewRochl							2/1316	1.5							Lev 3	NA	NA
Montefiore-Nyack					0/873	0.0			0/678	0.0							
Montefiore-Wakefield					1/2596	0.4									Lev 2/3	3/466	6.4
Mount St. Marys					0/399	0.0											
Mt Sinai	3/1343	2.2	7/5931	1.2	4/2917	1.4			3/2928	1.0	2/1173	1.7	6/2126	2.8	RPC	3/2703	1.1
Mt Sinai Beth Israel	1/450	2.2			4/1539	2.6	0/277	0.0	1/780	1.3					Lev 2/3	NA	NA
Mt Sinai Brooklyn							3/1271	2.4									
Mt Sinai Queens							1/1256	0.8									
Mt Sinai St Lukes	2/487	4.1	2/1741	1.1	0/1424	0.0			0/408	0.0							
Mt Sinai West							0/1018	0.0			0/196	0.0			Lev 3	0/691	0.0
NY Community Hosp							0/614	0.0									
NYP-Allen							2/1012	2.0									
NYP-Brklyn Methodist	1/842	1.2	0/1785	0.0			1/3765	0.3					0/61	0.0	Lev 3	1/1501	0.7
NYP-Columbia	8/5441	1.5	4/7203	0.6	12/5229	^ 2.3			6/3028	2.0	3/2871	1.0					
NYP-Hudson Valley							0/862	0.0							Lev 2/3	NA	NA
NYP-Lawrence					5/1679	^ 3.0											
NYP-Lower Manhattan							2/2310	0.9									
NYP-Morgan Stanley													7/7995	0.9	RPC	6/6393	1.1
NYP-Queens	0/771	0.0	0/1009	0.0	2/1387	1.4			0/1068	0.0					Lev 3	0/306	0.0
NYP-Weill Cornell	4/3466	1.2	2/4708	0.4	5/3172	1.6			9/2880	^ 3.1	2/1933	1.0	8/2529	3.2	RPC	6/4511	1.6
NYU Langone					1/954	1.0			3/1249	2.4					Lev 2/3	NA	NA
NYU Tisch			0/1053	0.0	3/2888	1.0			4/3405	1.2	0/686	0.0	3/3310	0.9	RPC	1/3152	0.3
NYU Winthrop					4/2537	1.6			3/4358	0.7	0/870	0.0	1/459	2.2	RPC	4/1964	1.7

Table 14. Central line-associated bloodstream infection rates by ward type, New York State 2017

	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**
State average rate	**1.45**		**0.56**		**0.92**		**0.77**		**1.03**		**0.83**		**1.43**		**RPC 1.19/L3 0.68/L23 2.52**		
Nassau University	0/632	0.0			0/1532	0.0			0/432	0.0			NA	NA	Lev 3	0/535	0.0
Nathan Littauer							0/460	0.0									
Newark Wayne					0/1130	0.0											
Niagara Falls							1/898	1.1									
North Central Bronx							1/306	3.3									
North Shore	1/1490	0.7	7/4770	^ 1.5	1/2725	0.4			1/2186	0.5	2/1221	1.6			RPC	1/2027	0.5
Northern Dutchess							0/438	0.0									
Northern Westchester							2/558	3.6							Lev 3	NA	NA
Noyes Memorial							0/262	0.0									
Oishei Childrens													5/1493	3.3	RPC	7/4987	1.4
Olean General							0/1005	0.0									
Oneida Healthcare							0/212	0.0									
Orange Regional							3/2180	1.4									
Oswego Hospital					0/313	0.0											
Our Lady of Lourdes							0/767	0.0									
Peconic Bay Medical							0/760	0.0									
Phelps Memorial							1/640	1.6									
Plainview Hospital							1/987	1.0									
Putnam Hospital							0/667	0.0									
Queens Hospital					1/1658	0.6									Lev 3	1/288	3.3
Richmond Univ MC	0/117	0.0			4/2249	1.8			1/1336	0.7			0/61	0.0	Lev 3	1/865	1.1
Rochester General			0/3523	0.0	1/3452	0.3			1/2432	0.4							
Rome Memorial							0/430	0.0									
Roswell Park							2/2367	0.8									
SUNY Downstate	2/417	4.8	0/746	0.0			2/1157	1.7					0/71	0.0	RPC	1/942	0.8
Samaritan- Troy							1/1653	0.6									
Samaritan- Watertown							0/878	0.0									
Saratoga Hospital					1/727	1.4											
Sisters of Charity							1/1771	0.6							Lev 3	2/887	2.1
Sisters- St Joseph							0/604	0.0									
South Nassau Comm.							3/4312	0.7									

Table 14. Central line-associated bloodstream infection rates by ward type, New York State 2017

	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**
State average rate	**1.45**		**0.56**		**0.92**		**0.77**		**1.03**		**0.83**		**1.43**		**RPC 1.19/L3 0.68/L23 2.52**		
Southampton					1/555	1.8											
Southside			1/1320	0.8	1/731	1.4	1/70	14.3	2/864	2.3							
St Anthony							0/161	0.0									
St Barnabas					1/864	1.2			0/383	0.0					Lev 2/3	0/302	0.0
St Catherine Siena	0/769	0.0					1/913	1.1									
St Charles Hospital					0/851	0.0											
St Elizabeth Medical			0/1328	0.0			2/2089	1.0									
St Francis- Roslyn			1/5155	0.2	1/2907	0.3			2/2556	0.8							
St Johns Episcopal	0/602	0.0			3/853	3.5											
St Johns Riverside							1/1035	1.0									
St Joseph- Bethpage							1/1988	0.5									
St Josephs- Syracuse					4/3871	1.0			1/4411	0.2					Lev 2/3	0/173	0.0
St Josephs- Yonkers							1/600	1.7									
St Lukes Cornwall							2/1710	1.2									
St Marys Amsterdam							0/301	0.0									
St Peters Hospital	1/1021	1.0	0/1816	0.0	2/3080	0.6									Lev 3	0/582	0.0
Staten Island U N			1/1384	0.7			2/4456	0.4					0/54	0.0	Lev 3	0/396	0.0
Staten Island U S							0/1178	0.0									
Strong Memorial			7/3130	^ 2.2	2/3089	0.6			1/2316	0.4			5/3433	1.5	RPC	10/9549	1.1
Syosset Hospital							0/556	0.0									
UHS Binghamton							0/341	0.0									
UHS Chenango Memor							0/55	0.0									
UHS Wilson	3/1910	1.6	3/1394	2.2											Lev 2/3	1/198	5.1
UPMC Chautauqua					2/1060	1.9											
United Memorial							0/353	0.0									
Unity Hosp Rochester							2/3239	0.6									
Univ Hosp SUNY Upst			0/2299	0.0	2/6587	0.3			4/3141	1.3	1/2891	0.3	1/1158	0.9			
Univ Hosp StonyBrook	2/860	2.3	0/1793	0.0	0/2173	0.0			0/1727	0.0			0/537	0.0	RPC	3/2078	1.5
Upst. Community Gen							0/995	0.0									
Vassar Brothers			0/925	0.0			1/3500	0.3							Lev 2/3	0/409	0.0
Westchester Medical	1/1265	0.8	1/4071	0.2	2/2549	0.8			0/1109	0.0	0/2340	0.0	3/1763	1.7	RPC	2/4390	0.4

Table 14. Central line-associated bloodstream infection rates by ward type, New York State 2017

	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**
State average rate	**1.45**		**0.56**		**0.92**		**0.77**		**1.03**		**0.83**		**1.43**		**RPC 1.19/L3 0.68/L23 2.52**		
White Plains Hosp							0/2364	0.0							Lev 3	0/209	0.0
Woodhull Med Ctr							0/1371	0.0							Lev 2/3	2/272	7.4
Wyckoff Heights					3/1357	2.2									Lev 3	1/291	3.5
Wyoming County							NA	NA									

New York State data reported as of June 25, 2018. — Significantly higher than state average. —Significantly lower than state average. —Same as state average.
Rates are per 1000 central line days (CLDAYS). Excludes Mucosal Barrier Injury (MBI)-CLABSIs

Table 15. Central line-associated bloodstream infection rates by ward type, New York State 2017

	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
State average rate	**1.01**		**0.84**		**0.76**		**0.82**		**1.10**	
Adirondack Medical			1/696	1.4						
Albany Med Ctr	20/16179	1.2	0/1575	0.0	4/5667	0.7	1/1190	0.8	3/3719	0.8
Albany Memorial	1/460	2.2	NA	NA	1/314	3.2				
Alice Hyde Med Ctr			0/298	0.0						
Arnot Ogden Med Ctr			3/3721	0.8						
Auburn Memorial			0/837	0.0	0/278	0.0				
Bellevue Hospital	12/4973	^ 2.4	1/749	1.3	0/798	0.0			NA	NA
Bon Secours			0/332	0.0	NA	NA				
Bronx-Lebanon	5/3769	1.3	3/2775	1.1			1/253	4.0	NA	NA
Brookdale Hospital	0/528	0.0			2/708	2.8	2/108	^18.5	NA	NA
Brookhaven Memorial			3/2945	1.0			0/706	0.0		
Brooklyn Hosp Ctr	0/1749	0.0	0/2002	0.0			0/1796	0.0	0/77	0.0
Brooks Memorial			1/326	3.1						
Buffalo General	2/2707	0.7	0/3203	0.0	1/1968	0.5	8/6692	1.2		
Canton-Potsdam			1/1212	0.8						
Catskill Regional			1/451	2.2	0/399	0.0				
Cayuga Medical Ctr			1/1572	0.6						
Champlain Valley			1/3718	0.3			1/2335	0.4		
Claxton-Hepburn			1/1350	0.7						
Clifton Springs	0/888	0.0								
Cohens Childrens									0/1896	0.0
Columbia Memorial	0/444	0.0	4/1638	2.4						
Coney Island Hosp	7/5740	1.2	0/249	0.0	1/1316	0.8	0/347	0.0		
Corning Hospital	0/484	0.0			0/399	0.0				
Cortland Reg Med	0/287	0.0								
Crouse Hospital			10/7081	1.4						
DeGraff Memorial			0/260	0.0						
East. Niag. Lockport			0/186	0.0						
Eastern Long Island			0/131	0.0						
Ellis Hospital	1/4136	0.2			1/984	1.0	0/374	0.0		
Elmhurst Hospital	3/2220	1.4	3/1696	1.8	2/1437	1.4			0/80	0.0
Erie County Med Ctr			17/11354	^ 1.5						

Table 15. Central line-associated bloodstream infection rates by ward type, New York State 2017

	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
State average rate	**1.01**		**0.84**		**0.76**		**0.82**		**1.10**	
FF Thompson	1/1138	0.9	0/363	0.0						
Faxton St. Lukes			1/2055	0.5	1/931	1.1	1/1600	0.6	NA	NA
Flushing Hospital			5/2723	1.8					NA	NA
Geneva General	1/821	1.2	0/501	0.0						
Glen Cove Hospital			0/355	0.0	NA	NA				
Glens Falls Hospital	2/2042	1.0	0/1262	0.0	0/900	0.0			0/62	0.0
Good Samar. Suffern			3/1868	1.6						
Good Samar. W Islip	1/6375	** 0.2			1/2169	0.5	NA	NA	0/126	0.0
Harlem Hospital	1/1885	0.5			2/1384	1.4			NA	NA
HealthAlli Broadway	1/2176	0.5	4/524	^ 7.6	1/512	2.0				
Highland Hospital	5/7303	0.7	3/2266	1.3	1/1547	0.6				
Hosp for Spec Surg			0/2631	0.0			0/238	0.0	NA	NA
Huntington Hospital	0/514	0.0	1/747	1.3	0/123	0.0			NA	NA
Interfaith Med Ctr			2/1556	1.3						
JT Mather Hospital			0/3528	0.0	0/1011	0.0	1/1667	0.6		
Jacobi Med Ctr	3/1748	1.7	0/999	0.0	0/163	0.0	2/215	^ 9.3	NA	NA
Jamaica Hospital			10/4090	^ 2.4	0/843	0.0	0/783	0.0		
Jones Memorial			0/648	0.0						
Kenmore Mercy			2/1522	1.3	NA	NA				
Kings County Hosp	4/2429	1.6	1/2794	0.4	3/1056	2.8			0/62	0.0
Kingsbrook Jewish MC	16/4313	^ 3.7	1/695	1.4						
LIJ at Forest Hills	2/2540	0.8			0/263	0.0				
LIJ at Valley Stream			1/1252	0.8	0/79	0.0				
Lenox Hill Hospital	1/2563	0.4	0/293	0.0	0/768	0.0	0/1090	0.0		
Lincoln Med Ctr	2/1473	1.4			6/1381	^ 4.3	1/2646	0.4		
Long Isl Jewish(LIJ)	5/8155	0.6	1/990	1.0	1/2151	0.5				
Maimonides Med Ctr	12/6997	1.7	2/944	2.1			2/1126	1.8	0/695	0.0
Mary Imogene Bassett	0/1404	0.0	0/806	0.0	0/1877	0.0	0/1165	0.0		
Massena Memorial			0/150	0.0			NA	NA		
Mercy Hosp Buffalo	0/131	0.0	3/4992	0.6	0/639	0.0	2/860	2.3		
Mercy Med Ctr	0/1289	0.0	0/343	0.0			1/463	2.2		
Metropolitan Hosp	0/848	0.0			0/454	0.0				

Table 15. Central line-associated bloodstream infection rates by ward type, New York State 2017

	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
State average rate	**1.01**		**0.84**		**0.76**		**0.82**		**1.10**	
MidHudson Reg of			3/1679	1.8			0/639	0.0		
Millard Fill. Suburb			3/6778	0.4						
Montefiore-Einstein	13/7059	1.8			3/3564	0.8				
Montefiore-Moses	25/17387	1.4	0/930	0.0	3/3839	0.8			5/5201	1.0
Montefiore-Mt Vernon			1/530	1.9			0/204	0.0		
Montefiore-NewRochl			0/596	0.0	0/385	0.0	0/630	0.0		
Montefiore-Nyack			1/1894	0.5			0/1006	0.0	0/358	0.0
Montefiore-Wakefield	2/3978	0.5	0/223	0.0						
Mount St. Marys			0/2287	0.0						
Mt Sinai	18/10006	^ 1.8	12/2709	^ 4.4	5/4019	1.2	0/97	0.0	4/1843	2.2
Mt Sinai Beth Israel	3/2852	1.1	0/507	0.0	0/1020	0.0	0/424	0.0		
Mt Sinai Brooklyn	6/3575	1.7			0/632	0.0	1/53	18.9		
Mt Sinai Queens			2/3448	0.6						
Mt Sinai St Lukes	3/3036	1.0	1/538	1.9	1/935	1.1				
Mt Sinai West			2/2135	0.9						
NY Community Hosp			1/323	3.1			0/589	0.0		
NYP-Allen	5/1590	^ 3.1	0/853	0.0						
NYP-Brklyn Methodist	1/2307	0.4	4/5233	0.8	3/1029	2.9	1/472	2.1	0/450	0.0
NYP-Columbia	15/9696	1.5	5/7994	0.6	3/4771	0.6				
NYP-Hudson Valley			2/1632	1.2			1/444	2.3		
NYP-Lawrence			6/3490	1.7						
NYP-Lower Manhattan			2/1995	1.0						
NYP-Morgan Stanley									2/2377	0.8
NYP-Queens	4/5149	0.8			0/1031	0.0	0/163	0.0		
NYP-Weill Cornell	4/4310	0.9	13/8296	1.6	7/2843	^ 2.5			1/1790	0.6
NYU Langone	2/1697	1.2	3/958	3.1	0/793	0.0	2/1276	1.6		
NYU Tisch	4/4621	0.9			3/5801	0.5	2/2849	0.7	4/2288	1.7
NYU Winthrop	8/9232	0.9	2/1236	1.6	1/949	1.1			0/706	0.0
Nassau University	5/1814	2.8	0/93	0.0	0/69	0.0			NA	NA
Nathan Littauer			0/554	0.0						
Newark Wayne	0/1551	0.0								
Niagara Falls					0/816	0.0	0/559	0.0		

Table 15. Central line-associated bloodstream infection rates by ward type, New York State 2017

	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
State average rate	**1.01**		**0.84**		**0.76**		**0.82**		**1.10**	
North Central Bronx	1/507	2.0	0/104	0.0						
North Shore	2/5736	0.3	0/2330	0.0	6/4627	1.3				
Northern Dutchess	0/187	0.0	0/778	0.0						
Northern Westchester	3/1850	1.6			0/228	0.0	NA	NA	NA	NA
Noyes Memorial	0/382	0.0								
Oishei Childrens	0/360	0.0							1/1355	0.7
Olean General	1/2412	0.4			1/351	2.8				
Oneida Healthcare			0/601	0.0						
Orange Regional	5/4513	1.1	0/735	0.0						
Oswego Hospital			1/983	1.0						
Our Lady of Lourdes	2/2886	0.7	0/141	0.0	2/1190	1.7	0/205	0.0		
Peconic Bay Medical			0/1652	0.0						
Phelps Memorial	0/840	0.0	0/334	0.0						
Plainview Hospital	1/1575	0.6			NA	NA				
Putnam Hospital			1/1100	0.9						
Queens Hospital	2/1257	1.6	1/502	2.0	0/258	0.0	0/416	0.0		
Richmond Univ MC	6/2053	^ 2.9			1/547	1.8				
Rochester General	6/6980	0.9	1/4157	0.2	4/4328	0.9				
Rome Memorial	0/225	0.0					0/331	0.0		
SUNY Downstate	4/2421	1.7	5/4027	1.2			3/1339	2.2	0/84	0.0
Samaritan- Troy			1/3777	0.3						
Samaritan- Watertown	NA	NA	2/2771	0.7						
Saratoga Hospital	1/2694	0.4			NA	NA				
Sisters of Charity	1/2798	0.4	1/2026	0.5	0/1508	0.0				
Sisters- St Joseph			0/1877	0.0	0/302	0.0				
South Nassau Comm.			4/7172	0.6			5/4007	1.2	0/82	0.0
Southampton			1/457	2.2					2/520	3.8
Southside	0/294	0.0	4/3232	1.2			0/478	0.0		
St Anthony			0/256	0.0						
St Barnabas			0/1085	0.0			0/239	0.0		
St Catherine Siena	0/3211	** 0.0			0/422	0.0				
St Charles Hospital			0/1047	0.0						

Table 15. Central line-associated bloodstream infection rates by ward type, New York State 2017

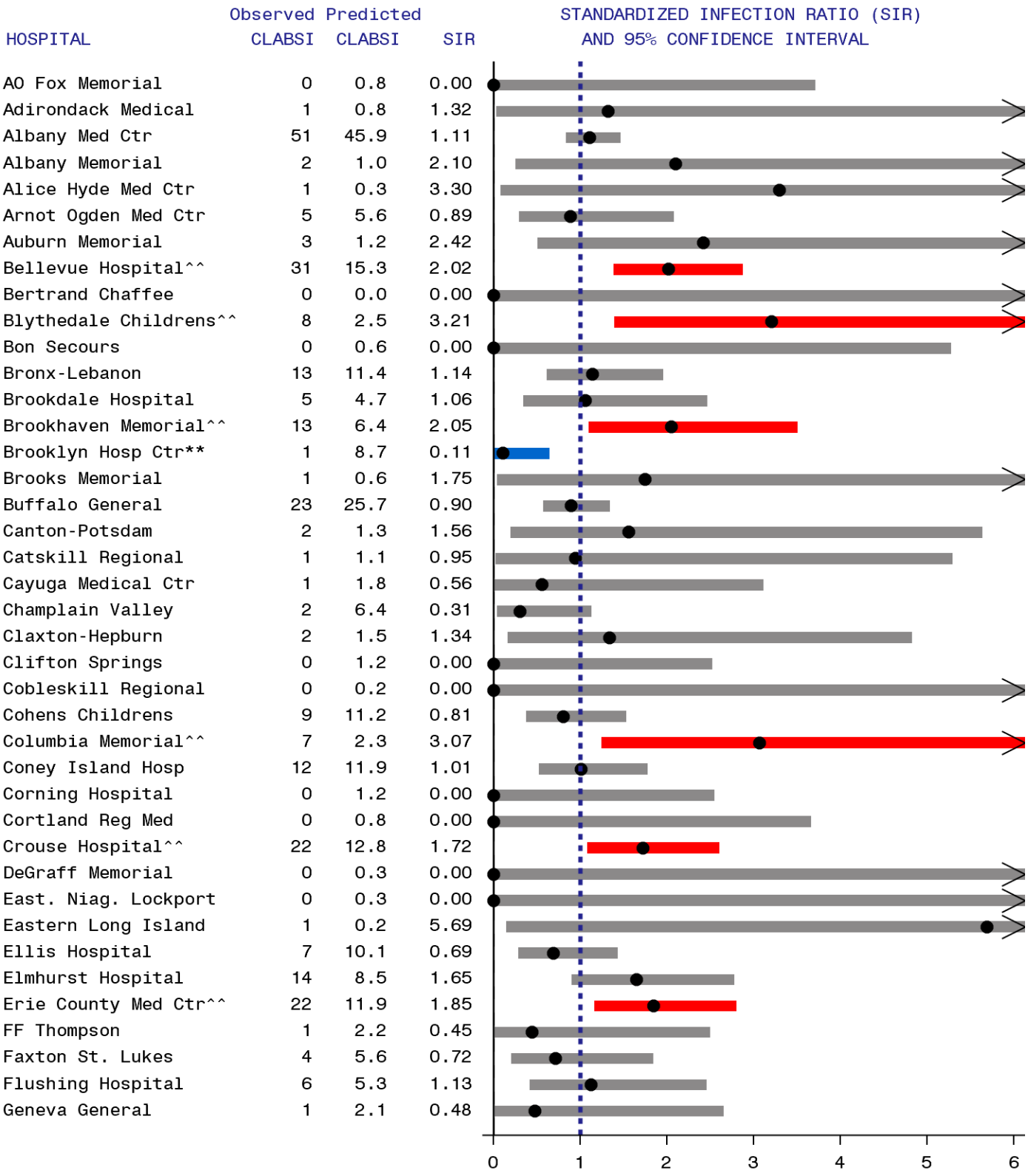
	Medical Wards		Medical Surgical Wards		Surgical Wards		Step Down Units		Pediatric Wards	
Hospital	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate
State average rate	**1.01**		**0.84**		**0.76**		**0.82**		**1.10**	
St Elizabeth Medical			1/2123	0.5			0/1878	0.0		
St Francis- Roslyn			3/8019	0.4			0/1518	0.0		
St Johns Episcopal			3/2215	1.4						
St Johns Riverside	1/1214	0.8	0/629	0.0						
St Joseph- Bethpage			0/996	0.0			0/354	0.0		
St Josephs- Syracuse			3/10876	** 0.3						
St Josephs- Yonkers			0/818	0.0			0/185	0.0		
St Lukes Cornwall			0/2301	0.0						
St Marys Amsterdam			0/487	0.0	1/747	1.3	0/389	0.0		
St Peters Hospital	6/11469	0.5	2/5605	0.4			0/2780	0.0		
Staten Island U N			4/3602	1.1	1/1105	0.9			0/174	0.0
Staten Island U S			2/898	2.2						
Strong Memorial	12/18896	0.6			1/9249	** 0.1	0/773	0.0	7/4601	1.5
Syosset Hospital	0/257	0.0			NA	NA				
UHS Binghamton			1/1097	0.9						
UHS Chenango Memor			0/126	0.0						
UHS Wilson	NA	NA	13/6019	^ 2.2	0/67	0.0				
UPMC Chautauqua	0/756	0.0	0/1118	0.0						
United Memorial	0/676	0.0			0/98	0.0				
Unity Hosp Rochester			2/10572	** 0.2						
Univ Hosp SUNY Upst	7/8912	0.8			0/3305	0.0	1/1196	0.8	0/1028	0.0
Univ Hosp StonyBrook	2/5061	0.4			4/7657	0.5	0/533	0.0	1/788	1.3
Upst. Community Gen	1/1235	0.8	0/1261	0.0						
Vassar Brothers	1/3815	0.3			0/973	0.0	0/1003	0.0	0/111	0.0
Westchester Medical	2/3215	0.6	3/4595	0.7	1/1989	0.5	6/5093	1.2	2/3230	0.6
White Plains Hosp			1/4392	0.2			3/2034	1.5		
Woodhull Med Ctr			2/2390	0.8	0/619	0.0	2/719	2.8	NA	NA
Wyckoff Heights			4/3436	1.2					NA	NA
Wyoming County			0/416	0.0						

New York State data reported as of June 25, 2018. — Significantly higher than state average. —Significantly lower than state average. —Same as state average.
Rates are per 1000 central line days (CLDAYS). Excludes Mucosal Barrier Injury (MBI)-CLABSIs.

Hospital-Specific, CLABSI Standardized Infection Ratios

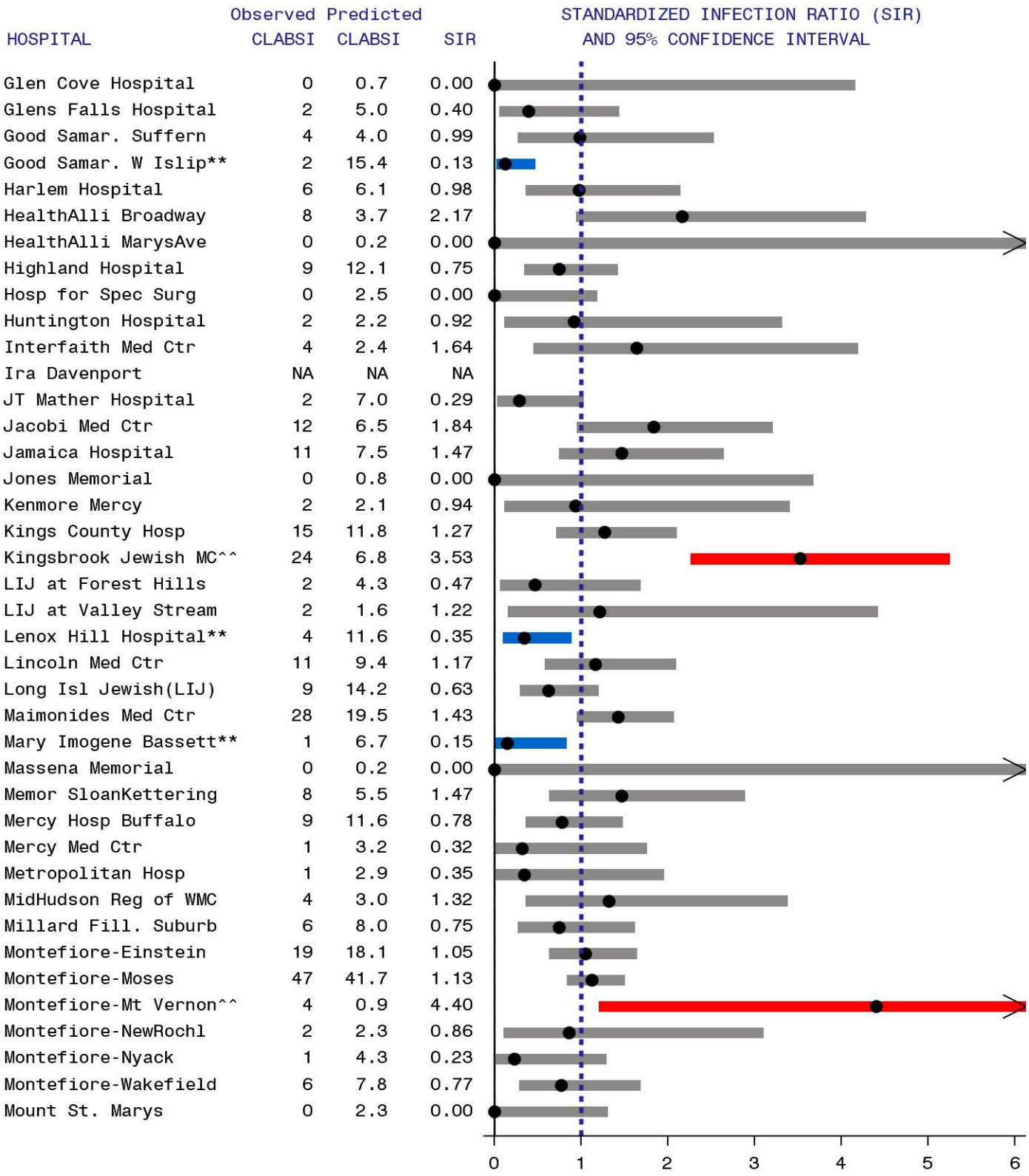
Figure 13 provides hospital-specific CLABSI SIRs for each hospital. CLABSI SIRs combine results across the eight different types of ICUs and five types of wards to show the average performance of each hospital for CLABSIs. Thirteen hospitals (8%) had high SIR flags in 2017; none were high for more than two consecutive years. These hospitals will submit improvement plans following the NYSDOH HAI Reporting Program's Policy for Facilities with Consecutive Years of High HAI Rates. Eleven hospitals (7%) had low SIR flags; St. Peters hospital and Unity Hospital of Rochester were low for three consecutive years.

Figure 13. Central Line-Associated Bloodstream Infection Standardized Infection Ratios for Intensive Care Units and Medical/Surgical/Stepdown Wards: New York 2017 (page 1 of 5)



Data reported as of June 25, 2018. ┆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 2017 average, adjusting for location and birthweight. Excludes mucosal barrier injury CLABSI.

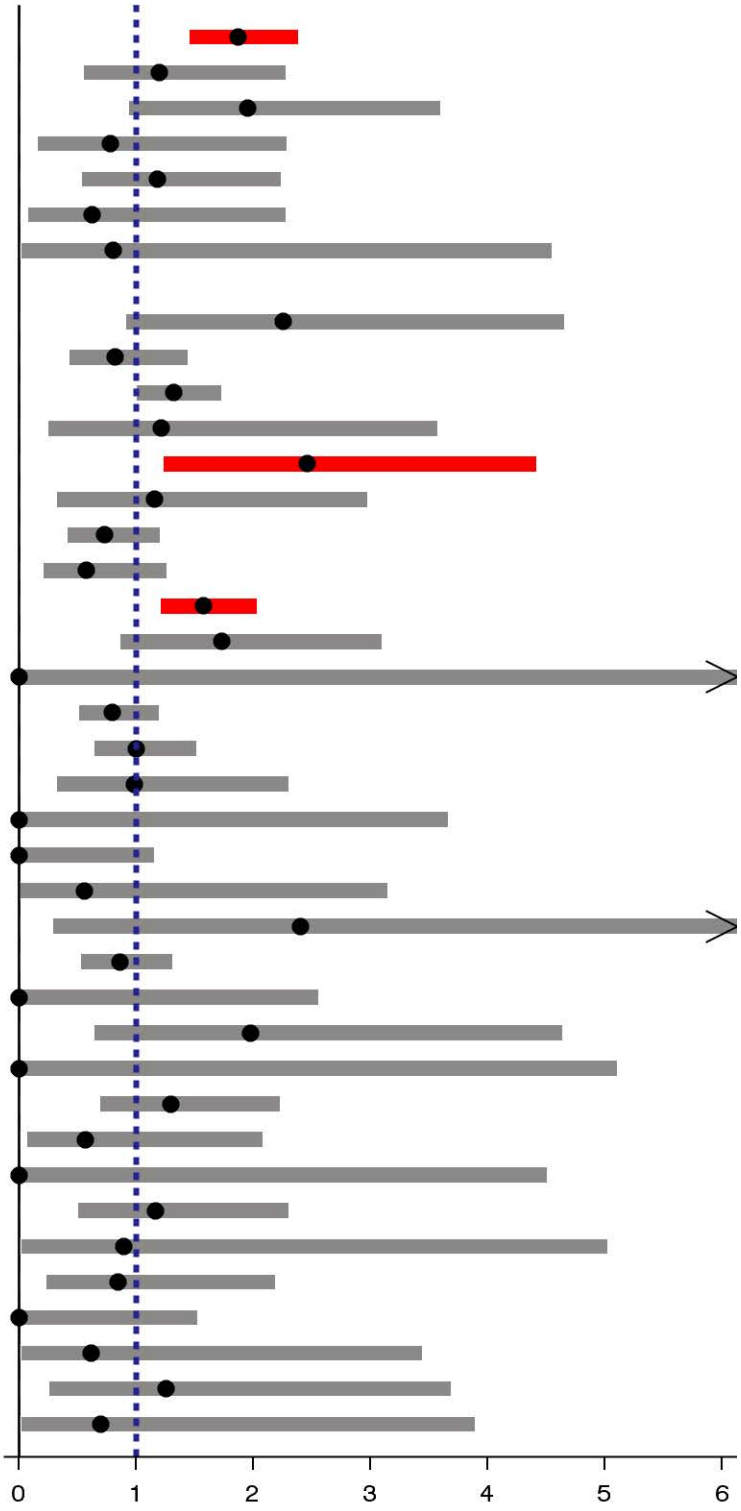
Figure 13. Central Line-Associated Bloodstream Infection Standardized Infection Ratios for Intensive Care Units and Medical/Surgical/Stepdown Wards: New York 2017 (page 2 of 5)



Data reported as of June 25, 2018. ¦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 2017 average, adjusting for location and birthweight. Excludes mucosal barrier injury CLABSI.

Figure 13. Central Line-Associated Bloodstream Infection Standardized Infection Ratios for Intensive Care Units and Medical/Surgical/Stepdown Wards: New York 2017 (page 3 of 5)

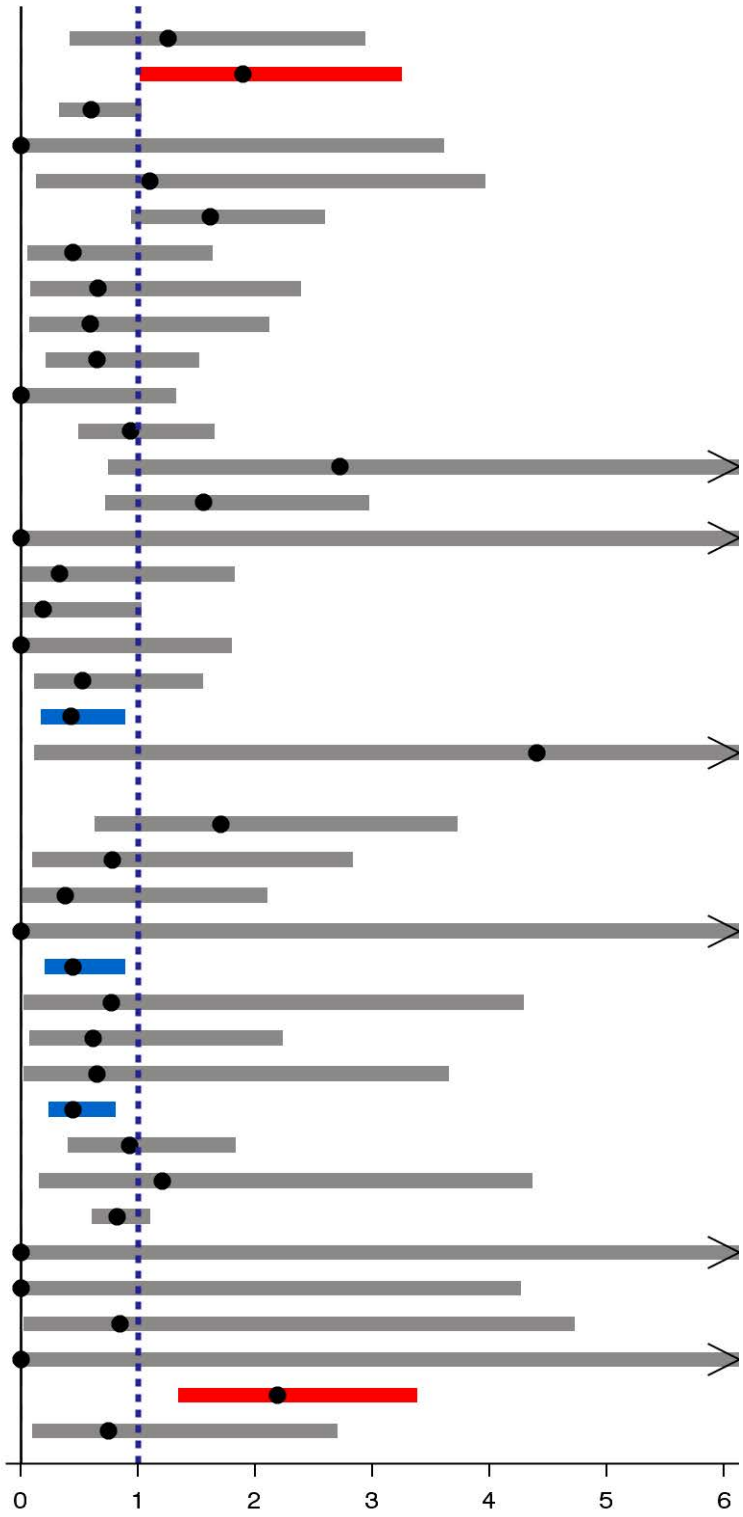
HOSPITAL	Observed CLABSI	Predicted CLABSI	SIR
Mt Sinai^^	67	35.8	1.87
Mt Sinai Beth Israel	9	7.5	1.20
Mt Sinai Brooklyn	10	5.1	1.95
Mt Sinai Queens	3	3.9	0.78
Mt Sinai St Lukes	9	7.6	1.18
Mt Sinai West	2	3.2	0.63
NY Community Hosp	1	1.2	0.81
NY Eye&Ear Mt Sinai	NA	NA	NA
NYP-Allen	7	3.1	2.26
NYP-Brklyn Methodist	12	14.6	0.82
NYP-Columbia	56	42.4	1.32
NYP-Hudson Valley	3	2.5	1.22
NYP-Lawrence^^	11	4.5	2.46
NYP-Lower Manhattan	4	3.4	1.16
NYP-Morgan Stanley	15	20.6	0.73
NYP-Queens	6	10.4	0.58
NYP-Weill Cornell^^	61	38.6	1.58
NYU Langone Brooklyn	11	6.4	1.73
NYU Orthopedic Hosp	0	0.2	0.00
NYU Tisch	24	30.0	0.80
NYU Winthrop	23	22.9	1.00
Nassau University	5	5.1	0.99
Nathan Littauer	0	0.8	0.00
Newark Wayne	0	2.6	0.00
Niagara Falls	1	1.8	0.56
North Central Bronx	2	0.8	2.40
North Shore	21	24.4	0.86
Northern Dutchess	0	1.2	0.00
Northern Westchester	5	2.5	1.98
Noyes Memorial	0	0.6	0.00
Oishei Childrens	13	10.0	1.30
Olean General	2	3.5	0.57
Oneida Healthcare	0	0.7	0.00
Orange Regional	8	6.9	1.17
Oswego Hospital	1	1.1	0.90
Our Lady of Lourdes	4	4.7	0.85
Peconic Bay Medical	0	2.0	0.00
Phelps Memorial	1	1.6	0.62
Plainview Hospital	3	2.4	1.26
Putnam Hospital	1	1.4	0.70



Data reported as of June 25, 2018. ┆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 2017 average, adjusting for location and birthweight. Excludes mucosal barrier injury CLABSI.

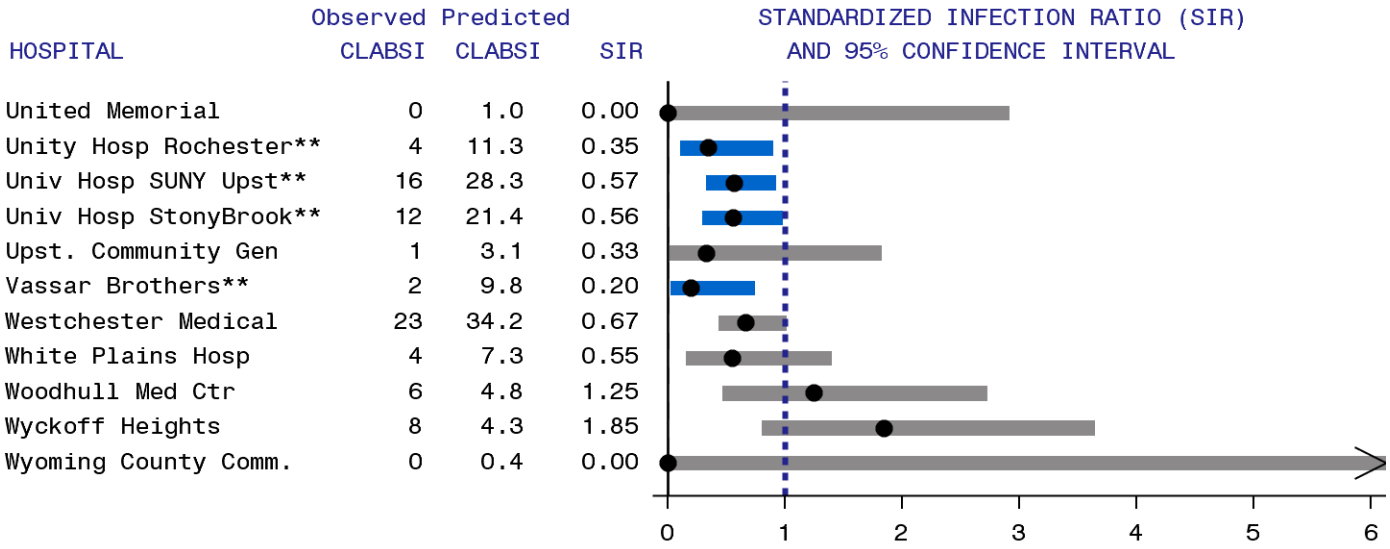
Figure 13. Central Line-Associated Bloodstream Infection Standardized Infection Ratios for Intensive Care Units and Medical/Surgical/Stepdown Wards: New York 2017 (page 4 of 5)

HOSPITAL	Observed CLABSI	Predicted CLABSI	SIR
Queens Hospital	5	4.0	1.26
Richmond Univ MC^^	13	6.8	1.90
Rochester General	13	21.5	0.60
Rome Memorial	0	0.8	0.00
Roswell Park	2	1.8	1.10
SUNY Downstate MedCr	17	10.5	1.62
Samaritan- Troy	2	4.4	0.45
Samaritan- Watertown	2	3.0	0.66
Saratoga Hospital	2	3.4	0.59
Sisters of Charity	5	7.7	0.65
Sisters- St Joseph	0	2.3	0.00
South Nassau Comm.	12	12.7	0.94
Southampton	4	1.5	2.72
Southside	9	5.8	1.56
St Anthony	0	0.3	0.00
St Barnabas	1	3.1	0.33
St Catherine Siena	1	5.4	0.19
St Charles Hospital	0	1.7	0.00
St Elizabeth Medical	3	5.7	0.53
St Francis- Roslyn**	7	16.2	0.43
St James Mercy	1	0.2	4.40
St Johns Dobbs Ferry	NA	NA	NA
St Johns Episcopal	6	3.5	1.71
St Johns Riverside	2	2.5	0.78
St Joseph- Bethpage	1	2.7	0.38
St Josephs- Elmira	0	0.1	0.00
St Josephs- Syracuse**	8	17.7	0.45
St Josephs- Yonkers	1	1.3	0.77
St Lukes Cornwall	2	3.2	0.62
St Marys Amsterdam	1	1.5	0.65
St Peters Hospital**	11	24.3	0.45
Staten Island U N	8	8.6	0.93
Staten Island U S	2	1.7	1.21
Strong Memorial	45	54.8	0.82
Sunnyview Rehab Hosp	0	0.1	0.00
Syosset Hospital	0	0.7	0.00
UHS Binghamton	1	1.2	0.85
UHS Chenango Memor	0	0.1	0.00
UHS Wilson^^	20	9.1	2.19
UPMC Chautauqua WCA	2	2.7	0.75



Data reported as of June 25, 2018. ┆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 2017 average, adjusting for location and birthweight. Excludes mucosal barrier injury CLABSI.

Figure 13. Central Line-Associated Bloodstream Infection Standardized Infection Ratios for Intensive Care Units and Medical/Surgical/Stepdown Wards: New York 2017 (page 5 of 5)



Data reported as of June 25, 2018. ┆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 2017 average, adjusting for location and birthweight. Excludes mucosal barrier injury CLABSI.

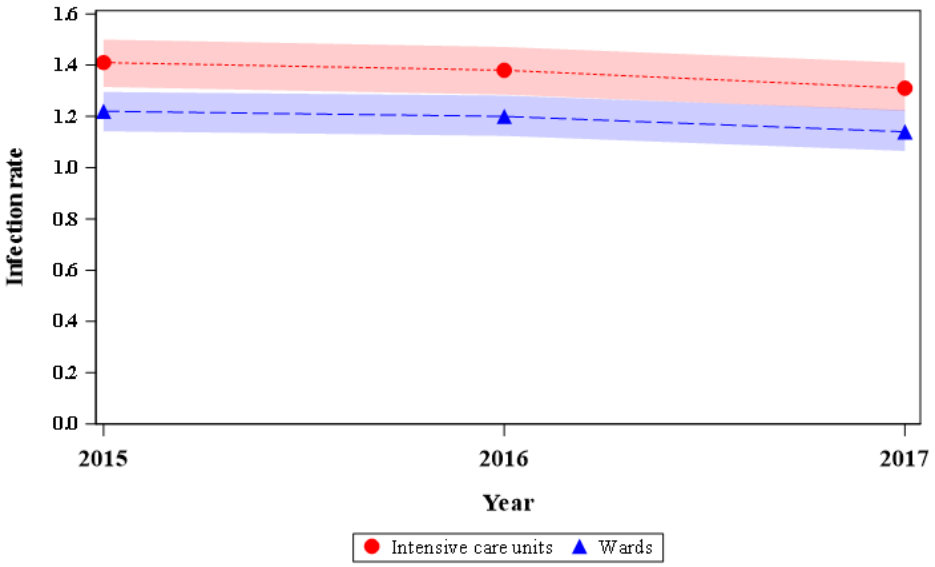
Catheter-Associated Urinary Tract Infections (CAUTIs)

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.

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.

Between 2015 and 2017, the CAUTI rate significantly declined 6%, from 1.30 infections per 1,000 catheter days in 2015, to 1.22 infections per 1,000 catheter days in 2017.
Catheter utilization also decreased significantly from 19% to 17% from 2015 to 2017 (Figure 14).

Figure 14. Catheter-associated urinary tract infection rates, New York State 2015-2017



Location	Year	# Hospitals	# Catheter-Associated Urinary Tract Infections	# Urinary Catheter Days	Catheter-Associated Urinary Tract Infection Rate[1]	Number of Patient Days	Device Utilization[2] (%)
Intensive Care Units	2015	157	901	641,269	1.41	1,160,365	55.3
	2016	160	855	621,562	1.38	1,156,335	53.8
	2017	160	764	581,863	1.31	1,147,031	50.7
Medical/surgical wards	2015	167	987	811,105	1.22	6,322,223	12.8
	2016	171	908	756,222	1.20	6,313,747	12.0
	2017	170	804	703,574	1.14	6,236,071	11.3
Total	2015	169	1,888	1,452,374	1.30	7,482,588	19.4
	2016	173	1,763	1,377,784	1.28	7,470,082	18.4
	2017	172	1,568	1,285,437	1.22	7,383,102	17.4

[1] Infection rate is the number of infections divided by the number of catheter days, multiplied by 1,000.
[2] Device utilization is the number of catheter days divided by the number of patient days.
Data reported as of May 31, 2018.

Microorganisms Associated with CAUTIs

The most common microorganism identified in CAUTIs in intensive care units and wards was *E. coli.* (Table 16).

Table 16. Microorganisms identified in catheter-associated urinary tract infections, New York State 2017

Microorganism	Number of Isolates	Percent of Infections
Escherichia coli	577	35.5
(CRE-*E. coli*)	(3)	(0.2)
Enterococci	280	17.9
(VRE)	(76)	(4.8)
Pseudomonas spp.	277	17.7
Klebsiella spp.	276	17.6
(CRE-*Klebsiella*)	(28)	(1.8)
Proteus spp.	119	7.6
Enterobacter spp.	70	4.5
(CRE-*Enterobacter*)	(10)	(0.6)
Coagulase negative staphylococci	38	2.4
Staphylococcus aureus	29	1.8
(MRSA)	(17)	(1.1)
Citrobacter spp.	22	1.4
Serratia spp.	22	1.4
Acinetobacter spp.	16	1.0
(MDR-A*cinetobacter*)	(10)	(0.6)
Morganella morganii	15	1.0
Providencia spp.	12	0.8
Streptococci	8	0.5
Other	14	0.9

New York State data reported as of May 31, 2018. Out of 1,568 infections.
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)

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. 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.*

This report will summarize FWI and OP areas only.

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 calendar 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 for CRE and CDI).

    - 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.

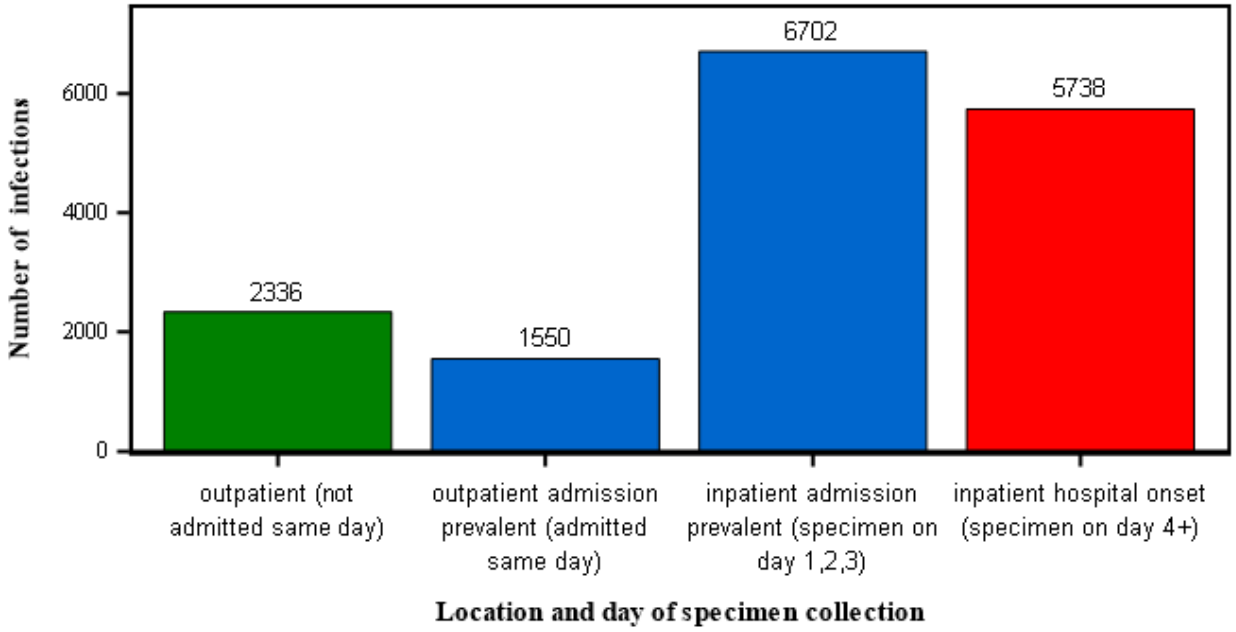
- Cases termed "hospital-onset (HO)" are cases in which the positive stool sample was obtained on day four or later during the hospital stay.

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 for CDI and CRE (to match the 2014 surveillance definition, and because these infected patients increase the risk of transmission in the inpatient area). In the situation where a CDI or CRE 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, and in the outpatient rate by NHSN; for other MDROs, the specimens are counted in the outpatient rate because NYS did not direct hospitals to enter the admission date for these pathogens.

Clostridium difficile Infections (CDI)

In 2017, 16,326 CDI events were reported by acute care hospitals: 14% were identified in ED/OBS units among patients who were not admitted the same day, 9% were identified in ED/OBS units among patients who were admitted the same day, 41% were identified in the FWI areas during the first three days of hospitalization, and 35% were identified in the FWI areas after the first three days of inpatient stay (Figure 15).

Figure 15. *Clostridium difficile* onset, New York State, 2017

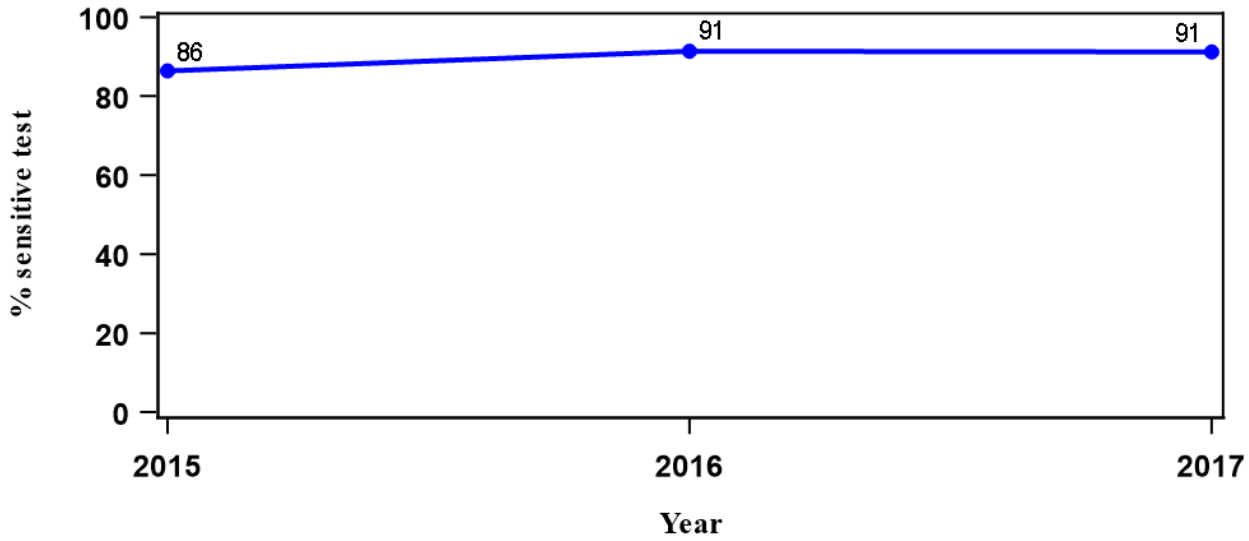


Data reported as of July 31, 2018. Includes recurrent cases. Excludes inpatient rehabilitation and inpatient psychiatric facilities. Specimens identified in the outpatient setting and admitted the next day are counted as outpatient.

Laboratory Testing for CDI

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 an 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. The percentage of patient days using more sensitive tests (i.e. nucleic acid amplification tests (NAAT) or multistep screening with confirmation with NAAT) increased 5% between 2015 and 2017 (Figure 16).

Figure 16. Percent of patient days using sensitive laboratory test method for *C. difficile*, New York State 2015-2017

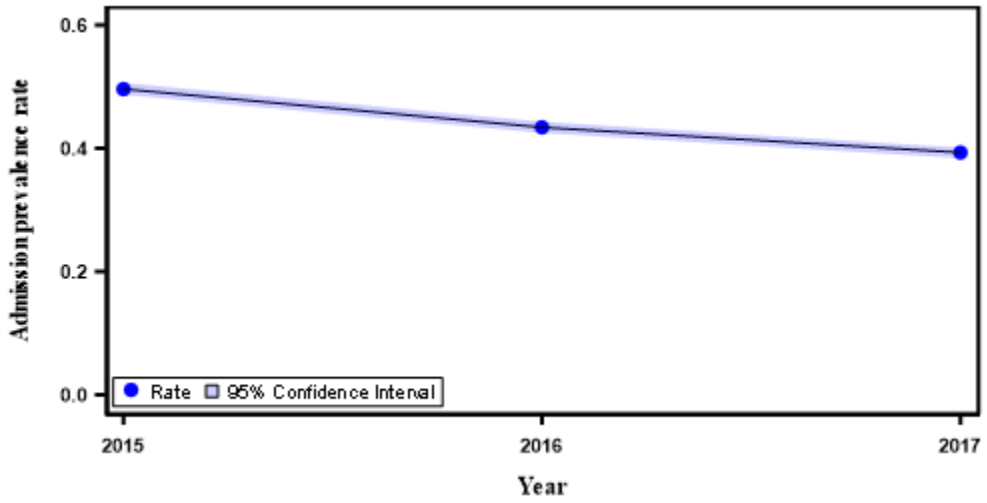


Data reported as of July 31, 2018.

Admission Prevalence

The admission prevalence rate describes the percentage of patients admitted to hospitals with CDIs. In 2017, there were 8,236 of these cases out of 2,129,830 admissions, for a rate of 0.39% (Figure 17). This was a statistically significant decrease of 22% compared to 2015.

Figure 17. Trend in *C. difficile* admission prevalence rate, New York State 2015-2017



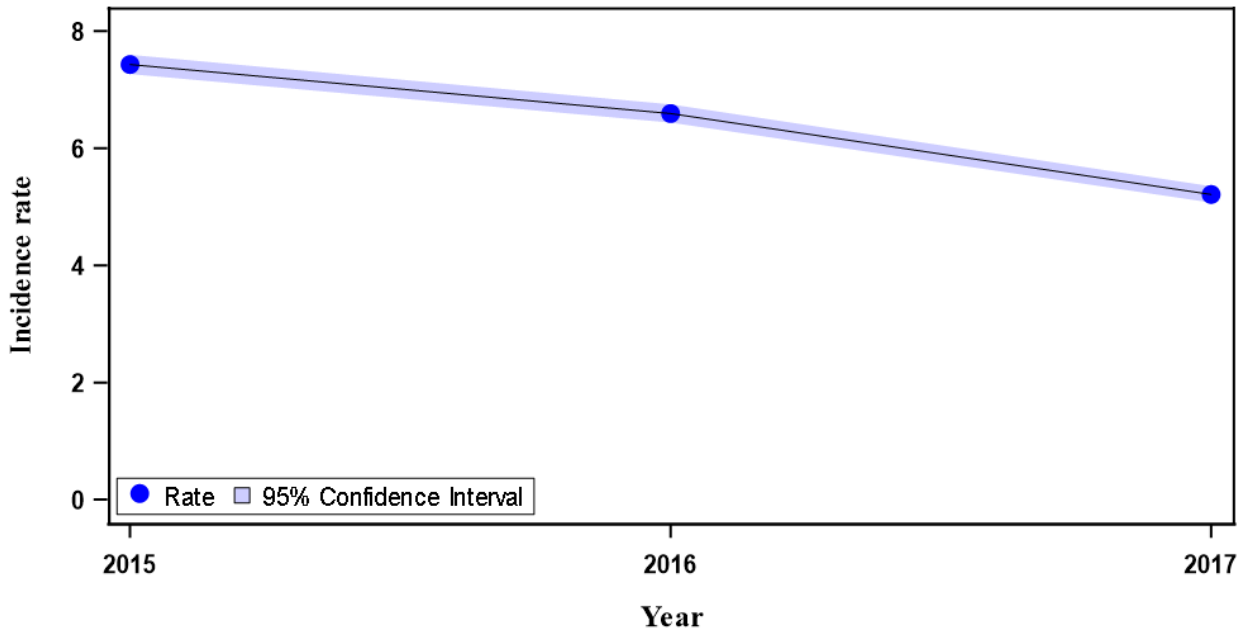
Year	# Hospitals	# Admission Prevalent Infections	# Admissions	Admission Prevalence Rate	% Discharged from Same Hospital in Previous 28 Days
2015	175	10,454	2,106,161	0.496	25%
2016	178	9,174	2,113,726	0.434	24%
2017	177	8,236	2,129,830	0.387	25%

Data reported as of July 31, 2018. Excludes inpatient rehabilitation and inpatient psychiatric facilities.
Rate is number of nonduplicate CDI events per patient per month identified ≤3 days after admission to the facility per 100 admissions. Includes cases identified in the emergency room if admitted the same day.

Hospital onset CDI rates

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. The HO rate was 5.21 per 10,000 patient days in 2017 (Figure 18). This is a statistically significant decrease of 30% compared to 2015.

Figure 18. Trend in *Clostridium difficile* hospital onset rates, New York State 2015-2017



Year	# Hospitals	# Hospital Onset Infections	# Patient Days	Hospital Onset Rate
2015	175	7,870	10,590,347	7.43
2016	178	6,940	10,525,449	6.59
2017	177	5,449	10,455,614	5.21

Data reported as of July 31, 2018. Excludes inpatient rehabilitation and inpatient psychiatric facilities.
Rate is number of incident CDI events identified >3 days after admission to the facility per 10,000 patient days.

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 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 3.4.

- Hospital bed size, as reported in 2017 NHSN survey – The HO rate at hospitals with 100 to 424 beds was 1.2 times higher than the rate at hospitals with less than 100 beds, and the HO rate at hospitals with greater than 424 beds was 1.5 times higher than the rate at hospitals with less than 100 beds.

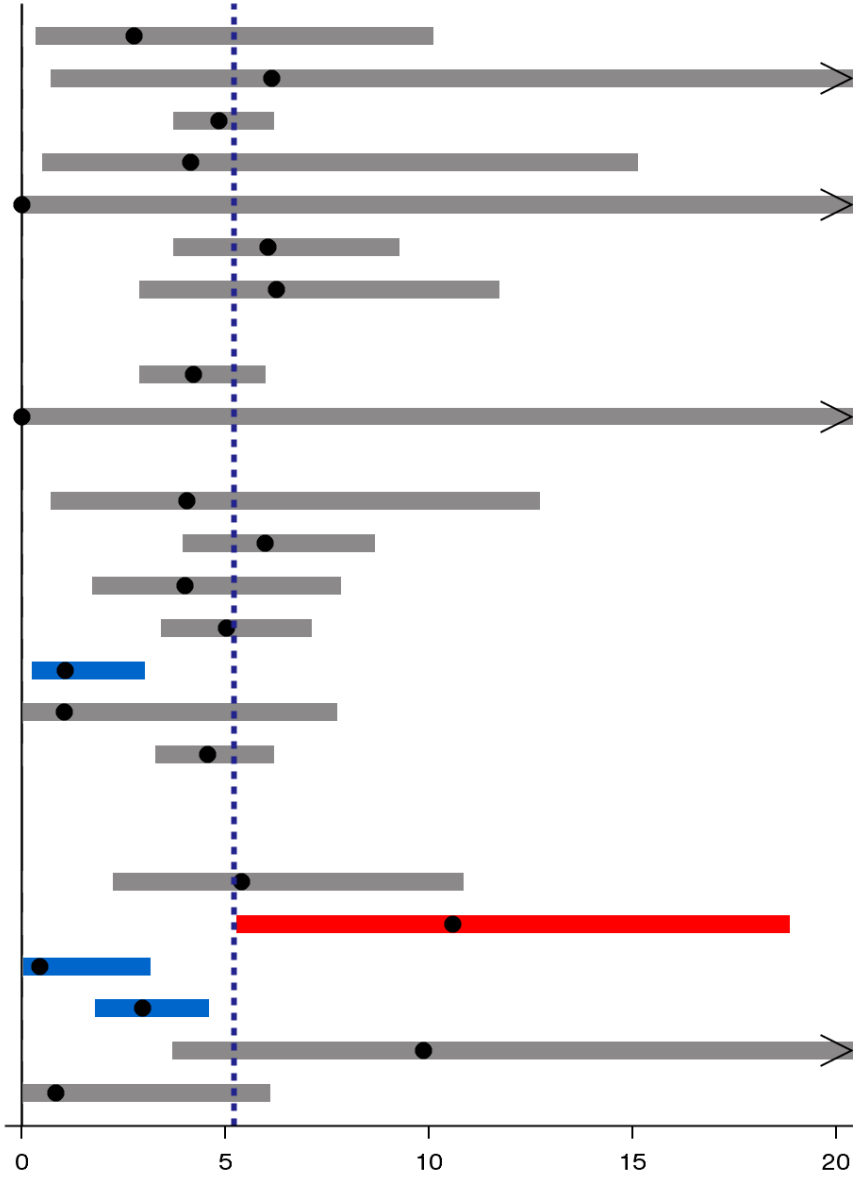
- Percent of patient days in adult intensive care units – This was calculated by dividing the number adult ICU patient days (from the CLABSI summary data) by the number of CDI patient days (from the MDRO summary data). As percent ICU days increased 10%, the HO rate increased by a factor of 1.2.

Hospital-specific FWI HO CDI rates are summarized in Figure 19. 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. The remaining 162 hospitals contributed 5,131 HO CDIs among 9,884,784 patient days, for an average HO rate of 5.2 per 10,000 patient days.

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. In 2017, 15 out of 162 hospitals (9%) were flagged with adjusted rates significantly higher than the state average; NYP-Columbia and NYP-Weill Cornell were flagged high for three consecutive years. The 15 hospitals will submit improvement plans following the NYSDOH HAI Reporting Program's Policy for Facilities with Consecutive Years of High HAI Rates. Fifteen hospitals (9%) were flagged significantly lower than average. One hospital (Rochester General) was significantly low for five consecutive years.

Figure 19. Hospital onset facility-wide inpatient *C. difficile* rates, New York State 2017 (Page 1 of 7)

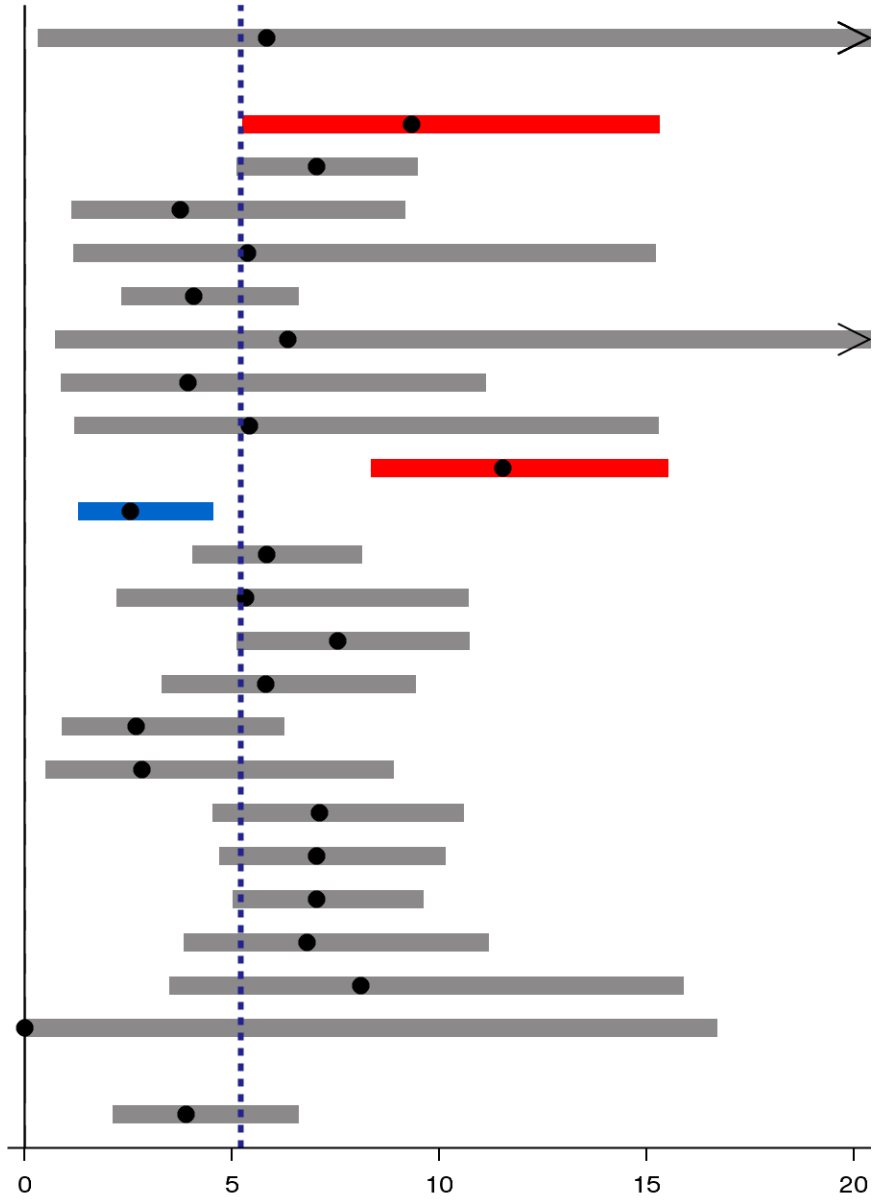
HOSPITAL	TEST METH	# OP	# CO-NMH	# CO-PMH	# HO	# PATDAYS	CO-NMH RATE	RAW HO RATE	ADJ HO RATE
AO Fox Memorial	S	3	19	2	3	8,311	0.9	3.6	2.8
Adirondack Medical	S	8	4	3	3	7,809	0.2	3.8	6.1
Albany Med Ctr	S	9	117	48	105	197,928	0.3	5.3	4.8
Albany Memorial	N	1	11	3	3	13,881	0.3	2.2	4.1
Alice Hyde Med Ctr	N	0	2	0	0	6,386	0.1	0.0	0.0
Arnot Ogden Med Ctr	S	5	55	17	34	43,720	0.6	7.8	6.0
Auburn Memorial	S	13	36	9	15	18,031	0.8	8.3	6.2
Bellevue Ellis	S	0	1	0	0	6,655	0.0	0.0	NA
Bellevue Hospital	S	9	28	12	52	105,633	0.3	4.9	4.2
Bertrand Chaffee	N	0	6	1	0	4,359	0.3	0.0	0.0
Blythedale Childrens	S	0	0	0	1	26,048	0.0	0.4	NA
Bon Secours	S	1	12	2	4	12,136	0.4	3.3	4.0
Bronx-Lebanon	S	0	38	18	45	103,324	0.2	4.4	6.0
Brookdale Hospital	N	2	10	1	13	69,459	0.1	1.9	4.0
Brookhaven Memorial	S	37	84	20	51	69,644	0.7	7.3	5.0
Brooklyn Hosp Ctr**	S	1	16	6	5	70,742	0.1	0.7	1.1
Brooks Memorial	S	10	16	3	1	6,819	0.8	1.5	1.0
Buffalo General	S	35	48	13	69	137,258	0.2	5.0	4.6
Burdett Care Center	N	0	0	0	0	2,405	0.0	0.0	NA
Calvary Hospital	N	0	2	0	12	79,303	0.1	1.5	NA
Canton-Potsdam	S	18	37	9	12	18,042	0.8	6.7	5.4
Catskill Regional^	S	2	24	8	18	14,533	0.7	12.4	10.6
Cayuga Medical Ctr**	S	9	29	4	1	19,923	0.5	0.5	0.4
Champlain Valley**	S	7	85	14	32	55,684	1.0	5.7	3.0
Claxton-Hepburn	S	19	8	2	10	10,677	0.3	9.4	9.9
Clifton Springs	S	2	10	4	1	14,177	0.5	0.7	0.8



Data reported as of July 31, 2018. 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, HO rate is per 10,000 patient days. HO rate adjusted using test method, CO-NMH rate, percent intensive care unit days, and number of beds. Rehabilitation and behavioral health units excluded.

Figure 19. Hospital onset facility-wide inpatient *C. difficile* rates, New York State 2017 (Page 2 of 7)

HOSPITAL	TEST METH	# OP	# CO-NMH	# CO-PMH	# HO	# PATDAYS	CO-NMH RATE	RAW HO RATE	ADJ HO RATE
Cobleskill Regional	S	0	3	1	2	4,817	0.4	4.2	5.8
Cohens Childrens	S	7	20	8	25	39,120	0.2	6.4	NA
Columbia Memorial^	S	32	27	5	25	23,762	0.6	10.5	9.3
Coney Island Hosp	S	15	59	11	72	88,478	0.5	8.1	7.0
Corning Hospital	S	11	35	4	7	13,853	0.8	5.1	3.7
Cortland Reg Med	N	2	13	6	5	12,959	0.4	3.9	5.4
Crouse Hospital	S	22	60	20	26	75,008	0.3	3.5	4.1
DeGraff Memorial	S	6	9	0	3	4,672	0.6	6.4	6.3
East. Niag. Lockport	N	5	8	4	5	26,643	0.2	1.9	3.9
Eastern Long Island	S	3	9	0	5	13,211	0.4	3.8	5.4
Ellis Hospital^	S	54	27	8	72	78,722	0.2	9.1	11.5
Elmhurst Hospital**	S	6	11	9	18	92,634	0.1	1.9	2.5
Erie County Med Ctr	S	4	36	18	57	97,947	0.2	5.8	5.8
FF Thompson	S	24	41	10	12	21,906	0.6	5.5	5.3
Faxton St. Lukes	S	13	76	25	51	60,679	0.5	8.4	7.5
Flushing Hospital	S	1	19	6	26	66,459	0.1	3.9	5.8
Geneva General	S	16	30	7	8	16,486	0.8	4.9	2.7
Glen Cove Hospital	S	5	9	4	4	16,415	0.2	2.4	2.8
Glens Falls Hospital	S	17	51	17	39	60,360	0.4	6.5	7.1
Good Samar. Suffern	S	25	72	12	47	54,563	0.5	8.6	7.0
Good Samar. W Islip	S	51	37	8	65	127,845	0.1	5.1	7.0
Harlem Hospital	S	0	11	3	25	52,408	0.1	4.8	6.8
HealthAlli Broadway	N	4	22	7	13	29,809	0.3	4.4	8.1
HealthAlli MarysAve	N	0	0	0	0	8,298	0.0	0.0	0.0
Henry J. Carter	S	0	2	0	20	52,510	0.7	3.8	NA
Highland Hospital	S	32	46	14	22	80,102	0.2	2.7	3.9



Data reported as of July 31, 2018. ┆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, HO rate is per 10,000 patient days. HO rate adjusted using test method, CO-NMH rate, percent intensive care unit days, and number of beds. Rehabilitation and behavioral health units excluded.

Figure 19. Hospital onset facility-wide inpatient *C. difficile* rates, New York State 2017 (Page 3 of 7)

HOSPITAL	TEST METH	# OP	# CO-NMH	# CO-PMH	# HO	# PATDAYS	CO-NMH RATE	RAW HO RATE	ADJ HO RATE
Hosp for Spec Surg	S	0	1	0	13	51,051	0.0	2.5	NA
Huntington Hospital	S	24	50	12	30	68,196	0.3	4.4	5.1
Interfaith Med Ctr	N	0	4	2	1	29,832	0.1	0.3	0.8
Ira Davenport	S	2	0	0	0	1,072	0.0	0.0	0.0
JT Mather Hospital^	N	27	26	8	41	58,863	0.2	7.0	13.2
Jacobi Med Ctr	S	9	21	7	46	85,401	0.1	5.4	5.9
Jamaica Hospital	S	4	32	12	32	80,538	0.2	4.0	4.3
Jones Memorial	S	3	8	0	1	6,853	0.6	1.5	1.4
Kenmore Mercy	S	6	25	4	15	31,597	0.3	4.7	5.5
Kings County Hosp	N	4	16	4	29	68,619	0.5	4.2	3.7
Kingsbrook Jewish MC^	S	0	34	10	48	47,886	0.5	10.0	9.2
LIJ at Forest Hills	S	14	29	9	22	65,533	0.2	3.4	4.7
LIJ at Valley Stream	S	12	11	1	8	43,525	0.1	1.8	3.1
Lenox Hill Hospital	S	10	38	17	36	106,843	0.1	3.4	3.7
Lincoln Med Ctr	N	3	4	6	13	82,605	0.0	1.6	3.7
Long Isl Jewish(LIJ)	S	34	82	18	98	190,701	0.2	5.1	5.7
Maimonides Med Ctr	N	18	61	25	43	166,847	0.2	2.6	4.2
Mary Imogene Bassett	S	8	31	11	17	46,520	0.3	3.7	4.4
Massena Memorial	N	1	7	5	4	8,999	0.2	4.4	10.8
Memor SloanKettering	S	8	74	46	179	153,918	0.3	11.6	NA
Mercy Hosp Buffalo	S	13	65	12	52	92,937	0.3	5.6	6.2
Mercy Med Ctr	S	8	22	11	21	44,288	0.3	4.7	6.1
Metropolitan Hosp	S	0	4	2	6	29,349	0.1	2.0	2.9
MidHudson Reg of WMC^	N	8	13	4	16	20,098	0.4	8.0	11.7
Millard Fill. Suburb	S	25	78	21	38	58,508	0.5	6.5	6.0
Monroe Community	S	NA	NA	NA	NA	8	0.0	NA	NA

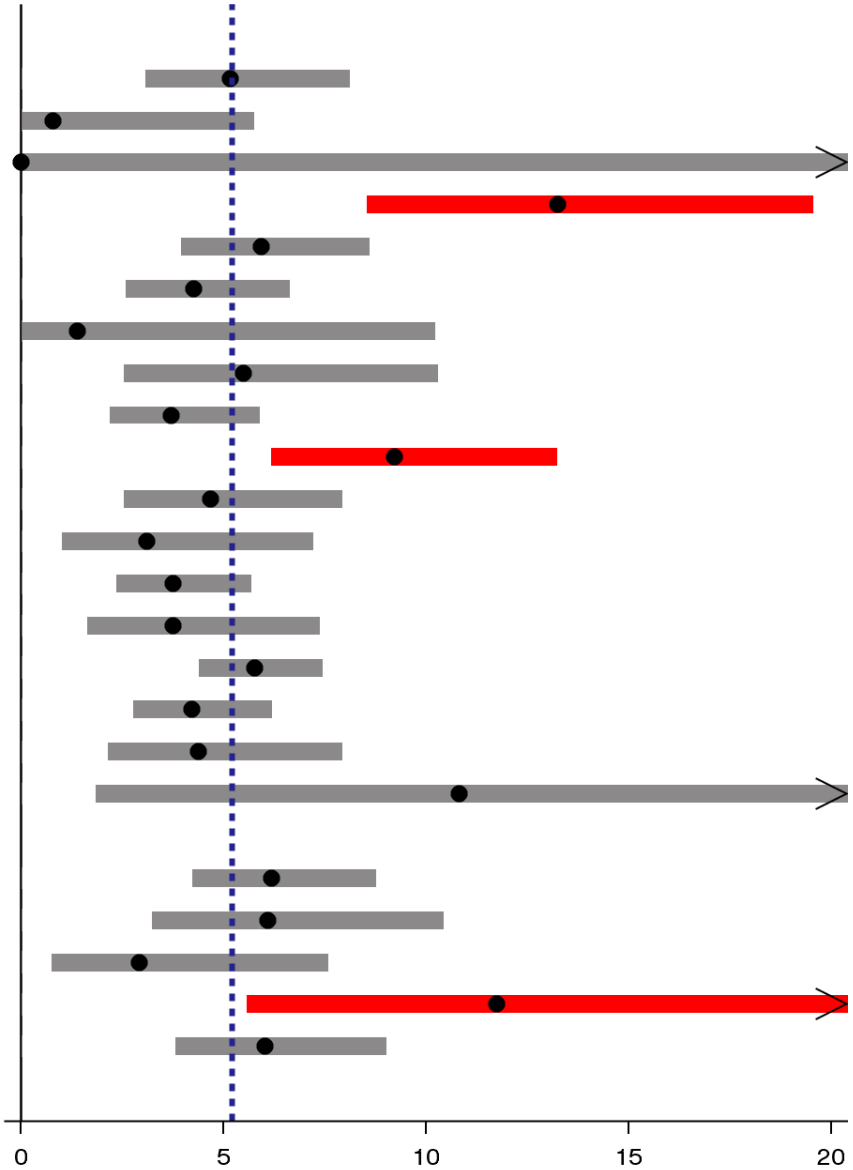


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Figure 19. Hospital onset facility-wide inpatient *C. difficile* rates, New York State 2017 (Page 4 of 7)

HOSPITAL	TEST METH	# OP	# CO-NMH	# CO-PMH	# HO	# PATDAYS	CO-NMH RATE	RAW HO RATE	ADJ HO RATE
Montefiore-Einstein^	S	13	100	21	116	150,058	0.3	7.7	7.3
Montefiore-Moses^	S	7	138	25	200	266,459	0.3	7.5	7.2
Montefiore-Mt Vernon^	S	1	8	2	13	14,597	0.3	8.9	14.5
Montefiore-NewRochl	S	7	23	7	14	30,641	0.4	4.6	6.4
Montefiore-Nyack**	S	6	89	17	26	62,186	0.8	4.2	2.7
Montefiore-Wakefield	S	2	51	5	43	64,980	0.3	6.6	7.8
Mount St. Marys	S	3	15	1	10	28,713	0.3	3.5	4.3
Mt Sinai	S	5	90	33	123	270,085	0.1	4.6	5.2
Mt Sinai Beth Israel**	S	3	20	8	7	72,754	0.1	1.0	1.3
Mt Sinai Brooklyn**	S	2	19	6	6	61,641	0.2	1.0	1.4
Mt Sinai Queens	S	12	14	3	7	50,177	0.1	1.4	2.2
Mt Sinai St Lukes**	S	0	9	4	10	78,818	0.1	1.3	1.8
Mt Sinai West**	S	19	9	2	7	87,223	0.0	0.8	1.1
NY Community Hosp^	S	3	45	4	47	36,459	0.7	12.9	10.3
NY Eye&Ear Mt Sinai	S	0	0	0	0	675	0.0	0.0	NA
NYP-Allen	S	21	36	16	27	48,126	0.2	5.6	7.7
NYP-Brklyn Methodist	S	38	76	19	87	161,891	0.2	5.4	5.9
NYP-Columbia^	S	63	159	47	197	212,965	0.3	9.3	7.2
NYP-Hudson Valley	S	8	47	10	31	36,458	0.5	8.5	7.5
NYP-Lawrence	S	7	32	11	20	48,345	0.3	4.1	5.0
NYP-Lower Manhattan	S	12	16	2	21	43,768	0.1	4.8	7.2
NYP-Morgan Stanley	S	18	29	13	29	65,353	0.1	4.4	NA
NYP-Queens**	S	23	88	28	55	155,766	0.3	3.5	3.5
NYP-Weill Cornell^	S	133	108	24	206	237,175	0.2	8.7	8.1
NYU Langone Brooklyn	S	22	60	12	44	81,778	0.3	5.4	6.3
NYU Orthopedic Hosp	S	0	1	1	3	18,807	0.0	1.6	NA

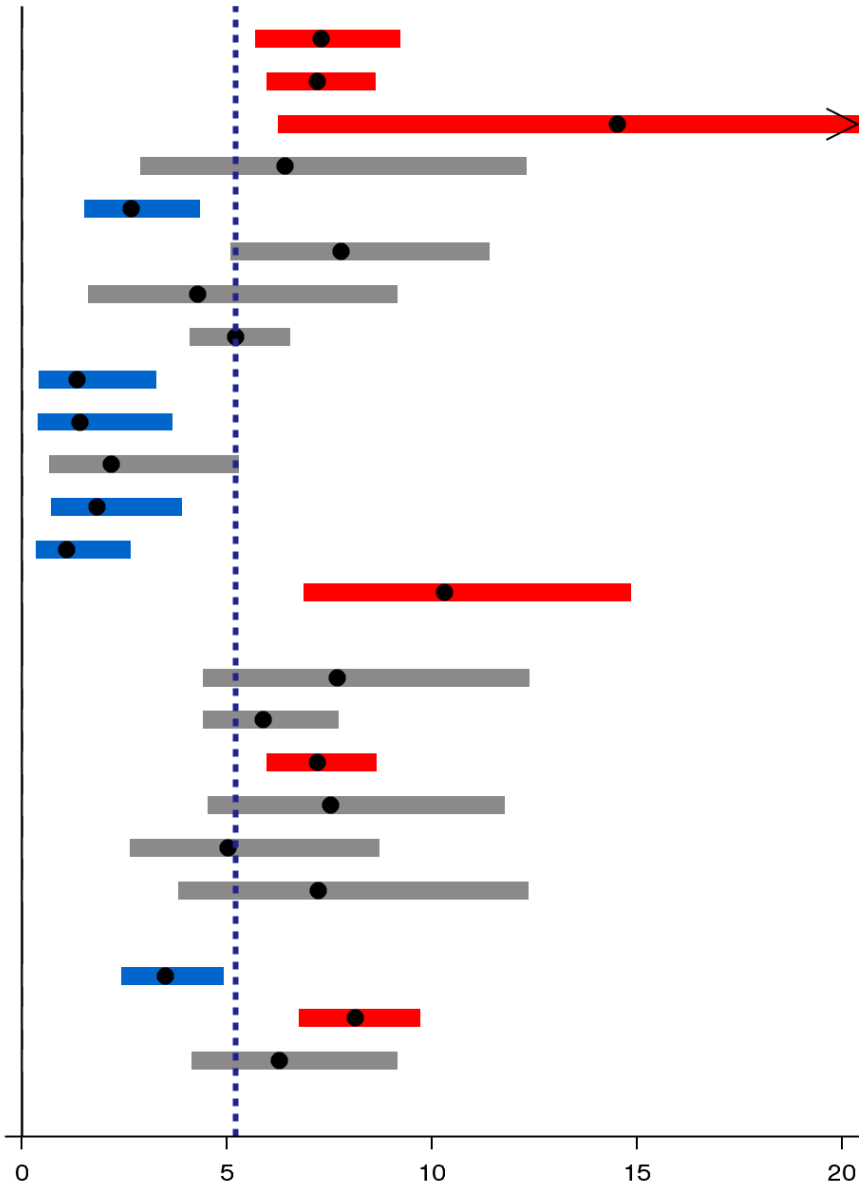

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Figure 19. Hospital onset facility-wide inpatient *C. difficile* rates, New York State 2017 (Page 5 of 7)

HOSPITAL	TEST METH	# OP	# CO-NMH	# CO-PMH	# HO	# PATDAYS	CO-NMH RATE	RAW HO RATE	ADJ HO RATE
NYU Tisch	S	92	99	24	98	149,095	0.3	6.6	5.9
NYU Winthrop	S	44	107	18	89	150,834	0.3	5.9	5.3
Nassau University	N	4	12	7	22	66,370	0.1	3.3	5.8
Nathan Littauer	N	2	10	3	4	9,151	0.4	4.4	6.7
Newark Wayne**	S	0	26	7	3	21,864	0.4	1.4	1.3
Niagara Falls	S	4	6	4	9	25,035	0.1	3.6	5.3
North Central Bronx	S	1	7	2	7	24,451	0.1	2.9	4.3
North Shore	S	1	60	28	109	262,189	0.1	4.2	4.8
Northern Dutchess^	S	16	30	4	20	17,338	0.5	11.5	12.5
Northern Westchester	S	2	45	8	20	36,221	0.7	5.5	4.2
Noyes Memorial	S	1	16	2	5	8,234	0.6	6.1	5.1
Oishei Childrens	S	1	6	1	2	32,152	0.1	0.6	NA
Olean General	S	4	32	12	16	31,310	0.5	5.1	5.3
Oneida Healthcare	S	4	19	3	1	9,304	0.8	1.1	0.8
Orange Regional	S	27	128	30	76	96,656	0.5	7.9	6.9
Oswego Hospital	S	8	25	6	8	13,586	0.8	5.9	4.1
Our Lady of Lourdes	S	29	43	11	17	42,416	0.4	4.0	4.3
Peconic Bay Medical	S	3	42	10	18	32,659	0.5	5.5	5.2
Phelps Memorial	S	1	41	7	26	37,386	0.6	7.0	6.0
Plainview Hospital	S	28	17	7	13	37,604	0.2	3.5	4.6
Putnam Hospital	S	16	37	8	11	22,912	0.5	4.8	4.4
Queens Hospital	S	1	11	8	13	48,934	0.1	2.7	4.1
Richmond Univ MC^	S	12	35	12	48	64,467	0.2	7.4	8.1
Rochester General**	S	20	80	34	84	155,940	0.7	5.4	3.2
Rome Memorial	S	4	28	8	8	13,414	0.7	6.0	5.4
Roswell Park	S	0	18	17	30	38,357	0.3	7.8	NA

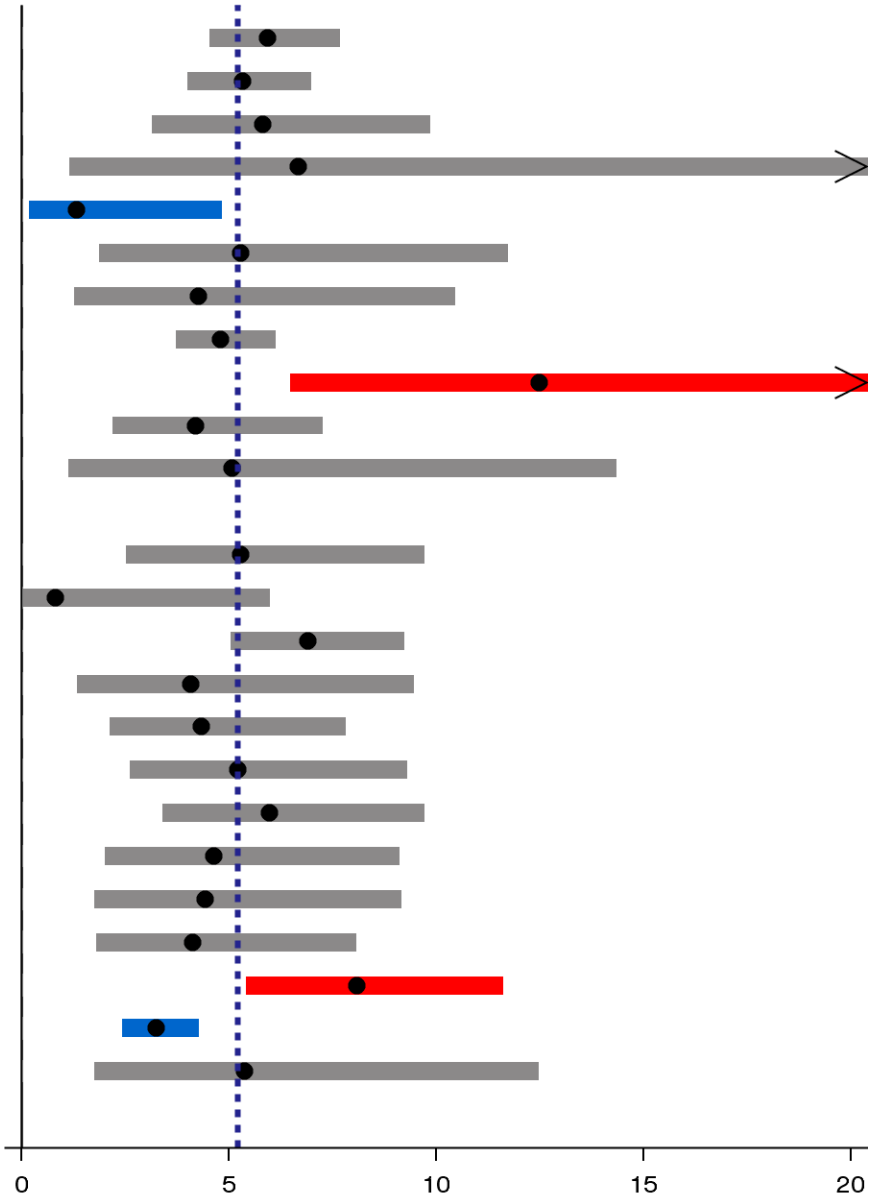

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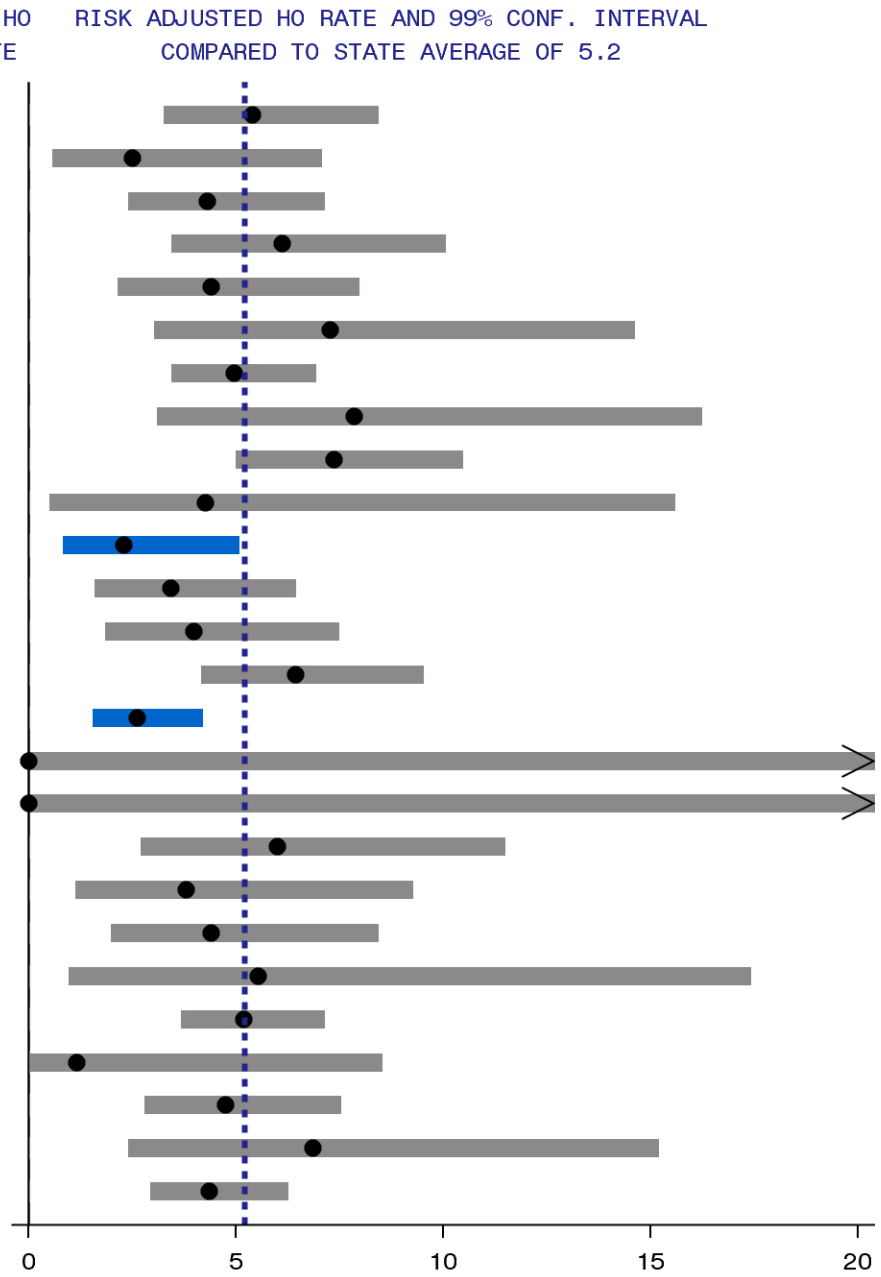
Figure 19. Hospital onset facility-wide inpatient *C. difficile* rates, New York State 2017 (Page 6 of 7)

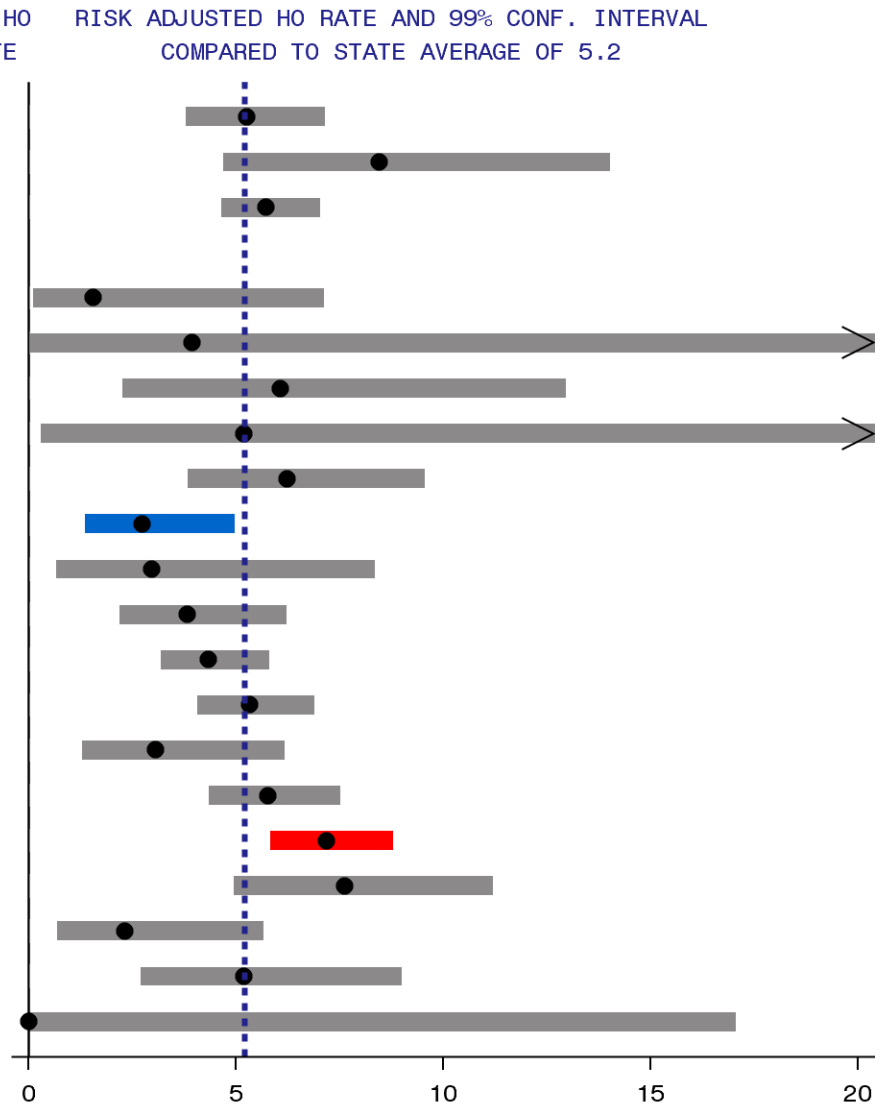
HOSPITAL	TEST METH	# OP	# CO-NMH	# CO-PMH	# HO	# PATDAYS	CO-NMH RATE	RAW HO RATE	ADJ HO RATE
SUNY Downstate MedCr	S	4	32	20	31	67,823	0.3	4.6	5.4
Samaritan- Troy	N	1	18	5	5	39,748	0.2	1.3	2.5
Samaritan- Watertown	S	16	58	10	24	37,297	0.8	6.4	4.3
Saratoga Hospital	S	34	30	9	25	51,497	0.2	4.9	6.1
Sisters of Charity	S	1	28	7	17	51,424	0.2	3.3	4.4
Sisters- St Joseph	S	6	19	6	12	20,704	0.4	5.8	7.3
South Nassau Comm.	S	46	106	14	56	95,932	0.6	5.8	4.9
Southampton	S	22	14	6	11	16,555	0.3	6.6	7.8
Southside	S	74	43	6	51	92,451	0.2	5.5	7.4
St Anthony	S	0	11	2	3	7,608	0.5	3.9	4.3
St Barnabas**	S	2	23	5	9	55,760	0.2	1.6	2.3
St Catherine Siena	S	3	31	9	15	48,798	0.3	3.1	3.4
St Charles Hospital	S	0	22	6	15	47,381	0.2	3.2	4.0
St Elizabeth Medical	S	14	54	14	41	45,732	0.6	9.0	6.4
St Francis- Roslyn**	S	23	57	16	28	101,246	0.3	2.8	2.6
St James Mercy	N	0	0	0	0	2,724	0.0	0.0	0.0
St Johns Dobbs Ferry	N	1	1	0	0	3,003	0.1	0.0	0.0
St Johns Episcopal	N	1	11	4	14	45,726	0.1	3.1	6.0
St Johns Riverside	N	3	7	3	7	45,179	0.1	1.5	3.8
St Joseph- Bethpage	S	9	31	8	14	32,093	0.5	4.4	4.4
St Josephs- Elmira	S	0	6	0	4	6,505	0.8	6.1	5.5
St Josephs- Syracuse	S	27	83	33	63	120,770	0.3	5.2	5.2
St Josephs- Yonkers	N	0	6	0	1	18,053	0.2	0.6	1.1
St Lukes Cornwall	S	0	66	13	29	44,031	0.7	6.6	4.7
St Marys Amsterdam	N	0	11	5	9	26,950	0.2	3.3	6.8
St Peters Hospital	S	55	69	23	48	115,138	0.2	4.2	4.4



Data reported as of July 31, 2018. ┆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, HO rate is per 10,000 patient days. HO rate adjusted using test method, CO-NMH rate, percent intensive care unit days, and number of beds. Rehabilitation and behavioral health units excluded..

Figure 19. Hospital onset facility-wide inpatient *C. difficile* rates, New York State 2017 (Page 7 of 7)

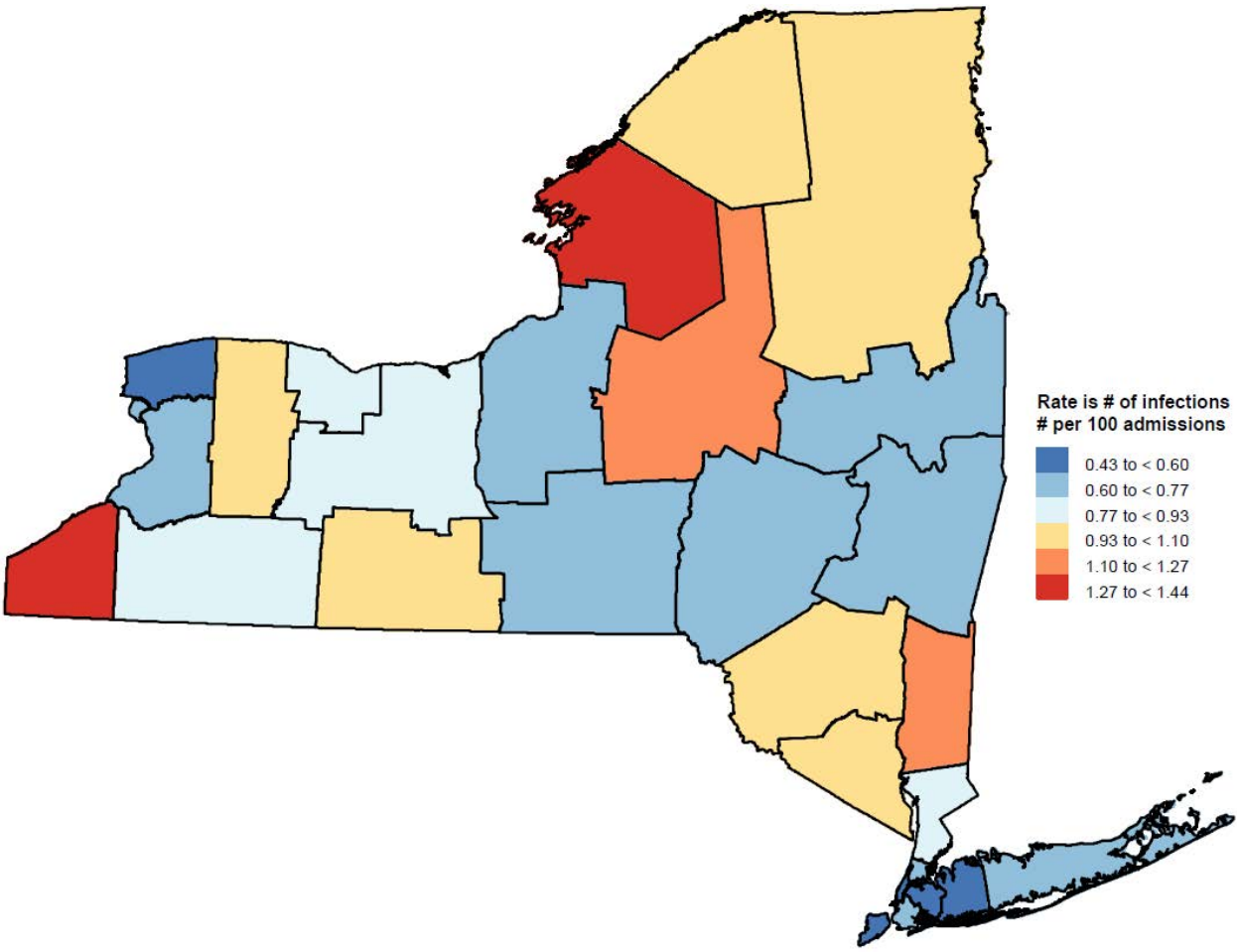
HOSPITAL	TEST METH	# OP	# CO-NMH	# CO-PMH	# HO	# PATDAYS	CO-NMH RATE	RAW HO RATE	ADJ HO RATE
Staten Island U N	S	73	51	14	69	137,826	0.2	5.0	5.3
Staten Island U S	S	25	15	5	24	41,801	0.2	5.7	8.5
Strong Memorial	S	84	85	29	158	235,674	0.4	6.7	5.7
Sunnyview Rehab Hosp	S	0	0	0	4	4,468	0.0	9.0	NA
Syosset Hospital	S	5	17	4	2	13,813	0.4	1.4	1.5
TLC Lake Shore	S	2	5	0	1	1,532	1.1	6.5	3.9
UHS Binghamton	S	1	15	2	10	19,433	0.3	5.1	6.0
UHS Chenango Memor	S	1	7	2	2	3,711	0.6	5.4	5.2
UHS Wilson	S	10	57	16	34	58,901	0.3	5.8	6.2
UPMC Chautauqua WCA**	S	19	62	6	17	20,774	1.2	8.2	2.7
United Memorial	S	7	24	10	5	12,861	0.6	3.9	2.9
Unity Hosp Rochester	S	34	53	10	26	85,857	0.3	3.0	3.8
Univ Hosp SUNY Upst	S	19	84	24	76	127,691	0.4	6.0	4.3
Univ Hosp StonyBrook	S	96	95	25	98	171,252	0.3	5.7	5.3
Upst. Community Gen	S	6	44	7	12	35,086	0.6	3.4	3.1
Vassar Brothers	S	13	171	45	92	97,183	0.8	9.5	5.8
Westchester Medical^	S	16	87	29	159	147,226	0.5	10.8	7.2
White Plains Hosp	S	37	39	15	42	76,209	0.2	5.5	7.6
Woodhull Med Ctr	S	3	11	1	7	47,665	0.1	1.5	2.3
Wyckoff Heights	S	0	26	4	20	53,603	0.2	3.7	5.2
Wyoming County Comm.	N	3	4	0	0	6,003	0.3	0.0	0.0



Data reported as of July 31, 2018. 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, HO rate is per 10,000 patient days. HO rate adjusted using test method, CO-NMH rate, percent intensive care unit days, and number of beds. Rehabilitation and behavioral health units excluded.

Figure 20 shows the FWI CDI overall patient prevalence rate by county (or merged county for those with few or no hospitals). In contrast to CRE (see maps in CRE section), the prevalence of CDI is low in New York City (NYC), and varies in the upstate area.

Figure 20. Facility-wide Inpatient *Clostridium difficile* Prevalence Rates, New York State 2017



Data reported as of July 31, 2018. Excludes specialty hospitals, inpatient rehabilitation facilities, and inpatient psychiatric facilities. Specimens identified in the outpatient setting and admitted the next day are not included. The number of cases reported in hospitals performing less sensitive tests was multiplied by 1.5 to approximate the number of cases expected if a more sensitive test was used.

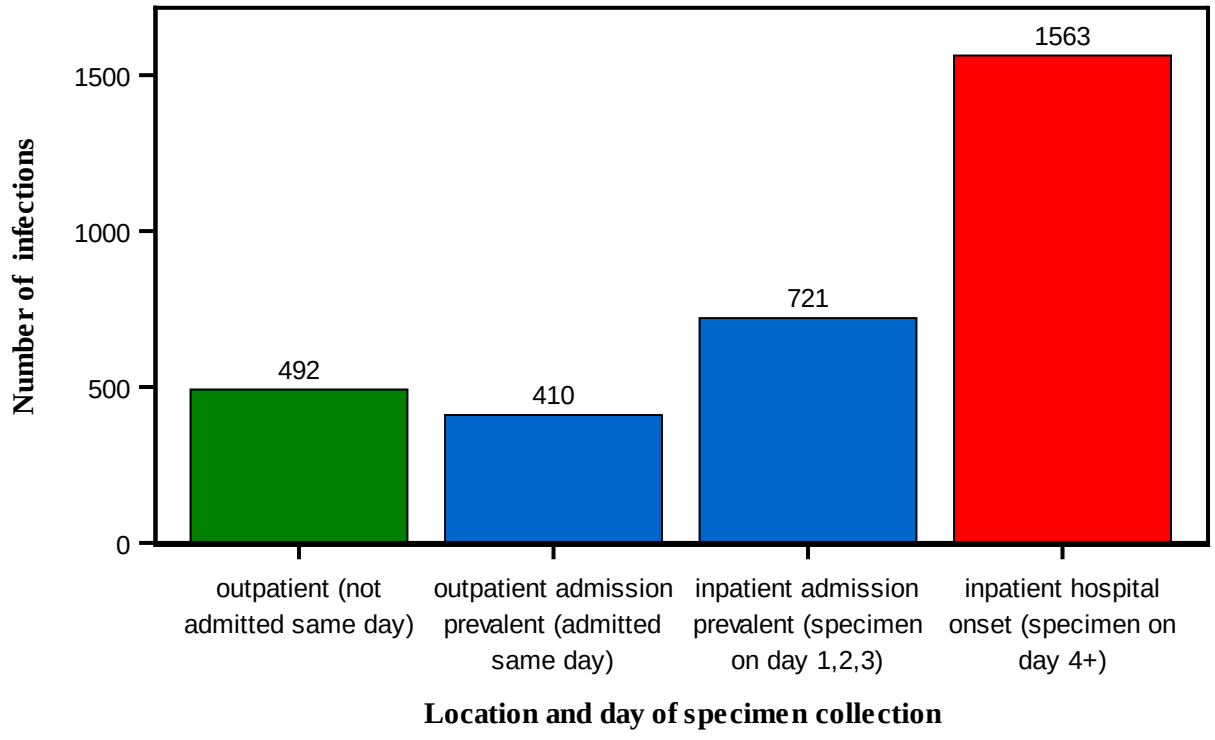
Carbapenem-resistant Enterobacteriaceae (CRE) Infections

The 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 2017, 3,186 CRE cases were reported: 15% 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, 23% 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 21).

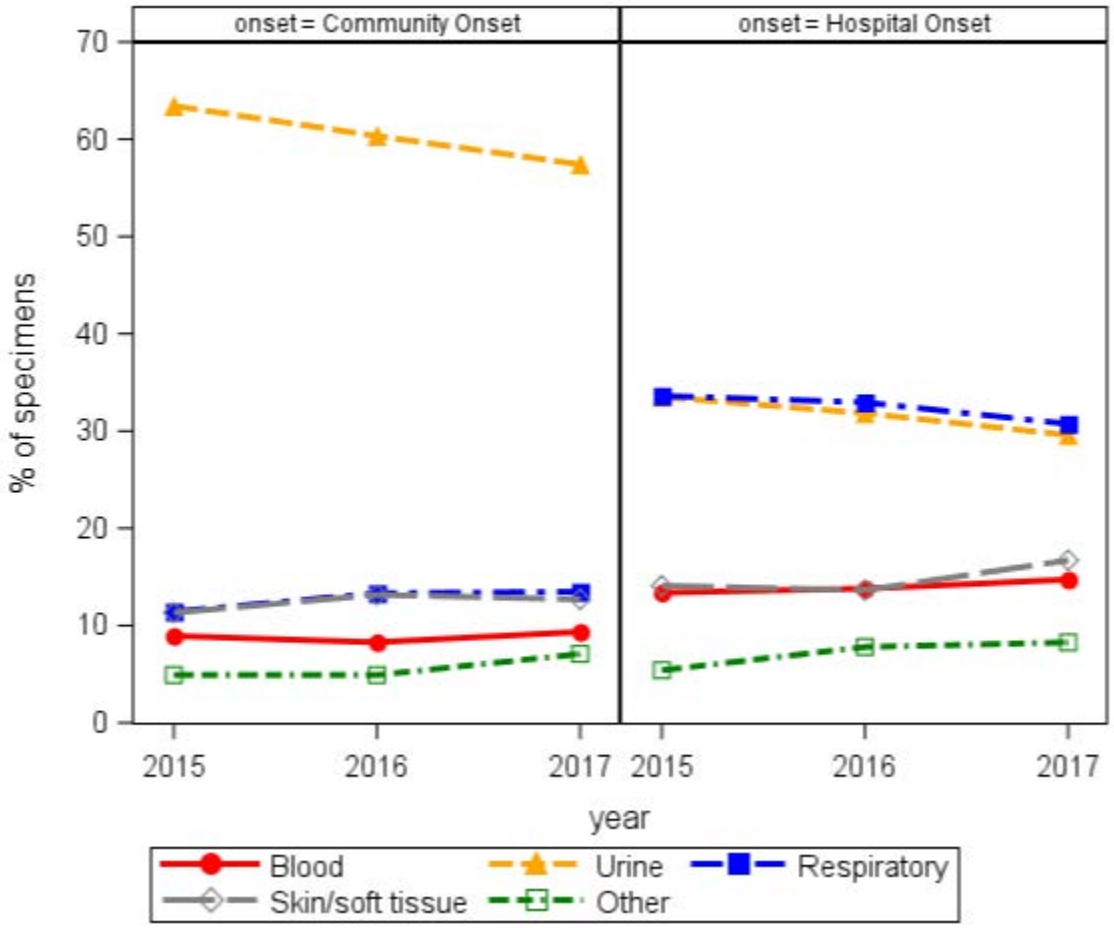
Figure 21. Carbapenem-resistant Enterobacteriaceae Infection Onset, NYS 2017



Data reported as of June 25, 2018. Excludes inpatient rehabilitation and inpatient psychiatric facilities. Specimens identified in the outpatient setting and admitted the next day are counted as outpatient.

Among community onset cases, the most common specimen site was by far the urinary tract, though the percentage of cases decreased from 63% to 57% between 2015 and 2017 (Figure 22).

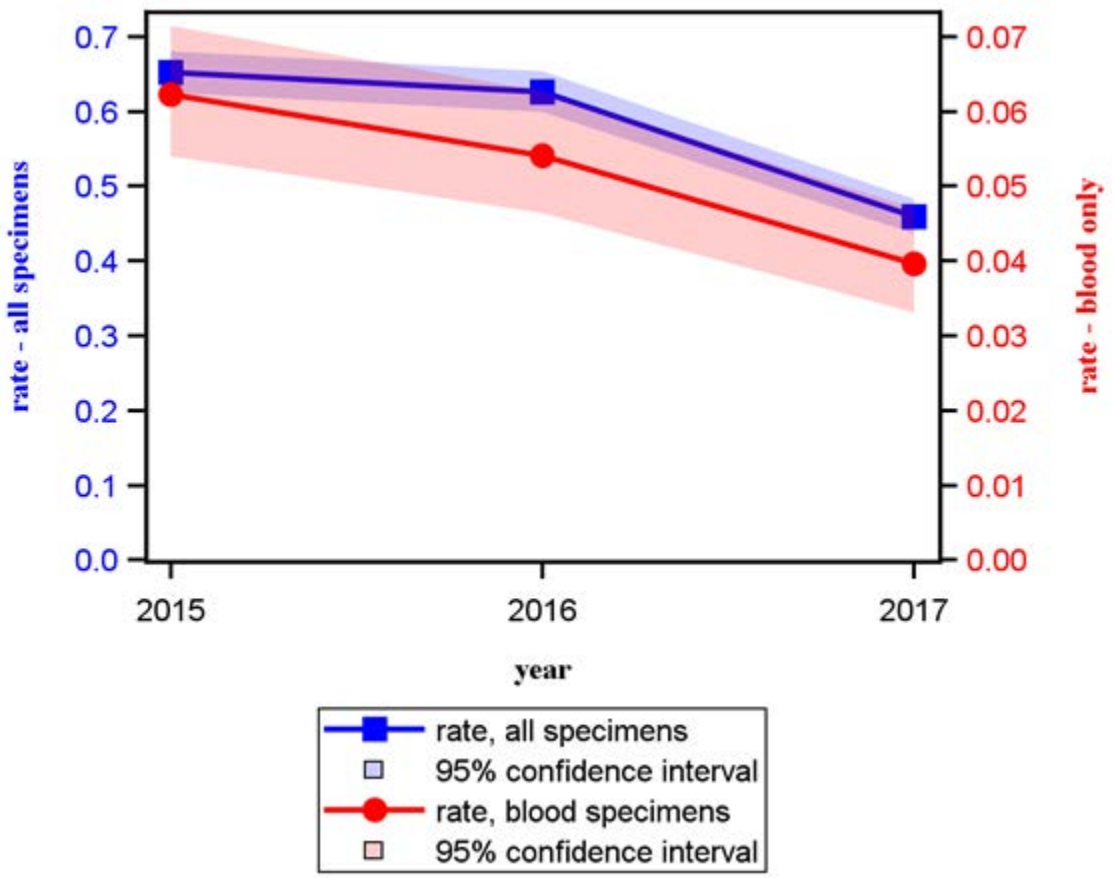
Figure 22. Carbapenem-resistant Enterobacteriaceae by specimen site, NYS 2015-2017



Data reported as of June 25, 2018.

The admission prevalence rate describes the percentage of patients admitted to hospitals with CRE. In 2017, there were 1,078 of these cases out of 2,347,628 admissions, for a rate of 0.459 infections per 1,000 admissions. The bloodstream infection (BSI) significantly decreased 36% between 2015 and 2017, and the all-specimen admission prevalence rate significantly decreased 30% between 2015 and 2017 (Figure 23). The 2017 all-specimen admission prevalence rate was 12 times higher than the BSI admission prevalence rate.

Figure 23. Facility-wide inpatient carbapenem-resistant Enterobacteriaceae admission prevalence infection rates, New York State 2015-2017

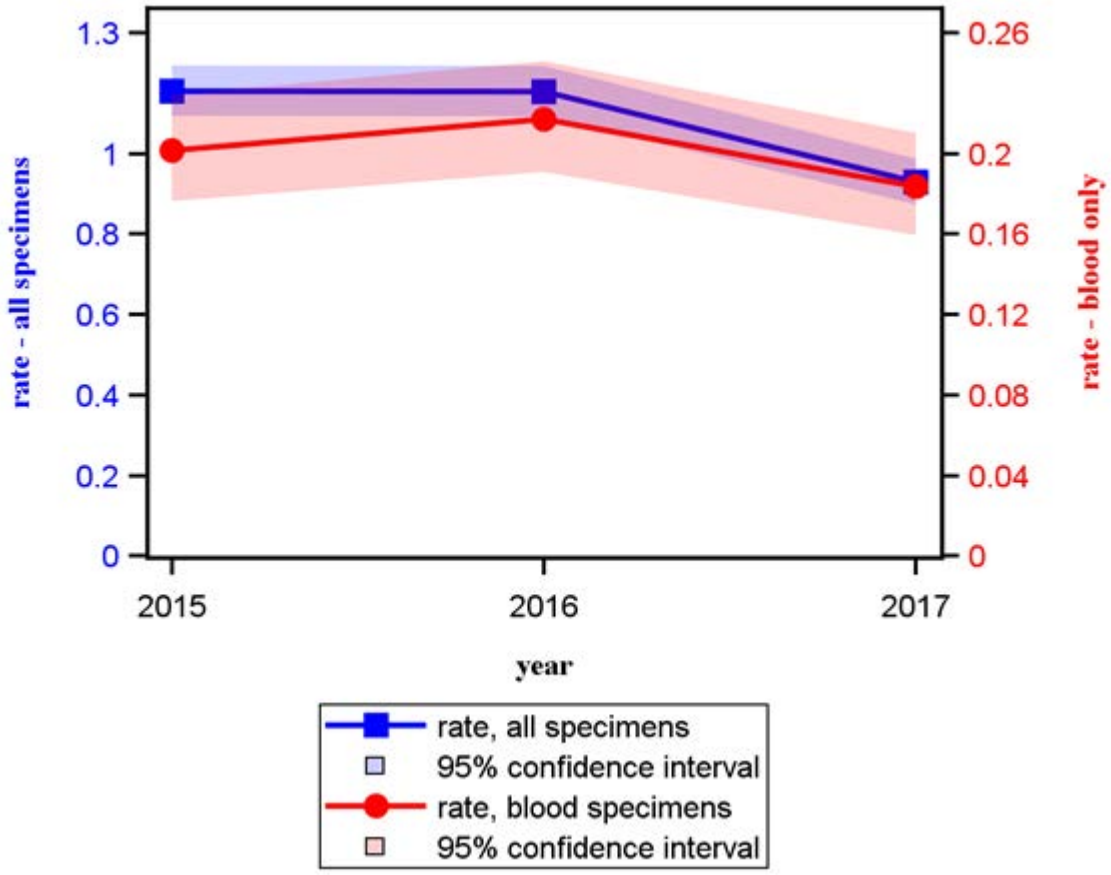


Year	# Bloodstream infections	# Total Infections	# Admissions	Bloodstream Infection Admission Prevalence Rate	All-Specimen Admission Prevalence Rate
2015	145	1,520	2,329,051	0.0623	0.652
2016	126	1,460	2,330,289	0.0541	0.627
2017	93	1,078	2,347,628	0.0396	0.459

Data reported as of June 25, 2018. Bloodstream Infection Admission Prevalence Rate = number of unique (no others in previous 14 days) blood source infections per patient per month identified ≤ 3 days after admission to the hospital / Number of patient admissions to the hospital x 1000. All Specimen Admission Prevalence Rate = number of first infections per patient per month identified ≤ 3 days after admission to the hospital / Number of patient admissions to the hospital x 1000. Includes cases identified in the emergency room if admitted the same day. Excludes inpatient rehabilitation and inpatient psychiatric locations.

The longer a person stays in the hospital, the higher the total risk of acquiring an infection in the hospital, so the incidence rates are reported using a denominator of patient days. The BSI incidence rate decreased 8% between 2015 and 2017, and the all-specimen incidence rate significantly decreased 19% between 2015 and 2017 (Figure 24). The 2017 all-specimen incidence rate was five times higher than the BSI incidence rate.

Figure 24. Facility-wide inpatient carbapenem-resistant Enterobacteriaceae infection incidence rates, New York State 2015-2017

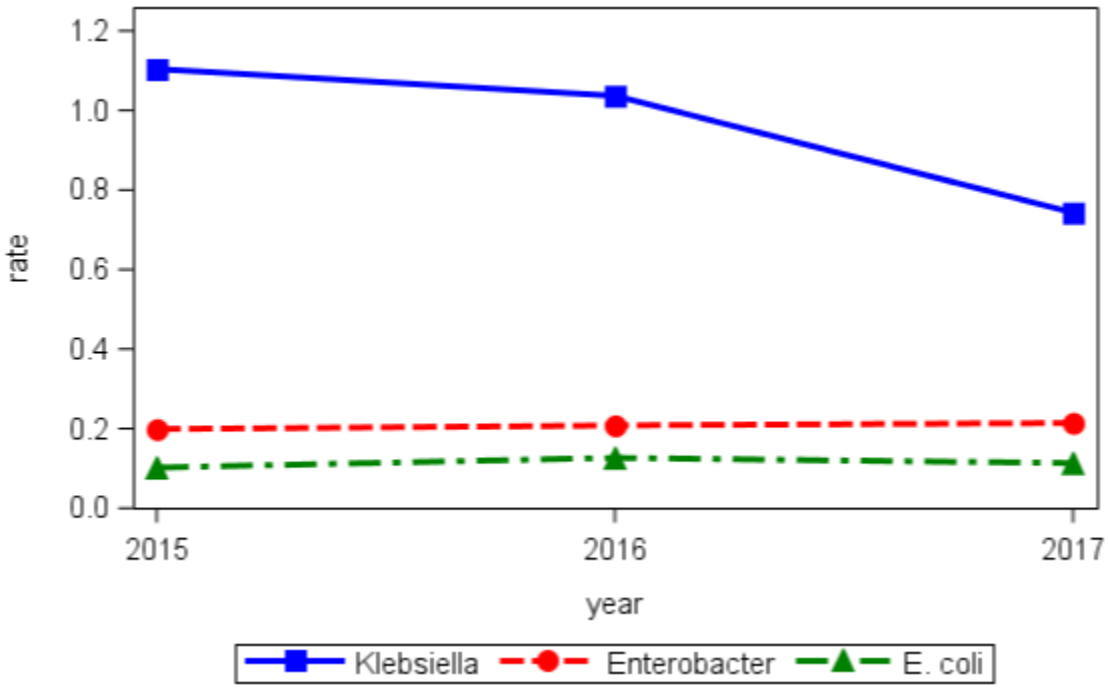


Year	# Bloodstream Infections	# Total Infections	# Patient Days	Bloodstream Infection Incidence Rate	All Specimen Infection/Colonization Incidence Rate
2015	231	1,324	11,466,593	0.201	1.15
2016	247	1,313	11,382,163	0.217	1.15
2017	208	1,054	11,333,990	0.184	0.93

Data reported as of June 25, 2018. Bloodstream Infection Incidence Rate = Number of all unique (no others in previous 14 days) blood source infections per patient per month identified > 3 days after admission to the hospital / Number of patient days x 10,000. All Specimen Infection/Colonization Incidence Rate = Number of first 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. Excludes inpatient rehabilitation and inpatient psychiatric locations.

Overall patient prevalence includes both admission prevalent and hospital onset cases. Overall patient prevalence rates by year and species are summarized in Figure 25. Between 2015 and 2017, the prevalence of *Klebsiella* significantly decreased 33%, the prevalence of *Enterobacter* spp. increased 8%, and the prevalence of *E. coli* increased 11%. A small percentage (2%) of patients harbored more than one type of organism.

Figure 25. Trends in overall patient prevalence carbapenem-resistant Enterobacteriaceae infection rates by species, NYS 2015-2017



year	*Klebsiella oxytoca and pneumoniae*	*Enterobacter* spp.	*E. coli*	Total
2015	1.104	0.199	0.102	1.405
2016	1.037	0.208	0.127	1.372
2017	0.743	0.214	0.113	1.070

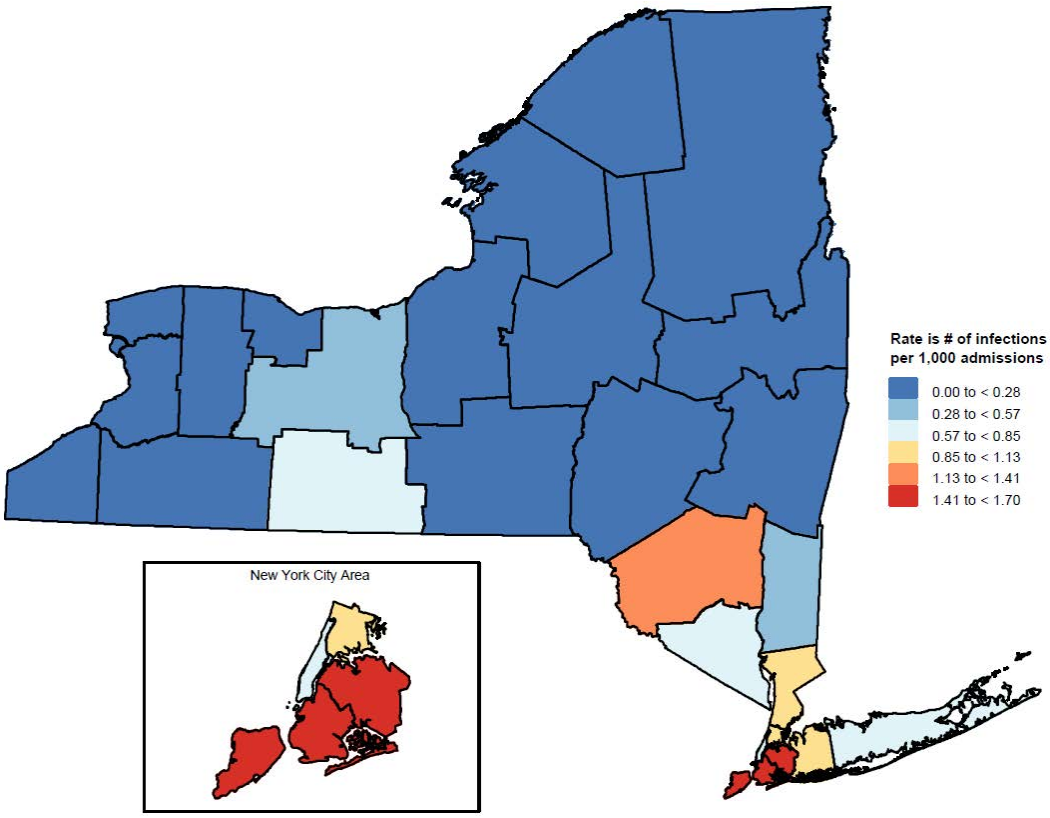
Data reported as of June 25, 2018. Inpatient rehab and pychiatric facility data excluded. Overall patient prevalence rate is the number of first LabID Events per patient per month (e.g. admission prevalent or hospital onset) / Number of patient admissions to the hospital x 1000

NYS staff contacted the IPs at hospitals with large decreases in CRE rates to obtain their informal assessment of the reasons for the declines. Responses included implementation of aggressive antimicrobial stewardship and improvements in cleaning and prevention activities in response to *Candida auris*.

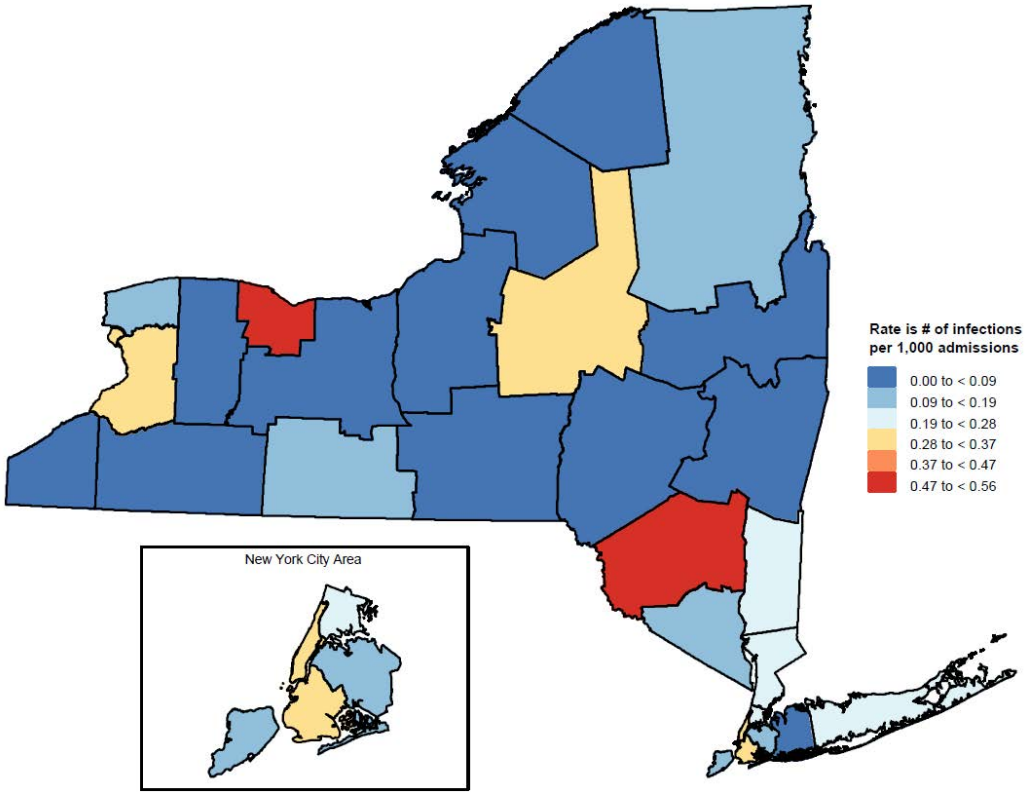
Figures 26 (a,b,c) show the FWI CRE patient prevalence rate by species and county (or merged county for those with few or no hospitals). FWI CRE-*Klebsiella* patient prevalence rates continue to be highest in the New York City area. FWI CRE-*E. coli* and CRE-*Enterobacter* rates are based on smaller numbers, and the maps show greater variability throughout the state. If the CRE-*Enterobacter* and CRE-*E. coli* maps used the same scale as the CRE-*Klebsiella* map, they would be entirely blue.

Figure 26 a-c. Facility-wide inpatient carbapenem-resistant Enterobacteriaceae patient prevalence rates, New York State 2017

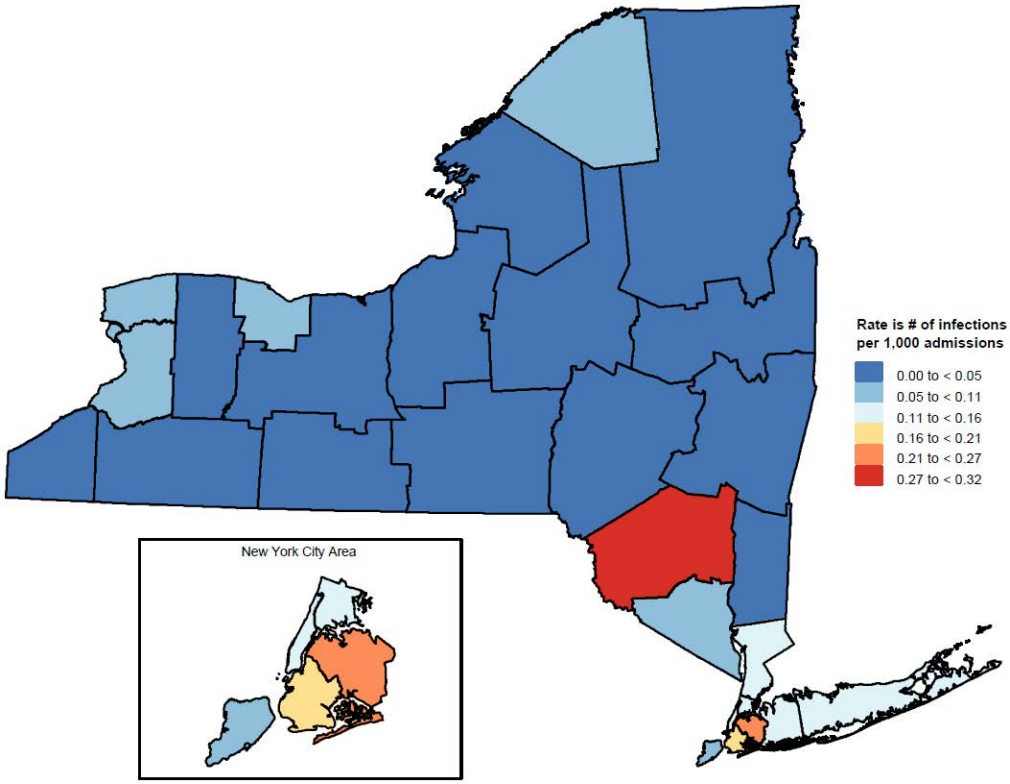
(a) CRE-*Klebsiella* overall patient prevalence rate 2017



(b) CRE-*Enterobacter* overall patient prevalence rate 2017



(c) CRE-*E. coli* overall patient prevalence rate 2017



Data reported as of June 25, 2018. Small counties have been merged.

Laboratory Testing Methods

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 2017 NHSN survey, 85% of facilities used the newer more sensitive (CLSI M22 or M23 standard) breakpoints in 2017, while 15% 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 carbapenem antibiotics), can also be used to meet the CRE LabID definition. In 2017, approximately 18% of specimens were tested for the presence of a carbapenemase. This was most commonly done using the Modified Hodge Test. Among those tested, a carbapenemase was identified 75% of the time.

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 CRE 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.

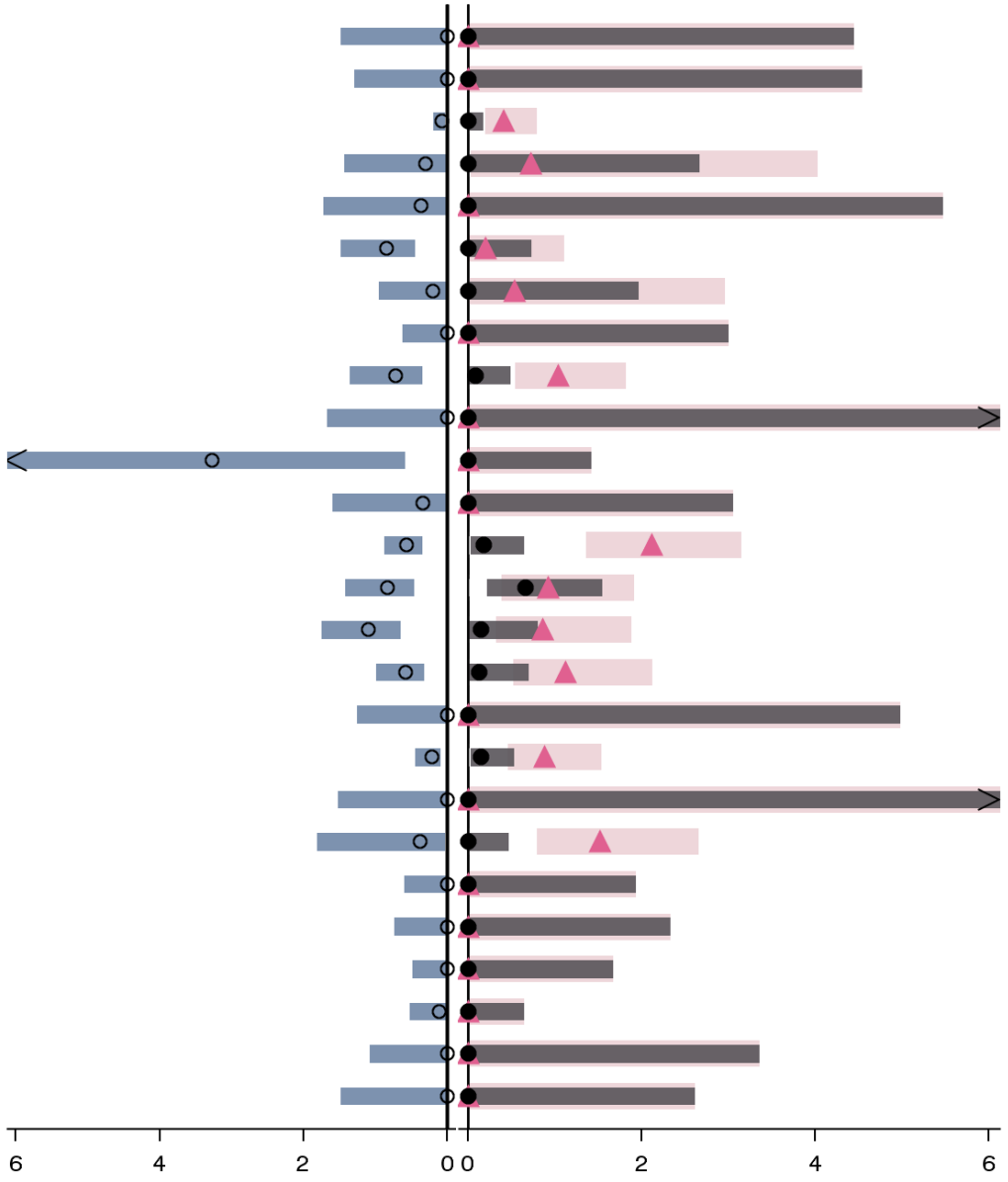
Hospitals should review their HO BSI rates in relation to their admission prevalence rates as shown in Figure 27, e.g. hospitals with high HO rates and low admission prevalence rates should examine whether they are testing patients promptly (days 1-3) and if their cases were clustered. With respect to interpreting the all-site rates, note there are variations in the types of specimens reported among hospitals, e.g. some hospitals have reported a very large proportion of urinary

tract infections/colonizations, others reported a very large proportion of skin or respiratory infections/colonizations. The hospital- and region-specific admission prevalence rate, bed size, and percent intensive care unit patient days do not strongly predict the HO BSI rate, therefore, risk-adjusted rates are not presented. 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 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 27. Hospital carbapenem-resistant Enterobacteriaceae infection rates, NYS 2017 (Page 1 of 7)

Hospital Name	# All AdmPrev	# Adms	AdmPrev Rate	HO-All Rate	HO-BSI Rate	# Patdays	# All	# BSI
AO Fox Memorial	0	2021	0.0	0.0	0.0	8311	0	0
Adirondack Medical	0	2326	0.0	0.0	0.0	8151	0	0
Albany Med Ctr	3	41886	0.1	0.4	0.0	218295	9	0
Albany Memorial	1	3330	0.3	0.7	0.0	13881	1	0
Alice Hyde Med Ctr	1	2756	0.4	0.0	0.0	6755	0	0
Arnot Ogden Med Ctr	9	10616	0.8	0.2	0.0	50897	1	0
Auburn Memorial	1	5003	0.2	0.5	0.0	18852	1	0
Bellevue Ellis	0	4844	0.0	0.0	0.0	12320	0	0
Bellevue Hospital	7	9733	0.7	1.0	0.1	115718	12	1
Bertrand Chaffee	0	1789	0.0	0.0	0.0	4359	0	0
Blythedale Childrens	2	610	3.3	0.0	0.0	26048	0	0
Bon Secours	1	2981	0.3	0.0	0.0	12136	0	0
Bronx-Lebanon	15	26602	0.6	2.1	0.2	113693	24	2
Brookdale Hospital	10	12026	0.8	0.9	0.7	75706	7	5
Brookhaven Memorial	13	11833	1.1	0.9	0.1	69644	6	1
Brooklyn Hosp Ctr	10	17193	0.6	1.1	0.1	80734	9	1
Brooks Memorial	0	2399	0.0	0.0	0.0	7423	0	0
Buffalo General	5	23882	0.2	0.9	0.1	137258	12	2
Burdett Care Center	0	1980	0.0	0.0	0.0	4311	0	0
Calvary Hospital	1	2625	0.4	1.5	0.0	79303	12	0
Canton-Potsdam	0	5076	0.0	0.0	0.0	19141	0	0
Catskill Regional	0	4054	0.0	0.0	0.0	15907	0	0
Cayuga Medical Ctr	0	6285	0.0	0.0	0.0	22157	0	0
Champlain Valley	1	9108	0.1	0.0	0.0	57493	0	0
Claxton-Hepburn	0	2790	0.0	0.0	0.0	11032	0	0
Clifton Springs	0	2022	0.0	0.0	0.0	14177	0	0



Data reported as of June 25, 2018. Facility-wide inpatient only, rehab and behavioral health units excluded

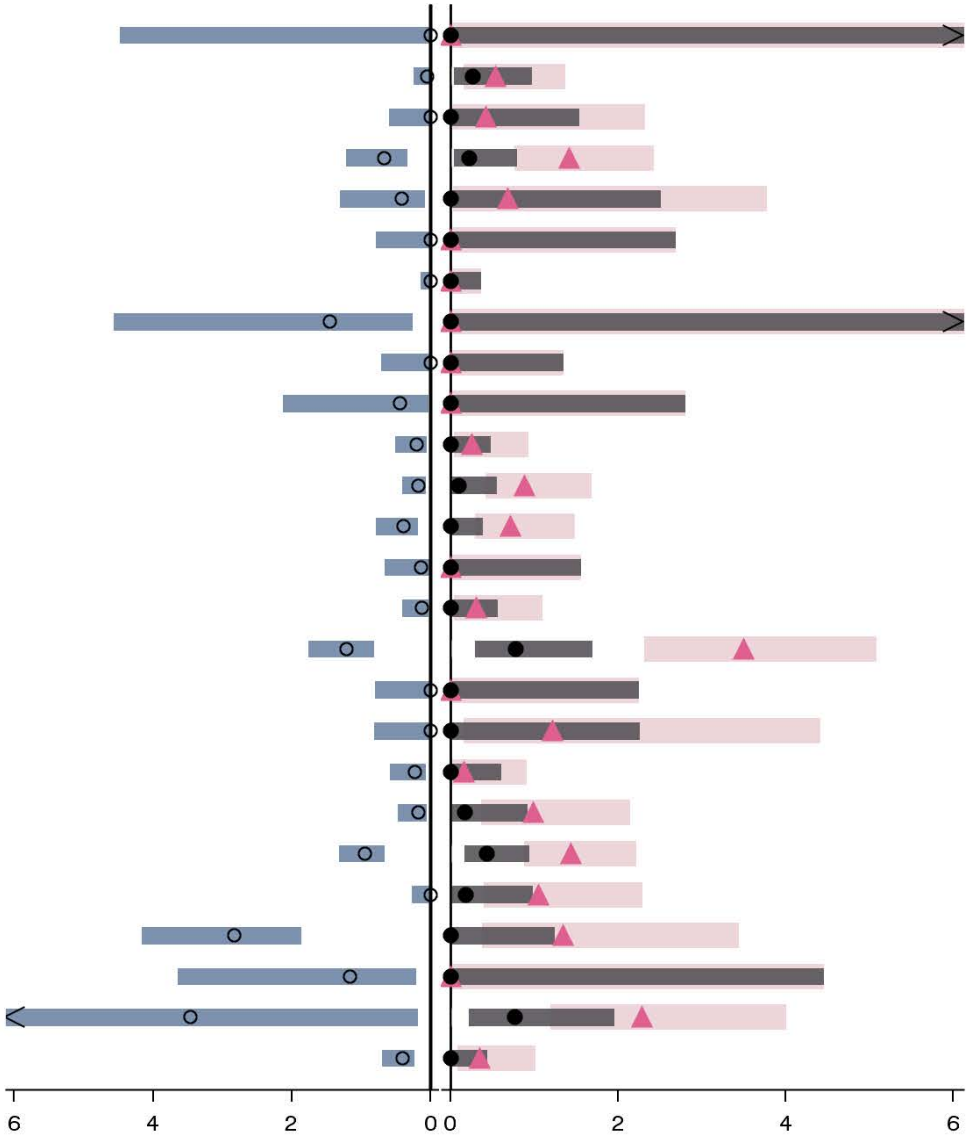
HO-All: hospital onset CRE incidence rate all sites per 10,000 patient days and 95% confidence interval (state average = 0.9)

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 = 0.5)

Figure 27. Hospital carbapenem-resistant Enterobacteriaceae infection rates, NYS 2017 (Page 2 of 7)

Hospital Name	# All AdmPrev	# Adms	AdmPrev Rate	HO-All Rate	HO-BSI Rate	# Patdays	# All	# BSI
Cobleskill Regional	0	668	0.0	0.0	0.0	4817	0	0
Cohens Childrens	1	19346	0.1	0.5	0.3	75358	4	2
Columbia Memorial	0	5046	0.0	0.4	0.0	24126	1	0
Coney Island Hosp	8	11910	0.7	1.4	0.2	91825	13	2
Corning Hospital	2	4840	0.4	0.7	0.0	14781	1	0
Cortland Reg Med	0	3797	0.0	0.0	0.0	13779	0	0
Crouse Hospital	0	21443	0.0	0.0	0.0	103033	0	0
DeGraff Memorial	2	1376	1.5	0.0	0.0	4540	0	0
East. Niag. Lockport	0	4233	0.0	0.0	0.0	27561	0	0
Eastern Long Island	1	2235	0.4	0.0	0.0	13211	0	0
Ellis Hospital	3	15161	0.2	0.3	0.0	78732	2	0
Elmhurst Hospital	4	22721	0.2	0.9	0.1	101884	9	1
Erie County Med Ctr	6	15214	0.4	0.7	0.0	97947	7	0
FF Thompson	1	7207	0.1	0.0	0.0	23887	0	0
Faxton St. Lukes	2	15640	0.1	0.3	0.0	66349	2	0
Flushing Hospital	20	16492	1.2	3.5	0.8	77350	27	6
Geneva General	0	3770	0.0	0.0	0.0	16486	0	0
Glen Cove Hospital	0	3715	0.0	1.2	0.0	16415	2	0
Glens Falls Hospital	3	13377	0.2	0.2	0.0	61913	1	0
Good Samar. Suffern	3	16666	0.2	1.0	0.2	61135	6	1
Good Samar. W Islip	26	27480	0.9	1.4	0.4	139963	20	6
Harlem Hospital	0	11016	0.0	1.0	0.2	57264	6	1
HealthAlli Broadway	19	6695	2.8	1.3	0.0	29809	4	0
HealthAlli MarysAve	2	1728	1.2	0.0	0.0	8298	0	0
Henry J. Carter	1	289	3.5	2.3	0.8	52510	12	4
Highland Hospital	10	24453	0.4	0.3	0.0	86983	3	0



Data reported as of June 25, 2018. Facility-wide inpatient only, rehab and behavioral health units excluded

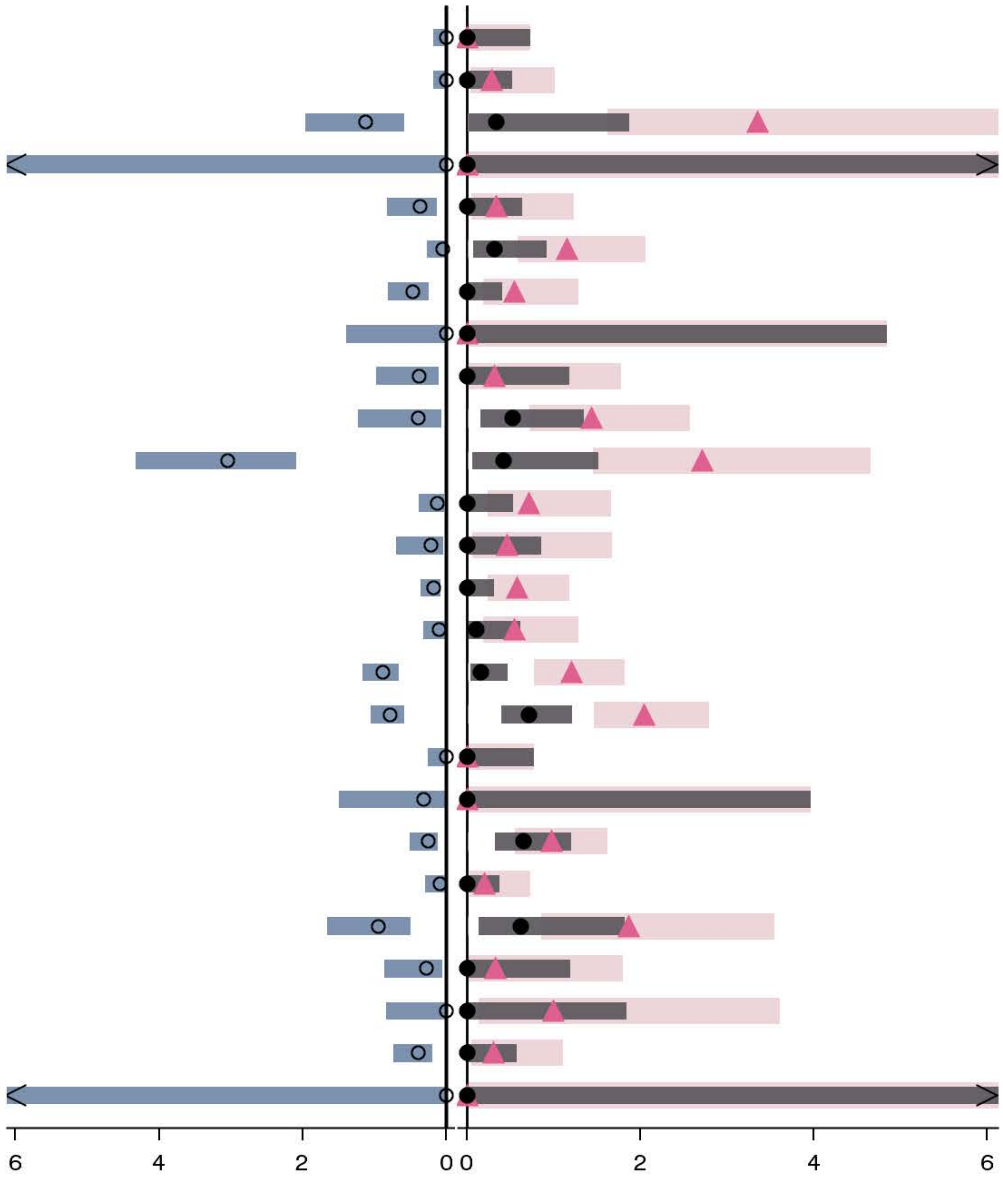
HO-All: hospital onset CRE incidence rate all sites per 10,000 patient days and 95% confidence interval (state average = 0.9)

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 = 0.5)

Figure 27. Hospital carbapenem-resistant Enterobacteriaceae infection rates, NYS 2017 (Page 3 of 7)

Hospital Name	# All AdmPrev	# Adms	AdmPrev Rate	HO-All Rate	HO-BSI Rate	# Patdays	# All	# BSI
Hosp for Spec Surg	0	16561	0.0	0.0	0.0	51051	0	0
Huntington Hospital	0	17097	0.0	0.3	0.0	72065	2	0
Interfaith Med Ctr	9	7992	1.1	3.4	0.3	29832	10	1
Ira Davenport	0	331	0.0	0.0	0.0	1072	0	0
JT Mather Hospital	4	11076	0.4	0.3	0.0	58863	2	0
Jacobi Med Ctr	1	17930	0.1	1.1	0.3	95944	11	3
Jamaica Hospital	9	19352	0.5	0.5	0.0	91765	5	0
Jones Memorial	0	2143	0.0	0.0	0.0	7631	0	0
Kenmore Mercy	3	7958	0.4	0.3	0.0	31597	1	0
Kings County Hosp	2	5125	0.4	1.4	0.5	76671	11	4
Kingsbrook Jewish MC	23	7534	3.1	2.7	0.4	47886	13	2
LIJ at Forest Hills	2	16627	0.1	0.7	0.0	70747	5	0
LIJ at Valley Stream	2	9054	0.2	0.5	0.0	43525	2	0
Lenox Hill Hospital	6	33188	0.2	0.6	0.0	122652	7	0
Lincoln Med Ctr	2	19618	0.1	0.5	0.1	91352	5	1
Long Isl Jewish(LIJ)	37	41626	0.9	1.2	0.2	190701	23	3
Maimonides Med Ctr	34	43243	0.8	2.0	0.7	195956	40	14
Mary Imogene Bassett	0	12059	0.0	0.0	0.0	48240	0	0
Massena Memorial	1	3173	0.3	0.0	0.0	9329	0	0
Memor SloanKettering	6	23516	0.3	1.0	0.6	153918	15	10
Mercy Hosp Buffalo	2	21528	0.1	0.2	0.0	99724	2	0
Mercy Med Ctr	9	9446	1.0	1.9	0.6	48321	9	3
Metropolitan Hosp	2	7343	0.3	0.3	0.0	31210	1	0
MidHudson Reg of WMC	0	3593	0.0	1.0	0.0	20098	2	0
Millard Fill. Suburb	7	17838	0.4	0.3	0.0	65641	2	0
Monroe Community	0	3	0.0	0.0	0.0	8	0	0



Data reported as of June 25, 2018. Facility-wide inpatient only, rehab and behavioral health units excluded

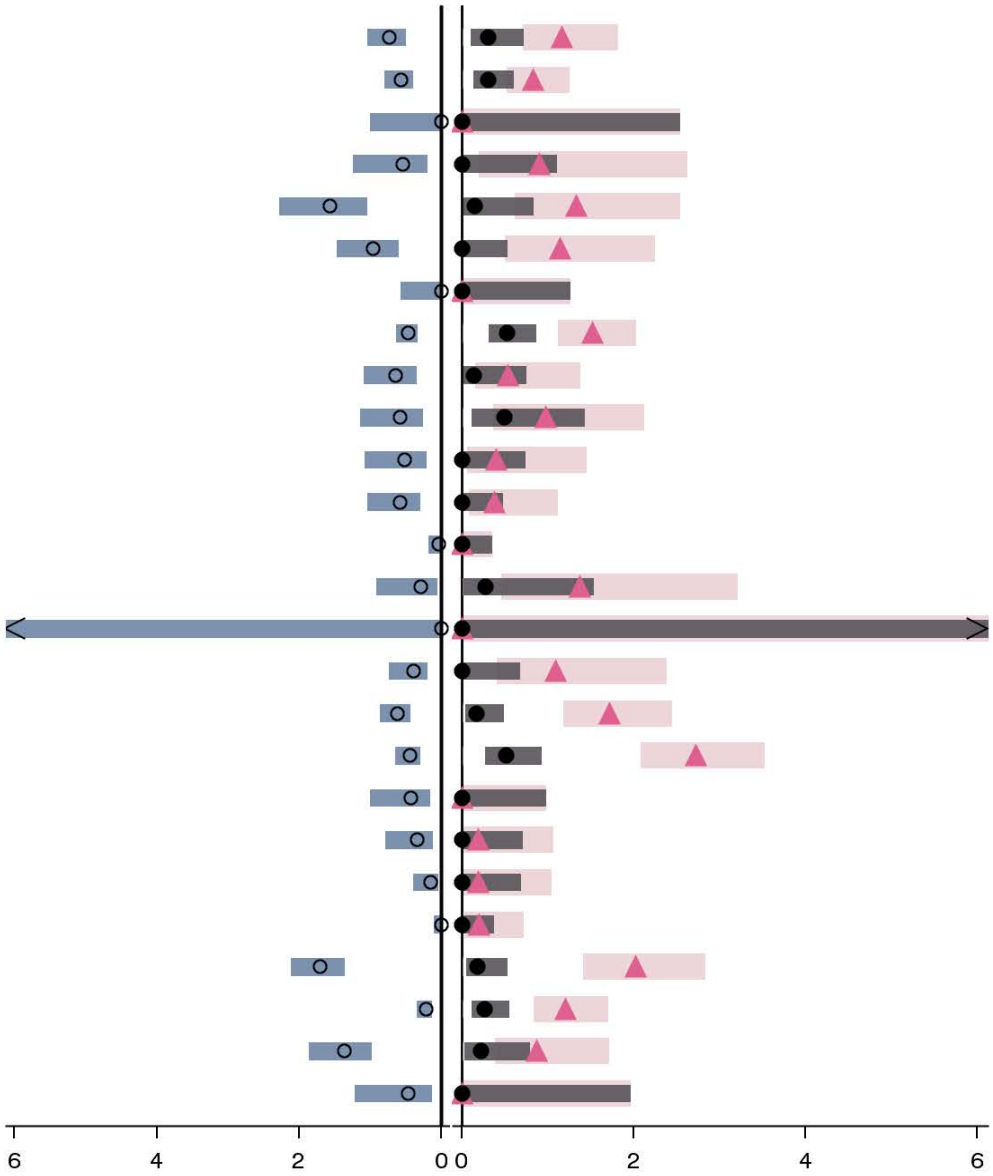
HO-All: hospital onset CRE incidence rate all sites per 10,000 patient days and 95% confidence interval (state average = 0.9)

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 = 0.5)

Figure 27. Hospital carbapenem-resistant Enterobacteriaceae infection rates, NYS 2017 (Page 4 of 7)

Hospital Name	# All AdmPrev	# Adms	AdmPrev Rate	HO-All Rate	HO-BSI Rate	# Patdays	# All	# BSI
Montefiore-Einstein	22	30246	0.7	1.2	0.3	163460	19	5
Montefiore-Moses	24	42441	0.6	0.8	0.3	266459	22	8
Montefiore-Mt Vernon	0	2989	0.0	0.0	0.0	14597	0	0
Montefiore-NewRochl	4	7418	0.5	0.9	0.0	33461	3	0
Montefiore-Nyack	20	12744	1.6	1.3	0.1	67524	9	1
Montefiore-Wakefield	15	15690	1.0	1.1	0.0	70292	8	0
Mount St. Marys	0	5265	0.0	0.0	0.0	29447	0	0
Mt Sinai	30	64485	0.5	1.5	0.5	303717	46	16
Mt Sinai Beth Israel	10	15632	0.6	0.5	0.1	74952	4	1
Mt Sinai Brooklyn	6	10361	0.6	1.0	0.5	61641	6	3
Mt Sinai Queens	5	9762	0.5	0.4	0.0	50177	2	0
Mt Sinai St Lukes	8	13853	0.6	0.4	0.0	78818	3	0
Mt Sinai West	1	27364	0.0	0.0	0.0	106067	0	0
NY Community Hosp	2	6918	0.3	1.4	0.3	36467	5	1
NY Eye&Ear Mt Sinai	0	304	0.0	0.0	0.0	675	0	0
NYP-Allen	7	17905	0.4	1.1	0.0	54929	6	0
NYP-Brklyn Methodist	25	40580	0.6	1.7	0.2	180206	31	3
NYP-Columbia	20	45466	0.4	2.7	0.5	212965	58	11
NYP-Hudson Valley	4	9172	0.4	0.0	0.0	38043	0	0
NYP-Lawrence	4	11720	0.3	0.2	0.0	52916	1	0
NYP-Lower Manhattan	3	19808	0.2	0.2	0.0	54039	1	0
NYP-Morgan Stanley	0	29852	0.0	0.2	0.0	100795	2	0
NYP-Queens	59	34625	1.7	2.0	0.2	168071	34	3
NYP-Weill Cornell	13	59868	0.2	1.2	0.3	266201	32	7
NYU Langone Brooklyn	29	21277	1.4	0.9	0.2	92553	8	2
NYU Orthopedic Hosp	3	6409	0.5	0.0	0.0	18807	0	0



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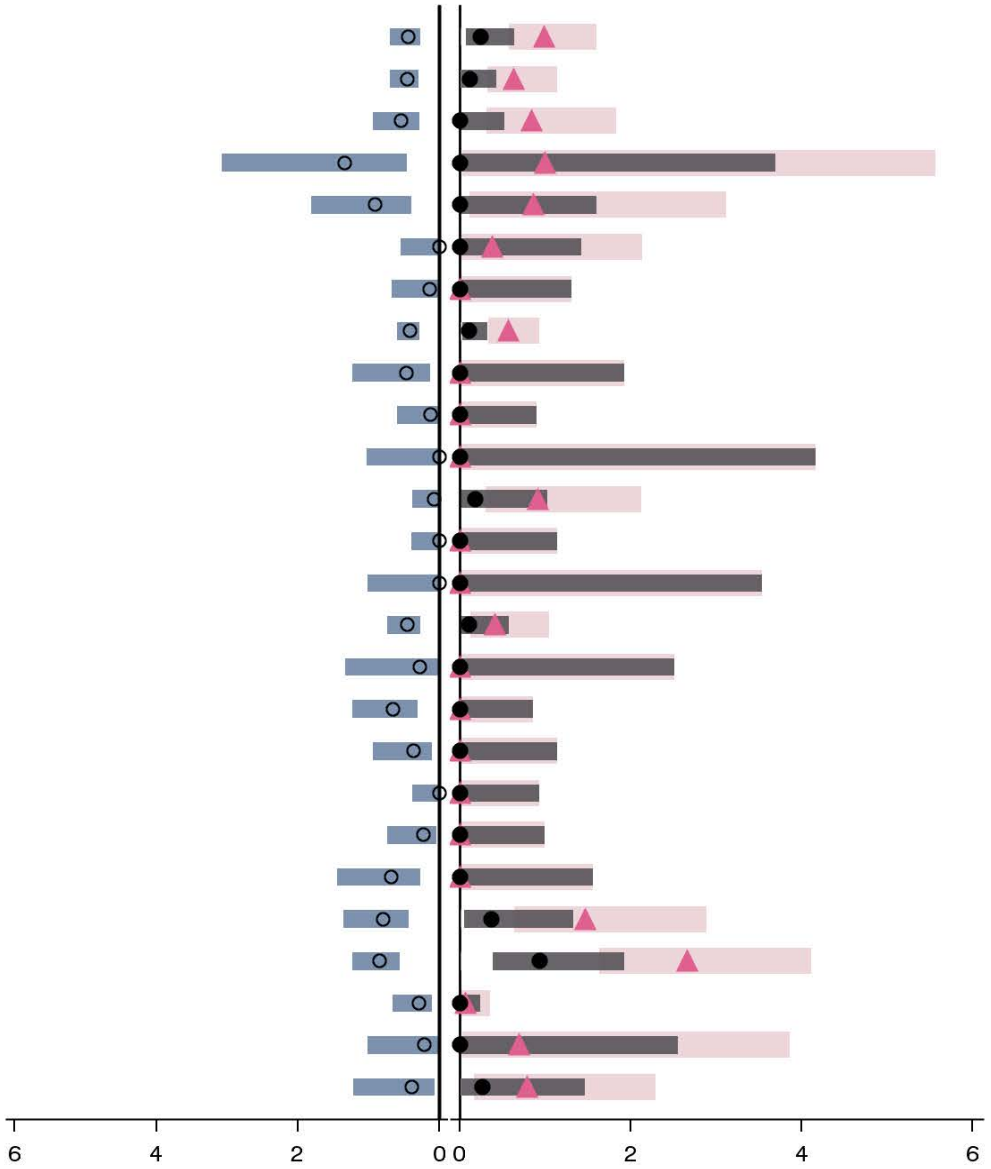
HO-BSI: hospital onset CRE blood incidence rate per 10,000 patient days and 95% confidence interval (state average = 0.2)

All-Admprev: all body site CRE admissions prevalence rate per 1,000 admissions and 95% confidence interval (state average = 0.5)

Figure 27. Hospital carbapenem-resistant Enterobacteriaceae infection rates, NYS 2017 (Page 5 of 7)

Hospital Name	# All AdmPrev	# Adms	AdmPrev Rate	HO-All Rate	HO-BSI Rate	# Patdays	# All	# BSI
NYU Tisch	14	31733	0.4	1.0	0.2	162845	16	4
NYU Winthrop	17	36909	0.5	0.6	0.1	173832	11	2
Nassau University	9	16692	0.5	0.8	0.0	71883	6	0
Nathan Littauer	4	2977	1.3	1.0	0.0	10024	1	0
Newark Wayne	6	6561	0.9	0.9	0.0	23252	2	0
Niagara Falls	0	5546	0.0	0.4	0.0	26189	1	0
North Central Bronx	1	7032	0.1	0.0	0.0	28427	0	0
North Shore	22	52764	0.4	0.6	0.1	283263	16	3
Northern Dutchess	3	6349	0.5	0.0	0.0	19244	0	0
Northern Westchester	1	8024	0.1	0.0	0.0	41295	0	0
Noyes Memorial	0	2906	0.0	0.0	0.0	8877	0	0
Oishei Childrens	1	12526	0.1	0.9	0.2	55079	5	1
Olean General	0	7738	0.0	0.0	0.0	32686	0	0
Oneida Healthcare	0	2972	0.0	0.0	0.0	10452	0	0
Orange Regional	12	26303	0.5	0.4	0.1	98656	4	1
Oswego Hospital	1	3580	0.3	0.0	0.0	14726	0	0
Our Lady of Lourdes	7	10744	0.7	0.0	0.0	43381	0	0
Peconic Bay Medical	3	8274	0.4	0.0	0.0	32659	0	0
Phelps Memorial	0	7850	0.0	0.0	0.0	40132	0	0
Plainview Hospital	2	8570	0.2	0.0	0.0	37604	0	0
Putnam Hospital	5	7312	0.7	0.0	0.0	23835	0	0
Queens Hospital	10	12565	0.8	1.5	0.4	54799	8	2
Richmond Univ MC	20	23672	0.8	2.7	0.9	75243	20	7
Rochester General	4	13970	0.3	0.1	0.0	162463	1	0
Rome Memorial	1	4715	0.2	0.7	0.0	14484	1	0
Roswell Park	2	5158	0.4	0.8	0.3	38357	3	1



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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 = 0.5)

Figure 27. Hospital carbapenem-resistant Enterobacteriaceae infection rates, NYS 2017 (Page 6 of 7)

Hospital Name	# All AdmPrev	# Adms	AdmPrev Rate	HO-All Rate	HO-BSI Rate	# Patdays	# All	# BSI
SUNY Downstate MedCr	10	11763	0.9	1.2	0.3	75157	9	2
Samaritan- Troy	4	11872	0.3	0.0	0.0	39748	0	0
Samaritan- Watertown	0	9092	0.0	0.0	0.0	42157	0	0
Saratoga Hospital	0	13290	0.0	0.2	0.0	53148	1	0
Sisters of Charity	1	15011	0.1	0.3	0.0	67775	2	0
Sisters- St Joseph	0	4308	0.0	0.5	0.0	20704	1	0
South Nassau Comm.	29	20774	1.4	2.0	0.1	101746	20	1
Southampton	0	5136	0.0	0.6	0.6	17779	1	1
Southside	7	23386	0.3	0.4	0.1	100262	4	1
St Anthony	0	2483	0.0	0.0	0.0	8618	0	0
St Barnabas	7	13897	0.5	0.8	0.0	59486	5	0
St Catherine Siena	4	10061	0.4	1.0	0.0	49053	5	0
St Charles Hospital	5	10068	0.5	0.8	0.2	51156	4	1
St Elizabeth Medical	4	8641	0.5	1.1	0.0	45732	5	0
St Francis- Roslyn	5	16387	0.3	0.9	0.4	101246	9	4
St James Mercy	0	657	0.0	0.0	0.0	2724	0	0
St Johns Dobbs Ferry	0	1241	0.0	0.0	0.0	3003	0	0
St Johns Episcopal	30	9711	3.1	5.9	0.8	47804	28	4
St Johns Riverside	10	11206	0.9	1.4	0.4	48826	7	2
St Joseph- Bethpage	9	6205	1.5	3.1	0.3	32093	10	1
St Josephs- Elmira	0	862	0.0	0.0	0.0	7576	0	0
St Josephs- Syracuse	2	33358	0.1	0.2	0.1	127529	2	1
St Josephs- Yonkers	3	3344	0.9	0.0	0.0	18053	0	0
St Lukes Cornwall	1	10506	0.1	0.0	0.0	47621	0	0
St Marys Amsterdam	0	5873	0.0	0.0	0.0	27836	0	0
St Peters Hospital	1	29563	0.0	0.0	0.0	126382	0	0

Data reported as of June 25, 2018. Facility-wide inpatient only, rehab and behavioral health units excluded

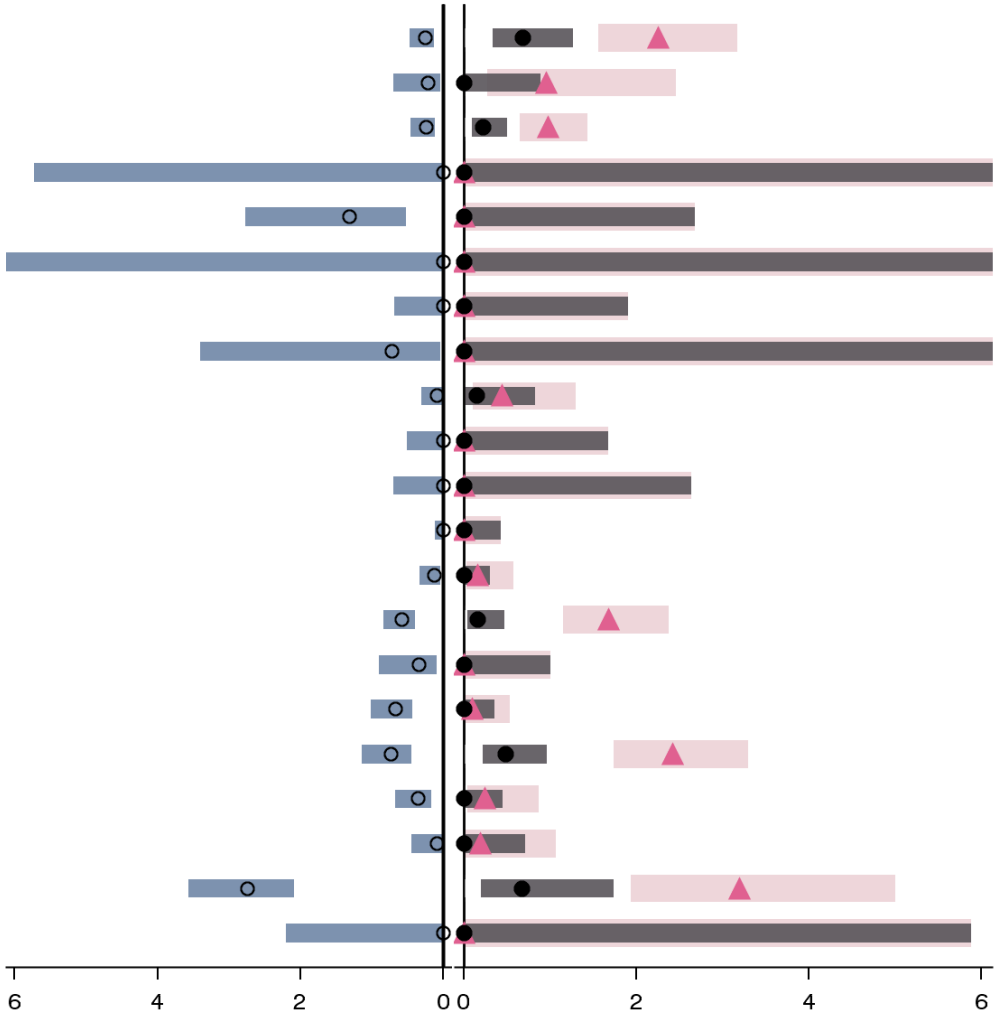
HO-All: hospital onset CRE incidence rate all sites per 10,000 patient days and 95% confidence interval (state average = 0.9)

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 = 0.5)

Figure 27. Hospital carbapenem-resistant Enterobacteriaceae infection rates, NYS 2017 (Page 7 of 7)

Hospital Name	# All AdmPrev	# Adms	AdmPrev Rate	HO-All Rate	HO-BSI Rate	# Patdays	# All	# BSI
Staten Island U N	8	31054	0.3	2.3	0.7	146504	33	10
Staten Island U S	2	9053	0.2	1.0	0.0	41801	4	0
Strong Memorial	7	28635	0.2	1.0	0.2	266960	26	6
Sunnyview Rehab Hosp	0	522	0.0	0.0	0.0	4468	0	0
Syosset Hospital	5	3794	1.3	0.0	0.0	13813	0	0
TLC Lake Shore	0	442	0.0	0.0	0.0	1532	0	0
UHS Binghamton	0	4362	0.0	0.0	0.0	19433	0	0
UHS Chenango Memor	1	1394	0.7	0.0	0.0	4262	0	0
UHS Wilson	2	21126	0.1	0.4	0.1	68027	3	1
UPMC Chautauqua WCA	0	5916	0.0	0.0	0.0	22188	0	0
United Memorial	0	4328	0.0	0.0	0.0	14052	0	0
Unity Hosp Rochester	0	26118	0.0	0.0	0.0	87398	0	0
Univ Hosp SUNY Upst	3	23260	0.1	0.2	0.0	127691	2	0
Univ Hosp StonyBrook	21	36381	0.6	1.7	0.2	191077	32	3
Upst. Community Gen	3	8656	0.3	0.0	0.0	36970	0	0
Vassar Brothers	17	25295	0.7	0.1	0.0	106167	1	0
Westchester Medical	14	19181	0.7	2.4	0.5	165635	40	8
White Plains Hosp	7	19679	0.4	0.2	0.0	84021	2	0
Woodhull Med Ctr	1	10623	0.1	0.2	0.0	52618	1	0
Wyckoff Heights	41	14919	2.7	3.2	0.7	59450	19	4
Wyoming County Comm.	0	1357	0.0	0.0	0.0	6286	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 = 0.5)

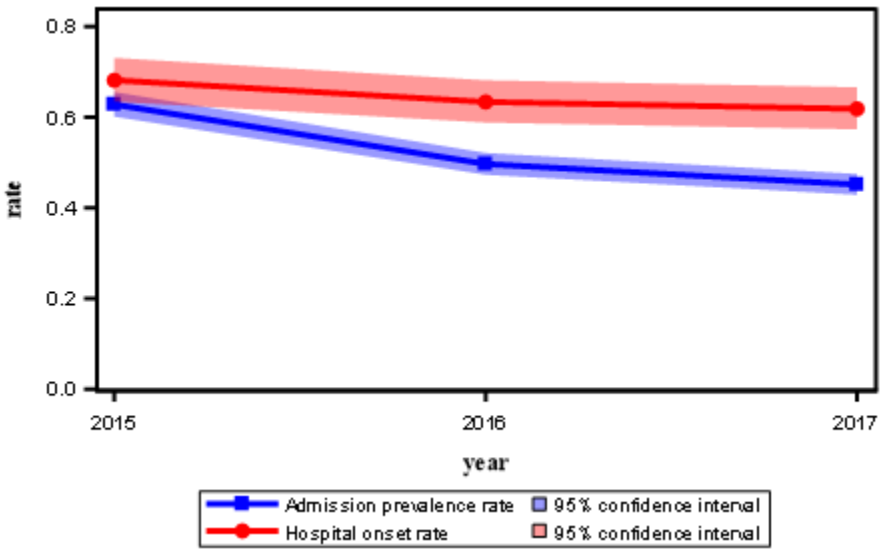
Other laboratory-identified MDROs

Methicillin-resistant *Staphylococcus aureus* (MRSA) bloodstream infections

Staphylococcus aureus is a common type of bacteria found on the skin or in the nose of many healthy individuals. When *Staphylococcus aureus* is resistant to the antibiotics oxacillin, cefoxitin, or methicillin, it is called MRSA. In 2017, 175 hospitals reported MRSA BSIs for participation in CMS incentive programs. MRSA is not a NYSDOH indicator. NYSDOH does not audit the data, and the DUA specifies that MRSA rates cannot be published by hospital.

Between 2015 and 2017, the number of MRSA BSIs identified in the ED increased 28%, and the number of MRSA BSIs identified in the inpatient area on the first three days of hospitalization decreased 28%. The hospital onset MRSA rate decreased 9% between 2015 and 2017 (Figure 28).

Figure 28. MRSA bloodstream infections, New York State 2015-2017

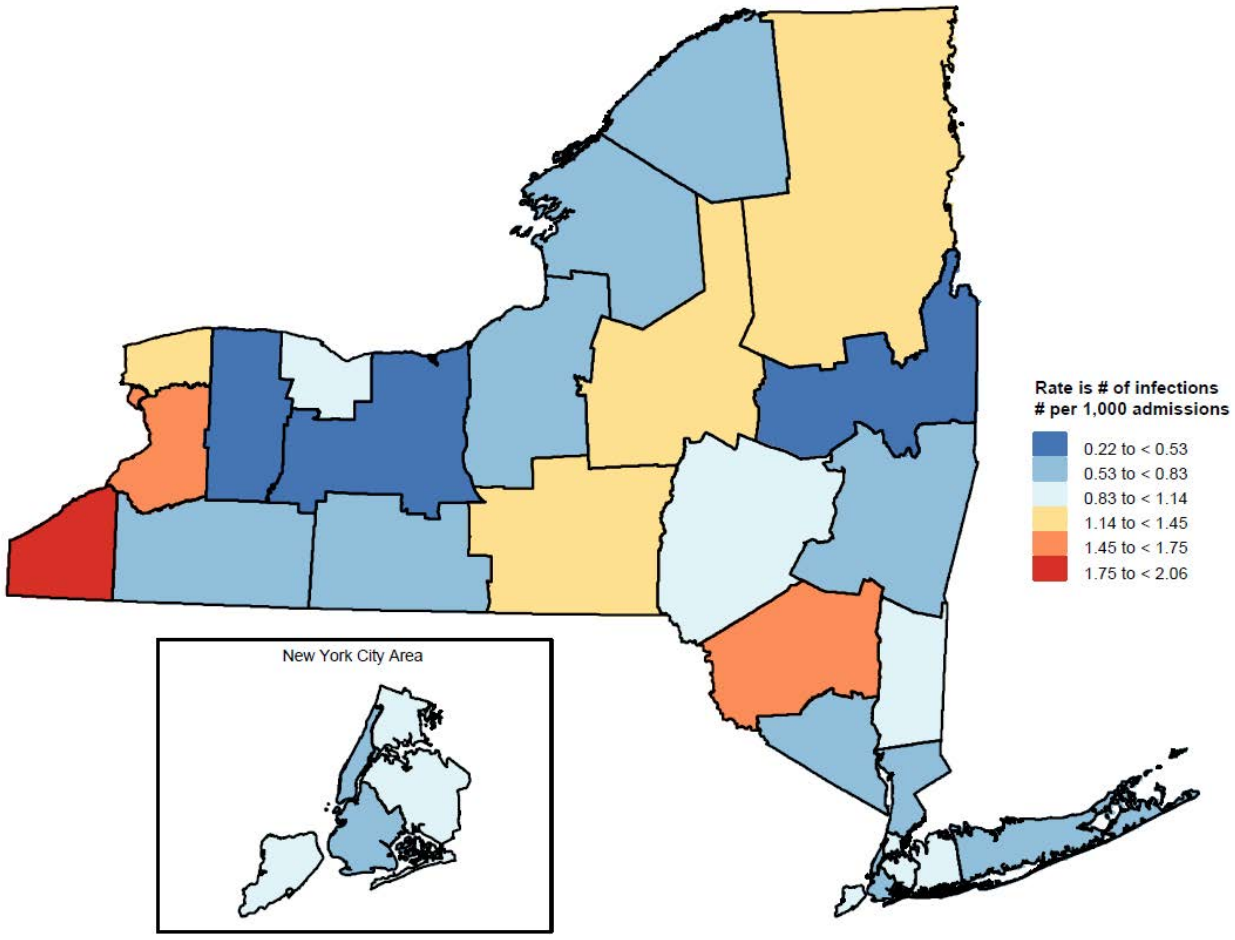


Year	# Hosp	# Emergency Dept. Infections	# Admission Prevalent Infections	# Admissions	Admission Prevalence Rate (per 1,000 admissions)	# Hospital Onset Infections	# Patient Days	Hospital Onset Incidence Rate (per 10,000 patient days)
2015	173	1,464	1,459	2,324,580	0.628	777	11,407,419	0.681
2016	176	1,905	1,157	2,330,778	0.496	720	11,369,221	0.633
2017	175	2,057	1,057	2,342,943	0.451	694	11,228,920	0.618

Facility-wide inpatient data reported as of May 31, 2018.

Figure 29 shows the FWI MRSA patient prevalence rate by county (or merged county for those with few or no hospitals). MRSA is more prevalent upstate than downstate, and is more variable than CDI (MRSA map ranged 9-fold (.22 to 2.06); CDI map ranged 3-fold (0.44 to 1.44)).

Figure 29. Facility-wide inpatient MRSA bloodstream infection patient prevalence rates, New York State 2017



Facility-wide inpatient data reported as of May 31, 2018.

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 20 hospitals (12%) in NYS (13 in NYC, 7 Upstate/Long Island) voluntarily performed LabID VRE surveillance using NHSN in 2017. The majority (54%) of the cases were urinary tract infections, while 22% were skin/soft tissue infections, and 13% were bloodstream infections. A total of 28 incident hospital onset BSIs were reported in the inpatient sample, for a HO BSI incidence rate of 0.33 per 10,000 patient days (Table 17). Extrapolating this small sample by region we would have expected a total of approximately 324 HO VRE BSIs if all hospitals had reported. The small number of hospitals that voluntarily report may not be representative of all NYS hospitals. VRE is not a NYSDOH indicator. NYSDOH does not audit the data and the DUA specifies that VRE rates cannot be published by hospital.

Table 17. Vancomycin-resistant Enterococci bloodstream infections, New York State 2015-2017

Year	# Hosp	# Admission Prevalent Bloodstream Infections	# Admissions	Admission Prevalence BSI Rate (per 1,000 admissions)	# Hospital Onset Bloodstream Infections	# Patient Days	Hospital Onset Incidence Rate (per 10,000 patient days)
2015	24	29	242,227	0.120	29	1,131,502	0.256
2016	23	19	221,471	0.086	37	1,001,207	0.370
2017	20	9	191,952	0.047	28	837,594	0.334

Facility-wide inpatient data reported as of May 31, 2018. Excludes cases identified in the emergency department.

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 24 hospitals (14%) in NYS (15 in NYC, 9 Upstate/Long Island) voluntarily performed LabID MDR-Acinetobacter surveillance using NHSN in 2017. The majority (56%) of the cases were respiratory tract infections, while 23% were skin/soft tissue infections, 12% were urinary tract infections, and 5% were bloodstream infections. A total of 7 incident BSIs were reported in the sample, for a HO BSI incidence rate of 0.08 per 10,000 patient days (Table 18). Extrapolating this small sample by region, we would have expected a total of approximately 65 hospital onset MDR-Acinetobacter BSIs if all hospitals had reported. The small number of hospitals that voluntarily report may not be representative of all NYS hospitals. MDR-

Acinetobacter is not a NYSDOH indicator. NYSDOH does not audit the data and the DUA specifies that MDR-Acinetobacter rates cannot be published by hospital.

Table 18. Multi-drug resistant Acinetobacter bloodstream infections, New York State 2015-2017

Year	# Hosp	# Admission Prevalent Bloodstream Infections	# Admissions	Admission Prevalence BSI Rate (per 1000 admissions)	# Hospital Onset Bloodstream Infections	# Patient Days	Hospital Onset BSI Incidence Rate (per 10,000 patient days)
2015	30	4	257,173	0.016	21	1,146,300	0.183
2016	25	2	243,511	0.008	15	1,090,203	0.138
2017	24	1	213,688	0.005	7	939,482	0.075

Facility-wide inpatient data reported as of May 31,2018. Excludes cases identified in the emergency department.

Candida auris infections

Candida auris (*C. auris*) is a globally emerging, multidrug-resistant yeast that has caused healthcare-associated outbreaks of invasive infections with high mortality. CDC issued a clinical alert to US healthcare facilities in June 2016 requesting notification of *C. auris* cases. Following the CDC alert, NYSDOH issued advisories, presented webinars, and provided other communications to relay information about *C auris* identification, prevention, and control to NYS healthcare facilities, clinicians, and laboratories.

Epidemiologic and laboratory evidence continues to show that multidrug-resistant *C. auris* has likely been transmitted within healthcare facilities in New York City/Metropolitan-area Region of NYS. In over two years of investigation, case counts have increased, and the New York City/Metropolitan-area region is one of the areas in the United States where the most *C. auris* cases have been detected; *C. auris* may already be endemic in healthcare facilities in some of the most impacted localities. Transmission of *C. auris* outside the affected region has not been observed, and only one case has been detected in a person previously admitted to an affected NYC hospital.

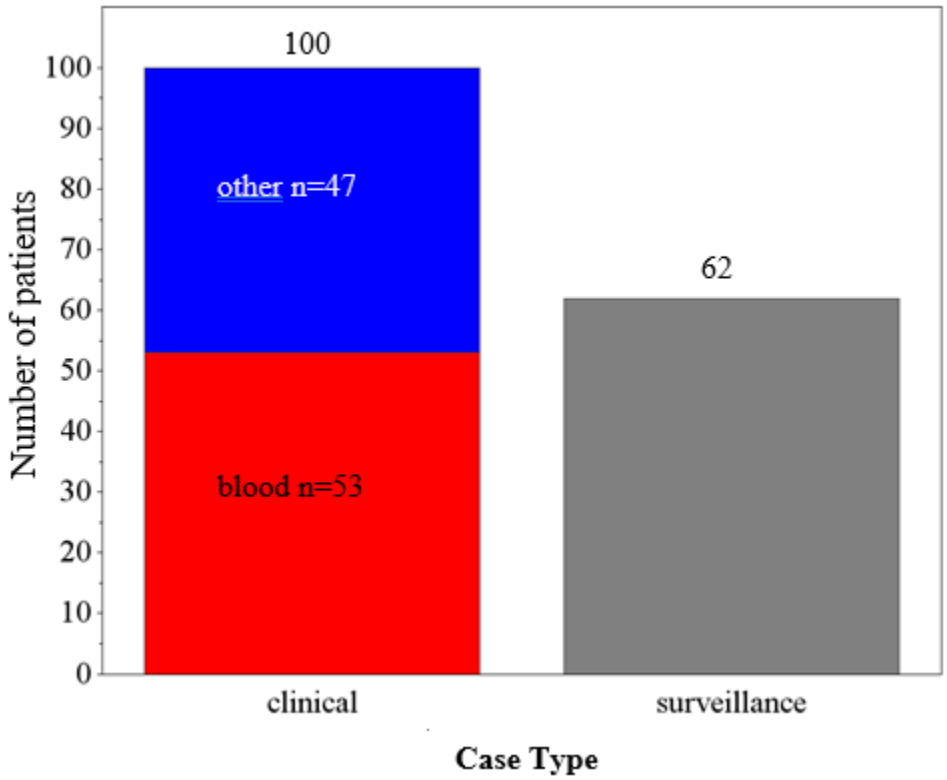
To curb further spread of *C. auris*, NYS developed a special investigative team to handle *C. auris* activity in the region. Working with senior staff in both regional and central offices, this team has been investigating cases of *C. auris*. Activities includes conducting on-site investigations; reviewing patient charts; developing lists of close contacts of confirmed cases; providing infection control education and recommendations to facilities experiencing *C. auris* or other MDR fungal outbreaks; collecting laboratory specimens from patients/residents and environmental surfaces in facilities; monitoring to ensure facility compliance with infection control recommendations; and implementing training programs on infection prevention issues,

including training for hospitals, nursing homes, and health care facilities, focusing on MDR fungi and general infection control; and providing guidance on environmental cleaning.

An admission screening pilot program was implemented and found to be effective as a means for early case detection. Expansion of admission screening efforts is planned and will depend on success of ongoing efforts to increase laboratory capacity for rapid detection of *C. auris.*

This section summarizes the laboratory test results confirmed by Wadsworth Center NYS's public health laboratory. Clinical cases were defined by culture positive for *C. auris* from specimens collected to diagnose or treat disease; they were divided into bloodstream infections and other clinical infections. Surveillance cases were defined by culture positive for *C. auris* from specimens collected from point prevalence surveys, admission screening, and contact tracing of patients without symptoms of infection. In 2017 there were 162 unique cases identified in hospitals (Figure 30). Of the 53 patients with bloodstream infections, 25 (47%) died within 30 days of their first positive isolate in 2017.

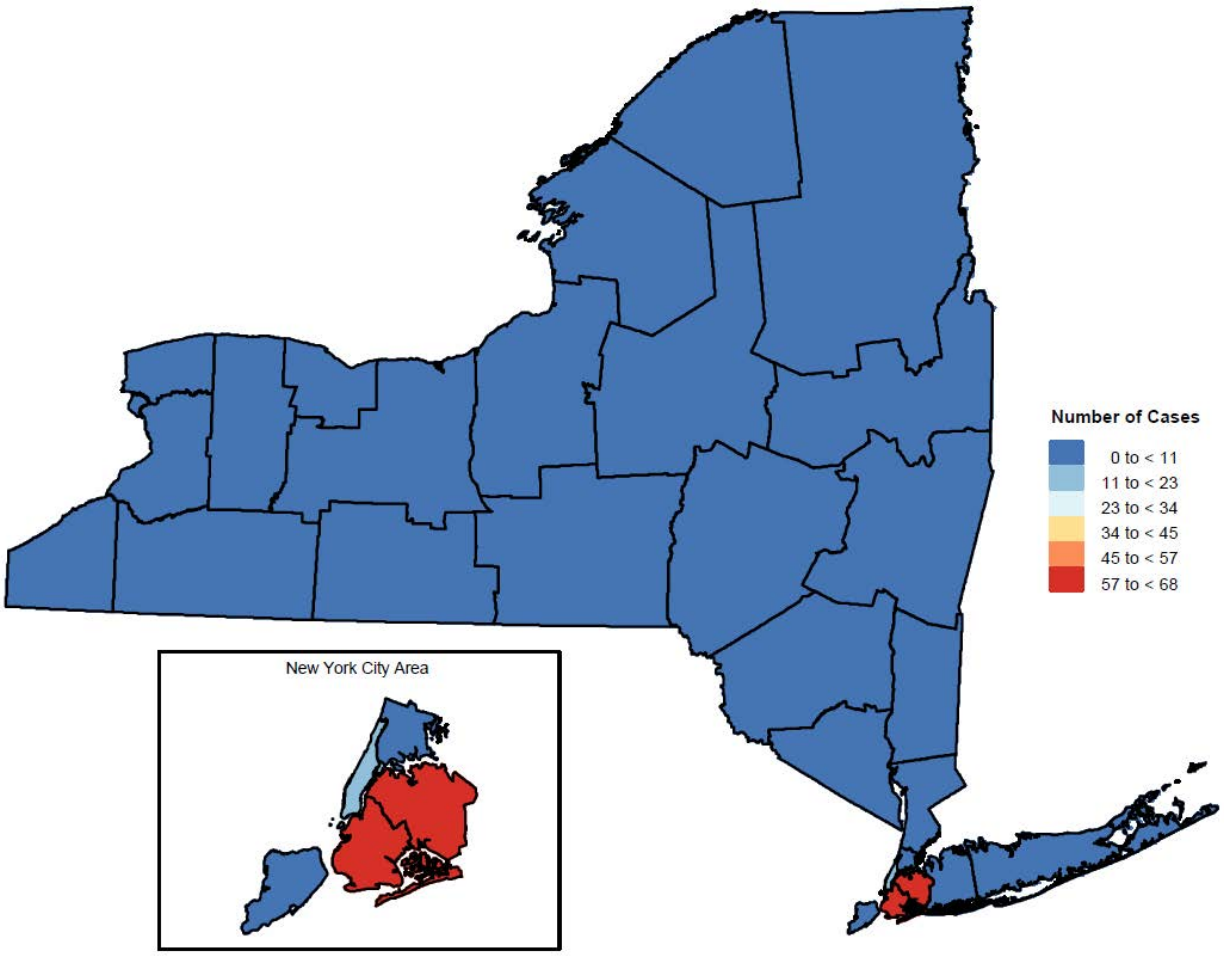
Figure 30. *Candida auris* cases, New York State hospitals 2017



Samples obtained by hospitals as of July 26, 2018. First positive per person per year; only the most severe case type was counted per person (blood over other clinical infection over surveillance infections). Does not include patients identified with *C. auris* outside of hospitals.

The 162 cases are mapped by county in Figure 31. Cases were concentrated in Brooklyn and Queens counties.

Figure 31. Number of patients either infected or colonized with *Candida auris*, New York State hospitals 2017



Data from Wadsworth Center, reported as of July 26, 2018. First positive per person per year. Does not include patients identified with *C. auris* outside of hospitals.

Mortality related to CDI and MDROs

NHSN does not collect data on mortality associated with CDI or 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 19. 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 attributable mortality rate derived from the scientific literature was multiplied by the total number of reported infections. Only bloodstream infections were counted for CRE, VRE, MDR-Acinetobacter, and *C. auris*. 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. 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 acquired immune deficiency syndrome (AIDS, 547), influenza (152), and tuberculosis (29) reported in NYS in 2016.[3]

Table 19. New York State hospital mortality estimates, 2017

Infection	% Attributable Deaths[3]	# Cases Total[4]	# Hospital Onset Cases	# Deaths Total	# Deaths from Hospital Onset Cases
Clostridium difficile[1]	6%	13,990	5,449	839	327
MRSA BSI	20%	1,877	720	375	144
VRE BSI[2]	28%	419	324	117	91
CRE BSI[1]	34%	208	93	71	32
MDR-Acinetobacter BSI[2]	22%	74	65	16	14
Candida auris BSI	47%	53	NA	25	NA
Total		16,621	6,651	1,444	608

NHSN facility-wide inpatient data downloaded 6/25/18 for CRE, 7/31/18 for CDI, 5/31/18 for MRSA, VRE, and MDR- Acinetobacter. *Candida auris* data from Wadsworth Center as of 7/27/18. 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. [5] Death dates were obtained by direct outreach to facilities and patients; deaths within 30 days of BSI were deemed attributable to *C. auris*.

MDRO Prevention Practices

NHSN requires all facilities to submit an annual survey. Table 20 summarizes the self-reported 2016-2017 survey results related to MDRO prevention practices.

Table 20. MDRO Prevention Practice Survey, New York State Hospitals 2016-2017

	2016 (n = 178)	2017 (n=177)
Does the facility routinely place patients infected or colonized with CRE on contact precautions?		
Yes, all infected or colonized patients	94%	93%
Yes, only all infected patients	3%	3%
Yes, only those admitted to high-risk settings	NA	1%
Yes, only those with high-risk for transmission	3%	4%
No	0%	0%
Facility routinely performs screening cultures for CRE?	13%	9%
Facility uses chlorhexidine bathing to prevent transmission of MDROs?	68%	72%
How often does your facility receive information from the transferring facility about their MDRO status?		
All of the time	15%	12%
More than half of the time	48%	53%
About half of the time	16%	18%
Less than half of the time	17%	12%
Never	4%	3%
Not applicable	1%	2%

National Healthcare Safety Network Surveys, downloaded 6/25/2018.

Results from the 2017 survey were very similar to results reported in 2016. 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.

Less than 15% of NYS hospitals reported receiving MDRO status from transferring healthcare facilities all the time. Hospitals should evaluate how to improve receiving this information as well as prioritizing sharing MDRO status, particularly when patients are discharged to skilled nursing or long-term care facilities. Prevention and control of MDROs relies on transferring

knowledge of patient MDRO history to allow for implementation of infection control practices appropriate to a specific healthcare setting. Breakdown in this communication can lead to MDRO transmission events. NYSDOH recommends prominent inclusion of MDRO history (e.g. CRE, *Candida auris*) whenever a patient is transferred between healthcare settings.

Antimicrobial Stewardship and Use

Antimicrobials are life-saving medications; however, unlike other medications, misuse of antimicrobials impacts both the individual and the larger population through the development and spread of antimicrobial resistant organisms.[4, 5] According to Dellit et al, "the primary goal of antimicrobial stewardship is to optimize clinical outcomes while minimizing unintended consequences of antimicrobial use, including toxicity, the selection of pathogenic organisms (such as *Clostridium difficile*), and the emergence of resistance.[6] Appropriate use of antimicrobials is a shared goal of healthcare and public health. Recently, focused attention on ASPs and their potential role in addressing antimicrobial resistance has been reflected in new requirements for healthcare facilities to implement ASPs.[7, 8, 9] Continued work on ASPs will help to develop more robust programs, further improve the appropriate use of antimicrobials, and identify process and outcome measures to enable comparison of program effectiveness between healthcare facilities.[10, 11]

The CDC Core Elements provides a framework for building a successful program tailored to the needs and capabilities of an individual facility. Multiple implementation guidelines from professional societies and from the CDC, are available.[12, 13, 14, 15] In 2015, 59% of NYS hospitals reported meeting all seven of the CDC Core Elements for ASP, per the NHSN Annual Survey. Since that time, New York State hospitals have increasingly reported meeting the core elements. In 2017, 88% of hospitals reported meeting all seven of the CDC Core Elements of ASPs (Table 21). Among the facilities that did not meet all seven core elements, tracking and reporting antibiotic use were the most common missing elements. Of note, over 90% of hospitals reported written statements of support from hospital leadership, but fewer hospitals (66%) reported financial support for stewardship activities.

As acute care hospitals develop more robust ASPs, they are encouraged to review their efforts to ensure programs are implemented with fidelity and evaluated for effectiveness. Nearly all hospitals in NYS reported at least one action as part of ASP activities (Table 21). Less than half (44%) of NYS hospitals report a formal procedure for clinicians to review antibiotics at 48 hours after the initial order, also known as an antibiotic time out. Most hospitals (90.4%) across the state track antibiotic use through one or more of the following: defined daily dose, days of therapy, or purchasing data. Additionally, hospitals should evaluate ASP process measures, such as adherence to treatment protocols, to determine the effectiveness of interventions. No single measure is available to compare program performance between healthcare facilities.

Table 21. Antimicrobial stewardship programs in NYS hospitals, 2015 – 2017 surveys

CDC Core Elements of antimicrobial stewardship program	2015 % hospitals with element (n = 175)	2016 % hospitals with element (n = 178)	2017 % hospitals with element (n = 177)
1. Hospital Leadership Commitment*	**80.0%**	**89.9%**	**98.3%**
Hospital has a written statement of support from leadership that supports efforts to improve antibiotic use.	74.3%	85.4%	93.6%
Hospital financially supports antibiotic stewardship activities.	44.0%	55.1%	66.9%
2. Accountability A leader is responsible for program outcomes of stewardship activities.	**88.6%**	**96.6%**	**98.9%**
3. Drug Expertise At least one pharmacist is responsible for improving antibiotic use.	**90.9%**	**95.5%**	**100%**
4. Action (Implementing recommended interventions)*	**98.3%**	**99.4%**	**99.4%**
Hospital has a policy that requires prescribers to document an indication for all antibiotic prescriptions in the medical record or during order entry.	50.3%	53.9%	68.0%
Hospital has facility-specific treatment recommendations, based on national guidelines and local susceptibility, to assist with antibiotic selection for common clinical conditions.	78.9%	83.7%	90.4%
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).	34.3%	41.0%	44.4%
Specified antibiotic agents need to be approved by a physician or pharmacist prior to dispensing.	81.7%	79.2%	83.1%
Physician or pharmacist reviews courses of therapy for specified antibiotic agents and communicates results with prescribers	83.4%	91.0%	92.1%
5. Tracking*	**86.3%**	**93.3%**	**96.1%**
Hospital monitors adherence to policy requiring documentation of indication for antibiotic use.	29.1%	40.4%	47.2%
Hospital monitors adherence to facility-specific treatment	55.4%	57.3%	64.6%
Hospital monitors antibiotic use at the unit, service, and/or facility wide level (e.g. by defined daily dose, days of therapy, or purchasing data).	79.4%	87.6%	90.4%
6. Reporting*	**88.6%**	**93.8%**	**94.4%**
Physician or pharmacist reviews courses of therapy for specified antibiotic agents and communicates results with prescribers (also counted as an action, above).	83.4%	91.0%	92.1%
Facility/unit/service-specific reports on antibiotics are shared with prescribers.	52.6%	62.9%	69.1%
7. Education Stewardship program provides education to clinicians and other relevant staff on improving antibiotic prescribing.	74.9%	**89.9**	**97.2%**
Total:** Meet all 7 Core Elements above	**58.9%**	**75.8%**	**88.2%**

Annual survey data downloaded from National Healthcare Safety Network on June 25, 2018.

* A core element is met when a facility answers "Yes" to at least one survey question within that core element category.

** All seven core elements are met if a facility has "Yes" for ALL seven core elements (bolded rows).

Measuring antimicrobial use

Measuring the impact of ASPs may be accomplished several ways, including measuring antimicrobial use, appropriate selection, patient outcomes, adverse events, or expenditures.[10,11,16] NYSDOH strongly recommends that hospitals measure antimicrobial use using the NHSN established definition for Days of Therapy per 1,000 patient days to establish baseline data and identify opportunities for targeted interventions. Between 2012, when NHSN began receiving data in the Antimicrobial Use and Resistance (AUR) module, and May 2018, the number of hospitals which have submitted data to the AUR module has grown to over 800 hospitals nationally. Significant uptake in use has occurred since 2016.[17,18]

In 2017, 18 hospitals (10%) in New York State voluntarily submitted antimicrobial use data to NHSN. These data are visible to NYSDOH via the CDC-NYS DUA. This DUA prohibits NYSDOH from publishing hospital-specific rates. NYSDOH does not audit this data.

Overall, the participating hospitals reported 1,015,825 days of antimicrobial use in 2,461,110 days present, for an average antimicrobial usage rate of 413 days of therapy per 1,000 days present. Days of therapy are the number of days for which any amount of a specific antimicrobial was administered to a patient in a specific location. Days present are the number of days in which a patient spent any time in a location, and are always greater than the total number of patient days reported in the rest of this report.

NHSN provides a metric called the standardized antimicrobial administration ratio (SAAR) that compares the observed days of therapy to the predicted days of therapy in the referent population (voluntary reporters in United States, 2014) after adjusting for patient care location. The 2017 NYS SAAR of 0.96 indicates that NYS antimicrobial use data was very similar to antimicrobial use among the group of hospitals that voluntarily reported AU data in 2014. NHSN notes that the SAAR alone is not a definitive measure of the appropriateness of antimicrobial use, but suggests areas for further evaluation by stewardship programs. Because the number of hospitals participating in AUR reporting has grown, CDC is currently working to update the SAAR baseline using 2017 data.[19]

NYSDOH received funding from a CDC Epidemiology and Laboratory Capacity **(**ELC) Cooperative agreement aimed at improving the uptake of AUR reporting. Contracts have been awarded to assist hospitals to implement or make significant progress toward reporting into the AUR module. Varying approaches are being employed, including implementation using a third-party vendor and development of internal mechanisms to report data to NHSN. Project completion will occur in 2018.

Summary

Antibiotic use concerns are not confined to acute care settings. Healthcare systems are encouraged to implement ASPs across all healthcare settings. Guidelines exist for antibiotic stewardship programs outside acute care settings.[20, 21] Opportunities for participation in collaborative activities to support antimicrobial stewardship are increasingly available at both state and national levels. Education is available through state and national professional associations and programs to improve knowledge and understanding of antimicrobial stewardship among potential ASP leaders.

Patients should understand and be educated on the consequences of inappropriate antibiotic use. Antibiotics are life-saving medications when used appropriately; misuse of antibiotics can cause harm. Consequences of using antibiotics when they are not needed can include antibiotic resistant infections that are difficult to treat, altering the bacteria in the gut thereby increasing the risk of infection with *Clostridium difficile*, and experiencing adverse reactions (e.g. allergic reactions or diarrhea) to the medication.[20] CDC's Be Antibiotics Aware campaign contains patient-centered education to address patient concerns and provide information about appropriate use of antibiotics.

Comparison of NYS HAI Rates with National HAI Rates

Approximate comparisons of concurrent state and national HAI rates are available in annual progress reports published by CDC[22]. As of the writing of this report (August 2018), comparisons of neither 2016 nor 2017 data are available.

HAI Prevention Projects

NYSDOH Funded Prevention Projects

NYSDOH funded HAI Prevention Projects with non-profit health care organizations to develop, implement, and evaluate strategies to reduce or eliminate targeted HAIs. The following three projects were funded between 2013 and 2018.

University of Rochester Medical Center, Year 5 of 5: April 2017-March 2018, $157,160

Since 2014, this project successfully assisted 10 long-term care facilities (LTCFs) in Rochester to implement antibiotic stewardship programs using CDC's Core Elements for Stewardship in Nursing Homes as a guide. Specific successes included: obtaining antibiotic data from multiple dispensing and in-house pharmacies and analyzing data to help LTCFs decide where to intervene; creating city-wide guidelines for the diagnosis and treatment of urinary tract infections, pneumonia and skin and soft tissue infections; through dissemination of the above-mentioned guidelines and face-to-face education, reducing quinolone use among project LTCFs; hosting 3 regional workshops to provide stewardship and infection prevention education to a diverse group of participants including consultant pharmacists, front-line nursing staff and LTCF IPs; and creating a Medical Director Advisory Team made up of local LTCF Medical Directors that provided expertise and guidance throughout the project.

Westchester County Healthcare Corporation (WCHC), Year 5 of 5: April 2017-March 2018, $62,462

The purpose of this project was to define the clinical features and molecular epidemiology of hospital-onset CDI and use data to guide a stringent enhanced environmental disinfection initiative. In the final year of this project, participating facilities implemented additional enhanced environmental disinfection modes, including use of disposable mop heads to replace reusable ones; expansion of use of ultraviolet light disinfection to additional units; and use of

daily ultraviolet light disinfections in *C. difficile* positive patient rooms. WCHC analyzed the impact of the environmental interventions by comparing pre -and post- intervention rates, as well as results from multi-locus sequence typing and whole genome sequencing to try to identify transmission events. Results indicated diverse acquisitions of *C. difficile*, both inside and outside of hospitals. Therefore, interventions to reduce transmission of *C. difficile* need to go beyond enhanced environmental measures and include colonized individuals. Additionally, results indicate that the use of genomics may serve as a useful tool in identifying likely transmission events to optimally deploy prevention strategies.

Weill Medical College, Year 5 of 5: April 2017-March 2018, $190,378

The principal objective of this project was 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 5 of this project, the Environmental Services (EVS) educational program "Cleaner is Safer: EVS on the Frontline of Infection Prevention" was evaluated. This interactive five-part educational program was given to frontline environmental service workers at the five participating acute care hospitals. Participants indicated they were more comfortable performing hand hygiene and better understood how daily cleaning prevents the spread of germs. Significant improvements were measured in the cleanliness of high-touch surfaces in occupied patient rooms. Educational content for antimicrobial prescribers to address knowledge, attitude, and practice gaps was presented on all study campuses.

CDC Funded HAI Prevention Projects

ELC for Infectious Diseases Grant (Aug 2014-July 2019)

New York State Long Term Care *Antimicrobial Stewardship Collaborative Project*

DOH continued its efforts to improve antibiotic use and implement antibiotic stewardship programs in NYS LTCFs with a project that used the CDC document *The Core Elements of Antibiotic Stewardship for Nursing Homes* as a framework, with a focus on appropriate antibiotic use for urinary tract infections (UTI). Between May 1, 2017 and April 30, 2018, a group of LTCFs participated in educational webinars, completed surveys on facility antibiotic stewardship policies and practices, and provided monthly tracking data on antibiotic starts and urine cultures collected related to UTI. The percent of facilities with at least one or more core element of an antibiotic stewardship program implemented increased. During the latter half of 2018, DOH began plans to expand upon the previous stewardship work that focused on UTIs, with a new focus on respiratory illness as it relates to LTCF antibiotic stewardship.

Carbapenem-resistant Enterobacteriaceae (CRE)

The mandated reporting of LabID CRE events in NYS hospitals has demonstrated that a wide variability exists in the incidence and prevalence of these organisms across NYS. In addition, CDC's creation of the Antimicrobial Resistance Laboratory Network (ARLN) and the increased testing of resistant isolates performed by Wadsworth Center Laboratory as one of CDC's seven regional antimicrobial resistance testing sites have further revealed that the burden of antimicrobial resistance in our communities may be greater than previously estimated, and include resistant gene-encoded plasmids that, up to this point, have only been thought to be sporadic and/or associated with spreading resistance in other parts of the world.

Current ARLN testing is focused on identifying carbapenemase-producing CRE (CP-CRE). Statewide, preliminary results indicate that roughly 67% of these isolates are CP-CRE, and of these *Klebsiella pneumoniae* carbapenemase is found most often (84%) as the mechanism of resistance. However, New Delhi metallo-β-lactamase and oxacillinase-48-type carbapenemases are also being identified in increasing numbers of CP-CRE isolates. These data highlight the urgent need to intensify efforts to combat the spread of carbapenem-resistant and other multidrug-resistant organisms before the AR problem becomes insurmountable.

Educational Efforts to Promote Appropriate Antibiotic Use: Get Smart

In 2017, NYSDOH built on its initial analysis of Medicaid claims data (targeting geographic counties with high "avoidable" rates of antibiotic prescribing for adults with upper respiratory tract infections) by extending its analysis to pharyngitis and analyzing data on specific antibiotics prescribed by class. Responding to requests from healthcare providers, NYSDOH distilled lengthy antibiotic prescribing guidelines from expert sources into a shortened version including drug dosage and duration which was posted online for healthcare providers. An updated provider commitment poster (to align with new CDC branding) was launched and was featured in a CDC blog and at a presentation at the Infectious Diseases Society of America. NY's evidence-based provider communications video on antibiotic use was re-edited into a patient-focused video which was run continuously in patient waiting areas at one large NYC hospital's outpatient settings. Outreach was extended to long-term care facilities via a NYSDOH webinar which offered multiple free AS educational materials for healthcare providers and for inclusion in admission packets for residents and their families. NYSDOH mentored other grant-funded and non-funded state health department partners, sharing best practices and NYSDOH-developed AS materials that could be modified for other states' use. Upon request, NYSDOH translated and distributed the CDC "viral prescription pad" into 10 non-English languages spoken by patients in NYS.

Summary

Table 22 summarizes the total number of each type of HAI for NYS in 2017. The table is sorted from most common to least common.

Table 22. Inpatient infections reported by New York State hospitals in 2017

Type of infection	Number	Rate
Hospital onset *Clostridium difficile* infections (CDIs)	5,449	5.2/10,000 patient days
Surgical site infections (SSIs) following		
Colon surgery[B]	863	4.4/100 procedures
Hip replacement or revision surgery[N]	315	0.9/100 procedures
Abdominal hysterectomy surgery[B]	203	1.2/100 procedures
Coronary artery bypass graft (CABG) - chest site[N]	168	1.5/100 procedures
CABG - donor site[N]	45	0.5/100 procedures
Catheter-associated urinary tract infections (CAUTIs) in intensive care units, and medical/surgical wards	1,568	1.2/1,000 catheter days
Central line-associated bloodstream infections (CLABSIs) in intensive care units and medical and surgical wards[B] and step down units[N]	1,226	0.9/1,000 line days
Hospital onset methicillin-resistant *Staphylococcus aureus* (MRSA) bloodstream infections[C]	694	0.62/10,000 patient days
Hospital onset carbapenem-resistant *Klebsiella, E. coli*, and *Enterobacter* (CRE) bloodstream infections[N]	208	0.18/10,000 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. SSI/CLABSI/CRE data reported as of 6/25/2018; CDI reported as of 7/31/2018; CAUTI and MRSA data reported as of 5/31/2017. Data from inpatient rehabilitation and psychiatric facilities were excluded.

Table 23 summarizes the rates of improvement, number of prevented infections, and direct cost savings associated with the NYS indicators, sorted by cost savings. The greatest improvement has been seen in CDI infections, with a 30% decrease in incidence. Costs savings are estimated with a range because HAIs vary in severity and studies upon which estimates are based differ somewhat in their cost estimates. Between 2015 and 2017, 4,157 infections were prevented because of reductions in HAI rates; this was related to a cost savings of $49.1 to $98.0 million.

Table 23 also compares NYS progress to National and State Prevention Goals. NYS has met the 2019 CDI goal of 30% decrease, is on track to reach the 2019 goal for colon SSI and CABG chest SSI, and is off track for the remaining indicators.

Table 23. Cost savings associated with change in HAI rates between 2015 and 2017

Type of Infection	National/State 2015-2019 Prevention Goal	2017 Improvement Since 2015 (Compared to 2019 Goal)	# Prevented Infections	Direct Cost Savings (in millions)	
				Min	Max
Hospital onset *Clostridium difficile* infections (CDI)	30%	improved 30% (met goal)	3,203	$33.9	$48.2
Colon surgery SSIs	30%	improved 21% (on track)	365	$7.1	$20.9
Central line-associated bloodstream infections (CLABSIs)	50%	improved 18% (off track)	409	$4.9	$19.7
Hip replacement or revision surgery SSIs	30%	improved 5% (off track)	77	$1.5	$4.4
Coronary artery bypass graft chest SSIs	30%	improved 15% (on track)	60	$1.2	$3.4
Abdominal hysterectomy surgery SSIs	30%	improved 2% (off track)	23	$0.4	$1.3
Hospital onset Carbapenem-resistant Enterobacteriaceae (CRE) bloodstream infections	25%	improved 8% (off track)	20	$0.1	$0.1
Total			4,157	$49.1	$98.0

Cost ranges for CDI, SSI, and CLABSI are from Scott RD. The direct medical costs of healthcare-associated infections in U.S. hospitals and the benefits of prevention. CDC, Division of Healthcare Quality Promotion, Atlanta GA, March 2009. Report CS200891-A. Cost ranges for CRE are from Bartsch SM et. al. Potential economic burden of carbapenem-resistant Enterobacteriaceae (CRE) in the United States. Clin Microbiol Infect. 2017; 48:e9-48.e16.
All costs converted to 2016 dollars based on the Consumer Price Index for Hospital Inpatient Services.
Cells are shaded green if on track to meet 2019 prevention goal, and shaded pink if not on track.

Recommendations and Next Steps

NYSDOH will continue to monitor and report 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 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 of HAI rates within the state, as well as for the analysis of NYS rates in comparison with other states' rates.

Efforts to combat the spread of CRE and *Candida auris* (and other MDROs) in NYS healthcare facilities will continue. NYSDOH will continue to visit hospitals and LTCFs to evaluate and discuss infection surveillance and prevention practices, barriers to implementation, antibiotic stewardship activities, and other strategies intended to reduce facility incidence rates, and provide assistance as needed. NYSDOH will continue to promote stewardship programs in LTCFs by engaging IPs, medical and nursing directors, pharmacists, and lab staff in a collaborative involving implementation of stewardship elements, and in hospitals through encouragement to report to the NHSN AUR module.

Appendix 1: List of Abbreviations

AIDS – Acquired immune deficiency syndrome
ARLN – Antimicrobial Resistance Laboratory Network
ASA – American Society of Anesthesiologists' classification of physical status
ASP – Antimicrobial stewardship program
AUR – Antimicrobial use and resistance
BMI – Body mass index
BSI – Bloodstream infection
CABG – Coronary artery bypass graft surgery
CAUTI – Catheter-associated urinary tract infection
CDC – Centers for Disease Control and Prevention
CDI – *Clostridium difficile* infection
C. auris – Candida auris
C. difficile – Clostridium difficile
CI – Confidence interval
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
CP-CRE - Carbapenemase-producing - Carbapenem-resistant Enterobacteriaceae
CRE – Carbapenem-resistant Enterobacteriaceae
DOH –Department of Health
DUA – Data use agreement
ED – Emergency department
EIA – Enzyme immunoassay
EVS – Environmental services
ELC – Epidemiology and Laboratory Capacity
FWI – Facility-wide inpatient
HAI – Hospital-acquired infection
HO – Hospital onset
ICU – Intensive care unit
IP – Infection preventionist
IPF – Inpatient psychiatric facility
IRF – Inpatient rehabilitation facility
LabID – Laboratory identified
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
NYC – New York City
NYS – New York State
NYSDOH – New York State Department of Health
OBS – Observation unit
OP – Outpatient
PATOS – Present at time of surgery
PDS – Post-discharge surveillance
PPE – Personal protective equipment
RPC – Regional Perinatal Center
SAAR – Standardized antimicrobial administration ratio
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 (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.

***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.

Device utilization ratio: This ratio is obtained by dividing the number of device days by the number of patient days. It is calculated for central line utilization and urinary catheter utilization.

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.

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

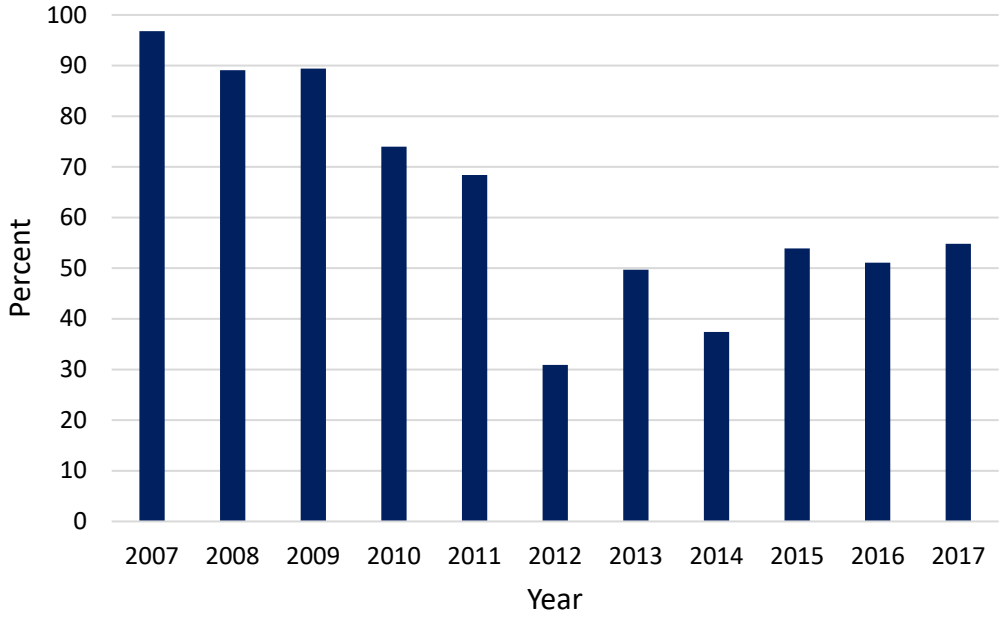
Data reported to the NHSN are validated by the NYSDOH using several methods.

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 32 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, or hired new hospital staff.

Figure 32. 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 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 2017 audit results will be summarized in the next annual report. In 2016, NYSDOH staff reviewed 5,857 records and agreed with the hospital-reported infection status 96% of the time. Disagreements were discussed with the IPs and corrected in NHSN. Table 24 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 24. Brief summary of 2016 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	728	115	6	568	39	93.8%
CABG SSI	170	33	2	133	2	97.6%
HYST	639	63	3	568	5	98.9%
Hip SSI	746	71	1	670	4	99.8%
CLABSI	645	125	1	487	32	94.9%
CDI	2,077	2014	8	0	55	97.0%
CRE	852	760	15	0	77	89.2%
TOTAL	**5,857**	**3,181**	**36**	**2,426**	**214**	**95.7%**

The 2016 audit was conducted between July 2016 and June 2017, and predominantly covered 2016 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).

Cross-checks for completeness and accuracy in reporting - NYS HAI staff match the NHSN colon, hip, hysterectomy, CDI, and CRE data 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 178 hospitals reporting complete data for 2017. 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 a location over a given period of time.
- For CDI and CRE there must be a minimum of 50 patient days.

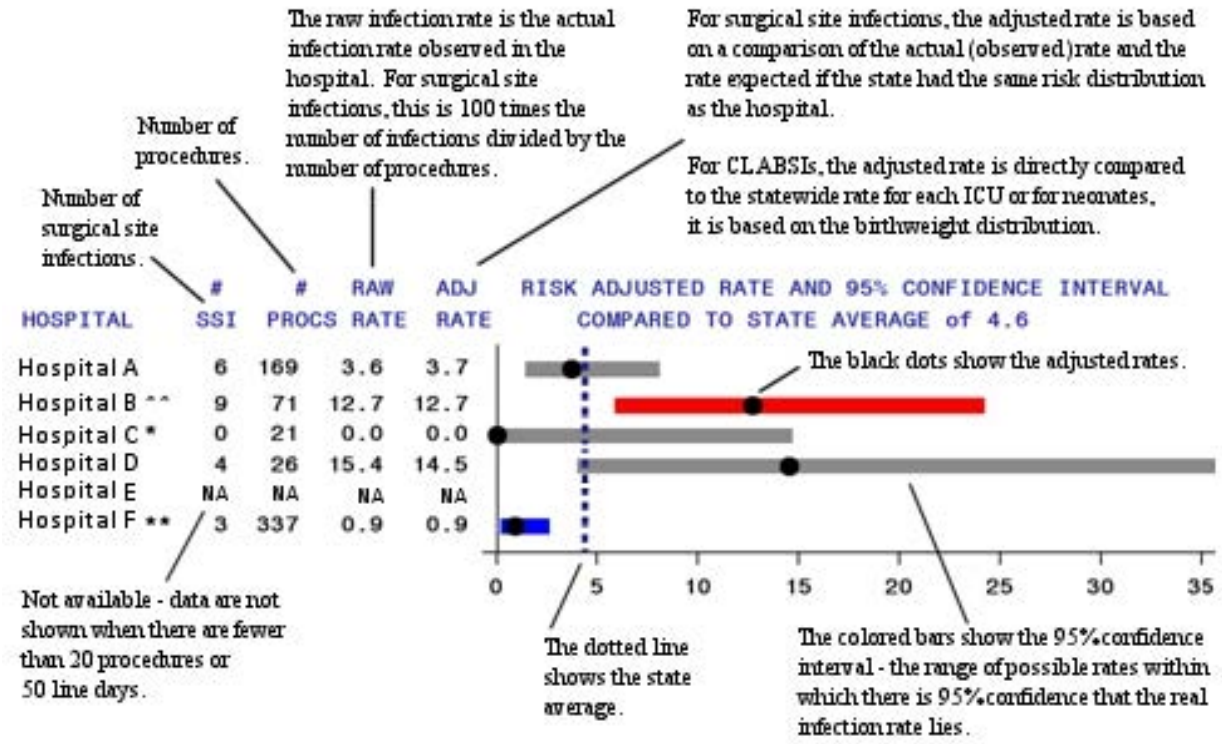
NYSDOH tracks hospital performance over time. Hospitals flagged high or low for at least three consecutive years (i.e. 2015, 2016, 2017) are specifically named in this report.

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 many 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 based on 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 95% confidence intervals for all indicators except CDI, for which a 99% CI was used. All data analyses were performed using SAS version 9.4 (SAS Institute, Cary NC). Figure 33 provides an example of how to interpret the hospital-specific SSI and CLABSI infection rate tables.

Figure 33. 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 25. 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 25. 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
	Dubberke 2008[29]	353	36	30.3	5.7
	Hensgens 2013[30]	317	14.8	5.4	9.4
	Barbut 2017[31]	482	9	5	4.0
	Weighted average				**6**
CRE	Borer 2009[11]	32	71.9	21.9	50.0
	Mouloudi 2014[12]	37	NA	NA	27.0
	Gallagher 2014[32]	43	45	18	27
	Weighted average				**34**
MRSA	Harbarth 1998[33]	39	36	28	8.0
	DeKraker 2011[34]	242	30.6	8.4	22.2
	Weighted average				**20**
VRE	Carmeli 2002[35]	21	NA	NA	25.0
	Edmond 1996[36]	27	66.7	29.6	37.0
	Song 2003[37]	159	50.3	27.7	22.6
	Stosor 1998[38]	21	NA	NA	61.9
	Weighted average				**28**
MDR Acinetobacter	Blot 2003[39]	45	42.2	34.4	7.8
	Grupper 2007[40]	52	55.8	19.2	36.5
	Wisplinghoff 1999[41]	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 national benchmarks.

The HAI rates reported by NYS and CMS may differ. Table 26 summarizes the reasons for these differences.

Table 26. Comparison of New York State and Hospital Compare data

	NYSDOH HAI Report	**CMS Hospital Compare**
Question answered	How did each hospital perform in 2017 compared to the NYS 2017 average?	How did each hospital perform in 2017 compared to the National 2015 average?
2017 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	Children, 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

Table 27 lists the hospitals individually identified in this report. Additional information on the hospitals can be obtained from the NYSDOH Hospital Profile at https://profiles.health.ny.gov/hospital/.

Table 27. List of hospitals included in this report

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	1169	330059	Montefiore-Moses
	1178	330009	Bronx-Lebanon
	1176	330399	St Barnabas
	1186	330385	North Central Bronx
	1165	330127	Jacobi Med Ctr
	1168	330059	Montefiore-Wakefield
	1172	330080	Lincoln Med Ctr
	3058	330059	Montefiore-Einstein
	1175	332006	Calvary Hospital
Broome	0058	330394	UHS Wilson
	0043	330011	Our Lady of Lourdes
	0042	330394	UHS Binghamton
Cattaraugus	0066	330103	Olean General
Cayuga	0085	330235	Auburn Memorial
Chautauqua	0103	330239	UPMC Chautauqua WCA
	0098	330229	Brooks Memorial
	0114	330132	TLC Lake Shore
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	0192	330049	Northern Dutchess
	0180	330234	MidHudson Reg of WMC
	0181	330023	Vassar Brothers

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

County	PFI	CMS ID	Hospital Name
Nassau	0528	330027	Nassau University
	0550	330106	Syosset Hospital
	0552	330331	Plainview Hospital
	0490	330181	Glen Cove Hospital
	0518	330372	LIJ at Valley Stream
	0541	330106	North Shore
	0551	330332	St Joseph -Bethpage
	0527	330198	South Nassau Comm.
	0563	330182	St Francis- Roslyn
	0511	330167	NYU Winthrop
	0513	33T259	Mercy Med Ctr
	3376	330195	Cohens Childrens
New York	1438	330204	Bellevue Hospital
	1439	330169	Mt Sinai Beth Israel
	1454	33T199	Metropolitan Hosp
	1469	330046	Mt Sinai St Lukes
	1466	330046	Mt Sinai West
	1450	330119	Lenox Hill Hospital
	1437	330101	NYP-Lower Manhattan
	1456	330024	Mt Sinai
	1463	330214	NYU Tisch
	1453	330154	Memor SloanKettering
	1464	330101	NYP-Columbia
	3975	330101	NYP-Allen
	1464	330101	NYP-Morgan Stanley
	1458	330101	NYP-Weill Cornell
	1445	330240	Harlem Hospital
	1446	330214	NYU Orthopedic Hosp
	1447	330270	Hosp for Spec Surg
	1486	332008	Henry J. Carter
	1460	330100	NY Eye&Ear Mt Sinai
Niagara	0583	330188	Mount St. Marys
	0565	330163	East. Niag. Lockport
	0574	330065	Niagara Falls
	0581	330005	DeGraff Memorial
Oneida	0598	330245	St Elizabeth Medical
	0599	330044	Faxton St. Lukes
	0589	330215	Rome Memorial

County	PFI	CMS ID	Hospital Name
Onondaga	0636	330203	Crouse Hospital
	0635	330241	Univ Hosp SUNY Upst
	0628	330241	Upst. Community Gen
	0630	330140	St Josephs- Syracuse
Ontario	0678	330074	FF Thompson
	0676	330265	Clifton Springs
	0671	330058	Geneva General
Orange	0699	330126	OrangeReg Goshen-Mid
	0694	330264	St Lukes Cornwall
	0708	330135	Bon Secours
	0704	330205	St Anthony
Oswego	0727	330218	Oswego Hospital
Otsego	0746	330136	Mary Imogene Bassett
	0739	330085	AO Fox Memorial
Putnam	0752	330273	Putnam Hospital
Queens	1633	330231	Queens Hospital
	1635	330395	St Johns Episcopal
	1638	330353	LIJ at Forest Hills
	1630	330195	Long Isl Jewish(LIJ)
	1629	330014	Jamaica Hospital
	1628	330193	Flushing Hospital
	1639	330024	Mt Sinai Queens
	1637	330055	NYP-Queens
	1626	330128	Elmhurst Hospital
Rensselaer	0756	330180	Samaritan- Troy
	9250	330409	Burdett Care Center
Richmond	1740	330160	Staten Island U N
	1738	330028	Richmond Univ MC
	1737	330160	Staten Island U S
Rockland	0779	330158	Good Samar. Suffern
	0776	330104	Montefiore-Nyack
	0775	330405	Helen Hayes Hospital
Saratoga	0818	330222	Saratoga Hospital
Schenectady	0829	330153	Ellis Hospital
	0831	330406	Sunnyview Rehab Hosp
	0848	330153	Bellevue Ellis
Schoharie	0851	330268	Cobleskill Regional

County	PFI	CMS ID	Hospital Name
St.Lawrence	0798	330211	Claxton-Hepburn
	0815	330197	Canton-Potsdam
	0804	330223	Massena Memorial
Steuben	0873	330144	Ira Davenport
	0870	330151	St James Mercy
	0866	330277	Corning Hospital
Suffolk	0885	330141	Brookhaven Memorial
	0938	330107	Peconic Bay Medical
	0891	330088	Eastern Long Island
	0925	330286	Good Samar. W Islip
	0943	330401	St Catherine Siena
	0896	330246	St Charles Hospital
	0924	330043	Southside
	0889	330340	Southampton
	0245	330393	Univ Hosp StonyBrook
	0913	330045	Huntington Hospital
	0895	330185	JT Mather Hospital
Sullivan	0971	330386	Catskill Regional
Tompkins	0977	330307	Cayuga Medical Ctr
Ulster	0989	330224	HealthAlli MarysAve
	0990	330004	HealthAlli Broadway
Warren	1005	330191	Glens Falls Hospital
Wayne	1028	330030	Newark Wayne
Westchester	1045	330304	White Plains Hosp
	1139	330234	Westchester Medical
	1129	330261	Phelps Memorial
	1117	330162	Northern Westchester
	1039	330267	NYP-Hudson Valley
	1097	330208	St Johns Riverside
	1061	330086	Montefiore-Mt Vernon
	1098	330006	St Josephs- Yonkers
	1122	330061	NYP-Lawrence
	1072	330184	Montefiore-NewRochl
	1138	333301	Blythedale Childrens
	1124	330208	St Johns Dobbs Ferry
Wyoming	1153	330008	Wyoming County Comm.

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