Hospital-Acquired Infections in New York State, 2018

Part 2: Technical Report

November 2019

NEW YORK STATE | Department of Health

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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 https://www.cdc.gov/hai/pdfs/stateplans/New-York_DUA.pdf.

Table 1 summarizes the progression of NYS reporting requirements through 2018 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	2015-2018
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		✓	✓	✓	✓	✓	✓	✓
Clostridioides 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 and visible through data use agreement between CDC and NYS beginning May 2013.

This report focuses on HAI rates in NYS hospitals in 2018. 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 2018. 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 2018, 160 hospitals reported a total of 1,139 colon SSIs out of 19,732 procedures, a rate of 5.8 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 1,139 infections, 253 (22%) were classified as PATOS. The PATOS SSIs were predominantly (87%) Organ/Space. At completion of the surgery 77% 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 886 infections, 42% were superficial, 8% were deep, and 51% were organ/space (Table 2). Most of the SSIs (58%) were detected during the initial hospitalization; 29% were identified upon readmission to the same hospital; 4% involved readmission to another hospital; and 10% 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 88 PDS infections in the final SSI rate so as not to penalize facilities with the best surveillance systems.

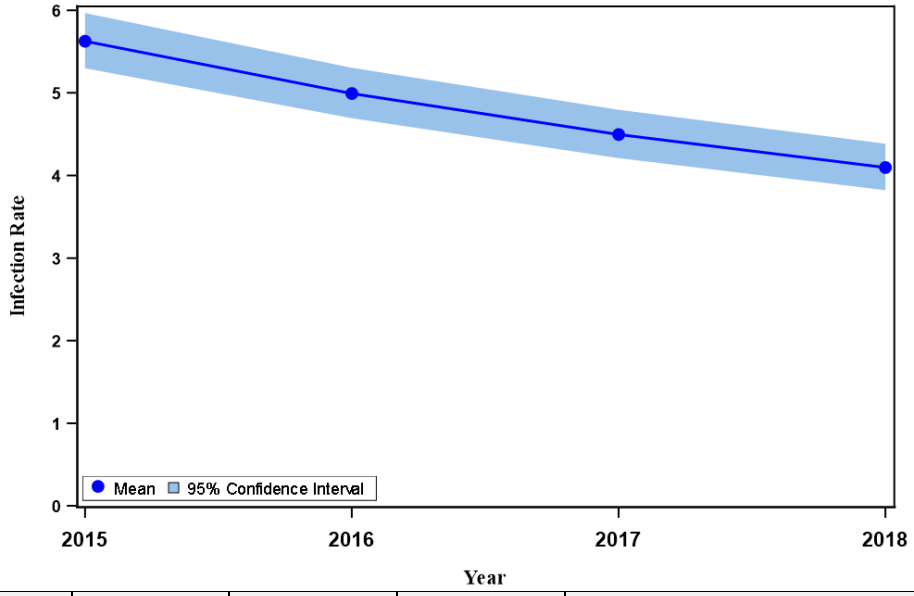
Table 2. Method of detection of colon surgical site infection by depth of infection, New York State 2018

Extent (Row%) (Column%)	When Detected				
	Initial Hospitalization	Readmitted to the Same Hospital	Readmitted to Another Hospital	Post-Discharge Surveillance Not Readmitted	Total
Superficial Incisional	182 (49.3%) (35.5%)	86 (23.3%) (33.9%)	14 (3.8%) (45.2%)	87 (23.6%) (98.9%)	369 (41.6%)
Deep Incisional	40 (58.8%) (7.8%)	25 (36.8%) (9.8%)	2 (2.9%) (6.5%)	1 (1.5%) (1.1%)	68 (7.7%)
Organ/Space	291 (64.8%) (56.7%)	143 (31.8%) (56.3%)	15 (3.3%) (48.4%)	0 (0.0%) (0.0%)	449 (50.7%)
Total	513 (57.9%)	254 (28.7%)	31 (3.5%)	88 (9.9%)	886

New York State data reported as of June 27, 2019. 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 2018, the colon surgical site infection rate declined 27%, from 5.63 infections per 100 procedures in 2015, to 4.10 infections per 100 procedures in 2018.

Figure 1. Trend in colon surgical site infection rates, New York State 2015-2018
Excluding infections present at time of surgery or 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	994	19,910	4.99 (4.69, 5.30)
2017	162	881	19,594	4.50 (4.21, 4.80)
2018	160	798	19,479	4.10 (3.82, 4.38)

New York State data reported as of June 27, 2019. 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 2018

Microorganism	Number of Isolates	Percent of Infections
Enterococci	378	33.2
(VRE)	(85)	(7.5)
Escherichia coli	322	28.3
(CRE-*E. coli*)	(3)	(0.3)
Yeast	112	9.8
(*Candida auris*)	(1)	(0.1)
Staphylococcus aureus	98	8.6
(MRSA)	(58)	(5.1)
Bacteroides spp.	94	8.3
Klebsiella spp.	89	7.8
(CRE-*Klebsiella*)	(4)	(0.4)
Pseudomonas spp.	88	7.7
Streptococci	74	6.5
Enterobacter spp.	60	5.3
(CRE-*Enterobacter*)	(8)	(0.7)
Coagulase negative staphylococci	59	5.2
Proteus spp.	31	2.7
Clostridium spp.	21	1.8
Morganella morganii	18	1.6
Citrobacter spp.	14	1.2
Prevotella spp.	12	1.1
Lactobacilli	7	0.6
Actinomyces spp.	5	0.4
Corynebacteria	5	0.4
Stenotrophomonas spp.	5	0.4
Acinetobacter spp.	4	0.4
(MDR-*Acinetobacter*)	(3)	(0.3)
Other	42	3.7

New York State data reported as of June 27, 2019. Out of 1,139 infections, no microorganisms identified for 242 (21%) 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 1.7 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 1.9 times more likely to result in SSI than procedures less than two hours. Procedures with duration between two and four hours were 1.2 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 132 hospitals that reported more than twenty procedures, five hospitals (4%) had colon SSI rates that were statistically higher than the state average. All five hospitals will submit improvement plans following the NYSDOH HAI Reporting Program's Policy for Facilities with Consecutive Years of High HAI Rates. Six hospitals (5%) had rates that were statistically lower than the state average. One hospital (Roswell Park) was significantly high for 3 consecutive years, and one hospital (Vassar Brothers Medical Center) was significantly low for 3 consecutive years.

Figure 2. Colon surgical site infection rates, New York 2018 (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	2	0	0	70	2.9	3.3
Albany Med Ctr^	33	8	4	503	6.6	6.8
Albany Memorial	NA	NA	NA	NA	NA	NA
Alice Hyde Med Ctr	NA	NA	NA	NA	NA	NA
Arnot Ogden Med Ctr	1	3	0	58	1.7	1.6
Auburn Memorial	3	1	0	33	9.1	8.6
Bellevue Hospital	3	2	0	90	3.3	3.2
Bertrand Chaffee	NA	NA	NA	NA	NA	NA
Bon Secours	1	0	0	20	5.0	6.5
BronxCare	0	1	0	64	0.0	0.0
Brookdale Hospital	3	1	1	77	3.9	3.0
Brooklyn Hosp Ctr	0	2	0	65	0.0	0.0
Brooks Memorial	NA	NA	NA	NA	NA	NA
Buffalo General*	0	0	0	116	0.0	0.0
Canton-Potsdam	2	0	0	39	5.1	4.6
Catskill Regional	1	0	0	27	3.7	3.8
Cayuga Medical Ctr	1	1	1	42	2.4	2.6
Champlain Valley	3	2	1	102	2.9	3.0
Claxton-Hepburn	1	0	1	31	3.2	2.8
Clifton Springs	NA	NA	NA	NA	NA	NA
Columbia Memorial	4	2	1	54	7.4	7.8
Coney Island Hosp	1	2	0	42	2.4	2.3
Corning Hospital	NA	NA	NA	NA	NA	NA
Cortland Reg Med	0	0	1	25	0.0	0.0
Crouse Hospital	8	1	0	230	3.5	3.5
East. Niag. Lockport	2	0	0	31	6.5	6.3
Eastern Long Island	NA	NA	NA	NA	NA	NA
Ellis Hospital	11	0	1	151	7.3	6.9
Elmhurst Hospital	1	3	0	64	1.6	1.5
Erie County Med Ctr	9	0	0	81	11.1	8.7
FF Thompson	5	1	1	64	7.8	9.2
Faxton St. Lukes	4	0	0	55	7.3	7.5
Flushing Hospital	1	0	0	41	2.4	2.8
Geneva General	0	0	0	58	0.0	0.0
Glen Cove Hospital	2	1	0	35	5.7	5.1
Glens Falls Hospital	8	1	0	148	5.4	6.0
Good Samar. Suffern	4	0	0	113	3.5	4.3
Good Samar. W Islip	6	5	0	262	2.3	2.4
Harlem Hospital	0	0	0	39	0.0	0.0

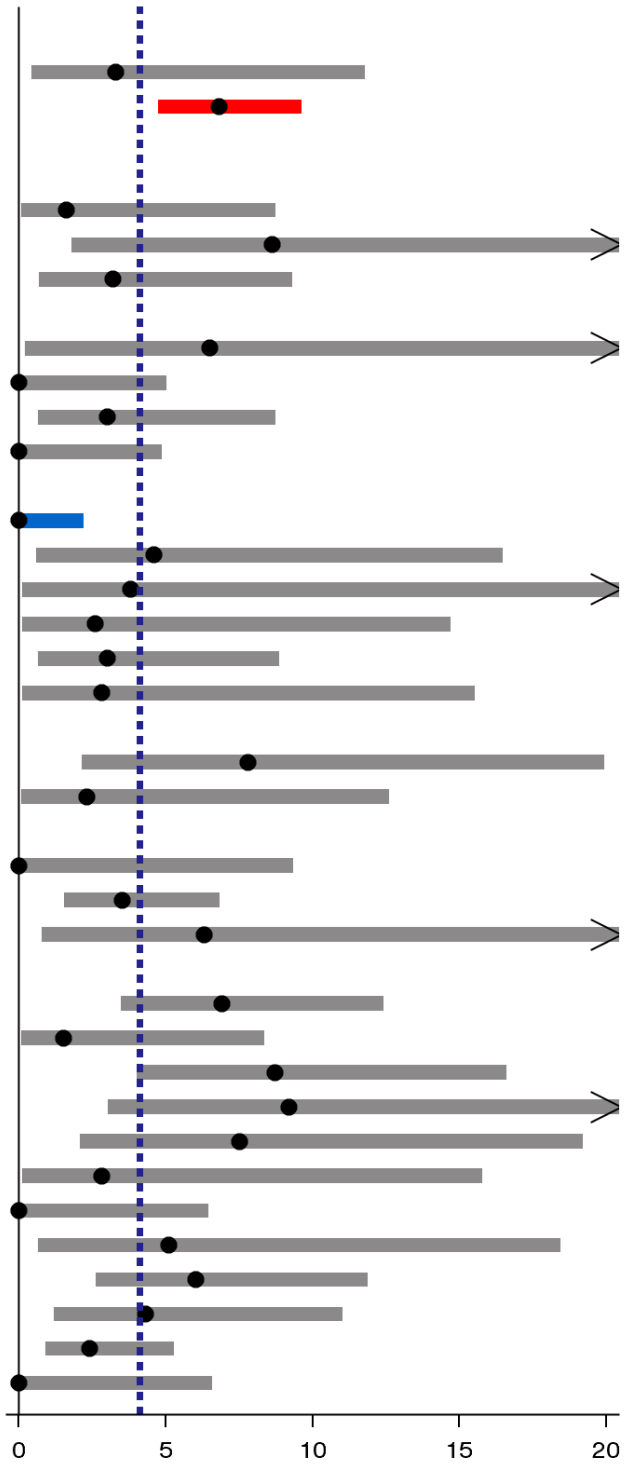


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Figure 2. Colon surgical site infection rates, New York 2018 (page 2 of 4)

Hospital	# SSI	#PATOS excl.	#PDS excl.	# Procs	Raw Rate	Adj Rate
HealthAlli Broadway	0	1	0	48	0.0	0.0
HealthAlli MarysAve	NA	NA	NA	NA	NA	NA
Highland Hospital	1	3	2	135	0.7	0.7
Huntington Hospital	4	2	0	215	1.9	2.2
Interfaith Med Ctr	NA	NA	NA	NA	NA	NA
JT Mather Hospital	7	3	0	113	6.2	6.2
Jacobi Med Ctr	10	0	0	89	11.2	8.3
Jamaica Hospital	2	0	0	59	3.4	2.9
Jones Memorial	NA	NA	NA	NA	NA	NA
Kenmore Mercy	10	8	0	166	6.0	6.0
Kings County Hosp*	0	2	0	92	0.0	0.0
Kingsbrook Jewish MC	4	0	0	38	10.5	9.3
LIJ at Forest Hills	1	0	1	83	1.2	1.2
LIJ at Valley Stream	2	0	0	44	4.5	3.8
Lenox Hill Hospital	14	3	0	322	4.3	4.4
Lincoln Med Ctr	5	1	0	82	6.1	4.6
Long Isl Jewish(LIJ)	13	3	0	436	3.0	2.8
Long Isl. Community	1	1	0	105	1.0	1.0
Maimonides Med Ctr	15	5	2	277	5.4	5.5
Mary Imogene Bassett	14	2	2	182	7.7	7.1
Massena Memorial	NA	NA	NA	NA	NA	NA
Memor SloanKettering	56	6	13	1115	5.0	4.1
Mercy Hosp Buffalo	15	4	0	291	5.2	5.6
Mercy Med Ctr	1	1	0	38	2.6	2.7
Metropolitan Hosp	NA	NA	NA	NA	NA	NA
MidHudson Reg of WMC	0	0	0	34	0.0	0.0
Millard Fill. Suburb	15	4	0	327	4.6	5.5
Montefiore-Einstein^	14	4	3	174	8.0	7.6
Montefiore-Moses	21	9	2	272	7.7	6.5
Montefiore-Mt Vernon	3	2	0	28	10.7	12.9
Montefiore-NewRochl	1	0	0	32	3.1	3.4
Montefiore-Nyack	4	1	0	84	4.8	5.3
Montefiore-Wakefield	1	0	0	25	4.0	3.6
Mount St. Marys	0	0	0	33	0.0	0.0
Mt Sinai	30	7	11	833	3.6	4.5
Mt Sinai Beth Israel	6	5	1	135	4.4	5.4
Mt Sinai Brooklyn	1	0	0	50	2.0	1.8
Mt Sinai Queens	1	0	0	44	2.3	2.4
Mt Sinai St Lukes	4	2	0	88	4.5	3.9
Mt Sinai West	3	1	0	154	1.9	1.5

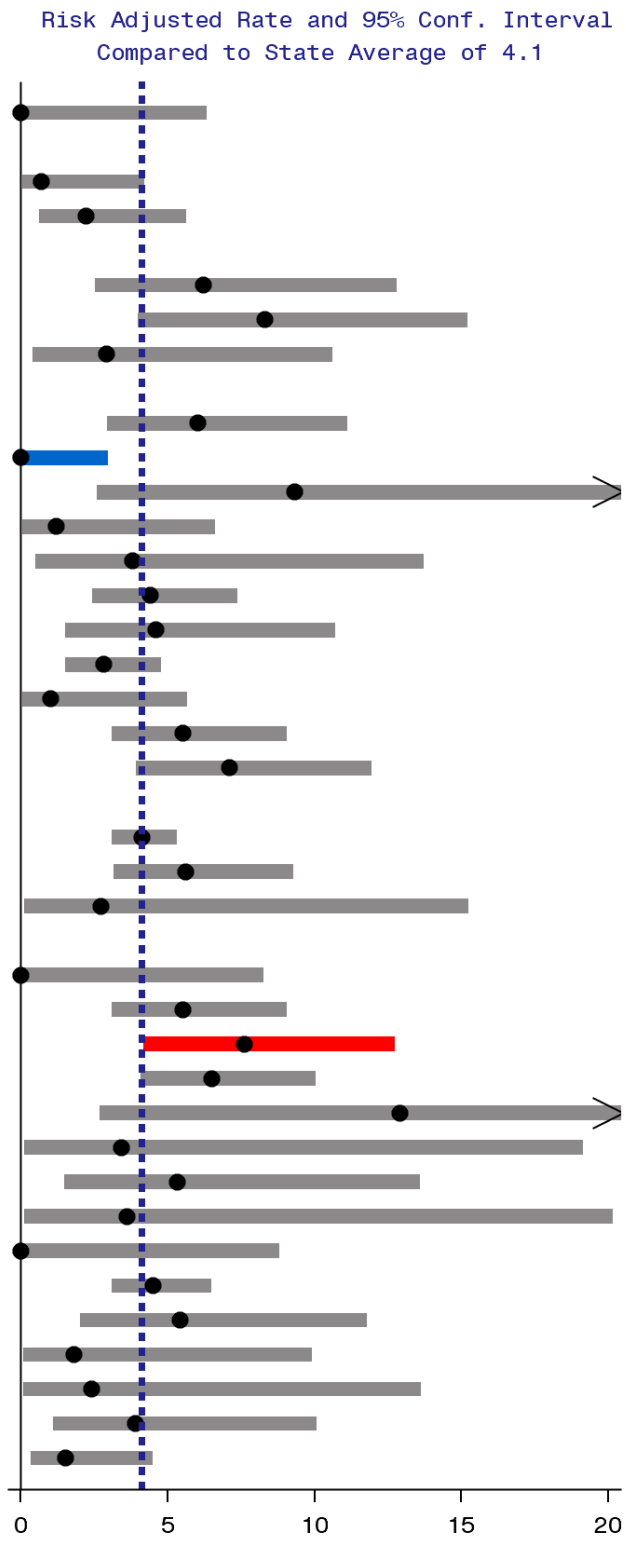

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Figure 2. Colon surgical site infection rates, New York 2018 (page 3 of 4)

Hospital	# SSI	#PATOS excl.	#PDS excl.	# Procs	Raw Rate	Adj Rate
NY Community Hosp	NA	NA	NA	NA	NA	NA
NYP-Allen	NA	NA	NA	NA	NA	NA
NYP-Brklyn Methodist	7	1	0	218	3.2	2.9
NYP-Columbia	8	9	0	462	1.7	2.1
NYP-Hudson Valley	1	1	0	40	2.5	2.7
NYP-Lawrence	2	1	0	76	2.6	2.9
NYP-Lower Manhattan	2	0	0	44	4.5	5.2
NYP-Morgan Stanley	0	0	0	40	0.0	0.0
NYP-Queens	7	4	0	218	3.2	3.3
NYP-Weill Cornell	18	8	0	441	4.1	4.5
NYU Langone Brooklyn^	13	3	0	155	8.4	7.7
NYU Tisch	18	1	1	633	2.8	3.1
NYU Winthrop	16	1	0	379	4.2	3.8
Nassau University	1	0	0	48	2.1	1.5
Nathan Littauer	NA	NA	NA	NA	NA	NA
Newark Wayne	1	1	0	45	2.2	2.5
Niagara Falls	2	1	0	33	6.1	7.4
North Central Bronx	NA	NA	NA	NA	NA	NA
North Shore*	10	6	0	556	1.8	1.6
Northern Dutchess	1	0	1	31	3.2	2.6
Northern Westchester	2	1	2	134	1.5	2.1
Noyes Memorial	2	0	0	24	8.3	7.7
Oishei Childrens	0	0	0	29	0.0	0.0
Olean General	2	0	2	61	3.3	3.7
Oneida Healthcare	5	3	1	104	4.8	7.0
Orange Regional	11	2	1	204	5.4	5.5
Oswego Hospital	NA	NA	NA	NA	NA	NA
Our Lady of Lourdes	8	1	2	112	7.1	8.0
Peconic Bay Medical*	0	1	0	67	0.0	0.0
Phelps Memorial	0	1	0	35	0.0	0.0
Plainview Hospital	1	4	1	105	1.0	0.9
Putnam Hospital	4	0	0	79	5.1	5.8
Queens Hospital	5	0	1	37	13.5	12.4
Richmond Univ MC	4	3	0	80	5.0	4.9
Rochester General	18	4	1	391	4.6	4.8
Rome Memorial	NA	NA	NA	NA	NA	NA
Roswell Park^	21	1	1	240	8.8	8.5
SUNY Downstate MedCr	1	2	0	53	1.9	1.9
Samaritan- Troy	6	1	2	99	6.1	6.6
Samaritan- Watertown	1	2	0	74	1.4	1.5

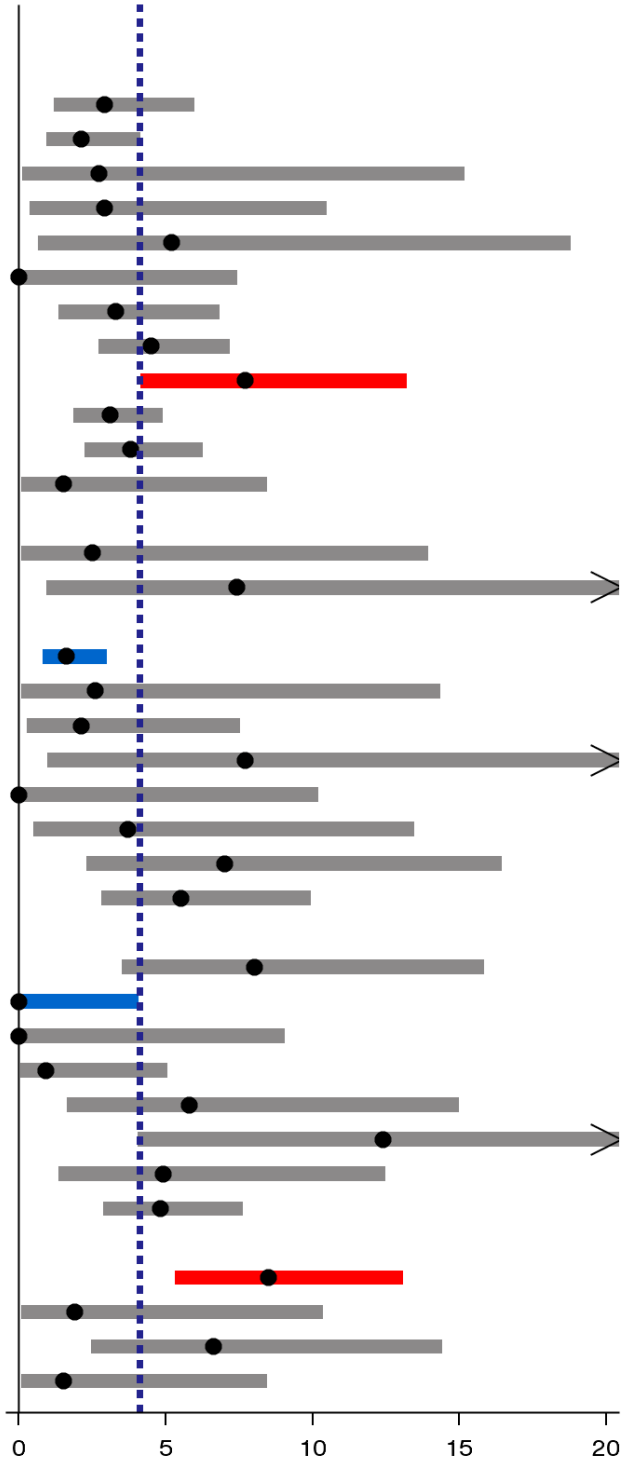

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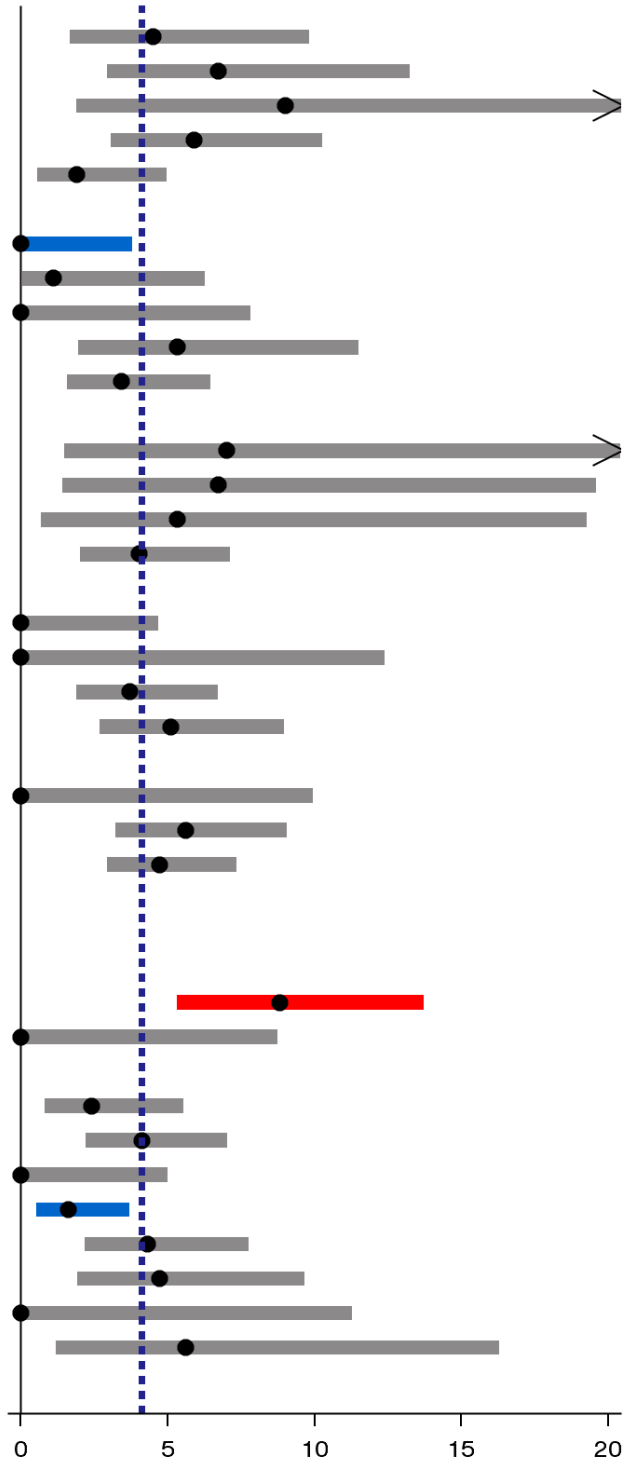
Figure 2. Colon surgical site infection rates, New York 2018 (page 4 of 4)

Hospital	# SSI	#PATOS excl.	#PDS excl.	# Procs	Raw Rate	Adj Rate
Saratoga Hospital	6	2	2	142	4.2	4.5
Sisters of Charity	8	2	0	123	6.5	6.7
Sisters- St Joseph	3	0	0	34	8.8	9.0
South Nassau Comm.	12	11	0	211	5.7	5.9
Southside	4	1	0	177	2.3	1.9
St Anthony	NA	NA	NA	NA	NA	NA
St Barnabas*	0	0	0	59	0.0	0.0
St Catherine Siena	1	1	0	107	0.9	1.1
St Charles Hospital	0	0	0	50	0.0	0.0
St Elizabeth Medical	6	0	0	105	5.7	5.3
St Francis- Roslyn	9	3	0	245	3.7	3.4
St James Mercy	NA	NA	NA	NA	NA	NA
St Johns Episcopal	3	0	0	35	8.6	7.0
St Johns Riverside	3	1	2	42	7.1	6.7
St Joseph- Bethpage	2	3	0	37	5.4	5.3
St Josephs- Syracuse	11	1	2	336	3.3	4.0
St Josephs- Yonkers	NA	NA	NA	NA	NA	NA
St Lukes Cornwall	0	5	0	72	0.0	0.0
St Marys Amsterdam	0	0	0	41	0.0	0.0
St Peters Hospital	11	2	0	363	3.0	3.7
Staten Island U N	12	3	3	215	5.6	5.1
Staten Island U S	NA	NA	NA	NA	NA	NA
StonyBrkSouthampton	0	0	0	30	0.0	0.0
StonyBrookUniv	16	4	2	234	6.8	5.6
Strong Memorial	20	4	1	422	4.7	4.7
Syosset Hospital	NA	NA	NA	NA	NA	NA
UHS Binghamton	NA	NA	NA	NA	NA	NA
UHS Chenango Memor	NA	NA	NA	NA	NA	NA
UHS Wilson^	19	4	1	244	7.8	8.8
UPMC Chautauqua WCA	0	0	0	38	0.0	0.0
United Memorial	NA	NA	NA	NA	NA	NA
Unity Hosp Rochester	5	0	0	235	2.1	2.4
Univ Hosp SUNY Upst	13	5	4	261	5.0	4.1
Upst. Community Gen	0	0	0	56	0.0	0.0
Vassar Brothers*	5	1	0	338	1.5	1.6
Westchester Medical	11	4	0	209	5.3	4.3
White Plains Hosp	7	7	3	204	3.4	4.7
Woodhull Med Ctr	0	0	0	21	0.0	0.0
Wyckoff Heights	3	4	0	52	5.8	5.6
Wyoming County Comm.	NA	NA	NA	NA	NA	NA



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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 2018, 37 hospitals reported a total of 159 CABG chest surgical site infections out of 10,540 procedures, a rate of 1.5 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 159 infections, none were classified as PATOS, and 38% were superficial, 33% were deep, and 30% were organ/space (Table 4). Most of the SSIs (70%) were detected upon readmission to the same hospital; 16% were identified during the initial hospitalization; 7% involved readmission to another hospital; and 7% 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 11 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 2018

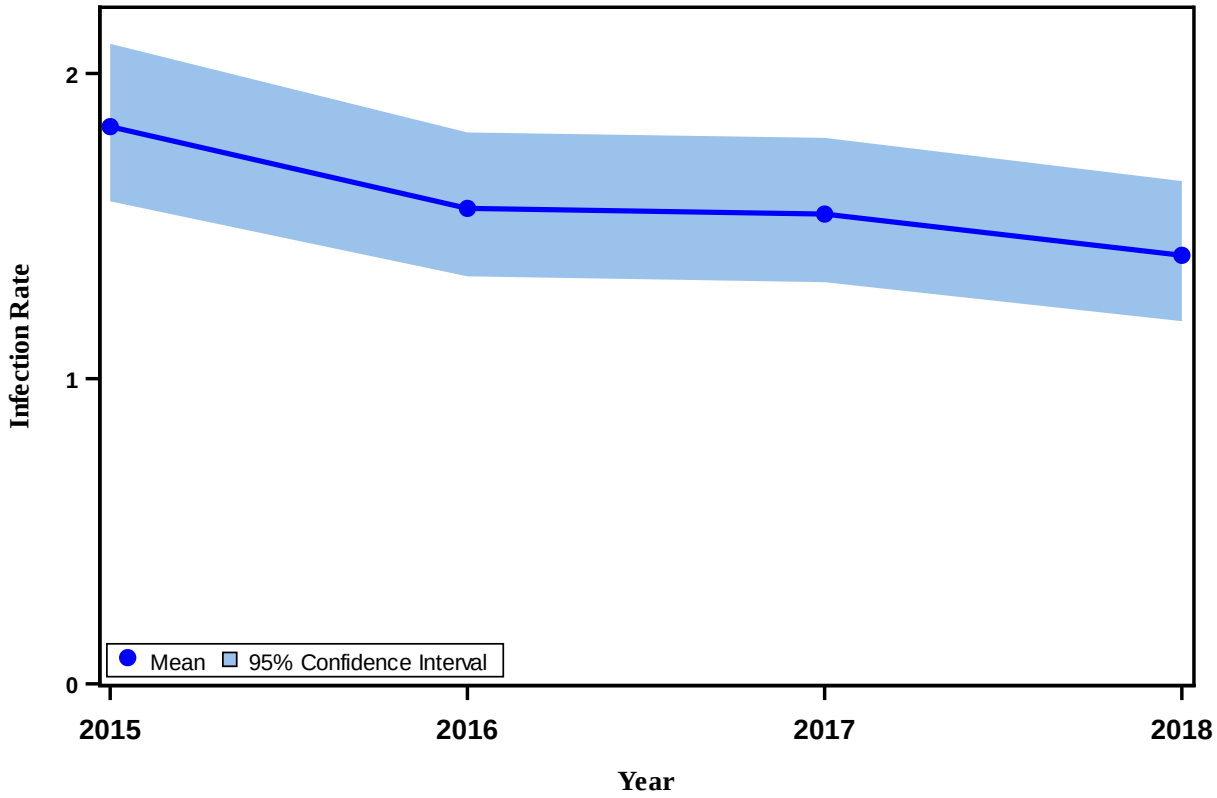
	When Detected				
Extent (Row%) (Column%)	**Initial Hospitalization**	**Readmitted to the Same Hospital**	**Readmitted to Another Hospital**	**Post-Discharge Surveillance Not Readmitted**	**Total**
Superficial Incisional	10 (16.7%) (38.5%)	34 (56.7%) (30.6%)	5 (8.3%) (45.5%)	11 (18.3%) (100.0%)	60 (37.7%)
Deep Incisional	9 (17.3%) (34.6%)	39 (75.0%) (35.1%)	4 (7.7%) (36.4%)	0 (0%) (0%)	52 (32.7%)
Organ/Space	7 (14.9%) (26.9%)	38 (80.9%) (34.2%)	2 (4.3%) (18.2%)	0 (0%) (0%)	47 (29.6%)
Total	26 (16.4%)	111 (69.8%)	11 (6.9%)	11 (6.9%)	159

New York State data reported as of June 27, 2019. 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 2018, the total number of CABG chest SSIs declined 23%, with 1.83 infections per 100 procedures in 2015, and 1.40 infections per 100 procedures in 2018.

Figure 3. Trend in coronary artery bypass graph chest site surgical site infection rates, New York State 2015-2018

Excluding infections present at time of surgery or 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	167	10,849	1.54 (1.32, 1.79)
2018	37	148	10,540	1.40 (1.19, 1.65)

New York State data reported as of June 27, 2019.
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 2018

Microorganism	Number of Isolates	Percent of Infections
Staphylococcus aureus	56	35.2
(MRSA)	(21)	(13.2)
Coagulase negative staphylococci	28	17.6
Pseudomonas spp.	16	10.1
Serratia spp.	12	7.5
Enterobacter spp.	9	5.7
Escherichia coli	9	5.7
Klebsiella spp.	9	5.7
Proteus spp.	5	3.1
Enterococci	4	2.5
Acinetobacter spp.	2	1.3
(MDR-*Acinetobacter*)	(1)	(0.6)
Other	19	11.9

New York State data reported as of June 27, 2019. Out of 159 infections. No microorganisms identified for 30 (19%) infections. MRSA: methicillin-resistant *Staphylococcus aureus;* MDR: multidrug resistant

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 2018, the following risk factors were associated with SSIs and were included in the risk-adjustment:

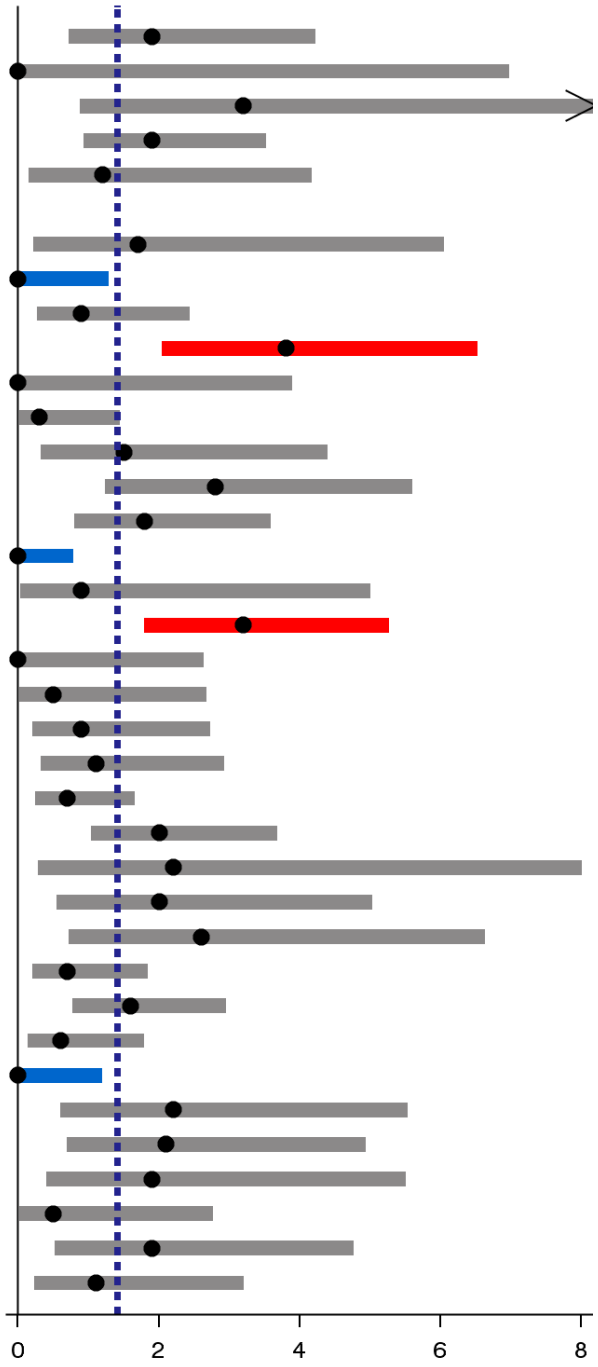
- Patients with diabetes were 2.3 times more likely to develop an SSI than patients without diabetes.
- Obese patients (with body mass index [BMI] greater than or equal to 30) were 1.4 times more likely to develop an SSI than patients with BMI less than 30.
- Females were 2.1 times more likely to develop an SSI than males.
- Patients who experienced trauma (i.e. a blunt or penetrating injury) prior to the procedure were 3.3 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 2018, 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 2018

Hospital	# SSI	#PATOS excl.	#PDS excl.	# Procs	Raw Rate	Adj Rate
Albany Med Ctr	6	0	0	330	1.8	1.9
Arnot Ogden Med Ctr	0	0	0	48	0.0	0.0
Bellevue Hospital	4	0	0	117	3.4	3.2
Buffalo General	10	0	0	507	2.0	1.9
Ellis Hospital	2	0	1	190	1.1	1.2
Glens Falls Hospital	NA	NA	NA	NA	NA	NA
Good Samar. Suffern	2	0	0	114	1.8	1.7
Good Samar. W Islip*	0	0	0	242	0.0	0.0
Lenox Hill Hospital	4	0	0	411	1.0	0.9
Maimonides Med Ctr^	13	0	1	323	4.0	3.8
Mary Imogene Bassett	0	0	0	83	0.0	0.0
Mercy Hosp Buffalo	1	0	0	377	0.3	0.3
Montefiore-Einstein	3	0	0	179	1.7	1.5
Montefiore-Moses	8	0	2	265	3.0	2.8
Mt Sinai	8	0	2	433	1.8	1.8
Mt Sinai St Lukes*	0	0	0	349	0.0	0.0
NYP-Brklyn Methodist	1	0	0	113	0.9	0.9
NYP-Columbia^	15	0	0	579	2.6	3.2
NYP-Queens	0	0	0	128	0.0	0.0
NYP-Weill Cornell	1	0	0	267	0.4	0.5
NYU Tisch	3	0	1	316	0.9	0.9
NYU Winthrop	4	0	0	316	1.3	1.1
North Shore	5	0	0	677	0.7	0.7
Rochester General	11	0	0	502	2.2	2.0
SUNY Downstate MedCr	2	0	0	78	2.6	2.2
Southside	4	0	0	223	1.8	2.0
St Elizabeth Medical	4	0	0	148	2.7	2.6
St Francis- Roslyn	4	0	0	632	0.6	0.7
St Josephs- Syracuse	10	0	0	613	1.6	1.6
St Peters Hospital	3	0	0	482	0.6	0.6
Staten Island U N*	0	0	0	221	0.0	0.0
StonyBrookUniv	4	0	0	206	1.9	2.2
Strong Memorial	5	0	1	252	2.0	2.1
UHS Wilson	3	0	0	145	2.1	1.9
Univ Hosp SUNY Upst	1	0	3	160	0.6	0.5
Vassar Brothers	4	0	0	236	1.7	1.9
Westchester Medical	3	0	0	277	1.1	1.1



Data reported as of June 27, 2019. ┆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 2018, 36 hospitals reported a total of 35 CABG donor site infections out of 9,410 procedures, a rate of 0.37 infections per 100 procedures. None of the infections were classified as PATOS.

Of the 35 infections, 83% were superficial, and 17% were deep (Table 6). Most of the SSIs (77%) were detected upon readmission to the same hospital; 9% were identified during the initial hospitalization; 6% involved readmission to another hospital; and 9% 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 3 PDS infections in the final SSI rate so as not to penalize facilities with the best surveillance systems.

Table 6. Method of detection for coronary artery bypass graft donor site infection by depth of infection, New York State 2018

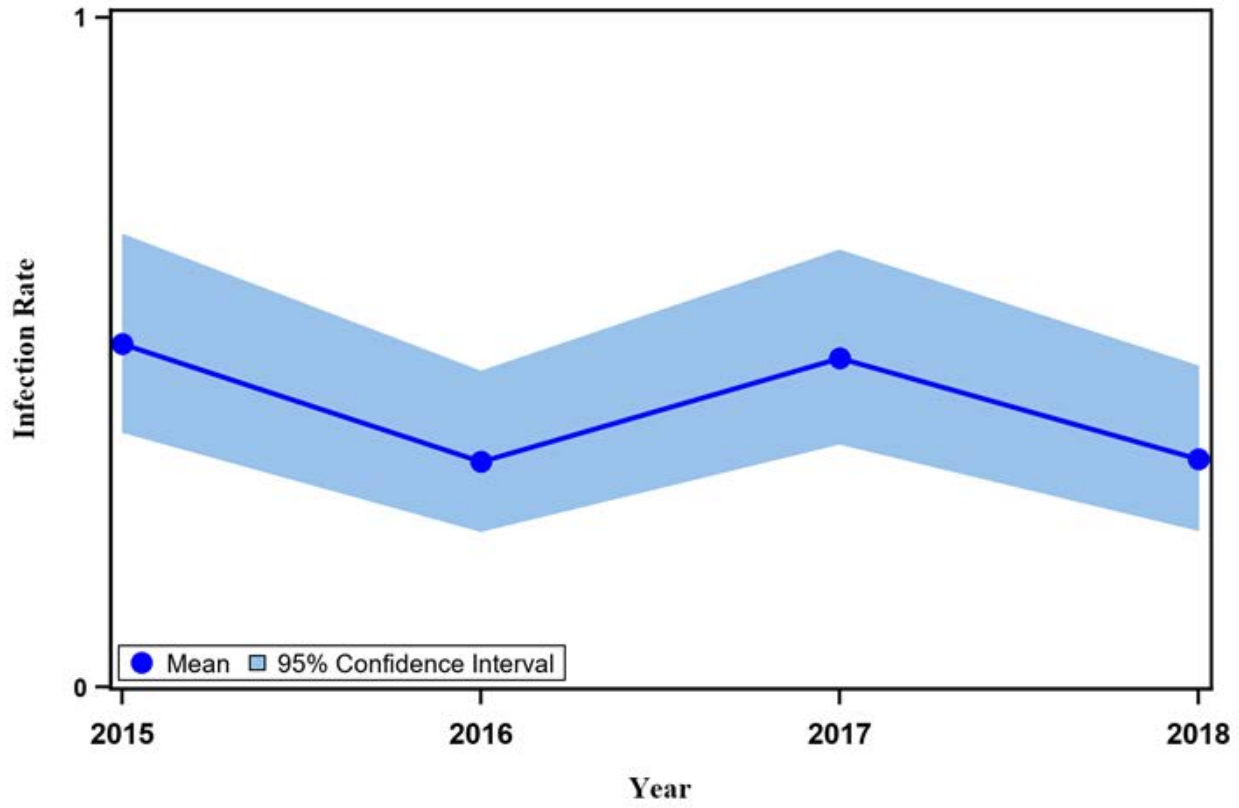
	When Detected				
Extent (Row%) (Column%)	**Initial Hospitalization**	**Readmitted to the Same Hospital**	**Readmitted to Another Hospital**	**Post-Discharge Surveillance Not Readmitted**	**Total**
Superficial Incisional	3 (10.3%) (100.0%)	22 (75.9%) (81.5%)	1 (3.4%) (50.0%)	3 (10.3%) (100.0%)	29 (82.9%)
Deep Incisional	0 (0.0%) (0.0%)	5 (83.3%) (18.5%)	1 (16.7%) (50.0%)	0 (0%) (0%)	6 (17.1%)
Total	3 (8.6%)	27 (77.1%)	2 (5.7%)	3 (8.6%)	35

New York State data reported as of June 27, 2019. Excludes infections present at time of surgery.

Trends in CABG SSI rates are shown in Figure 5. Between 2015 and 2018, the total number of CABG donor site infection rate decreased 33%, from 0.51 infections per 100 procedures in 2015, to 0.34 infections per 100 procedures in 2018.

Figure 5. Trend in coronary artery bypass graft donor site surgical site infection rates, New York State 2015-2018

Excluding infections present at time of surgery or 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	47	9,559	0.49 (0.36, 0.65)
2018	36	32	9,410	0.34 (0.23, 0.48)

New York State data reported as of June 27, 2019.
Infection rate is the number of infections divided by the number of procedures, multiplied by 100.

Klebsiella spp., *Escherichia coli, 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 2018

Microorganism	Number of Isolates	Percent of Infections
Klebsiella spp.	7	20.0
Escherichia coli	6	17.1
Staphylococcus aureus	6	17.1
(MRSA)	(1)	(2.9)
Pseudomonas spp.	5	14.3
Enterococci	2	5.7
Enterobacter spp.	1	2.9
Other	12	34.3

New York State data reported as of June 27, 2019. Out of 35 infections. No microorganisms identified for 9 (26%) infections. MRSA: methicillin-resistant *Staphylococcus aureus;* spp: multiples 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 2018, 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:

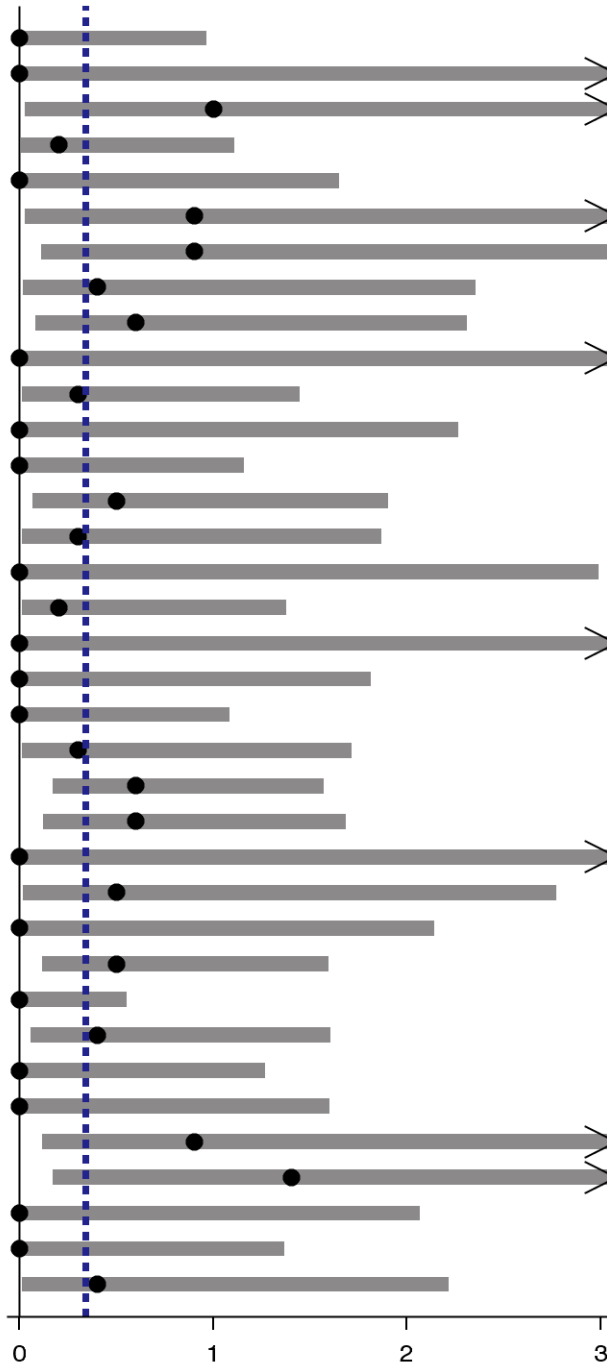
- Obese patients (with BMI at least 30) were 2.1 times more likely to develop an SSI than patients with BMI less than 30.
- Patients with diabetes were 2.0 times more likely to develop an SSI than patients without diabetes.

Hospital-Specific CABG Donor Site SSI rates

Hospital-specific CABG donor site SSI rates are provided in Figure 6. In 2018, no hospitals were flagged for having a significantly high or low rate.

Figure 6. Coronary artery bypass graft donor site infection rates, New York 2018

Hospital	# SSI	#PATOS excl.	#PDS excl.	# Procs	Raw Rate	Adj Rate
Albany Med Ctr	0	0	0	303	0.0	0.0
Arnot Ogden Med Ctr	0	0	0	45	0.0	0.0
Bellevue Hospital	1	0	0	112	0.9	1.0
Buffalo General	1	0	0	470	0.2	0.2
Ellis Hospital	0	0	0	181	0.0	0.0
Good Samar. Suffern	1	0	0	112	0.9	0.9
Good Samar. W Islip	2	0	0	231	0.9	0.9
Lenox Hill Hospital	1	0	0	254	0.4	0.4
Maimonides Med Ctr	2	0	0	309	0.6	0.6
Mary Imogene Bassett	0	0	0	68	0.0	0.0
Mercy Hosp Buffalo	1	0	0	364	0.3	0.3
Montefiore-Einstein	0	0	0	135	0.0	0.0
Montefiore-Moses	0	0	0	259	0.0	0.0
Mt Sinai	2	0	0	393	0.5	0.5
Mt Sinai St Lukes	1	0	0	294	0.3	0.3
NYP-Brklyn Methodist	0	0	0	111	0.0	0.0
NYP-Columbia	1	0	0	517	0.2	0.2
NYP-Queens	0	0	0	59	0.0	0.0
NYP-Weill Cornell	0	0	0	206	0.0	0.0
NYU Tisch	0	0	0	277	0.0	0.0
NYU Winthrop	1	0	0	303	0.3	0.3
North Shore	4	0	0	634	0.6	0.6
Rochester General	3	0	0	482	0.6	0.6
SUNY Downstate MedCr	0	0	0	46	0.0	0.0
Southside	1	0	0	211	0.5	0.5
St Elizabeth Medical	0	0	0	127	0.0	0.0
St Francis- Roslyn	3	0	0	597	0.5	0.5
St Josephs- Syracuse	0	0	0	506	0.0	0.0
St Peters Hospital	2	0	0	432	0.5	0.4
Staten Island U N	0	0	0	210	0.0	0.0
StonyBrookUniv	0	0	0	197	0.0	0.0
Strong Memorial	2	0	0	212	0.9	0.9
UHS Wilson	2	0	0	134	1.5	1.4
Univ Hosp SUNY Upst	0	0	0	141	0.0	0.0
Vassar Brothers	0	0	0	217	0.0	0.0
Westchester Medical	1	0	0	261	0.4	0.4



Data reported as of June 27, 2019. ┆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 2018, 154 hospitals reported a total of 372 hip replacement/revision surgical site infections out of 35,252 procedures, a rate of 1.1 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 372 infections, 11 were classified as PATOS and excluded from further analysis, because PATOS infections are more difficult to prevent.

Of the remaining 361 infections, 30% were superficial, 27% were deep, and 43% were organ/space (Table 8). Most of the SSIs (82%) were detected upon readmission to the same hospital; 4% were identified during the initial hospitalization; 8% involved readmission to another hospital; and 6% were detected using PDS and not readmitted. The majority (61%) 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 23 PDS infections in the final SSI rate so as not to penalize facilities with the best surveillance systems.

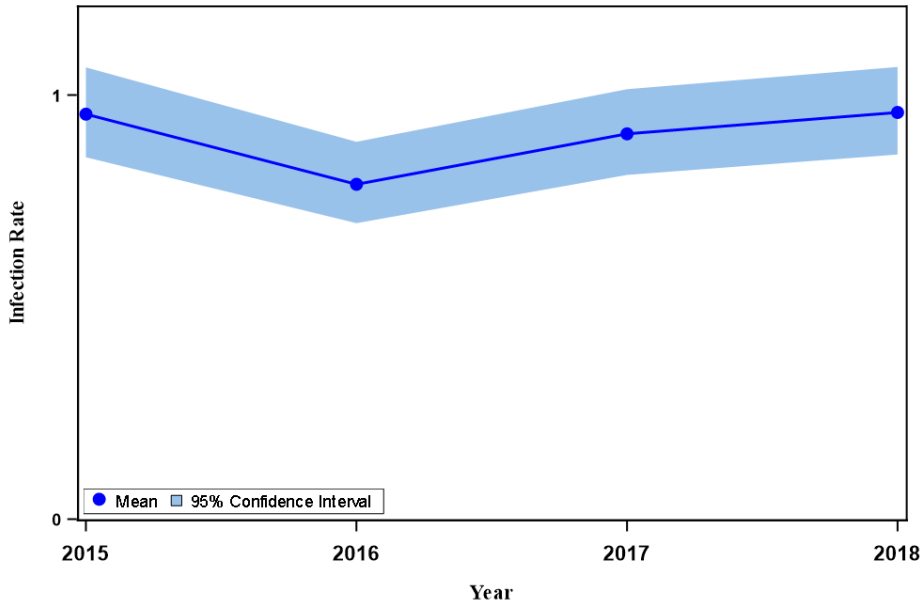
Table 8. Method of detection of hip surgical site infection by depth of infection, New York State 2018

	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 (5.6%) (46.2%)	77 (72.0%) (25.9%)	10 (9.3%) (35.7%)	14 (13.1%) (60.9%)	107 (29.6%)
Deep Incisional	4 (4.1%) (30.8%)	79 (81.4%) (26.6%)	5 (5.2%) (17.9%)	9 (9.3%) (39.1%)	97 (26.9%)
Organ/Space	3 (1.9%) (23.1%)	141 (89.8) (47.5%)	13 (8.3%) (46.4%)	0 (0%) (0 %)	157 (43.5%)
Total	13 (3.6%)	297 (82.3%)	28 (7.8%)	23 (6.4%)	361

New York State data reported as of June 27, 2019. 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 2018, the total number of hip surgical site infections remained the same, at 0.96 infections per 100 procedures.

Figure 7. Trend in hip surgical site infection rates, New York State 2015-2018
Excluding infections present at time of surgery or 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	267	33,811	0.790 (0.70, 0.89)
2017	157	317	34,883	0.909 (0.81, 1.01)
2018	154	338	35,241	0.959 (0.86, 1.07)

New York State Data reported as of June 27, 2019.
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 2018

Microorganism	Number of Isolates	Percent of Infections
Staphylococcus aureus	160	43.0
(MRSA)	(63)	(16.9)
Coagulase negative staphylococci	55	14.8
Enterococci	37	9.9
(VRE)	(4)	(1.1)
Pseudomonas spp.	34	9.1
Escherichia coli	27	7.3
Streptococci	27	7.3
Enterobacter spp.	15	4.0
Proteus spp.	14	3.8
Klebsiella spp.	13	3.5
(CRE-*Klebsiella*)	(1)	(0.3)
Serratia spp.	13	3.5
Corynebacteria	11	3.0
Yeast	5	1.3
Acinetobacter spp.	3	0.8
(MDR-*Acinetobacter*)	(1)	(0.3)
Other	24	6.5

New York State data reported as of June 27, 2019. Out of 372 infections. No microorganisms identified for 30 (8%) 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 2018, after excluding SSIs identified using PDS that did not result in hospitalization, and SSIs that were PATOS, the following risk factors were associated with SSIs. These variables were used to risk-adjust hospital-specific rates.

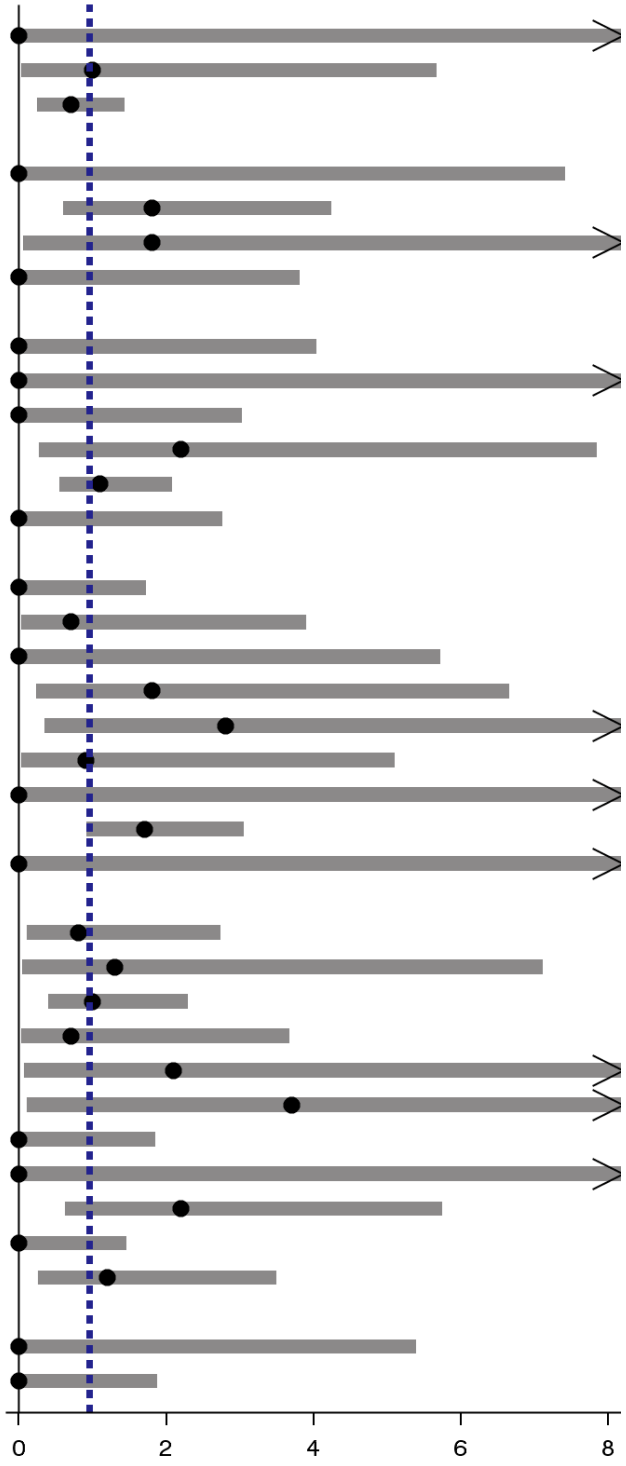
- Patients with severe systemic disease (ASA score of 3, 4, or 5) were 1.7 times more likely to develop an SSI than healthier patients (ASA score of 1 or 2).
- The risk of SSI varied by type of hip procedure. Compared to total and resurfacing primary hip replacement procedures, partial primary procedures were 1.5 times more likely to result in an SSI, revisions with no prior infection at the joint were 3.9 times more likely to result in an SSI, and revisions with prior infection at the joint were 4.0 times more likely to result in an SSI.
- Very obese patients (with BMI greater than or equal to 40) were 3.0 times more likely to develop an SSI, and obese patients (with BMI between 30 and 39) were 1.6 times more likely to develop an SSI than patients with BMI less than 30.

Hospital-Specific Hip SSI Rates

Hospital-specific hip SSI rates are provided in Figure 8. Of the 141 hospitals that reported more than twenty hip procedures in 2018, three hospitals (2%) had hip SSI rates that were 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. Two hospitals (1%) had an SSI rate significantly lower than the state average; Hospital for Special Surgery was significantly lower in each of the past eleven years (2008-2018).

Figure 8. Hip replacement surgical site infection rates, New York 2018 (page 1 of 4)

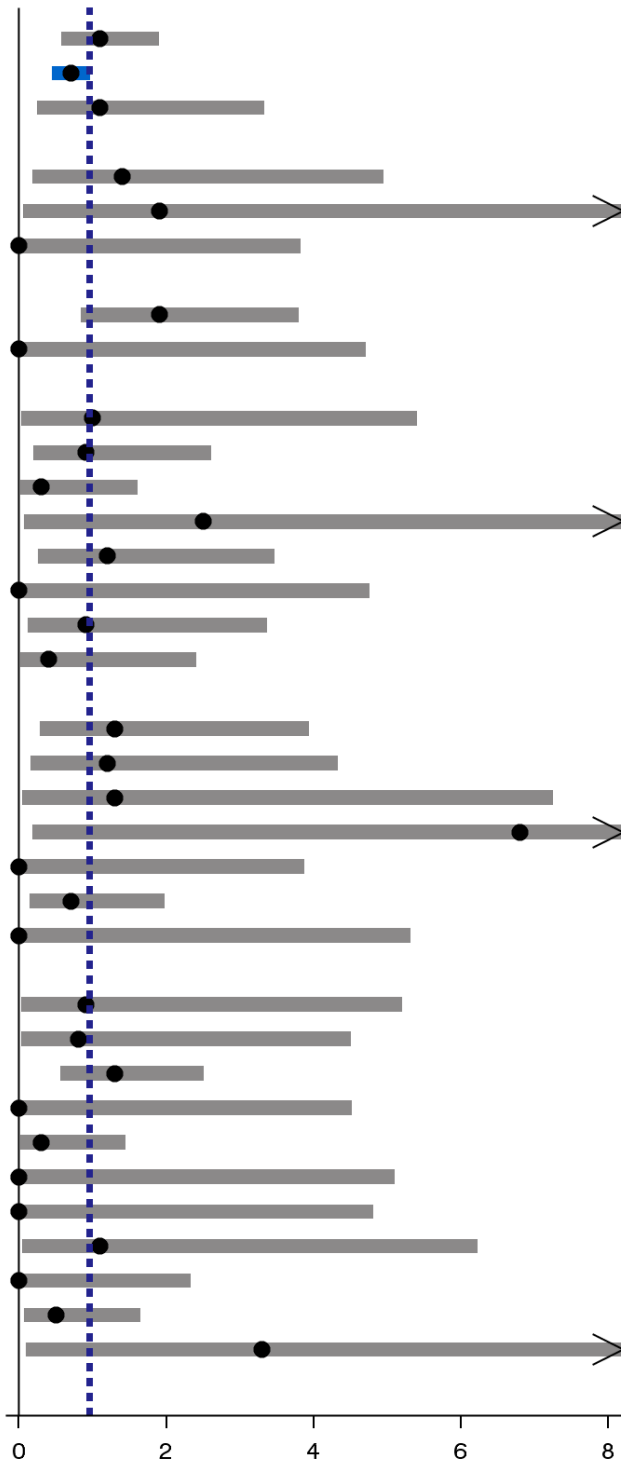
Hospital	# SSI	#PATOS excl.	#PDS excl.	# Procs	Raw Rate	Adj Rate
AO Fox Memorial	0	0	1	36	0.0	0.0
Adirondack Medical	1	0	0	98	1.0	1.0
Albany Med Ctr	6	0	0	933	0.6	0.7
Albany Memorial	NA	NA	NA	NA	NA	NA
Alice Hyde Med Ctr	0	0	0	42	0.0	0.0
Arnot Ogden Med Ctr	5	0	0	232	2.2	1.8
Auburn Memorial	1	0	0	46	2.2	1.8
Bellevue Hospital	0	0	0	85	0.0	0.0
Bon Secours	NA	NA	NA	NA	NA	NA
BronxCare	0	0	0	68	0.0	0.0
Brookdale Hospital	0	0	0	25	0.0	0.0
Brooklyn Hosp Ctr	0	0	0	111	0.0	0.0
Brooks Memorial	2	0	0	96	2.1	2.2
Buffalo General	10	0	0	690	1.4	1.1
Canton-Potsdam	0	0	0	88	0.0	0.0
Catskill Regional	NA	NA	NA	NA	NA	NA
Cayuga Medical Ctr	0	0	0	199	0.0	0.0
Champlain Valley	1	0	1	119	0.8	0.7
Claxton-Hepburn	0	0	0	44	0.0	0.0
Columbia Memorial	2	0	0	105	1.9	1.8
Coney Island Hosp	2	0	0	59	3.4	2.8
Corning Hospital	1	0	0	112	0.9	0.9
Cortland Reg Med	0	0	0	31	0.0	0.0
Crouse Hospital	12	0	0	744	1.6	1.7
East. Niag. Lockport	0	0	0	24	0.0	0.0
Eastern Long Island	NA	NA	NA	NA	NA	NA
Ellis Hospital	2	0	0	250	0.8	0.8
Elmhurst Hospital	1	0	0	69	1.4	1.3
Erie County Med Ctr	6	0	0	582	1.0	1.0
FF Thompson	1	0	0	161	0.6	0.7
Faxton St. Lukes	1	0	0	45	2.2	2.1
Flushing Hospital	1	0	0	37	2.7	3.7
Geneva General	0	0	0	134	0.0	0.0
Glen Cove Hospital	0	0	0	29	0.0	0.0
Glens Falls Hospital	4	0	0	178	2.2	2.2
Good Samar. Suffern	0	0	2	187	0.0	0.0
Good Samar. W Islip	3	0	1	201	1.5	1.2
Harlem Hospital	NA	NA	NA	NA	NA	NA
HealthAlli Broadway	0	0	0	46	0.0	0.0
HealthAlli MarysAve	0	0	0	126	0.0	0.0



Data reported as of June 27, 2019. ¦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 2018 (page 2 of 4)

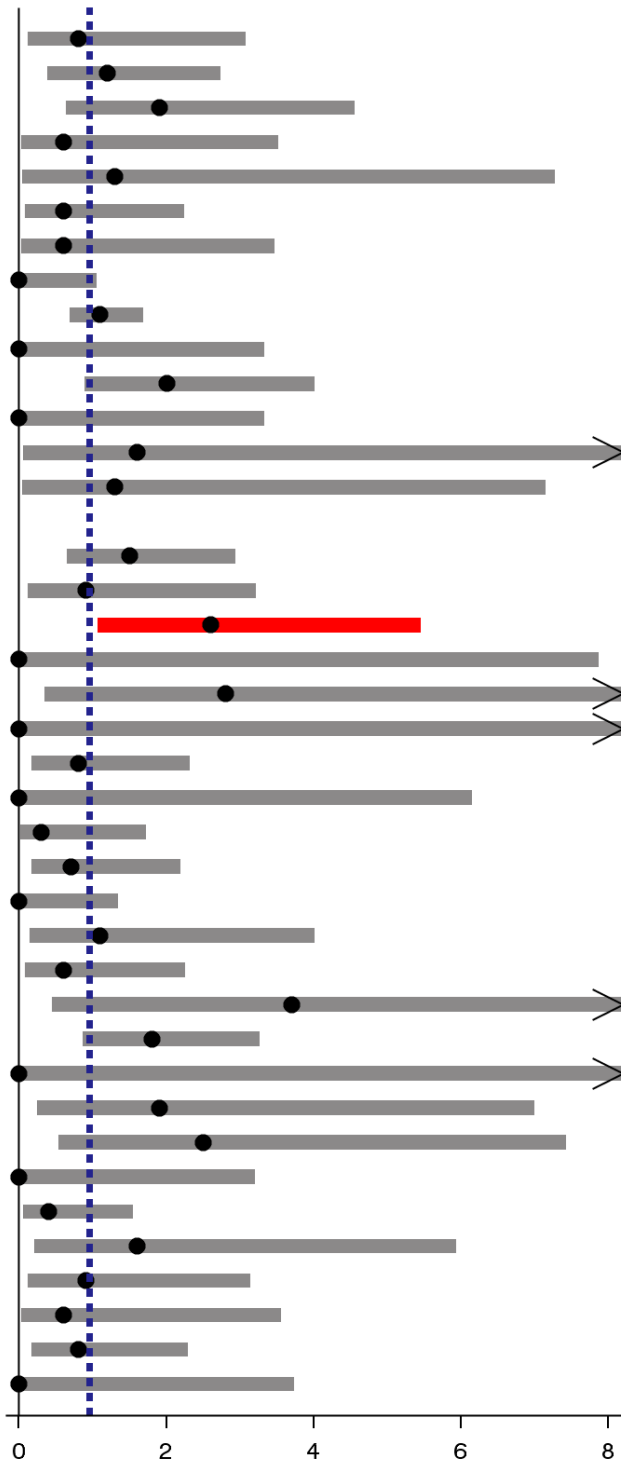
Hospital	# SSI	#PATOS excl.	#PDS excl.	# Procs	Raw Rate	Adj Rate
Highland Hospital	12	1	1	1209	1.0	1.1
Hosp for Spec Surg*	27	0	2	5105	0.5	0.7
Huntington Hospital	3	0	0	259	1.2	1.1
Interfaith Med Ctr	NA	NA	NA	NA	NA	NA
JT Mather Hospital	2	0	0	132	1.5	1.4
Jacobi Med Ctr	1	0	1	45	2.2	1.9
Jamaica Hospital	0	0	0	61	0.0	0.0
Jones Memorial	NA	NA	NA	NA	NA	NA
Kenmore Mercy	8	1	0	462	1.7	1.9
Kings County Hosp	0	0	0	57	0.0	0.0
Kingsbrook Jewish MC	NA	NA	NA	NA	NA	NA
LIJ at Forest Hills	1	0	0	99	1.0	1.0
LIJ at Valley Stream	3	0	0	390	0.8	0.9
Lenox Hill Hospital	1	0	0	419	0.2	0.3
Lincoln Med Ctr	1	0	0	34	2.9	2.5
Long Isl Jewish(LIJ)	3	0	0	299	1.0	1.2
Long Isl. Community	0	0	0	71	0.0	0.0
Maimonides Med Ctr	2	0	0	215	0.9	0.9
Mary Imogene Bassett	1	0	0	208	0.5	0.4
Massena Memorial	NA	NA	NA	NA	NA	NA
Memor SloanKettering	3	0	0	138	2.2	1.3
Mercy Hosp Buffalo	2	0	0	143	1.4	1.2
Mercy Med Ctr	1	0	0	79	1.3	1.3
Metropolitan Hosp	1	0	0	20	5.0	6.8
MidHudson Reg of WMC	0	0	0	83	0.0	0.0
Millard Fill. Suburb	3	0	0	453	0.7	0.7
Montefiore-Moses	0	0	0	40	0.0	0.0
Montefiore-Mt Vernon	NA	NA	NA	NA	NA	NA
Montefiore-NewRochl	1	0	0	136	0.7	0.9
Montefiore-Nyack	1	0	0	130	0.8	0.8
Montefiore-Wakefield	8	0	0	533	1.5	1.3
Mount St. Marys	0	0	0	65	0.0	0.0
Mt Sinai	1	2	0	387	0.3	0.3
Mt Sinai Beth Israel	0	0	0	63	0.0	0.0
Mt Sinai Brooklyn	0	0	1	54	0.0	0.0
Mt Sinai Queens	1	0	0	82	1.2	1.1
Mt Sinai St Lukes	0	0	0	109	0.0	0.0
Mt Sinai West	2	0	0	496	0.4	0.5
NY Community Hosp	1	0	0	24	4.2	3.3
NYP-Allen	NA	NA	NA	NA	NA	NA



Data reported as of June 27, 2019. ┆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 2018 (page 3 of 4)

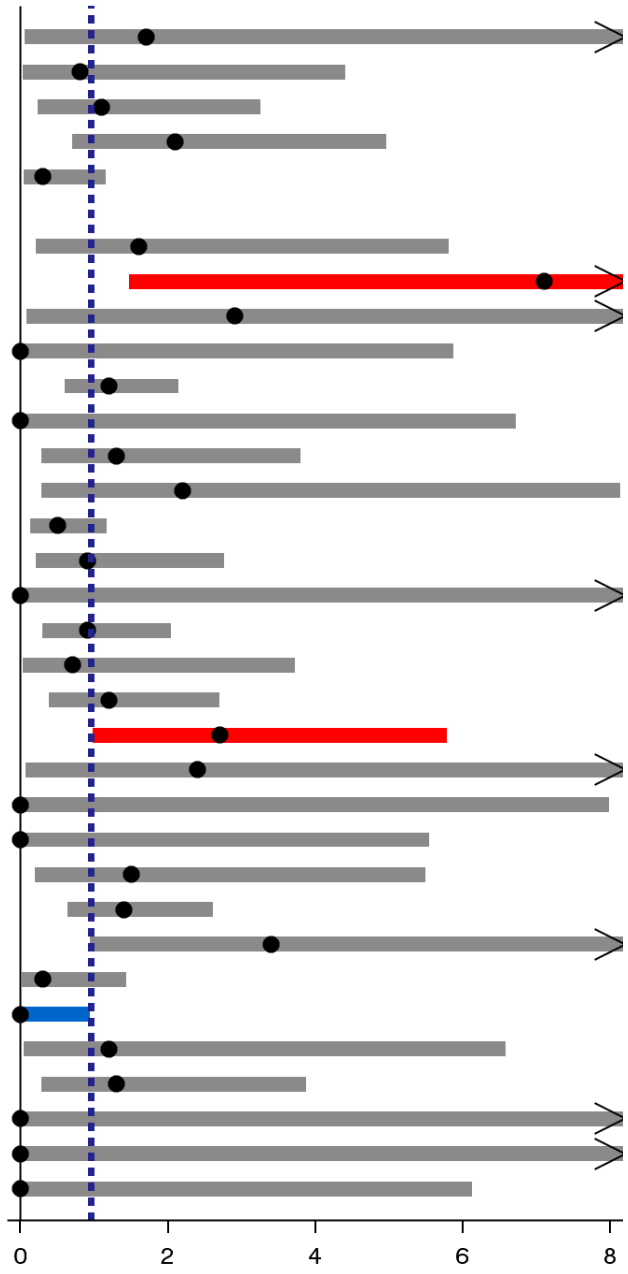
Hospital	# SSI	#PATOS excl.	#PDS excl.	# Procs	Raw Rate	Adj Rate
NYP-Brklyn Methodist	2	0	0	193	1.0	0.8
NYP-Columbia	5	1	0	486	1.0	1.2
NYP-Hudson Valley	5	0	0	179	2.8	1.9
NYP-Lawrence	1	0	0	152	0.7	0.6
NYP-Lower Manhattan	1	0	0	77	1.3	1.3
NYP-Queens	2	0	0	321	0.6	0.6
NYP-Weill Cornell	1	0	0	160	0.6	0.6
NYU Langone Brooklyn	0	0	0	261	0.0	0.0
NYU Orthopedic Hosp	21	1	0	1919	1.1	1.1
NYU Tisch	0	0	0	65	0.0	0.0
NYU Winthrop	8	0	0	372	2.2	2.0
Nassau University	0	0	0	80	0.0	0.0
Nathan Littauer	1	0	1	53	1.9	1.6
Newark Wayne	1	0	1	73	1.4	1.3
Niagara Falls	NA	NA	NA	NA	NA	NA
North Shore	8	0	0	500	1.6	1.5
Northern Dutchess	2	0	0	253	0.8	0.9
Northern Westchester^	7	0	0	301	2.3	2.6
Noyes Memorial	0	0	0	40	0.0	0.0
Olean General	2	0	0	73	2.7	2.8
Oneida Healthcare	0	0	0	21	0.0	0.0
Orange Regional	3	0	0	375	0.8	0.8
Oswego Hospital	0	0	0	40	0.0	0.0
Our Lady of Lourdes	1	0	4	278	0.4	0.3
Peconic Bay Medical	3	0	0	415	0.7	0.7
Phelps Memorial	0	0	0	316	0.0	0.0
Plainview Hospital	2	0	0	177	1.1	1.1
Putnam Hospital	2	0	0	300	0.7	0.6
Richmond Univ MC	2	0	2	45	4.4	3.7
Rochester General	10	1	0	541	1.8	1.8
Rome Memorial	0	0	0	22	0.0	0.0
SUNY Downstate MedCr	2	0	0	88	2.3	1.9
Samaritan- Troy	3	0	0	107	2.8	2.5
Samaritan- Watertown	0	0	0	103	0.0	0.0
Saratoga Hospital	2	1	1	428	0.5	0.4
Sisters of Charity	2	0	0	110	1.8	1.6
Sisters- St Joseph	2	0	0	223	0.9	0.9
South Nassau Comm.	1	0	0	144	0.7	0.6
Southside	3	0	0	401	0.7	0.8
St Anthony	0	0	0	84	0.0	0.0



Data reported as of June 27, 2019. ┆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 2018 (page 4 of 4)

Hospital	# SSI	#PATOS excl.	#PDS excl.	# Procs	Raw Rate	Adj Rate
St Barnabas	1	0	0	48	2.1	1.7
St Catherine Siena	1	0	0	97	1.0	0.8
St Charles Hospital	3	0	0	293	1.0	1.1
St Elizabeth Medical	5	0	2	232	2.2	2.1
St Francis- Roslyn	2	0	0	607	0.3	0.3
St James Mercy	NA	NA	NA	NA	NA	NA
St Johns Dobbs Ferry	2	0	0	145	1.4	1.6
St Johns Episcopal^	3	0	0	34	8.8	7.1
St Johns Riverside	1	0	0	25	4.0	2.9
St Joseph- Bethpage	0	0	0	43	0.0	0.0
St Josephs- Syracuse	11	0	1	871	1.3	1.2
St Josephs- Yonkers	0	0	0	39	0.0	0.0
St Lukes Cornwall	3	1	0	226	1.3	1.3
St Marys Amsterdam	2	0	0	80	2.5	2.2
St Peters Hospital	4	1	0	858	0.5	0.5
Staten Island U N	3	0	0	311	1.0	0.9
StonyBrkSouthampton	0	0	0	39	0.0	0.0
StonyBrookUniv	5	0	0	487	1.0	0.9
Strong Memorial	1	0	0	103	1.0	0.7
Syosset Hospital	5	0	0	456	1.1	1.2
UHS Binghamton^	6	0	0	243	2.5	2.7
UHS Chenango Memor	1	0	0	41	2.4	2.4
UHS Wilson	0	0	0	35	0.0	0.0
UPMC Chautauqua WCA	0	0	0	48	0.0	0.0
United Memorial	2	0	0	121	1.7	1.5
Unity Hosp Rochester	9	0	0	616	1.5	1.4
Univ Hosp SUNY Upst	4	0	0	76	5.3	3.4
Upst. Community Gen	1	1	1	341	0.3	0.3
Vassar Brothers*	0	0	0	282	0.0	0.0
Westchester Medical	1	0	0	74	1.4	1.2
White Plains Hosp	3	0	0	213	1.4	1.3
Woodhull Med Ctr	0	0	0	28	0.0	0.0
Wyckoff Heights	0	0	0	20	0.0	0.0
Wyoming County Comm.	0	0	0	52	0.0	0.0



Data reported as of June 27, 2019. ┆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 2018, 149 hospitals reported a total of 267 hysterectomy surgical site infections out of 16,806 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 267 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 264 infections, 49% were superficial, 8% were deep, and 42% were organ/space (Table 10). Most of the SSIs (52%) were detected upon readmission to the same hospital; 11% were identified during the initial hospitalization; 7% involved readmission to another hospital; and 30% were detected using post-discharge surveillance and not readmitted. Most (90%) 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 78 PDS infections in the final SSI rate so as not to penalize facilities with the best surveillance systems.

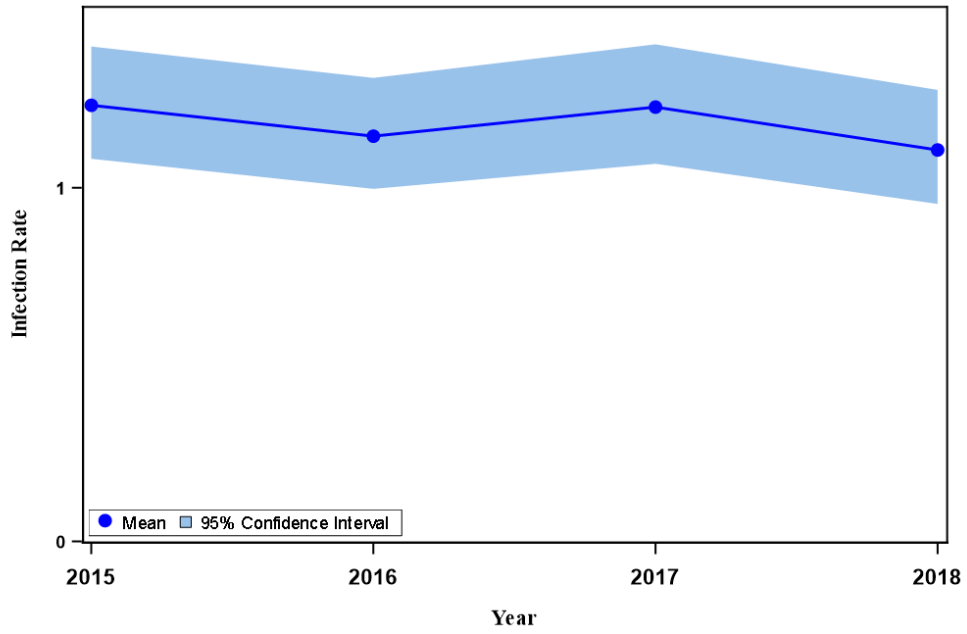
Table 10. Method of detection of hysterectomy surgical site infection by depth of infection, New York State 2018

	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 (7.7%) (34.5%)	43 (33.1%) (31.2%)	7 (5.4%) (36.8%)	70 (53.8%) (89.7%)	130 (49.2%)
Deep Incisional	4 (18.2%) (13.8%)	10 (45.5%) (7.2%)	4 (18.2%) (21.1%)	4 (18.2%) (5.1%)	22 (8.3%)
Organ/Space	15 (13.4%) (51.7%)	85 (75.9%) (61.6%)	8 (7.1%) (42.1%)	4 (3.6%) (5.1%)	112 (42.4%)
Total	29 (11.0%)	138 (52.3%)	19 (7.2%)	78 (29.6%)	264

New York State data reported as of June 27, 2019. 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 2018 the total number of hysterectomy surgical site infections decreased 10%, from 1.23 infections per 100 procedures in 2015, to 1.11 infections per 100 procedures in 2018.

Figure 9. Trend in hysterectomy surgical site infection rates, New York State 2015-2018
Excluding infections present at time of surgery or 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	210	18,325	1.15 (1.00, 1.31)
2017	149	208	16,934	1.23 (1.07, 1.41)
2018	149	186	16,803	1.11 (0.95, 1.28)

New York State data reported as of June 27, 2019.
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 2018

Microorganism	Number of Isolates	Percent of Infections
Enterococci	45	16.9
(VRE)	(2)	(0.7)
Escherichia coli	44	16.5
Staphylococcus aureus	33	12.4
(MRSA)	(10)	(3.7)
Streptococci	33	12.4
Coagulase negative staphylococci	30	11.2
Bacteroides spp.	22	8.2
Klebsiella spp.	18	6.7
(CRE)	(2)	(0.7)
Proteus spp.	15	5.6
Pseudomonas spp.	12	4.5
Enterobacter spp.	11	4.1
Yeast	9	3.4
Citrobacter spp.	7	2.6
Corynebacterium spp.	7	2.6
Prevotella spp.	7	2.6
Other	24	9.0

New York State data reported as of June 27, 2019. Out of 267 infections. No microorganisms identified for 72 (27%) infections. CRE: carbapenem-resistant Enterobacteriaceae; MRSA: methicillin-resistant *Staphylococcus aureus;* 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.

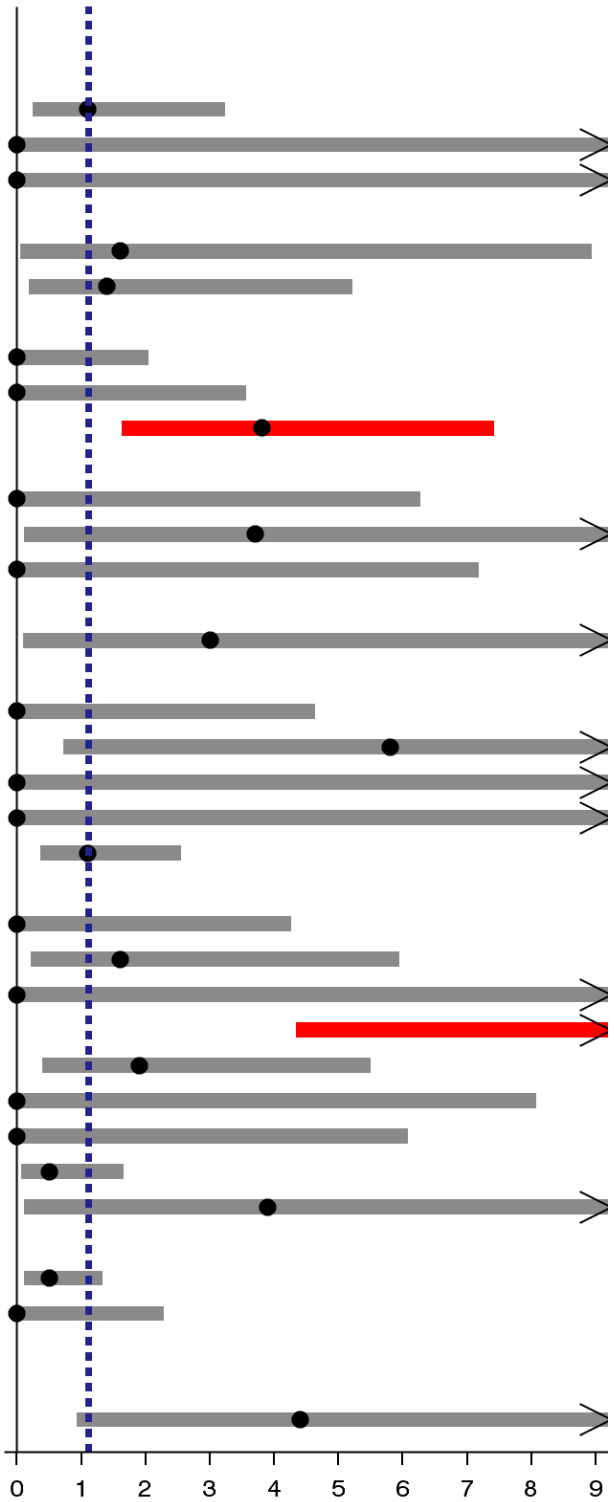
- For each unit increase in ASA score (1, 2, 3, 4/5), a measure of systemic disease, patients were 1.5 times more likely to develop an SSI.
- Procedures that involved traditional surgical incisions were 2.2 times more likely to result in SSI than procedures performed entirely with a laparoscopic instrument.
- Patients with diabetes were 1.6 times more likely to develop an SSI than patients without diabetes.
- Obese patients (with body mass index [BMI] greater than 30) were 2.0 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 1.8 times more likely to result in SSI than procedures less than three hours.

Hospital-Specific Hysterectomy SSI Rates

Hospital-specific hysterectomy SSI rates are provided in Figure 10. Of the 109 hospitals that reported more than twenty procedures in 2018, four hospitals (4%) had a hysterectomy SSI rate that was statistically higher than the state average. These four 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 2018 (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	3	0	0	294	1.0	1.1
Albany Memorial	0	0	0	21	0.0	0.0
Arnot Ogden Med Ctr	0	0	1	20	0.0	0.0
Auburn Memorial	NA	NA	NA	NA	NA	NA
Bellevue Ellis	1	0	1	68	1.5	1.6
Bellevue Hospital	2	0	3	102	2.0	1.4
Bon Secours	NA	NA	NA	NA	NA	NA
BronxCare	0	0	0	99	0.0	0.0
Brookdale Hospital	0	0	0	67	0.0	0.0
Brooklyn Hosp Ctr^	8	0	0	207	3.9	3.8
Brooks Memorial	NA	NA	NA	NA	NA	NA
Buffalo General	0	0	0	50	0.0	0.0
Canton-Potsdam	1	0	0	37	2.7	3.7
Catskill Regional	0	0	0	32	0.0	0.0
Cayuga Medical Ctr	NA	NA	NA	NA	NA	NA
Champlain Valley	1	0	0	36	2.8	3.0
Claxton-Hepburn	NA	NA	NA	NA	NA	NA
Columbia Memorial	0	0	0	81	0.0	0.0
Coney Island Hosp	2	0	0	23	8.7	5.8
Corning Hospital	0	0	0	27	0.0	0.0
Cortland Reg Med	0	0	0	28	0.0	0.0
Crouse Hospital	5	0	2	528	0.9	1.1
East. Niag. Lockport	NA	NA	NA	NA	NA	NA
Ellis Hospital	0	0	0	108	0.0	0.0
Elmhurst Hospital	2	0	2	101	2.0	1.6
FF Thompson	0	0	0	28	0.0	0.0
Faxton St. Lukes^	7	0	0	55	12.7	10.8
Flushing Hospital	3	0	2	220	1.4	1.9
Glens Falls Hospital	0	0	0	51	0.0	0.0
Good Samar. Suffern	0	0	0	47	0.0	0.0
Good Samar. W Islip	2	0	7	446	0.4	0.5
Harlem Hospital	1	0	0	21	4.8	3.9
HealthAlli Broadway	NA	NA	NA	NA	NA	NA
Highland Hospital	3	0	3	655	0.5	0.5
Huntington Hospital	0	0	0	204	0.0	0.0
Interfaith Med Ctr	NA	NA	NA	NA	NA	NA
Ira Davenport	NA	NA	NA	NA	NA	NA
JT Mather Hospital	3	0	1	103	2.9	4.4



Data reported as of June 27, 2019. ¦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 2018 (page 2 of 4)

Hospital	# SSI	#PATOS excl.	#PDS excl.	# Procs	Raw Rate	Adj Rate
Jacobi Med Ctr	2	0	2	62	3.2	1.9
Jamaica Hospital	0	0	0	91	0.0	0.0
Jones Memorial	NA	NA	NA	NA	NA	NA
Kings County Hosp	0	0	0	91	0.0	0.0
Kingsbrook Jewish MC	NA	NA	NA	NA	NA	NA
LIJ at Forest Hills	1	0	0	130	0.8	0.8
LIJ at Valley Stream	NA	NA	NA	NA	NA	NA
Lenox Hill Hospital	4	0	1	210	1.9	1.8
Lincoln Med Ctr	1	0	2	66	1.5	1.0
Long Isl Jewish(LIJ)	5	0	0	545	0.9	0.7
Maimonides Med Ctr	2	1	3	219	0.9	0.7
Mary Imogene Bassett	0	0	0	68	0.0	0.0
Massena Memorial	NA	NA	NA	NA	NA	NA
Memor SloanKettering	18	0	11	1002	1.8	1.5
Mercy Hosp Buffalo	0	0	0	184	0.0	0.0
Mercy Med Ctr	0	0	0	34	0.0	0.0
Metropolitan Hosp	0	0	0	22	0.0	0.0
MidHudson Reg of WMC	1	0	0	54	1.9	4.0
Millard Fill. Suburb	3	0	0	542	0.6	0.7
Montefiore-Einstein^	9	0	0	267	3.4	2.5
Montefiore-Moses	0	0	2	127	0.0	0.0
Montefiore-Mt Vernon	1	0	0	27	3.7	3.7
Montefiore-NewRochl	0	0	1	28	0.0	0.0
Montefiore-Nyack	1	0	1	50	2.0	2.1
Montefiore-Wakefield	NA	NA	NA	NA	NA	NA
Mount St. Marys	NA	NA	NA	NA	NA	NA
Mt Sinai	2	0	4	424	0.5	0.5
Mt Sinai Beth Israel	0	0	0	36	0.0	0.0
Mt Sinai Brooklyn	0	0	0	36	0.0	0.0
Mt Sinai Queens	NA	NA	NA	NA	NA	NA
Mt Sinai St Lukes	0	0	0	57	0.0	0.0
Mt Sinai West	1	0	0	131	0.8	0.6
NY Community Hosp	NA	NA	NA	NA	NA	NA
NYP-Allen	NA	NA	NA	NA	NA	NA
NYP-Brklyn Methodist	1	0	0	288	0.3	0.2
NYP-Columbia	2	1	0	169	1.2	0.9
NYP-Hudson Valley	NA	NA	NA	NA	NA	NA
NYP-Lawrence	NA	NA	NA	NA	NA	NA
NYP-Lower Manhattan	0	0	0	49	0.0	0.0
NYP-Morgan Stanley	NA	NA	NA	NA	NA	NA

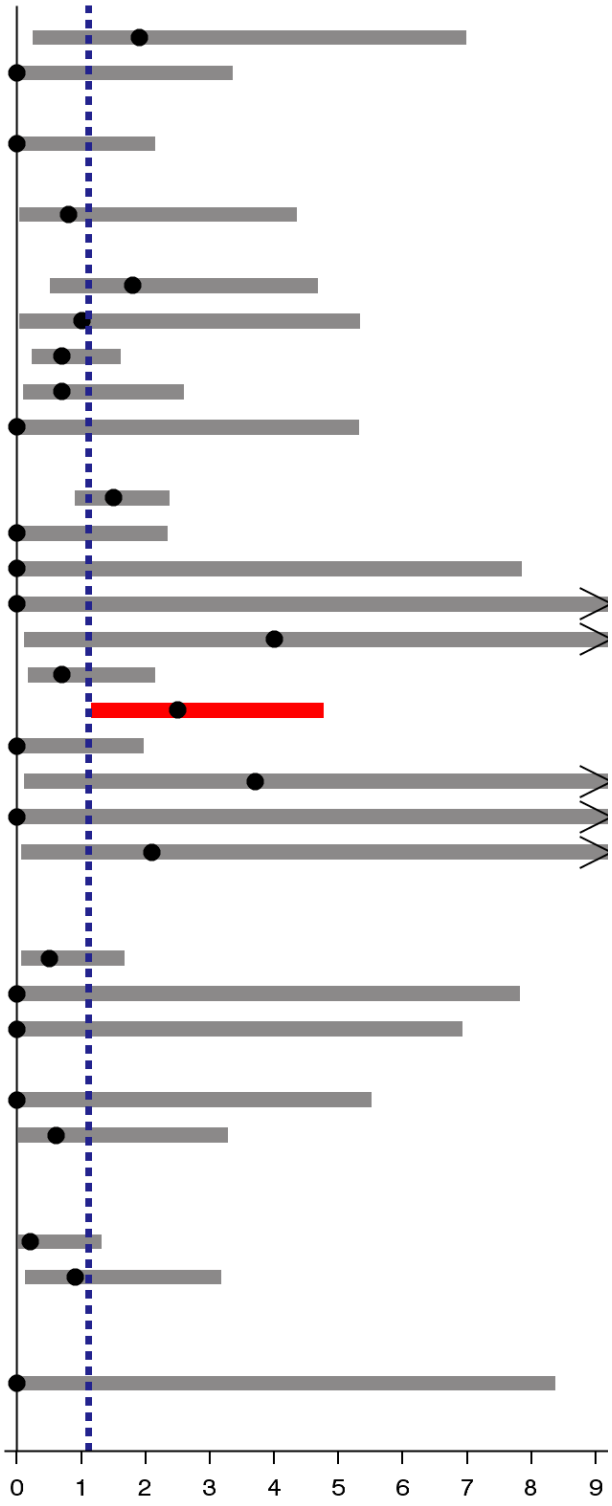


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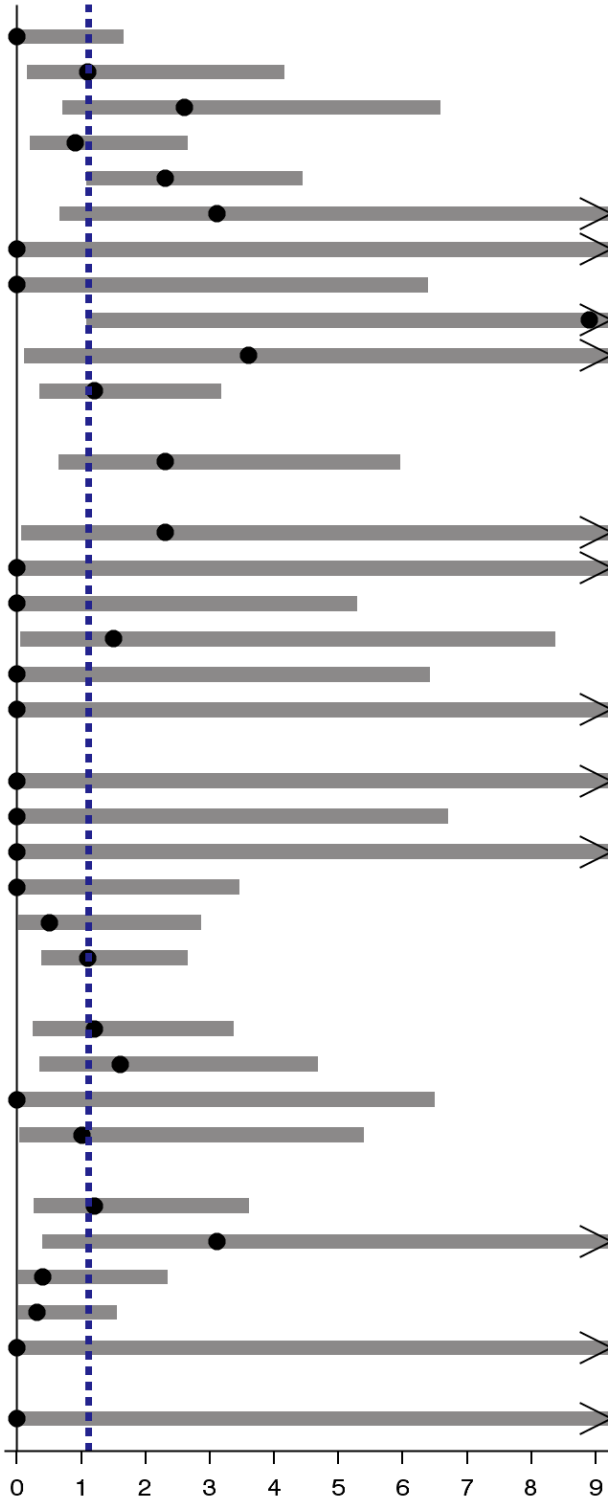
Figure 10. Abdominal hysterectomy surgical site infection rates, New York 2018 (page 3 of 4)

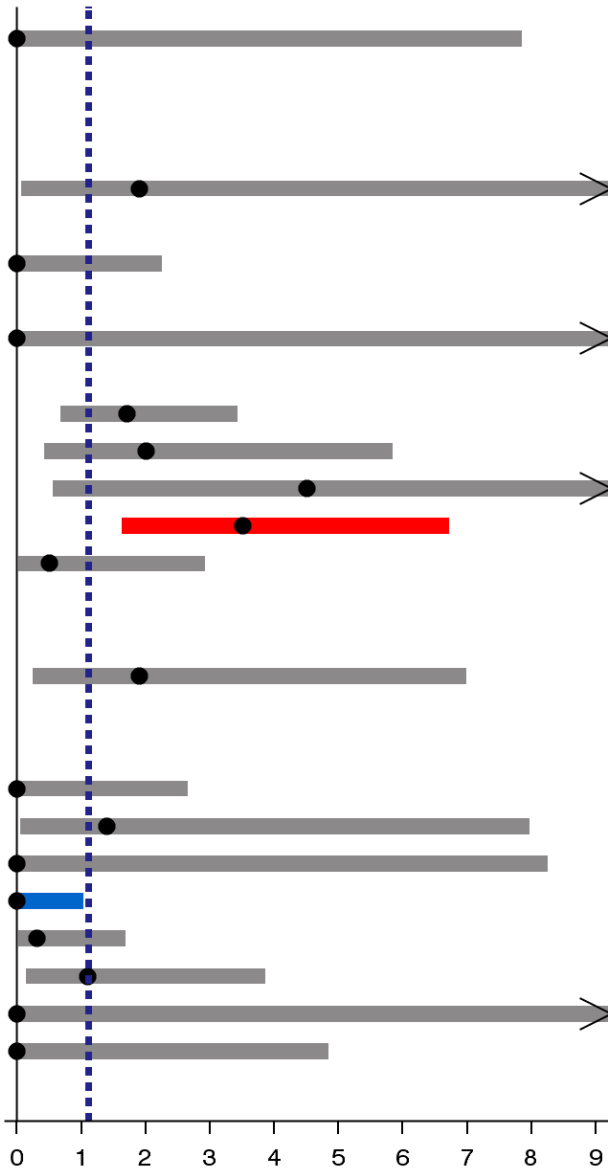
Hospital	# SSI	#PATOS excl.	#PDS excl.	# Procs	Raw Rate	Adj Rate
NYP-Queens	0	0	0	158	0.0	0.0
NYP-Weill Cornell	2	0	0	177	1.1	1.1
NYU Langone Brooklyn	4	0	0	145	2.8	2.6
NYU Tisch	3	0	1	314	1.0	0.9
NYU Winthrop	9	1	2	313	2.9	2.3
Nassau University	3	0	0	52	5.8	3.1
Nathan Littauer	0	0	0	22	0.0	0.0
Newark Wayne	0	0	0	90	0.0	0.0
Niagara Falls	2	0	0	47	4.3	8.9
North Central Bronx	1	0	1	20	5.0	3.6
North Shore	4	0	0	274	1.5	1.2
Northern Dutchess	NA	NA	NA	NA	NA	NA
Northern Westchester	4	0	0	257	1.6	2.3
Noyes Memorial	NA	NA	NA	NA	NA	NA
Oishei Childrens	1	0	0	31	3.2	2.3
Olean General	0	0	0	22	0.0	0.0
Oneida Healthcare	0	0	0	94	0.0	0.0
Orange Regional	1	0	0	69	1.4	1.5
Oswego Hospital	0	0	0	39	0.0	0.0
Our Lady of Lourdes	0	0	0	55	0.0	0.0
Peconic Bay Medical	NA	NA	NA	NA	NA	NA
Phelps Memorial	0	0	0	20	0.0	0.0
Plainview Hospital	0	0	0	46	0.0	0.0
Putnam Hospital	0	0	0	26	0.0	0.0
Queens Hospital	0	0	0	61	0.0	0.0
Richmond Univ MC	1	0	0	279	0.4	0.5
Rochester General	5	0	0	523	1.0	1.1
Rome Memorial	NA	NA	NA	NA	NA	NA
Roswell Park	3	0	10	318	0.9	1.2
SUNY Downstate MedCr	3	0	0	117	2.6	1.6
Samaritan- Troy	0	0	0	67	0.0	0.0
Samaritan- Watertown	1	0	3	162	0.6	1.0
Saratoga Hospital	NA	NA	NA	NA	NA	NA
Sisters of Charity	3	0	1	281	1.1	1.2
Sisters- St Joseph	2	0	0	97	2.1	3.1
South Nassau Comm.	1	0	0	284	0.4	0.4
Southside	1	0	0	359	0.3	0.3
St Anthony	0	0	0	62	0.0	0.0
St Barnabas	NA	NA	NA	NA	NA	NA
St Catherine Siena	0	0	0	31	0.0	0.0



Data reported as of June 27, 2019. ┆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 2018 (page 4 of 4)

Hospital	# SSI	#PATOS excl.	#PDS excl.	# Procs	Raw Rate	Adj Rate
St Charles Hospital	0	0	0	40	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	NA	NA	NA	NA	NA	NA
St Johns Riverside	1	0	0	60	1.7	1.9
St Joseph- Bethpage	NA	NA	NA	NA	NA	NA
St Josephs- Syracuse	0	0	1	182	0.0	0.0
St Josephs- Yonkers	NA	NA	NA	NA	NA	NA
St Lukes Cornwall	0	0	0	25	0.0	0.0
St Marys Amsterdam	NA	NA	NA	NA	NA	NA
St Peters Hospital	7	0	1	528	1.3	1.7
Staten Island U N	3	0	1	107	2.8	2.0
StonyBrkSouthampton	2	0	0	61	3.3	4.5
StonyBrookUniv^	9	0	1	205	4.4	3.5
Strong Memorial	1	0	0	177	0.6	0.5
UHS Binghamton	NA	NA	NA	NA	NA	NA
UHS Chenango Memor	NA	NA	NA	NA	NA	NA
UHS Wilson	2	0	1	88	2.3	1.9
UPMC Chautauqua WCA	NA	NA	NA	NA	NA	NA
United Memorial	NA	NA	NA	NA	NA	NA
Unity Hosp Rochester	0	0	0	144	0.0	0.0
Univ Hosp SUNY Upst	1	0	0	53	1.9	1.4
Upst. Community Gen	0	0	1	58	0.0	0.0
Vassar Brothers*	0	0	0	410	0.0	0.0
Westchester Medical	1	0	0	206	0.5	0.3
White Plains Hosp	2	0	0	354	0.6	1.1
Woodhull Med Ctr	0	0	0	25	0.0	0.0
Wyckoff Heights	0	0	1	58	0.0	0.0
Wyoming County Comm.	NA	NA	NA	NA	NA	NA



Data reported as of June 27, 2019. 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).

Central Line-Associated Bloodstream Infections (CLABSIs)

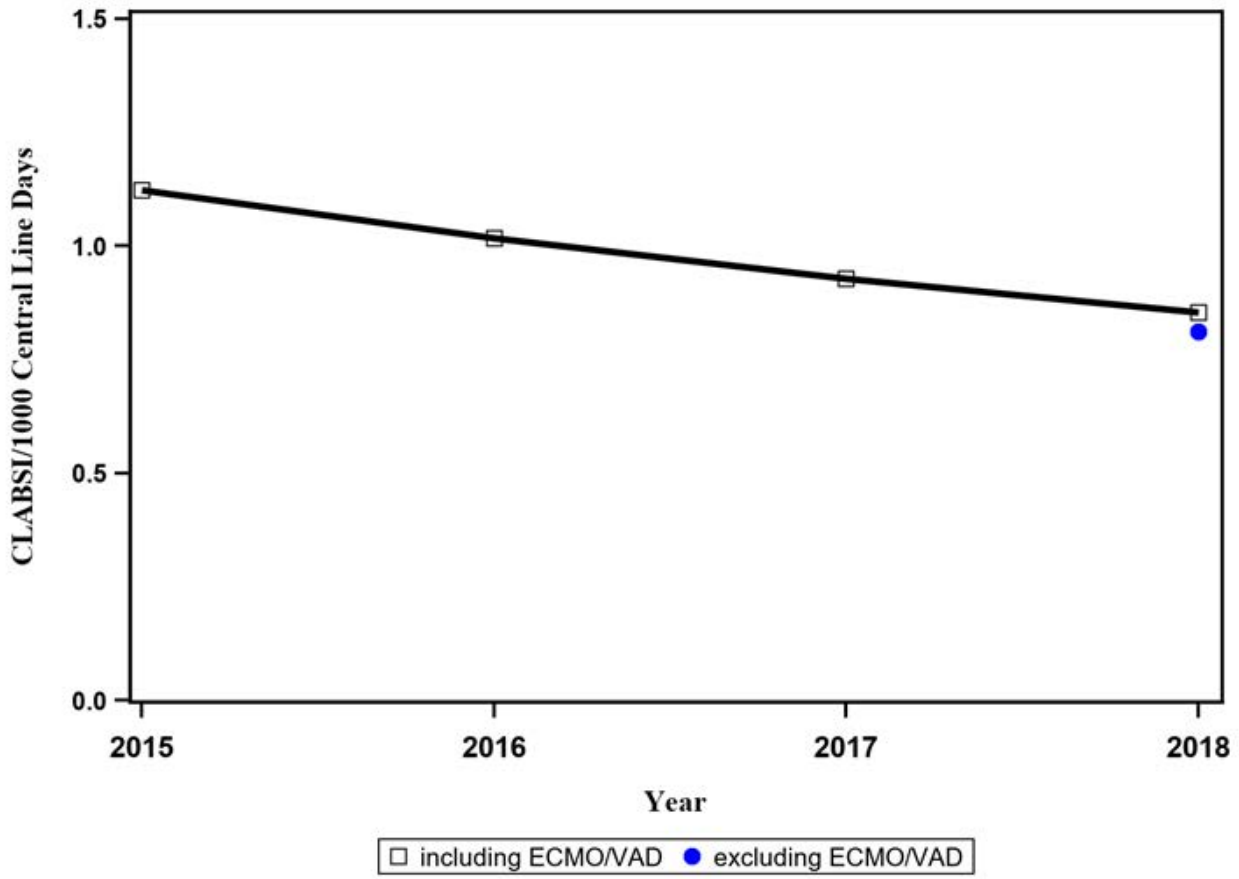
In 2018, a total of 1,051 CLABSIs were associated with 1,294,898 days of central line use, for an overall rate of 0.81 infections per 1,000 central line days in selected ICUs and wards.

In addition, a total of 81 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-CLABSIs were excluded from CLABSI rates beginning in 2015.

In 2018, NHSN began identifying and excluding from CLABSI rates BSIs occurring in patients with ventricular assist devices (VAD) and/or extracorporeal membrane oxygenation (ECMO) because patients who have these devices are at an increased risk of acquiring a BSI independent of the presence of a central line. In 2018, 16 hospitals reported 30 ECMO BSIs, 22 VAD BSIs, and 2 ECMO and VAD BSIs. This definition change resulted in a 5% decrease in the overall CLABSI rate, and a 55% decrease in the rate in cardiothoracic ICUs, where ECMO and VAD are most frequently used.

The 2015-2018 CLABSI, MBI, ECMO, VAD, and device utilization data are summarized by location type in Figure 11. Including VAD and ECMO as CLABSIs for consistency in definitions over time, the CLABSI rate steadily declined 24%, from 1.123 infections per 1,000 central line days in 2015, to 0.853 infections per 1,000 central line days in 2018.

Figure 11. Central line-associated bloodstream infection (CLABSI) rates, New York State 2015-2018



Year	# Hospitals	# CLABSI excluding ECMO/VAD starting 2018	# Central Line Days	CLABSI Rate excluding ECMO/VAD starting 2018	# MBI	# ECMO/ VAD	CLABSI Rate including ECMO/VAD all years	# Patient Days	Device Utilization ratio
Cardiothoracic ICU									
2015	33	64	79,156	0.809	1	NA	0.809	112,709	70.2
2016	32	65	79,411	0.819	1	NA	0.819	111,186	71.4
2017	31	44	78,437	0.561	0	NA	0.561	114,241	68.7
2018	31	26	81,749	0.318	0	32	0.709	117,028	69.9
Coronary ICU									
2015	39	48	45,986	1.044	0	NA	1.044	120,051	38.3
2016	35	64	42,059	1.522	0	NA	1.522	112,528	37.4
2017	34	55	37,965	1.449	0	NA	1.449	111,092	34.2
2018	35	44	37,294	1.180	0	0	1.180	108,899	34.2
Medical ICU									

Year	# Hospitals	# CLABSI excluding ECMO/VAD starting 2018	# Central Line Days	CLABSI Rate excluding ECMO/VAD starting 2018	# MBI	# ECMO/ VAD	CLABSI Rate including ECMO/VAD all years	# Patient Days	Device Utilization ratio
2015	55	153	121,410	1.260	10	NA	1.260	251,564	48.3
2016	61	127	132,405	0.959	10	NA	0.959	275,727	48.0
2017	62	117	126,843	0.922	13	NA	0.922	275,285	46.1
2018	60	100	120,323	0.831	9	2	0.848	267,524	45.0
Medical Surgical ICU									
2015	100	130	134,545	0.966	2	NA	0.966	317,598	42.4
2016	95	97	119,493	0.812	2	NA	0.812	293,048	40.8
2017	100	94	120,747	0.778	9	NA	0.778	293,092	41.2
2018	98	97	120,454	0.805	9	3	0.830	297,710	40.5
Neurosurgical ICU									
2015	12	16	17,781	0.900	0	NA	0.900	49,593	35.9
2016	12	14	18,588	0.753	0	NA	0.753	51,259	36.3
2017	13	15	18,093	0.829	0	NA	0.829	51,992	34.8
2018	13	16	17,118	0.935	0	0	0.935	54,100	31.6
Pediatric ICU									
2015	28	52	33,541	1.550	1	NA	1.550	90,551	37.0
2016	28	46	32,813	1.402	0	NA	1.402	93,349	35.2
2017	28	50	34,947	1.431	3	NA	1.431	97,260	35.9
2018	28	39	32,645	1.195	6	9	1.470	98,097	33.3
Surgical ICU									
2015	41	81	76,345	1.061	0	NA	1.061	156,625	48.7
2016	41	81	74,301	1.090	0	NA	1.090	158,236	47.0
2017	41	72	69,621	1.034	2	NA	1.034	156,813	44.4
2018	38	52	66,880	0.778	2	2	0.807	150,198	44.5
---Subtotal Adult/Pediatric ICUs---									
2015	156	544	508,764	1.069	14	NA	1.069	1,098,691	46.3
2016	158	494	499,070	0.990	13	NA	0.990	1,095,333	45.6
2017	160	447	486,653	0.919	27	NA	0.919	1,099,775	44.3
2018	159	374	476,463	0.785	26	48	0.886	1,093,556	43.6
Neonatal ICU Level II/III									
2015	12	8	4,580	1.747	0	NA	1.747	42,092	10.9
2016	12	8	4,593	1.742	0	NA	1.742	39,549	11.6
2017	13	11	4,372	2.516	0	NA	2.516	38,285	11.4
2018	12	5	4,223	1.184	0	0	1.184	37,922	11.1
Neonatal ICU Level III									
2015	24	23	17,000	1.353	0	NA	1.353	112,246	15.1

Year	# Hospitals	# CLABSI excluding ECMO/VAD starting 2018	# Central Line Days	CLABSI Rate excluding ECMO/VAD starting 2018	# MBI	# ECMO/ VAD	CLABSI Rate including ECMO/VAD all years	# Patient Days	Device Utilization ratio
2016	24	19	15,635	1.215	0	NA	1.215	106,830	14.6
2017	24	11	16,063	0.685	0	NA	0.685	111,163	14.4
2018	24	11	15,136	0.727	0	0	0.727	106,736	14.2
Neonatal ICU Regional Perinatal Center									
2015	17	63	60,702	1.038	0	NA	1.038	233,570	26.0
2016	17	48	60,254	0.797	1	NA	0.797	240,354	25.1
2017	17	74	62,341	1.187	0	NA	1.187	250,151	24.9
2018	17	44	60,972	0.722	1	0	0.722	254,881	23.9
---Subtotal Neonatal ICUs---									
2015	53	94	82,282	1.142	0	NA	1.142	387,908	21.2
2016	53	75	80,482	0.932	1	NA	0.932	386,733	20.8
2017	54	96	82,776	1.160	0	NA	1.160	399,599	20.7
2018	53	60	80,331	0.747	1	0	0.747	399,539	20.1
Medical Surgical Ward									
2015	136	356	315,134	1.130	17	NA	1.130	2,812,762	11.2
2016	136	311	297,571	1.045	14	NA	1.045	2,764,558	10.8
2017	132	224	264,816	0.846	12	NA	0.846	2,652,695	10.0
2018	134	198	257,923	0.768	6	0	0.768	2,643,272	9.8
Medical Ward									
2015	85	338	294,669	1.147	19	NA	1.147	2,338,541	12.6
2016	83	333	292,615	1.138	17	NA	1.138	2,379,097	12.3
2017	88	293	289,799	1.011	32	NA	1.011	2,398,442	12.1
2018	90	263	279,454	0.941	29	4	0.955	2,518,708	11.1
Pediatric ward									
2015	54	41	34,275	1.196	12	NA	1.196	267,238	12.8
2016	55	38	34,287	1.108	16	NA	1.108	272,971	12.6
2017	54	40	36,134	1.107	23	NA	1.107	291,593	12.4
2018	53	34	39,220	0.867	15	0	0.867	298,120	13.2
Step down unit									
2015	55	99	67,484	1.467	1	NA	1.467	359,515	18.8
2016	55	68	65,829	1.033	0	NA	1.033	366,761	17.9
2017	59	51	60,786	0.839	1	NA	0.839	367,760	16.5
2018	67	39	61,860	0.630	2	0	0.630	382,365	16.2
Surgical Ward									
2015	71	118	113,102	1.043	1	NA	1.043	913,475	12.4
2016	72	85	109,071	0.779	0	NA	0.779	906,607	12.0

Year	# Hospitals	# CLABSI excluding ECMO/VAD starting 2018	# Central Line Days	CLABSI Rate excluding ECMO/VAD starting 2018	# MBI	# ECMO/ VAD	CLABSI Rate including ECMO/VAD all years	# Patient Days	Device Utilization ratio
2017	73	80	104,985	0.762	2	NA	0.762	917,616	11.4
2018	76	83	99,647	0.833	2	2	0.853	913,147	10.9
---Subtotal Adult/Pediatric Wards---									
2015	167	952	824,664	1.154	50	NA	1.154	6,691,531	12.3
2016	170	835	799,373	1.045	47	NA	1.045	6,689,994	11.9
2017	170	688	756,520	0.909	70	NA	0.909	6,628,106	11.4
2018	167	617	738,104	0.836	54	6	0.844	6,755,612	10.9
----------Grand Total----------									
2015	167	1,590	1,415,710	1.123	64	NA	1.123	8,178,130	17.3
2016	170	1,404	1,378,925	1.018	61	NA	1.018	8,172,060	16.9
2017	172	1,231	1,325,949	0.928	97	NA	0.928	8,127,480	16.3
2018	170	1,051	1,294,898	0.812	81	54	0.853	8,248,707	15.7

New York State data as of June 27, 2019. CLABSI rates are per 1,000 central line days. Device utilization = 100* central line days/patient days. MBI = mucosal barrier injury (excluded from all counts starting in 2015); ICU = intensive care unit; VAD = ventricular assist devices; ECMO = extracorporeal membrane oxygenation. Beginning in 2017, ICU data from the two cancer hospitals: Memorial Sloan Kettering Cancer Center and Roswell Park Cancer Institute were 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 and *Staphylococcus aureus*. 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 2018

Microorganism	Number of Isolates	Percent of Infections
Yeast	298	26.5
(*Candida auris*)	(12)	(1.1)
Enterococci	223	19.8
(VRE)	(107)	(9.5)
Staphylococcus aureus	159	14.1
(MRSA)	(61)	(5.4)
Coagulase negative staphylococci	127	11.3
Klebsiella spp.	108	9.6
(CRE-*Klebsiella*)	(12)	(1.1)
Escherichia coli	57	5.1
(CRE-*E. coli*)	(1)	(0.1)
Enterobacter spp.	45	4.0
(CRE-*Enterobacter*)	(3)	(0.3)
Pseudomonas spp.	44	3.9
Serratia spp.	29	2.6
Acinetobacter spp.	20	1.8
(MDR-*Acinetobacter*)	(5)	(0.4)
Streptococci	18	1.6
Proteus spp.	16	1.4
Citrobacter spp.	10	0.9
Bacteroides spp.	9	0.8
Lactobacillus spp.	9	0.8
Stenotrophomonas spp.	8	0.7
Bacilli	7	0.6
Other	56	5.0

New York State data reported as of June 27, 2019. Out of 1,071 infections (includes mucosal barrier injury infections; excludes bloodstream infections associated with extracorporeal membrane oxygenation and ventricular assist devices). 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 2018

Microorganism	Number of Isolates	Percent of Infections
Staphylococcus aureus	18	29.5
(MRSA)	(5)	(8.2)
Coagulase negative staphylococci	13	21.3
Enterococci	9	14.8
Yeast	9	14.8
Escherichia coli	4	6.6
Klebsiella spp.	4	6.6
Enterobacter spp.	4	6.6
Other	6	9.8

New York State data reported as of June 27, 2019. Out of 61 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. No risk adjustment is performed by birthweight group in Level II/III facilities due to the small number of CLABSI. In Level III NICUs, babies weighing less than 1001 grams were 5.0 times more likely to develop a CLABSI than babies weighing more than 1000 grams. In Regional Perinatal Centers (RPCs), for the first time since the HAI program began in 2007, there was no difference in CLABSI rates between babies weighing more or less than 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-four high flags will be addressed in CLABSI improvement plans by the eighteen affected hospitals.

Table 14. Central line-associated bloodstream infection rates by intensive care unit type, New York State 2018

	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	**1.18**		**0.32**		**0.83**		**0.81**		**0.78**		**0.93**		**1.19**		**RPC 0.72/L3 0.73/L23 1.18**		
Adirondack Medical							1/230	4.3									
Albany Med Ctr	2/1926	1.0	0/3057	0.0	0/3332	0.0			4/4671	0.9			0/1485	0.0	RPC	3/2834	1.1
Albany Memorial							0/201	0.0									
Alice Hyde Med Ctr							NA	NA									
Arnot Ogden Med Ctr							2/2002	1.0							Lev 3	1/1322	1.0
Auburn Memorial							1/367	2.7									
Bellevue Hospital	1/1817	0.6	0/749	0.0	2/1407	1.4			8/1591	^ 5.0	0/248	0.0	0/85	0.0	RPC	5/2079	^ 2.4
Bon Secours							1/240	4.2									
BronxCare	0/821	0.0			2/3841	0.5							NA	NA	Lev 3	1/475	1.5
Brookdale Hospital	2/566	3.5			3/2216	1.4			3/1104	2.7			NA	NA	Lev 3	0/426	0.0
Brooklyn Hosp Ctr	0/1113	0.0			0/2928	0.0							0/184	0.0	Lev 3	0/1381	0.0
Brooks Memorial							2/318	6.3									
Buffalo General			0/3476	0.0	5/7070	0.7			0/2666	0.0	2/2274	0.9					
Canton-Potsdam							0/287	0.0									
Catskill Regional							0/441	0.0									
Cayuga Medical Ctr							0/667	0.0									
Champlain Valley							0/1550	0.0									
Claxton-Hepburn							0/480	0.0									
Clifton Springs					0/256	0.0											
Cohens Childrens													2/2309	0.9	RPC	0/5585	* 0.0
Columbia Memorial							3/642	^ 4.7									
Coney Island Hosp	0/522	0.0			4/2368	1.7			1/1305	0.8							
Corning Hospital							0/286	0.0									
Cortland Reg Med					0/460	0.0											
Crouse Hospital							1/1490	0.7							RPC	6/4487	1.3
East. Niag. Lockport							1/183	5.5									
Eastern Long Island							NA	NA									
Ellis Hospital							2/5334	0.4									
Elmhurst Hospital	1/452	2.2			2/1126	1.8			3/909	3.3					Lev 2/3	1/435	2.3
Erie County Med Ctr					4/2540	1.6											
FF Thompson					0/729	0.0											

Table 14. Central line-associated bloodstream infection rates by intensive care unit type, New York State 2018

	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	**1.18**		**0.32**		**0.83**		**0.81**		**0.78**		**0.93**		**1.19**		**RPC 0.72/L3 0.73/L23 1.18**		
Faxton St. Lukes							2/2147	0.9									
Flushing Hospital					2/1082	1.8	0/215	0.0							Lev 3	0/774	0.0
Geneva General							0/704	0.0									
Glen Cove Hospital							1/394	2.5									
Glens Falls Hospital							0/1278	0.0									
Good Samar. Suffern			0/663	0.0	2/1493	1.3			0/565	0.0							
Good Samar. W Islip			0/1196	0.0	1/2447	0.4			1/2116	0.5	0/248	0.0	0/84	0.0	Lev 3	0/947	0.0
Harlem Hospital	0/373	0.0					1/2152	0.5					NA	NA	Lev 3	0/708	0.0
HealthAlli Broadway							0/826	0.0									
HealthAlli MarysAve							NA	NA									
Highland Hospital							2/1742	1.1									
Hosp for Spec Surg							0/124	0.0									
Huntington Hospital	0/275	0.0					0/473	0.0									
Interfaith Med Ctr							0/1584	0.0									
JT Mather Hospital							0/2489	0.0									
Jacobi Med Ctr	2/723	2.8			0/1251	0.0			1/722	1.4			NA	NA	Lev 3	3/1142	2.5
Jamaica Hospital					4/1559	2.6			1/1057	0.9					Lev 3	0/559	0.0
Jones Memorial							0/212	0.0									
Kenmore Mercy							0/890	0.0									
Kings County Hosp	1/741	1.3			2/1099	1.8			3/858	3.5	3/533	^ 5.6	NA	NA	Lev 2/3	1/710	1.4
Kingsbrook Jewish MC							6/2474	^ 2.4									
LIJ at Forest Hills					0/1840	0.0											
LIJ at Valley Stream							0/570	0.0									
Lenox Hill Hospital	2/756	2.6	0/2589	0.0	2/1668	1.2			0/1752	0.0					Lev 2/3	0/930	0.0
Lincoln Med Ctr	0/753	0.0			3/1861	1.6			0/680	0.0					Lev 3	0/484	0.0
Long Isl Jewish(LIJ)	0/394	0.0			2/1193	1.7	0/567	0.0	0/1335	0.0							
Long Isl. Community	1/675	1.5			2/781	2.6			0/774	0.0							
Maimonides Med Ctr	2/1290	1.6	2/2783	0.7	1/2220	0.5			0/1631	0.0			1/513	1.9	RPC	0/1979	0.0
Mary Imogene Bassett							3/3057	1.0									
Massena Memorial							NA	NA									
Memor SloanKettering							10/4979	^ 2.0					5/1187	^ 4.2			

Table 14. Central line-associated bloodstream infection rates by intensive care unit type, New York State 2018

	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	**1.18**		**0.32**		**0.83**		**0.81**		**0.78**		**0.93**		**1.19**		**RPC 0.72/L3 0.73/L23 1.18**		
Mercy Hosp Buffalo	0/700	0.0	0/1759	0.0			0/3539	0.0									
Mercy Med Ctr							0/1191	0.0							Lev 3	0/187	0.0
Metropolitan Hosp							0/1094	0.0							Lev 2/3	0/347	0.0
MidHudson Reg of WMC							1/929	1.1									
Millard Fill. Suburb							0/3399	0.0									
Montefiore-Einstein			2/2976	0.7	3/2953	1.0									RPC	3/1944	1.5
Montefiore-Moses	3/1975	1.5	5/3185	^ 1.6	3/3453	0.9			3/2397	1.3			2/2648	0.8			
Montefiore-Mt Vernon							3/425	^ 7.1									
Montefiore-NewRochl							2/1096	1.8							Lev 3	NA	NA
Montefiore-Nyack					1/918	1.1			0/559	0.0							
Montefiore-Wakefield					2/2204	0.9									Lev 2/3	1/327	3.1
Mount St. Marys					0/643	0.0											
Mt Sinai	0/1064	0.0	3/5463	0.5	3/2582	1.2			2/2265	0.9	1/926	1.1	2/1778	1.1	RPC	3/3109	1.0
Mt Sinai Beth Israel	0/364	0.0					1/1971	0.5									
Mt Sinai Brooklyn							0/1119	0.0									
Mt Sinai Queens							0/1217	0.0									
Mt Sinai St Lukes	1/726	1.4	1/1699	0.6	1/1368	0.7			2/591	3.4							
Mt Sinai West							1/1104	0.9			0/325	0.0			Lev 3	0/1054	0.0
NY Community Hosp							0/680	0.0									
NYP-Allen							0/894	0.0									
NYP-Brklyn Methodist	2/684	2.9	0/1450	0.0			0/3984	* 0.0					0/95	0.0	Lev 3	0/1341	0.0
NYP-Columbia	8/5828	1.4	2/6949	0.3	6/5114	1.2			3/3012	1.0	1/2608	0.4					
NYP-Hudson Valley							0/745	0.0							Lev 2/3	NA	NA
NYP-Lawrence					0/1387	0.0											
NYP-Lower Manhattan							1/2258	0.4									
NYP-Morgan Stanley													16/7856	2.0	RPC	8/6902	1.2
NYP-Queens	0/761	0.0	0/751	0.0	0/1322	0.0			0/881	0.0					Lev 3	0/256	0.0
NYP-Weill Cornell	5/3394	1.5	0/4766	0.0	1/2948	0.3			5/3459	1.4	2/1493	1.3	3/2343	1.3	RPC	4/4451	0.9
NYU Langone Brooklyn					1/703	1.4			0/752	0.0					Lev 2/3	0/73	0.0
NYU Orthopedic Hosp																	
NYU Tisch			0/492	0.0	0/2122	0.0	0/1817	0.0	3/2189	1.4	3/343	^ 8.7	1/3271	0.3	RPC	1/2839	0.4

Table 14. Central line-associated bloodstream infection rates by intensive care unit type, New York State 2018

	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	**1.18**		**0.32**		**0.83**		**0.81**		**0.78**		**0.93**		**1.19**		**RPC 0.72/L3 0.73/L23 1.18**		
NYU Winthrop					5/2450	2.0			2/4153	0.5	1/935	1.1	0/493	0.0	RPC	1/1836	0.5
Nassau University	0/533	0.0			0/1344	0.0			0/340	0.0			NA	NA	Lev 3	1/451	2.8
Nathan Littauer							0/650	0.0									
Newark Wayne					2/1036	1.9											
Niagara Falls							2/709	2.8									
North Central Bronx							0/254	0.0									
North Shore	3/1730	1.7	3/5711	0.5	2/2505	0.8			1/2072	0.5	1/1330	0.8			RPC	0/2134	0.0
Northern Dutchess							0/498	0.0									
Northern Westchester							2/546	3.7							Lev 3	0/59	0.0
Noyes Memorial							0/275	0.0									
Oishei Childrens													0/1107	0.0	RPC	2/5499	0.4
Olean General							1/801	1.2									
Oneida Healthcare							0/173	0.0									
Orange Regional							6/1665	^ 3.6									
Oswego Hospital					0/225	0.0											
Our Lady of Lourdes							0/883	0.0									
Peconic Bay Medical							0/1055	0.0									
Phelps Memorial							0/737	0.0									
Plainview Hospital							5/1244	^ 4.0									
Putnam Hospital							0/568	0.0									
Queens Hospital					1/1831	0.5									Lev 3	1/362	2.0
Richmond Univ MC	0/111	0.0			2/2091	1.0			0/1192	0.0			NA	NA	Lev 3	1/872	1.0
Rochester General			0/3604	0.0	4/3784	1.1			0/2274	0.0							
Rome Memorial							1/401	2.5									
Roswell Park							5/2427	2.1									
SUNY Downstate MedCr	1/302	3.3	0/1058	0.0			1/1456	0.7					0/80	0.0	RPC	0/750	0.0
Samaritan- Troy							3/2464	1.2									
Samaritan- Watertown							0/871	0.0									
Saratoga Hospital					1/688	1.5											
Sisters of Charity							1/1394	0.7							Lev 3	1/934	1.0
Sisters- St Joseph							0/627	0.0									

Table 14. Central line-associated bloodstream infection rates by intensive care unit type, New York State 2018

	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	**1.18**		**0.32**		**0.83**		**0.81**		**0.78**		**0.93**		**1.19**		**RPC 0.72/L3 0.73/L23 1.18**		
South Nassau Comm.							7/4161	1.7									
Southside			2/1220	1.6	0/787	0.0			0/1049	0.0							
St Anthony							0/122	0.0									
St Barnabas					1/882	1.1			0/553	0.0					Lev 2/3	0/327	0.0
St Catherine Siena	1/667	1.5					0/721	0.0									
St Charles Hospital					0/733	0.0											
St Elizabeth Medical			1/1147	0.9			2/1991	1.0									
St Francis- Roslyn			1/5139	0.2	0/2249	0.0			0/2018	0.0							
St Johns Episcopal	1/779	1.3			0/852	0.0											
St Johns Riverside							0/1072	0.0									
St Joseph- Bethpage							0/1304	0.0									
St Josephs- Syracuse					0/3426	0.0			0/4005	* 0.0					Lev 2/3	0/126	0.0
St Josephs- Yonkers							1/688	1.5									
St Lukes Cornwall							0/1876	0.0									
St Marys Amsterdam							1/225	4.4									
St Peters Hospital	0/426	0.0	0/1884	0.0	0/3017	0.0									Lev 3	1/474	2.3
Staten Island U N			0/1515	0.0			0/4710	* 0.0					NA	NA	Lev 3	0/315	0.0
Staten Island U S							0/1102	0.0									
StonyBrkSouthampton					1/429	2.3											
StonyBrookUniv	0/932	0.0	0/2014	0.0	0/2331	0.0			1/1926	0.5			0/286	0.0	RPC	0/2241	0.0
Strong Memorial			1/4296	0.2	1/2789	0.4			2/2501	0.8			4/4150	1.0	RPC	6/7399	0.8
Syosset Hospital							0/835	0.0									
UHS Binghamton							0/237	0.0									
UHS Chenango Memor							1/50	20.0									
UHS Wilson	4/1715	2.3	1/1832	0.5											Lev 2/3	1/133	7.5
UPMC Chautauqua WCA					5/1392	^ 3.6											
United Memorial							0/371	0.0									
Unity Hosp Rochester							1/3618	0.3									
Univ Hosp SUNY Upst			1/2588	0.4	4/6915	0.6			2/3364	0.6	2/3142	0.6	0/1133	0.0			
Upst. Community Gen							2/920	2.2									
Vassar Brothers			0/1180	0.0			3/4000	0.8							Lev 2/3	1/463	2.2

Table 14. Central line-associated bloodstream infection rates by intensive care unit type, New York State 2018

	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	**1.18**		**0.32**		**0.83**		**0.81**		**0.78**		**0.93**		**1.19**		**RPC 0.72/L3 0.73/L23 1.18**		
Westchester Medical	1/1406	0.7	1/4558	0.2	4/2768	1.4			1/1592	0.6	0/2713	0.0	3/1384	2.2	RPC	2/4904	0.4
White Plains Hosp							1/2334	0.4							Lev 3	0/151	0.0
Woodhull Med Ctr							3/1231	2.4							Lev 2/3	0/344	0.0
Wyckoff Heights					3/1315	2.3									Lev 3	1/449	2.2
Wyoming County Comm.							NA	NA									

New York State data reported as of June 27, 2019. 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 and bloodstream infections associated with use of extracorporeal membrane oxygenation and ventricular assist devices.

Table 15. Central line-associated bloodstream infection rates by ward type, New York State 2018

	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	**0.94**		**0.77**		**0.83**		**0.63**		**0.87**	
AO Fox Memorial	0/95	0.0	0/503	0.0	0/364	0.0				
Adirondack Medical			0/522	0.0						
Albany Med Ctr	16/14916	1.1	1/1728	0.6	2/5003	0.4	1/1018	1.0	0/2590	0.0
Albany Memorial	0/497	0.0	NA	NA	0/182	0.0				
Alice Hyde Med Ctr			1/268	3.7						
Arnot Ogden Med Ctr			1/2871	0.3						
Auburn Memorial			0/510	0.0	0/241	0.0				
Bellevue Hospital	14/5745	^ 2.4	0/592	0.0	4/816	^ 4.9			0/104	0.0
Bertrand Chaffee			NA	NA						
Blythedale Childrens									3/2839	1.1
Bon Secours			0/296	0.0	NA	NA				
BronxCare	8/4832	1.7	5/3629	1.4			1/411	2.4	NA	NA
Brookdale Hospital	6/3160	1.9			1/583	1.7	2/96	^20.8	NA	NA
Brooklyn Hosp Ctr	1/3561	0.3	1/2919	0.3			0/3887	0.0	0/239	0.0
Brooks Memorial			0/325	0.0						
Buffalo General	2/2944	0.7	2/3309	0.6	1/1624	0.6	5/5215	1.0		
Canton-Potsdam	NA	NA	0/1579	0.0						
Catskill Regional			1/274	3.6	1/120	8.3				
Cayuga Medical Ctr			1/1353	0.7					NA	NA
Champlain Valley			2/3067	0.7			0/1400	0.0	NA	NA
Claxton-Hepburn			3/1658	1.8						
Clifton Springs	0/901	0.0								
Cobleskill Regional	0/146	0.0								
Cohens Childrens									2/2005	1.0
Columbia Memorial	0/578	0.0	1/1244	0.8						
Coney Island Hosp	2/4153	0.5	0/56	0.0	0/1016	0.0	0/353	0.0	NA	NA
Corning Hospital	1/342	2.9			0/364	0.0				
Cortland Reg Med	0/293	0.0	0/394	0.0						
Crouse Hospital			8/6161	1.3						
East. Niag. Lockport			1/168	6.0						
Eastern Long Island			0/59	0.0						
Ellis Hospital	0/3686	* 0.0	0/110	0.0	0/750	0.0	0/304	0.0		

Table 15. Central line-associated bloodstream infection rates by ward type, New York State 2018

	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	**0.94**		**0.77**		**0.83**		**0.63**		**0.87**	
Elmhurst Hospital	2/1843	1.1	5/1301	^ 3.8	2/1158	1.7			NA	NA
Erie County Med Ctr			16/12059	1.3						
FF Thompson	0/1266	0.0	1/325	3.1						
Faxton St. Lukes			2/1989	1.0	0/979	0.0	3/2009	1.5	NA	NA
Flushing Hospital			2/2177	0.9					NA	NA
Geneva General	0/486	0.0	0/476	0.0			0/223	0.0		
Glen Cove Hospital			0/257	0.0	NA	NA				
Glens Falls Hospital	0/1408	0.0	1/1177	0.8	0/639	0.0			NA	NA
Good Samar. Suffern			2/3314	0.6			0/1054	0.0		
Good Samar. W Islip	1/4102	0.2			0/1479	0.0	NA	NA	1/133	7.5
Harlem Hospital	1/1498	0.7			1/1357	0.7			0/61	0.0
HealthAlli Broadway	1/2142	0.5	0/477	0.0	0/419	0.0				
HealthAlli MarysAve					0/280	0.0				
Highland Hospital	3/4435	0.7	0/1879	0.0	0/1390	0.0				
Hosp for Spec Surg			0/2250	0.0			0/202	0.0	NA	NA
Huntington Hospital	0/316	0.0	0/588	0.0	0/129	0.0			NA	NA
Interfaith Med Ctr			1/2536	0.4					NA	NA
Ira Davenport			NA	NA						
JT Mather Hospital			2/3050	0.7	1/788	1.3	1/2189	0.5		
Jacobi Med Ctr	3/2587	1.2	0/1117	0.0	1/283	3.5	0/170	0.0	NA	NA
Jamaica Hospital			5/2816	1.8	1/378	2.6	0/384	0.0	NA	NA
Jones Memorial			0/587	0.0						
Kenmore Mercy			0/2172	0.0	NA	NA				
Kings County Hosp	1/2864	0.3	1/2913	0.3	0/596	0.0			NA	NA
Kingsbrook Jewish MC	12/4082	^ 2.9	1/620	1.6						
LIJ at Forest Hills	4/2146	1.9	NA	NA	0/193	0.0				
LIJ at Valley Stream			2/1363	1.5	NA	NA	NA	NA		
Lenox Hill Hospital	4/2763	1.4	0/228	0.0	0/988	0.0	2/1310	1.5		
Lincoln Med Ctr	1/1292	0.8			0/1052	0.0	2/1824	1.1	NA	NA
Long Isl Jewish(LIJ)	3/6139	0.5	0/1796	0.0	2/1927	1.0	NA	NA		
Long Isl. Community	3/1689	1.8	1/763	1.3						
Maimonides Med Ctr	6/6228	1.0	2/1122	1.8			1/1023	1.0	1/571	1.8

Table 15. Central line-associated bloodstream infection rates by ward type, New York State 2018

	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	**0.94**		**0.77**		**0.83**		**0.63**		**0.87**	
Mary Imogene Bassett	0/1313	0.0	2/1012	2.0	3/2249	1.3	1/1064	0.9		
Massena Memorial			0/107	0.0			NA	NA		
Mercy Hosp Buffalo	0/355	0.0	2/5437	0.4	1/1066	0.9	0/817	0.0		
Mercy Med Ctr	1/1155	0.9	0/207	0.0			1/535	1.9		
Metropolitan Hosp	1/687	1.5			0/307	0.0			NA	NA
MidHudson Reg of WMC			4/1542	2.6			0/503	0.0		
Millard Fill. Suburb			2/7320	0.3						
Montefiore-Einstein	9/6101	1.5			4/3007	1.3				
Montefiore-Moses	14/15894	0.9	1/746	1.3	9/4481	^ 2.0			3/4792	0.6
Montefiore-Mt Vernon			0/469	0.0			0/140	0.0		
Montefiore-NewRochl			0/474	0.0	1/401	2.5	2/509	3.9		
Montefiore-Nyack			1/1884	0.5			2/786	2.5	0/232	0.0
Montefiore-Wakefield	6/3530	1.7	0/316	0.0						
Mount St. Marys			0/2195	0.0						
Mt Sinai	12/7682	1.6	9/3030	^ 3.0	5/3508	1.4	1/754	1.3	3/1382	2.2
Mt Sinai Beth Israel	2/2320	0.9	0/389	0.0	0/675	0.0	0/146	0.0		
Mt Sinai Brooklyn	2/2657	0.8			2/394	5.1	NA	NA		
Mt Sinai Queens	3/2006	1.5			0/836	0.0				
Mt Sinai St Lukes	2/2726	0.7	0/449	0.0	0/864	0.0				
Mt Sinai West			0/1777	0.0						
NY Community Hosp			0/257	0.0			0/525	0.0		
NY Eye&Ear Mt Sinai			NA	NA						
NYP-Allen	1/1680	0.6	0/737	0.0						
NYP-Brklyn Methodist	2/2073	1.0	3/5121	0.6	1/1143	0.9	0/572	0.0	0/743	0.0
NYP-Columbia	20/12902	^ 1.6	3/6954	0.4	6/4508	1.3				
NYP-Hudson Valley			1/1441	0.7			0/293	0.0		
NYP-Lawrence			2/3662	0.5					NA	NA
NYP-Lower Manhattan			0/1903	0.0						
NYP-Morgan Stanley									12/7812	1.5
NYP-Queens	2/5171	0.4			1/1167	0.9	0/104	0.0	NA	NA
NYP-Weill Cornell	14/8445	1.7	14/4665	^ 3.0	2/3824	0.5	1/412	2.4	1/1477	0.7
NYU Langone Brooklyn	1/1633	0.6	0/826	0.0	1/613	1.6	0/874	0.0	NA	NA

Table 15. Central line-associated bloodstream infection rates by ward type, New York State 2018

	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	**0.94**		**0.77**		**0.83**		**0.63**		**0.87**	
NYU Orthopedic Hosp							0/176	0.0		
NYU Tisch	3/3287	0.9	0/1249	0.0	2/4336	0.5	1/2969	0.3	1/2452	0.4
NYU Winthrop	7/10333	0.7	1/1314	0.8	2/978	2.0			0/714	0.0
Nassau University	1/1369	0.7	1/323	3.1	0/63	0.0			NA	NA
Nathan Littauer			0/762	0.0						
Newark Wayne	0/1472	0.0								
Niagara Falls					1/873	1.1	0/445	0.0		
North Central Bronx	0/370	0.0	0/86	0.0						
North Shore	4/5374	0.7	2/2548	0.8	1/4889	0.2	NA	NA		
Northern Dutchess	0/271	0.0	1/899	1.1						
Northern Westchester	1/1862	0.5			0/354	0.0	NA	NA	NA	NA
Noyes Memorial	0/539	0.0								
Oishei Childrens									2/1840	1.1
Olean General	1/1901	0.5			1/366	2.7				
Oneida Healthcare			1/545	1.8						
Orange Regional	1/2790	0.4	0/455	0.0						
Oswego Hospital			0/581	0.0						
Our Lady of Lourdes	0/3183	0.0	0/179	0.0	1/1211	0.8	NA	NA		
Peconic Bay Medical			1/2240	0.4	0/215	0.0				
Phelps Memorial	2/792	2.5	0/384	0.0					NA	NA
Plainview Hospital	1/1727	0.6	NA	NA	0/155	0.0	NA	NA		
Putnam Hospital			0/1174	0.0						
Queens Hospital	1/1671	0.6	0/1022	0.0	1/197	5.1	0/381	0.0		
Richmond Univ MC	1/1270	0.8			0/430	0.0				
Rochester General	10/7501	1.3	0/4438	* 0.0	6/3736	1.6				
Rome Memorial	1/235	4.3					1/339	2.9		
SUNY Downstate MedCr	0/1100	0.0	3/3322	0.9			2/1094	1.8	0/239	0.0
Samaritan- Troy	NA	NA	1/2908	0.3			0/863	0.0		
Samaritan- Watertown	0/77	0.0	3/2758	1.1						
Saratoga Hospital	1/3142	0.3			NA	NA				
Sisters of Charity	3/2742	1.1	3/2007	1.5	1/1390	0.7				
Sisters- St Joseph			2/1773	1.1	1/353	2.8				

Table 15. Central line-associated bloodstream infection rates by ward type, New York State 2018

	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	**0.94**		**0.77**		**0.83**		**0.63**		**0.87**	
South Nassau Comm.			6/7997	0.8			4/4241	0.9	0/51	0.0
Southside	0/330	0.0	6/3574	1.7			0/624	0.0	NA	NA
St Anthony			1/214	4.7						
St Barnabas			0/1166	0.0			0/371	0.0		
St Catherine Siena	1/2826	0.4			0/371	0.0				
St Charles Hospital			0/759	0.0						
St Elizabeth Medical			4/2820	1.4			1/1830	0.5		
St Francis- Roslyn			2/6642	0.3			0/1384	0.0		
St James Mercy			0/196	0.0						
St Johns Dobbs Ferry			NA	NA						
St Johns Episcopal			11/2810	^ 3.9					NA	NA
St Johns Riverside	0/1111	0.0	0/646	0.0						
St Joseph- Bethpage			0/813	0.0			0/289	0.0		
St Josephs- Elmira	NA	NA								
St Josephs- Syracuse			0/10180	* 0.0						
St Josephs- Yonkers			1/531	1.9			0/141	0.0	NA	NA
St Lukes Cornwall			0/2215	0.0						
St Marys Amsterdam			0/545	0.0	0/489	0.0	0/563	0.0		
St Peters Hospital	6/11142	0.5	1/6115	0.2			0/2687	0.0		
Staten Island U N			3/3336	0.9	1/995	1.0	NA	NA	0/185	0.0
Staten Island U S			1/825	1.2						
StonyBrkSouthampton			4/1316	^ 3.0						
StonyBrookUniv	8/4524	1.8			5/7310	0.7	2/449	4.5	0/722	0.0
Strong Memorial	14/15141	0.9			6/8545	0.7	1/392	2.6	1/4101	0.2
Sunnyview Rehab Hosp			0/85	0.0						
Syosset Hospital	0/320	0.0	NA	NA	NA	NA				
UHS Binghamton			0/1116	0.0						
UHS Chenango Memor			0/166	0.0						
UHS Wilson	0/68	0.0	9/8045	1.1	0/485	0.0				
UPMC Chautauqua WCA	1/973	1.0	1/953	1.0						
United Memorial	0/717	0.0			0/181	0.0				
Unity Hosp Rochester			1/11195	* 0.1						

Table 15. Central line-associated bloodstream infection rates by ward type, New York State 2018

	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	**0.94**		**0.77**		**0.83**		**0.63**		**0.87**	
Univ Hosp SUNY Upst	2/10394	* 0.2			1/4125	0.2	0/1352	0.0	2/1187	1.7
Upst. Community Gen	1/931	1.1	0/1157	0.0						
Vassar Brothers	2/3685	0.5			0/545	0.0	0/1967	0.0	0/65	0.0
Westchester Medical	3/2784	1.1	4/5909	0.7	0/2497	0.0	1/5441	0.2	2/2519	0.8
White Plains Hosp			1/3861	0.3			0/1906	0.0		
Woodhull Med Ctr			2/2058	1.0	0/263	0.0	0/588	0.0	NA	NA
Wyckoff Heights			5/3750	1.3			0/89	0.0	NA	NA

New York State data reported as of June 27, 2019. — 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 and bloodstream infections associated with use of extracorporeal membrane oxygenation and ventricular assist devices.

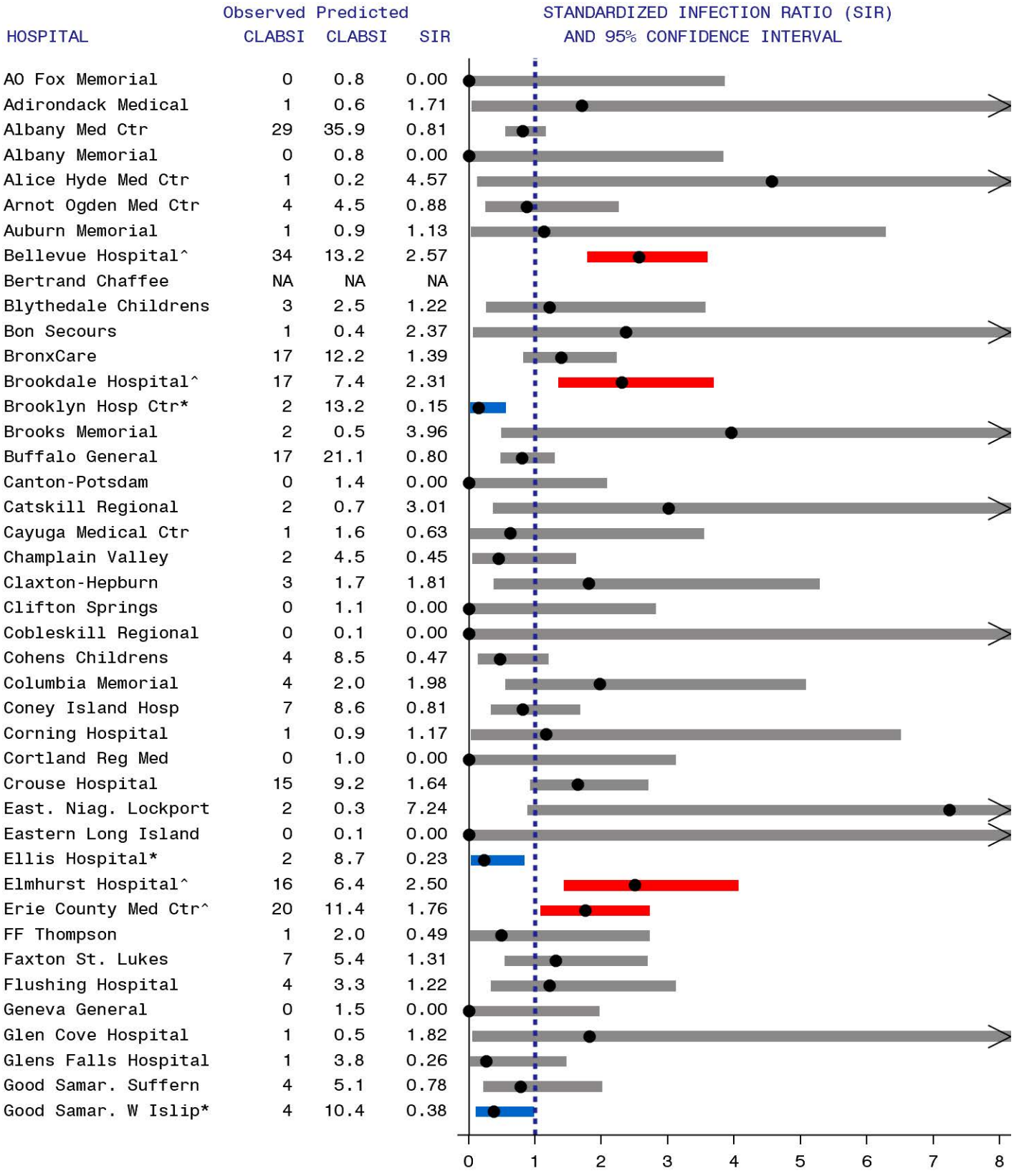
Hospital-Specific, CLABSI Standardized Infection Ratios

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 NYS data in the same calendar year. The CLABSI SIR is calculated by dividing the total observed number of CLABSIs across all reportable locations in the hospital by the statistically predicted number of CLABSIs in each location. 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.

- An SIR of 1.0 means the observed number of infections is equal to the number of predicted infections.
- An 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. For example, a hospital SIR of 1.12 indicates that the hospital performed 12% worse than the state average. If the SIR is significantly higher than 1, the result is highlighted in red.
- An 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. For example, a hospital SIR of 0.85 indicates that the hospital performed 15% better than the state average. If the SIR is significantly lower than 1, the result is highlighted in blue.

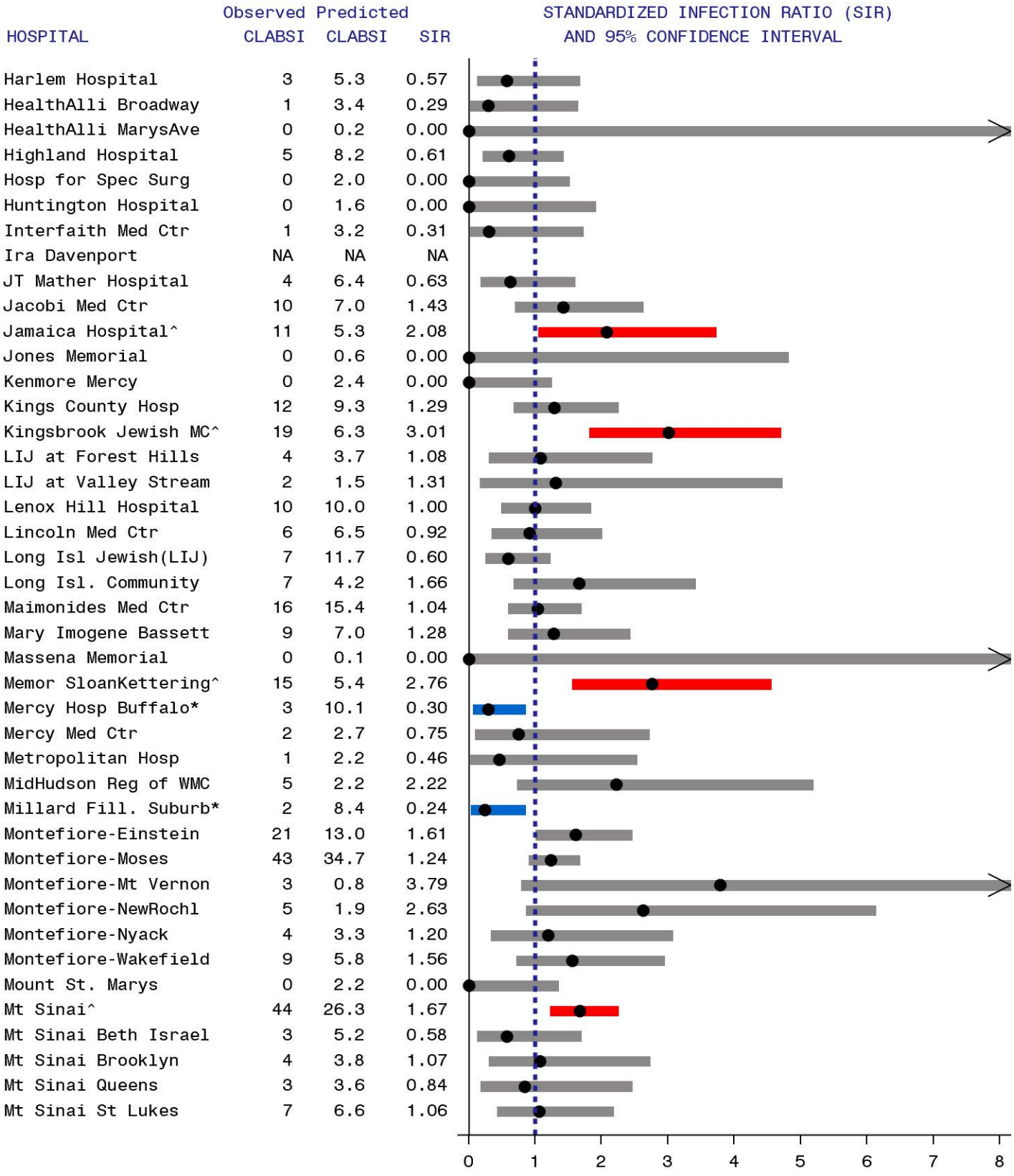
Figure 12 provides hospital-specific CLABSI SIRs for each hospital. Thirteen hospitals (8%) had high SIR flags in 2018; two (Kingsbrook Jewish and Mount Sinai) were high for three consecutive years. These hospitals will submit improvement plans following the NYSDOH HAI Reporting Program's Policy for Facilities with Consecutive Years of High HAI Rates. Twelve hospitals (7%) had low SIR flags; St. Peters Hospital and Unity Hospital of Rochester were low for four consecutive years, and Good Samaritan Medical Center (Islip) and St. Francis Hospital, the Heart Center were low for three consecutive years.

Figure 12. Central line-associated bloodstream infection standardized infection ratios for intensive care units and medical/surgical/stepdown wards: New York 2018 (page 1 of 4)



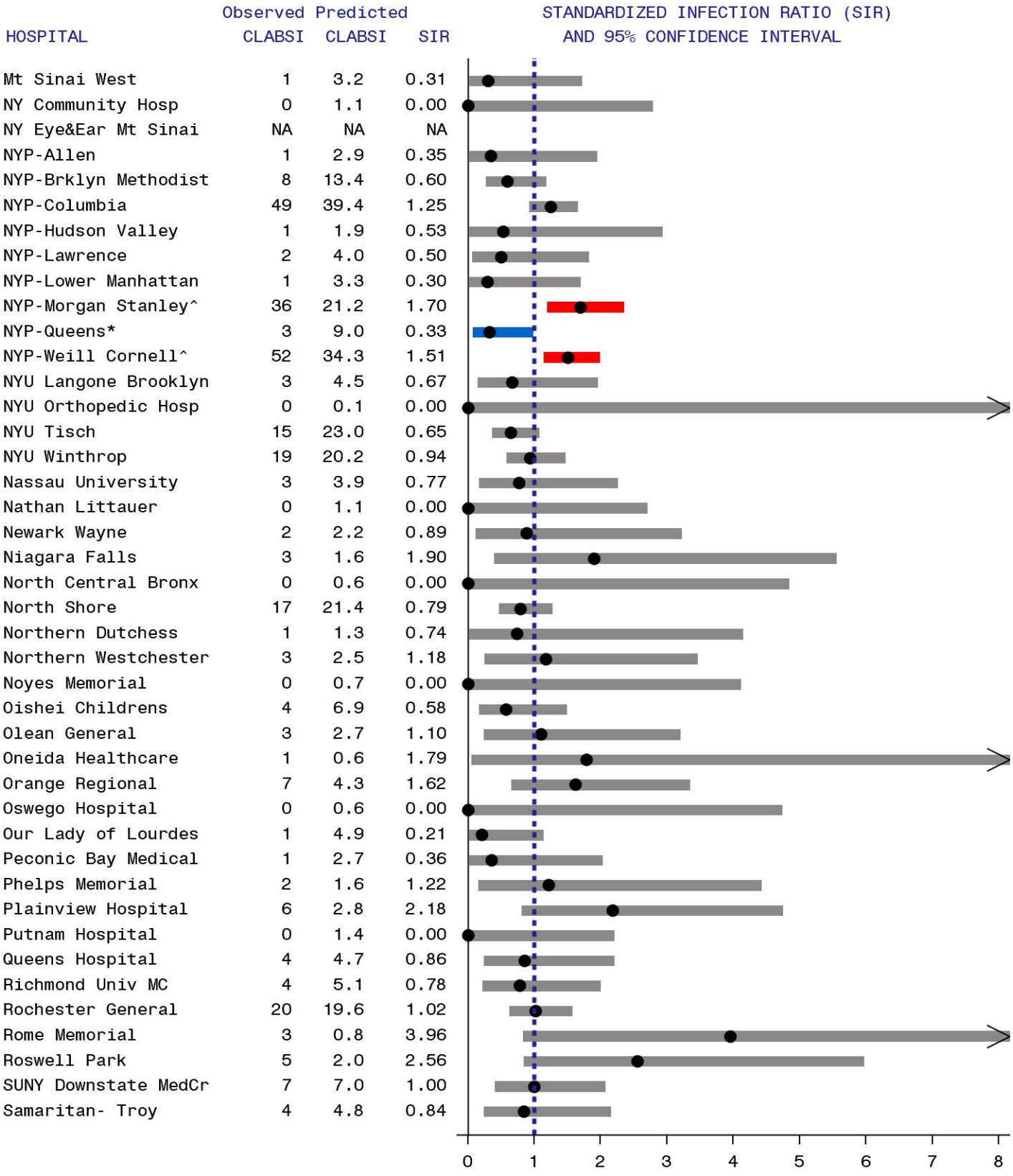
Data reported as of June 27, 2019. ┆State Average. ●SIR. ▬^^Significantly higher than state average. ▬**Significantly lower than state average. ▬Average. > Upper confidence limit exceeds graph area. NA: less than 50 central line days. Predicted based on NYS 2018 average, adjusting for location and birthweight. Excludes mucosal barrier injury CLABSI and bloodstream infections associated with use of extracorporeal membrane oxygenation and ventricular assist devices.

Figure 12. Central line-associated bloodstream infection standardized infection ratios for intensive care units and medical/surgical/stepdown wards: New York 2018 (page 2 of 4)



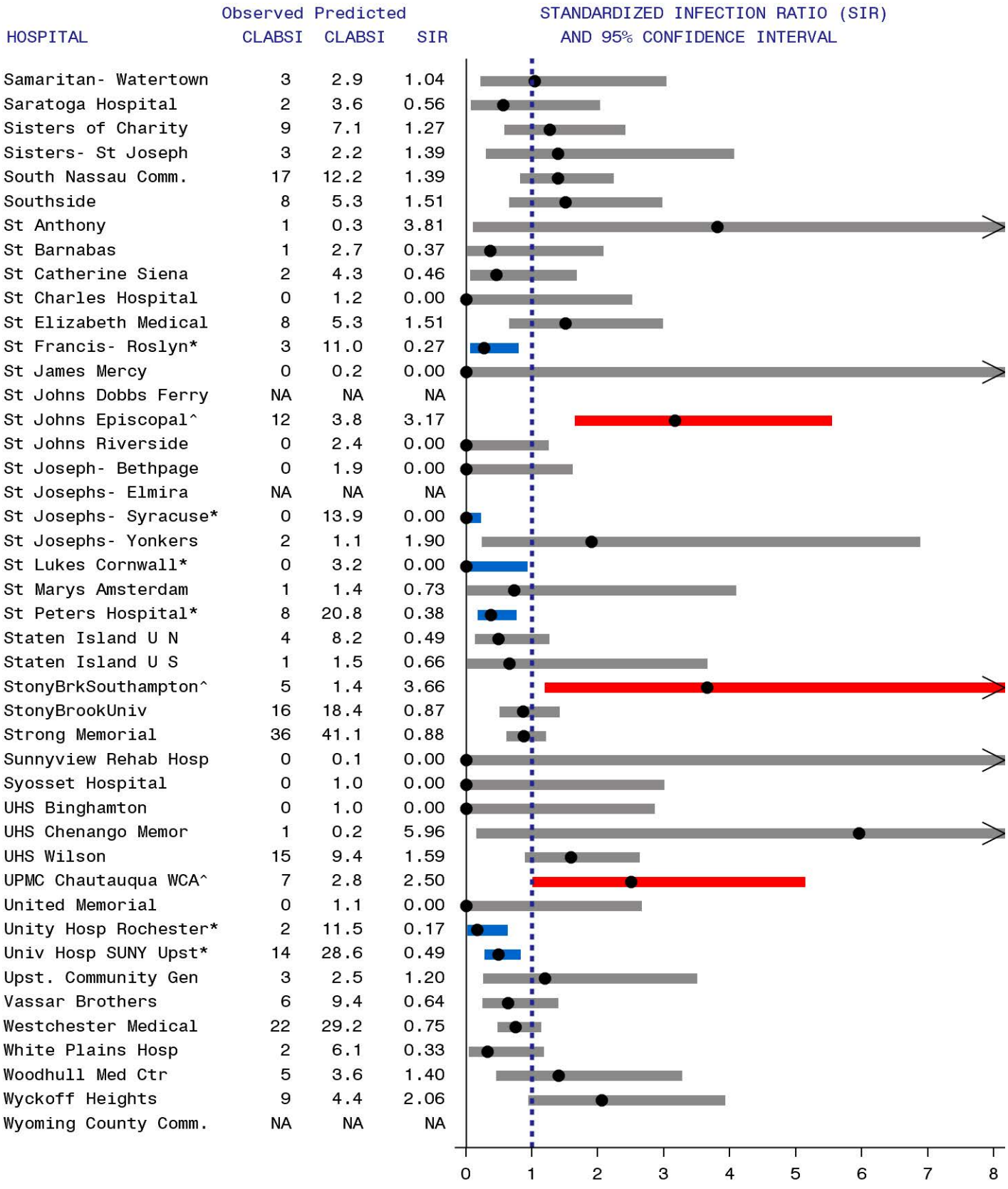
Data reported as of June 27, 2019. ┆State Average. ●SIR. ▬^^Significantly higher than state average. ▬**Significantly lower than state average. ▬Average. > Upper confidence limit exceeds graph area. NA: less than 50 central line days. Predicted based on NYS 2018 average, adjusting for location and birthweight. Excludes mucosal barrier injury CLABSI and bloodstream infections associated with use of extracorporeal membrane oxygenation and ventricular assist devices.

Figure 12. Central line-associated bloodstream infection standardized infection ratios for intensive care units and medical/surgical/stepdown wards: New York 2018 (page 3 of 4)



Data reported as of June 27, 2019. ┆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 2018 average, adjusting for location and birthweight. Excludes mucosal barrier injury CLABSI and bloodstream infections associated with use of extracorporeal membrane oxygenation and ventricular assist devices.

Figure 12. Central line-associated bloodstream infection standardized infection ratios for intensive care units and medical/surgical/stepdown wards: New York 2018 (page 4 of 4)



Data reported as of June 27, 2019. ┆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 2018 average, adjusting for location and birthweight. Excludes mucosal barrier injury CLABSI and bloodstream infections associated with use of extracorporeal membrane oxygenation and ventricular assist devices.

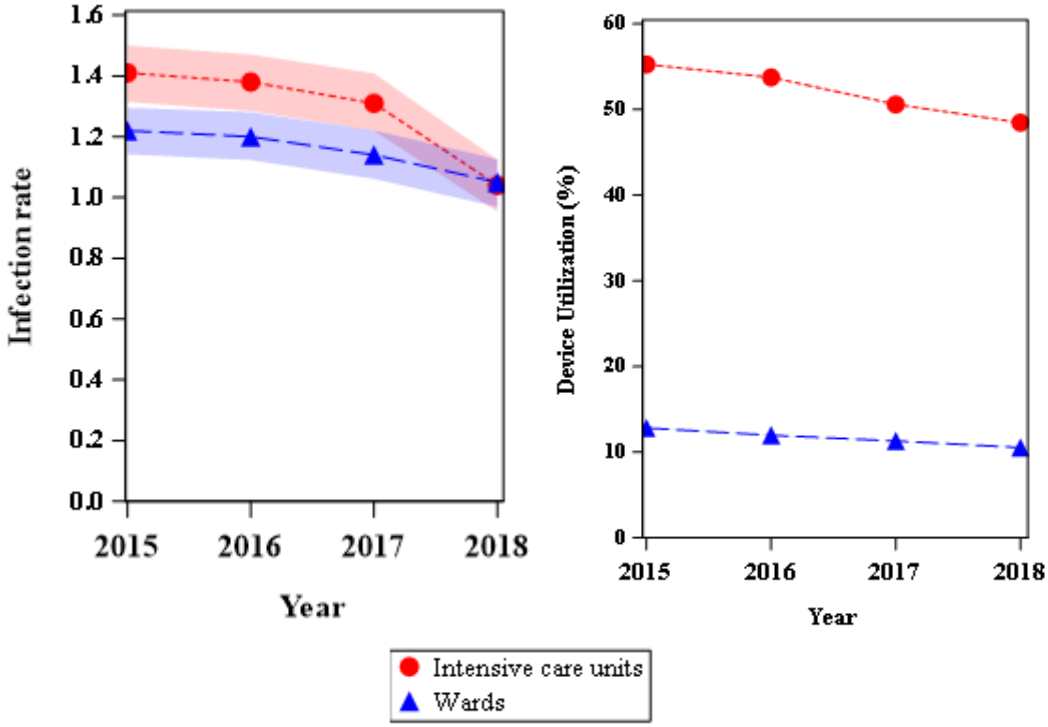
Catheter-Associated Urinary Tract Infections (CAUTIs)

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 2018, the CAUTI rate declined 25%, from 1.30 infections per 1,000 catheter days in 2015, to 1.04 infections per 1,000 catheter days in 2018. The decline was greater in ICUs (26%) than in wards (14%). Catheter utilization decreased from 55% to 48% in ICUs, and from 13% to 10% in wards (Figure 13).

Figure 13. Catheter-associated urinary tract infection and device utilization rates, New York State 2015-2018



year	Location	# Hospitals	# Catheter associated urinary tract infections	# Urinary catheter days	Catheter associated urinary tract infection	# Patient days	Device utilization rate
2015	Intensive Care Unit	157	901	641,269	1.41	1,160,365	55.3
2016	Intensive Care Unit	160	855	621,562	1.38	1,156,335	53.8
2017	Intensive Care Unit	160	763	581,732	1.31	1,149,734	50.6
2018	Intensive Care Unit	159	576	555,875	1.04	1,146,854	48.5
2015	Medical and Surgical Ward	167	987	811,105	1.22	6,322,223	12.8
2016	Medical and Surgical Ward	171	908	756,457	1.20	6,315,241	12.0
2017	Medical and Surgical Ward	169	800	702,450	1.14	6,207,829	11.3
2018	Medical and Surgical Ward	166	699	668,618	1.05	6,342,782	10.5
2015	TOTAL	169	1,888	1,452,374	1.30	7,482,588	19.4
2016	TOTAL	173	1,763	1,378,019	1.28	7,471,576	18.4
2017	TOTAL	171	1,563	1,284,182	1.22	7,357,563	17.5
2018	TOTAL	169	1,275	1,224,493	1.04	7,489,636	16.3

[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 16, 2019.

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 2018

Microorganism	Number of Isolates	Percent of Infections
Escherichia coli	447	35.1
(CRE-*E. coli*)	(2)	(0.2)
Enterococci	251	19.7
(VRE)	(66)	(5.2)
Pseudomonas spp.	213	16.7
Klebsiella spp.	207	16.2
(CRE-*Klebsiella*)	(19)	(1.5)
Enterobacter spp.	82	6.4
(CRE-*Enterobacter*)	(2)	(0.2)
Proteus spp.	77	6.0
Coagulase negative staphylococci	33	2.6
Citrobacter spp.	31	2.4
Staphylococcus aureus	28	2.2
(MRSA)	(15)	(1.2)
Morganella morganii	13	1.0
Acinetobacter spp.	11	0.9
(MDR-A*cinetobacter*)	(4)	(0.3)
Serratia spp.	11	0.9
Providencia spp.	10	0.8
Other	27	2.1

New York State data reported as of May 16, 2019. Out of 1,275 infections.
CRE: carbapenem-resistant Enterobacteriaceae;
MDR: multidrug resistant; MRSA: methicillin-resistant *Staphylococcus aureus;*
VRE: vancomycin-resistant Enterococci; spp: multiple species

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

NYS requires hospitals to track *Clostridioides difficile* infections (CDI) and carbapenem-resistant Enterobacteriaceae (CRE) infections. CMS programs require hospitals to report methicillin-resistant *Staphylococcus aureus* (MRSA). *Candida auris* is an emerging healthcare-associated fungal pathogen that causes infections reportable to NYS and the local health department.

CDI, CRE, and MRSA 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.*
- 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 Clostridioides 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.

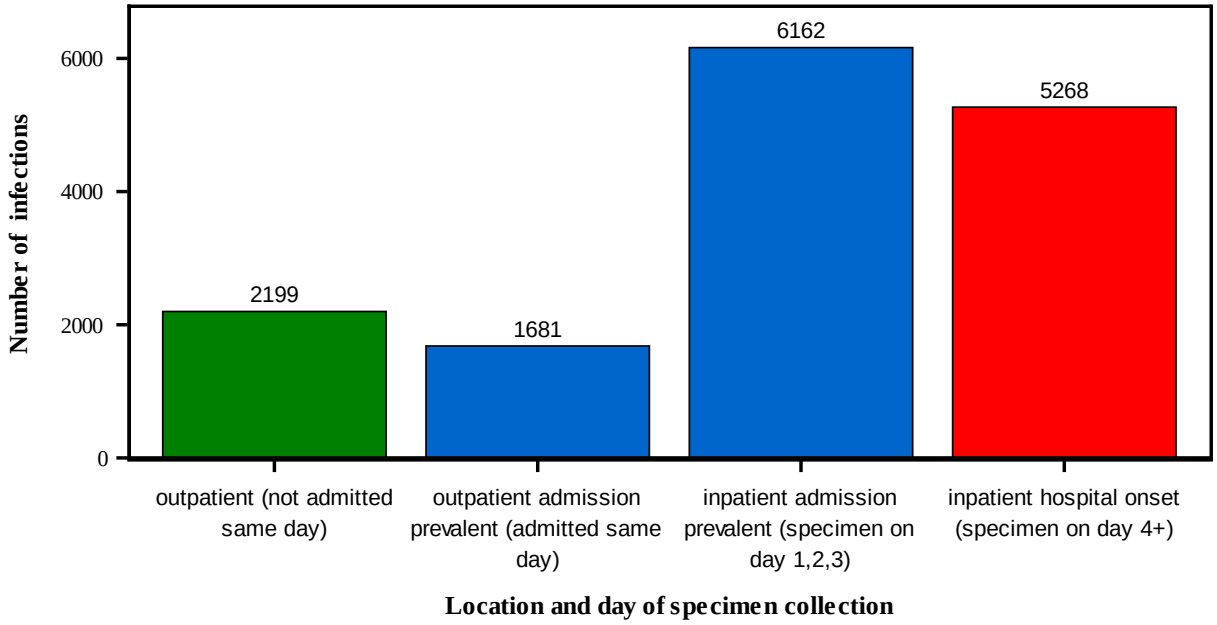
- Cases termed "hospital-onset (HO)" are cases in which the positive stool sample was obtained on day four or later during the hospital stay.

These definitions are slightly different than the ones used in CDC/CMS reports. Admission date is optional in NHSN for ED/OBS reports; however, between 2015 and 2018 NYS required hospitals to enter the admission date if it occurred 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.

Clostridioides difficile Infections (CDI)

In 2018, 15,310 CDI events were reported by acute care hospitals: 14% were identified in ED/OBS units among patients who were not admitted the same day, 11% were identified in ED/OBS units among patients who were admitted the same day, 40% were identified in the FWI areas during the first three days of hospitalization, and 34% were identified in the FWI areas after the first three days of inpatient stay (Figure 14).

Figure 14. *Clostridioides difficile* onset, New York State, 2018



Data reported as of June 18, 2019. 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 method (i.e. nucleic acid amplification tests (NAAT)).

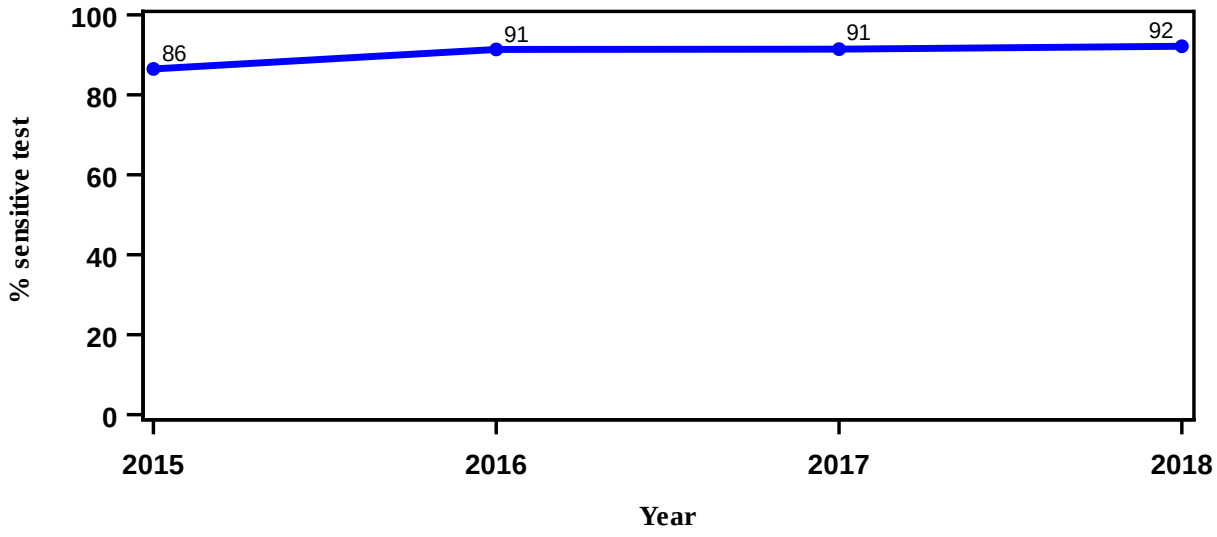
In 2018 NHSN changed the protocol for hospitals using multi-step testing algorithms, requiring them to report the results of the final CDI test that is placed in the patient's medical record. This impacted the risk adjustment method for the "NAAT plus enzyme immunoassay (EIA), if NAAT-positive" test. In 2017, two hospitals used this method, which was considered a sensitive test because NAAT-positive/EIA negative cases were reported. In 2018, six hospitals reported using that algorithm, which is now considered a less sensitive test because NAAT-positive/EIA negative cases are not reported. Table 17 summarizes the testing methods reported by hospitals in December 2018.

Table 17. *C. difficile* test method, New York State Hospitals, December 2018

Test method	More or less sensitive	Number (%) of hospitals
Enzyme immunoassay (EIA) for toxin	less	10 (6%)
Glutamate dehydrogenase (GDH) antigen plus EIA for toxin (2-step algorithm)	less	9 (5%)
Nucleic acid amplification tests (NAAT) plus EIA, if NAAT-positive (2-step algorithm)	less	6 (3%)
GDH plus EIA for toxin, followed by NAAT for discrepant results	more	41 (23%)
GDH plus NAAT (2-step algorithm)	more	7 (4%)
NAAT	more	102 (58%)

The percentage of patient days surveilled using more sensitive tests has not changed much between 2016 and 2018 (Figure 15).

Figure 15. Percent of patient days using sensitive laboratory test method for *C. difficile*, New York State 2015-2018

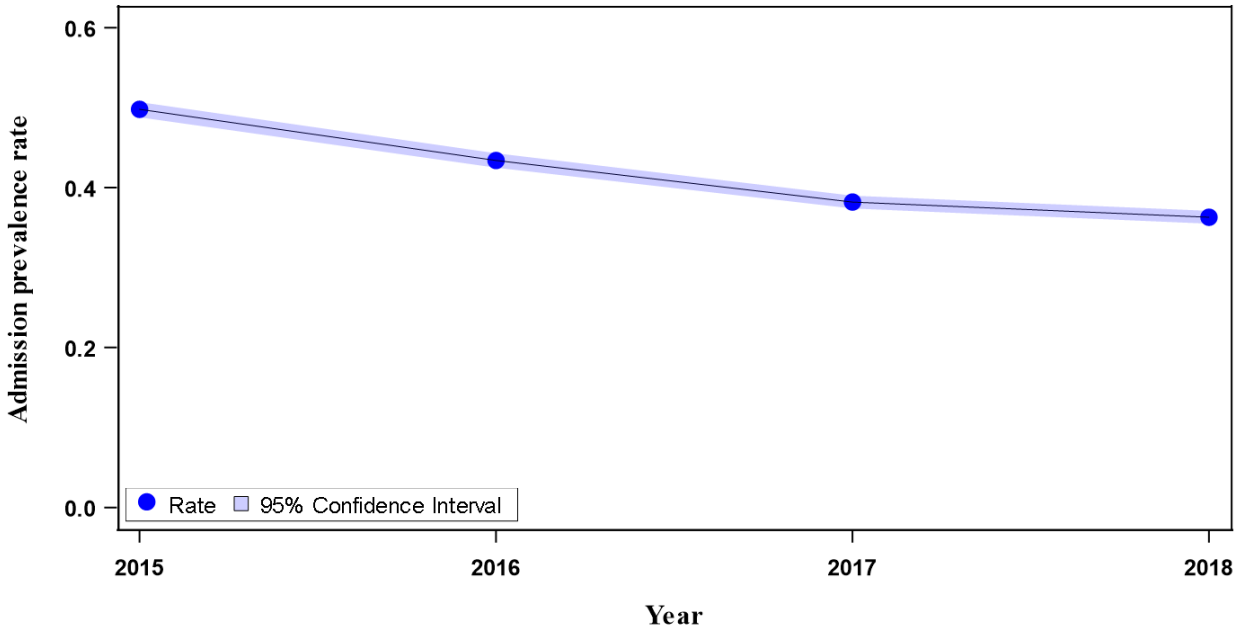


Data reported as of June 18, 2019.

Admission Prevalence

The admission prevalence rate describes the percentage of patients admitted to hospitals with CDIs. In 2018, there were 7,827 of these cases out of 2,158,053 admissions, for a rate of 0.36% (Figure 16). This was a decrease of 27% compared to 2015.

Figure 16. Trend in *C. difficile* admission prevalence rate, New York State 2015-2018



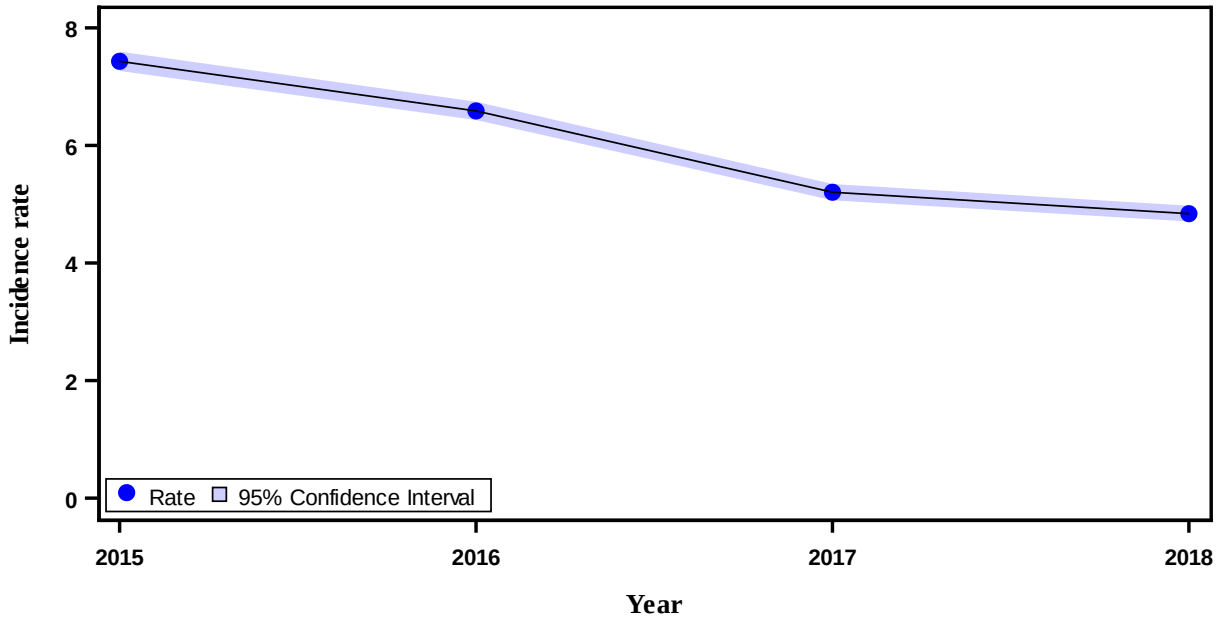
Year	# Hospitals	# Admission Prevalent Infections	# Admissions	Admission Prevalence Rate	% Discharged from Same Hospital in Previous 28 Days
2015	175	10,454	2,106,161	0.496	25%
2016	178	9,173	2,113,844	0.434	24%
2017	177	8,278	2,166,855	0.382	25%
2018	175	7,827	2,158,053	0.363	25%

Data reported as of June 18, 2019. 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 4.84 per 10,000 patient days in 2018 (Figure 17), a decrease of 35% compared to 2015.

Figure 17. Trend in *Clostridioides difficile* hospital onset rates, New York State 2015-2018



Year	# Hospitals	# Hospital Onset Infections	# Patient Days	Hospital Onset Rate
2015	175	7,870	10,590,347	7.43
2016	178	6,933	10,525,449	6.59
2017	177	5,449	10,471,466	5.20
2018	175	5,057	10,449,466	4.84

Data reported as of June 18, 2019. 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 was used. Consistent with results from previous NYS reports, the HO rate for hospitals performing more sensitive tests was set to 1.5 times higher than hospitals performing less sensitive tests.

- 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 3.6.

- Hospital bed size, as reported in 2018 NHSN survey – The HO rate at hospitals with 100 to 424 beds was 1.3 times higher than the rate at hospitals with less than 100 beds, and the HO rate at hospitals with greater than 424 beds was 1.7 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 of 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 18. 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, and one very small hospital was excluded due to an outlying CO-NMH prevalence rate. The remaining 159 hospitals contributed 4,690 HO CDIs among 9,870,269 patient days, for an average HO rate of 4.75 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 2018, 13 out of 159 hospitals (7%) were flagged with adjusted rates significantly higher than the state average; NYP-Columbia and NYP-Weill Cornell were flagged high for four consecutive years, and Montefiore Moses was flagged high for three consecutive years. The 13 hospitals will submit improvement plans following the NYSDOH HAI Reporting Program's Policy for Facilities with Consecutive Years of High HAI Rates. Thirteen hospitals (7%) were flagged significantly lower than average. Mount Sinai West, Mount Sinai Beth Israel, and St. Barnabas Hospital were significantly lower than average for the last three consecutive years.

Figure 18. Hospital onset facility-wide inpatient *C. difficile* rates, New York State 2018 (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	2	17	5	6	7,928	0.8	7.6	8.3
Adirondack Medical	S	15	9	4	3	7,332	0.4	4.1	4.9
Albany Med Ctr	S	11	135	34	121	192,180	0.3	6.3	5.1
Albany Memorial	S	3	11	2	2	11,371	0.4	1.8	2.6
Alice Hyde Med Ctr	N	1	5	0	0	6,600	0.2	0.0	0.0
Arnot Ogden Med Ctr	S	11	31	11	22	46,040	0.3	4.8	5.2
Auburn Memorial^	S	21	28	10	23	16,647	0.6	13.8	13.5
Bellevue Ellis	S	NA	NA	NA	NA	6,034	0.0	NA	NA
Bellevue Hospital	S	16	25	10	56	109,851	0.3	5.1	4.3
Bertrand Chaffee	N	0	3	0	1	4,436	0.2	2.3	7.3
Blythedale Childrens	S	NA	NA	NA	NA	28,331	0.0	NA	NA
Bon Secours	S	0	6	5	2	8,996	0.2	2.2	3.6
BronxCare	S	0	42	16	42	108,199	0.2	3.9	5.1
Brookdale Hospital	N	4	6	2	16	64,997	0.1	2.5	5.2
Brooklyn Hosp Ctr*	S	4	23	1	8	84,644	0.2	0.9	1.4
Brooks Memorial	S	2	7	0	2	7,079	0.3	2.8	3.6
Buffalo General	S	44	52	11	92	139,530	0.2	6.6	5.6
Burdett Care Center	S	NA	NA	NA	NA	2,501	0.0	NA	NA
Calvary Hospital	N	NA	NA	NA	NA	77,710	0.0	NA	NA
Canton-Potsdam	S	24	28	12	10	18,576	0.6	5.4	5.7
Catskill Regional	S	16	16	11	12	15,247	0.5	7.9	9.9
Cayuga Medical Ctr	S	18	28	7	4	21,427	0.5	1.9	1.6
Champlain Valley	S	6	77	12	36	54,119	1.0	6.7	3.4
Claxton-Hepburn	S	14	18	4	7	11,929	0.7	5.9	3.5
Clifton Springs	S	0	9	2	1	15,270	0.4	0.7	0.9
Cobleskill Regional	S	NA	NA	NA	NA	4,822	0.2	NA	NA

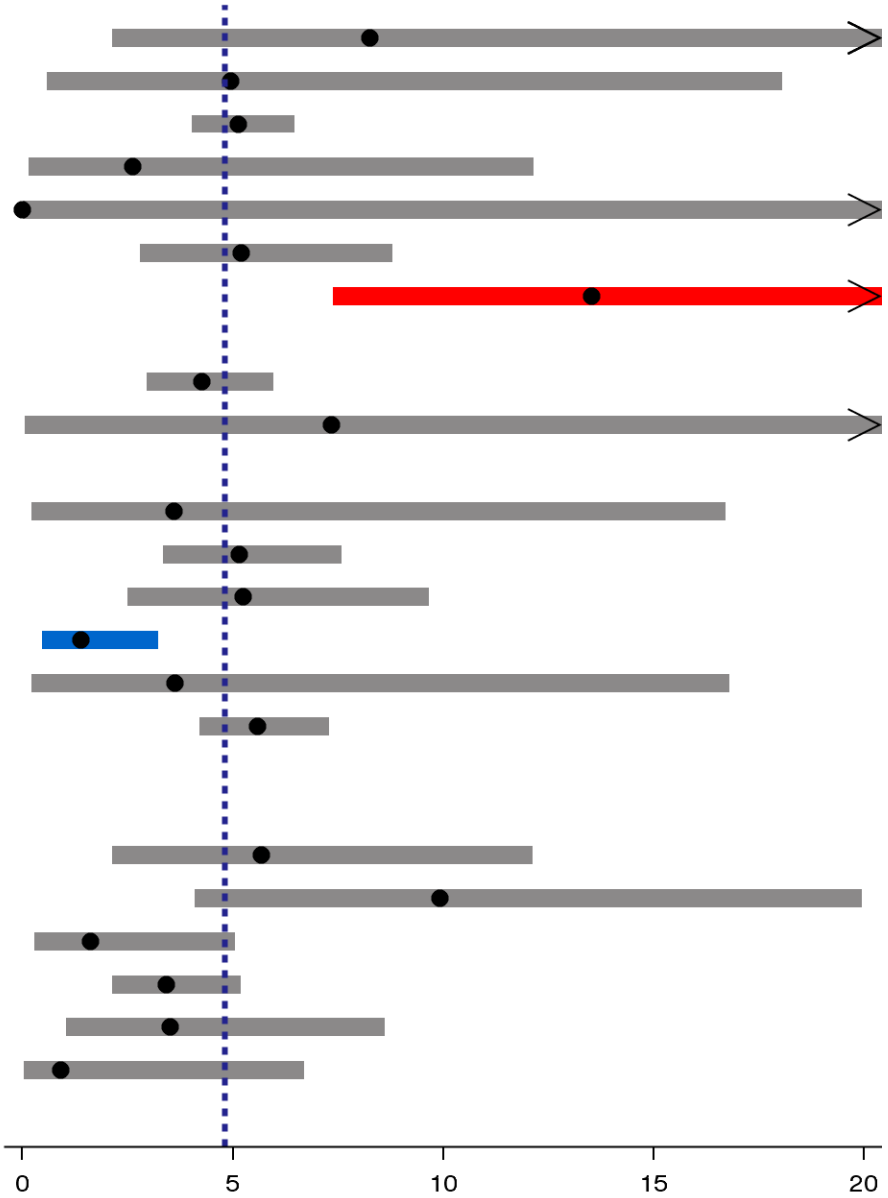


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Figure 18. Hospital onset facility-wide inpatient *C. difficile* rates, New York State 2018 (Page 2 of 7)

HOSPITAL	TEST METH	# OP	# CO-NMH	# CO-PMH	# HO	# PATDAYS	CO-NMH RATE	RAW HO RATE	ADJ HO RATE
Cohens Childrens	S	NA	NA	NA	NA	39,252	0.3	NA	NA
Columbia Memorial^	S	54	15	4	31	24,456	0.3	12.7	14.7
Coney Island Hosp	S	13	56	11	40	81,035	0.6	4.9	3.7
Corning Hospital	S	23	28	4	6	14,411	0.6	4.2	4.7
Cortland Reg Med*	S	3	31	11	4	11,993	0.9	3.3	1.4
Crouse Hospital*	S	19	68	15	22	77,401	0.4	2.8	2.5
DeGraff Memorial	S	NA	NA	NA	NA	1,593	2.0	NA	NA
East. Niag. Lockport	N	0	2	2	5	26,375	0.0	1.9	4.7
Eastern Long Island	S	0	7	0	0	11,545	0.4	0.0	0.0
Ellis Hospital	S	36	48	9	44	79,144	0.3	5.6	5.6
Elmhurst Hospital	S	4	17	6	23	92,011	0.1	2.5	3.0
Erie County Med Ctr	S	23	25	18	56	102,319	0.2	5.5	5.8
FF Thompson	S	32	19	9	9	23,778	0.3	3.8	4.5
Faxton St. Lukes	S	41	42	15	34	58,063	0.3	5.9	6.7
Flushing Hospital	S	2	15	6	9	57,453	0.1	1.6	2.4
Geneva General	S	22	23	2	4	14,182	0.7	2.8	1.7
Glen Cove Hospital	S	4	6	1	5	13,976	0.2	3.6	4.6
Glens Falls Hospital	S	4	43	15	33	57,168	0.4	5.8	6.3
Good Samar. Suffern^	S	2	52	20	41	49,367	0.3	8.3	7.9
Good Samar. W Islip	S	40	40	10	41	116,098	0.2	3.5	3.6
Harlem Hospital	S	1	11	6	8	51,807	0.1	1.5	2.1
HealthAlli Broadway	N	3	16	8	12	26,129	0.3	4.6	8.8
HealthAlli MarysAve	N	0	0	0	0	7,764	0.0	0.0	0.0
Henry J. Carter	S	NA	NA	NA	NA	49,110	0.0	NA	NA
Highland Hospital	S	25	52	7	16	86,370	0.2	1.9	2.6
Hosp for Spec Surg	S	NA	NA	NA	NA	46,501	0.0	NA	NA

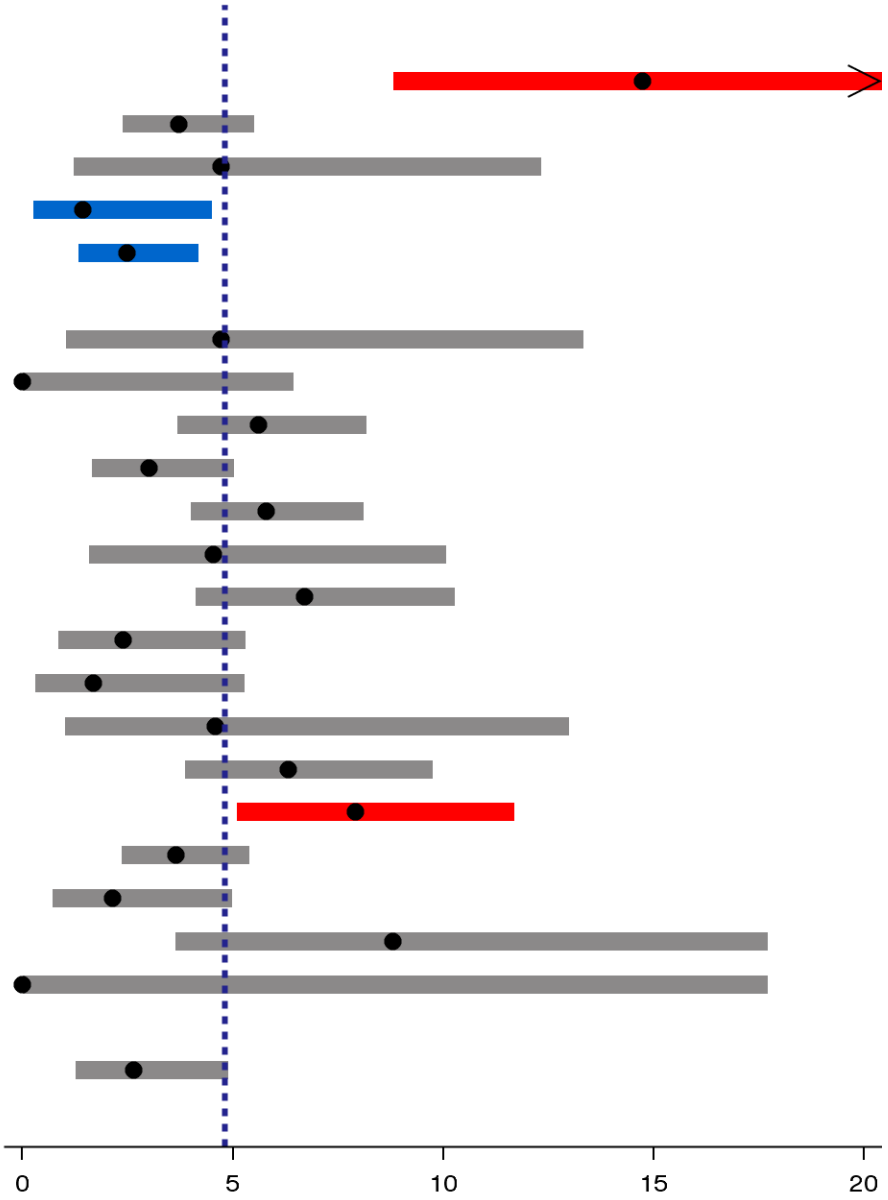

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Figure 18. Hospital onset facility-wide inpatient *C. difficile* rates, New York State 2018 (Page 3 of 7)

HOSPITAL	TEST METH	# OP	# CO-NMH	# CO-PMH	# HO	# PATDAYS	CO-NMH RATE	RAW HO RATE	ADJ HO RATE
Huntington Hospital	S	23	60	14	33	68,843	0.4	4.8	5.1
Interfaith Med Ctr	S	0	3	0	5	29,571	0.0	1.7	3.2
Ira Davenport	S	4	0	0	0	639	0.0	0.0	0.0
JT Mather Hospital	N	12	16	9	24	58,577	0.2	4.1	8.4
Jacobi Med Ctr	S	9	36	5	46	87,687	0.2	5.2	6.3
Jamaica Hospital	S	6	13	14	29	69,826	0.1	4.2	4.7
Jones Memorial	S	2	10	0	1	7,008	0.7	1.4	1.3
Kenmore Mercy	S	3	29	3	16	33,223	0.4	4.8	5.2
Kings County Hosp	S	9	23	3	36	92,743	0.2	3.9	3.9
Kingsbrook Jewish MC	S	1	19	5	14	42,476	0.3	3.3	3.6
LIJ at Forest Hills	S	5	38	13	28	69,309	0.2	4.0	5.2
LIJ at Valley Stream	S	6	19	1	7	45,311	0.2	1.5	2.1
Lenox Hill Hospital*	S	6	46	13	26	109,398	0.2	2.4	2.4
Lincoln Med Ctr	N	1	6	1	18	77,338	0.0	2.3	5.4
Long Isl Jewish(LIJ)	S	39	62	21	88	200,324	0.1	4.4	5.1
Long Isl. Community	S	31	45	17	45	69,239	0.4	6.5	6.5
Maimonides Med Ctr	N	9	34	20	31	173,407	0.1	1.8	3.1
Mary Imogene Bassett	S	12	27	6	16	47,265	0.3	3.4	4.1
Massena Memorial	N	11	11	2	0	7,494	0.5	0.0	0.0
Memor SloanKettering	S	NA	NA	NA	NA	162,956	0.5	NA	NA
Mercy Hosp Buffalo	S	16	55	23	57	95,966	0.3	5.9	6.8
Mercy Med Ctr	S	10	31	9	15	43,483	0.3	3.4	3.9
Metropolitan Hosp	S	1	5	2	4	26,920	0.1	1.5	2.0
MidHudson Reg of WMC	N	4	7	2	6	19,258	0.2	3.1	5.9
Millard Fill. Suburb	S	38	79	24	32	62,717	0.5	5.1	4.5
Montefiore-Einstein^	S	25	87	17	110	148,006	0.3	7.4	9.2

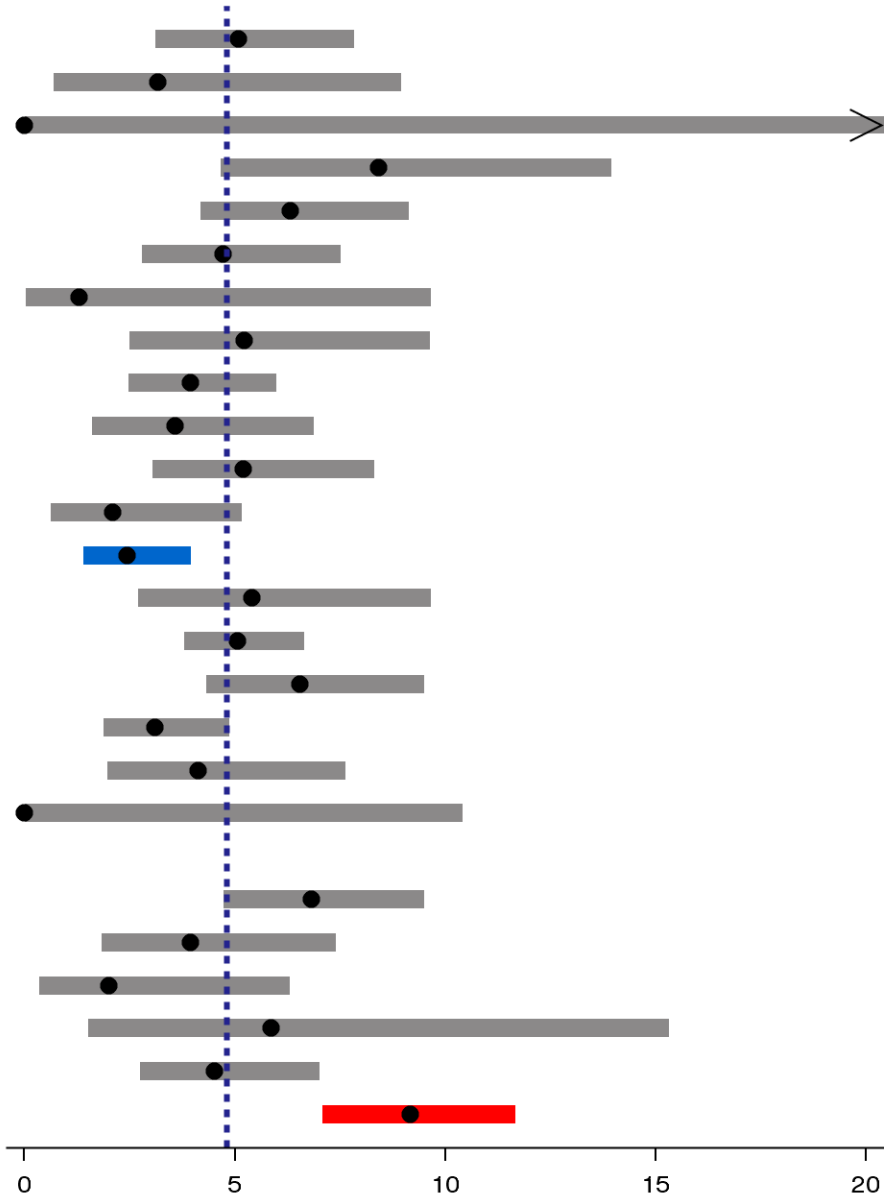

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Figure 18. Hospital onset facility-wide inpatient *C. difficile* rates, New York State 2018 (Page 4 of 7)

HOSPITAL	TEST METH	# OP	# CO-NMH	# CO-PMH	# HO	# PATDAYS	CO-NMH RATE	RAW HO RATE	ADJ HO RATE
Montefiore-Moses^	S	12	131	25	203	264,865	0.3	7.7	7.3
Montefiore-Mt Vernon	S	4	9	8	6	13,881	0.3	4.3	7.3
Montefiore-NewRochl	S	1	21	7	15	30,228	0.4	5.0	7.5
Montefiore-Nyack*	S	14	50	13	7	60,677	0.5	1.2	1.1
Montefiore-Wakefield^	S	6	39	8	56	66,489	0.3	8.4	10.8
Mount St. Marys	S	1	24	4	16	32,530	0.5	4.9	4.6
Mt Sinai	S	28	83	31	110	273,961	0.2	4.0	4.3
Mt Sinai Beth Israel*	S	3	26	7	4	66,202	0.2	0.6	0.8
Mt Sinai Brooklyn*	S	0	11	4	4	60,276	0.1	0.7	1.0
Mt Sinai Queens	S	12	11	2	8	52,434	0.1	1.5	2.4
Mt Sinai St Lukes*	S	8	17	3	9	78,711	0.1	1.1	1.5
Mt Sinai West*	S	9	7	4	6	80,184	0.0	0.7	0.9
NY Community Hosp	S	3	26	5	27	35,622	0.4	7.6	8.2
NY Eye&Ear Mt Sinai	S	NA	NA	NA	NA	1,001	0.0	NA	NA
NYP-Allen	S	8	44	18	18	46,526	0.4	3.9	4.2
NYP-Brklyn Methodist	S	26	71	20	92	161,329	0.2	5.7	6.1
NYP-Columbia^	S	53	144	48	198	213,561	0.4	9.3	6.4
NYP-Hudson Valley	S	42	34	9	20	32,600	0.4	6.1	6.1
NYP-Lawrence	S	12	36	8	33	53,619	0.3	6.2	6.9
NYP-Lower Manhattan	S	11	16	1	15	45,070	0.1	3.3	4.6
NYP-Morgan Stanley	S	NA	NA	NA	NA	62,588	0.2	NA	NA
NYP-Queens*	S	17	93	13	43	153,117	0.3	2.8	2.7
NYP-Weill Cornell^	S	100	87	33	205	229,502	0.2	8.9	8.4
NYU Langone Brooklyn	S	20	40	16	30	76,821	0.2	3.9	4.2
NYU Orthopedic Hosp	S	NA	NA	NA	NA	17,558	0.0	NA	NA
NYU Tisch	S	114	69	22	75	149,227	0.2	5.0	5.0

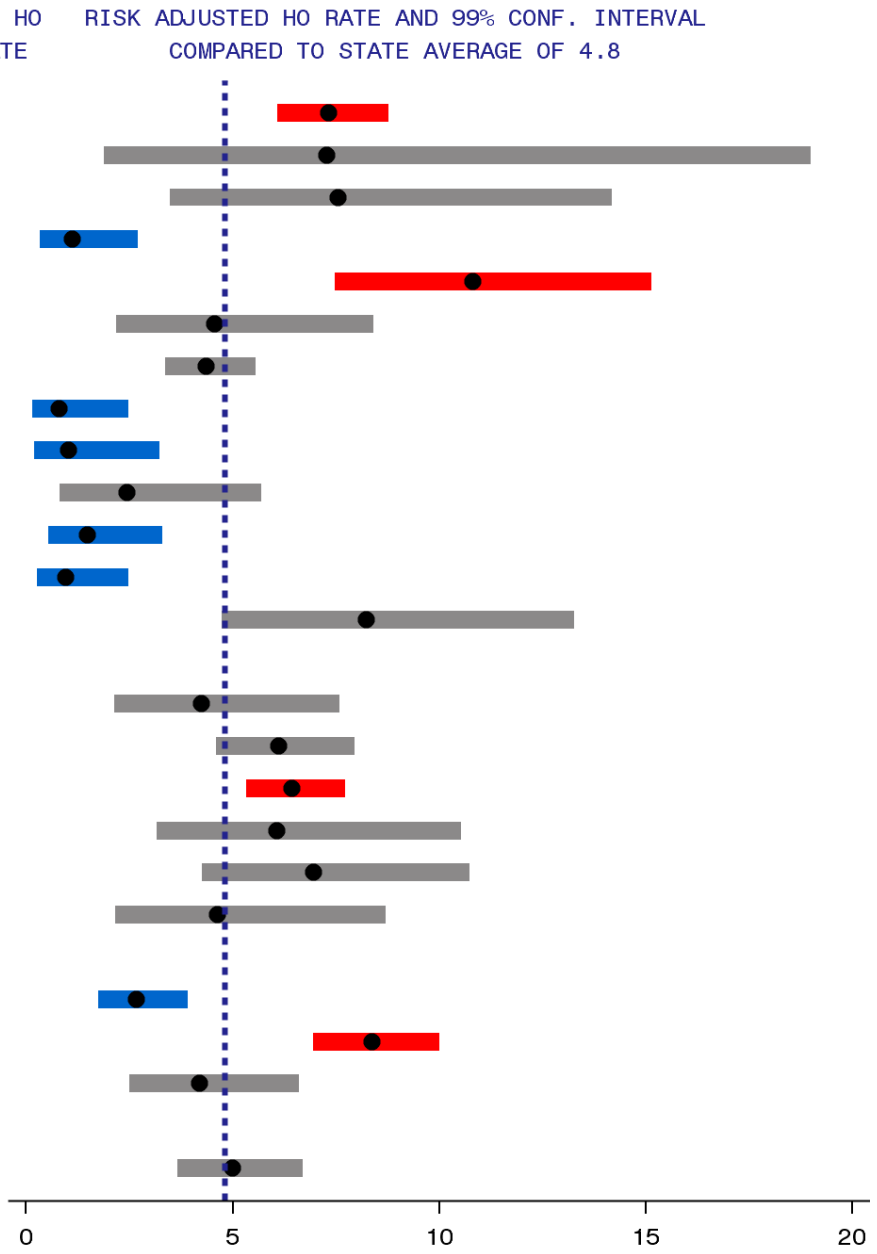

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Figure 18. Hospital onset facility-wide inpatient *C. difficile* rates, New York State 2018 (Page 5 of 7)

HOSPITAL	TEST METH	# OP	# CO-NMH	# CO-PMH	# HO	# PATDAYS	CO-NMH RATE	RAW HO RATE	ADJ HO RATE
NYU Winthrop	S	44	88	23	86	153,646	0.3	5.6	5.2
Nassau University	N	2	22	4	24	68,821	0.1	3.5	4.9
Nathan Littauer	N	1	7	1	3	7,673	0.3	3.9	7.8
Newark Wayne	S	0	17	5	12	19,872	0.2	6.0	7.1
Niagara Falls	S	3	14	2	5	21,728	0.3	2.3	2.6
North Central Bronx	S	4	18	1	5	26,133	0.3	1.9	2.2
North Shore	S	0	64	37	101	258,939	0.1	3.9	4.2
Northern Dutchess	S	9	28	4	7	18,613	0.5	3.8	5.4
Northern Westchester	S	2	33	7	15	29,892	0.5	5.0	4.4
Noyes Memorial	S	4	11	2	1	8,520	0.4	1.2	1.4
Oishei Childrens	S	NA	NA	NA	NA	34,885	0.1	NA	NA
Olean General	S	7	27	11	15	30,228	0.4	5.0	5.5
Oneida Healthcare	S	1	14	3	3	9,261	0.6	3.2	3.3
Orange Regional	S	38	105	27	54	99,963	0.4	5.4	5.3
Oswego Hospital	S	0	17	1	5	12,795	0.6	3.9	3.8
Our Lady of Lourdes	N	4	67	21	21	43,282	0.7	4.9	4.8
Peconic Bay Medical*	S	2	40	11	7	36,856	0.5	1.9	1.8
Phelps Memorial	S	1	28	5	18	38,515	0.4	4.7	5.0
Plainview Hospital	S	13	33	3	14	38,666	0.4	3.6	3.7
Putnam Hospital	S	7	26	4	11	20,780	0.4	5.3	6.0
Queens Hospital	S	0	12	3	14	51,771	0.1	2.7	4.1
Richmond Univ MC	S	8	23	7	33	60,957	0.1	5.4	7.7
Rochester General	S	10	78	41	63	164,041	0.2	3.8	4.1
Rome Memorial	S	5	17	3	5	12,889	0.5	3.9	4.7
Roswell Park	S	NA	NA	NA	NA	40,205	0.8	NA	NA
SUNY Downstate MedCr	S	0	19	4	22	59,794	0.2	3.7	4.8

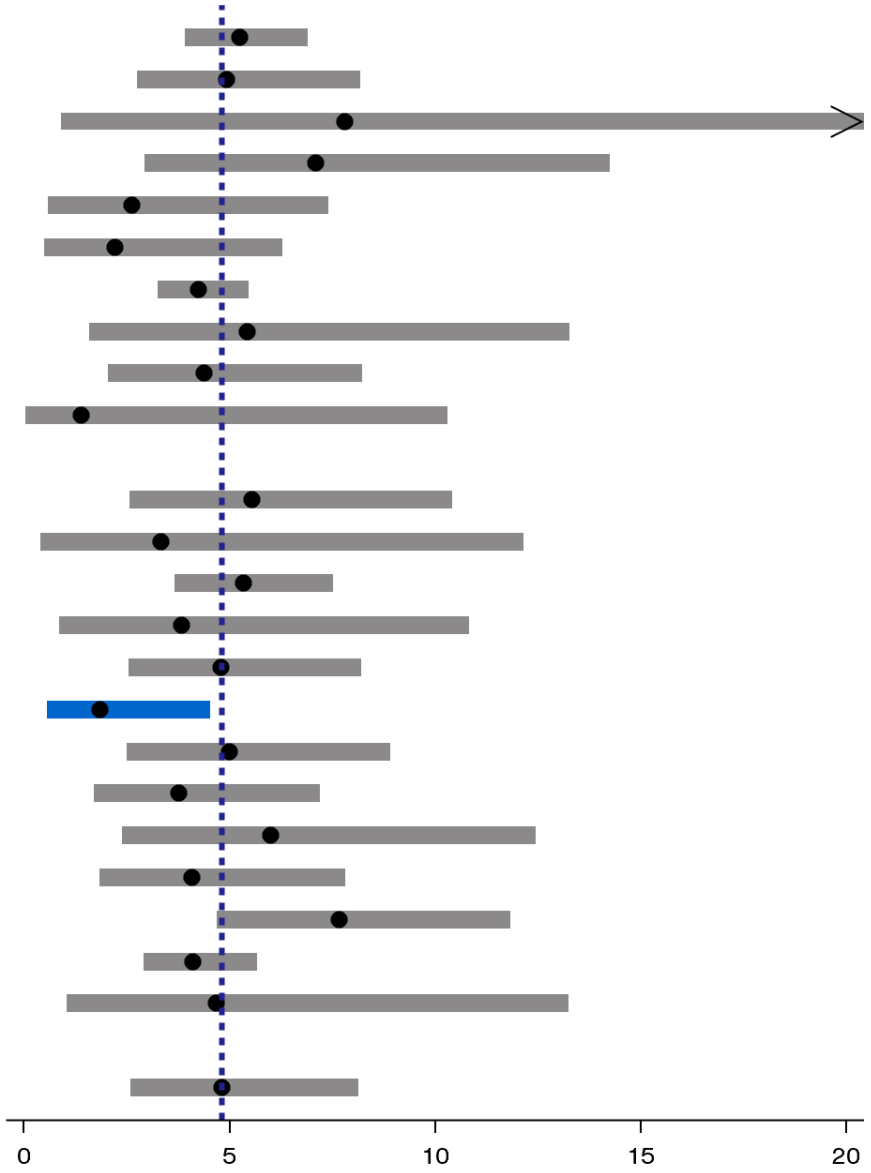

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Figure 18. Hospital onset facility-wide inpatient *C. difficile* rates, New York State 2018 (Page 6 of 7)

HOSPITAL	TEST METH	# OP	# CO-NMH	# CO-PMH	# HO	# PATDAYS	CO-NMH RATE	RAW HO RATE	ADJ HO RATE
Samaritan- Troy	S	5	42	9	21	43,389	0.4	4.8	5.1
Samaritan- Watertown	S	38	44	7	15	36,764	0.6	4.1	3.4
Saratoga Hospital	S	31	55	15	28	54,953	0.4	5.1	5.1
Sisters of Charity	S	4	49	11	28	49,141	0.5	5.7	5.8
Sisters- St Joseph	S	7	15	3	10	19,430	0.4	5.1	7.6
South Nassau Comm.	S	52	84	9	37	99,548	0.5	3.7	3.7
Southside	S	32	38	12	35	93,592	0.2	3.7	5.0
St Anthony	S	0	21	1	4	7,017	0.9	5.7	4.0
St Barnabas*	S	1	25	11	1	59,605	0.2	0.2	0.2
St Catherine Siena	S	4	22	10	8	50,372	0.2	1.6	2.1
St Charles Hospital	S	0	17	4	24	47,530	0.2	5.0	6.7
St Elizabeth Medical^	S	7	44	16	41	45,614	0.4	9.0	7.9
St Francis- Roslyn	S	16	54	14	34	95,356	0.3	3.6	3.4
St James Mercy	N	0	0	0	0	2,853	0.0	0.0	0.0
St Johns Dobbs Ferry	N	0	1	1	0	2,964	0.1	0.0	0.0
St Johns Episcopal	S	8	14	4	13	43,402	0.2	3.0	3.9
St Johns Riverside	N	4	21	12	16	47,144	0.2	3.4	7.0
St Joseph- Bethpage	S	10	20	10	14	28,729	0.3	4.9	5.3
St Josephs- Elmira	S	0	2	0	0	6,846	0.4	0.0	0.0
St Josephs- Syracuse	S	52	73	27	59	118,433	0.2	5.0	5.2
St Josephs- Yonkers	N	0	4	4	8	19,649	0.1	4.1	8.9
St Lukes Cornwall	S	9	43	17	11	45,094	0.4	2.4	2.4
St Marys Amsterdam	N	0	13	7	9	25,132	0.2	3.6	6.9
St Peters Hospital*	S	19	124	39	40	114,481	0.4	3.5	2.8
Staten Island U N	S	70	41	13	85	140,649	0.1	6.0	6.4
Staten Island U S	S	4	26	6	11	41,391	0.3	2.7	3.2

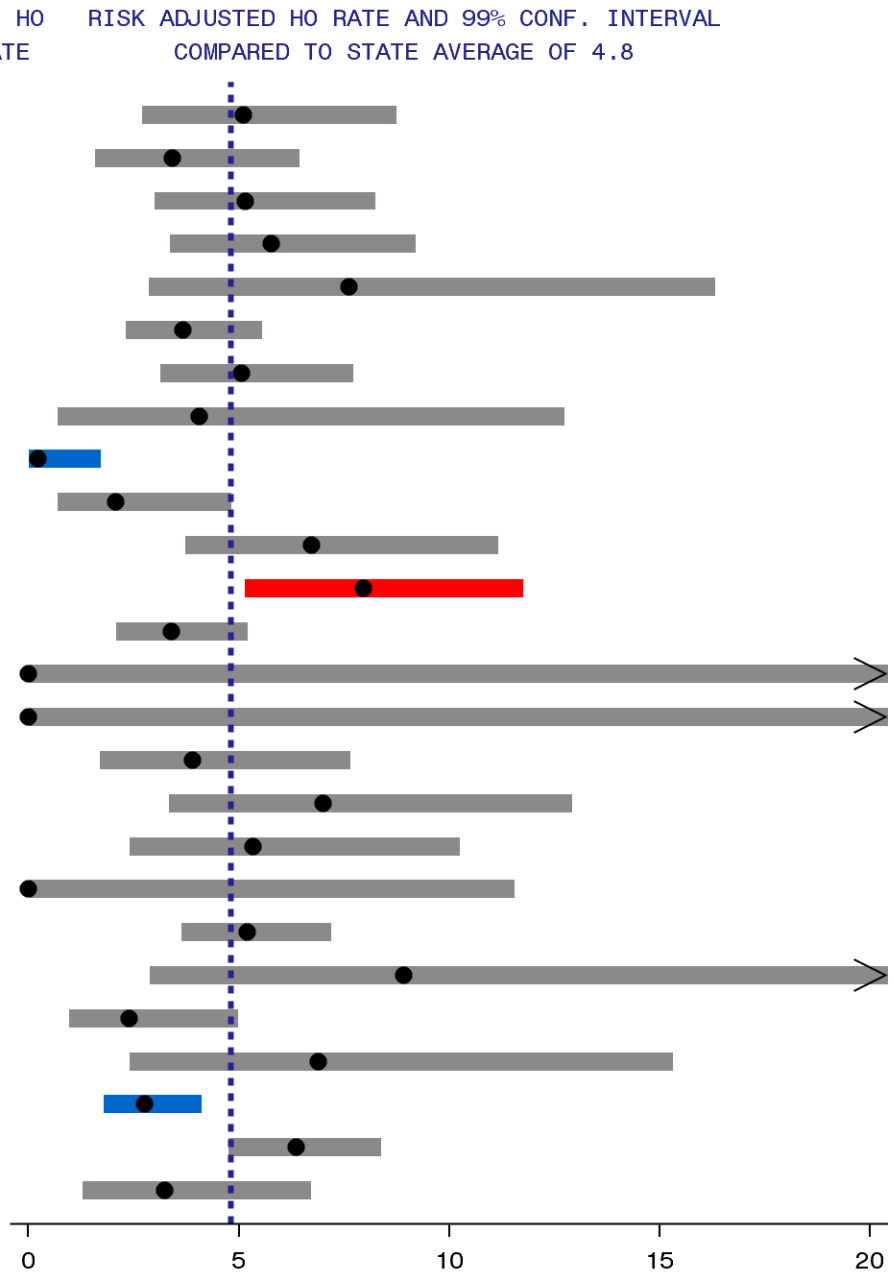

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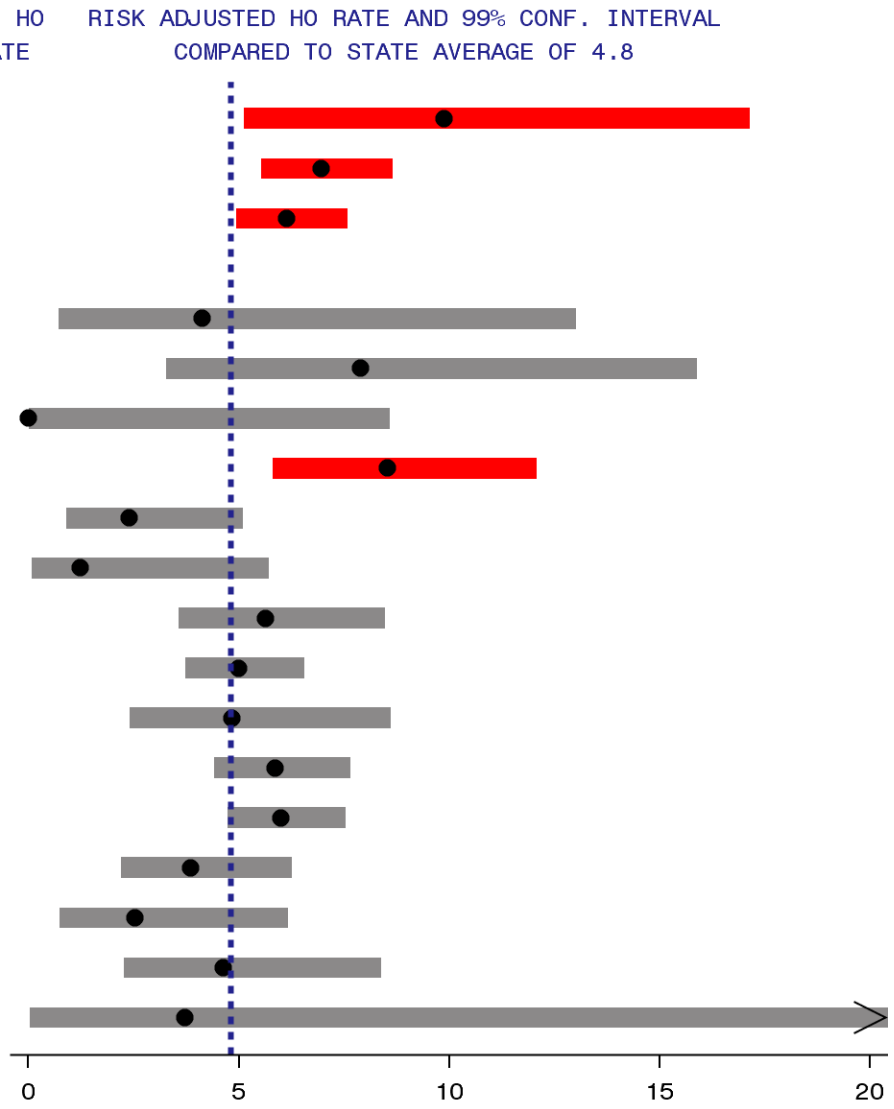
Figure 18. Hospital onset facility-wide inpatient *C. difficile* rates, New York State 2018 (Page 7 of 7)

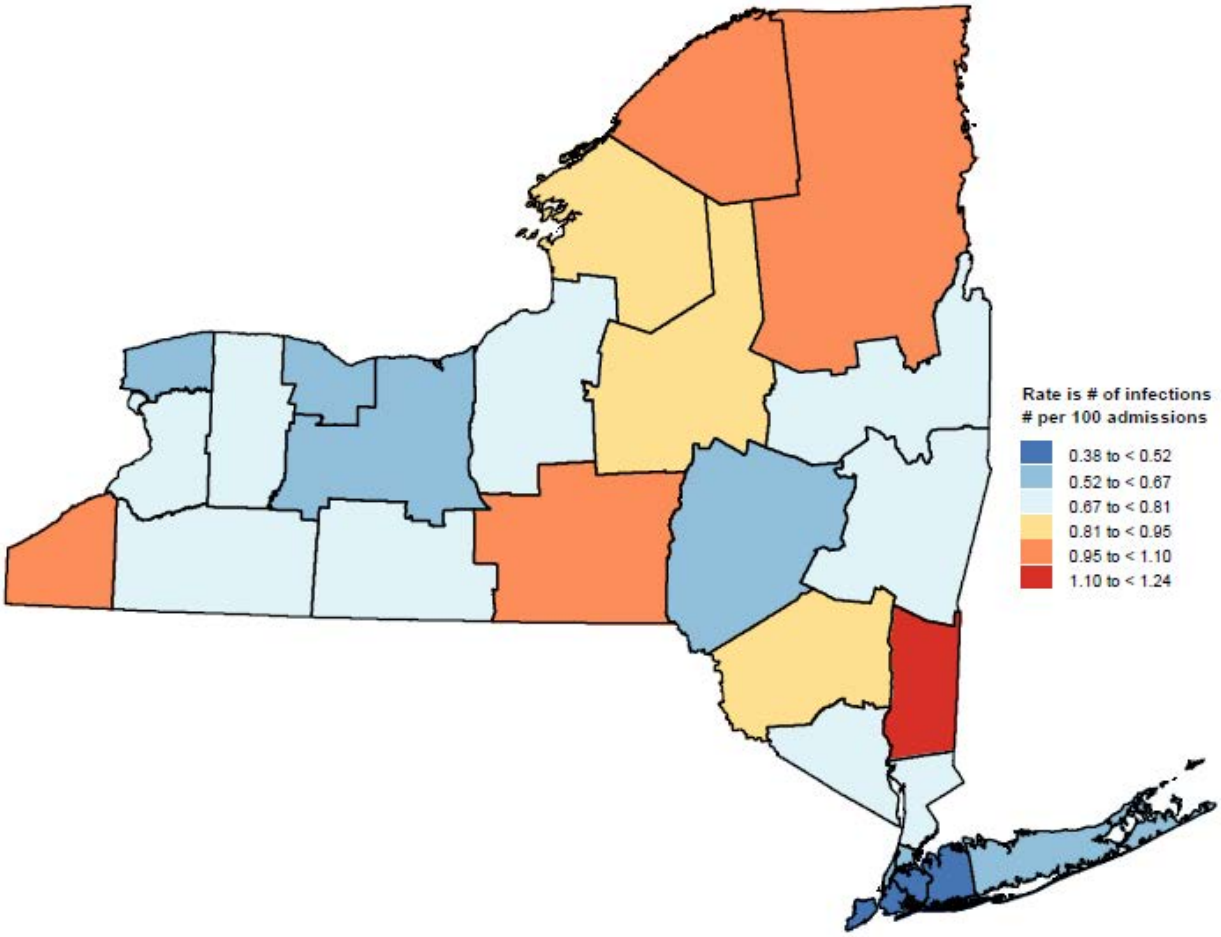
HOSPITAL	TEST METH	# OP	# CO-NMH	# CO-PMH	# HO	# PATDAYS	CO-NMH RATE	RAW HO RATE	ADJ HO RATE
StonyBrkSouthampton^	S	8	24	8	20	18,624	0.5	10.7	9.9
StonyBrookUniv^	S	108	95	38	137	171,271	0.3	8.0	7.0
Strong Memorial^	S	24	100	42	149	236,506	0.2	6.3	6.1
Sunnyview Rehab Hosp	S	NA	NA	NA	NA	4,150	0.2	NA	NA
Syosset Hospital	S	3	9	1	4	14,617	0.2	2.7	4.1
UHS Binghamton	S	6	13	3	12	16,725	0.4	7.2	7.9
UHS Chenango Memor	S	0	11	4	0	3,669	0.9	0.0	0.0
UHS Wilson^	S	13	56	22	52	64,284	0.3	8.1	8.5
UPMC Chautauqua WCA	S	16	41	6	10	21,808	0.8	4.6	2.4
United Memorial	S	4	22	4	2	12,717	0.6	1.6	1.2
Unity Hosp Rochester	S	32	59	22	38	84,016	0.3	4.5	5.6
Univ Hosp SUNY Upst	S	4	117	36	87	126,560	0.5	6.9	5.0
Upst. Community Gen	S	1	43	13	18	33,643	0.5	5.4	4.8
Vassar Brothers	S	16	142	37	91	97,781	0.8	9.3	5.9
Westchester Medical	S	25	70	14	127	151,395	0.4	8.4	6.0
White Plains Hosp	S	3	60	20	26	81,443	0.3	3.2	3.8
Woodhull Med Ctr	S	0	8	0	7	43,645	0.1	1.6	2.5
Wyckoff Heights	S	1	17	13	17	53,631	0.1	3.2	4.6
Wyoming County Comm.	N	0	3	1	1	6,518	0.2	1.5	3.7



Data reported as of June 18, 2019. ┆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 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 19. Facility-wide inpatient *Clostridioides difficile* prevalence rates, New York State 2018



Data reported as of June 18, 2019. 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.

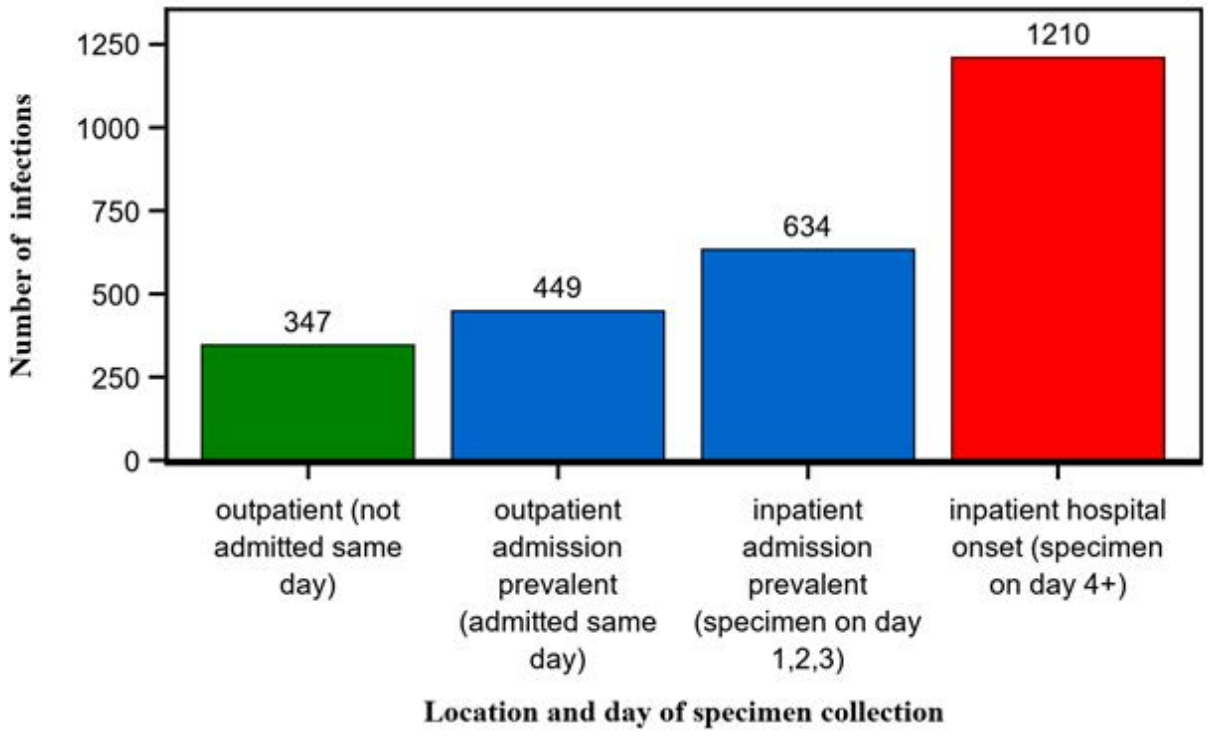
Carbapenem-resistant Enterobacteriaceae (CRE) Infections

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 2018, 2,640 CRE cases were reported: 13% were identified in ED/OBS units among patients who were not admitted the same day, 17% were identified in ED/OBS units among patients who were admitted the same day, 24% were identified in the FWI area during the first three days of hospitalization, and 46% were identified in the FWI area after the first three days of inpatient stay (Figure 20).

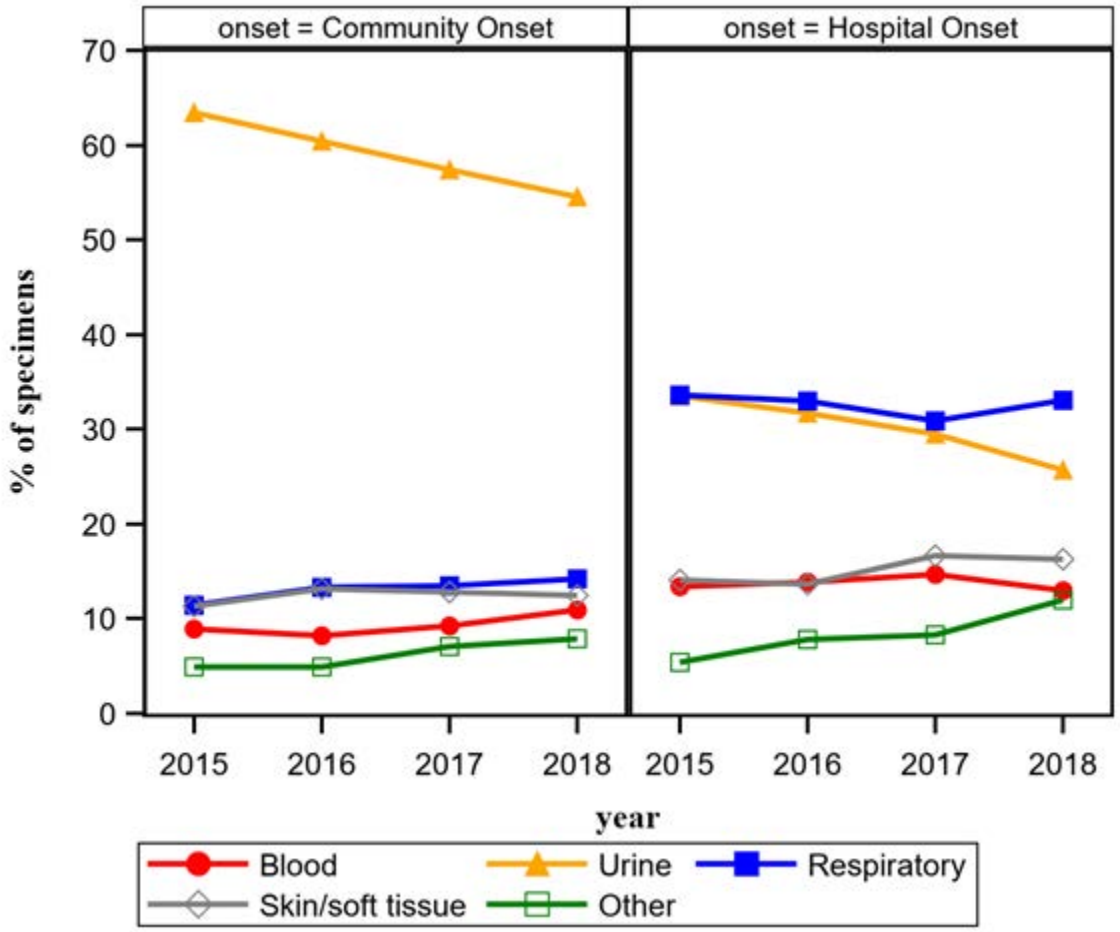
Figure 20. Carbapenem-resistant Enterobacteriaceae infection onset, NYS 2018



Data reported as of June 18, 2019. 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; among hospital onset cases, there was an increase in the proportion of respiratory specimens in 2018 (Figure 21).

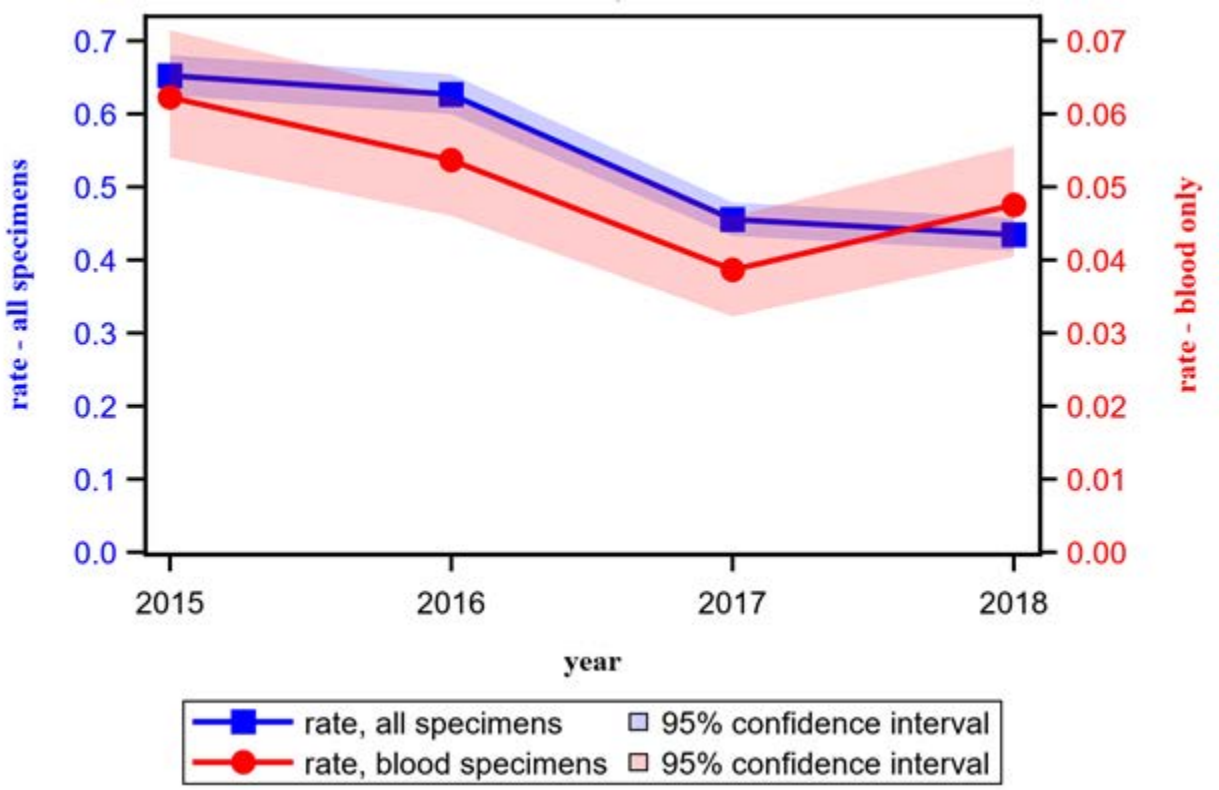
Figure 21. Carbapenem-resistant Enterobacteriaceae by specimen site, NYS 2015-2018



Data reported as of June 18, 2019

The admission prevalence rate describes the percentage of patients admitted to hospitals with CRE. In 2018, there were 1,033 of these cases out of 2,376,700 admissions, for a rate of 0.435 infections per 1,000 admissions. The overall admission prevalence rate decreased 33% between 2015 and 2018. The bloodstream infection (BSI) rate decreased 24% over the same time period; there was an increase between 2017 and 2018 that was not statistically significant (Figure 22).

Figure 22. Facility-wide inpatient carbapenem-resistant Enterobacteriaceae admission prevalence infection rates, New York State 2015-2018

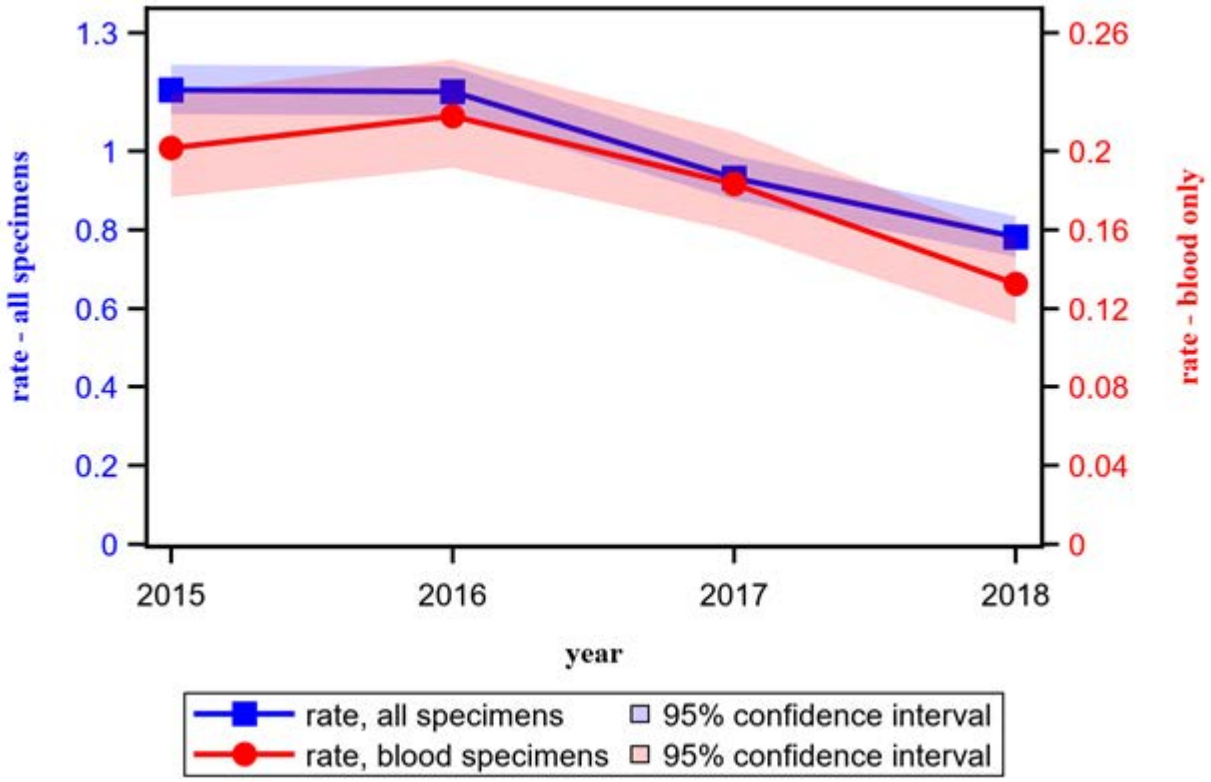


Year	# Bloodstream infections	# Total Infections	# Admissions	Bloodstream Infection Admission Prevalence Rate	All-Specimen Admission Prevalence Rate
2015	145	1,519	2,329,051	0.0623	0.652
2016	125	1,459	2,328,690	0.0537	0.627
2017	92	1,084	2,379,788	0.0387	0.456
2018	113	1,033	2,376,700	0.0475	0.435

Data reported as of June 18, 2019. 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 34% between 2015 and 2018, and the all-specimen incidence rate significantly decreased 32% between 2015 and 2018 (Figure 23). The 2018 all-specimen incidence rate was six times higher than the BSI incidence rate.

Figure 23. Facility-wide inpatient carbapenem-resistant Enterobacteriaceae infection incidence rates, New York State 2015-2018

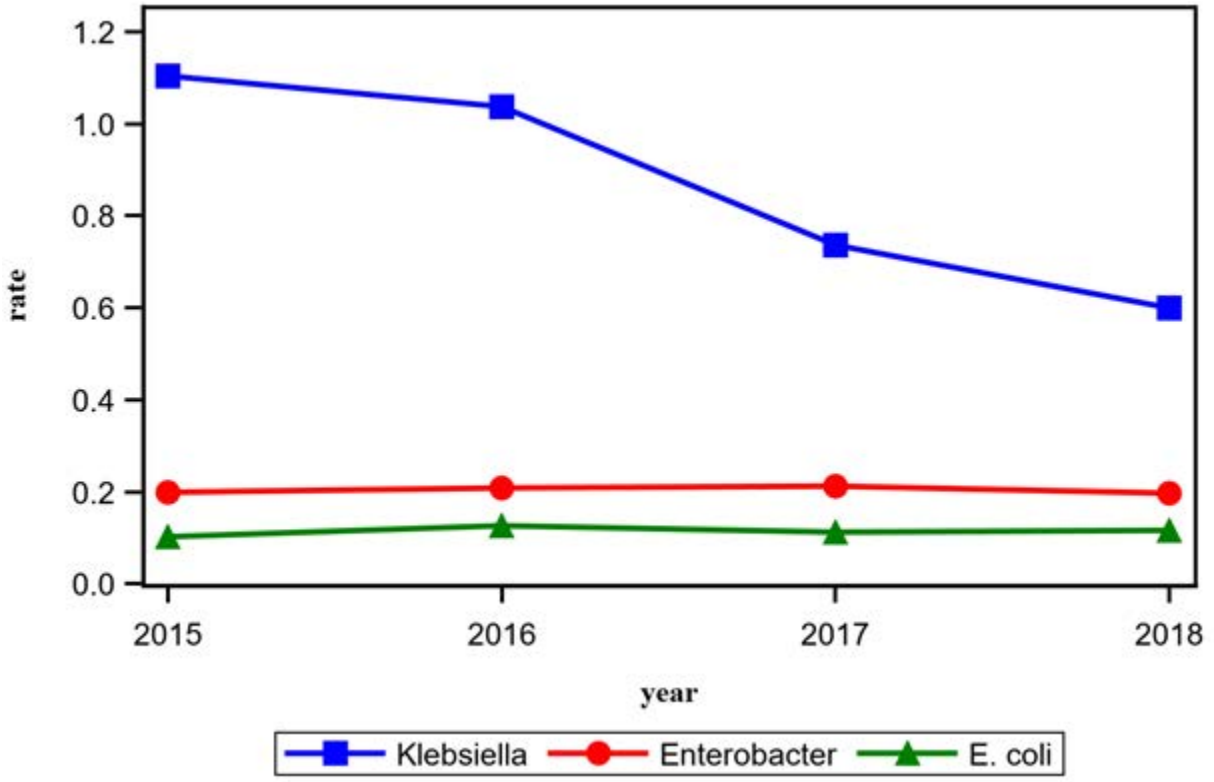


Year	# Bloodstream Infections	# Total Infections	# Patient Days	Bloodstream Infection Incidence Rate	All Specimen Infection/Colonization Incidence Rate
2015	231	1,324	11,466,593	0.201	1.155
2016	248	1,311	11,397,102	0.218	1.150
2017	208	1,057	11,355,798	0.183	0.931
2018	150	885	11,330,490	0.132	0.781

Data reported as of June 18, 2019. 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 24. Between 2015 and 2018, the prevalence of *Klebsiella* decreased 46%, the prevalence of *Enterobacter* spp. decreased 1%, and the prevalence of *E. coli* increased 14%. A small percentage (3%) of patients harbored more than one type of organism.

Figure 24. Trends in overall patient prevalence carbapenem-resistant Enterobacteriaceae infection rates by species, NYS 2015-2018



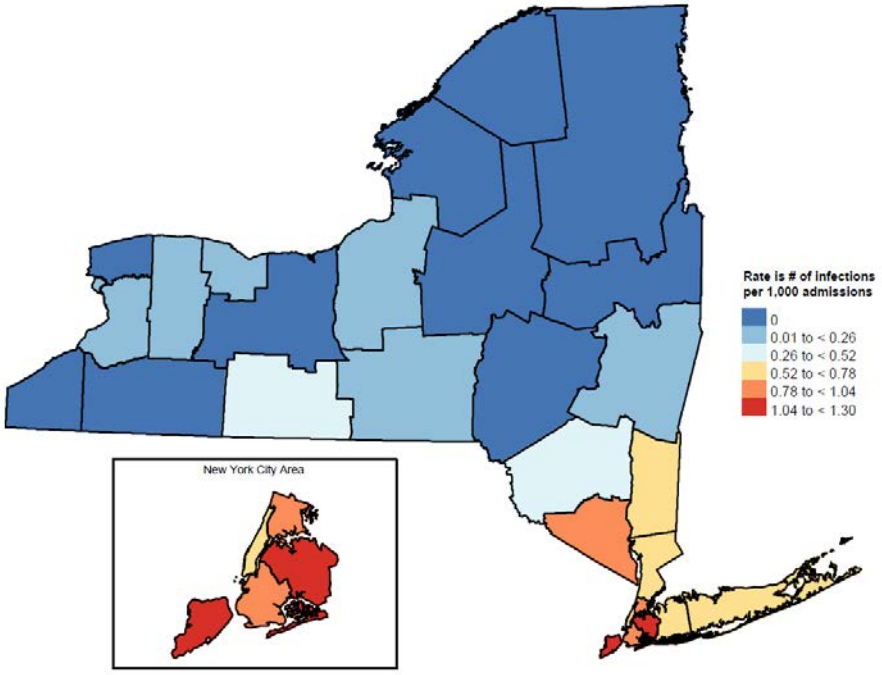
Year	*Klebsiella oxytoca and pneumoniae*	*Enterobacter* spp.	*E. coli*	Total
2015	1.104	0.199	0.102	1.405
2016	1.037	0.208	0.126	1.372
2017	0.736	0.212	0.112	1.061
2018	0.600	0.197	0.116	0.913

Data reported as of June 18, 2019. 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

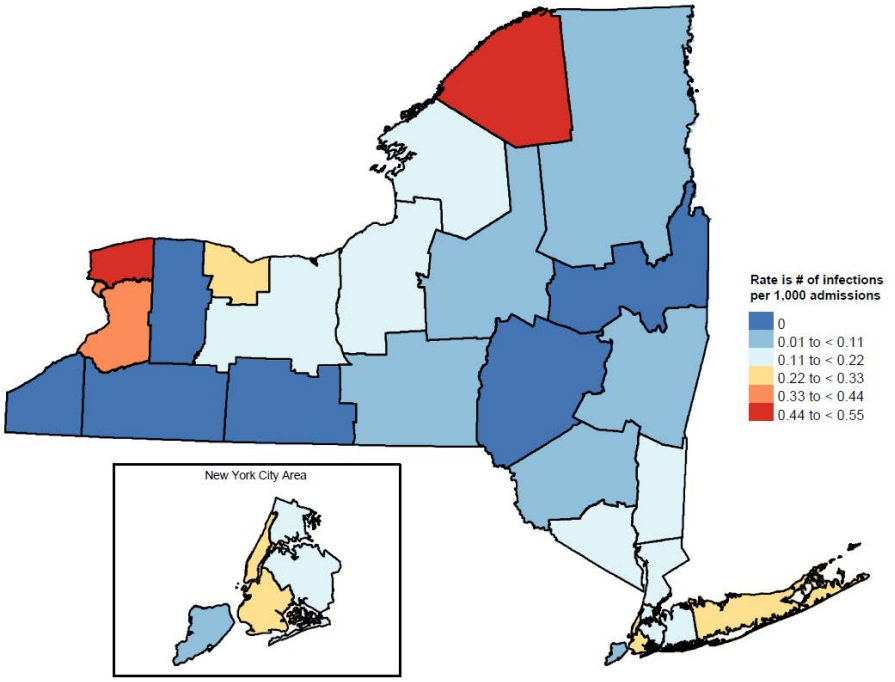
Figures 25 (a,b,c) show the FWI CRE patient prevalence rate by species and county (or merged county for those with few or no hospitals). FWI CRE-*Klebsiella* and CRE-*E. coli* patient prevalence rates are highest in the New York City area. CRE-*Enterobacter* rates showed some spikes in western and northern NYS. Note that all maps were made to show areas with zero reported cases in the darkest shade of blue, followed by five equal ranges; if the CRE-*Enterobacter* and CRE-*E. coli* maps used the same scale as the CRE-*Klebsiella* map, they would be entirely in the three shades of blue.

Figure 25 a-c. Facility-wide inpatient carbapenem-resistant Enterobacteriaceae patient prevalence rates, New York State 2018

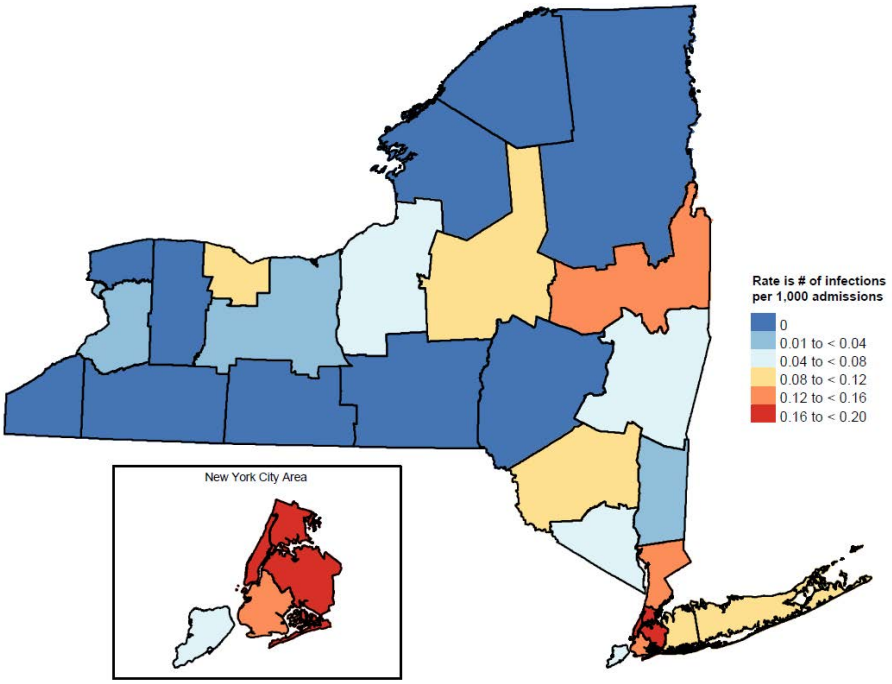
(a) CRE-*Klebsiella* overall patient prevalence rate 2018



(b) CRE-*Enterobacter* overall patient prevalence rate 2018



(c) CRE-*E. coli* overall patient prevalence rate 2018



Data reported as of June 18, 2019. 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 2018 NHSN survey, 91% of facilities used the newer more sensitive (CLSI M22 or M23 standard) breakpoints in 2018, while 9% 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. On the 2018 NHSN survey, 47% of facilities reported that their labs perform a special test for carbapenemase production. However, based on the list of 2018 CRE infections reported to NHSN, approximately 17% 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 69% 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 26, 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 26. Hospital carbapenem-resistant Enterobacteriaceae infection rates, NYS 2018 (Page 1 of 7)

Hospital Name	# All AdmPrev	# Adms	AdmPrev Rate	HO-All Rate	HO-BSI Rate	# Patdays	# All	# BSI
AO Fox Memorial	0	2164	0.0	0.0	0.0	7928	0	0
Adirondack Medical	0	2186	0.0	0.0	0.0	7641	0	0
Albany Med Ctr	12	42302	0.3	0.3	0.0	211919	7	0
Albany Memorial	2	3107	0.6	0.0	0.0	11371	0	0
Alice Hyde Med Ctr	0	3041	0.0	0.0	0.0	7190	0	0
Arnot Ogden Med Ctr	3	11621	0.3	0.0	0.0	53489	0	0
Auburn Memorial	1	4810	0.2	0.0	0.0	17414	0	0
Bellevue Ellis	0	4635	0.0	0.0	0.0	11920	0	0
Bellevue Hospital	2	9197	0.2	0.8	0.3	120277	10	4
Bertrand Chaffee	0	1761	0.0	0.0	0.0	4436	0	0
Blythedale Childrens	0	508	0.0	0.4	0.0	28331	1	0
Bon Secours	0	2968	0.0	0.0	0.0	8996	0	0
BronxCare	45	26426	1.7	3.1	0.4	117384	36	5
Brookdale Hospital	3	13411	0.2	0.3	0.0	70552	2	0
Brooklyn Hosp Ctr	19	17401	1.1	1.7	0.2	94773	16	2
Brooks Memorial	0	2358	0.0	0.0	0.0	7745	0	0
Buffalo General	1	23980	0.0	0.7	0.1	139530	10	2
Burdett Care Center	0	2079	0.0	0.0	0.0	4516	0	0
Calvary Hospital	0	2947	0.0	0.5	0.0	77710	4	0
Canton-Potsdam	4	4914	0.8	0.5	0.0	19639	1	0
Catskill Regional	1	4117	0.2	0.0	0.0	16660	0	0
Cayuga Medical Ctr	0	6485	0.0	0.0	0.0	23603	0	0
Champlain Valley	0	8591	0.0	0.0	0.0	55793	0	0
Claxton-Hepburn	0	2698	0.0	0.0	0.0	12431	0	0
Clifton Springs	0	2134	0.0	0.0	0.0	15270	0	0

Data reported as of June 18, 2019. Facility-wide inpatient only, rehab and behavioral health units excluded

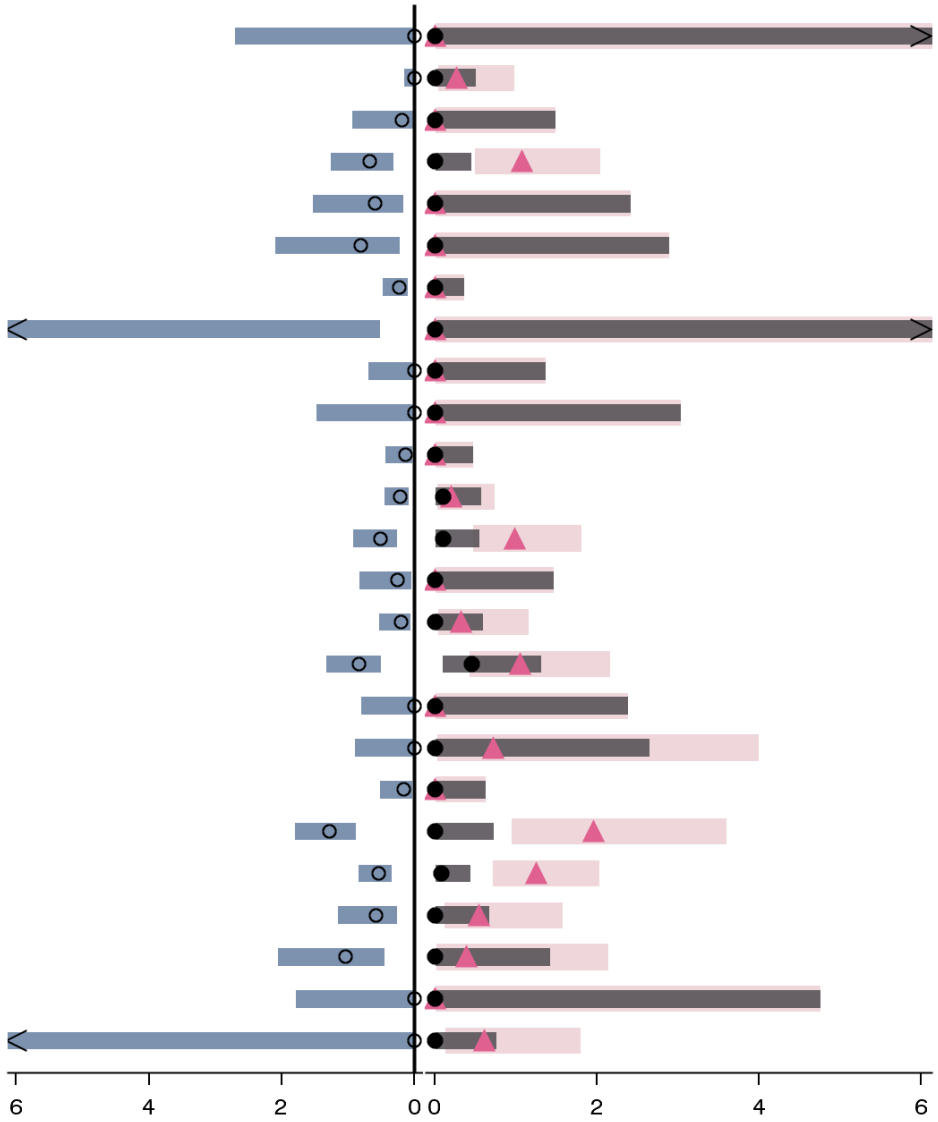
HO-All: hospital onset CRE incidence rate all sites per 10,000 patient days and 95% confidence interval (state average = 0.8)

HO-BSI: hospital onset CRE blood incidence rate per 10,000 patient days and 95% confidence interval (state average = 0.1)

All-Admprev: all body site CRE admissions prevalence rate per 1,000 admissions and 95% confidence interval (state average = 0.4)

Figure 26. Hospital carbapenem-resistant Enterobacteriaceae infection rates, NYS 2018 (Page 2 of 7)

Hospital Name	# All AdmPrev	# Adms	AdmPrev Rate	HO-All Rate	HO-BSI Rate	# Patdays	# All	# BSI
Cobleskill Regional	0	1111	0.0	0.0	0.0	4822	0	0
Cohens Childrens	0	19981	0.0	0.3	0.0	74690	2	0
Columbia Memorial	1	5122	0.2	0.0	0.0	24996	0	0
Coney Island Hosp	7	10444	0.7	1.1	0.0	84153	9	0
Corning Hospital	3	5086	0.6	0.0	0.0	15303	0	0
Cortland Reg Med	3	3699	0.8	0.0	0.0	12786	0	0
Crouse Hospital	5	22255	0.2	0.0	0.0	103230	0	0
DeGraff Memorial	1	100	10.0	0.0	0.0	1593	0	0
East. Niag. Lockport	0	4362	0.0	0.0	0.0	27119	0	0
Eastern Long Island	0	2034	0.0	0.0	0.0	12180	0	0
Ellis Hospital	2	14655	0.1	0.0	0.0	79144	0	0
Elmhurst Hospital	5	23293	0.2	0.2	0.1	99859	2	1
Erie County Med Ctr	8	15789	0.5	1.0	0.1	102319	10	1
FF Thompson	2	7665	0.3	0.0	0.0	25239	0	0
Faxton St. Lukes	3	14734	0.2	0.3	0.0	63180	2	0
Flushing Hospital	13	15587	0.8	1.0	0.4	67060	7	3
Geneva General	0	3729	0.0	0.0	0.0	15511	0	0
Glen Cove Hospital	0	3361	0.0	0.7	0.0	13976	1	0
Glens Falls Hospital	2	12384	0.2	0.0	0.0	59871	0	0
Good Samar. Suffern	24	18757	1.3	1.9	0.0	51312	10	0
Good Samar. W Islip	15	27696	0.5	1.2	0.1	128572	16	1
Harlem Hospital	6	10350	0.6	0.5	0.0	55906	3	0
HealthAlli Broadway	6	5785	1.0	0.4	0.0	26129	1	0
HealthAlli MarysAve	0	1681	0.0	0.0	0.0	7764	0	0
Henry J. Carter	0	301	0.0	0.6	0.0	49110	3	0



Data reported as of June 18, 2019. Facility-wide inpatient only, rehab and behavioral health units excluded

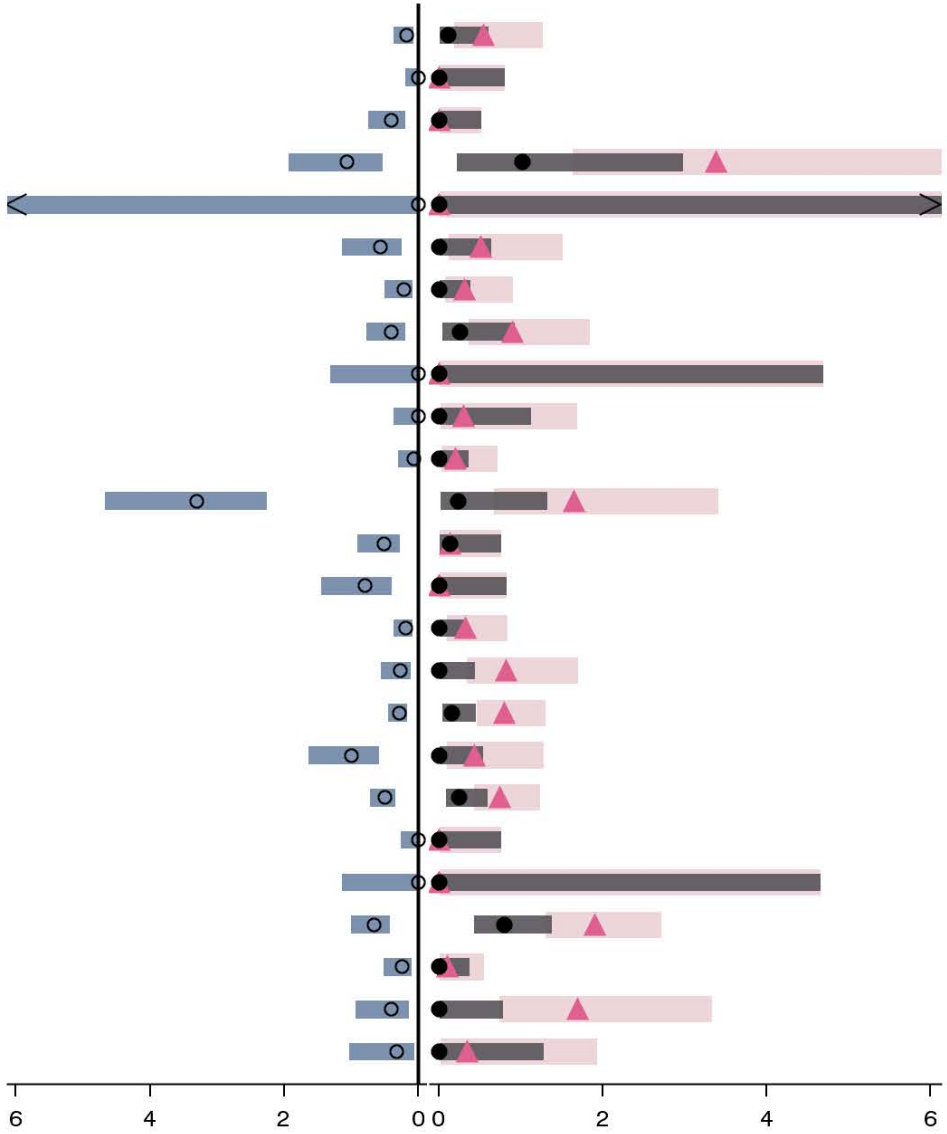
HO-All: hospital onset CRE incidence rate all sites per 10,000 patient days and 95% confidence interval (state average = 0.8)

HO-BSI: hospital onset CRE blood incidence rate per 10,000 patient days and 95% confidence interval (state average = 0.1)

All-Admprev: all body site CRE admissions prevalence rate per 1,000 admissions and 95% confidence interval (state average = 0.4)

Figure 26. Hospital carbapenem-resistant Enterobacteriaceae infection rates, NYS 2018 (Page 3 of 7)

Hospital Name	# All AdmPrev	# Adms	AdmPrev Rate	HO-All Rate	HO-BSI Rate	# Patdays	# All	# BSI
Highland Hospital	5	29299	0.2	0.5	0.1	93099	5	1
Hosp for Spec Surg	0	15992	0.0	0.0	0.0	46501	0	0
Huntington Hospital	7	17559	0.4	0.0	0.0	72063	0	0
Interfaith Med Ctr	8	7490	1.1	3.4	1.0	29571	10	3
Ira Davenport	0	220	0.0	0.0	0.0	639	0	0
JT Mather Hospital	6	10493	0.6	0.5	0.0	58577	3	0
Jacobi Med Ctr	4	18083	0.2	0.3	0.0	97570	3	0
Jamaica Hospital	7	17054	0.4	0.9	0.3	78571	7	2
Jones Memorial	0	2280	0.0	0.0	0.0	7889	0	0
Kenmore Mercy	0	8149	0.0	0.3	0.0	33223	1	0
Kings County Hosp	1	15929	0.1	0.2	0.0	102787	2	0
Kingsbrook Jewish MC	23	6966	3.3	1.6	0.2	42476	7	1
LIJ at Forest Hills	9	17467	0.5	0.1	0.1	74609	1	1
LIJ at Valley Stream	8	10035	0.8	0.0	0.0	45311	0	0
Lenox Hill Hospital	6	32895	0.2	0.3	0.0	123744	4	0
Lincoln Med Ctr	5	18897	0.3	0.8	0.0	85252	7	0
Long Isl Jewish(LIJ)	12	43032	0.3	0.8	0.1	200324	16	3
Long Isl. Community	12	11948	1.0	0.4	0.0	69239	3	0
Maimonides Med Ctr	22	43505	0.5	0.7	0.2	201268	15	5
Mary Imogene Bassett	0	11809	0.0	0.0	0.0	48999	0	0
Massena Memorial	0	2627	0.0	0.0	0.0	7944	0	0
Memor SloanKettering	16	24286	0.7	1.9	0.8	162956	31	13
Mercy Hosp Buffalo	5	20744	0.2	0.1	0.0	102262	1	0
Mercy Med Ctr	4	9869	0.4	1.7	0.0	47402	8	0
Metropolitan Hosp	2	6099	0.3	0.3	0.0	28985	1	0



Data reported as of June 18, 2019. Facility-wide inpatient only, rehab and behavioral health units excluded

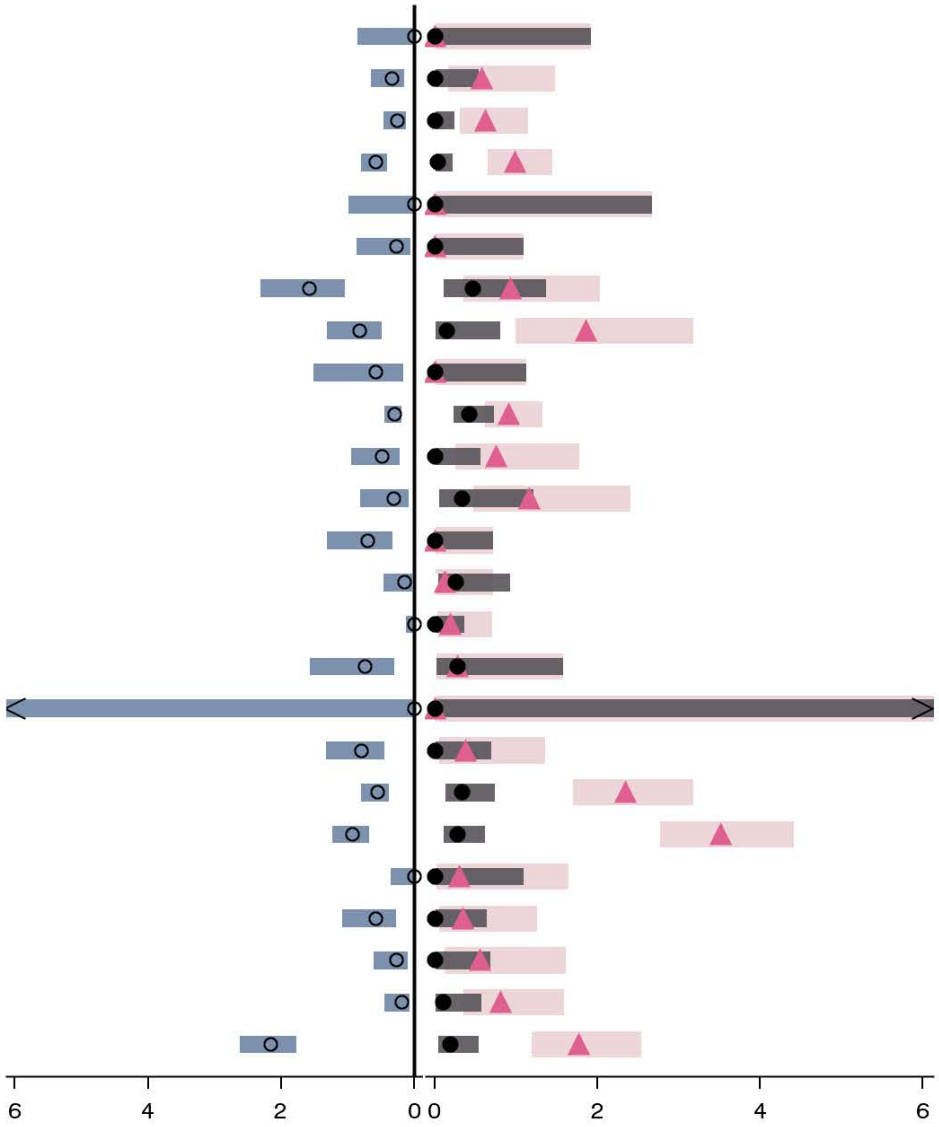
HO-All: hospital onset CRE incidence rate all sites per 10,000 patient days and 95% confidence interval (state average = 0.8)

HO-BSI: hospital onset CRE blood incidence rate per 10,000 patient days and 95% confidence interval (state average = 0.1)

All-Admprev: all body site CRE admissions prevalence rate per 1,000 admissions and 95% confidence interval (state average = 0.4)

Figure 26. Hospital carbapenem-resistant Enterobacteriaceae infection rates, NYS 2018 (Page 4 of 7)

Hospital Name	# All AdmPrev	# Adms	AdmPrev Rate	HO-All Rate	HO-BSI Rate	# Patdays	# All	# BSI
MidHudson Reg of WMC	0	3500	0.0	0.0	0.0	19258	0	0
Millard Fill. Suburb	6	18126	0.3	0.6	0.0	69689	4	0
Montefiore-Einstein	8	31033	0.3	0.6	0.0	161232	10	0
Montefiore-Moses	27	46856	0.6	1.0	0.0	264865	26	1
Montefiore-Mt Vernon	0	3034	0.0	0.0	0.0	13881	0	0
Montefiore-NewRochl	2	7286	0.3	0.0	0.0	33973	0	0
Montefiore-Nyack	19	12043	1.6	0.9	0.5	64725	6	3
Montefiore-Wakefield	13	15715	0.8	1.9	0.1	70059	13	1
Mount St. Marys	3	5111	0.6	0.0	0.0	33238	0	0
Mt Sinai	18	59722	0.3	0.9	0.4	308919	28	13
Mt Sinai Beth Israel	6	12478	0.5	0.8	0.0	66202	5	0
Mt Sinai Brooklyn	3	9588	0.3	1.2	0.3	60276	7	2
Mt Sinai Queens	7	10059	0.7	0.0	0.0	52434	0	0
Mt Sinai St Lukes	2	13873	0.1	0.1	0.3	78711	1	2
Mt Sinai West	0	24268	0.0	0.2	0.0	104442	2	0
NY Community Hosp	5	6693	0.7	0.3	0.3	35622	1	1
NY Eye&Ear Mt Sinai	0	353	0.0	0.0	0.0	1001	0	0
NYP-Allen	11	13789	0.8	0.4	0.0	53546	2	0
NYP-Brklyn Methodist	22	39657	0.6	2.3	0.3	179236	42	6
NYP-Columbia	34	36738	0.9	3.5	0.3	213561	75	6
NYP-Hudson Valley	0	8434	0.0	0.3	0.0	34066	1	0
NYP-Lawrence	7	12109	0.6	0.3	0.0	58152	2	0
NYP-Lower Manhattan	4	15156	0.3	0.5	0.0	54689	3	0
NYP-Morgan Stanley	4	20486	0.2	0.8	0.1	99807	8	1
NYP-Queens	76	35191	2.2	1.8	0.2	164433	29	3



Data reported as of June 18, 2019. 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 = 0.8)

HO-BSI: hospital onset CRE blood incidence rate per 10,000 patient days and 95% confidence interval (state average = 0.1)

All-Admprev: all body site CRE admissions prevalence rate per 1,000 admissions and 95% confidence interval (state average = 0.4)

Figure 26. Hospital carbapenem-resistant Enterobacteriaceae infection rates, NYS 2018 (Page 5 of 7)

Hospital Name	# All AdmPrev	# Adms	AdmPrev Rate	HO-All Rate	HO-BSI Rate	# Patdays	# All	# BSI
NYP-Weill Cornell	10	53822	0.2	1.4	0.5	257438	35	12
NYU Langone Brooklyn	13	23840	0.5	0.3	0.0	87317	3	0
NYU Orthopedic Hosp	0	6424	0.0	0.0	0.0	17558	0	0
NYU Tisch	10	37466	0.3	0.5	0.1	172514	8	1
NYU Winthrop	18	37857	0.5	0.5	0.1	176796	9	1
Nassau University	4	16507	0.2	0.8	0.0	74483	6	0
Nathan Littauer	1	2765	0.4	0.0	0.0	8507	0	0
Newark Wayne	2	7698	0.3	0.0	0.0	21352	0	0
Niagara Falls	3	5051	0.6	0.4	0.0	22729	1	0
North Central Bronx	1	6787	0.1	0.0	0.0	29929	0	0
North Shore	8	51891	0.2	0.5	0.1	281914	14	2
Northern Dutchess	2	6866	0.3	0.5	0.0	20506	1	0
Northern Westchester	2	7740	0.3	0.0	0.0	35051	0	0
Noyes Memorial	0	3011	0.0	0.0	0.0	9180	0	0
Oishei Childrens	0	13054	0.0	0.5	0.0	60280	3	0
Olean General	0	7802	0.0	0.0	0.0	31727	0	0
Oneida Healthcare	0	2986	0.0	0.0	0.0	10389	0	0
Orange Regional	1	27845	0.0	0.1	0.1	102258	1	1
Oswego Hospital	0	3560	0.0	0.0	0.0	13826	0	0
Our Lady of Lourdes	4	10175	0.4	0.2	0.0	44125	1	0
Peconic Bay Medical	3	8525	0.4	0.0	0.0	36856	0	0
Phelps Memorial	1	8080	0.1	0.2	0.0	41333	1	0
Plainview Hospital	2	8409	0.2	0.3	0.0	38666	1	0
Putnam Hospital	7	6582	1.1	0.9	0.5	21704	2	1
Queens Hospital	14	12811	1.1	0.7	0.0	58102	4	0

Data reported as of June 18, 2019. Facility-wide inpatient only, rehab and behavioral health units excluded

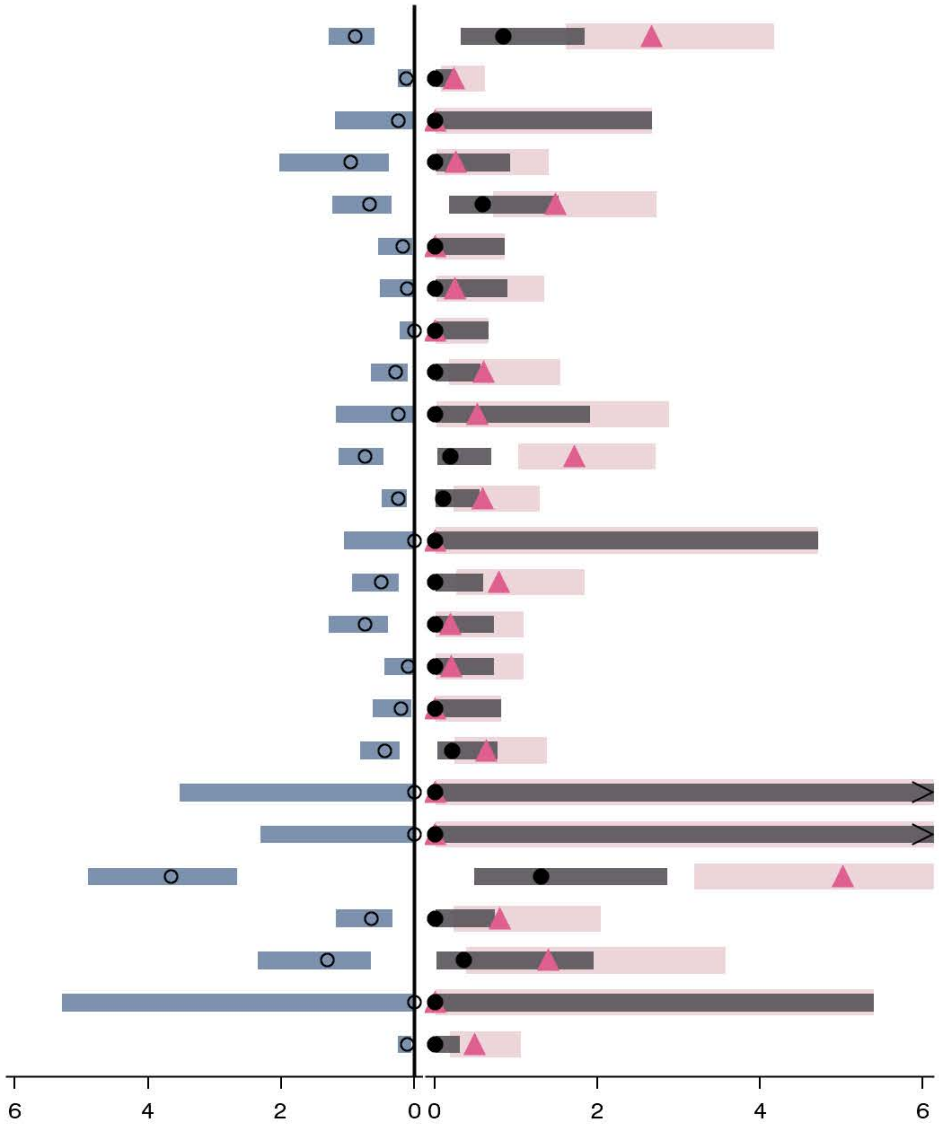
HO-All: hospital onset CRE incidence rate all sites per 10,000 patient days and 95% confidence interval (state average = 0.8)

HO-BSI: hospital onset CRE blood incidence rate per 10,000 patient days and 95% confidence interval (state average = 0.1)

All-Admprev: all body site CRE admissions prevalence rate per 1,000 admissions and 95% confidence interval (state average = 0.4)

Figure 26. Hospital carbapenem-resistant Enterobacteriaceae infection rates, NYS 2018 (Page 6 of 7)

Hospital Name	# All AdmPrev	# Adms	AdmPrev Rate	HO-All Rate	HO-BSI Rate	# Patdays	# All	# BSI
Richmond Univ MC	21	23543	0.9	2.7	0.8	71303	19	6
Rochester General	5	42808	0.1	0.2	0.0	169473	4	0
Rome Memorial	1	4005	0.2	0.0	0.0	13879	0	0
Roswell Park	5	5200	1.0	0.2	0.0	40205	1	0
SUNY Downstate MedCr	8	11760	0.7	1.5	0.6	67764	10	4
Samaritan- Troy	2	11518	0.2	0.0	0.0	43389	0	0
Samaritan- Watertown	1	9246	0.1	0.2	0.0	41820	1	0
Saratoga Hospital	0	14270	0.0	0.0	0.0	56560	0	0
Sisters of Charity	4	14066	0.3	0.6	0.0	66496	4	0
Sisters- St Joseph	1	4018	0.2	0.5	0.0	19430	1	0
South Nassau Comm.	15	20369	0.7	1.7	0.2	105280	18	2
Southside	6	24181	0.2	0.6	0.1	102107	6	1
St Anthony	0	2844	0.0	0.0	0.0	7846	0	0
St Barnabas	7	14092	0.5	0.8	0.0	63530	5	0
St Catherine Siena	9	12190	0.7	0.2	0.0	51727	1	0
St Charles Hospital	1	10682	0.1	0.2	0.0	51521	1	0
St Elizabeth Medical	2	10104	0.2	0.0	0.0	45614	0	0
St Francis- Roslyn	8	17884	0.4	0.6	0.2	95356	6	2
St James Mercy	0	849	0.0	0.0	0.0	2853	0	0
St Johns Dobbs Ferry	0	1295	0.0	0.0	0.0	2964	0	0
St Johns Episcopal	32	8762	3.7	5.0	1.3	45907	23	6
St Johns Riverside	8	12327	0.6	0.8	0.0	50504	4	0
St Joseph- Bethpage	8	6135	1.3	1.4	0.3	28729	4	1
St Josephs- Elmira	0	565	0.0	0.0	0.0	6846	0	0
St Josephs- Syracuse	4	37669	0.1	0.5	0.0	124376	6	0



Data reported as of June 18, 2019. 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 = 0.8)

HO-BSI: hospital onset CRE blood incidence rate per 10,000 patient days and 95% confidence interval (state average = 0.1)

All-Admprev: all body site CRE admissions prevalence rate per 1,000 admissions and 95% confidence interval (state average = 0.4)

Figure 26. Hospital carbapenem-resistant Enterobacteriaceae infection rates, NYS 2018 (Page 7 of 7)

Hospital Name	# All AdmPrev	# Adms	AdmPrev Rate	HO-All Rate	HO-BSI Rate	# Patdays	# All	# BSI
St Josephs- Yonkers	2	3457	0.6	1.0	0.0	19649	2	0
St Lukes Cornwall	9	11093	0.8	0.2	0.0	48711	1	0
St Marys Amsterdam	3	5744	0.5	0.0	0.0	26068	0	0
St Peters Hospital	5	28937	0.2	0.0	0.0	124029	0	0
Staten Island U N	7	30843	0.2	1.5	0.4	149137	23	6
Staten Island U S	2	8960	0.2	0.0	0.0	41391	0	0
StonyBrkSouthampton	1	5571	0.2	0.5	0.0	20244	1	0
StonyBrookUniv	27	35179	0.8	2.0	0.4	190918	38	8
Strong Memorial	21	44852	0.5	0.8	0.1	267501	22	3
Sunnyview Rehab Hosp	0	504	0.0	0.0	0.0	4150	0	0
Syosset Hospital	0	3936	0.0	0.0	0.0	14617	0	0
UHS Binghamton	0	3490	0.0	0.0	0.0	16725	0	0
UHS Chenango Memor	0	1635	0.0	0.0	0.0	4212	0	0
UHS Wilson	1	21307	0.0	0.3	0.0	73432	2	0
UPMC Chautauqua WCA	0	5926	0.0	0.0	0.0	23193	0	0
United Memorial	1	4368	0.2	0.0	0.0	13830	0	0
Unity Hosp Rochester	0	23742	0.0	0.3	0.0	87806	3	0
Univ Hosp SUNY Upst	10	22947	0.4	0.5	0.1	126560	6	1
Upst. Community Gen	2	9292	0.2	0.0	0.0	36135	0	0
Vassar Brothers	18	21324	0.8	0.5	0.0	107208	5	0
Westchester Medical	8	19888	0.4	1.3	0.3	172366	23	5
White Plains Hosp	6	20741	0.3	0.2	0.0	89178	2	0
Woodhull Med Ctr	2	9160	0.2	0.0	0.0	48052	0	0
Wyckoff Heights	16	14393	1.1	1.7	0.0	58937	10	0
Wyoming County Comm.	0	1648	0.0	0.0	0.0	6802	0	0

Data reported as of June 18, 2019. 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 = 0.8)

HO-BSI: hospital onset CRE blood incidence rate per 10,000 patient days and 95% confidence interval (state average = 0.1)

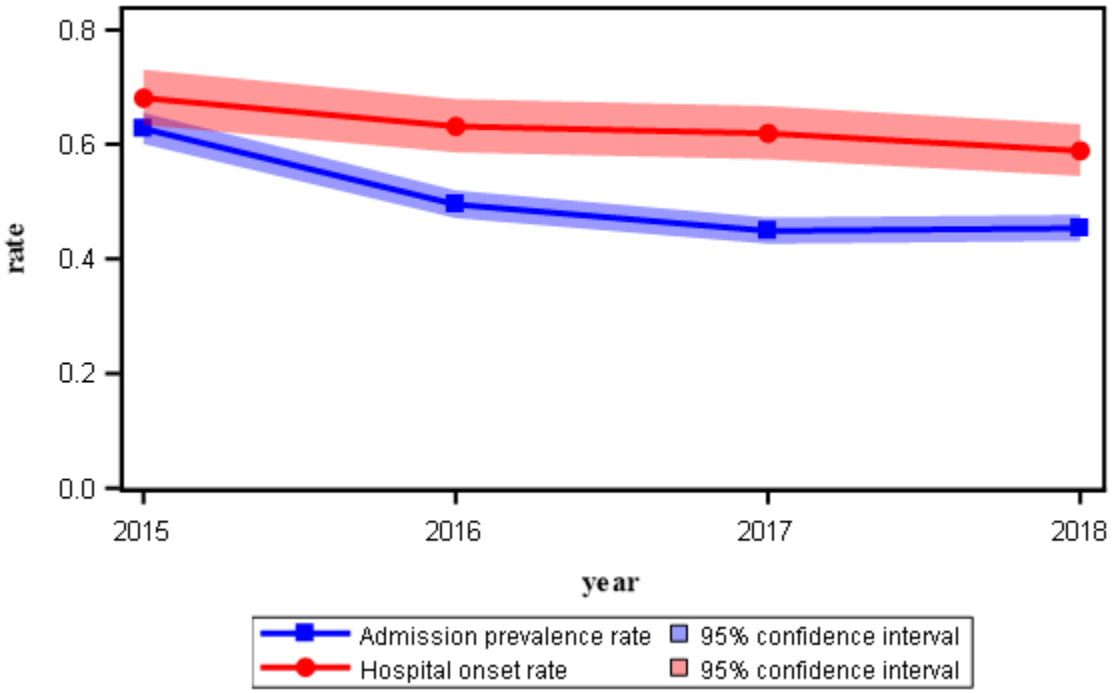
All-Admprev: all body site CRE admissions prevalence rate per 1,000 admissions and 95% confidence interval (state average = 0.4)

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 2018, 173 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 2018, the admission prevalence MRSA BSI rate decreased 28% and the hospital onset MRSA rate decreased 17% (Figure 27).

Figure 27. MRSA bloodstream infections, New York State 2015-2018

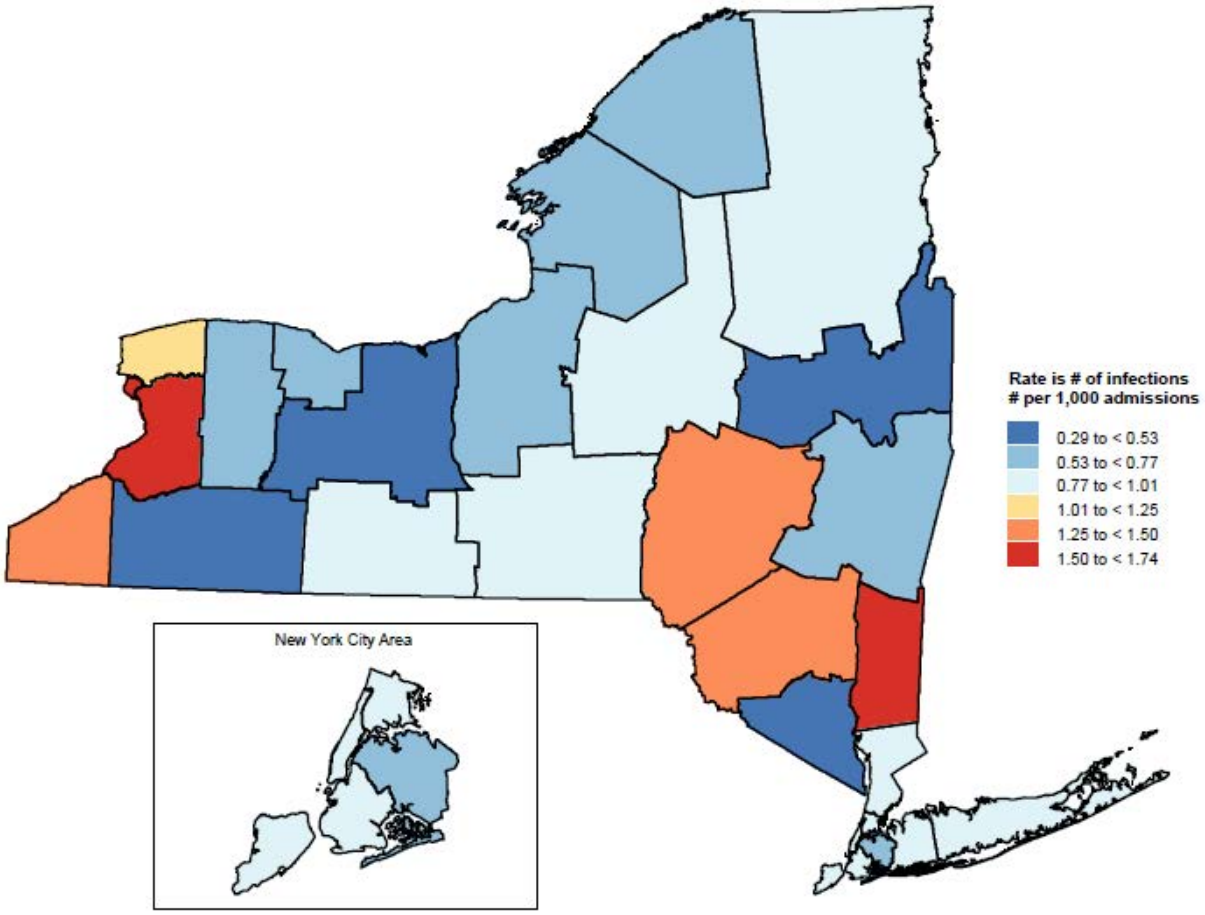


Year	# Hosp	# Emergency Dept. Infections	# Admission Prevalent Infections	# Admissions	Admission Prevalence Rate (per 1,000 admissions)	# Hospital Onset Infections	# Patient Days	Hospital Onset Incidence Rate (per 10,000 patient days)
2015	174	1,464	1,459	2,325,035	0.628	777	11,410,301	0.681
2016	177	1,921	1,154	2,330,860	0.495	718	11,369,649	0.632
2017	175	2,083	1,059	2,358,724	0.449	695	11,222,935	0.619
2018	173	2,253	1,078	2,375,972	0.453	661	11,225,000	0.589

Facility-wide inpatient data reported as of May 16, 2019

Figure 28 shows the FWI MRSA patient prevalence rate by county (or merged county for those with few or no hospitals).

Figure 28. Facility-wide inpatient MRSA bloodstream infection patient prevalence rates, New York State 2018



Facility-wide inpatient data reported as of May 16, 2019. Small counties were merged.

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 continue to show that *C. auris* has been transmitted within healthcare facilities in New York City and the surrounding Metropolitan area of NYS. In over two years of investigation, case counts have increased, and the New York City/Metropolitan area 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.

To curb further spread of *C. auris*, NYS developed a special 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 include 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*; 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. Admission screening recommendations are planned, depending on the success of ongoing efforts to increase laboratory capacity for rapid detection of *C. auris*. These recommendations will be in addition to current CDC recommendations and will be tailored for the NYS situation.

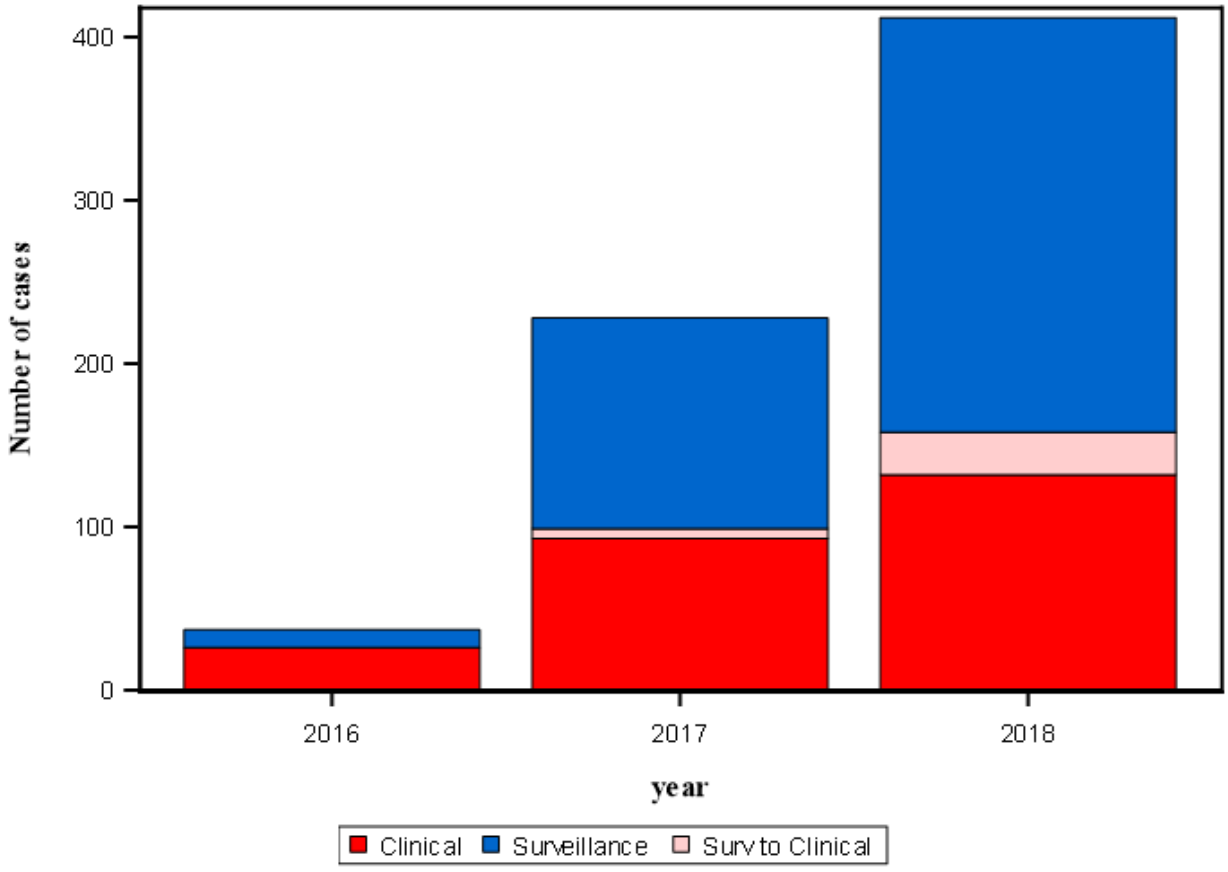
This section summarizes the laboratory test results confirmed by Wadsworth Center, NYS's public health laboratory. Clinical cases are defined as persons with a positive *C. auris* culture from specimens collected to diagnose or treat disease in the normal course of care. Screening/surveillance cases are defined as persons without symptoms of infection but with a positive *C. auris* culture from specimens collected from point prevalence surveys, admission screening, and contact tracing. Some surveillance cases later developed clinical illness and so are also counted as surveillance-to-clinical cases. For example, if an asymptomatic person was identified as a surveillance case in 2017 then develops clinical illness in 2018, he is counted both as a 2017 surveillance case and as a surveillance-to-clinical case in 2018. For consistency, if a

person is identified as a surveillance case in 2018 and develops clinical illness later in 2018, she is counted as both a surveillance case and as a surveillance-to-clinical case in 2018.

In 2018 there were 254 surveillance cases, 132 clinical cases, and 26 clinical cases that were also previously counted as surveillance cases (Figure 29). Eighty-one patients had bloodstream infections. The average patient age was 69 (range 21 to 100 years).

Figure 29. *Candida auris* cases, New York State facilities 2016-18

year	# clinical cases	# surveillance to clinical	# surveillance cases	# total
2016	26	0	11	37
2017	93	6	129	228
2018	132	26	254	412

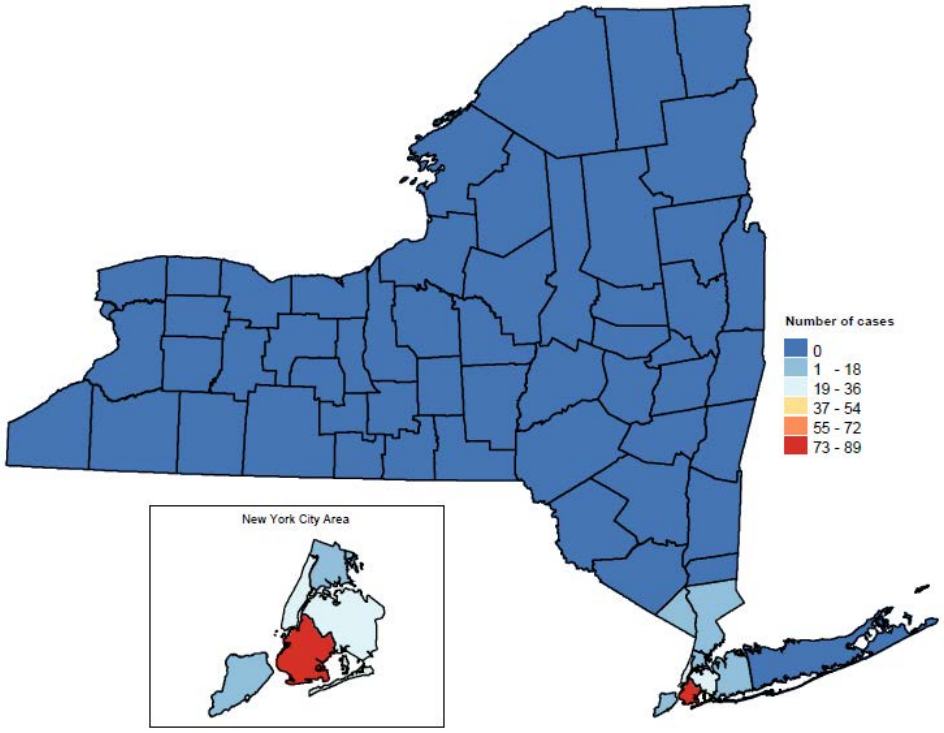


Samples reported as of July 11, 2019. First positive per person per specimen type (clinical/surveillance). Includes cases identified in hospitals, nursing homes, and other facility types.

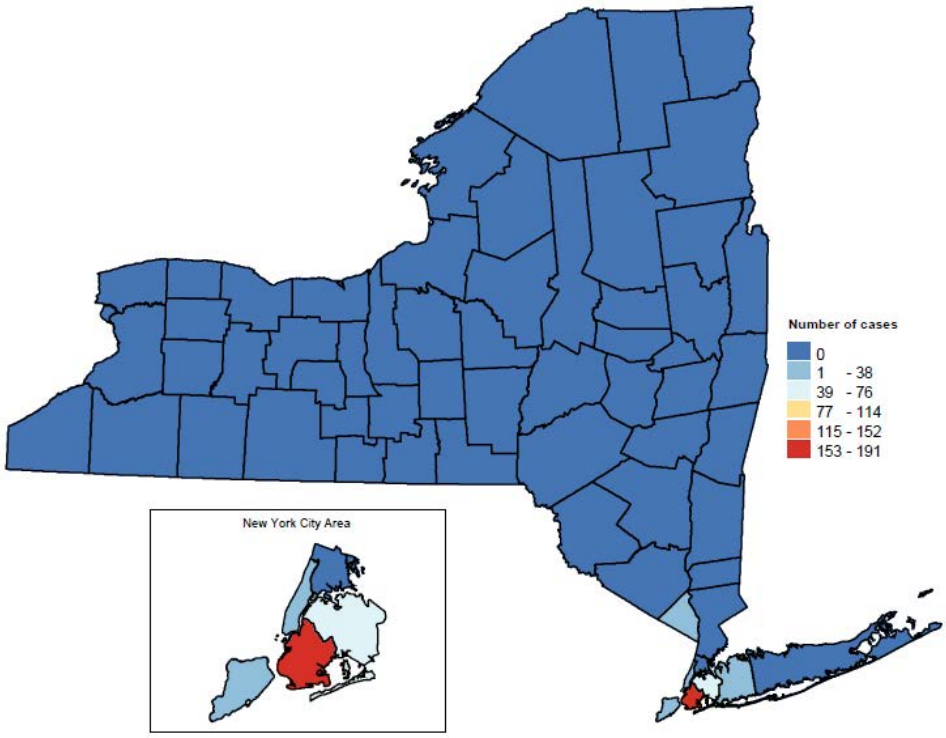
Clinical and surveillance cases are mapped by county of diagnosis in Figure 30. Cases were concentrated in Brooklyn.

Figure 30. Number of patients colonized or infected with *Candida auris*, New York State 2018

a) Clinical cases



b) Surveillance cases



Samples reported as of July 11, 2019. First positive per person per specimen type (clinical/surveillance). Includes cases identified in hospitals and LTCFs.

C. auris has been found in health care facilities throughout the New York City metropolitan area. It is not a problem particular to any one facility but rather a challenge for all facilities in the region, regardless of whether *C. auris* has thus far been identified there. When a hospital or LTCF cares for patients or residents whose positive colonization status is known, NYS personnel work with the facility to institute the appropriate infection control measures and, in certain situations, to conduct point prevalence surveys to detect other colonized patients and residents. Because of these activities, transmission is less likely to occur when a person's positive colonization status is known.

Between January 1, 2016 and June 28, 2019, 64 hospitals, 1 long term acute care hospital, 103 LTCFs, and 3 hospices were known to have cared for a person infected, colonized, or possibly colonized with *C. auris* (Tables 18 and 19). There are several caveats to the use of this information:

- Facilities are included if they cared for one or more patients with known *C. auris* infection or colonization or if a person with *C. auris* infection or colonization had been cared for in the facility within 90 days before diagnosis. Facilities caring for patients within 90 days before diagnosis are included because people can be colonized for weeks, months, or longer before an infection occurs or before colonization is detected. However, this might result in a facility being included on this list even though the patient in question was not yet colonized while in that facility. Conversely, it also might result in a facility not being included on this list if it cared for a colonized patient more than 90 days before the colonization was detected.
- Surveillance for *C. auris* cases in NYS is likely incomplete because cases are found in many health care facilities throughout the New York City metropolitan area and because of the resource-intensive nature of patient tracking. Therefore, it is likely that there are facilities which have cared for affected patients but which are not included on the lists below.
- Inclusion on these lists of impacted facilities does not necessarily imply that the facility is currently caring for any patients or residents with *C. auris*. For example, the lists include facilities that had patients more than a year ago and are not known to have cared for patients with *C. auris* since then. It is not possible to determine the date a colonized or infected patient was last present in a facility. This, along with the fact that affected persons are frequently transferred to and from different facilities, also accounts for the fact that the number of affected persons in each facility cannot be provided.
- Inclusion on these lists of impacted facilities does not necessarily imply that the patient or resident acquired *C. auris* at that facility. Persons who are colonized or infected with *C. auris* tend to have multiple serious medical problems and frequent admissions and transfers to different hospitals or LTCFs. Because a person can be asymptomatically

colonized for an indeterminate period, it is not usually possible to determine where *C. auris* was acquired.

- Some hospitals on the list of impacted facilities are large institutions, often with discrete wings and sections or multiple buildings. Having cared for one or more patients with *C. auris* in one area might not result in an increased risk for patients cared for in other areas.
- LTCFs, by regulation, can only accept residents for whom they can provide an appropriate care plan. LTCFs which decline admissions of residents with known *C. auris* infection or colonization are less likely to be included on the list, although they might be caring for colonized residents whose colonization has not yet been detected.

For all of these reasons, these lists of affected facilities should not be used by consumers to decide where to seek care, and inclusion on the lists does not relate to quality of care. Consumers interested in information about quality of care should refer to the NYS HAI report "Summary for Consumers" or CMS's Hospital Compare website for hospital information and CMS's Nursing Home Compare website for LTCFs.

The lists below can be used to get a sense for how widespread *C. auris* is in a community. All facilities in highly affected communities might care for patients or residents who are colonized or infected with *C. auris*, whether known or unknown. This illustrates the need for careful and thorough routine infection control, including environmental cleaning and disinfection, in every health care facility.

Table 18. Hospitals that Have Cared for Persons with *Candida auris* Infection or Colonization, as of 6/28/2019

Hospital Name	ID	Hospital Name	ID	Hospital Name	ID
New York County (Manhattan)		**Kings County (Brooklyn)**		**Richmond County (Staten Island)**	
Bellevue Hospital Center	1438	Brookdale Hospital Medical Center	1286	Richmond University Medical Center	1738
Harlem Hospital Center	1445	Brooklyn Hospital Center - Downtown Campus	1288	Staten Island University Hosp - North	1740
Henry J. Carter Specialty Hospital	1486	Calvary Hospital Inc (Brooklyn campus)	1175	Staten Island University Hosp - South	1737
Lenox Hill Hospital	1450	Coney Island Hospital	1294	**Westchester County**	
Memorial Hospital for Cancer and Allied Diseases	1453	Interfaith Medical Center	1309	SJRH - St Johns Division	1097
Metropolitan Hospital Center	1454	Kings County Hospital Center	1301	Westchester Medical Center	1139
Mount Sinai Beth Israel	1439	Kingsbrook Jewish Medical Center	1315	**Rockland County**	
Mount Sinai Hospital	1456	Maimonides Medical Center	1305	Good Samaritan Hospital of Suffern	0779
Mount Sinai West	1466	Mount Sinai Brooklyn	1324	Helen Hayes Hospital	0775
New York Presbyterian Hospital - Allen Hospital	3975	New York Community Hospital of Brooklyn, Inc	1293	Montefiore Nyack	0776
New York Presbyterian Hospital - Columbia Presbyterian Center	1464	NewYork-Presbyterian Brooklyn Methodist Hospital	1306	**Nassau County**	
New York Presbyterian Hospital - New York Weill Cornell Center	1458	NYU Langone Hospital-Brooklyn	1304	North Shore University Hospital	0541
New York-Presbyterian/Lower Manhattan Hospital	1437	University Hospital of Brooklyn	1320	Glen Cove Hospital	0490
NYU Langone Hospitals	1463	Woodhull Medical & Mental Health Center	1692	Mount Sinai South Nassau	0527
NYU Langone Orthopedic Hospital	1446	Wyckoff Heights Medical Center	1318	NYU Winthrop Hospital	0511
Queens County (Queens)		**Bronx County (Bronx)**		**Suffolk County**	
Elmhurst Hospital Center	1626	BronxCare Hospital Center (Concourse)	1178	Huntington Hospital	0913
Flushing Hospital Medical Center	1628	Calvary Hospital Inc (Bronx campus)	1175	Southside Hospital	0924
Jamaica Hospital Medical Center	1629	Lincoln Medical and Mental Health Center	1172	University Hospital	0245
Long Island Jewish Forest Hills	1638	Montefiore Med Center - Jack D Weiler Hosp of A Einstein College Div	3058	**Orange County**	
Long Island Jewish Medical Center	1630	Montefiore Medical Center - Henry and Lucy Moses Div	1169	Orange Regional Medical Center	0699
Mount Sinai Hospital - Mount Sinai Hospital of Queens	1639	Montefiore Medical Center - Wakefield Hospital	1168	**Dutchess County**	
NewYork-Presbyterian/Queens	1637	SBH Health System	1176	Vassar Brothers Medical Center	0181
Queens Hospital Center	1633			**Albany County**	
St Johns Episcopal Hospital So Shore	1635			Albany Medical Center Hospital	0001
				Monroe County	
				Rochester General Hospital	0411

Table 19. Long-term Care Facilities and Hospices that Have Cared for Persons with *Candida auris* Infection or Colonization, as of 6/28/2019

LTCF Name	ID	LTCF or Hospice Name	ID	LTCF Name	ID
New York County (Manhattan)		**Kings County (Brooklyn)**		**Bronx County (Bronx)**	
Isabella Geriatric Center Inc	1569	Atrium Center for Rehabilitation and Nursing	1430	BronxCare Special Care Center	4501
Amsterdam Nursing Home Corp (1992)	1605	Bedford Center for Nursing and Rehabilitation	1409	Bainbridge Nursing & Rehabilitation Center	1227
Mary Manning Walsh Nursing Home Co Inc	1571	Bensonhurst Center for Rehabilitation and Healthcare	1406	Bronx Gardens Rehabilitation and Nursing Center	4887
Terence Cardinal Cooke Health Care Center	3089	Boro Park Center for Rehabilitation and Healthcare	1403	Concourse Rehabilitation and Nursing Center, Inc	1253
The New Jewish Home, Manhattan	1603	Brooklyn Center for Rehabilitation and Residential Health Care	1395	Fieldston Lodge Care Center	1233
The Riverside	1370	Brooklyn Gardens Nursing & Rehabilitation Center	7069	Grand Manor Nursing & Rehabilitation Center	0856
Queens County (Queens)		Brooklyn United Methodist Church Home	1368	Pelham Parkway Nursing Care and Rehabilitation Facility LLC	1245
Beacon Rehabilitation and Nursing Center	1736	Brooklyn-Queens Nursing Home	0277	Split Rock Rehabilitation and Health Care Center	1243
Bridge View Nursing Home	1673	Bushwick Center for Rehabilitation and Health Care	4037	Wayne Center for Nursing & Rehabilitation	1257
Brookhaven Rehabilitation & Health Care Center LLC	1703	Caton Park Rehabilitation and Nursing Center, LLC	1380	**Richmond County (Staten Island)**	
Cliffside Rehabilitation & Residential Health Care Center	1676	Cobble Hill Health Center, Inc	1381	Clove Lakes Health Care and Rehabilitation Center, Inc	1750
Dry Harbor Nursing Home	1705	Concord Nursing and Rehabilitation Center	1404	New Vanderbilt Rehabilitation and Care Center, Inc	1752
Fairview Nursing Care Center Inc	1678	Crown Heights Center for Nursing and Rehabilitation	1407	Richmond Center for Rehabilitation and Specialty Healthcare	4823
Franklin Center for Rehabilitation and Nursing	1708	Ditmas Park Care Center	1576	Silver Lake Specialized Rehabilitation and Care Center	1753
Haven Manor Health Care Center, LLC	3256	Downtown Brooklyn Nursing & Rehabilitation Center	1408	Staten Island Care Center	1756
Highland Care Center	1711	Four Seasons Nursing and Rehabilitation Center	3227	**Westchester County**	
Holliswood Center for Rehabilitation and Healthcare	1712	Hamilton Park Nursing and Rehabilitation Center	4285	Adira at Riverside Rehabilitation and Nursing	6250
Long Island Care Center Inc	1685	Haym Solomon Home for the Aged	1361	Schaffer Extended Care Center	1081
Meadow Park Rehabilitation and Health Care Center LLC	1687	Hopkins Center for Rehabilitation and Healthcare	5546	Tarrytown Hall Care Center	1115
Midway Nursing Home	1704	King David Center for Nursing and Rehabilitation	1364	**Rockland County**	
Oceanview Nursing & Rehabilitation Center, LLC	1688	Linden Center for Nursing and Rehabilitation	7665	Friedwald Center for Rehabilitation and Nursing, LLC	0787
Park Nursing Home	1689	Lutheran Augustana Center for Extended Care & Rehabilitation (closed)	1372	Northern Manor Geriatric Center Inc	0784
Park Terrace Care Center	1698	Menorah Home & Hospital for Aged & Infirm	2539	Northern Riverview Health Care Center, Inc	0774
Parker Jewish Institute for Health Care & Rehab	1671	New Carlton Rehab and Nursing Center, LLC	1379	Nyack Ridge Rehab & Nursing Center	0786
Peninsula Nursing and Rehabilitation Center	1672	Oxford Nursing Home	1391	Pine Valley Center for Rehabilitation and Nursing	0778
Promenade Rehabilitation and Health Care Center	1690	Palm Gardens Center for Nursing and Rehabilitation	1392	**Nassau County**	
Queens Nassau Rehabilitation and Nursing Center	1702	Rutland Nursing Home, Inc.	1316	Excel at Woodbury for Rehabilitation and Nursing, LLC	0559
Regal Heights Rehabilitation and Health Care Center	7875	Saints Joachim & Anne Nursing and Rehabilitation Center	4418	Fulton Commons Care Center Inc	6312
Resort Nursing Home	1694	Schulman and Schachne Institute for Nursing and Rehabilitation	1376	Meadowbrook Care Center, Inc	6009
Rockaway Care Center	1666	Sea Crest Nursing and Rehabilitation Center	1401	Nassau Rehabilitation & Nursing Center	5710
Silvercrest	4407	Seagate Rehabilitation and Nursing Center	1373	South Shore Rehabilitation and Nursing Center	0504
The Grand Rehabilitation and Nursing at Queens	1675	Shore View Nursing & Rehabilitation Center	1399	Sunharbor Manor	0548
The Pavilion at Queens for Rehabilitation & Nursing	7298	Spring Creek Rehabilitation & Nursing Care Center	1400	The Five Towns Premier Rehabilitation & Nursing Center	0539
Union Plaza Care Center	6037	The Chateau at Brooklyn Rehabilitation and Nursing Center	1383	The Grand Rehabilitation and Nursing at South Point	0564
West Lawrence Care Center, LLC	1726	The Heritage Rehabilitation and Health Care Center	1393	Townhouse Center for Rehabilitation & Nursing	6050
Woodcrest Rehabilitation & Residential Health Care Center., LLC	1700	The Phoenix Rehabilitation and Nursing Center	1405	**Suffolk County**	
		Kings County (Brooklyn) Hospices		Medford Multicare Center for Living	6462
		Hospice of New York (Brooklyn Hospital inpatient unit)	7234		
		MJHS Hospice and Palliative Care, Inc. (Boro Park branch)	4039		
		MJHS Hospice and Palliative Care, Inc. (Menorah branch, closed)	4039		

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 20. 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. The number of deaths caused by *C. auris* could not be calculated because of lack of attributable mortality data. 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 deaths from CDI, MRSA, and CRE (1,224), 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 20. New York State hospital mortality estimates, 2018

Infection[1]	% Attributable Deaths[2]	# Cases Total[3]	# Hospital Onset Cases	# Deaths Total	# Deaths from Hospital Onset Cases
Clostridioides difficile	6%	13,109	5,057	787	303
MRSA BSI	20%	1,739	661	348	132
CRE BSI	34%	263	150	89	51
Total		15,111	5,868	1,224	486

NHSN facility-wide inpatient data downloaded 6/18/2019 for CRE and CDI, 5/16/2019 for MRSA. BSI = bloodstream infection. [1] CDI and CRE data were deduplicated to one infection per person, MRSA data did not contain unique identifiers and may contain duplicates. [2] Based on estimations from scientific literature, see Appendix 2. [3] Total cases = community and hospital onset.

MDRO Prevention Practices

NHSN requires all facilities to submit an annual survey. Table 21 summarizes the self-reported 2018 survey results related to MDRO prevention practices.

Table 21. MDRO Prevention Practice Survey, New York State Hospitals 2018

Patients infected or colonized with MRSA are routinely placed on contact precautions?	
No	15%
Yes, all infected or colonized	59%
Yes, only all infected	19%
Yes, only those with high risk	7%
Patients infected or colonized with CRE are routinely placed on contact precautions?	
No	0%
Yes, all infected or colonized	98%
Yes, only all infected	1%
Yes, only those with high risk	2%
Facility routinely performs screening cultures for CRE?	8%
Facility routinely performs screening cultures for MRSA in non-NICU settings (e.g. on pre-operative patients to prevent SSI, or on high risk patients)	27%
Facility routinely performs screening cultures for MRSA in patients admitted to NICUs	20%
Facility routinely uses chlorhexidine bathing to prevent transmission of MDROs?	75%
Facility routinely uses a combination of topical chlorhexidine and intranasal mupirocin to prevent transmission of MRSA? (Note: this does not include the use of these agents in preoperative patients or dialysis patients.)	20%

National Healthcare Safety Network Surveys, downloaded May 20, 2019. All 175 hospitals responded.

Although 98% 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.

Antimicrobial Stewardship and Use

Appropriate use of antibiotics is a recognized element of global efforts to combat antimicrobial resistance. In 2018, 90% of NYS hospitals reported meeting all seven elements of the CDC Core Elements of Antimicrobial Stewardship Programs[4] (Table 22). The CDC Core Elements identify common elements among successful programs. However, flexibility to tailor ASPs to local needs is important. As ASPs mature, hospitals should continually evaluate ASPs using both process and outcome measures to ensure programs are implemented with fidelity and are effective. No single measure is available to compare program performance between healthcare facilities.

Table 22. Antimicrobial stewardship practices in NYS hospitals, 2018 survey

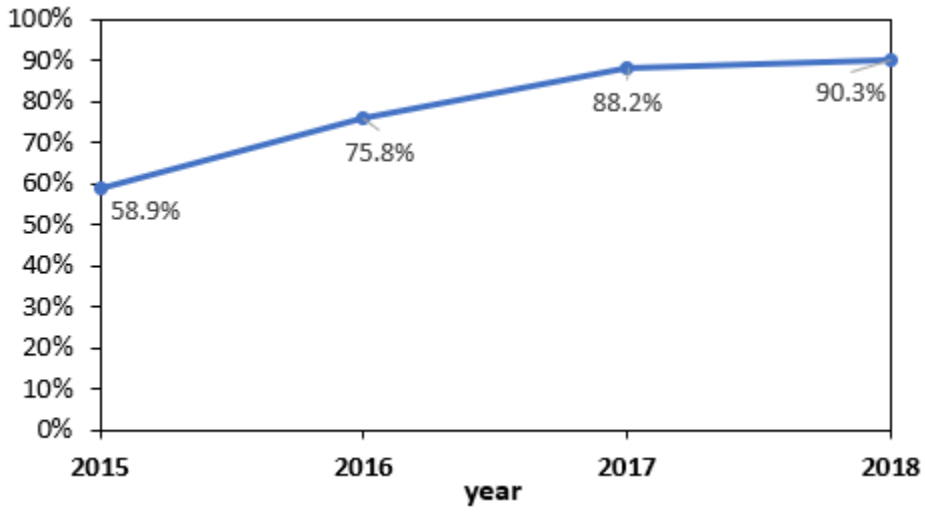
CDC Core Elements of antimicrobial stewardship program	% met
1. Hospital Leadership Commitment*	**100%**
Formal statement of support for antibiotic stewardship (e.g. a written policy or statement approved by board)	97.1%
Hospital leadership communicates to staff about stewardship activities	88.0%
Hospital leadership provides opportunities for staff training and development	74.3%
Hospital leadership allocates information technology resources	81.1%
Committee responsible for antibiotic stewardship	94.9%
Physician leader has antibiotic stewardship responsibilities in job description/contract	49.7%
Pharmacist leader has antibiotic stewardship responsibilities in job description/contract	49.7%
2. Accountability	**98.9%**
A leader is responsible for program outcomes of stewardship activities.	98.9%
3. Drug Expertise*	**98.9%**
Antibiotic stewardship outcomes are lead/co-lead by pharmacist	74.3%
Lead/co-lead is not pharmacist, but at least one pharmacist is responsible for improving antibiotic use	24.6%
4. Action (Implementing recommended interventions)*	**99.4%**
Require documentation of indication for antibiotic orders	67.4%
Require documentation of duration for antibiotic orders	42.3%
Review antibiotics 48-72 hours after initial order (i.e. antibiotic time-out)	52.0%
Stewardship team provides prospective audit and feedback to treatment team	75.4%
Require prior authorization before restricted antibiotics can be dispensed	61.7%
Providers have access to facility- or region-specific treatment guidelines or recommendations for commonly encountered infections	94.3%
Target select diagnoses for active interventions to optimize antibiotic use	73.7%
5. Tracking*	**99.4%**
Formal procedure or required documentation of indication for antibiotic orders and our stewardship team monitors adherence to that policy or formal procedure	78.8%
Providers have access to facility- or region-specific treatment guidelines or recommendations for commonly encountered infections and our stewardship team monitors adherence to those guidelines or recommendations	70.9%
Stewardship team monitors antibiotic resistance patterns (either facility- or region-specific)	91.9%
Stewardship team monitors antibiotic use in days of therapy (DOT) per 1000 patient days or days present	77.7%
Stewardship team monitors antibiotic use in defined daily doses (DDT) per 1000 patient days	22.9%
Stewardship team monitors antibiotic expenditures	55.4%
6. Reporting*	**97.7%**
Stewardship team provides prospective audit and feedback to treatment team (also counted as an action)	75.4%

Stewardship team provides facility/unit/service-specific reports on antibiotics with prescribers	54.5%
Stewardship team provides updates to facility leadership on antibiotic use and stewardship efforts	93.7%
Stewardship team provides outcomes for antibiotic stewardship interventions to staff	64.0%
7. Education*	**92.0%**
Stewardship program provides education to prescribers on improving antibiotic prescribing	82.9%
Stewardship program provides education to nurses on improving antibiotic prescribing	59.4%
Stewardship program provides education to pharmacists on improving antibiotic prescribing	84.0%
Total:** Met all 7 Core Elements above	**90.3%**

Annual survey data downloaded from National Healthcare Safety Network on June 25, 2019. 100% of 175 hospitals responded.
* 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).

Between 2015 and 2018, the percent of NYS hospitals meeting all 7 core stewardship elements increased from 59% to 90% (Figure 31).

Figure 31. Trend in percent of New York hospitals that met all 7 core stewardship elements

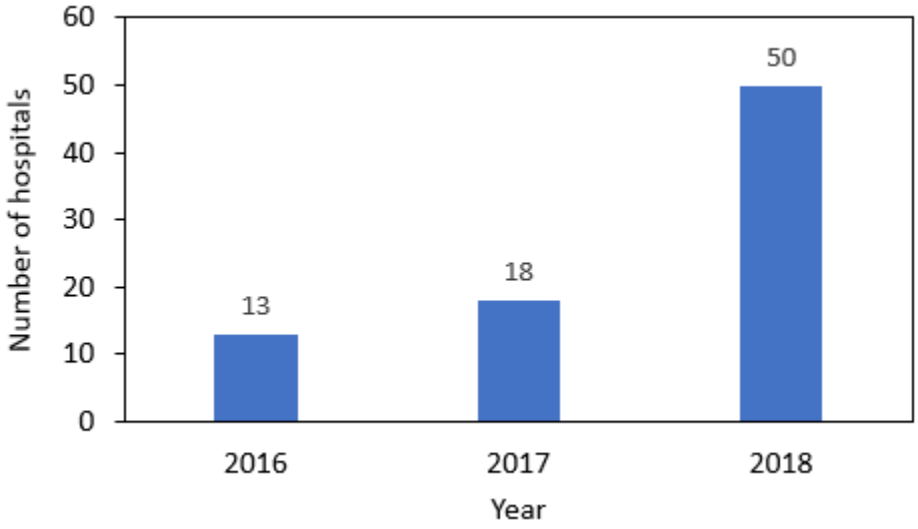


Annual survey data downloaded from National Healthcare Safety Network on June 25, 2019.

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.[5,6,7] NYSDOH strongly recommends that hospitals measure antimicrobial use using the NHSN established definition for Days of Therapy (DOT) per 1,000 patient days to establish baseline data and identify opportunities for targeted interventions. Almost 78% of hospitals reported using DOT per 1000 patient days or days present to track antibiotic use as part of an ASP. Between 2015 and 2018, the number NYS of hospitals that submitted AU data to NHSN increased from 13 to 50 (29%) (Figure 32). These data are visible to NYSDOH via the CDC-NYS DUA, but the DUA prohibits NYSDOH from publishing hospital-specific data.

Figure 32. Number of hospitals reporting antimicrobial use data to the National Healthcare Safety Network, New York State 2015-2018



In 2018, NYS hospitals reported an average antimicrobial usage rate of 561 DOT per 1,000 days present in adult medical, medical-surgical, and surgical ICUs and wards, step down units, and oncology units. DOT 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 DOT to the predicted DOT in the referent population (voluntary reporters in United States, 2017) after adjusting for patient care location. The 2018 NYS SAAR of 0.91 (Table 23) indicates that NYS antimicrobial use data was 9% lower than antimicrobial use in the 2017 referent population. The SAAR alone is not a definitive measure of the appropriateness of antimicrobial use, but suggests areas for further evaluation by stewardship programs. Trends are not shown because the group of participating hospitals changed over time.

Table 23. Antimicrobial usage and standardized antimicrobial administration ratio (SAAR) in NYS hospitals in 2018, adult medical, medical-surgical, and surgical ICUs and wards, step down units, and oncology units

	Antimicrobial days observed	Antimicrobial days predicted	Antimicrobial use per 1,000 days present	SAAR compared to United States 2017
[1] All antibacterial agents	1,728,610	1,905,033	561.3	0.91
[2] Broad spectrum antibacterial agents predominantly used for hospital-onset infections	491,036	468,254	159.4	1.05
[3] Broad spectrum antibacterial agents predominantly used for community-acquired infections	348,377	434,088	113.1	0.80
[4] Antibacterial agents predominantly used for resistant Gram-positive infections (e.g., MRSA)	264,820	303,100	86.0	0.87
[5] Narrow spectrum beta-lactam agents	255,522	271,765	83.0	0.94
[6] Antibacterial agents posing the highest risk for CDI	435,024	536,098	141.2	0.81
[7] Antifungal agents predominantly used for invasive candidiasis	67,636	73,989	22.0	0.91

National Healthcare Safety Network data reported as of June 25, 2019.

[1] excluding delafloxacin, meropenem/vaborbactam, piperacillin, ticarcillin/clavulanate

[2] amikacin (IV only), aztreonam (IV only), cefepime, ceftazidime, doripenem, gentamicin (IV only), imipenem/cilastatin, meropenem, piperacillin/tazobactam, tobramycin (IV only)

[3] cefaclor, cefdinir, cefixime, cefotaxime, cefpodoxime, cefprozil, ceftriaxone, ciprofloxacin, cefuroxime, ertapenem, gemifloxacin, levofloxacin, moxifloxacin

[4] ceftaroline, dalbavancin, daptomycin, linezolid, oritavancin, quinupristin/dalfopristin, tedizolid, telavancin, vancomycin (IV only)

[5] amoxicillin, amoxicillin/clavulanate, ampicillin, ampicillin/sulbactam, cefadroxil, cefazolin, cefotetan, cefoxitin, cephalexin, dicloxacillin, nafcillin, oxacillin, penicillin G, penicillin V

[6] cefdinir, cefepime, cefixime, cefotaxime, cefpodoxime, ceftazidime, ceftriaxone, ciprofloxacin, clindamycin, gemifloxacin, levofloxacin, moxifloxacin

[7] anidulafungin, caspofungin, fluconazole, micafungin

From 2017 to 2018, NYSDOH used a portion of funding received via the CDC Epidemiology and Laboratory Capacity **(**ELC) Cooperative Agreement to support hospitals to improve the uptake of AUR reporting. Using a competitive award process, nine contracts were awarded to hospitals or hospital systems to implement or make significant progress toward reporting into the AUR module. One facility did not complete the project. The majority of participants used funds to meet NHSN reporting requirements through the use of third-party health information technology vendors.

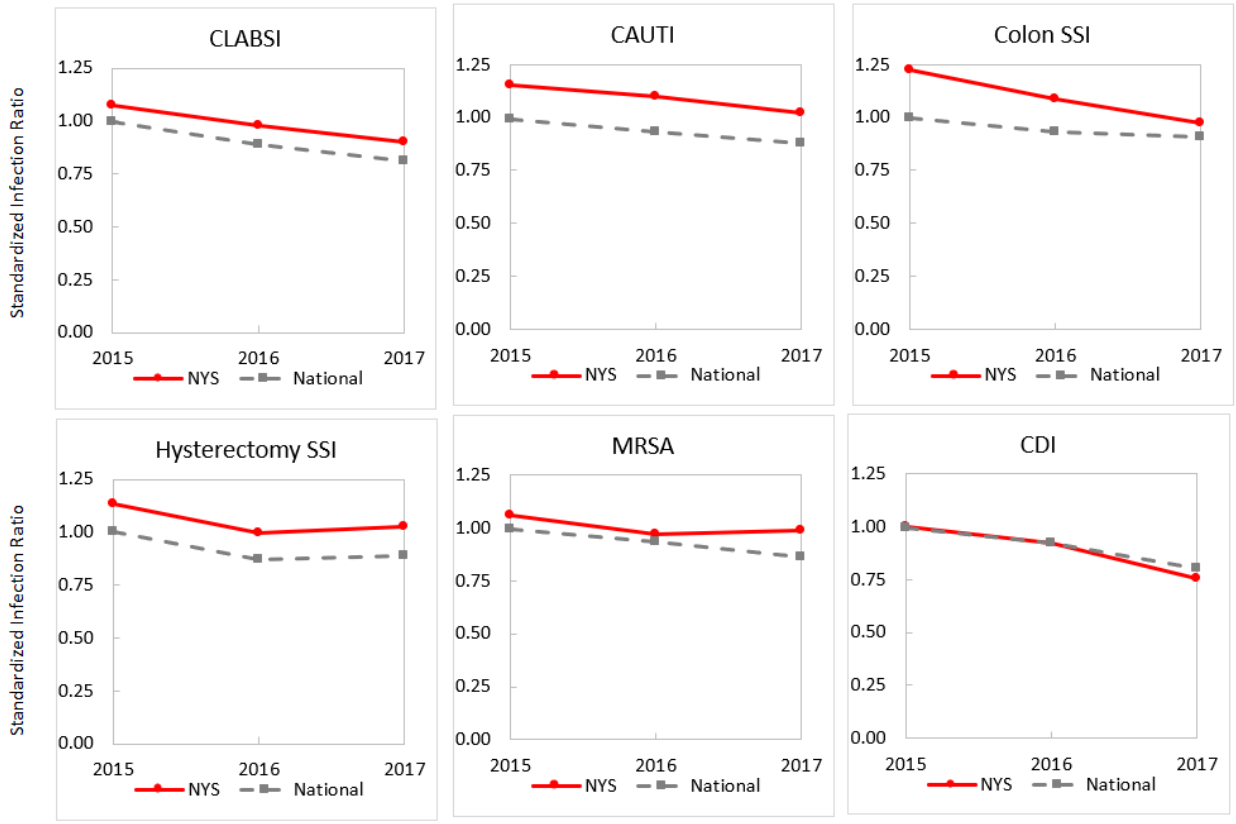
Measurement of antibiotic use and evaluation and intervention to ensure appropriate use are important in healthcare, including hospitals, long term care, and ambulatory/outpatient care settings.[8, 9] Guidelines and numerous training programs are available through federal and state partners, as well as professional associations. Efforts across healthcare settings to use antibiotics appropriately will contribute to public health goals to reduce antimicrobial resistance.

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 *Clostridioides difficile*, and experiencing adverse reactions (e.g. allergic reactions or diarrhea) to the medication[10]. 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[11]. Figure 33 summarizes data from the 2015, 2016, and 2017 CDC reports.

Figure 33. Trends in New York State and National Standardized Infection Ratios



Type of Hospital-Acquired Infection	2017 New York SIR^	2017 National SIR^
Central-line associated bloodstream infections (CLABSIs)*	0.900	0.814
Catheter-associated urinary tract infections (CAUTI)	1.022	0.880
Colon surgical site infections (SSIs)*	0.973	0.906
Abdominal hysterectomy SSIs*	1.026	0.890
MRSA bacteremia	0.990	0.862
Clostridium difficile infections (CDI)*	0.755	0.804

Source of data: CDC. 2015, 2016, and 2017 National and State Healthcare-associated Infection Data Reports.
^ Standardized Infection Ratio is compared to national 2015 baseline
* Data audited by New York State

Figure 33 shows that HAI rates in NYS are higher than national rates, with the exception of CDI. The rate of change in NYS between 2015 and 2017 was similar to the rate of change nationally for

CLABSI, CAUTI, CDI, and hysterectomy SSIs. NYS improved faster than the Nation for colon SSIs, and slower for MRSA.

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

Infection Prevention Resources

NYSDOH conducts a biennial survey to measure hospital infection prevention staffing levels. Information is obtained on the number of IPs; their educational background and certification; infection control program support services; activities and responsibilities of infection prevention and control program staff; and time dedicated to various activities. This section summarizes the highlights of the 2018 survey. A total of 175 hospitals (100%) responded to the survey.

NYS IPs reported having an average of ten years of experience in infection prevention. Fifty-five percent of IPs were board certified (CIC ®), and 78% were members of the Association for Professionals in Infection Control (APIC). IPs spent most of their time (36%) on infection surveillance. The rest of their time was spent on department rounds (12%), daily isolation issues (8%), quality/performance improvement (8%), administrative/policy and procedure development (7%), environment/construction rounds (6%), infection prevention for hospital affiliated outpatient areas (5%), employee/occupational health (4%), emergency preparedness (4%), staff education/central sterile processing/risk management/community education (8%), and other issues (1%).

IP staffing levels are typically calculated as the number of acute care beds (i.e. patients) for which one full-time equivalent (FTE) IP is responsible. In this report, we present that measure (# inpatients per IP), along with another measure (# total patients per IP) that is a weighted aggregate of patients in acute and non-acute settings (i.e. long-term care centers, dialysis centers, ambulatory surgery centers, ambulatory surgery clinics, private physician practices, and EDs). In 2018, the average FTE IP in NYS was responsible for 89 inpatients and 228 total patients per day. These results are similar to those reported in the 2016 survey (Figure 34).

Figure 34. Patients per one full time equivalent Infection Preventionist in NYS, 2016-2018

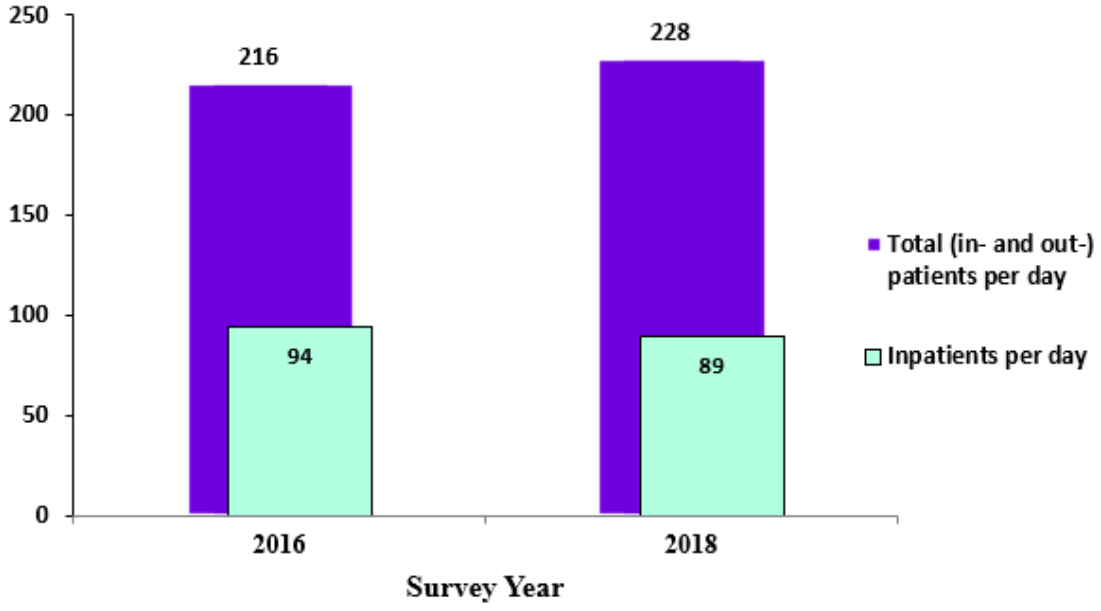
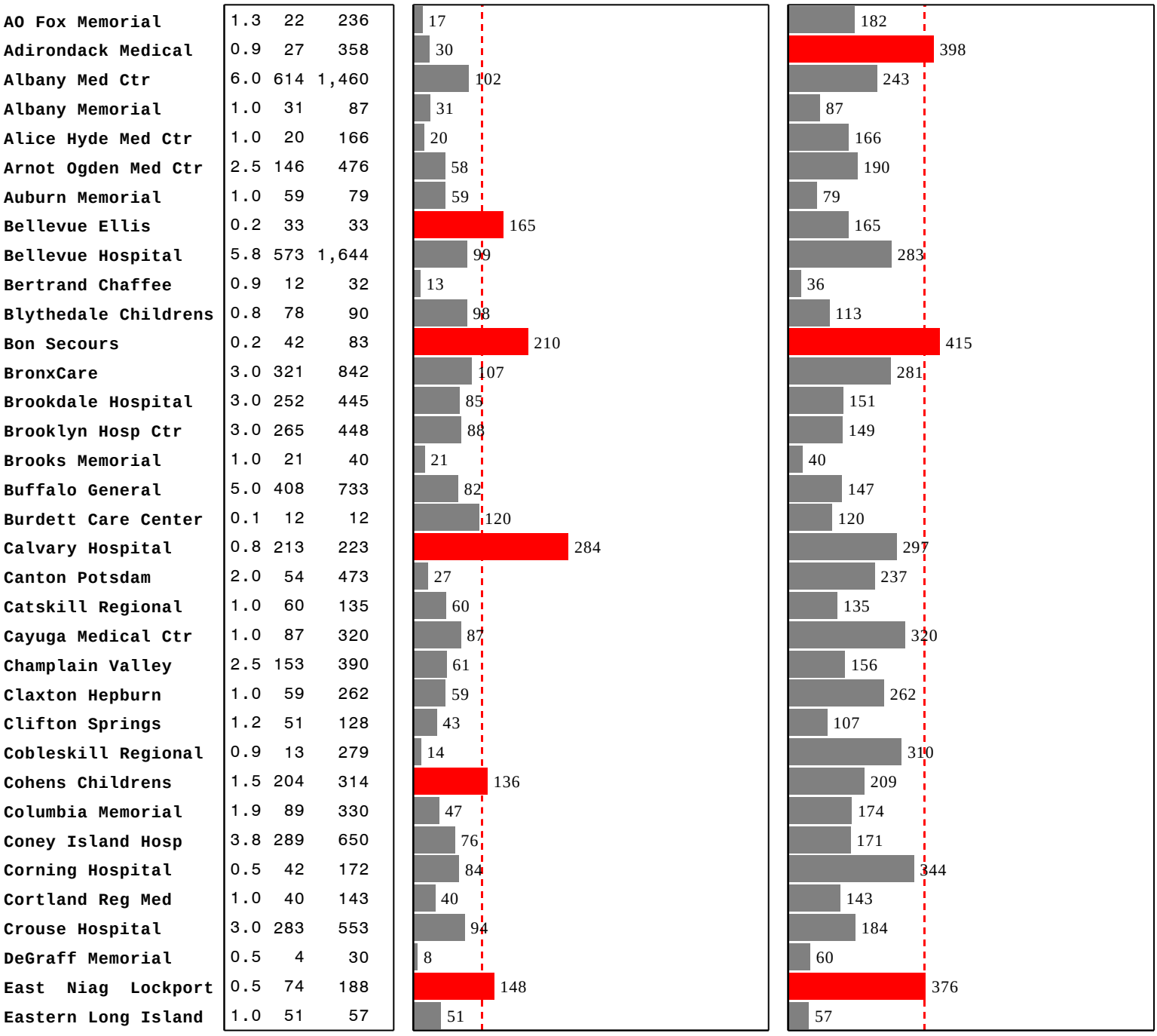


Figure 35 summarizes the IP staffing levels by hospital. Hospitals in the lowest 15th percentile using either infection prevention staffing measure are graphed in red. Facilities with low IP resources are encouraged to review the responsibilities of their IPs to ensure that staffing levels are appropriate. The review should take into consideration the range of the clinical programs, the risks of the patient population, the scope of the duties covered by the IPs, and the availability of support staff and information technology to assist with surveillance functions and reporting requirements. For example, ambulatory outpatient clinics vary in size (larger clinics require more resources than smaller clinics) and infection risk (e.g. endoscopy and dental clinics, which require high level disinfection, require more IP oversite than radiology and chemical dependency clinics).

Figure 35. Infection Preventionist Personnel Resources in NYS Hospitals, 2018 (page 1 of 5)



FTE = Full Time Equivalent; IP = Infection Preventionist; # Inpatients per day = # facility-wide inpatient days / 365 + # inpatient rehabilitation facility patient days / 365 + # inpatient psychiatric facility patient days / 365; # Total in- and out-patients per day = # inpatients per day + intensive care unit patients per day (note: also counted as inpatients) + 0.5 * long term care beds + 50 * dialysis centers + 50 * ambulatory surgery centers + 10 * ambulatory surgery clinics + 5 * private physician practices + 0.2 * emergency department visits per day; Vertical reference lines indicate 15th percentiles (126 inpatients, 373 total patients per FTE IP);
hospital staffing levels among the lowest 15th percent in the state; hospital staffing resources are not low.

Figure 35. Infection Preventionist Personnel Resources in NYS Hospitals, 2018 (page 2 of 5)

Hospital	# FTE IPs	# Inpatients per day	# Total In- and Out patients per day	# Inpatients per FTE IP	# Total Patients (Inpatient and Outpatient) per FTE IP
Ellis Hospital	3.4	217	639	64	188
Elmhurst Hospital	4.7	382	831	82	179
Erie County Med Ctr	3.7	424	750	115	203
FF Thompson	0.4	69	359	173	898
Faxton St Lukes	3.5	185	670	53	191
Flushing Hospital	2.6	197	744	77	292
Geneva General	0.9	45	210	50	233
Glen Cove Hospital	1.0	95	125	95	125
Glens Falls Hospital	1.5	183	498	126	343
Good Samar Suffern	1.6	140	316	88	198
Good Samar W Islip	4.0	352	498	88	125
Harlem Hospital	2.8	210	628	76	228
HealthAlli Broadway	1.1	72	98	65	89
HealthAlli MarysAve	0.1	59	59	590	590
Henry J Carter	2.0	134	216	67	108
Highland Hospital	2.9	255	423	88	146
Hosp for Spec Surg	3.7	127	158	35	43
Huntington Hospital	2.9	217	375	75	129
Interfaith Med Ctr	3.0	183	276	61	92
Ira Davenport	0.5	2	67	4	134
JT Mather Hospital	3.8	194	321	52	86
Jacobi Med Ctr	5.0	358	1,091	72	218
Jamaica Hospital	4.0	280	374	70	94
Jones Memorial	0.5	22	127	44	254
Kenmore Mercy	0.4	105	164	263	410
Kings County Hosp	4.7	433	1,446	93	311
Kingsbrook Jewish MC	2.5	186	586	74	234
LIJ at Forest Hills	2.0	204	259	102	130
LIJ at Valley Stream	1.5	124	163	83	109
Lenox Hill Hospital	5.0	362	597	72	119
Lincoln Med Ctr	3.3	277	572	85	176
Long Isl Community	2.5	208	377	83	151
Long Isl Jewish(LIJ)	4.8	548	777	115	164
Maimonides Med Ctr	3.0	616	1,010	205	337
Mary Imogene Bassett	5.0	146	1,019	29	204

FTE = Full Time Equivalent; IP = Infection Preventionist; # Inpatients per day = # facility-wide inpatient days / 365 + # inpatient rehabilitation facility patient days / 365 + # inpatient psychiatric facility patient days / 365; # Total in- and out-patients per day = # inpatients per day + intensive care unit patients per day (note: also counted as inpatients) + 0.5 * long term care beds + 50 * dialysis centers + 50 * ambulatory surgery centers + 10 * ambulatory surgery clinics + 5 * private physician practices + 0.2 * emergency department visits per day; Vertical reference lines indicate 15th percentiles (126 inpatients, 373 total patients per FTE IP);
hospital staffing levels among the lowest 15th percent in the state; hospital staffing resources are not low.

Figure 35. Infection Preventionist Personnel Resources in NYS Hospitals, 2018 (page 3 of 5)

Hospital	# FTE IPs	# Inpatients per day	# Total In- and Out patients per day	# Inpatients per FTE IP	# Total Patients (Inpatient and Outpatient) per FTE IP
Massena Memorial	0.5	22	142	44	284
Memor SloanKettering	5.4	446	4,558	82	841
Mercy Hosp Buffalo	3.2	296	605	93	189
Mercy Med Ctr	2.0	190	253	95	127
Metropolitan Hosp	3.0	194	670	65	223
MidHudson Reg of WMC	1.1	119	230	113	219
Millard Fill Suburb	2.0	191	225	96	113
Montefiore Einstein	1.3	441	762	339	586
Montefiore Moses	4.8	749	1,493	156	311
Montefiore Mt Vernon	1.0	58	72	58	72
Montefiore NewRochl	0.8	93	177	113	216
Montefiore Nyack	0.6	177	239	305	412
Montefiore Wakefield	2.3	238	571	103	248
Mount St Marys	1.0	91	180	91	180
Mt Sinai	8.0	922	2,121	115	265
Mt Sinai Beth Israel	3.0	252	1,119	84	373
Mt Sinai Brooklyn	2.0	165	206	83	103
Mt Sinai Queens	2.0	144	336	72	168
Mt Sinai St Lukes	1.8	268	723	153	413
Mt Sinai West	2.0	321	718	161	359
NY Community Hosp	1.0	98	116	98	116
NY Eye&Ear Mt Sinai	1.0	3	178	3	178
NYP Allen	1.0	171	254	171	254
NYP Brklyn Methodist	4.8	550	722	115	150
NYP Columbia	5.0	623	1,197	125	239
NYP Hudson Valley	1.9	93	174	49	92
NYP Lawrence	1.7	159	228	94	134
NYP Lower Manhattan	1.0	150	290	150	290
NYP Morgan Stanley	3.0	273	723	91	241
NYP Queens	4.4	450	811	102	184
NYP Weill Cornell	6.0	757	1,497	126	250
NYU Langone Brooklyn	2.3	291	353	129	157
NYU Orthopedic Hosp	1.2	90	92	78	80
NYU Tisch	5.2	508	3,957	99	768
NYU Winthrop	5.9	484	1,361	82	230

FTE = Full Time Equivalent; IP = Infection Preventionist; # Inpatients per day = # facility-wide inpatient days / 365 + # inpatient rehabilitation facility patient days / 365 + # inpatient psychiatric facility patient days / 365; # Total in- and out-patients per day = # inpatients per day + intensive care unit patients per day (note: also counted as inpatients) + 0.5 * long term care beds + 50 * dialysis centers + 50 * ambulatory surgery centers + 10 * ambulatory surgery clinics + 5 * private physician practices + 0.2 * emergency department visits per day; Vertical reference lines indicate 15th percentiles (126 inpatients, 373 total patients per FTE IP);
hospital staffing levels among the lowest 15th percent in the state; hospital staffing resources are not low.

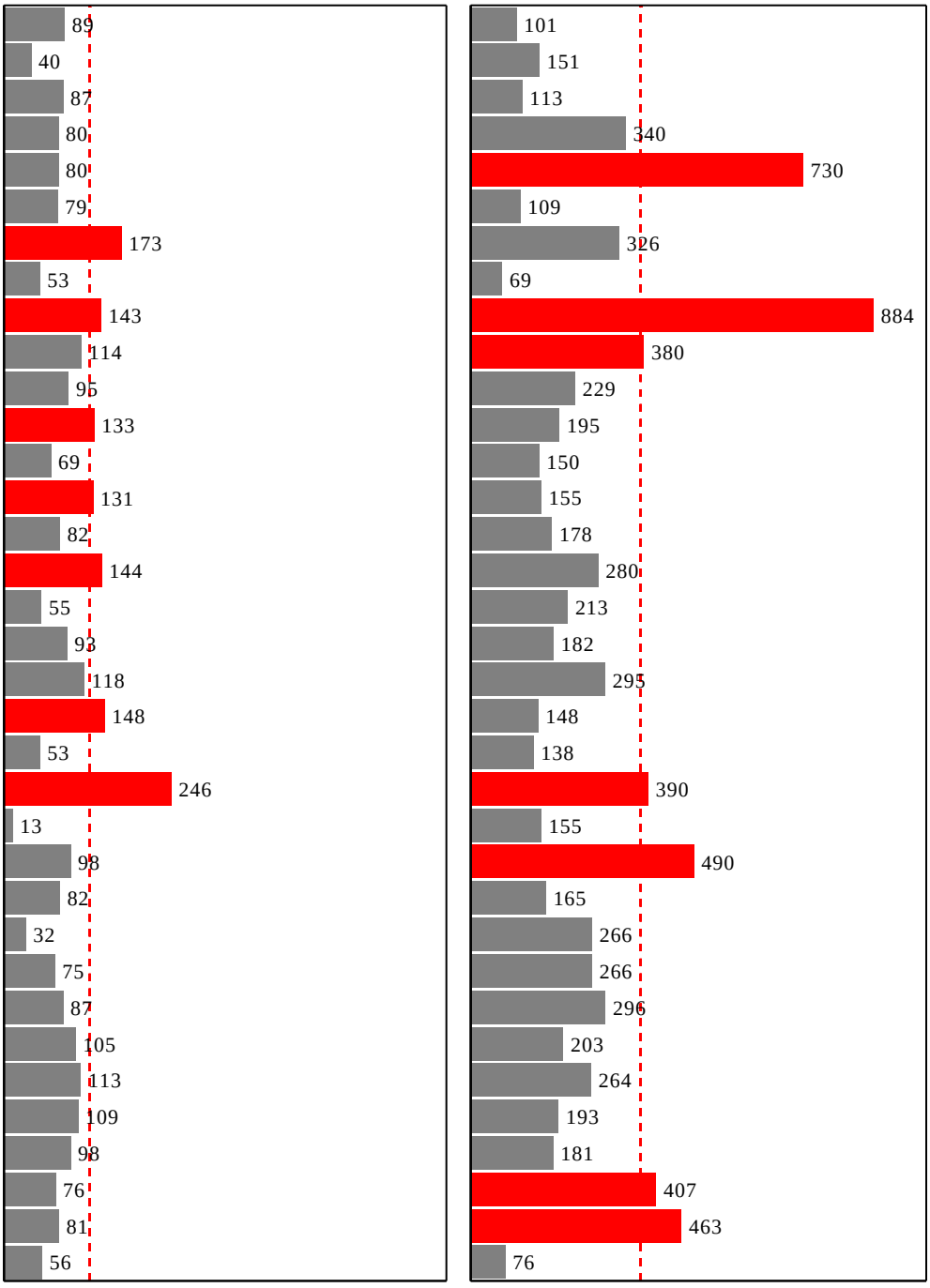
Figure 35. Infection Preventionist Personnel Resources in NYS Hospitals, 2018 (page 4 of 5)

Hospital	# FTE IPs	# Inpatients per day	# Total In- and Out patients per day	# Inpatients per FTE IP	# Total Patients (Inpatient and Outpatient) per FTE IP
Nassau University	3.7	344	705	93	191
Nathan Littauer	1.0	23	302	23	302
Newark Wayne	1.2	67	114	56	95
Niagara Falls	0.9	62	165	69	183
North Central Bronx	2.0	132	914	66	457
North Shore	6.4	772	1,080	121	169
Northern Dutchess	1.0	63	80	63	80
Northern Westchester	2.0	108	170	54	85
Noyes Memorial	0.5	25	231	50	462
Oishei Childrens	1.7	165	503	97	296
Olean General	1.0	87	418	87	418
Oneida Healthcare	2.3	28	269	12	117
Orange Regional	3.9	329	1,205	84	309
Oswego Hospital	0.8	38	325	48	406
Our Lady of Lourdes	1.0	121	541	121	541
Peconic Bay Medical	1.0	101	129	101	129
Phelps Memorial	2.0	138	259	69	130
Plainview Hospital	1.5	106	132	71	88
Putnam Hospital	1.0	70	89	70	89
Queens Hospital	4.0	206	1,149	52	291
Richmond Univ MC	2.0	231	416	116	208
Rochester General	3.2	488	2,303	153	720
Rome Memorial	1.0	47	155	47	155
Roswell Park	3.0	110	418	37	139
SUNY Downstate MedCr	4.0	194	531	49	133
Samaritan Troy	2.0	136	338	68	169
Samaritan Watertown	1.8	142	714	81	408
Saratoga Hospital	2.1	155	395	76	193
Sisters St Joseph	1.2	53	73	44	61
Sisters of Charity	1.2	182	273	152	228
South Nassau Comm	3.0	321	539	107	180
Southside	3.0	280	345	93	115
St Anthony	0.2	21	90	105	450
St Barnabas	3.0	221	400	74	133
St Catherine Siena	2.0	181	310	93	159

FTE = Full Time Equivalent; IP = Infection Preventionist; # Inpatients per day = # facility-wide inpatient days / 365 + # inpatient rehabilitation facility patient days / 365 + # inpatient psychiatric facility patient days / 365; # Total in- and out-patients per day = # inpatients per day + intensive care unit patients per day (note: also counted as inpatients) + 0.5 * long term care beds + 50 * dialysis centers + 50 * ambulatory surgery centers + 10 * ambulatory surgery clinics + 5 * private physician practices + 0.2 * emergency department visits per day; Vertical reference lines indicate 15th percentiles (126 inpatients, 373 total patients per FTE IP);
hospital staffing levels among the lowest 15th percent in the state; hospital staffing resources are not low.

Figure 35. Infection Preventionist Personnel Resources in NYS Hospitals, 2018 (page 5 of 5)

Hospital	# FTE IPs	# Inpatients per day	# Total In- and Out patients per day	# Inpatients per FTE IP	# Total Patients (Inpatient and Outpatient) per FTE IP
St Charles Hospital	2.0	177	202	89	101
St Elizabeth Medical	3.5	141	530	40	151
St Francis Roslyn	3.0	261	340	87	113
St James Mercy	0.1	8	34	80	340
St Johns Dobbs Ferry	0.1	8	73	80	730
St Johns Episcopal	2.0	158	218	79	109
St Johns Riverside	0.8	138	261	173	326
St Joseph Bethpage	1.5	79	104	53	69
St Josephs Elmira	0.4	53	327	143	884
St Josephs Syracuse	3.0	341	1,141	114	380
St Josephs Yonkers	1.0	95	229	95	229
St Lukes Cornwall	1.0	133	195	133	195
St Marys Amsterdam	1.3	86	188	69	150
St Peters Hospital	2.6	340	403	131	155
Staten Island U N	5.5	450	976	82	178
Staten Island U S	1.0	144	280	144	280
StonyBrkSouthampton	1.0	55	213	55	213
StonyBrookUniv	6.0	557	1,094	93	182
Strong Memorial	7.0	825	2,068	118	295
Sunnyview Rehab Hosp	0.6	89	89	148	148
Syosset Hospital	1.0	53	138	53	138
UHS Binghamton	0.5	123	195	246	390
UHS Chenango Memor	1.0	12	147	13	155
UHS Wilson	2.1	201	1,004	98	490
UPMC Chautauqua WCA	1.0	82	165	82	165
United Memorial	1.2	38	319	32	266
Unity Hosp Rochester	3.2	240	852	75	266
Univ Hosp SUNY Upst	4.5	390	1,333	87	296
Upst Community Gen	1.1	115	223	105	203
Vassar Brothers	2.6	294	686	113	264
Westchester Medical	5.2	565	1,002	109	193
White Plains Hosp	2.5	244	452	98	181
Woodhull Med Ctr	3.0	228	1,222	76	407
Wyckoff Heights	2.0	161	925	81	463
Wyoming County Comm	0.5	28	38	56	76



FTE = Full Time Equivalent; IP = Infection Preventionist; # Inpatients per day = # facility-wide inpatient days / 365 + # inpatient rehabilitation facility patient days / 365 + # inpatient psychiatric facility patient days / 365; # Total in- and out-patients per day = # inpatients per day + intensive care unit patients per day (note: also counted as inpatients) + 0.5 * long term care beds + 50 * dialysis centers + 50 * ambulatory surgery centers + 10 * ambulatory surgery clinics + 5 * private physician practices + 0.2 * emergency department visits per day; Vertical reference lines indicate 15th percentiles (126 inpatients, 373 total patients per FTE IP);
hospital staffing levels among the lowest 15th percent in the state; hospital staffing resources are not low.

HAI Prevention Projects

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 planned a follow up 6-month quality improvement project focusing on re-assessing treatment (24-72 hours after antibiotic start) of residents with acute respiratory illness (ARI). Project activities include data collection to track the frequency of re-assessment and of treatment or diagnosis change post re-assessment, as well as educational webinars on topics related to ARI and antibiotic stewardship.

Multidrug-Resistant Organisms such as 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, were thought to be rare in NYS.

Current ARLN testing is focused on identifying carbapenemase-producing CRE (CP-CRE). Statewide, results indicate that roughly 65% of submitted CRE isolates are CP-CRE, and of these *Klebsiella pneumoniae* carbapenemase is found most often 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 2018, NYSDOH expanded 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 one more year to include 2010 to 2016 and by extending its analysis to include broad vs. narrow-spectrum antibiotic prescribing and prescribing per enrollee. NYSDOH's distilled Adult/Pediatric Antibiotic Prescribing Guidelines in both electronic and hard-copy pocket versions (including dosage and duration) were popular, with uptake of over 12,000 of the pocket versions in 2018. The guidelines were adapted by at least one other state health department and a healthcare system and were included in the order sets for another healthcare system. The guidelines were also featured in a national webinar for urgent care providers. NYSDOH amplified its antibiotic stewardship outreach in collaboration with the New York State Association of County Health Officials (NYSACHO) by offering a webinar on antibiotic stewardship academic detailing for public health nurses; a public health nurse toolkit on antibiotic stewardship is in development. Outreach to schools was furthered through sharing of educational materials with individual school systems and school health educators from the NYS Association of Health, Physical Education, Recreation and Dance educators (NYS AHPERD). A presentation was made to the Evidence-Based Medicine class at Albany Medical College for 2nd year medical students. NYSDOH collaborated with the NYS Dental Association and the NYSDOH Division of Medical and Dental Directors (Office of Health Insurance Programs) to further outreach of the antibiotic stewardship message in dental settings. Upon request, NYSDOH expanded its translations of CDC's "viral prescription pad" from 10 to 13 non-English languages spoken by patients in NYS, including Bengali, Nepali, and French.

Summary

Table 24 summarizes the total number of each type of HAI for NYS in 2018. The table is sorted from most common to least common.

Table 24. Inpatient infections reported by New York State hospitals in 2018

Type of infection	Number	Rate
Hospital onset *Clostridioides difficile* infections (CDIs)	5,057	4.8/10,000 patient days
Surgical site infections (SSIs) following		
Colon surgery[B]	798	4.1/100 procedures
Hip replacement or revision surgery[N]	338	1.0/100 procedures
Abdominal hysterectomy surgery[B]	186	1.1/100 procedures
Coronary artery bypass graft (CABG) - chest site[N]	148	1.4/100 procedures
CABG - donor site[N]	32	0.3/100 procedures
Catheter-associated urinary tract infections (CAUTIs) in intensive care units, and medical/surgical wards	1,275	1.0/1,000 catheter days
Central line-associated bloodstream infections (CLABSIs) in intensive care units and medical and surgical wards[B] and step down units[N]	1,051	0.8/1,000 line days
Hospital onset methicillin-resistant *Staphylococcus aureus* (MRSA) bloodstream infections[C]	661	0.59/10,000 patient days
Hospital onset carbapenem-resistant *Klebsiella, E. coli*, and *Enterobacter* (CRE) bloodstream infections[N]	150	0.13/10,000 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 data reported as of 6/27/2019; CDI/CRE reported as of 6/18/2019; CAUTI and MRSA data reported as of 5/16/2019. Data from inpatient rehabilitation and psychiatric facilities were excluded. SSI data exclude infections present at time of surgery or detected in outpatient settings without readmission. CLABSI data exclude mucosal barrier injury, ventricular assist device, and extracorporeal membrane oxygenation-associated BSI.

Table 25 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 CDIs, with a 35% decrease in incidence. Cost 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 2018, 7,622 infections were prevented because of reductions in HAI rates; this was related to a cost savings of $91.5 to $178.3 million.

Table 25 also compares NYS progress to National and State Prevention Goals. NYS has met the 2019 CDI and CRE goals, is on track to reach the 2019 goal for colon SSI and CABG chest SSI, and is off track for the remaining indicators.

Table 25. Cost savings associated with change in HAI rates between 2015 and 2018

Type of Infection	National/State 2015-2019 Prevention Goal	2018 Improvement Since 2015 (Compared to 2019 Goal)	# Prevented Infections	Direct Cost Savings (in millions)	
				Min	Max
Hospital onset *Clostridioides difficile* infections (CDI)	30%	improved 35% (met goal)	5,930	$62.9	$89.5
Colon surgery SSIs	30%	improved 27% (on track)	645	$12.7	$37.0
Central line-associated bloodstream infections (CLABSIs)	50%	improved 24% (off track)	752	$9.1	$36.3
Hip replacement or revision surgery SSIs	30%	improved 0% (off track)	71	$1.4	$4.1
Coronary artery bypass graft chest SSIs	30%	improved 23% (on track)	105	$2.1	$6.0
Abdominal hysterectomy surgery SSIs	30%	improved 10% (off track)	38	$0.7	$2.2
Hospital onset carbapenem-resistant Enterobacteriaceae (CRE) bloodstream infections	25%	improved 34% (met goal)	81	$2.6	$3.2
Total			7,622	$91.5	$178.3

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 yellow if 2019 prevention goal was met, green if on track to meet 2019 prevention goal, and 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 to provide assistance as needed.

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 – *Clostridioides difficile* infection
C. auris – Candida auris
C. difficile – Clostridioides 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
ECMO – Extracorporeal membrane oxygenation
ED – Emergency department
EIA – Enzyme immunoassay
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
VAD – Ventricular assist device
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.

***Clostridioides 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.

- An SIR of 1.0 means the observed number of infections is equal to the number of predicted infections.
- An 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. For example, a hospital SIR of 1.12 indicates that the hospital performed 12% worse than the state average.
- An 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. For example, a hospital SIR of 0.85 indicates that the hospital performed 15% better than the state average.

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

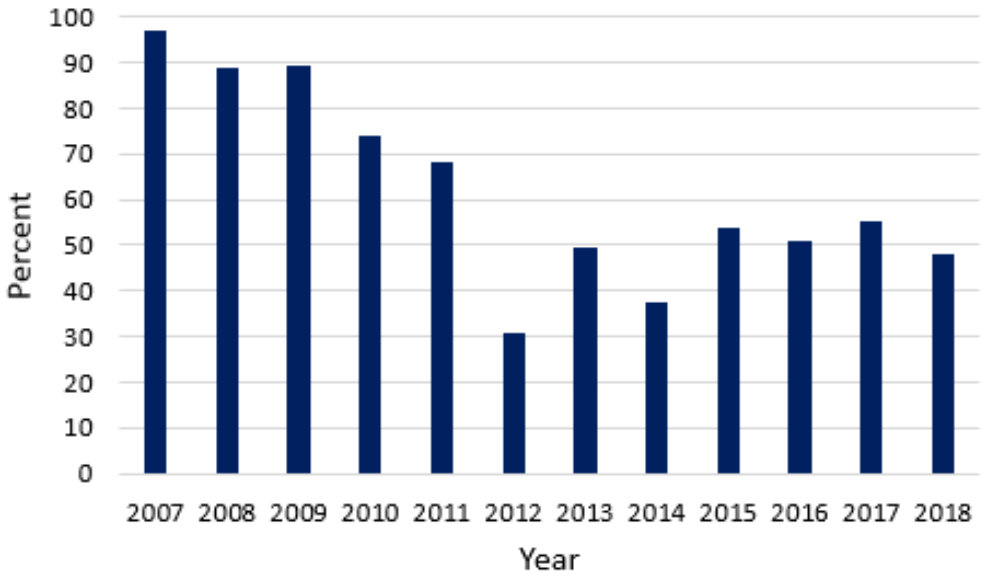
Data reported to the NHSN are validated by the NYSDOH using several methods.

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 36 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 36. 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 2018 audit results will be summarized in the next annual report. In 2017, NYSDOH staff reviewed 6,945 records and agreed with the hospital-reported infection status 96% of the time. Disagreements were discussed with the IPs and corrected in NHSN. Table 26 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 26. Brief summary of 2017 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	788	118	5	609	56	92.3 %
CABG SSI	170	27	1	139	3	97.6 %
Hyst SSI	702	49	0	641	12	98.3 %
Hip SSI	780	71	1	702	6	99.1 %
CLABSI	859	143	3	686	27	96.5 %
CDI	2,697	2,611	14	0	72	96.8 %
CRE	949	883	3	0	63	93.0 %
Total	6,945	3,902	27	2,777	239	96.2 %

The 2017 audit was conducted between October 2017 and June 2018, and predominantly covered 2017 data.
SSI = surgical site infection; CLABSI = central line associated bloodstream infection; CDI = *Clostridioides 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 175 hospitals reporting complete data for 2018. 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.

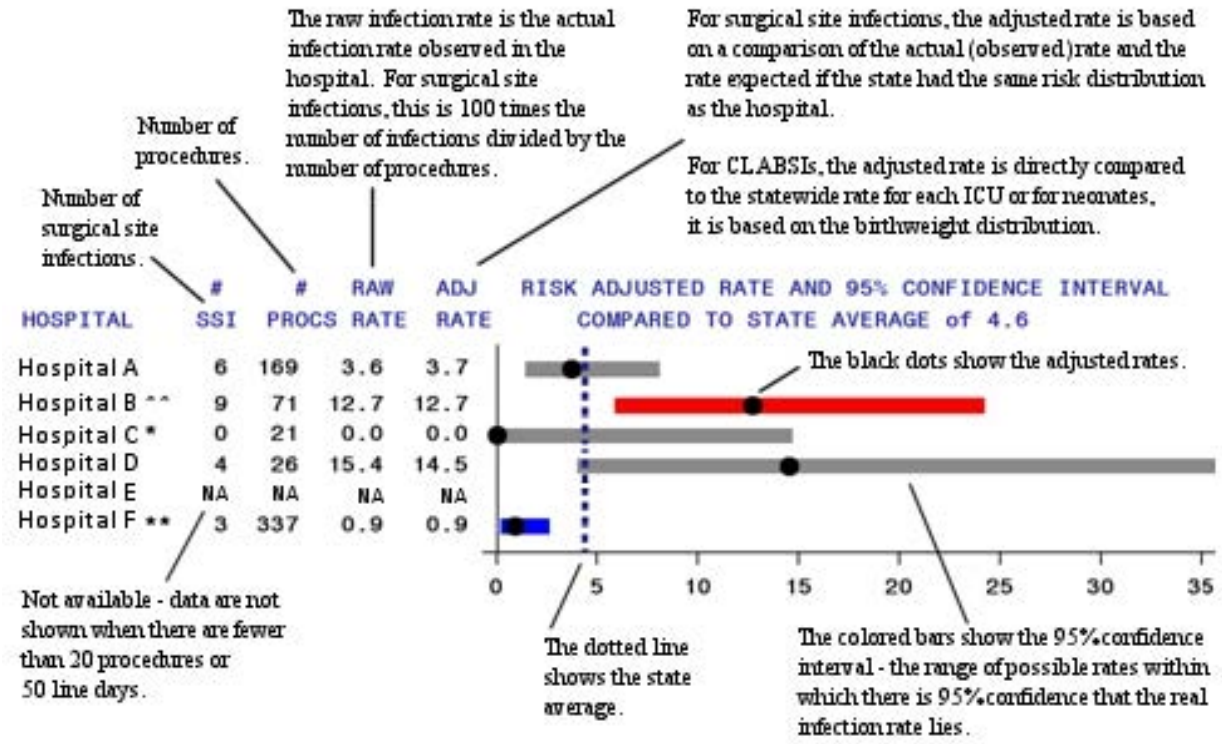
NYSDOH tracks hospital performance over time. Hospitals flagged high or low for at least three consecutive years (i.e. 2016, 2017, 2018) are specifically named in this report.

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 37 provides an example of how to interpret the hospital-specific SSI and CLABSI infection rate tables.

Figure 37. 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

In the 2015, 2016, and 2017 NYS HAI reports, we summarized the SSI results for colon, hip, CABG, and hysterectomy procedures into the SSI SIR, which described the average performance for each hospital across the colon, hip, CABG, and hysterectomy procedures that they performed. For example, if a hospital performed significantly better than average for colon SSIs, and significantly worse than average for hip SSIs, the hospital SSI SIR indicator would be average (1.0). If a hospital performed somewhat worse than average for colon, hip, and hysterectomy SSIs, even without indicator-specific flags, the SSI SIR might flag the hospital as significantly worse than average overall because the confidence interval decreases when all the procedures are combined.

The advantages of the SIR are that it summarizes several risk-adjusted rates into one number, may be useful to identify issues at small hospitals with insufficient data in any one indicator to receive a statistical flag, and may be useful when the same infection prevention strategies impact all SSI rates. The disadvantages are that one cannot tell which indicator is a problem without drilling down to the indicator-specific adjusted rates, and some prevention strategies or bundles are not procedure- or location- specific. In particular, hospitals that were flagged with a high SSI SIRs and no indicator-specific SIRs found it difficult to write improvement plans. In conclusion, after discussing the SSI SIR with the TAW, we decided to remove the SSI SIR from the 2018 report.

Attributable Mortality of CDI/MDROs

Attributable mortality rates were calculated using the data in Table 27. 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 27. Attributable mortality estimates from literature review

MDRO	Reference	# MDROs	% Deaths MDROs	% Deaths Controls	Attributable Mortality %
CDI	Dodek 2013[12]	227	29	27	2.0
	Gravel 2009[13]	1430	N/A	N/A	5.7
	Kenneally 2007[14]	278	36.7	30.6	6.1
	Loo 2005[15]	1703	N/A	N/A	6.9
	Pepin 2005[16]	161	23	7	16.0
	Tabak 2013[17]	255	11.8	7.3	4.5
	Dubberke 2008[18]	353	36	30.3	5.7
	Hensgens 2013[19]	317	14.8	5.4	9.4
	Barbut 2017[20]	482	9	5	4.0
	Weighted average				**6**
CRE	Borer 2009[21]	32	71.9	21.9	50.0
	Mouloudi 2014[22]	37	NA	NA	27.0
	Gallagher 2014[23]	43	45	18	27
	Weighted average				**34**
MRSA	Harbarth 1998[24]	39	36	28	8.0
	DeKraker 2011[25]	242	30.6	8.4	22.2
	Weighted average				**20**

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.

The first important difference is the peer group to which each hospital is compared.

- In the NYS 2018 report, each hospital's 2018 data is compared to 2018 data reported by other hospitals in NYS.

- In CMS Hospital Compare, each hospital's 2018 data is compared to 2015 data reported by other hospitals in the United States.

In general, NYS hospital Standardized Infection Ratios (SIRs) tend to be higher than CMS SIRs for two reasons.

- HAI rates decrease over time as infection prevention practices improve; the NYS benchmark is expected to decrease over time (but the average SIR is always 1.0 because comparison is in the same year), while the CMS benchmark remains the same (SIRs decrease over time).

- NYS HAI data are audited more than data from other states. Auditing is likely to increase HAI rates because missed infections are identified and entered into the National Healthcare Surveillance Network (NHSN), and training efforts lead to better identification of HAIs.

We also note that by comparing data within the same year, NYS ensures that the same protocol is followed for identification of a hospital's data and the data to which it is compared. There were some changes to CLABSI surveillance definitions in 2018.

Finally, the statistical models used to predict HAI rates in NYS and CMS models are slightly different. These differences are described in Table 28. For HAI rates published on Hospital Compare we show the CMS model, and for HAI rates not published on Hospital Compare, we show a model available through the NHSN application that hospitals may or may not use for internal benchmarking.[26]

Each approach has advantages and disadvantages and may be implemented for different purposes. NYS assesses hospital-specific performance each year, while CMS and NHSN measure improvement over time. NYS often avoids using hospital-level risk adjustment variables (e.g. teaching hospital vs. not) because these are effects we are interested in measuring, while NHSN may include these variables to increase the homogeneity of the groups under comparison. NYS includes superficial infections (except those identified from post-discharge surveillance) because they have been found to be similar to deeper infections in terms of infectious etiologies and length of stay, while CMS focuses on deeper infections because they may be reported more consistently across facilities[27].

Table 28. Comparison of New York State and Centers for Medicare and Medicaid Services (CMS) Methods for 2018 Hospital-Acquired Infection Reports

Indicator	Report	Exclusions	Risk Adjustment
CLABSI	NYS	Mucosal barrier injury-, extracorporeal membrane oxygenation-, or ventricular assist device- associated bloodstream infections; neurologic, burn, trauma, and respiratory ICUs	In adult/pediatric units, CLABSI rates are compared within each CDC location independently. In NICUs, CLABSI rates are compared by level (RPC, Level 3, Level 2/3) and birthweight group. Hospital compared to NYS 2018 average.
	CMS	Mucosal barrier injury CLABSIs; step down units	In adult/pediatric units, negative binomial regression model with location type, facility bed size, medical school affiliation, and facility type. In NICUs, only birthweight group. Hospital compared to National 2015 average.
Colon SSI	NYS	SSIs detected by post discharge surveillance (PDS) or present at time of surgery (PATOS)	ASA, duration, BMI, trauma, laparoscope. Hospital compared to NYS 2018 average.
	CMS	Complex 30-day SSI model: age<18, superficial SSIs, PATOS, outliers	Diabetes, ASA, gender, age, BMI, closure technique, oncology hospital. Hospital compared to National 2015 average.
Hysterectomy SSI	NYS	PDS, PATOS	Diabetes, ASA, BMI, duration, laparoscope. Hospital compared to NYS 2018 average.
	CMS	Complex 30-day SSI model: age<18, superficial SSIs, PATOS, outliers	Diabetes, ASA, BMI, age, cancer hospital. Hospital compared to National 2015 average.
Hip SSI	NYS	PDS, PATOS	ASA, BMI, procedure type. Hospital compared to NYS 2018 average.
	NHSN	Complex admission/readmission model: superficial SSIs, PDS, PATOS, outliers	Adults: Diabetes, trauma, anesthesia, ASA, wound class, medical school affiliation, hospital bed size, age, duration, BMI, procedure type. Children: intercept only. Hospital compared to National 2015 average.
CABG chest SSI	NYS	PDS, PATOS	Diabetes, BMI, gender, trauma. Hospital compared to NYS 2018 average.
	NHSN	Complex admission/readmission model: superficial SSIs, PDS, PATOS, outliers, children.	Diabetes, gender, ASA, trauma, wound class, medical school affiliation, hospital bed size, age duration, BMI, age-gender interaction. Hospital compared to National 2015 average.

CABG donor SSI	NYS	PDS, PATOS	BMI, diabetes. Hospital compared to NYS 2018 average.
	NHSN	No model	No model
Clostridium difficile	NYS	Outlier community onset (CO) prevalence rate	CDI test type, CO admission prevalence rate (including patients tested in ED and admitted same day), hospital bed size, % patient days in adult ICUs. Hospital compared to NYS 2018 average.
	CMS	Outlier CO prevalence rate	Hospitals: CDI test type, CO admission prevalence rate, medical school affiliation, number of ICU beds, facility type, facility bed size, reporting from ED. LTACHs: CDI test type, CO rate, % ventilator, % single occupancy. Hospital compared to National 2015 average.

Appendix 4: List of Hospitals by County

Table 29 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 29. 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	BronxCare
	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
Chemung	0116	330090	Arnot Ogden Med Ctr
	0118	330090	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	330067	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	330005	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
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	330259	Mercy Med Ctr
New York	1438	330204	Bellevue Hospital
	1439	330169	Mt Sinai Beth Israel
	1454	330199	Metropolitan Hosp
	1469	330046	Mt Sinai St Lukes
	1466	330046	Mt Sinai West
	1450	330119	Lenox Hill Hospital
	1437	330064	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
Onondaga	0636	330203	Crouse Hospital
	0635	330241	Univ Hosp SUNY Upst
	0628	330241	Upst. Community Gen
	0630	330140	St Josephs- Syracuse

County	PFI	CMS ID	Hospital Name
Ontario	0678	330074	FF Thompson
	0676	330265	Clifton Springs
	0671	330058	Geneva General
Orange	0699	330126	Orange Regional
	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
	3376	330195	Cohens Childrens
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
Saratoga	0818	330222	Saratoga Hospital
Schenectady	0829	330153	Ellis Hospital
	0831	330406	Sunnyview Rehab Hosp
	0848	330153	Bellevue Ellis
Schoharie	0851	330268	Cobleskill Regional
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

County	PFI	CMS ID	Hospital Name
Suffolk	0885	330141	Long Isl. Community
	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	StonyBrkSouthampton
	0245	330393	StonyBrookUniv
	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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