Hospital-Acquired Infections in New York State, 2019

Part 2: Technical Report

NEW YORK STATE | Department of Health

May 2021

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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 2020 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	2019	2020 *
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 medical/surgical/medical-surgical/step-down wards						DUA	DUA	✓	✓	✓
Spinal fusion surgical site infections									✓	✓
Central line-associated bloodstream infections in oncology and mixed-acuity units									✓	✓
Central line-associated bloodstream infections in telemetry units										✓
Catheter-associated urinary tract infections						DUA	DUA	DUA	DUA	DUA
Methicillin-resistant *Staphylococcus aureus* bacteremia						DUA	DUA	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.
* Reporting was suspended for January to June 2020 due to the COVID-19 pandemic.

This report focuses on HAI rates in 167 NYS hospitals in 2019. NYS does not require reporting by hospitals that do not have enough data to produce statistically meaningful rates. These hospitals are:

- critical access hospitals or hospitals with less than 26 acute care beds;
- hospitals that perform fewer than twenty reportable surgeries and have fewer than 50 central line days per year and an average length of stay of less than 3 days; and
- hospitals that are exclusively research, psychiatric, addiction recovery (alcohol or drugs), or freestanding rehabilitation.

The detailed information in this report 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" of this two-part report.

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 2019. For information on HAI rates prior to 2015, please see the 2015 NYS HAI Report.
(https://www.health.ny.gov/statistics/facilities/hospital/hospital_acquired_infections/)

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 2019, 158 hospitals reported a total of 1,199 colon SSIs out of 19,530 procedures, a rate of 6.1 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 1,199 infections, 323 (27%) were classified as PATOS. The PATOS SSIs were predominantly (88%) Organ/Space. At completion of the surgery 83% 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 876 infections, 42% were superficial, 5% were deep, and 52% were organ/space (Table 2). Half of the SSIs (50%) were detected during the initial hospitalization; 34% were identified upon readmission to the same hospital; 4% involved readmission to another hospital; and 11% 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 100 PDS infections in the final SSI rate so as not to penalize facilities with the best surveillance systems.

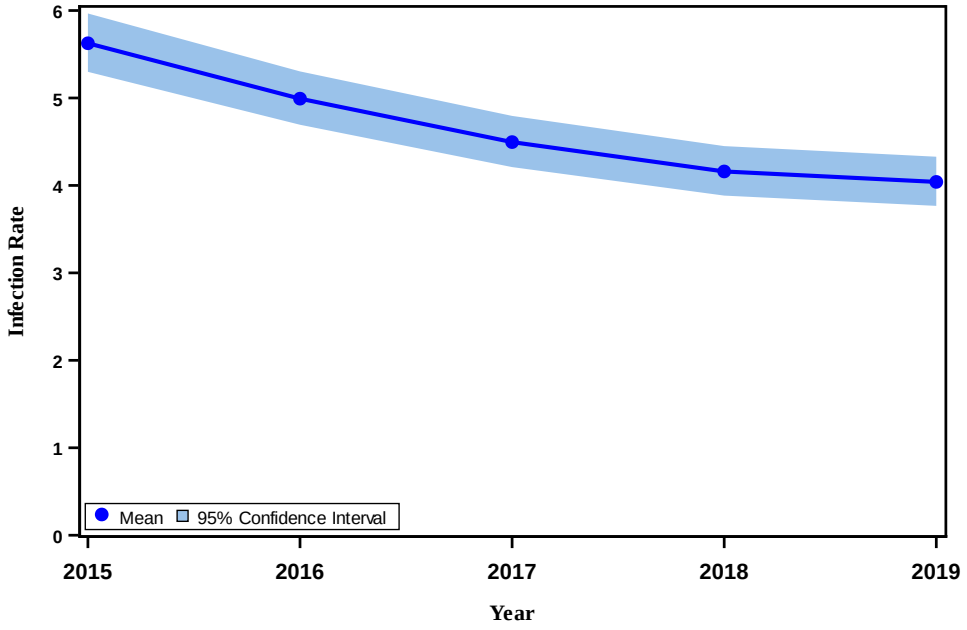
Table 2. Method of detection of colon surgical site infection by depth of infection, New York State 2019

	When Detected				
Extent (Row%) (Column%)	**Initial Hospitalization**	**Readmitted to the Same Hospital**	**Readmitted to Another Hospital**	**Post-Discharge Surveillance Not Readmitted**	**Total**
Superficial Incisional	165 (44.5%) (37.4%)	106 (28.6%) (35.3%)	7 (1.9%) (20.0%)	93 (25.1%) (93.0%)	371 (42.4%)
Deep Incisional	25 (52.1%) (5.7%)	19 (39.6%) (6.3%)	2 (4.2%) (5.7%)	2 (4.2%) (2.0%)	48 (5.5%)
Organ/Space	251 (54.9%) (56.9%)	175 (38.3%) (58.3%)	26 (5.7%) (74.3%)	5 (1.1%) (5.0%)	457 (52.2%)
Total	441 (50.0%)	300 (34.2%)	35 (4.0%)	100 (11.4%)	876

New York State data reported as of December 8, 2020. Excludes infections present at time of surgery.

Trends in colon SSI rates after deleting PATOS and PDS infections are shown in Figure 1. Between 2015 and 2019, the colon surgical site infection rate declined 28%, from 5.63 infections per 100 procedures in 2015, to 4.04 infections per 100 procedures in 2019.

Figure 1. Trend in colon surgical site infection rates, New York State 2015-2019
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	810	19,472	4.16 (3.88, 4.45)
2019	158	776	19,207	4.04 (3.77, 4.33)

New York State data reported as of December 8, 2020. 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 2019

Microorganism	Number of Isolates	Percent of Infections
Enterococci	343	28.6
(VRE)	(61)	(5.1)
Escherichia coli	308	25.7
(CRE-*E. coli*)	(2)	(0.2)
Yeast	104	8.7
Klebsiella spp.	100	8.3
(CRE-*Klebsiella*)	(4)	(0.3)
Bacteroides spp.	94	7.8
Pseudomonas spp.	94	7.8
Staphylococcus aureus	86	7.2
(MRSA)	(44)	(3.7)
Streptococci	73	6.1
Coagulase negative staphylococci	63	5.3
Enterobacter spp.	33	2.8
(CRE-*Enterobacter*)	(2)	(0.2)
Clostridium spp.	29	2.4
Proteus spp.	28	2.3
Morganella morganii	22	1.8
Citrobacter spp.	21	1.8
Acinetobacter spp.	3	0.3
(MDR-*Acinetobacter*)	(3)	(0.3)
Other	101	8.4

New York State data reported as of December 8, 2020. Out of 1,199 infections, no microorganisms identified for 326 (27%) 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:

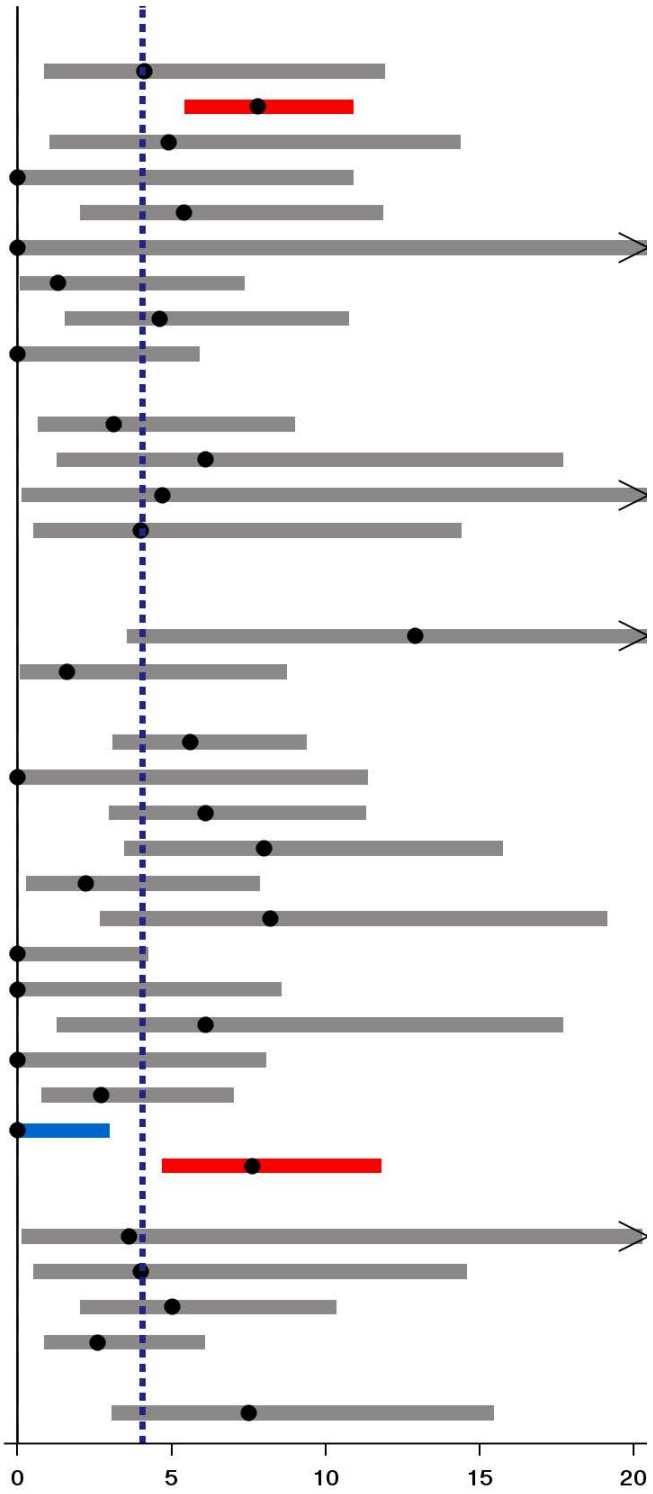
- For each increase in American Society of Anesthesiologists (ASA) score (1, 2, 3/4/5), a measure of systemic disease, patients were 1.3 times more likely to develop an SSI.
- Procedures that used traditional surgical incisions were 1.9 times more likely to result in SSI than procedures performed entirely 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.
- For each additional hour of procedure duration, patients were 1.2 times more likely to develop an SSI.

Hospital-Specific Colon SSI Rates

Hospital-specific colon SSI rates are provided in Figure 2. Of the 130 hospitals that reported more than twenty procedures, six hospitals (5%) had colon SSI rates that were statistically higher than the state average. All six hospitals will submit improvement plans following the NYSDOH HAI Reporting Program's Policy for Facilities with Consecutive Years of High HAI Rates. Five hospitals (4%) had rates that were statistically lower than the state average; Vassar Brothers Medical Center was significantly low for 4 consecutive years.

Figure 2. Colon surgical site infection rates, New York 2019 (page 1 of 4)

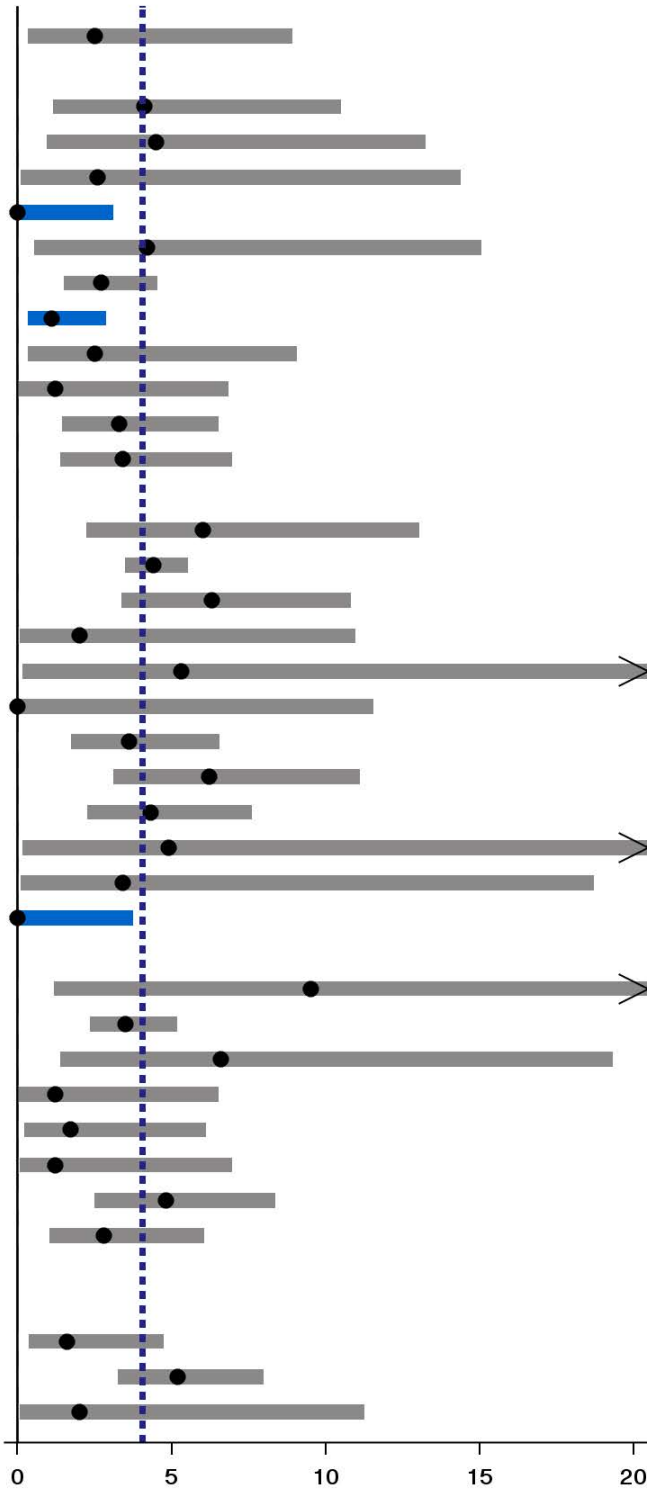
Hospital	# SSI	#PATOS excl.	#PDS excl.	# Procs	Raw Rate	Adj Rate
AO Fox Memorial	NA	NA	NA	NA	NA	NA
Adirondack Medical	3	4	3	87	3.4	4.1
Albany Med Ctr^	34	10	9	481	7.1	7.8
Arnot Ogden Med Ctr	3	1	0	54	5.6	4.9
Auburn Community Hos	0	0	0	24	0.0	0.0
Bellevue Hospital	6	1	2	96	6.3	5.4
Bon Secours	0	0	0	20	0.0	0.0
BronxCare HealthSyst	1	0	0	68	1.5	1.3
Brookdale Hospital	5	4	1	85	5.9	4.6
Brooklyn Hosp Ctr	0	3	0	56	0.0	0.0
Brooks Memorial	NA	NA	NA	NA	NA	NA
Buffalo General	3	5	0	93	3.2	3.1
Canton-Potsdam	3	0	0	45	6.7	6.1
Catskill Regional MC	1	0	0	20	5.0	4.7
Cayuga Medical Ctr	2	0	0	52	3.8	4.0
Claxton-Hepburn	NA	NA	NA	NA	NA	NA
Clifton Springs	NA	NA	NA	NA	NA	NA
Columbia Memorial	4	5	0	27	14.8	12.9
Coney Island Hosp	1	4	0	59	1.7	1.6
Corning Hospital	NA	NA	NA	NA	NA	NA
Crouse Hospital	14	4	1	260	5.4	5.6
Eastern Niagara Hosp	0	0	0	26	0.0	0.0
Ellis Hospital	10	1	0	166	6.0	6.1
Elmhurst Hospital	8	3	2	78	10.3	8.0
Erie County Med Ctr	2	1	0	86	2.3	2.2
FF Thompson	5	0	1	77	6.5	8.2
Faxton St. Lukes	0	0	0	75	0.0	0.0
Flushing Hospital	0	0	0	40	0.0	0.0
Geneva General	3	0	0	72	4.2	6.1
Glen Cove Hospital	0	0	0	32	0.0	0.0
Glens Falls Hospital	4	0	0	154	2.6	2.7
Good Samar. Suffern*	0	0	1	104	0.0	0.0
Good Samar. W Islip^	20	4	3	281	7.1	7.6
Guthrie Cortland MC	NA	NA	NA	NA	NA	NA
Harlem Hospital	1	0	0	27	3.7	3.6
HealthAlli Broadway	2	0	0	52	3.8	4.0
Highland Hospital	7	3	3	157	4.5	5.0
Huntington Hospital	5	3	0	227	2.2	2.6
Interfaith Med Ctr	NA	NA	NA	NA	NA	NA
Jacobi Med Ctr	7	0	0	82	8.5	7.5



Data reported as December 8, 2020. ┆ State Average. ● Risk-adjusted Infection rate. ▬^^Significantly higher than state average. ▬**Significantly lower than state average. ▬Average. > Upper confidence limit exceeds graph area. NA: less than 20 procedures.
SSI: surgical site infections, Procs: procedures. Rates are per 100 procedures. Adjusted using ASA score, obesity, duration, and endoscope.
Excludes SSIs present at time of surgery and non-readmitted cases identified using post discharge surveillance.

Figure 2. Colon surgical site infection rates, New York 2019 (page 2 of 4)

Hospital	# SSI	#PATOS excl.	#PDS excl.	# Procs	Raw Rate	Adj Rate
Jamaica Hospital	2	2	0	76	2.6	2.5
Jones Memorial	NA	NA	NA	NA	NA	NA
Kenmore Mercy	4	4	0	128	3.1	4.1
Kings County Hosp	3	1	0	78	3.8	4.5
Kingsbrook Jewish MC	1	0	0	31	3.2	2.6
LIJ at Forest Hills*	0	0	1	96	0.0	0.0
LIJ at Valley Stream	2	0	0	44	4.5	4.2
LIJ(Long Isl Jewish)	14	8	0	481	2.9	2.7
Lenox Hill Hospital*	4	2	0	386	1.0	1.1
Lincoln Med Ctr	2	2	1	67	3.0	2.5
Long Isl. Community	1	2	0	82	1.2	1.2
Maimonides Med Ctr	8	14	2	245	3.3	3.3
Mary Imogene Bassett	7	0	2	178	3.9	3.4
Massena Memorial	NA	NA	NA	NA	NA	NA
Mather Hospital	6	4	1	104	5.8	6.0
Memor SloanKettering	74	10	17	1279	5.8	4.4
Mercy Hosp Buffalo	13	7	0	246	5.3	6.3
Mercy Med Ctr	1	1	0	49	2.0	2.0
Metropolitan Hosp	1	0	0	22	4.5	5.3
MidHudson Reg of WMC	0	1	1	29	0.0	0.0
Millard Fill. Suburb	10	3	0	320	3.1	3.6
Montefiore-Einstein	11	7	2	174	6.3	6.2
Montefiore-Moses	12	2	11	247	4.9	4.3
Montefiore-Mt Vernon	1	0	0	23	4.3	4.9
Montefiore-NewRochl	1	1	0	33	3.0	3.4
Montefiore-Nyack*	0	0	0	91	0.0	0.0
Montefiore-Wakefield	NA	NA	NA	NA	NA	NA
Mount St. Marys	2	0	0	23	8.7	9.5
Mt Sinai	27	4	4	877	3.1	3.5
Mt Sinai Beth Israel	3	3	0	49	6.1	6.6
Mt Sinai Brooklyn	1	1	0	66	1.5	1.2
Mt Sinai Morningside	2	2	1	96	2.1	1.7
Mt Sinai Queens	1	0	0	68	1.5	1.2
Mt Sinai S Nassau	12	10	0	273	4.4	4.8
Mt Sinai West	6	1	0	162	3.7	2.8
NY Community Hosp	NA	NA	NA	NA	NA	NA
NYP-Allen	NA	NA	NA	NA	NA	NA
NYP-Brklyn Methodist	3	6	0	177	1.7	1.6
NYP-Columbia	21	10	0	460	4.6	5.2
NYP-Hudson Valley	1	0	0	54	1.9	2.0



Data reported as of December 8, 2020. State Average. ●Risk-adjusted Infection rate. —^^Significantly higher than state average. —**Significantly lower than state average. —Average. > Upper confidence limit exceeds graph area. NA: less than 20 procedures. SSI: surgical site infections, Procs: procedures. Rates are per 100 procedures. Adjusted using ASA score, obesity, duration, and endoscope. Excludes SSIs present at time of surgery and non-readmitted cases identified using post discharge surveillance.

Figure 2. Colon surgical site infection rates, New York 2019 (page 3 of 4)

Hospital	# SSI	#PATOS excl.	#PDS excl.	# Procs	Raw Rate	Adj Rate
NYP-Lawrence	3	0	0	63	4.8	5.0
NYP-Lower Manhattan	0	0	0	35	0.0	0.0
NYP-Morgan Stanley	2	0	0	30	6.7	6.6
NYP-Queens	8	6	0	197	4.1	4.1
NYP-Weill Cornell	14	6	0	440	3.2	3.7
NYU Langone Brooklyn	6	3	0	158	3.8	3.4
NYU Tisch	18	5	2	536	3.4	3.4
NYU Winthrop	9	9	0	366	2.5	2.2
Nassau University	NA	NA	NA	NA	NA	NA
Nathan Littauer	NA	NA	NA	NA	NA	NA
Newark Wayne	2	1	0	37	5.4	6.2
Niagara Falls	0	0	0	22	0.0	0.0
North Central Bronx	0	0	0	22	0.0	0.0
North Shore	13	16	0	454	2.9	2.7
Northern Dutchess	0	2	0	27	0.0	0.0
Northern Westchester	4	3	0	123	3.3	4.2
Noyes Memorial	1	0	0	23	4.3	3.5
Oishei Childrens	0	0	0	31	0.0	0.0
Olean General	3	0	1	34	8.8	8.4
Oneida Healthcare	5	4	1	95	5.3	6.6
Orange Regional^	13	2	0	178	7.3	7.6
Oswego Hospital	3	1	2	29	10.3	10.0
Our Lady of Lourdes	7	2	1	103	6.8	8.4
Peconic Bay Medical	0	2	0	58	0.0	0.0
Phelps Memorial	0	0	0	41	0.0	0.0
Plainview Hospital	2	0	0	98	2.0	2.0
Putnam Hospital	2	0	0	63	3.2	4.2
Queens Hospital	3	0	1	49	6.1	5.3
Richmond Univ MC^	9	1	2	91	9.9	10.1
Rochester General	18	4	1	395	4.6	5.0
Rome Memorial	0	0	0	21	0.0	0.0
Roswell Park	15	4	2	227	6.6	6.6
SJRH Dobbs Ferry	NA	NA	NA	NA	NA	NA
SJRH St Johns	1	0	0	55	1.8	2.1
SUNY Downstate MC	2	0	0	47	4.3	3.6
Samaritan AlbanyMem	NA	NA	NA	NA	NA	NA
Samaritan Hosp Troy	5	2	0	85	5.9	7.0
Samaritan- Watertown	1	0	0	73	1.4	1.6
Saratoga Hospital^	14	4	6	163	8.6	9.4
Sisters of Charity	4	1	0	123	3.3	3.8

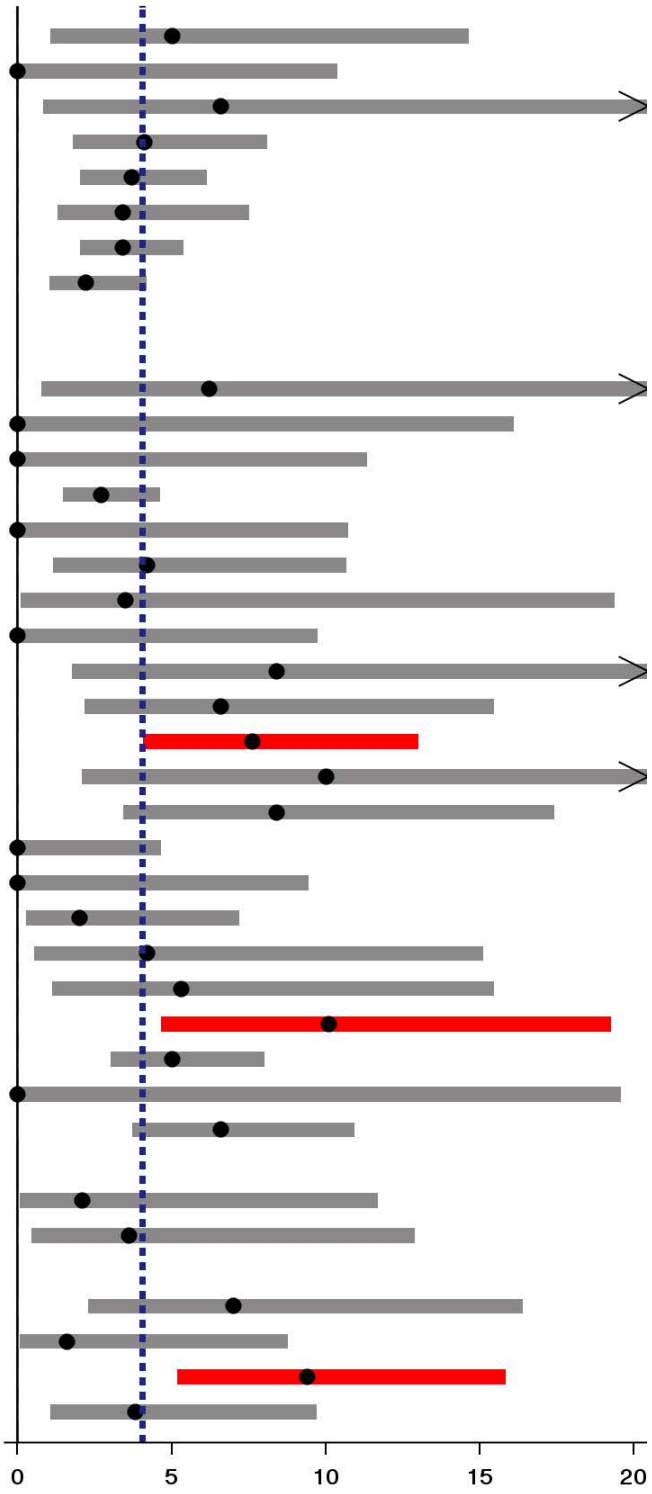


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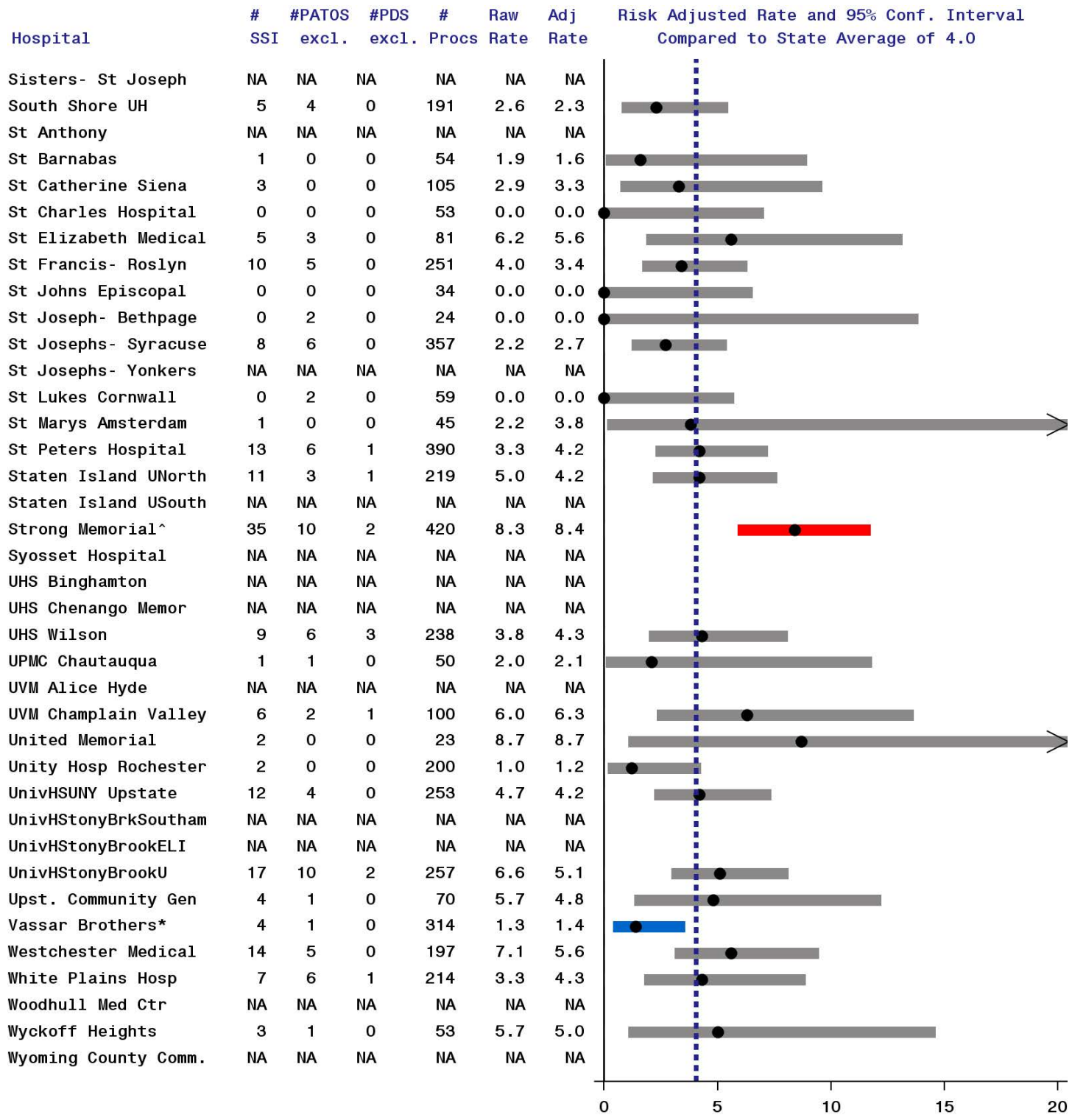
Figure 2. Colon surgical site infection rates, New York 2019 (page 4 of 4)



Hospital	# SSI	#PATOS excl.	#PDS excl.	# Procs	Raw Rate	Adj Rate
Sisters- St Joseph	NA	NA	NA	NA	NA	NA
South Shore UH	5	4	0	191	2.6	2.3
St Anthony	NA	NA	NA	NA	NA	NA
St Barnabas	1	0	0	54	1.9	1.6
St Catherine Siena	3	0	0	105	2.9	3.3
St Charles Hospital	0	0	0	53	0.0	0.0
St Elizabeth Medical	5	3	0	81	6.2	5.6
St Francis- Roslyn	10	5	0	251	4.0	3.4
St Johns Episcopal	0	0	0	34	0.0	0.0
St Joseph- Bethpage	0	2	0	24	0.0	0.0
St Josephs- Syracuse	8	6	0	357	2.2	2.7
St Josephs- Yonkers	NA	NA	NA	NA	NA	NA
St Lukes Cornwall	0	2	0	59	0.0	0.0
St Marys Amsterdam	1	0	0	45	2.2	3.8
St Peters Hospital	13	6	1	390	3.3	4.2
Staten Island UNorth	11	3	1	219	5.0	4.2
Staten Island USouth	NA	NA	NA	NA	NA	NA
Strong Memorial^	35	10	2	420	8.3	8.4
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	9	6	3	238	3.8	4.3
UPMC Chautauqua	1	1	0	50	2.0	2.1
UVM Alice Hyde	NA	NA	NA	NA	NA	NA
UVM Champlain Valley	6	2	1	100	6.0	6.3
United Memorial	2	0	0	23	8.7	8.7
Unity Hosp Rochester	2	0	0	200	1.0	1.2
UnivHSUNY Upstate	12	4	0	253	4.7	4.2
UnivHStonyBrkSoutham	NA	NA	NA	NA	NA	NA
UnivHStonyBrookELI	NA	NA	NA	NA	NA	NA
UnivHStonyBrookU	17	10	2	257	6.6	5.1
Upst. Community Gen	4	1	0	70	5.7	4.8
Vassar Brothers*	4	1	0	314	1.3	1.4
Westchester Medical	14	5	0	197	7.1	5.6
White Plains Hosp	7	6	1	214	3.3	4.3
Woodhull Med Ctr	NA	NA	NA	NA	NA	NA
Wyckoff Heights	3	1	0	53	5.7	5.0
Wyoming County Comm.	NA	NA	NA	NA	NA	NA

Data reported as of December 8, 2020. State Average. ●Risk-adjusted Infection rate. ^^Significantly higher than state average. **Significantly lower than state average. Average. > Upper confidence limit exceeds graph area. NA: less than 20 procedures. SSI: surgical site infections, Procs: procedures. Rates are per 100 procedures. Adjusted using ASA score, obesity, duration, and endoscope. Excludes SSIs present at time of surgery and non-readmitted cases identified using post discharge surveillance.

Coronary Artery Bypass Graft (CABG) Surgical Site Infections

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

CABG Chest Infections

In 2019, 36 hospitals reported a total of 142 CABG chest surgical site infections out of 10,628 procedures, a rate of 1.3 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 142 infections, one was classified as PATOS. 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 141 infections, 38% were superficial, 28% were deep, and 35% were organ/space (Table 4). Most of the SSIs (75%) were detected upon readmission to the same hospital; 12% were identified during the initial hospitalization; 6% involved readmission to another hospital; and 6% were detected using PDS and not readmitted. All 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 9 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 2019

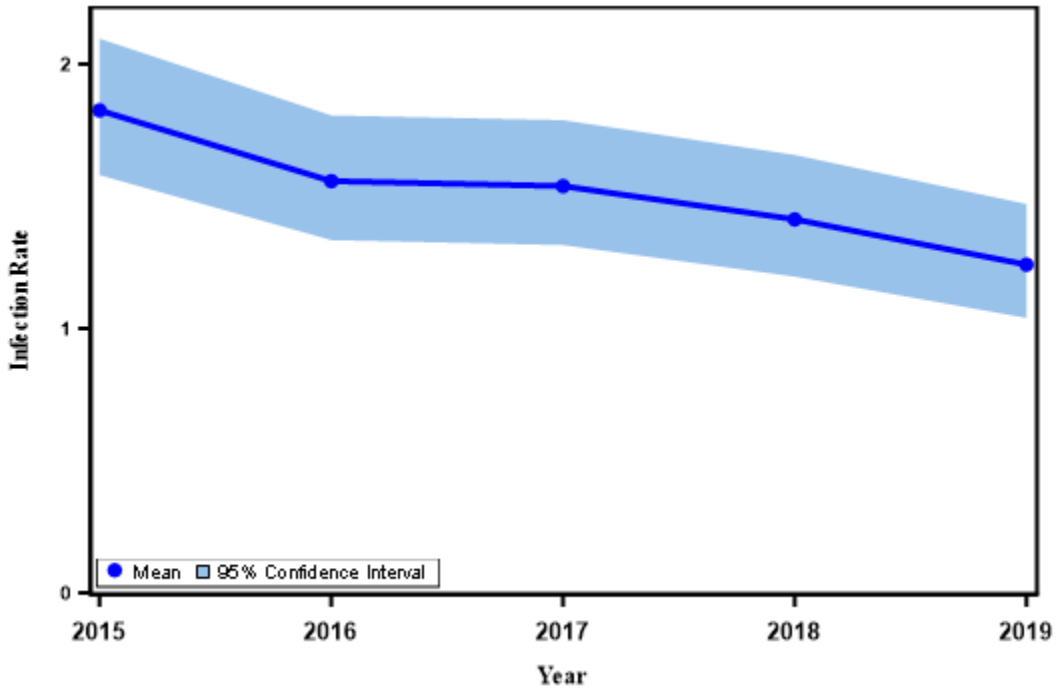
	When Detected				
Extent (Row%) (Column%)	**Initial Hospitalization**	**Readmitted to the Same Hospital**	**Readmitted to Another Hospital**	**Post-Discharge Surveillance Not Readmitted**	**Total**
Superficial Incisional	8 (15.1%) (47.1%)	33 (62.3%) (31.1%)	3 (5.7%) (33.3%)	9 (17.0%) (100.0%)	53 (37.6%)
Deep Incisional	1 (2.6%) (5.9%)	34 (87.2%) (32.1%)	4 (10.3%) (44.4%)	0 (0%) (0%)	39 (27.7%)
Organ/Space	8 (16.3%) (47.1%)	39 (79.6%) (36.8%)	2 (4.1%) (22.2%)	0 (0%) (0%)	49 (34.8%)
Total	17 (12.1%)	106 (75.2%)	9 (6.4%)	9 (6.4%)	141

New York State data reported as of December 8, 2020. 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 2019, 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 2019.

Figure 3. Trend in coronary artery bypass graph chest site surgical site infection rates, New York State 2015-2019

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	149	10,542	1.41 (1.20, 1.66)
2019	36	132	10,627	1.24 (1.04, 1.47)

New York State data reported as of December 8, 2020.
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 2019

Microorganism	Number of Isolates	Percent of Infections
Staphylococcus aureus	46	32.4
(MRSA)	(13)	(9.2)
Coagulase negative staphylococci	27	19.0
Klebsiella spp.	15	10.6
Escherichia coli	11	7.7
Pseudomonas spp.	9	6.3
Serratia spp.	9	6.3
Enterobacter spp.	7	4.9
(CRE-Enterobacter)	(1)	(0.7)
Enterococci	4	2.5
(VRE)	(2)	(1.4)
Other	31	21.8

New York State data reported as of December 8, 2020. Out of 142 infections. No microorganisms identified for 27 (19%) infections. MRSA: methicillin-resistant *Staphylococcus aureus;* MDR: multidrug resistant; VRE: vancomycin-resistant enterococci; CRE: carbapenem-resistant Enterobacteriaceae; spp: multiple species

Risk Adjustment for CABG Chest SSIs

Certain patient and procedure-specific risk factors increased the risk of developing a chest SSI following CABG surgery. In 2019, the following risk factors were associated with SSIs and were included in the risk-adjustment:

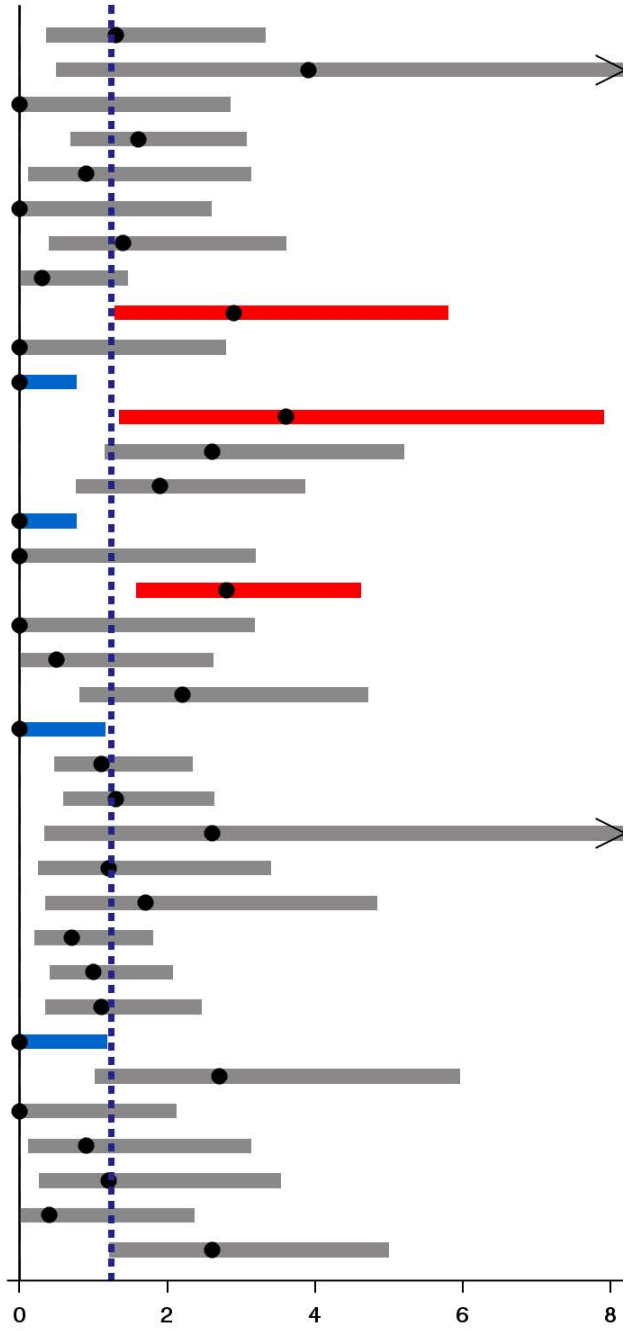
- Patients with diabetes were 1.8 times more likely to develop an SSI than patients without diabetes.
- Obese patients (with body mass index [BMI] greater than or equal to 30) were 1.8 times more likely to develop an SSI than patients with BMI less than 30.
- Females were 3.0 times more likely to develop an SSI than males.

Hospital-Specific CABG Chest SSI Rates

Hospital-specific CABG chest SSI rates are provided in Figure 4. In 2019, of the 36 reporting hospitals, three (8%) 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. Four hospitals (11%) 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 2019

Hospital	# SSI	#PATOS excl.	#PDS excl.	# Procs	Raw Rate	Adj Rate
Albany Med Ctr	4	0	1	324	1.2	1.3
Arnot Ogden Med Ctr	2	0	0	60	3.3	3.9
Bellevue Hospital	0	0	0	124	0.0	0.0
Buffalo General	8	0	0	513	1.6	1.6
Ellis Hospital	2	0	1	214	0.9	0.9
Good Samar. Suffern	0	0	2	125	0.0	0.0
Good Samar. W Islip	4	0	0	265	1.5	1.4
Lenox Hill Hospital	1	0	1	404	0.2	0.3
Maimonides Med Ctr^	8	0	1	267	3.0	2.9
Mary Imogene Bassett	0	0	1	103	0.0	0.0
Mercy Hosp Buffalo*	0	0	0	369	0.0	0.0
Montefiore-Einstein^	6	0	1	167	3.6	3.6
Montefiore-Moses	8	0	0	267	3.0	2.6
Mt Sinai	7	0	0	369	1.9	1.9
Mt Sinai Morningside*	0	0	0	387	0.0	0.0
NYP-Brklyn Methodist	0	0	0	98	0.0	0.0
NYP-Columbia^	15	0	0	561	2.7	2.8
NYP-Queens	0	0	0	93	0.0	0.0
NYP-Weill Cornell	1	0	0	259	0.4	0.5
NYU Tisch	6	0	1	306	2.0	2.2
NYU Winthrop*	0	0	0	273	0.0	0.0
North Shore	7	0	0	646	1.1	1.1
Rochester General	8	0	0	568	1.4	1.3
SUNY Downstate MC	2	0	0	71	2.8	2.6
South Shore UH	3	0	0	250	1.2	1.2
St Elizabeth Medical	3	0	0	157	1.9	1.7
St Francis- Roslyn	4	0	0	638	0.6	0.7
St Josephs- Syracuse	7	0	0	662	1.1	1.0
St Peters Hospital	5	0	0	435	1.1	1.1
Staten Island UNorth*	0	0	0	233	0.0	0.0
Strong Memorial	6	0	0	246	2.4	2.7
UHS Wilson	0	0	0	110	0.0	0.0
UnivHSUNY Upstate	2	0	0	217	0.9	0.9
UnivHStonyBrookU	3	0	0	247	1.2	1.2
Vassar Brothers	1	0	0	243	0.4	0.4
Westchester Medical	9	1	0	356	2.5	2.6



Data reported as of December 8, 2020. ┆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, and gender. Excludes SSIs present at time of surgery (PATOS) and non-readmitted cases identified using post discharge surveillance (PDS).

CABG Donor Site Infections

In 2019, 36 hospitals reported a total of 31 CABG donor site infections out of 9,465 procedures, a rate of 0.33 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.

None of the infections were classified as PATOS. Of the 31 infections, 94% were superficial, and 6% were deep (Table 6). Just over half of the SSIs (52%) were detected upon readmission to the same hospital; 10% were identified during the initial hospitalization; 4% involved readmission to another hospital; and 26% 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 8 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 2019

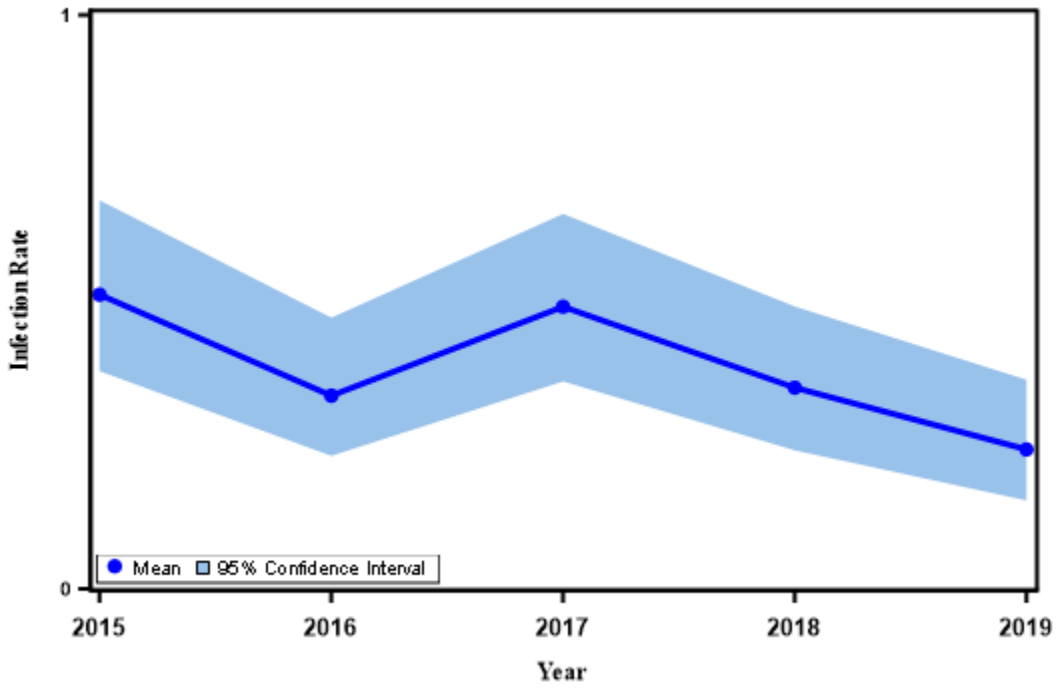
	When Detected				
Extent (Row%) (Column%)	**Initial Hospitalization**	**Readmitted to the Same Hospital**	**Readmitted to Another Hospital**	**Post-Discharge Surveillance Not Readmitted**	**Total**
Superficial Incisional	2 (6.9%) (66.7%)	16 (55.2%) (100.0%)	4 (13.8%) (100.0%)	7 (24.1%) (87.5%)	29 (93.6%)
Deep Incisional	1 (50.0%) (33.3%)	0 (0.0%) (0.0%)	0 (0.0%) (0.0%)	1 (50%) (12.5%)	2 (6.4%)
Total	3 (9.7%)	16 (51.6%)	4 (12.9%)	8 (25.8%)	31

New York State data reported as of December 8, 2020. Excludes infections present at time of surgery.

Trends in CABG SSI rates are shown in Figure 5. Between 2015 and 2019, the total number of CABG donor site infection rate decreased 63%, from 0.51 infections per 100 procedures in 2015, to 0.24 infections per 100 procedures in 2019.

Figure 5. Trend in coronary artery bypass graft donor site surgical site infection rates, New York State 2015-2019

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	0.513 (0.38, 0.68)
2016	37	33	9,801	0.337 (0.23, 0.47)
2017	36	47	9,559	0.492 (0.36, 0.65)
2018	36	33	9,413	0.351 (0.24, 0.49)
2019	36	23	9,464	0.243 (0.15, 0.36)

New York State data reported as of December 8, 2020. Infection rate is the number of infections divided by the number of procedures, multiplied by 100.

Escherichia coli (16.1%), Staphylococcus aureus(12.9%), and Klebsiella spp. (9.7%) were the most common microorganisms associated with CABG donor site SSIs.

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 2019, after excluding SSIs identified using PDS that did not result in hospitalization, the following risk factors were associated with SSI. These variables were used to risk-adjust hospital-specific rates:

- Obese patients (with BMI at least 30) were 1.8 times more likely to develop an SSI than patients with BMI less than 30.
- Patients with diabetes were 1.5 times more likely to develop an SSI than patients without diabetes.

In 2018 and 2019, no hospitals were flagged for having a significantly high or low rate.

Hip Replacement/Revision Surgical Site Infections

In 2019, 153 hospitals reported a total of 355 hip replacement/revision surgical site infections out of 35,228 procedures, a rate of 1.0 infections per 100 procedures. NYSDOH excludes some of these SSIs and procedures from SSI rates before evaluating time trends and comparing hospital performance, as described below.

Of the 355 infections, 12 were classified as PATOS and excluded from further analysis, because PATOS infections are more difficult to prevent.

Of the remaining 343 infections, 31% were superficial, 30% were deep, and 39% were organ/space (Table 7). Most of the SSIs (79%) were detected upon readmission to the same hospital; 5% were identified during the initial hospitalization; 7% involved readmission to another hospital; and 10% were detected using PDS and not readmitted. The majority (73%) 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 33 PDS infections in the final SSI rate so as not to penalize facilities with the best surveillance systems.

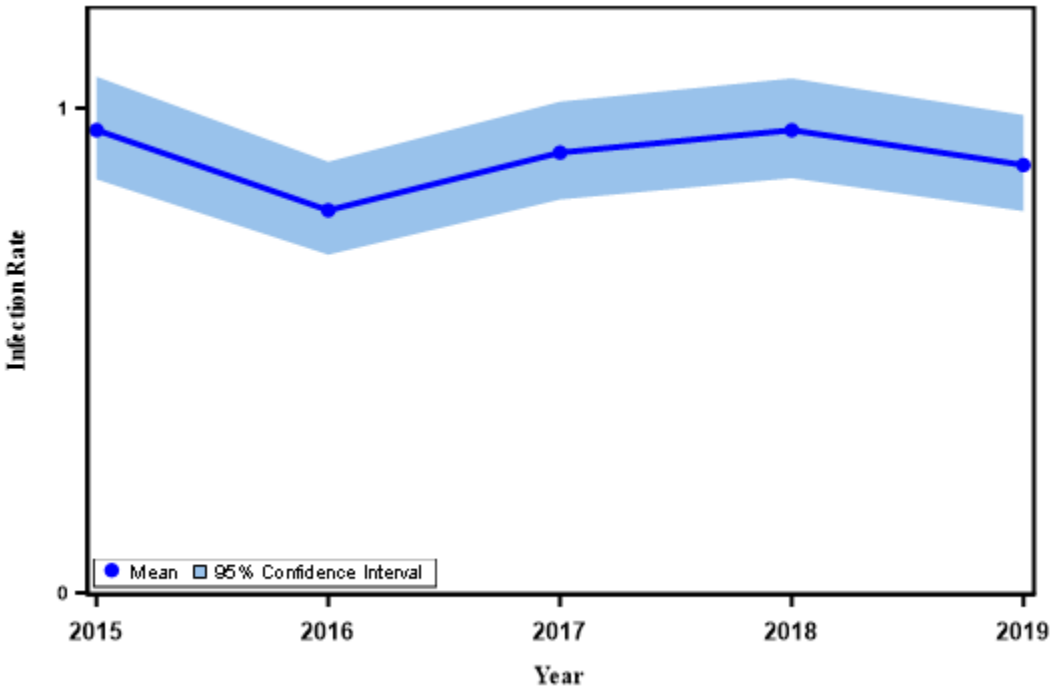
Table 7. Method of detection of hip surgical site infection by depth of infection, New York State 2019

	When Detected				
Extent (Row%) (Column%)	**Initial Hospitalization**	**Readmitted to the Same Hospital**	**Readmitted to Another Hospital**	**Post-Discharge Surveillance Not Readmitted**	**Total**
Superficial Incisional	5 (4.8%) (31.2%)	73 (69.5%) (26.9%)	3 (2.9%) (13.0%)	24 (22.9%) (72.7%)	105 (30.6%)
Deep Incisional	8 (7.7%) (50.0%)	77 (74.0%) (28.4%)	10 (9.6%) (43.5%)	9 (8.6%) (27.3%)	104 (30.3%)
Organ/Space	3 (2.2%) (18.8%)	121 (90.3) (44.6%)	10 (7.5%) (43.5%)	0 (0%) (0 %)	134 (39.1%)
Total	16 (4.7%)	271 (79.0%)	23 (6.7%)	33 (9.6%)	343

New York State data reported as of December 8, 2020. Excludes infections present at time of surgery.

Trends in hip SSI rates after deleting PATOS and PDS infections are shown in Figure 6. Between 2015 and 2019, the total number of hip SSIs declined 8%, with 0.96 infections per 100 procedures in 2015, and 0.88 infections per 100 procedures in 2019, though there was no statistically significant trend.

Figure 6. Trend in hip surgical site infection rates, New York State 2015-2019
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	33,812	0.790 (0.70, 0.89)
2017	157	317	34,884	0.909 (0.81, 1.01)
2018	154	337	35,290	0.955 (0.86, 1.06)
2019	153	310	35,216	0.880 (0.78, 0.98)

New York State Data reported as of December 8, 2020.
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 8).

Table 8. Microorganisms identified in hip replacement surgical site infections, New York State 2019

Microorganism	Number of Isolates	Percent of Infections
Staphylococcus aureus	136	38.3
(MRSA)	(36)	(10.1)
Coagulase negative staphylococci	59	16.6
Enterococci	27	7.6
(VRE)	(1)	(0.3)
Streptococci	26	7.3
Pseudomonas spp.	24	6.8
Escherichia coli	23	6.5
Proteus spp.	20	5.6
Enterobacter spp.	15	4.2
Klebsiella spp.	15	4.2
(CRE-*Klebsiella*)	(1)	(0.3)
Other	49	13.8

New York State data reported as of December 8, 2020. Out of 355 infections. No microorganisms identified for 44 (12%) infections. CRE: carbapenem-resistant Enterobacteriaceae; VRE: vancomycin-resistant enterococci; MRSA: methicillin-resistant *Staphylococcus aureus;* 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 2019, 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.

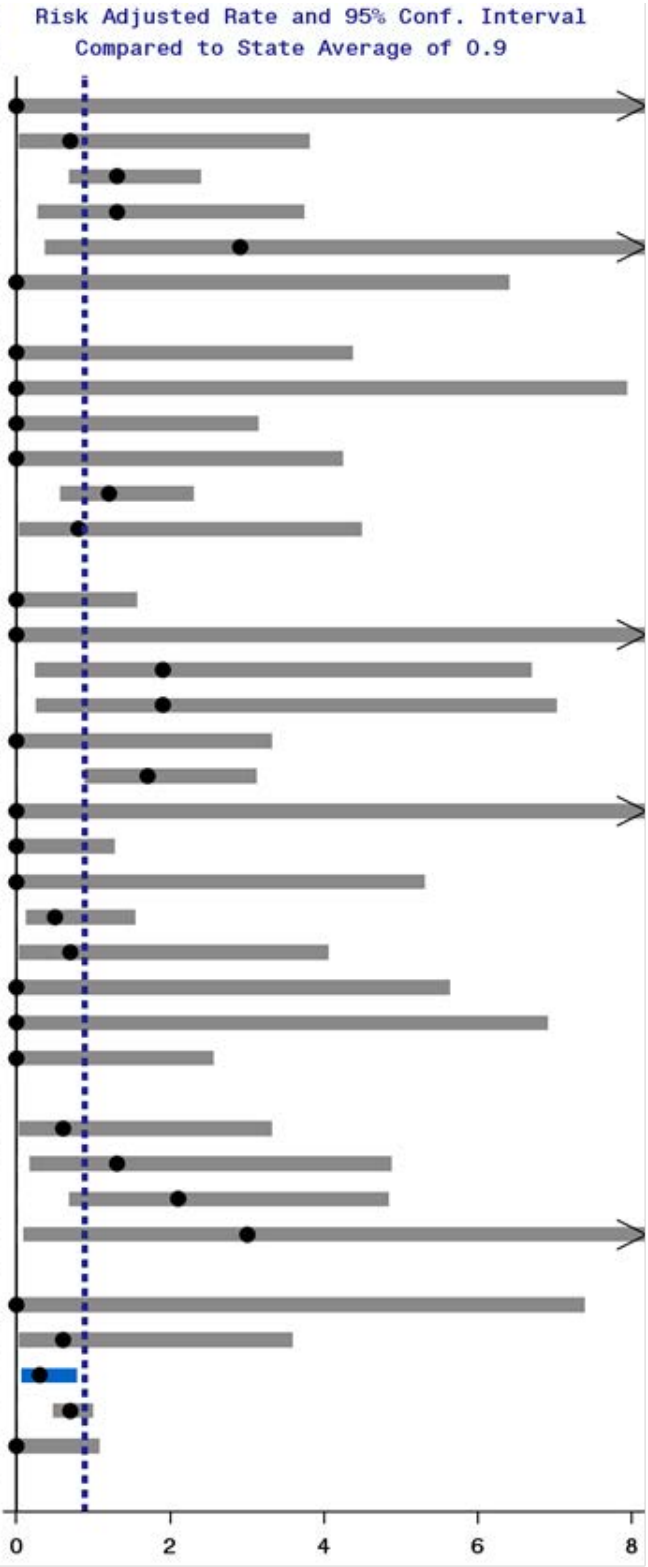
- Patients with severe systemic disease (ASA score of 3, 4, or 5) were 1.5 times more likely to develop an SSI than healthier patients (ASA score of 1 or 2).
- The risk of SSI varied by type of hip procedure. Compared to total and resurfacing primary hip replacement procedures, partial primary procedures were 1.9 times more likely to result in an SSI, revisions with no prior infection at the joint were 4.5 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 3.2 times more likely to develop an SSI, and obese patients (with BMI between 30 and 39) were 1.4 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 7. Of the 138 hospitals that reported more than twenty hip procedures in 2019, 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. No hospitals were high or low for more than two consecutive years.

Figure 7. Hip replacement surgical site infection rates, New York 2019 (page 1 of 4)

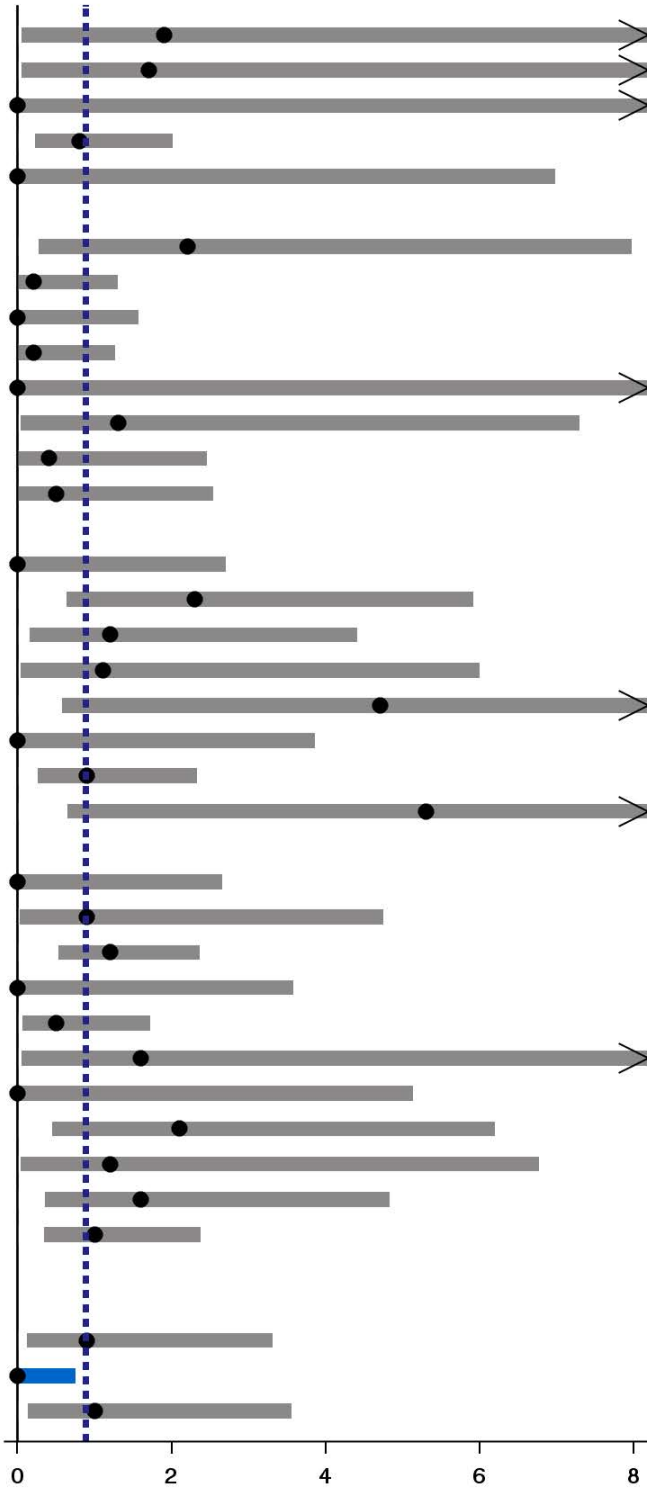
Hospital	# SSI	#PATOS excl.	#PDS excl.	# Procs	Raw Rate	Adj Rate
AO Fox Memorial	0	0	0	36	0.0	0.0
Adirondack Medical	1	1	0	142	0.7	0.7
Albany Med Ctr	11	0	0	884	1.2	1.3
Arnot Ogden Med Ctr	3	0	1	225	1.3	1.3
Auburn Community Hos	2	0	1	59	3.4	2.9
Bellevue Hospital	0	0	0	58	0.0	0.0
Bon Secours	NA	NA	NA	NA	NA	NA
BronxCare HealthSyst	0	0	0	65	0.0	0.0
Brookdale Hospital	0	0	0	39	0.0	0.0
Brooklyn Hosp Ctr	0	0	0	114	0.0	0.0
Brooks Memorial	0	0	0	85	0.0	0.0
Buffalo General	9	0	0	570	1.6	1.2
Canton-Potsdam	1	0	0	96	1.0	0.8
Catskill Regional MC	NA	NA	NA	NA	NA	NA
Cayuga Medical Ctr	0	0	1	217	0.0	0.0
Claxton-Hepburn	0	0	0	28	0.0	0.0
Columbia Memorial	2	0	2	101	2.0	1.9
Coney Island Hosp	2	0	0	70	2.9	1.9
Corning Hospital	0	0	1	100	0.0	0.0
Crouse Hospital	11	0	1	662	1.7	1.7
Eastern Niagara Hosp	0	0	0	26	0.0	0.0
Ellis Hospital	0	0	1	211	0.0	0.0
Elmhurst Hospital	0	0	0	59	0.0	0.0
Erie County Med Ctr	3	0	0	598	0.5	0.5
FF Thompson	1	0	0	143	0.7	0.7
Faxton St. Lukes	0	0	0	45	0.0	0.0
Flushing Hospital	0	0	0	50	0.0	0.0
Geneva General	0	0	1	102	0.0	0.0
Glen Cove Hospital	NA	NA	NA	NA	NA	NA
Glens Falls Hospital	1	0	0	175	0.6	0.6
Good Samar. Suffern	2	0	1	148	1.4	1.3
Good Samar. W Islip	5	0	0	204	2.5	2.1
Guthrie Cortland MC	1	0	0	30	3.3	3.0
Harlem Hospital	NA	NA	NA	NA	NA	NA
HealthAlli Broadway	0	0	0	33	0.0	0.0
HealthAlli MarysAve	1	0	0	105	1.0	0.6
Highland Hospital*	3	1	0	1257	0.2	0.3
Hosp for Spec Surg	29	3	3	5159	0.6	0.7
Huntington Hospital	0	0	0	274	0.0	0.0
Interfaith Med Ctr	NA	NA	NA	NA	NA	NA



Data reported as of December 8, 2020. ¦ 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 7. Hip replacement surgical site infection rates, New York 2019 (page 2 of 4)

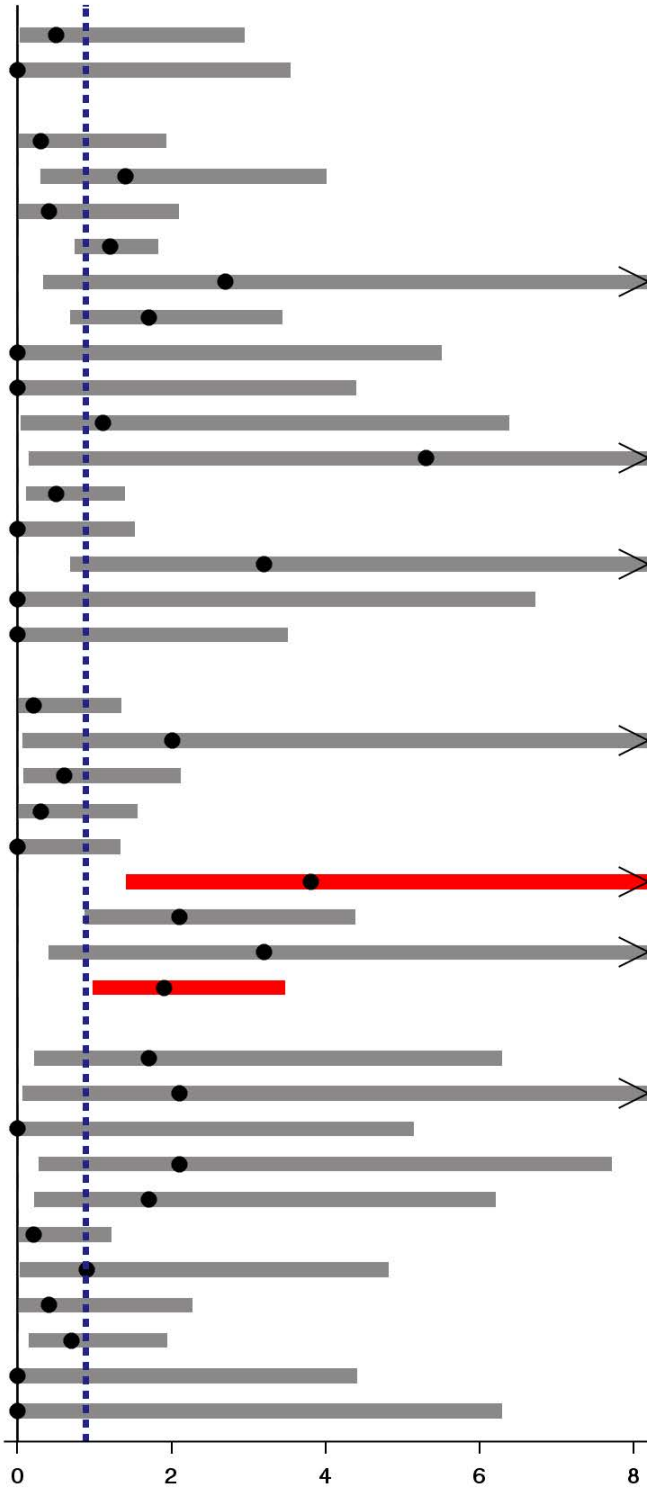
Hospital	# SSI	#PATOS excl.	#PDS excl.	# Procs	Raw Rate	Adj Rate
Jacobi Med Ctr	1	0	0	44	2.3	1.9
Jamaica Hospital	1	0	0	61	1.6	1.7
Jones Memorial	0	0	0	27	0.0	0.0
Kenmore Mercy	4	0	0	537	0.7	0.8
Kings County Hosp	0	0	0	50	0.0	0.0
Kingsbrook Jewish MC	NA	NA	NA	NA	NA	NA
LIJ at Forest Hills	2	0	0	82	2.4	2.2
LIJ at Valley Stream	1	0	0	487	0.2	0.2
LIJ(Long Isl Jewish)	0	0	0	224	0.0	0.0
Lenox Hill Hospital	1	0	0	509	0.2	0.2
Lincoln Med Ctr	0	0	0	35	0.0	0.0
Long Isl. Community	1	0	0	75	1.3	1.3
Maimonides Med Ctr	1	0	0	204	0.5	0.4
Mary Imogene Bassett	1	0	1	200	0.5	0.5
Massena Memorial	NA	NA	NA	NA	NA	NA
Mather Hospital	0	0	0	113	0.0	0.0
Memor SloanKettering	4	1	1	118	3.4	2.3
Mercy Hosp Buffalo	2	0	0	130	1.5	1.2
Mercy Med Ctr	1	0	0	81	1.2	1.1
Metropolitan Hosp	2	0	0	35	5.7	4.7
MidHudson Reg of WMC	0	0	0	101	0.0	0.0
Millard Fill. Suburb	4	0	0	459	0.9	0.9
Montefiore-Moses	2	1	0	26	7.7	5.3
Montefiore-Mt Vernon	NA	NA	NA	NA	NA	NA
Montefiore-NewRochl	0	0	0	155	0.0	0.0
Montefiore-Nyack	1	0	0	129	0.8	0.9
Montefiore-Wakefield	8	0	0	562	1.4	1.2
Mount St. Marys	0	0	0	75	0.0	0.0
Mt Sinai	2	0	0	408	0.5	0.5
Mt Sinai Beth Israel	1	0	0	56	1.8	1.6
Mt Sinai Brooklyn	0	0	0	49	0.0	0.0
Mt Sinai Morningside	3	0	0	108	2.8	2.1
Mt Sinai Queens	1	0	0	76	1.3	1.2
Mt Sinai S Nassau	3	0	0	150	2.0	1.6
Mt Sinai West	5	0	0	474	1.1	1.0
NY Community Hosp	NA	NA	NA	NA	NA	NA
NYP-Allen	NA	NA	NA	NA	NA	NA
NYP-Brklyn Methodist	2	0	0	203	1.0	0.9
NYP-Columbia*	0	2	0	425	0.0	0.0
NYP-Hudson Valley	2	0	0	186	1.1	1.0



Data reported as of December 8, 2020. 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 7. Hip replacement surgical site infection rates, New York 2019 (page 3 of 4)

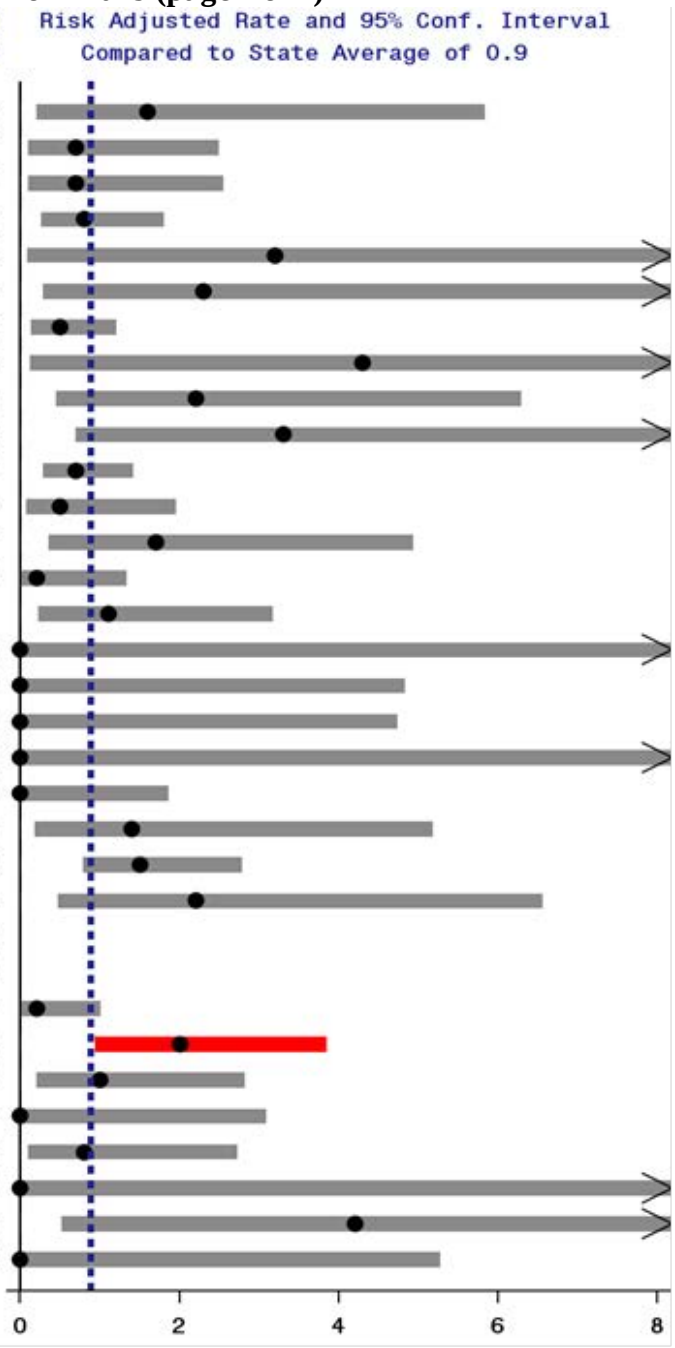
Hospital	# SSI	#PATOS excl.	#PDS excl.	# Procs	Raw Rate	Adj Rate
NYP-Lawrence	1	0	0	165	0.6	0.5
NYP-Lower Manhattan	0	0	0	75	0.0	0.0
NYP-Morgan Stanley	NA	NA	NA	NA	NA	NA
NYP-Queens	1	0	0	268	0.4	0.3
NYP-Weill Cornell	3	0	0	182	1.6	1.4
NYU Langone Brooklyn	1	0	0	261	0.4	0.4
NYU Orthopedic Hosp	21	1	0	1698	1.2	1.2
NYU Tisch	2	0	0	60	3.3	2.7
NYU Winthrop	7	0	0	375	1.9	1.7
Nassau University	0	0	0	47	0.0	0.0
Nathan Littauer	0	0	1	49	0.0	0.0
Newark Wayne	1	0	2	88	1.1	1.1
Niagara Falls	1	0	0	21	4.8	5.3
North Shore	3	0	1	599	0.5	0.5
Northern Dutchess	0	0	0	214	0.0	0.0
Northern Westchester	3	1	2	115	2.6	3.2
Noyes Memorial	0	0	0	46	0.0	0.0
Olean General	0	0	1	76	0.0	0.0
Oneida Healthcare	NA	NA	NA	NA	NA	NA
Orange Regional	1	0	0	412	0.2	0.2
Oswego Hospital	1	0	1	42	2.4	2.0
Our Lady of Lourdes	2	0	3	295	0.7	0.6
Peconic Bay Medical	1	0	0	398	0.3	0.3
Phelps Memorial	0	0	0	304	0.0	0.0
Plainview Hospital^	6	0	0	147	4.1	3.8
Putnam Hospital	7	0	1	327	2.1	2.1
Richmond Univ MC	2	0	2	52	3.8	3.2
Rochester General^	11	1	0	552	2.0	1.9
Rome Memorial	NA	NA	NA	NA	NA	NA
SJRH Dobbs Ferry	2	0	0	135	1.5	1.7
SJRH St Johns	1	0	0	29	3.4	2.1
SUNY Downstate MC	0	0	0	59	0.0	0.0
Samaritan Hosp Troy	2	0	0	100	2.0	2.1
Samaritan- Watertown	2	0	0	119	1.7	1.7
Saratoga Hospital	1	0	1	441	0.2	0.2
Sisters of Charity	1	0	0	121	0.8	0.9
Sisters- St Joseph	1	0	0	226	0.4	0.4
South Shore UH	3	0	0	447	0.7	0.7
St Anthony	0	0	1	72	0.0	0.0
St Barnabas	0	0	0	42	0.0	0.0



Data reported as of December 8, 2020. 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 7. Hip replacement surgical site infection rates, New York 2019 (page 4 of 4)

Hospital	# SSI	#PATOS excl.	#PDS excl.	# Procs	Raw Rate	Adj Rate
St Catherine Siena	2	0	0	108	1.9	1.6
St Charles Hospital	2	0	0	329	0.6	0.7
St Elizabeth Medical	2	0	0	242	0.8	0.7
St Francis- Roslyn	5	0	0	586	0.9	0.8
St Johns Episcopal	1	0	0	31	3.2	3.2
St Joseph- Bethpage	2	0	0	78	2.6	2.3
St Josephs- Syracuse	4	0	0	837	0.5	0.5
St Josephs- Yonkers	1	0	0	20	5.0	4.3
St Lukes Cornwall	3	0	0	156	1.9	2.2
St Marys Amsterdam	3	0	0	94	3.2	3.3
St Peters Hospital	7	0	1	938	0.7	0.7
Staten Island UNorth	2	0	0	381	0.5	0.5
Strong Memorial	3	0	0	127	2.4	1.7
Syosset Hospital	1	0	0	458	0.2	0.2
UHS Binghamton	3	0	0	291	1.0	1.1
UHS Chenango Memor	0	0	0	26	0.0	0.0
UHS Wilson	0	0	0	57	0.0	0.0
UPMC Chautauqua	0	0	0	62	0.0	0.0
UVM Alice Hyde	0	0	0	27	0.0	0.0
UVM Champlain Valley	0	0	1	144	0.0	0.0
United Memorial	2	0	0	132	1.5	1.4
Unity Hosp Rochester	11	0	0	706	1.6	1.5
UnivHSUNY Upstate	3	0	0	82	3.7	2.2
UnivHStonyBrkSoutham	NA	NA	NA	NA	NA	NA
UnivHStonyBrookELI	NA	NA	NA	NA	NA	NA
UnivHStonyBrookU	1	0	0	497	0.2	0.2
Upst. Community Gen^	9	0	0	433	2.1	2.0
Vassar Brothers	3	0	0	265	1.1	1.0
Westchester Medical	0	0	0	89	0.0	0.0
White Plains Hosp	2	0	0	269	0.7	0.8
Woodhull Med Ctr	0	0	0	23	0.0	0.0
Wyckoff Heights	2	0	0	31	6.5	4.2
Wyoming County Comm.	0	0	0	56	0.0	0.0



Data reported as of December 8, 2020. ┆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 2019, 151 hospitals reported a total of 297 hysterectomy surgical site infections out of 17,321 procedures, a rate of 1.7 infections per 100 procedures. NYSDOH excludes some of these SSIs and procedures from SSI rates before evaluating time trends and comparing hospital performance, as described below.

Of the 297 infections, 9 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 288 infections, 44% were superficial, 10% were deep, and 46% were organ/space (Table 9). Most of the SSIs (60%) were detected upon readmission to the same hospital; 12% were identified during the initial hospitalization; 8% involved readmission to another hospital; and 20% were detected using post-discharge surveillance and not readmitted. Most (91%) 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 58 PDS infections in the final SSI rate so as not to penalize facilities with the best surveillance systems.

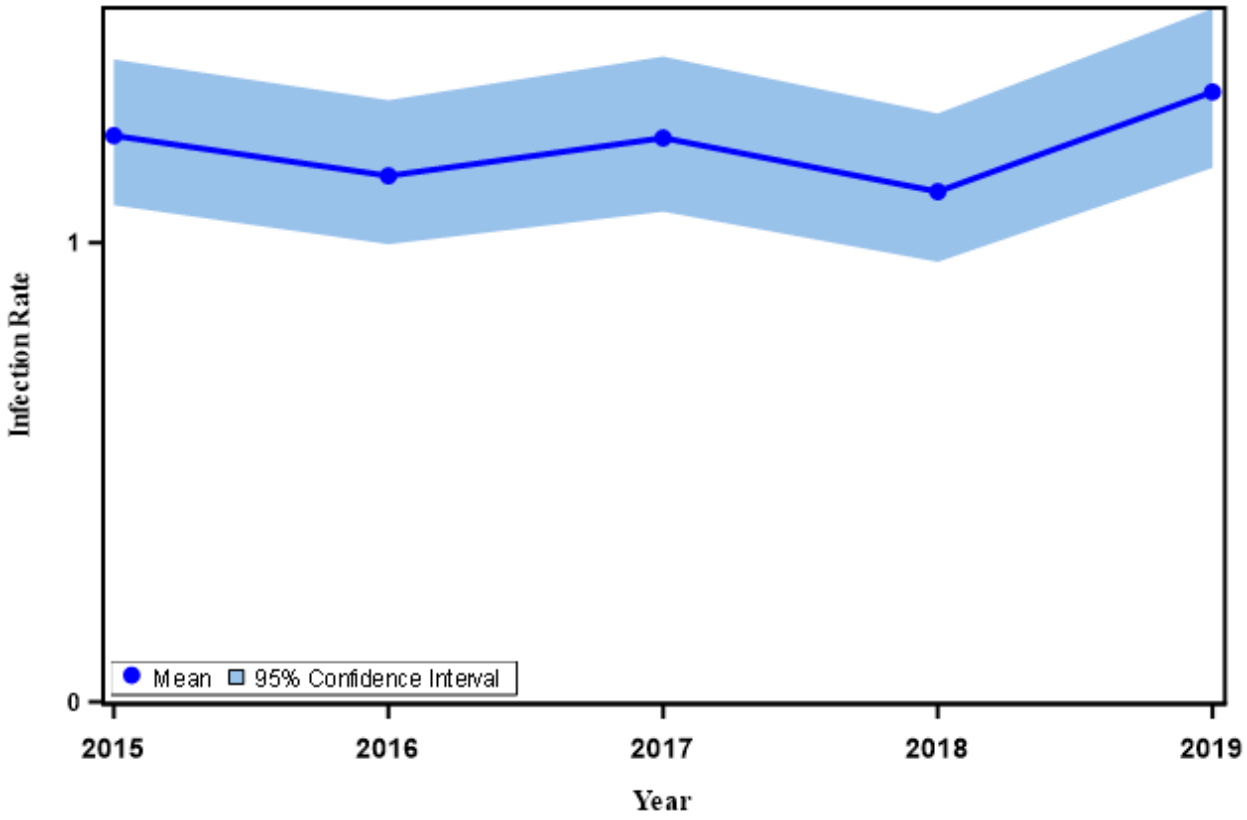
Table 9. Method of detection of hysterectomy surgical site infection by depth of infection, New York State 9

	When Detected				
Extent (Row%) (Column%)	**Initial Hospitalization**	**Readmitted to the Same Hospital**	**Readmitted to Another Hospital**	**Post-Discharge Surveillance Not Readmitted**	**Total**
Superficial Incisional	12 (9.4%) (33.3%)	56 (44.1%) (32.6%)	6 (4.7%) (27.3%)	53 (41.7%) (91.4%)	127 (44.1%)
Deep Incisional	3 (10.3%) (8.3%)	19 (65.5%) (11.0%)	6 (20.7%) (27.3%)	1 (3.4%) (1.7%)	29 (10.1%)
Organ/Space	21 (15.9%) (58.3%)	97 (73.5%) (56.4%)	10 (7.6%) (45.5%)	4 (3.0%) (6.9%)	132 (45.8%)
Total	36 (12.5%)	172 (59.7%)	22 (7.6%)	58 (20.1%)	288

New York State data reported as of December 8, 2020. Excludes infections present at time of surgery.

Trends in hysterectomy SSI rates after deleting PATOS and PDS infections are shown in Figure 8. Between 2015 and 2019 the total number of hysterectomy surgical site infections increased 8%, from 1.23 infections per 100 procedures in 2015, to 1.33 infections per 100 procedures in 2019, though the increase was not statistically significant.

Figure 8. Trend in hysterectomy surgical site infection rates, New York State 2015-2019
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	1.233 (1.08, 1.40)
2016	148	210	18,326	1.146 (1.00, 1.31)
2017	149	208	16,934	1.228 (1.07, 1.41)
2018	149	187	16,824	1.111 (0.96, 1.28)
2019	151	230	17,312	1.329 (1.16, 1.51)

New York State data reported as of December 8, 2020.
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 10).

Table 10. Microorganisms identified in hysterectomy surgical site infections, New York State 2019

Microorganism	Number of Isolates	Percent of Infections
Enterococci	52	17.5
(VRE)	(2)	(0.7)
Escherichia coli	45	15.2
Staphylococcus aureus	37	12.5
(MRSA)	(13)	(4.4)
Coagulase negative staphylococci	31	10.4
Streptococci	30	10.1
Klebsiella spp.	25	8.4
(CRE)	(1)	(0.3)
Bacteroides spp.	18	6.1
Proteus spp.	14	5.1
Pseudomonas spp.	10	4.7
Other	73	24.6

New York State data reported as of December 8, 2020. Out of 297 infections. No microorganisms identified for 81 (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 2019, 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.

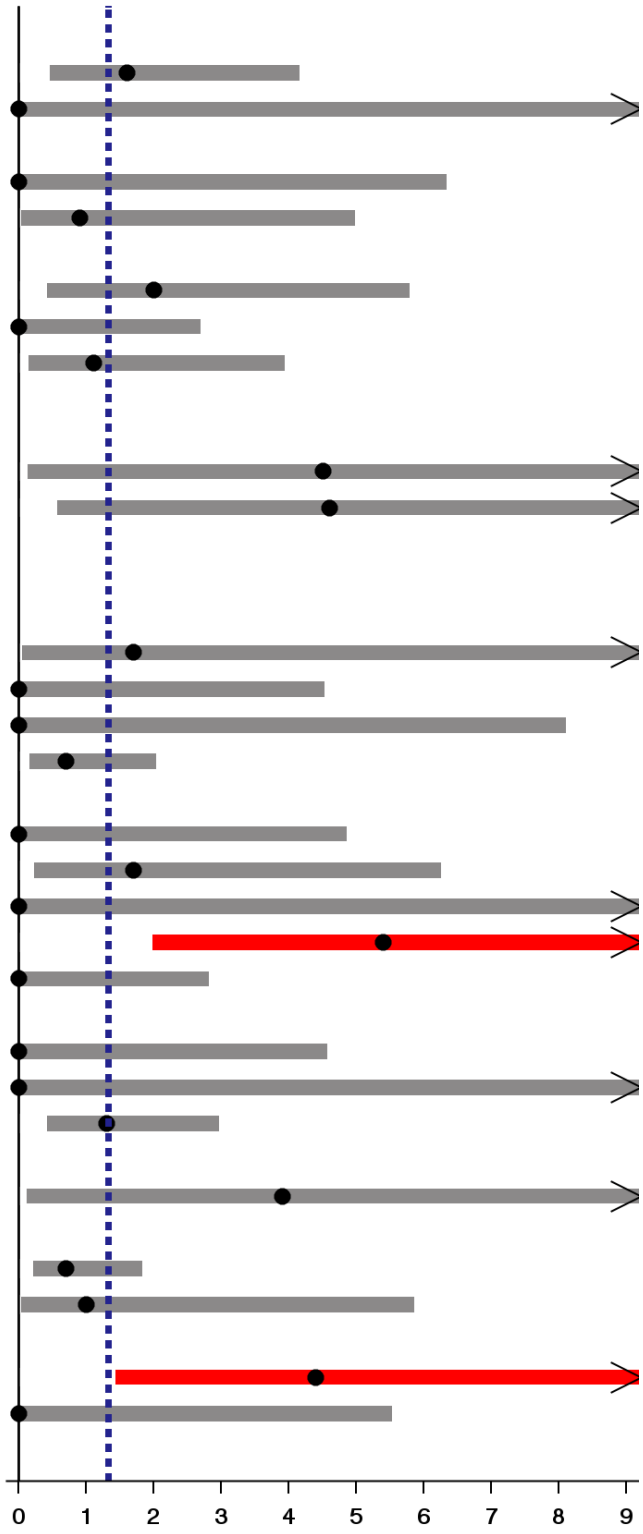
- Patients with an ASA score (a measure of systemic disease) of 3, 4, or 5 were 1.9 times more likely to develop an SSI than patients with an ASA score of 1 or 2.
- Procedures that involved traditional surgical incisions were 2.6 times more likely to result in SSI than procedures performed entirely with a laparoscopic instrument.
- Patients with diabetes were 1.2 times more likely to develop an SSI than patients without diabetes.
- Obese patients (with body mass index [BMI] greater than 30) were 1.9 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 1.9 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 9. Of the 109 hospitals that reported more than twenty procedures in 2019, three hospitals (3%) had a hysterectomy SSI rate that was statistically higher than the state average. Faxton St. Luke's Hospital was flagged 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. No hospital had an SSI rate that was significantly lower than the state average.

Figure 9. Abdominal hysterectomy surgical site infection rates, New York 2019 (page 1 of 4)

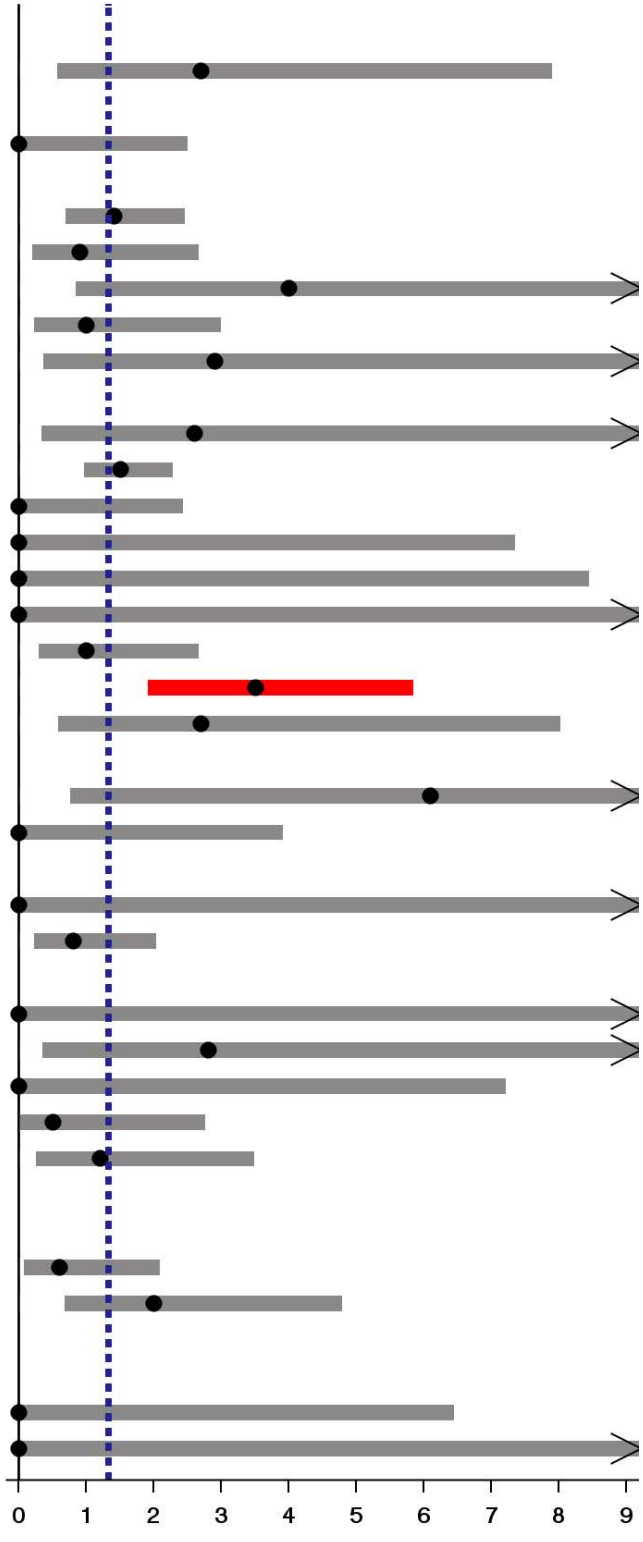
Hospital	# SSI	#PATOS excl.	#PDS excl.	# Procs	Raw Rate	Adj Rate
Adirondack Medical	NA	NA	NA	NA	NA	NA
Albany Med Ctr	4	0	0	264	1.5	1.6
Arnot Ogden Med Ctr	0	0	0	23	0.0	0.0
Auburn Community Hos	NA	NA	NA	NA	NA	NA
Bellevue Ellis	0	0	1	59	0.0	0.0
Bellevue Hospital	1	0	0	80	1.3	0.9
Bon Secours	NA	NA	NA	NA	NA	NA
BronxCare HealthSyst	3	0	1	88	3.4	2.0
Brookdale Hospital	0	0	0	66	0.0	0.0
Brooklyn Hosp Ctr	2	0	1	155	1.3	1.1
Brooks Memorial	NA	NA	NA	NA	NA	NA
Buffalo General	NA	NA	NA	NA	NA	NA
Canton-Potsdam	1	0	0	32	3.1	4.5
Catskill Regional MC	2	0	0	30	6.7	4.6
Cayuga Medical Ctr	NA	NA	NA	NA	NA	NA
Claxton-Hepburn	NA	NA	NA	NA	NA	NA
Clifton Springs	NA	NA	NA	NA	NA	NA
Columbia Memorial	1	0	1	95	1.1	1.7
Coney Island Hosp	0	0	0	53	0.0	0.0
Corning Hospital	0	0	0	35	0.0	0.0
Crouse Hospital	3	2	0	530	0.6	0.7
Eastern Niagara Hosp	NA	NA	NA	NA	NA	NA
Ellis Hospital	0	0	1	105	0.0	0.0
Elmhurst Hospital	2	0	1	102	2.0	1.7
FF Thompson	0	0	0	21	0.0	0.0
Faxton St. Lukes^	6	0	1	99	6.1	5.4
Flushing Hospital	0	0	0	168	0.0	0.0
Glen Cove Hospital	NA	NA	NA	NA	NA	NA
Glens Falls Hospital	0	0	0	93	0.0	0.0
Good Samar. Suffern	0	0	0	21	0.0	0.0
Good Samar. W Islip	5	0	3	425	1.2	1.3
Guthrie Cortland MC	NA	NA	NA	NA	NA	NA
Harlem Hospital	1	0	1	21	4.8	3.9
HealthAlli Broadway	NA	NA	NA	NA	NA	NA
Highland Hospital	4	0	1	590	0.7	0.7
Huntington Hospital	1	0	0	174	0.6	1.0
Interfaith Med Ctr	NA	NA	NA	NA	NA	NA
Jacobi Med Ctr^	5	0	1	76	6.6	4.4
Jamaica Hospital	0	0	0	51	0.0	0.0
Jones Memorial	NA	NA	NA	NA	NA	NA



Data reported as of December 8, 2020. ¦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 9. Abdominal hysterectomy surgical site infection rates, New York 2019 (page 2 of 4)

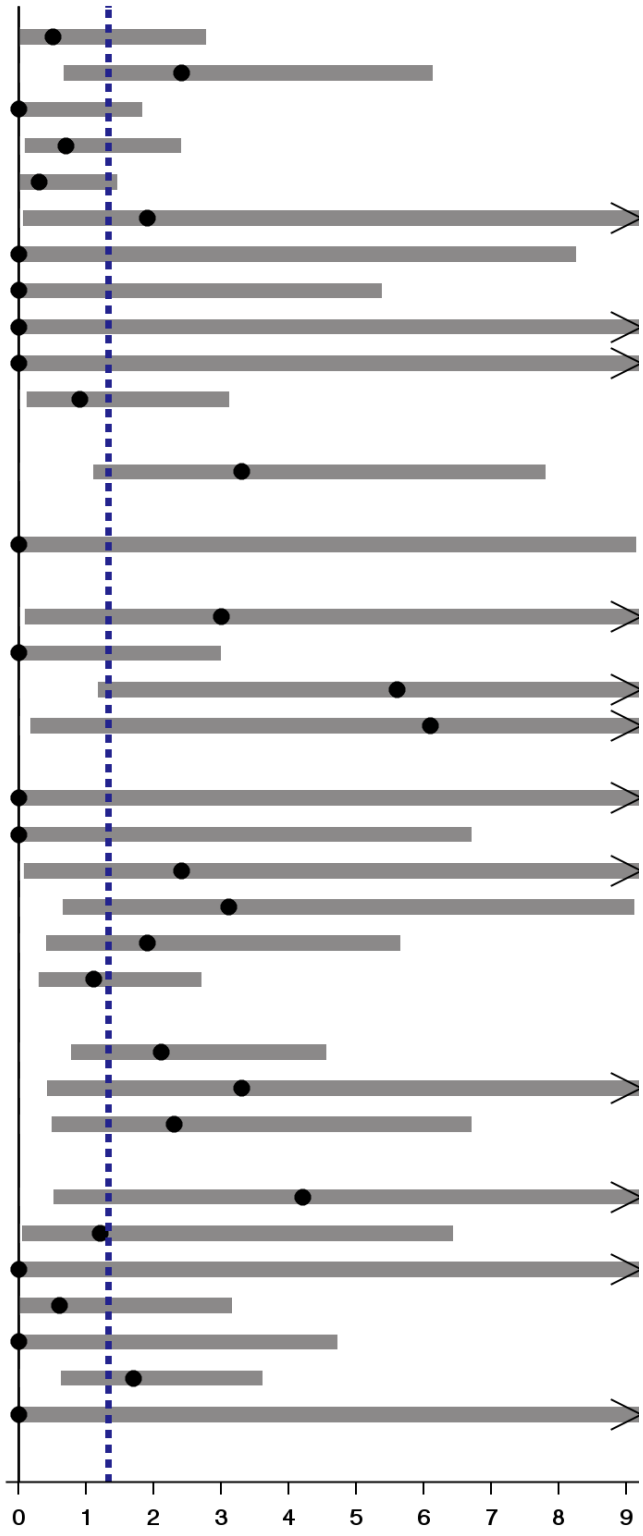
Hospital	# SSI	#PATOS excl.	#PDS excl.	# Procs	Raw Rate	Adj Rate
Kenmore Mercy	NA	NA	NA	NA	NA	NA
Kings County Hosp	3	0	0	108	2.8	2.7
Kingsbrook Jewish MC	NA	NA	NA	NA	NA	NA
LIJ at Forest Hills	0	0	0	138	0.0	0.0
LIJ at Valley Stream	NA	NA	NA	NA	NA	NA
LIJ(Long Isl Jewish)	11	0	2	546	2.0	1.4
Lenox Hill Hospital	3	0	0	300	1.0	0.9
Lincoln Med Ctr	3	0	1	48	6.3	4.0
Maimonides Med Ctr	3	0	0	237	1.3	1.0
Mary Imogene Bassett	2	0	0	52	3.8	2.9
Massena Memorial	NA	NA	NA	NA	NA	NA
Mather Hospital	2	1	0	64	3.1	2.6
Memor SloanKettering	23	0	16	1102	2.1	1.5
Mercy Hosp Buffalo	0	0	0	228	0.0	0.0
Mercy Med Ctr	0	0	0	39	0.0	0.0
Metropolitan Hosp	0	0	1	22	0.0	0.0
MidHudson Reg of WMC	0	0	0	64	0.0	0.0
Millard Fill. Suburb	4	1	0	522	0.8	1.0
Montefiore-Einstein^	14	3	2	260	5.4	3.5
Montefiore-Moses	3	0	1	90	3.3	2.7
Montefiore-Mt Vernon	NA	NA	NA	NA	NA	NA
Montefiore-NewRochl	2	0	0	32	6.3	6.1
Montefiore-Nyack	0	0	0	68	0.0	0.0
Montefiore-Wakefield	NA	NA	NA	NA	NA	NA
Mount St. Marys	0	0	0	36	0.0	0.0
Mt Sinai	4	0	3	463	0.9	0.8
Mt Sinai Beth Israel	NA	NA	NA	NA	NA	NA
Mt Sinai Brooklyn	0	0	0	29	0.0	0.0
Mt Sinai Morningside	2	0	0	58	3.4	2.8
Mt Sinai Queens	0	0	0	32	0.0	0.0
Mt Sinai S Nassau	1	0	0	262	0.4	0.5
Mt Sinai West	3	0	0	178	1.7	1.2
NY Community Hosp	NA	NA	NA	NA	NA	NA
NYP-Allen	NA	NA	NA	NA	NA	NA
NYP-Brklyn Methodist	2	0	0	231	0.9	0.6
NYP-Columbia	5	0	0	202	2.5	2.0
NYP-Hudson Valley	NA	NA	NA	NA	NA	NA
NYP-Lawrence	NA	NA	NA	NA	NA	NA
NYP-Lower Manhattan	0	0	0	47	0.0	0.0
NYP-Morgan Stanley	0	0	0	20	0.0	0.0



Data reported as of December 8, 2020. ¦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 9. Abdominal hysterectomy surgical site infection rates, New York 2019 (page 3 of 4)

Hospital	# SSI	#PATOS excl.	#PDS excl.	# Procs	Raw Rate	Adj Rate
NYP-Queens	1	0	0	164	0.6	0.5
NYP-Weill Cornell	4	0	0	197	2.0	2.4
NYU Langone Brooklyn	0	1	0	166	0.0	0.0
NYU Tisch	2	0	0	300	0.7	0.7
NYU Winthrop	1	0	1	333	0.3	0.3
Nassau University	1	0	0	37	2.7	1.9
Nathan Littauer	0	0	0	35	0.0	0.0
Newark Wayne	0	0	0	100	0.0	0.0
Niagara Falls	0	0	0	45	0.0	0.0
North Central Bronx	0	0	0	34	0.0	0.0
North Shore	2	0	0	232	0.9	0.9
Northern Dutchess	NA	NA	NA	NA	NA	NA
Northern Westchester	5	0	0	155	3.2	3.3
Noyes Memorial	NA	NA	NA	NA	NA	NA
Oishei Childrens	0	0	0	20	0.0	0.0
Olean General	NA	NA	NA	NA	NA	NA
Oneida Healthcare	1	0	0	65	1.5	3.0
Orange Regional	0	0	0	83	0.0	0.0
Oswego Hospital	3	0	0	34	8.8	5.6
Our Lady of Lourdes	1	0	0	32	3.1	6.1
Peconic Bay Medical	NA	NA	NA	NA	NA	NA
Phelps Memorial	0	0	0	20	0.0	0.0
Plainview Hospital	0	0	0	37	0.0	0.0
Putnam Hospital	1	0	0	74	1.4	2.4
Queens Hospital	3	0	1	67	4.5	3.1
Richmond Univ MC	3	0	0	192	1.6	1.9
Rochester General	4	0	0	527	0.8	1.1
Rome Memorial	NA	NA	NA	NA	NA	NA
Roswell Park	6	0	9	321	1.9	2.1
SJRH St Johns	2	0	0	70	2.9	3.3
SUNY Downstate MC	3	0	0	99	3.0	2.3
Samaritan AlbanyMem	NA	NA	NA	NA	NA	NA
Samaritan Hosp Troy	2	0	0	78	2.6	4.2
Samaritan- Watertown	1	0	0	156	0.6	1.2
Saratoga Hospital	0	0	0	51	0.0	0.0
Sisters of Charity	1	0	0	267	0.4	0.6
Sisters- St Joseph	0	0	0	134	0.0	0.0
South Shore UH	6	0	0	425	1.4	1.7
St Anthony	0	0	0	39	0.0	0.0
St Barnabas	NA	NA	NA	NA	NA	NA



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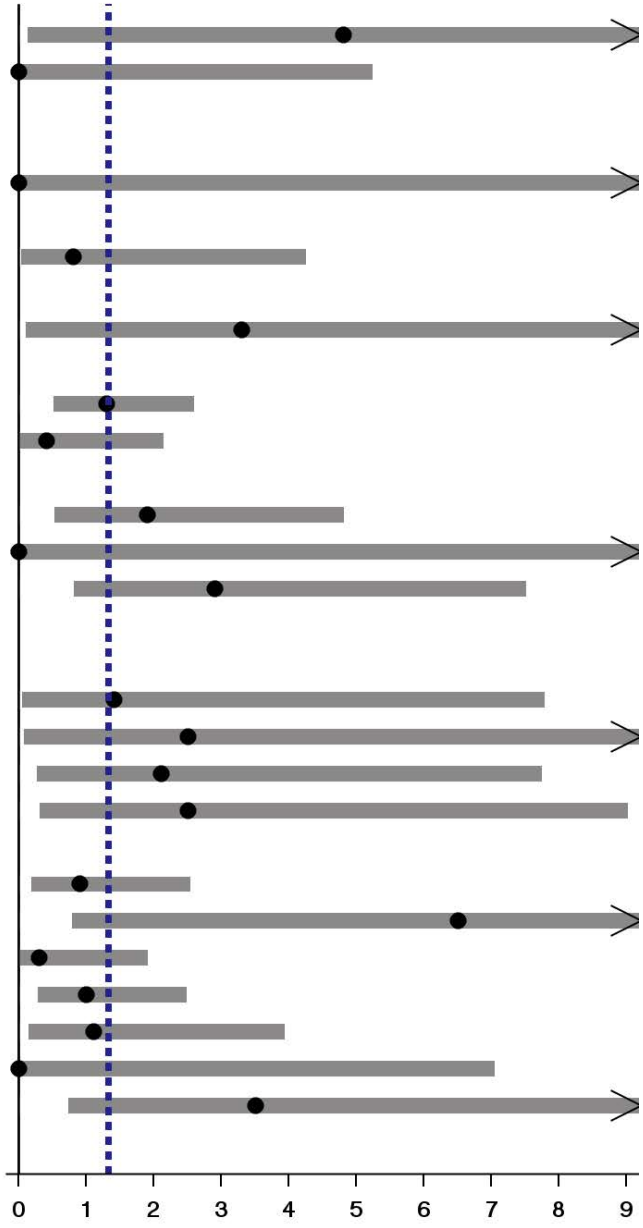
SSI: surgical site infections, Procs: procedures. Rates are per 100 procedures. Adjusted using ASA score, duration, diabetes, obesity, and endoscope. Excludes SSIs present at time of surgery (PATOS) and non-readmitted cases identified using post discharge surveillance (PDS).

Figure 9. Abdominal hysterectomy surgical site infection rates, New York 2019 (page 4 of 4)

Hospital	# SSI	#PATOS excl.	#PDS excl.	# Procs	Raw Rate	Adj Rate
St Catherine Siena	1	0	0	29	3.4	4.8
St Charles Hospital	0	0	0	66	0.0	0.0
St Elizabeth Medical	NA	NA	NA	NA	NA	NA
St Francis- Roslyn	NA	NA	NA	NA	NA	NA
St Johns Episcopal	0	0	0	21	0.0	0.0
St Joseph- Bethpage	NA	NA	NA	NA	NA	NA
St Josephs- Syracuse	1	0	0	177	0.6	0.8
St Josephs- Yonkers	NA	NA	NA	NA	NA	NA
St Lukes Cornwall	1	0	0	29	3.4	3.3
St Marys Amsterdam	NA	NA	NA	NA	NA	NA
St Peters Hospital	7	0	0	755	0.9	1.3
Staten Island UNorth	1	1	4	202	0.5	0.4
Staten Island USouth	NA	NA	NA	NA	NA	NA
Strong Memorial	4	0	0	156	2.6	1.9
UHS Chenango Memor	0	0	0	20	0.0	0.0
UHS Wilson	4	0	1	141	2.8	2.9
UPMC Chautauqua	NA	NA	NA	NA	NA	NA
UVM Alice Hyde	NA	NA	NA	NA	NA	NA
UVM Champlain Valley	1	0	0	113	0.9	1.4
United Memorial	1	0	0	31	3.2	2.5
Unity Hosp Rochester	2	0	0	169	1.2	2.1
UnivHSUNY Upstate	2	0	0	66	3.0	2.5
UnivHStonyBrkSoutham	NA	NA	NA	NA	NA	NA
UnivHStonyBrookU	3	0	0	217	1.4	0.9
Upst. Community Gen	2	0	0	48	4.2	6.5
Vassar Brothers	1	0	1	409	0.2	0.3
Westchester Medical	4	0	0	255	1.6	1.0
White Plains Hosp	2	0	0	406	0.5	1.1
Woodhull Med Ctr	0	0	0	41	0.0	0.0
Wyckoff Heights	3	0	0	75	4.0	3.5
Wyoming County Comm.	NA	NA	NA	NA	NA	NA



Data reported as of December 8, 2020. 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).

Spinal Fusion Surgical Site Infections

In 2019, 118 hospitals reported a total of 393 spinal fusion surgical site infections out of 29,049 procedures, a rate of 1.4 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 393 infections, 13 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 380 infections, 31% were superficial, 41% were deep, and 28% were organ/space (Table 11). Most of the SSIs (69%) were detected upon readmission to the same hospital; 10% were identified during the initial hospitalization; 11% involved readmission to another hospital; and 10% 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 37 PDS infections in the final SSI rate so as not to penalize facilities with the best surveillance systems.

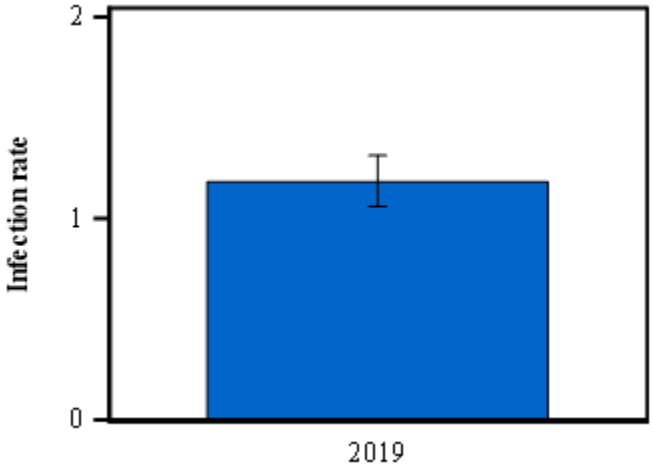
Table 11. Method of detection of Spinal fusion surgical site infection by depth of infection, New York State 9

	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 (8.5%) (25.6%)	64 (54.2%) (24.4%)	16 (13.6%) (38.1%)	28 (23.7%) (75.7%)	118 (31.1%)
Deep Incisional	16 (10.3%) (41.0%)	115 (74.2%) (43.9%)	16 (10.3%) (38.1%)	8 (5.2%) (21.6%)	155 (40.8%)
Organ/Space	13 (12.1%) (33.3%)	83 (77.6%) (31.7%)	10 (9.3%) (23.8%)	1 (0.9%) (2.7%)	107 (28.2%)
Total	39 (10.3%)	262 (69.0%)	42 (11.1%)	37 (9.7%)	380

New York State data reported as of December 8, 2020. Excludes infections present at time of surgery.

After deleting PATOS and PDS infections there were 1.18 infections per 100 procedures (Figure 10).

Figure 10. Spinal fusion surgical site infection rates, New York State 2019
Excluding infections present at time of surgery or detected in outpatient settings without readmission



Year	# Hospitals	# Infections	# Procedures	Infection Rate (95% Confidence Interval)
2019	118	343	29,036	1.18 (1.06, 1.31)

New York State data reported as of December 8, 2020.
Infection rate is the number of infections divided by the number of procedures, multiplied by 100.

Microorganisms Associated with Spinal fusion SSIs

The most common microorganisms associated with hysterectomy SSIs was *Staphylococcus aureus* (Table 12).

Table 12. Microorganisms identified in spinal fusion surgical site infections, New York State 2019

Microorganism	Number of Isolates	Percent of Infections
Staphylococcus aureus	122	31.0
(MRSA)	(33)	(8.4)
Coagulase negative staphylococci	77	19.6
Escherichia coli	36	9.2
Klebsiella spp.	34	8.7
(CRE-*Klebsiella)*	(1)	(0.3)
Pseudomonas spp.	33	8.4
Proteus spp.	26	6.6
Enterococci	24	6.1
(VRE)	(4)	(1.0)
Cutibacterium spp.	18	4.6
Enterobacter spp.	17	4.3
(CRE-*Enterobacter)*	(1)	(0.3)
Serratia spp.	16	4.1
Acinetobacter spp.	2	0.5
(MDRO-*Acinetobacter)*	(1)	(0.3)
Other	54	13.7

New York State data reported as of December 8, 2020. Out of 393 infections. No microorganisms identified for 44 (11%) infections. CRE: carbapenem-resistant Enterobacteriaceae; MRSA: methicillin-resistant *Staphylococcus aureus;* VRE: vancomycin-resistant enterococci; MDR: multi-drug resistant; spp: multiple species.

Risk Adjustment for Spinal fusion Surgical Site Infections

Certain patient and procedure-specific factors increased the risk of developing an SSI following abdominal hysterectomy. In 2019, 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.

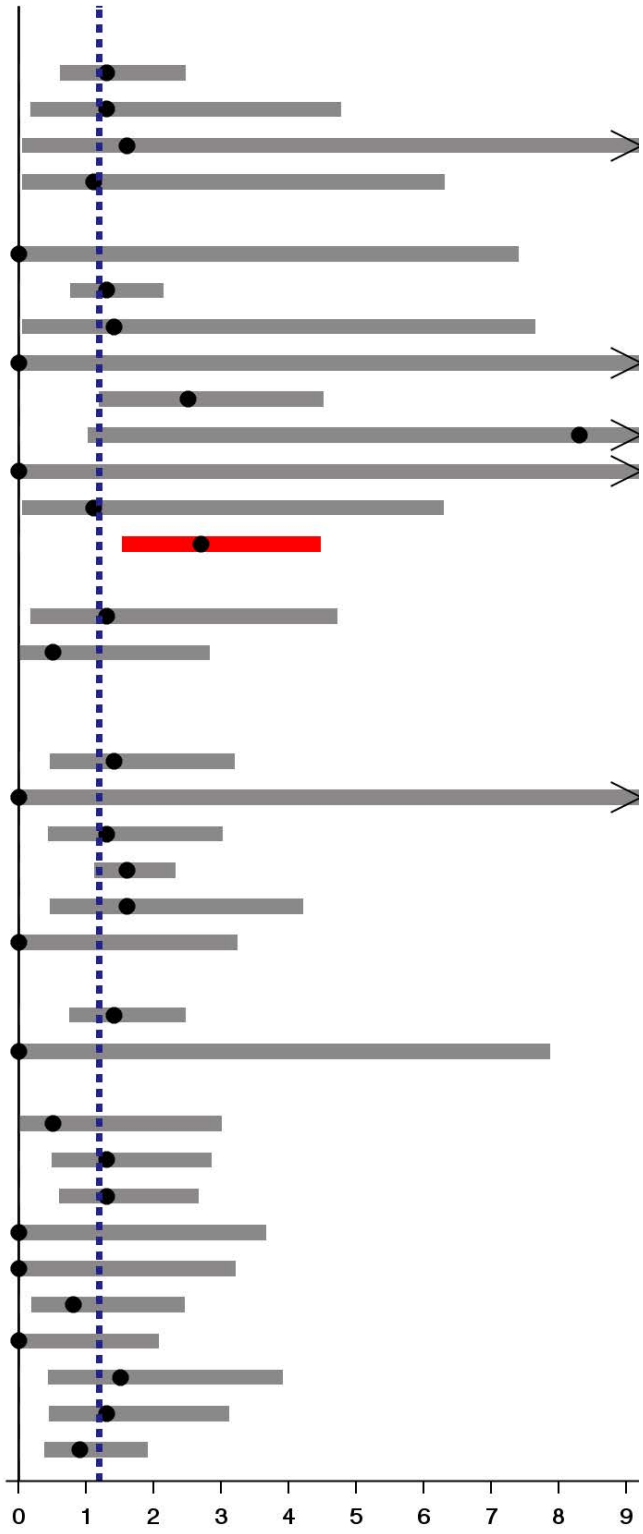
- For each unit increase in ASA score (1, 2, 3, 4/5), a measure of systemic disease, patients were 1.6 times more likely to develop an SSI.
- Patients with diabetes were 1.4 times more likely to develop an SSI than patients without diabetes.
- Very obese patients (with BMI greater than or equal to 40) were 1.8 times more likely to develop an SSI, and obese patients (with BMI between 30 and 39) were 1.3 times more likely to develop an SSI than patients with BMI less than 30.
- For each additional hour of procedure (up to 10 hours), patients were 1.1 times more likely to develop an SSI.
- Patients who experienced trauma (i.e. a blunt or penetrating injury) prior to the procedure were 1.7 times more likely to develop an SSI than other patients.
- Procedures that involved a posterior or bidirectional approach were 3.1 times more likely to result in SSI than procedures performed entirely with an anterior approach.
- Procedures performed at the dorsal/dorsolumbar or cervical/dorsal/dorsolumbar levels were 1.7 times more likely to develop an SSI than procedures performed at the atlas-axis or cervical levels. There was no difference between procedures performed at the lumbar/lumbosacral levels and those performed at the atlas-axis or cervical levels.

Hospital-Specific Spinal fusion SSI Rates

Hospital-specific fusion SSI rates are provided in Figure 11. Of the 103 hospitals that reported more than twenty procedures in 2019, three hospitals (3%) had a spinal fusion 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 (3%) had an SSI rate that was significantly lower than the state average.

Figure 11. Spinal fusion surgical site infection rates, New York 2019 (page 1 of 3)

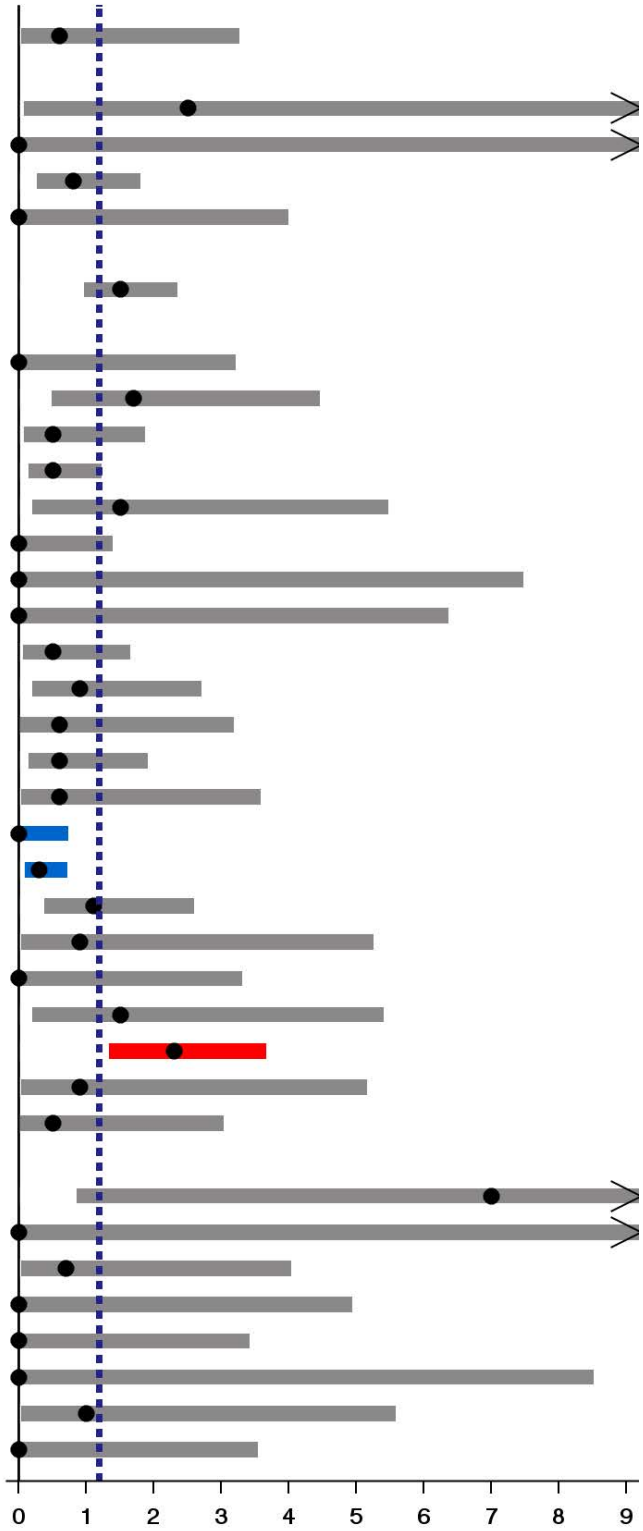
Hospital	# SSI	#PATOS excl.	#PDS excl.	# Procs	Raw Rate	Adj Rate
AO Fox Memorial	NA	NA	NA	NA	NA	NA
Albany Med Ctr	9	3	0	595	1.5	1.3
Arnot Ogden Med Ctr	2	0	2	163	1.2	1.3
Bellevue Hospital	1	0	0	42	2.4	1.6
BronxCare HealthSyst	1	0	0	148	0.7	1.1
Brookdale Hospital	NA	NA	NA	NA	NA	NA
Brooklyn Hosp Ctr	0	0	0	77	0.0	0.0
Buffalo General	16	0	0	1364	1.2	1.3
Cayuga Medical Ctr	1	0	0	53	1.9	1.4
Coney Island Hosp	0	0	0	28	0.0	0.0
Crouse Hospital	10	1	0	457	2.2	2.5
Eastern Niagara Hosp	2	0	0	38	5.3	8.3
Ellis Hospital	0	0	0	20	0.0	0.0
Elmhurst Hospital	1	0	0	43	2.3	1.1
Erie County Med Ctr^	15	0	0	451	3.3	2.7
FF Thompson	NA	NA	NA	NA	NA	NA
Faxton St. Lukes	2	0	0	199	1.0	1.3
Geneva General	1	0	0	194	0.5	0.5
Glens Falls Hospital	NA	NA	NA	NA	NA	NA
Good Samar. Suffern	NA	NA	NA	NA	NA	NA
Good Samar. W Islip	5	0	2	413	1.2	1.4
Harlem Hospital	0	0	0	21	0.0	0.0
Highland Hospital	5	0	9	489	1.0	1.3
Hosp for Spec Surg	31	0	1	2356	1.3	1.6
Huntington Hospital	4	0	0	241	1.7	1.6
Jacobi Med Ctr	0	0	0	34	0.0	0.0
Jamaica Hospital	NA	NA	NA	NA	NA	NA
Kenmore Mercy	12	0	0	1122	1.1	1.4
Kings County Hosp	0	0	0	24	0.0	0.0
LIJ at Forest Hills	NA	NA	NA	NA	NA	NA
LIJ at Valley Stream	1	0	0	235	0.4	0.5
LIJ(Long Isl Jewish)	6	0	0	360	1.7	1.3
Lenox Hill Hospital	8	0	0	757	1.1	1.3
Lincoln Med Ctr	0	0	0	75	0.0	0.0
Long Isl. Community	0	0	0	56	0.0	0.0
Maimonides Med Ctr	3	0	1	319	0.9	0.8
Mary Imogene Bassett	0	0	0	122	0.0	0.0
Mather Hospital	4	0	1	219	1.8	1.5
Memor SloanKettering	5	0	0	206	2.4	1.3
Mercy Hosp Buffalo	7	0	0	764	0.9	0.9



Data reported as of December 8. 2020. ┆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, diabetes, obesity, duration, trauma, approach, and level. Excludes SSIs present at time of surgery (PATOS) and non-readmitted cases identified using post discharge surveillance (PDS).

Figure 11. Spinal fusion surgical site infection rates, New York 2019 (page 2 of 3)

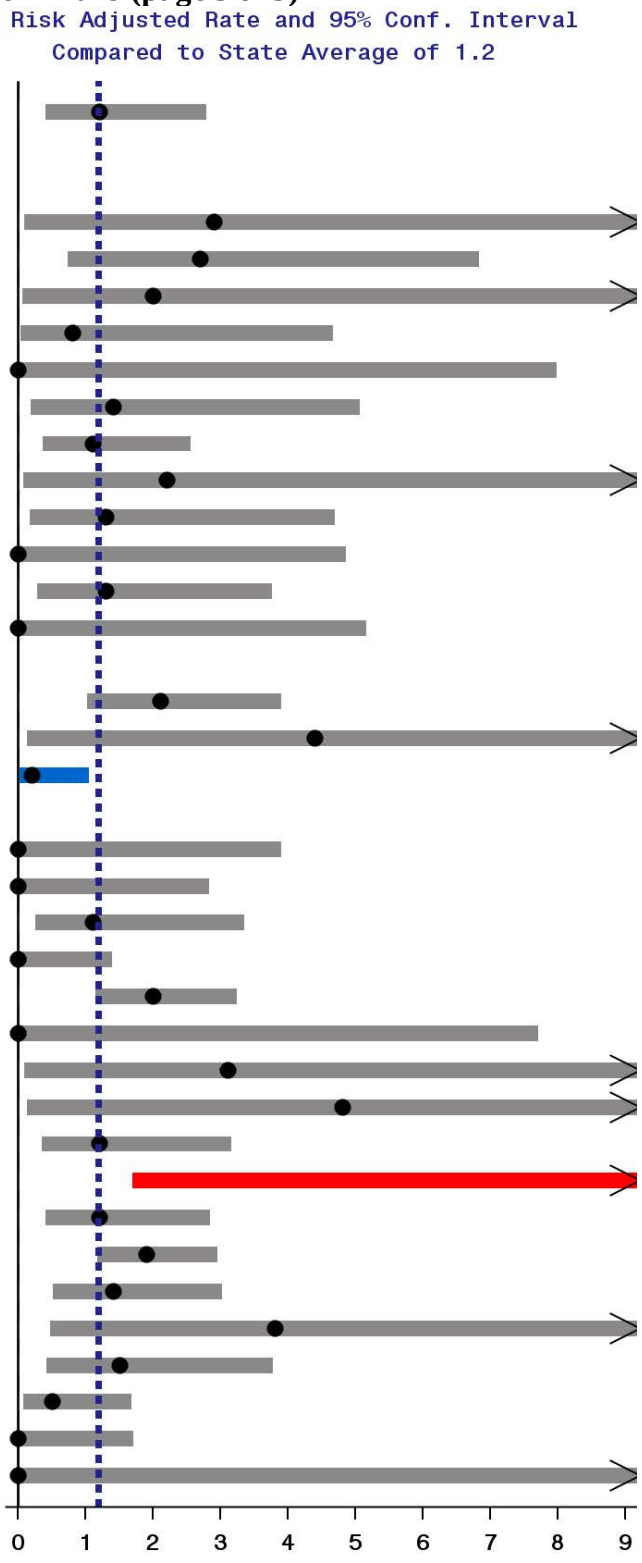
Hospital	# SSI	#PATOS excl.	#PDS excl.	# Procs	Raw Rate	Adj Rate
Mercy Med Ctr	1	0	0	282	0.4	0.6
Metropolitan Hosp	NA	NA	NA	NA	NA	NA
MidHudson Reg of WMC	1	0	0	37	2.7	2.5
Millard Fill. Suburb	0	0	0	26	0.0	0.0
Montefiore-Moses	5	0	1	430	1.2	0.8
Montefiore-NewRochl	0	0	0	61	0.0	0.0
Montefiore-Nyack	NA	NA	NA	NA	NA	NA
Mt Sinai	21	1	8	1138	1.8	1.5
Mt Sinai Beth Israel	NA	NA	NA	NA	NA	NA
Mt Sinai Morningside	0	0	0	57	0.0	0.0
Mt Sinai S Nassau	4	0	0	298	1.3	1.7
Mt Sinai West	2	0	0	327	0.6	0.5
NYP-Allen	4	0	0	661	0.6	0.5
NYP-Brklyn Methodist	2	0	0	146	1.4	1.5
NYP-Columbia	0	0	0	128	0.0	0.0
NYP-Hudson Valley	0	0	0	31	0.0	0.0
NYP-Lawrence	0	0	0	38	0.0	0.0
NYP-Lower Manhattan	2	0	0	783	0.3	0.5
NYP-Morgan Stanley	3	0	0	200	1.5	0.9
NYP-Queens	1	0	0	136	0.7	0.6
NYP-Weill Cornell	3	0	0	495	0.6	0.6
NYU Langone Brooklyn	1	0	0	188	0.5	0.6
NYU Orthopedic Hosp*	0	0	0	383	0.0	0.0
NYU Tisch*	4	0	0	1223	0.3	0.3
NYU Winthrop	5	0	1	443	1.1	1.1
Nassau University	1	0	1	169	0.6	0.9
Nathan Littauer	0	0	0	114	0.0	0.0
Niagara Falls	2	0	0	243	0.8	1.5
North Shore^	17	1	0	768	2.2	2.3
Northern Dutchess	1	0	0	141	0.7	0.9
Northern Westchester	1	0	1	252	0.4	0.5
Oishei Childrens	NA	NA	NA	NA	NA	NA
Olean General	2	0	0	30	6.7	7.0
Orange Regional	0	0	0	30	0.0	0.0
Our Lady of Lourdes	1	0	0	171	0.6	0.7
Peconic Bay Medical	0	0	0	68	0.0	0.0
Phelps Memorial	0	0	0	82	0.0	0.0
Plainview Hospital	0	0	0	40	0.0	0.0
Putnam Hospital	1	0	0	131	0.8	1.0
Richmond Univ MC	0	0	0	65	0.0	0.0



Data reported as of December 8, 2020. ┆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, diabetes, obesity, duration, trauma, approach, and level. Excludes SSIs present at time of surgery (PATOS) and non-readmitted cases identified using post discharge surveillance (PDS).

Figure 11. Spinal fusion surgical site infection rates, New York 2019 (page 3 of 3)

Hospital	# SSI	#PATOS excl.	#PDS excl.	# Procs	Raw Rate	Adj Rate
Rochester General	5	1	0	406	1.2	1.2
Rome Memorial	NA	NA	NA	NA	NA	NA
Roswell Park	NA	NA	NA	NA	NA	NA
SJRH Dobbs Ferry	1	0	0	61	1.6	2.9
SJRH St Johns	4	0	0	180	2.2	2.7
SUNY Downstate MC	1	0	0	43	2.3	2.0
Samaritan Hosp Troy	1	0	0	158	0.6	0.8
Samaritan- Watertown	0	0	0	39	0.0	0.0
Saratoga Hospital	2	0	0	152	1.3	1.4
Sisters of Charity	5	0	0	452	1.1	1.1
Sisters- St Joseph	1	0	0	27	3.7	2.2
South Shore UH	2	0	0	138	1.4	1.3
St Barnabas	0	0	0	31	0.0	0.0
St Catherine Siena	3	0	0	244	1.2	1.3
St Charles Hospital	0	0	0	89	0.0	0.0
St Elizabeth Medical	NA	NA	NA	NA	NA	NA
St Francis- Roslyn	10	0	0	496	2.0	2.1
St Joseph- Bethpage	1	0	0	34	2.9	4.4
St Josephs- Syracuse*	1	0	0	711	0.1	0.2
St Josephs- Yonkers	NA	NA	NA	NA	NA	NA
St Lukes Cornwall	0	0	0	53	0.0	0.0
St Marys Amsterdam	0	0	0	118	0.0	0.0
St Peters Hospital	3	0	0	300	1.0	1.1
Staten Island UNorth	0	0	1	205	0.0	0.0
Strong Memorial	16	1	0	539	3.0	2.0
Syosset Hospital	0	0	0	49	0.0	0.0
UHS Binghamton	1	0	1	25	4.0	3.1
UHS Chenango Memor	1	0	0	24	4.2	4.8
UHS Wilson	4	3	5	385	1.0	1.2
UVM Champlain Valley^	2	0	0	20	10.0	13.9
Unity Hosp Rochester	5	0	0	458	1.1	1.2
UnivHSUNY Upstate	20	1	0	714	2.8	1.9
UnivHStonyBrookU	6	0	2	351	1.7	1.4
Upst. Community Gen	2	0	0	64	3.1	3.8
Vassar Brothers	4	1	0	239	1.7	1.5
Westchester Medical	2	0	0	310	0.6	0.5
White Plains Hosp	0	0	0	230	0.0	0.0
Wyckoff Heights	0	0	0	39	0.0	0.0



Data reported as of December 8, 2020. 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, diabetes, obesity, duration, trauma, approach, and level. Excludes SSIs present at time of surgery (PATOS) and non-readmitted cases identified using post discharge surveillance (PDS).

Central Line-Associated Bloodstream Infections (CLABSIs)

There were two changes to CLABSI reporting in NYS in 2019.

First, NYSDOH required reporting in oncology and mixed-acuity units. As a result of this change, analysis of historic trends will exclude these units.

Second, CDC added five new exclusions to the NHSN protocol. The following reported bloodstream infections (BSI) are no longer counted as CLABSIs:

1. Observed or suspected patient injection into a vascular line.
2. Known or suspected Munchausen Syndrome by Proxy (MSP), a condition where a patient or caregiver makes up or causes an illness, for example deliberate contamination of a sterile device such as a central line.
3. Epidermolysis bullosa (EB), a group of genetic disorders characterized by blister formation after minor trauma to the skin.
4. BSIs in patients with both a central line and another vascular access device, where an organism identified from pus at the other access site matches an organism identified in the blood.
5. Group B *Streptococcus* BSIs in infants during the first 6 days of life.

The exclusions would be expected to decrease CLABSI rates slightly. NYSDOH was not able to quantify the impact of these exclusions on the 2019 NYS CLABSI rate because the excluded data are not visible to NYSDOH within NHSN. In 2020 the NHSN application was updated such that future HAI reports will allow us to measure the BSIs excluded under these rules.

In 2019, a total of 1,719 CLABSIs were associated with 1,535,332 days of central line use, for an overall rate of 1.12 infections per 1,000 central line days in the selected ICUs and wards (Table 13). Of these, 419 (24%) were mucosal barrier injury (MBI)-CLABSIs. 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. MBI-CLABSIs occurred most commonly in oncology wards. Oncology ICUs are not reported separately in this report because there are only two cancer hospitals in NYS; oncology ICUs were combined with medical/surgical and pediatric units by NYSDOH beginning in 2017.

In 2018, NHSN began 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 2019, hospitals reported 27 ECMO BSIs, 24 VAD BSIs, and 5 ECMO and VAD BSIs. These 56 events represented 3% of the total number of CLABSIs, and occurred mostly in cardiothoracic ICUs, where ECMO and VAD are most frequently used.

Table 13 summarizes the total number of CLABSIs reported in 2019 by unit. The CLABSI rate in ICUS (8.24/1,000 central line days) was only slightly higher than the rate in wards (8.05/1,000 central line days).

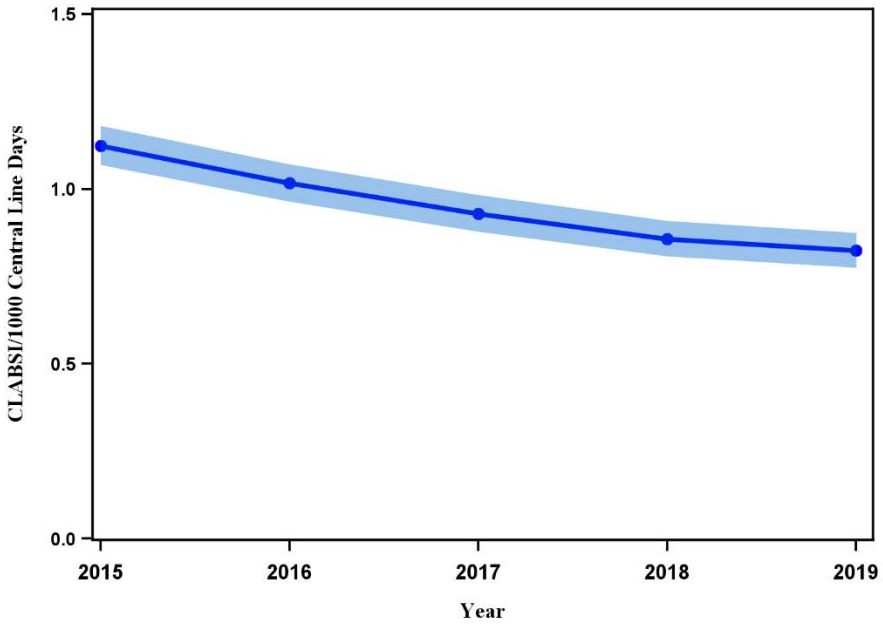
Table 13. Central line-associated bloodstream infection (CLABSI) rates by unit, New York State 2019

Unit	# Hospitals	# MBI	# ECMO/ VAD	# CLABSI[1]	# Central Line Days	CLABSI Rate[1]	# Patient Days	Device Utilization ratio
Adult/Pediatric Intensive Care Units								
Cardiothoracic ICU	29	1	40	28	80,057	0.350	115,367	69.4
Coronary ICU	33	0	1	47	34,651	1.356	105,018	33.0
Medical ICU	61	15	1	108	119,131	0.907	271,709	43.8
Medical Surgical ICU	97	8	3	84	123,260	0.681	304,926	40.4
Neurosurgical ICU	13	0	0	13	16,295	0.798	59,456	27.4
Pediatric ICU	28	1	4	43	34,713	1.239	100,820	34.4
Surgical ICU	39	3	2	67	65,052	1.030	154,119	42.2
Subtotal Adult/Pediatric ICUs	159	28	51	390	473,159	0.824	1,111,415	42.6
Neonatal Intensive Care Units								
Neonatal ICU Level II/III	12	0	0	5	3,823	1.308	36,192	10.6
Neonatal ICU Level III	24	0	0	12	14,873	0.807	104,803	14.2
Neonatal ICU RPC	17	1	1	46	61,247	0.751	257,386	23.8
Subtotal Neonatal ICUs	53	1	1	63	79,943	0.788	398,381	20.1
Adult/Pediatric Wards								
Medical Surgical Ward	129	9	1	153	251,578	0.608	2,581,136	9.7
Medical Ward	88	17	1	223	285,876	0.780	2,602,154	11.0
Mixed Acuity Ward	20	0	0	16	16,924	0.945	97,484	17.4
Oncology ward	25	348	0	225	232,016	0.970	445,492	52.1
Pediatric ward	51	14	0	50	39,160	1.277	282,084	13.9
Step down unit	62	0	1	50	54,107	0.924	347,386	15.6
Surgical Ward	75	2	1	74	102,569	0.721	922,038	11.1
Subtotal Adult/Pediatric Wards	163	390	4	791	982,230	0.805	7,277,774	13.5
Total								
Grand Total	164	419	56	1,244	1,535,332	0.810	8,787,570	17.5

[1]Excluding mucosal barrier injury (MBI), ventricular assist devices (VAD) and/or extracorporeal membrane oxygenation (ECMO). New York State data as of November 23, 2020. CLABSI rates are per 1,000 central line days. Device utilization = 100* central line days/patient days.

Figure 12 shows trends in CLABSI rates between 2015 and 2019. For consistency over time, ECMO BSIs and VAD BSIs were included, and oncology and mixed acuity units were excluded. Between 2015 and 2019 the CLABSI rate decreased 27%, from 1.123 to 0.823 CLABSI per 1,000 central line days.

Figure 12. Trends in central line-associated bloodstream infection (CLABSI) rates, New York State 2015-2019



Year	# Hospitals	# CLABSI	# Central Line Days	CLABSI Rate (95% CI)	# Patient Days	Device Utilization ratio
2015	167	1,590	1,415,710	1.123 (1.069, 1.180)	8,178,130	17.3
2016	169	1,398	1,376,060	1.016 (0.963, 1.071)	8,122,132	16.9
2017	172	1,228	1,322,501	0.929 (0.877, 0.982)	8,077,737	16.4
2018	170	1,110	1,295,018	0.857 (0.807, 0.909)	8,248,580	15.7
2019	164	1,059	1,286,392	0.823 (0.774, 0.874)	8,244,594	15.6

New York State data as of Nov 23, 2020 Rates are per 1,000 central line days. Device utilization = 100* central line days/patient days. Includes ECMO and VAD. Excludes MBI-CLABSI, oncology units and mixed acuity wards.

The distribution of microorganisms associated with CLABSIs is presented by location in Tables 14 and 15. Enterococci and yeast were the most common organism in adult and pediatric ICUs and wards. The most common organism in neonatal ICUs was *Staphylococcus aureus*.

Table 14. Microorganisms identified in central line-associated bloodstream infections, adult and pediatric intensive care units and wards, New York State 2019

Microorganism	Number of Isolates	Percent of Infections
Enterococci	381	23.0
(VRE)	(181)	(10.9)
Yeast	352	21.3
(*Candida auris*)	(12)	(0.7)
Coagulase negative staphylococci	187	11.3
Escherichia coli	178	10.8
(CRE-*E. coli*)	(1)	(0.1)
Klebsiella spp.	177	10.7
(CRE-*Klebsiella*)	(13)	(0.8)
Staphylococcus aureus	158	9.6
(MRSA)	(63)	(3.8)
Pseudomonas spp.	87	5.3
Streptococci	76	4.6
Enterobacter spp.	56	3.4
Serratia spp.	30	1.8
Acinetobacter spp.	22	1.3
(MDRO-*Acinetobacter*)	(8)	(0.5)
Proteus spp.	17	1.0
Clostridium spp.	16	1.0
Stenotrophomonas spp.	16	1.0
Other	126	7.6

New York State data reported as of November 23, 2020. Out of 1,654 infections.
VRE: vancomycin-resistant enterococci; CRE: carbapenem-resistant Enterobacteriaceae; MRSA: methicillin-resistant *Staphylococcus aureus;* MDR: multi-drug resistant; spp: multiple species.

Table 15. Microorganisms associated with central line-associated bloodstream infections, neonatal intensive care units, New York State 2019

Microorganism	Number of Isolates	Percent of Infections
Staphylococcus aureus	20	30.8
(MRSA)	(3)	(4.6)
Enterococci	12	18.5
Coagulase negative staphylococci	10	15.4
Escherichia coli	7	10.8
(CRE-*E. coli*)	(1)	(1.5)
Enterobacter spp.	2	3.1
Klebsiella spp.	2	3.1
Acinetobacter spp.	1	1.5
Other	13	20.0

New York State data reported as of November 23, 2020. Out of 65 infections.
MRSA: methicillin-resistant *Staphylococcus aureus;* CRE: carbapenem-resistant Enterobacteriaceae; 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 Regional Perinatal Centers (RPCs), babies weighing less than 1001 grams were 2.2 times more likely to develop a CLABSI than babies weighing more than 1000 grams. In Level III NICUs, there was no difference by birthweight.

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 16 (ICUs) and Table 17 (wards) help hospital IPs target their CLABSI reduction efforts to specific locations. Overall, twenty-seven high flags will be addressed in CLABSI improvement plans by twenty-three affected hospitals.

Table 16. Central line-associated bloodstream infection rates by intensive care unit type, New York State 2019

	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	**1.36**		**0.35**		**0.91**		**0.68**		**1.03**		**0.80**		**1.24**		**RPC 0.75/L3 0.81/L23 1.31**		
Adirondack Medical							0/240	0.0									
Albany Med Ctr	3/1645	1.8	2/2947	0.7	1/3360	0.3			3/4749	0.6			0/1218	0.0	RPC	2/2852	0.7
Arnot Ogden Med Ctr							2/1804	1.1							Lev 3	1/1121	0.9
Auburn Community Hos							1/472	2.1									
Bellevue Hospital	5/1525	3.3	0/789	0.0	0/1072	0.0			2/1054	1.9	0/185	0.0	0/78	0.0	RPC	2/1411	1.3
Bon Secours							0/280	0.0									
BronxCare HealthSyst	1/573	1.7			2/3170	0.6							0/22	0.0	Lev 3	1/572	1.8
Brookdale Hospital	0/605	0.0			2/2126	0.9			2/1266	1.6			0/1	0.0	Lev 3	1/502	2.0
Brooklyn Hosp Ctr	0/1381	0.0			1/2423	0.4							0/69	0.0	Lev 3	1/645	1.6
Brooks Memorial							0/234	0.0									
Buffalo General			0/3109	0.0	6/7200	0.8			5/2518	2.0	1/1995	0.5					
Canton-Potsdam							0/423	0.0									
Catskill Regional MC							0/428	0.0									
Cayuga Medical Ctr							0/783	0.0									
Claxton-Hepburn							1/675	1.5									
Clifton Springs					0/220	0.0											
Cohens Childrens													2/2232	0.9	RPC	2/5111	0.4
Columbia Memorial							0/755	0.0									
Coney Island Hosp	1/463	2.2			1/2161	0.5			1/1146	0.9							
Corning Hospital							0/304	0.0									
Crouse Hospital							0/2428	0.0							RPC	11/5008	2.2
Eastern Niagara Hosp							0/288	0.0									
Ellis Hospital							1/5911	0.2									
Elmhurst Hospital	0/271	0.0			1/963	1.0			0/786	0.0					Lev 2/3	1/347	2.9
Erie County Med Ctr					1/2077	0.5											
FF Thompson					1/956	1.0											
Faxton St. Lukes							5/2340	2.1									
Flushing Hospital					3/1379	2.2	0/175	0.0							Lev 3	0/642	0.0
Geneva General							1/921	1.1									
Glen Cove Hospital							0/470	0.0									
Glens Falls Hospital							0/1056	0.0									

Table 16. Central line-associated bloodstream infection rates by intensive care unit type, New York State 2019

	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	1.36		0.35		0.91		0.68		1.03		0.80		1.24		RPC 0.75/L3 0.81/L23 1.31		
Good Samar. Suffern			0/699	0.0	1/1588	0.6			1/667	1.5							
Good Samar. W Islip			0/1418	0.0	2/1938	1.0			1/2174	0.5	0/259	0.0	0/167	0.0	Lev 3	0/875	0.0
Guthrie Cortland MC					0/319	0.0											
Harlem Hospital	0/91	0.0					2/1814	1.1					0/9	0.0	Lev 3	0/604	0.0
HealthAlli Broadway							0/983	0.0									
Highland Hospital							3/1611	1.9									
Hosp for Spec Surg							0/114	0.0									
Huntington Hospital	0/280	0.0					0/557	0.0									
Interfaith Med Ctr							3/1451	2.1									
Jacobi Med Ctr	0/584	0.0			4/1108	3.6			0/1054	0.0			0/41	0.0	Lev 3	2/920	2.2
Jamaica Hospital					1/1971	0.5			2/858	2.3					Lev 3	0/627	0.0
Jones Memorial							0/197	0.0									
Kenmore Mercy							0/1231	0.0									
Kings County Hosp					1/1668	0.6			3/1624	1.8			0/16	0.0	Lev 2/3	0/468	0.0
Kingsbrook Jewish MC							4/1797	2.2									
LIJ at Forest Hills					0/2160	0.0											
LIJ at Valley Stream							0/799	0.0									
LIJ(Long Isl Jewish)	0/635	0.0			1/1569	0.6	0/867	0.0	0/1259	0.0							
Lenox Hill Hospital	0/805	0.0	0/1946	0.0	3/1691	1.8			0/1413	0.0					Lev 2/3	1/1035	1.0
Lincoln Med Ctr					2/2875	0.7			0/713	0.0					Lev 3	1/666	1.5
Long Isl. Community	0/831	0.0			1/915	1.1			4/797	5.0							
Maimonides Med Ctr	5/1571	3.2	2/2686	0.7	4/2476	1.6			2/1749	1.1			1/493	2.0	RPC	0/1837	0.0
Mary Imogene Bassett							2/2987	0.7									
Massena Memorial							0/19	0.0									
Mather Hospital							1/1938	0.5									
Memor SloanKettering							7/5043	1.4					3/1173	2.6			
Mercy Hosp Buffalo			1/2088	0.5			1/3055	0.3									
Mercy Med Ctr							0/1080	0.0							Lev 3	0/202	0.0
Metropolitan Hosp							1/777	1.3							Lev 2/3	0/144	0.0
MidHudson Reg of WMC							0/716	0.0									
Millard Fill. Suburb							0/3463	0.0									

Table 16. Central line-associated bloodstream infection rates by intensive care unit type, New York State 2019

	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	1.36		0.35		0.91		0.68		1.03		0.80		1.24		RPC 0.75/L3 0.81/L23 1.31		
Montefiore-Einstein			1/3103	0.3	6/2116	2.8									RPC	3/2631	1.0
Montefiore-Moses	1/1991	0.5	0/3212	0.0	9/2927	3.1			0/2238	0.0			1/2797	0.4			
Montefiore-Mt Vernon							0/289	0.0									
Montefiore-NewRochl							1/1210	0.8							Lev 3	0/1	0.0
Montefiore-Nyack					0/940	0.0			0/608	0.0							
Montefiore-Wakefield					3/1953	1.5									Lev 2/3	1/505	2.0
Mount St. Marys					0/92	0.0											
Mt Sinai	1/1030	1.0	4/4020	1.0	3/2276	1.3			3/2048	1.5	2/864	2.3	1/2739	0.4	RPC	2/3229	0.6
Mt Sinai Beth Israel	1/373	2.7					0/1754	0.0									
Mt Sinai Brooklyn							1/929	1.1									
Mt Sinai Morningside	2/953	2.1	2/2110	0.9	0/1557	0.0			2/479	4.2							
Mt Sinai Queens							0/871	0.0									
Mt Sinai S Nassau							3/3363	0.9									
Mt Sinai West							1/1266	0.8			0/258	0.0			Lev 3	1/1036	1.0
NY Community Hosp							1/588	1.7									
NYP-Allen							2/1209	1.7									
NYP-Brklyn Methodist	0/662	0.0	0/1232	0.0			4/3800	1.1					0/147	0.0	Lev 3	1/1349	0.7
NYP-Columbia	15/5573	2.7	3/7860	0.4	11/4949	2.2			2/3364	0.6	2/2297	0.9					
NYP-Hudson Valley							0/460	0.0							Lev 2/3	0/11	0.0
NYP-Lawrence					0/1184	0.0											
NYP-Lower Manhattan							1/1752	0.6									
NYP-Morgan Stanley													10/7258	1.4	RPC	2/7228	0.3
NYP-Queens	0/806	0.0	0/603	0.0	0/1287	0.0			1/806	1.2					Lev 3	0/406	0.0
NYP-Weill Cornell	2/3211	0.6	1/4669	0.2	4/3261	1.2			7/3251	2.2	4/1603	2.5	3/2606	1.2	RPC	2/5156	0.4
NYU Langone Brooklyn					0/789	0.0			2/703	2.8					Lev 2/3	0/154	0.0
NYU Orthopedic Hosp									0/52	0.0							
NYU Tisch					3/2386	1.3	6/7145	0.8			0/712	0.0	4/3961	1.0	RPC	3/2429	1.2
NYU Winthrop					0/1703	0.0			1/3478	0.3	0/674	0.0	0/289	0.0	RPC	0/1165	0.0
Nassau University	0/444	0.0			0/1218	0.0			4/279	14.3			0/14	0.0	Lev 3	0/213	0.0
Nathan Littauer							0/617	0.0									
Newark Wayne					0/762	0.0											

Table 16. Central line-associated bloodstream infection rates by intensive care unit type, New York State 2019

	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	1.36		0.35		0.91		0.68		1.03		0.80		1.24		RPC 0.75/L3 0.81/L23 1.31		
Niagara Falls							0/811	0.0									
North Central Bronx							0/278	0.0									
North Shore	0/2121	0.0	1/5614	0.2	2/2368	0.8			1/2155	0.5	1/1370	0.7			RPC	2/1918	1.1
Northern Dutchess							0/400	0.0									
Northern Westchester							0/529	0.0							Lev 3	0/14	0.0
Noyes Memorial							1/316	3.2									
Oishei Childrens													3/1363	2.2	RPC	0/5107	* 0.0
Olean General							1/1141	0.9									
Oneida Healthcare							0/157	0.0									
Orange Regional							3/1845	1.6									
Oswego Hospital					0/159	0.0											
Our Lady of Lourdes							3/849	3.5									
Peconic Bay Medical							0/746	0.0									
Phelps Memorial							0/947	0.0									
Plainview Hospital							2/921	2.2									
Putnam Hospital							0/552	0.0									
Queens Hospital					0/2172	0.0									Lev 3	0/361	0.0
Richmond Univ MC	0/119	0.0			3/2216	1.4			0/1165	0.0			0/33	0.0	Lev 3	2/1498	1.4
Rochester General			2/3846	0.5	0/3710	* 0.0			1/2501	0.4							
Rome Memorial							0/478	0.0									
Roswell Park							4/2801	1.4									
SJRH St Johns							0/1064	0.0									
SUNY Downstate MC	0/348	0.0			2/1046	1.9			0/700	0.0			0/196	0.0	RPC	0/936	0.0
Samaritan AlbanyMem							0/52	0.0									
Samaritan Hosp Troy							3/2432	1.2									
Samaritan- Watertown							1/849	1.2									
Saratoga Hospital					2/1602	1.2											
Sisters of Charity							0/911	0.0							Lev 3	1/1186	0.8
Sisters- St Joseph							0/326	0.0									
South Shore UH			0/1342	0.0	1/526	1.9	0/562	0.0	2/678	2.9							
St Anthony							0/177	0.0									

Table 16. Central line-associated bloodstream infection rates by intensive care unit type, New York State 2019

	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	1.36		0.35		0.91		0.68		1.03		0.80		1.24		RPC 0.75/L3 0.81/L23 1.31		
St Barnabas					0/960	0.0			1/557	1.8					Lev 2/3	0/154	0.0
St Catherine Siena	0/699	0.0					0/813	0.0									
St Charles Hospital					0/826	0.0											
St Elizabeth Medical			2/1176	1.7			1/2027	0.5									
St Francis- Roslyn			0/4701	0.0	0/2056	0.0			1/1995	0.5							
St Johns Episcopal	1/592	1.7			1/777	1.3											
St Joseph- Bethpage							0/1305	0.0									
St Josephs- Syracuse					0/3304	0.0			2/4438	0.5					Lev 2/3	0/210	0.0
St Josephs- Yonkers							0/825	0.0									
St Lukes Cornwall							0/2296	0.0									
St Marys Amsterdam							0/334	0.0									
St Peters Hospital	0/477	0.0	0/1832	0.0	1/3240	0.3									Lev 3	0/533	0.0
Staten Island UNorth			0/1556	0.0			2/4297	0.5					0/31	0.0	Lev 3	0/456	0.0
Staten Island USouth							0/1130	0.0									
Strong Memorial			1/4660	0.2	3/3227	0.9			6/2520	2.4			9/4397	2.0	RPC	6/7230	0.8
Syosset Hospital							0/667	0.0									
UHS Binghamton							0/253	0.0									
UHS Chenango Memor							0/27	0.0									
UHS Wilson	4/1832	2.2	2/1860	1.1											Lev 2/3	0/106	0.0
UPMC Chautauqua					1/1023	1.0											
UVM Champlain Valley							1/1592	0.6									
United Memorial							1/370	2.7									
Unity Hosp Rochester							1/4160	0.2									
UnivHSUNY Upstate			1/3292	0.3	2/6553	0.3			3/3307	0.9	1/3293	0.3	1/1583	0.6			
UnivHStonyBrkSoutham	0/2	0.0			0/440	0.0											
UnivHStonyBrookELI							0/56	0.0									
UnivHStonyBrookU	1/943	1.1	1/2473	0.4	8/1933	4.1			0/2483	0.0	0/47	0.0	0/474	0.0	RPC	1/2790	0.4
Upst. Community Gen							0/1246	0.0									
Vassar Brothers			1/1374	0.7			4/3889	1.0							Lev 2/3	1/513	1.9
Westchester Medical	4/1215	3.3	1/3840	0.3	2/2809	0.7			2/1420	1.4	2/2738	0.7	5/1306	3.8	RPC	8/5209	1.4
White Plains Hosp							0/1900	0.0							Lev 3	0/169	0.0

Table 16. Central line-associated bloodstream infection rates by intensive care unit type, New York State 2019

	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	**1.36**		**0.35**		**0.91**		**0.68**		**1.03**		**0.80**		**1.24**		**RPC 0.75/L3 0.81/L23 1.31**		
Woodhull Med Ctr							1/1180	0.8							Lev 2/3	1/176	5.7
Wyckoff Heights					2/1399	1.4									Lev 3	0/275	0.0
Wyoming County Comm.							0/10	0.0									

New York State data reported as of November 23, 2020. 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 17. Central line-associated bloodstream infection rates by ward type, New York State 2019

	Medical Wards		Medical Surgical Wards		Surgical Wards		Step Down Units		Pediatric Wards		Oncology Wards		Mixed Acuity Wards	
Hospital	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate
State average rate	0.78		0.61		0.72		0.92		1.28		0.97		0.95	
AO Fox Memorial			0/549	0.0	0/316	0.0								
Adirondack Medical			0/641	0.0										
Albany Med Ctr	9/13993	0.6	4/2131	1.9	0/5376	* 0.0	2/1096	1.8	1/2919	0.3				
Arnot Ogden Med Ctr			3/2135	1.4										
Auburn Community Hos			1/458	2.2	0/188	0.0								
Bellevue Hospital	7/4683	1.5	1/405	2.5	1/887	1.1			0/116	0.0				
Blythedale Childrens									9/2423	3.7				
Bon Secours			0/143	0.0	NA	NA								
BronxCare HealthSyst	3/3233	0.9	8/1924	4.2			0/191	0.0	NA	NA				
Brookdale Hospital	3/4249	0.7			1/587	1.7	0/100	0.0	NA	NA				
Brooklyn Hosp Ctr	0/3154	0.0	0/2360	0.0			0/2839	0.0	0/88	0.0				
Brooks Memorial			0/239	0.0										
Buffalo General	10/11970	0.8	2/2063	1.0	0/1902	0.0	3/4708	0.6						
Canton-Potsdam			1/1126	0.9										
Catskill Regional MC			0/272	0.0	0/135	0.0								
Cayuga Medical Ctr			1/1448	0.7					NA	NA				
Claxton-Hepburn			2/1498	1.3										
Clifton Springs	0/1071	0.0												
Cohens Childrens									0/1840	0.0	4/4440	0.9		
Columbia Memorial	0/310	0.0	0/1557	0.0										
Coney Island Hosp	5/4099	1.2	0/85	0.0	0/1220	0.0	0/109	0.0	NA	NA				
Corning Hospital	0/392	0.0			0/366	0.0								
Crouse Hospital			7/7025	1.0										
Eastern Niagara Hosp			0/216	0.0										
Ellis Hospital	3/3854	0.8	0/284	0.0	1/881	1.1	0/324	0.0						
Elmhurst Hospital	2/1662	1.2	2/1202	1.7	1/784	1.3			NA	NA				
Erie County Med Ctr			6/9058	0.7										
FF Thompson	0/1416	0.0	0/484	0.0										
Faxton St. Lukes			1/2590	0.4	3/1498	2.0	6/2073	2.9	0/80	0.0	1/2870	0.3		
Flushing Hospital			3/2232	1.3					NA	NA				
Geneva General	0/564	0.0	0/643	0.0										
Glen Cove Hospital			0/400	0.0	0/79	0.0								

Table 17. Central line-associated bloodstream infection rates by ward type, New York State 2019

	Medical Wards		Medical Surgical Wards		Surgical Wards		Step Down Units		Pediatric Wards		Oncology Wards		Mixed Acuity Wards	
Hospital	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate
State average rate	**0.78**		**0.61**		**0.72**		**0.92**		**1.28**		**0.97**		**0.95**	
Glens Falls Hospital	1/1432	0.7	0/305	0.0	0/460	0.0					0/1615	0.0		
Good Samar. Suffern			0/4250	0.0										
Good Samar. W Islip	1/2573	0.4	0/577	0.0	0/857	0.0	NA	NA	0/95	0.0	1/1217	0.8		
Guthrie Cortland MC	0/327	0.0	0/241	0.0										
Harlem Hospital	0/1191	0.0			1/921	1.1			NA	NA				
HealthAlli Broadway	0/714	0.0	0/602	0.0	0/1000	0.0								
HealthAlli MarysAve					0/130	0.0								
Highland Hospital	3/4266	0.7	0/3847	0.0	0/1656	0.0							0/1639	0.0
Hosp for Spec Surg			1/2661	0.4			0/214	0.0	0/53	0.0				
Huntington Hospital	0/469	0.0	0/836	0.0	0/142	0.0			NA	NA	0/808	0.0		
Interfaith Med Ctr			1/2779	0.4					NA	NA				
Jacobi Med Ctr	1/2577	0.4	2/1308	1.5	1/196	5.1	2/180	11.1	NA	NA				
Jamaica Hospital			2/2996	0.7	0/787	0.0			NA	NA			2/910	2.2
Jones Memorial			0/454	0.0										
Kenmore Mercy			0/2354	0.0	NA	NA								
Kings County Hosp	0/2272	0.0	3/3305	0.9	2/760	2.6			NA	NA				
Kingsbrook Jewish MC	4/4112	1.0	1/686	1.5										
LIJ at Forest Hills	1/2621	0.4	NA	NA	0/321	0.0								
LIJ at Valley Stream			0/865	0.0	NA	NA	NA	NA						
LIJ(Long Isl Jewish)	5/7053	0.7	0/1734	0.0	1/2512	0.4	NA	NA						
Lenox Hill Hospital	3/2603	1.2	0/346	0.0	1/1330	0.8	0/1158	0.0						
Lincoln Med Ctr	2/1519	1.3			0/922	0.0	7/1825	3.8	NA	NA			NA	NA
Long Isl. Community	2/1286	1.6	2/929	2.2									2/599	3.3
Maimonides Med Ctr	13/5826	2.2	1/984	1.0			1/883	1.1	1/1024	1.0				
Mary Imogene Bassett	0/1111	0.0	1/614	1.6	1/1888	0.5	1/1030	1.0					NA	NA
Massena Memorial			0/69	0.0			NA	NA						
Mather Hospital			1/2458	0.4	1/969	1.0	1/1789	0.6						
Memor SloanKettering											89/80632	1.1		
Mercy Hosp Buffalo	0/413	0.0	2/5186	0.4	0/1118	0.0	0/614	0.0						
Mercy Med Ctr	0/402	0.0	0/245	0.0			0/448	0.0			0/1254	0.0		
Metropolitan Hosp	0/1141	0.0			0/324	0.0			NA	NA				
MidHudson Reg of			0/1816	0.0			1/694	1.4						

Table 17. Central line-associated bloodstream infection rates by ward type, New York State 2019

	Medical Wards		Medical Surgical Wards		Surgical Wards		Step Down Units		Pediatric Wards		Oncology Wards		Mixed Acuity Wards	
Hospital	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate
State average rate	0.78		0.61		0.72		0.92		1.28		0.97		0.95	
Millard Fill. Suburb			5/7072	0.7										
Montefiore-Einstein	7/6185	1.1			8/3646	2.2					5/2519	2.0		
Montefiore-Moses	15/18006	0.8	2/1203	1.7	5/3779	1.3			9/5548	1.6	7/4266	1.6		
Montefiore-Mt Vernon			0/381	0.0			0/171	0.0						
Montefiore-NewRochl			3/577	5.2	0/324	0.0	2/506	4.0						
Montefiore-Nyack			0/1419	0.0			0/732	0.0	0/127	0.0				
Montefiore-Wakefield	7/3487	2.0	0/341	0.0										
Mount St. Marys			0/519	0.0										
Mt Sinai	16/6425	2.5	4/3136	1.3	6/3750	1.6	0/450	0.0	4/1387	2.9	15/17053	0.9	0/773	0.0
Mt Sinai Beth Israel	0/2328	0.0	1/1202	0.8	NA	NA	0/172	0.0			0/81	0.0		
Mt Sinai Brooklyn	0/2605	0.0			1/476	2.1								
Mt Sinai Morningside	3/2564	1.2	0/582	0.0	0/1209	0.0								
Mt Sinai Queens	3/2369	1.3			0/714	0.0								
Mt Sinai S Nassau			2/6399	0.3			1/4182	0.2	0/179	0.0				
Mt Sinai West	1/780	1.3	2/1949	1.0	0/389	0.0								
NY Community Hosp			0/199	0.0			1/596	1.7						
NYP-Allen	5/1737	2.9	0/538	0.0										
NYP-Brklyn Methodist	2/1974	1.0	1/4631	0.2	2/1115	1.8	0/517	0.0	0/873	0.0			NA	NA
NYP-Columbia	16/12357	1.3	8/6593	1.2	5/4463	1.1					12/12280	1.0		
NYP-Hudson Valley			0/1335	0.0			0/71	0.0					2/260	7.7
NYP-Lawrence			0/3165	0.0					NA	NA				
NYP-Lower Manhattan			2/2761	0.7										
NYP-Morgan Stanley									7/8122	0.9				
NYP-Queens	0/5940	* 0.0			0/1266	0.0	0/86	0.0	NA	NA				
NYP-Weill Cornell	8/8875	0.9	4/4201	1.0	7/4156	1.7	1/482	2.1	3/1910	1.6	25/15894	1.6		
NYU Langone Brooklyn	0/2638	0.0	0/577	0.0	2/801	2.5	0/294	0.0	NA	NA				
NYU Orthopedic Hosp							NA	NA						
NYU Tisch	9/5780	1.6	2/3284	0.6	0/4206	* 0.0			2/2002	1.0	3/3798	0.8		
NYU Winthrop	2/7498	0.3	0/1268	0.0	1/941	1.1			1/574	1.7			NA	NA
Nassau University	0/1888	0.0	0/107	0.0	NA	NA			NA	NA				
Nathan Littauer			1/719	1.4										
Newark Wayne	0/1146	0.0												

Table 17. Central line-associated bloodstream infection rates by ward type, New York State 2019

	Medical Wards		Medical Surgical Wards		Surgical Wards		Step Down Units		Pediatric Wards		Oncology Wards		Mixed Acuity Wards	
Hospital	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate
State average rate	**0.78**		**0.61**		**0.72**		**0.92**		**1.28**		**0.97**		**0.95**	
Niagara Falls					0/741	0.0	0/696	0.0						
North Central Bronx	0/475	0.0	0/62	0.0										
North Shore	3/5510	0.5	5/2671	1.9	3/5177	0.6	NA	NA			4/9414	0.4		
Northern Dutchess	0/314	0.0	0/933	0.0										
Northern Westchester	1/1792	0.6			0/506	0.0			NA	NA				
Noyes Memorial	1/434	2.3												
Oishei Childrens									4/1505	2.7	3/2372	1.3		
Olean General	2/2255	0.9			0/270	0.0								
Oneida Healthcare			0/494	0.0										
Orange Regional	6/3777	1.6	3/647	4.6										
Oswego Hospital			0/680	0.0										
Our Lady of Lourdes	2/2616	0.8	0/214	0.0	0/983	0.0								
Peconic Bay Medical			0/1583	0.0			0/261	0.0						
Phelps Memorial	1/956	1.0	1/349	2.9										
Plainview Hospital	0/1030	0.0	0/396	0.0			NA	NA						
Putnam Hospital			0/1305	0.0										
Queens Hospital	1/2149	0.5	0/1256	0.0	1/337	3.0	0/773	0.0						
Richmond Univ MC	1/1270	0.8			0/402	0.0							2/782	2.6
Rochester General	8/7387	1.1	1/6196	0.2	4/3979	1.0					5/3587	1.4	2/4257	0.5
Rome Memorial	0/104	0.0					1/366	2.7						
Roswell Park											19/26390	0.7		
SJRH Dobbs Ferry			NA	NA										
SJRH St Johns	0/1552	0.0	0/790	0.0										
SUNY Downstate MC	2/3378	0.6			2/1215	1.6	1/1347	0.7	1/210	4.8				
Samaritan AlbanyMem	0/185	0.0												
Samaritan Hosp Troy	0/376	0.0	2/1950	1.0			3/1222	2.5						
Samaritan- Watertown	0/71	0.0	1/3109	0.3									NA	NA
Saratoga Hospital	1/3755	0.3			NA	NA								
Sisters of Charity	1/2046	0.5	0/1543	0.0	0/827	0.0								
Sisters- St Joseph			0/966	0.0	0/96	0.0								
South Shore UH	0/437	0.0	1/4461	0.2			1/556	1.8	NA	NA				
St Anthony			0/205	0.0										

Table 17. Central line-associated bloodstream infection rates by ward type, New York State 2019

	Medical Wards		Medical Surgical Wards		Surgical Wards		Step Down Units		Pediatric Wards		Oncology Wards		Mixed Acuity Wards	
Hospital	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate
State average rate	**0.78**		**0.61**		**0.72**		**0.92**		**1.28**		**0.97**		**0.95**	
St Barnabas	NA	NA	2/2041	1.0			0/403	0.0						
St Catherine Siena	0/2746	0.0			0/340	0.0								
St Charles Hospital			0/904	0.0										
St Elizabeth Medical			5/2551	2.0			2/1484	1.3						
St Francis- Roslyn			3/6455	0.5			0/1365	0.0						
St Johns Episcopal			1/2299	0.4					NA	NA				
St Joseph- Bethpage			0/950	0.0			0/193	0.0					0/65	0.0
St Josephs- Syracuse			1/10022	* 0.1							0/1789	0.0	0/1431	0.0
St Josephs- Yonkers			1/1017	1.0			0/73	0.0	NA	NA				
St Lukes Cornwall			0/2752	0.0									0/57	0.0
St Marys Amsterdam			1/1012	1.0	0/454	0.0	1/613	1.6						
St Peters Hospital	6/10120	0.6	1/6405	0.2			0/2324	0.0						
Staten Island UNorth			6/2847	2.1	0/604	0.0	0/56	0.0	0/95	0.0				
Staten Island USouth			0/714	0.0										
Strong Memorial	3/13709	* 0.2			5/9438	0.5	1/269	3.7	3/3784	0.8	14/11328	1.2	5/4067	1.2
Sunnyview Rehab Hosp			0/83	0.0										
Syosset Hospital	0/163	0.0	NA	NA	NA	NA								
UHS Binghamton			0/910	0.0										
UHS Chenango Memor			0/105	0.0										
UHS Wilson	0/139	0.0	3/5689	0.5	0/541	0.0	1/359	2.8			1/1567	0.6		
UPMC Chautauqua	1/941	1.1	2/789	2.5									0/607	0.0
UVM Alice Hyde			0/352	0.0									NA	NA
UVM Champlain Valley			1/2825	0.4			2/1656	1.2	NA	NA				
United Memorial	0/592	0.0			0/177	0.0								
Unity Hosp Rochester			7/13253	0.5										
UnivHSUNY Upstate	3/9864	0.3			3/4278	0.7	0/914	0.0	1/1490	0.7	8/9449	0.8	0/57	0.0
UnivHStonyBrkSoutham			0/1463	0.0										
UnivHStonyBrookELI			NA	NA										
UnivHStonyBrookU	5/4776	1.0			3/7287	0.4	2/476	4.2	2/626	3.2	0/5271	* 0.0	1/1318	0.8
Upst. Community Gen	0/1132	0.0	1/1586	0.6										
Vassar Brothers	1/3918	0.3			0/656	0.0	0/2344	0.0	0/56	0.0	0/1870	0.0		
Westchester Medical	2/2760	0.7	3/5447	0.6	1/2147	0.5	4/4902	0.8	2/1883	1.1	9/10252	0.9		

Table 17. Central line-associated bloodstream infection rates by ward type, New York State 2019

	Medical Wards		Medical Surgical Wards		Surgical Wards		Step Down Units		Pediatric Wards		Oncology Wards		Mixed Acuity Wards	
Hospital	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate
State average rate	**0.78**		**0.61**		**0.72**		**0.92**		**1.28**		**0.97**		**0.95**	
White Plains Hosp			2/3940	0.5			2/2014	1.0						
Woodhull Med Ctr			2/2064	1.0	0/230	0.0	0/369	0.0	NA	NA				
Wyckoff Heights			1/3455	0.3			0/458	0.0	NA	NA				

New York State data reported as of November 23, 2020. — 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.

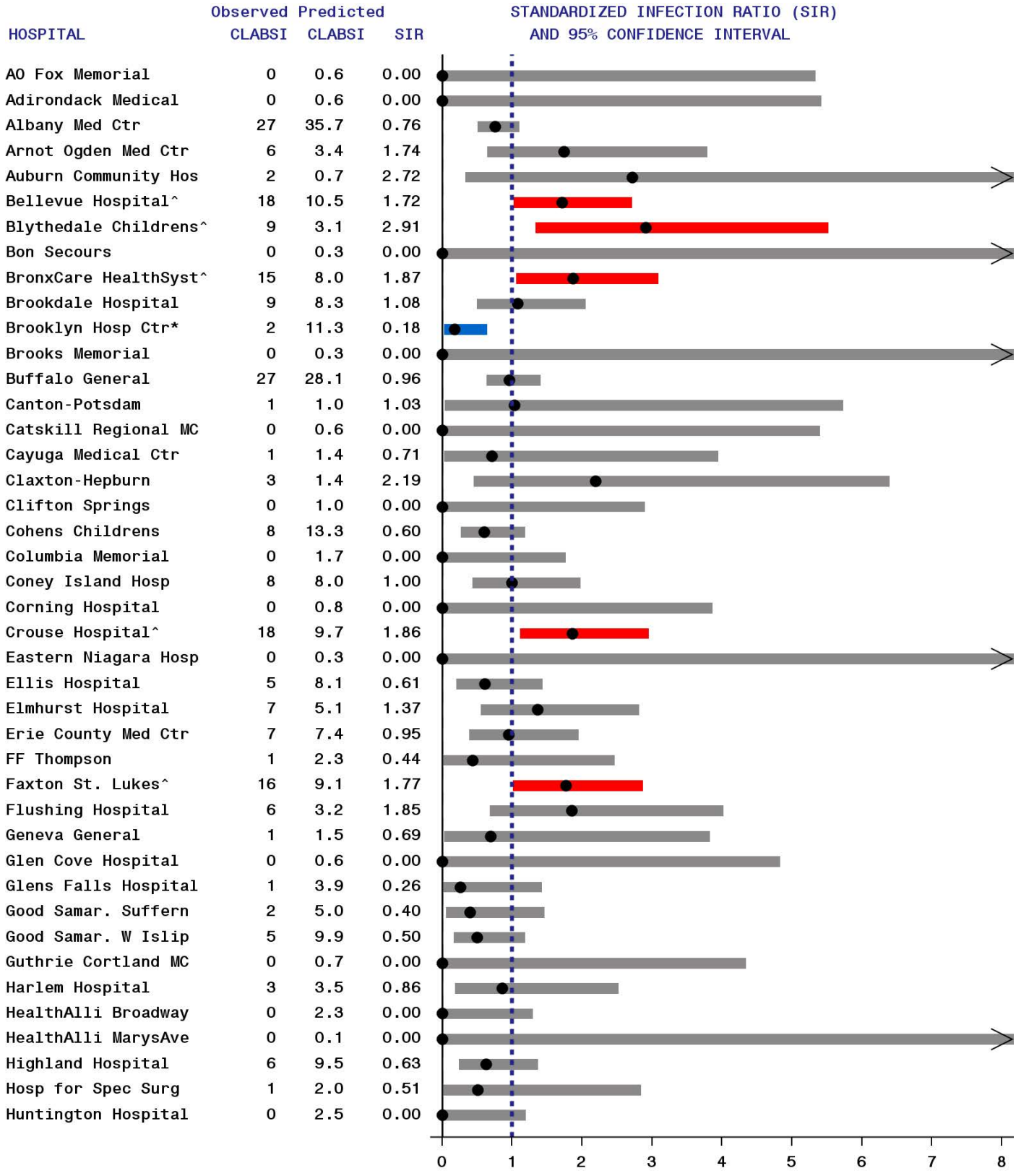
Hospital-Specific, CLABSI Standardized Infection Ratios

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.

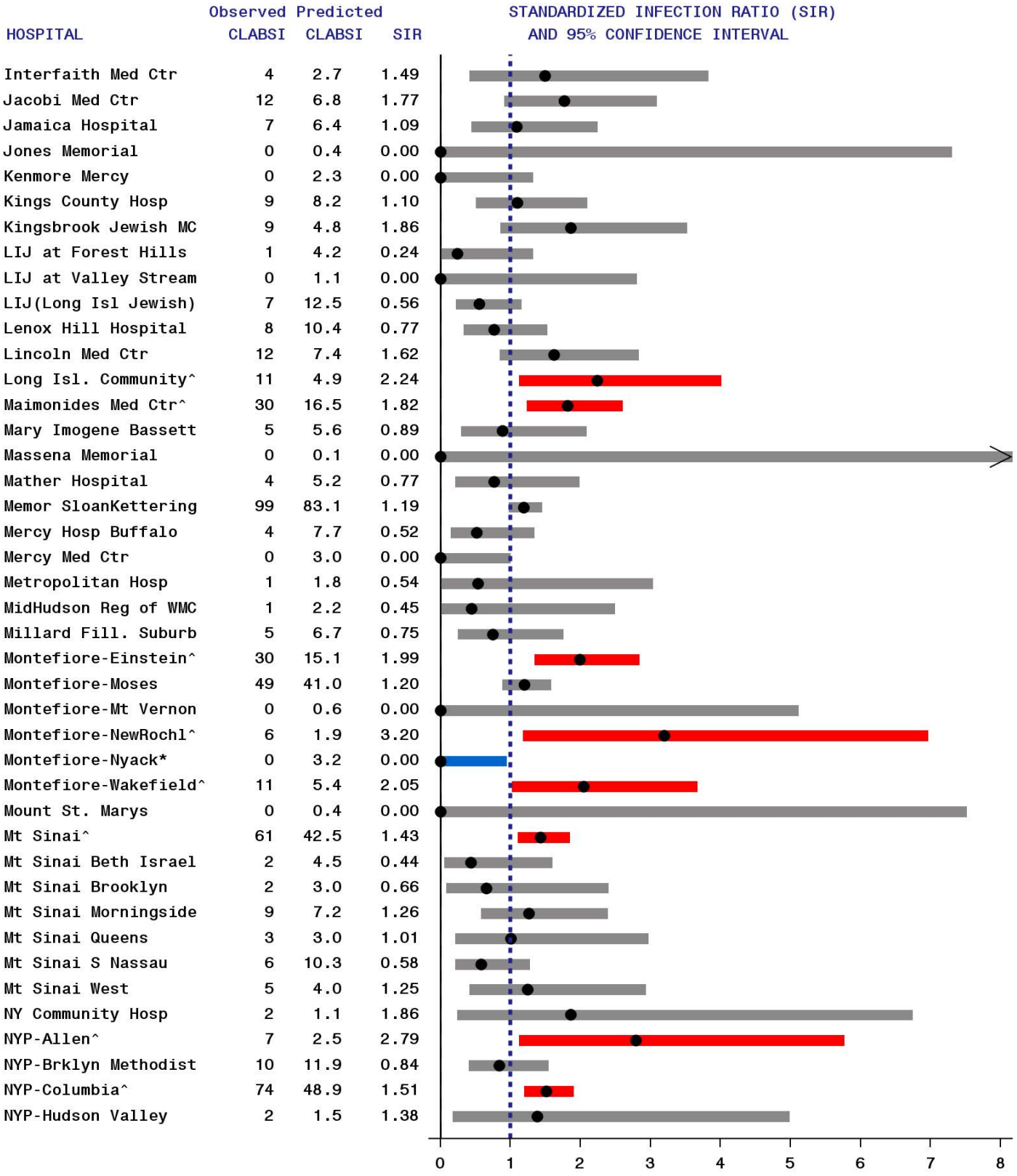
Figure 13 provides hospital-specific CLABSI SIRs for each hospital. Sixteen hospitals (10%) had high SIR flags in 2019; two (Bellevue Hospital and New York-Presbyterian/Weill Cornell Hospital) were high for three consecutive years, and one (Mt. Sinai Hospital) was high for four consecutive years. These hospitals will submit improvement plans following the NYSDOH HAI Reporting Program's Policy for Facilities with Consecutive Years of High HAI Rates. Eleven hospitals (7%) had low SIR flags; St. Joseph's Hospital (Syracuse), University Hospital SUNY Upstate, and Brooklyn Hospital Center were low for three consecutive years; St. Francis Hospital and Heart Center was low for four consecutive years, and St. Peter's Hospital was low for five consecutive years.

Figure 13. Central line-associated bloodstream infection standardized infection ratios for intensive care units and medical/surgical/medical-surgical/stepdown/oncology/mixed acuity wards: New York 2019 (page 1 of 4)



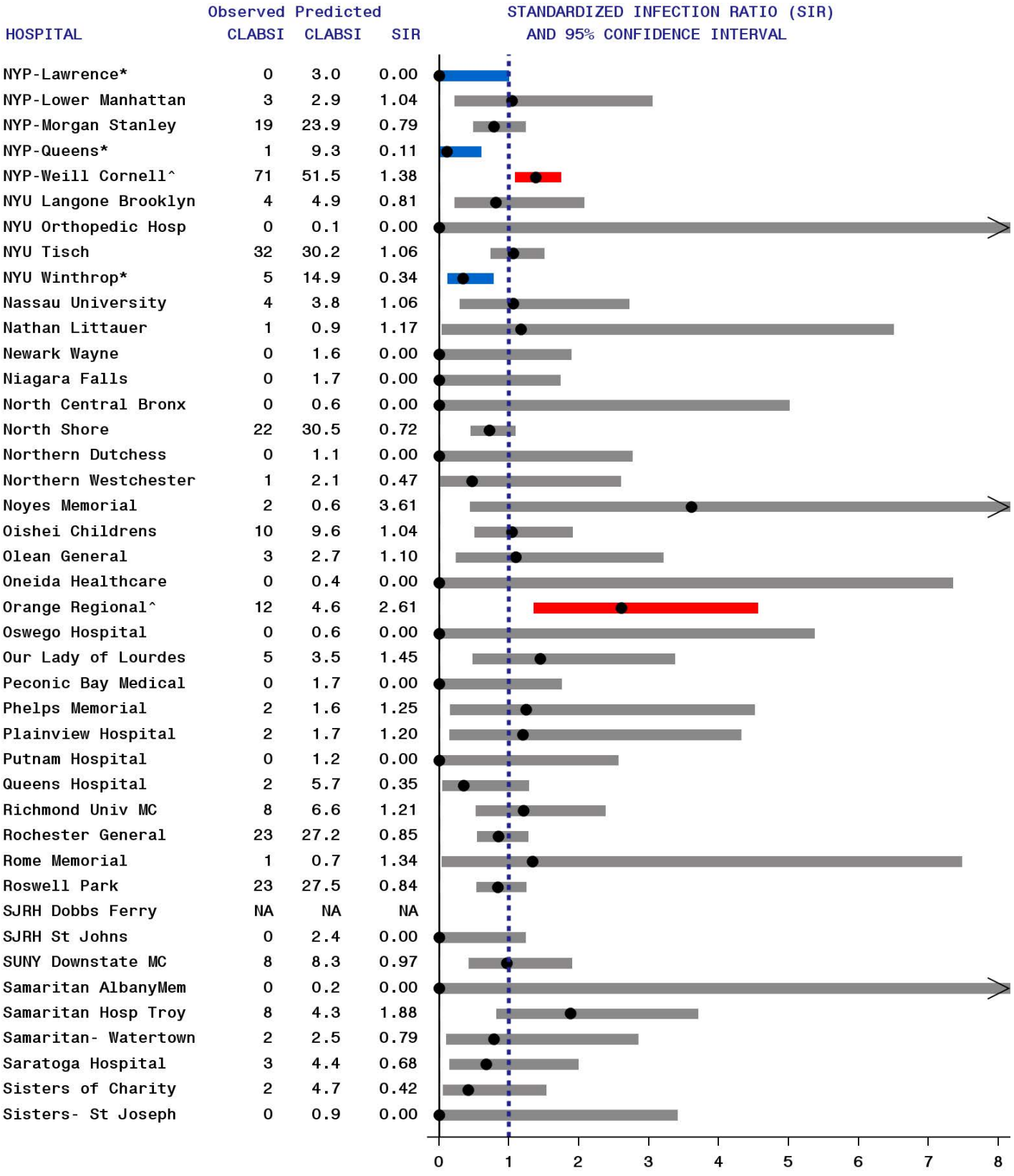
Data reported as of November 23, 2020. ┆ State Average. ● SIR. ▬^^Significantly higher than state average. ▬**Significantly lower than state average. ▬Average. > Upper confidence limit exceeds graph area. NA: less than 50 central line days. Predicted based on NYS 2019 average, adjusting for location and birthweight. Excludes mucosal barrier injury CLABSI and bloodstream infections associated with use of extracorporeal membrane oxygenation and ventricular assist devices.

Figure 13. Central line-associated bloodstream infection standardized infection ratios for intensive care units and medical/surgical/medical-surgical/stepdown/oncology/mixed acuity wards: New York 2019 (page 2 of 4)



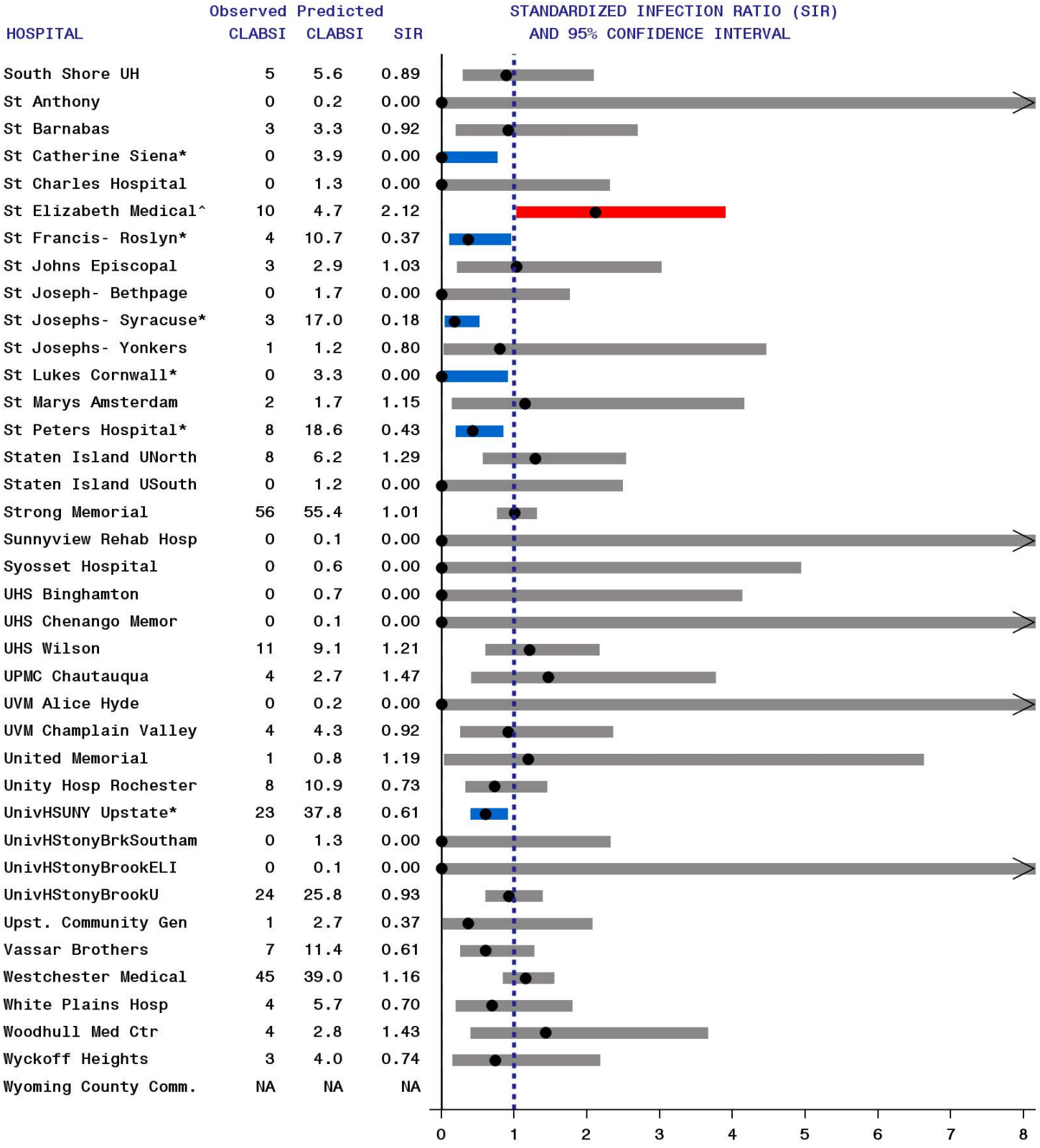
Data reported as of November 23, 2020. ┆ State Average. ● SIR. ▬ ^^Significantly higher than state average. ▬ **Significantly lower than state average. ▬ Average. > Upper confidence limit exceeds graph area. NA: less than 50 central line days. Predicted based on NYS 2019 average, adjusting for location and birthweight. Excludes mucosal barrier injury CLABSI and bloodstream infections associated with use of extracorporeal membrane oxygenation and ventricular assist devices.

Figure 13. Central line-associated bloodstream infection standardized infection ratios for intensive care units and medical/surgical/medical-surgical/stepdown/oncology/mixed acuity wards: New York 2019 (page 3 of 4)



Data reported as of November 23, 2020. ┆ 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 2019 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 13. Central line-associated bloodstream infection standardized infection ratios for intensive care units and medical/surgical/medical-surgical/stepdown/oncology/mixed acuity wards: New York 2019 (page 4 of 4)



Data reported as of November 23, 2020. ┆ 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 2019 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.

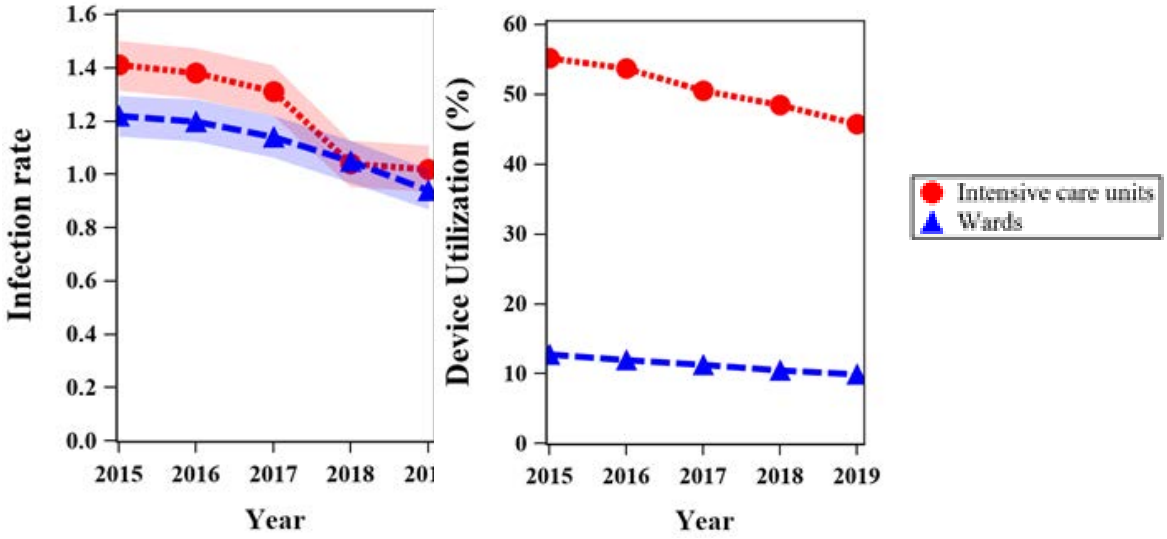
Catheter-Associated Urinary Tract Infections (CAUTIs)

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 2019, the CAUTI rate declined 25%, from 1.30 infections per 1,000 catheter days in 2015, to 0.98 infections per 1,000 catheter days in 2019. The decline was greater in ICUs (28%) than in wards (23%). Catheter utilization decreased from 55% to 46% in ICUs, and from 13% to 10% in wards (Figure 14).

Figure 14. Catheter-associated urinary tract infection and device utilization rates, New York State 2015-2019



year	Location	# Hospitals	# Catheter associated urinary tract infections	# Urinary catheter days	Catheter associated urinary tract infection rate[1]	# 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
2019	Intensive Care Unit	159	545	535,772	1.02	1,169,651	45.8
2015	Medical and Surgical Ward	167	987	812,276	1.22	6,332,292	12.8
2016	Medical and Surgical Ward	171	908	757,072	1.20	6,325,408	12.0
2017	Medical and Surgical Ward	169	800	702,789	1.14	6,220,021	11.3
2018	Medical and Surgical Ward	166	699	668,867	1.05	6,349,777	10.5
2019	Medical and Surgical Ward	160	598	635,228	0.94	6,361,366	10.0
2015	TOTAL	169	1888	1,453,545	1.30	7,492,657	19.4
2016	TOTAL	173	1763	1,378,634	1.28	7,481,743	18.4
2017	TOTAL	171	1563	1,284,521	1.22	7,369,755	17.4
2018	TOTAL	169	1275	1,224,742	1.04	7,496,631	16.3
2019	TOTAL	164	1143	1,171,000	0.98	7,531,017	15.5

[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 November 12, 2020.

The most common microorganism identified in CAUTIs in intensive care units and medical surgical wards was *E. coli.* (Table 18).

Table 18. Microorganisms identified in catheter-associated urinary tract infections, New York State 2019

Microorganism	Number of Isolates	Percent of Infections
Escherichia coli	413	36.1
(CRE-*E. coli*)	(1)	(0.1)
Klebsiella spp.	235	20.6
(CRE-*Klebsiell*a)	(16)	(1.4)
Enterococci	186	16.3
(VRE)	(43)	(3.8)
Pseudomonas spp.	173	15.1
Proteus spp.	92	8.0
Enterobacter spp.	39	3.4
(CRE-*Enterobacter*)	(3)	(0.3)
Coagulase negative staphylococci	29	2.5
Citrobacter spp.	26	2.3
Staphylococcus aureus	18	1.6
(MRSA)	(9)	(0.8)
Serratia spp.	16	1.4
Morganella morganii	11	1.0
Acinetobacter spp.	8	0.7
(MDRO-*Acinetobacter*)	(3)	(0.3)
Providencia spp.	6	0.5
Streptococci	5	0.4
Other	16	1.4

New York State data reported as of November 12, 2020. Out of 1,143 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.

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.

- 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.

    - 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.

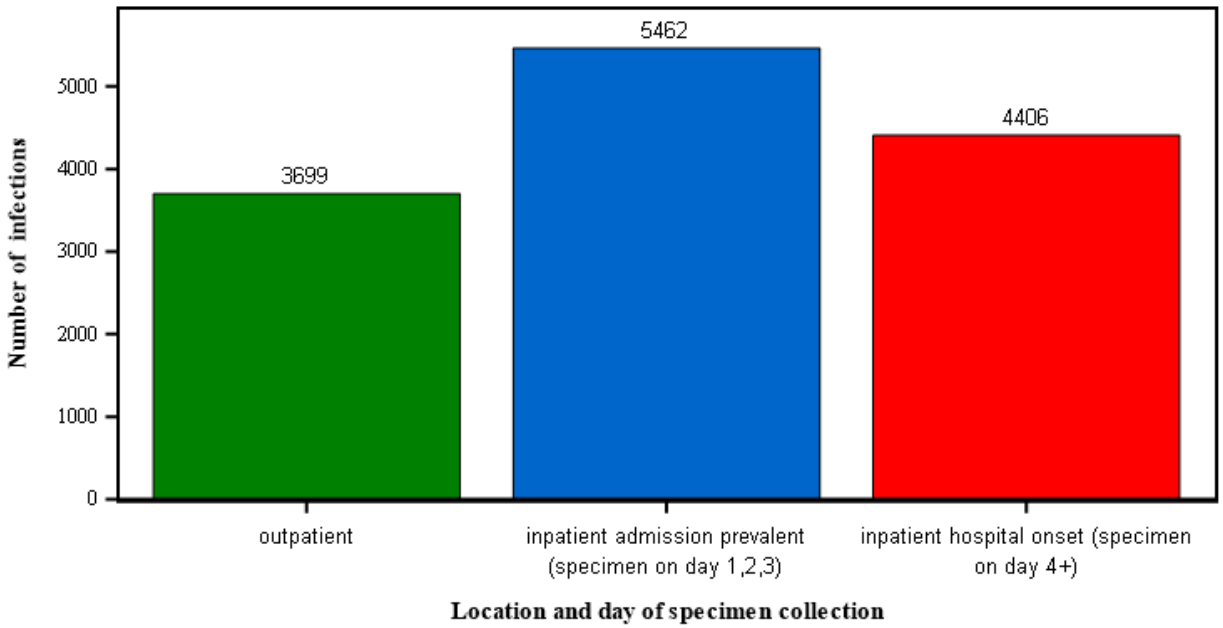
Between 2015 and 2018, NYS counted patients whose positive CDI specimen was collected in the ED and who were admitted to the hospital on the same day as the specimen collection as admission prevalent cases. However, in 2019 NHSN changed the application such that the admission date associated with outpatient tests could no longer be entered by IPs. To avoid bias caused by this definition change, analysis of statewide CDI trends for the 2019 report excludes outpatient cases from all admission prevalence rates. However, previously calculated (2015-2018) hospital-specific HO CDI rates (which adjust for the admission prevelance rate) were not recalculated.

CDI cases are also classified based on whether or not the patient recently had another positive CDI test. Cases occurring more than eight weeks after a previous positive test in the same patient at the same hospital are considered "incident" (i.e. new), as are cases when the positive test is the first for that patient. Cases occurring more than two weeks and less than or equal to eight weeks after a previous positive test are called "recurrent". Cases occurring less than or equal to two weeks after a previous positive are considered duplicates.

Clostridioides difficile Infections (CDI)

In 2019, 13,567 CDI events were reported by acute care hospitals: 27% were identified in ED/OBS units (outpatient), 40% were identified in the FWI areas during the first three days of hospitalization, and 32% were identified in the FWI areas after the first three days of inpatient stay (Figure 15).

Figure 15. *Clostridioides difficile* onset, New York State, 2019



Data reported as of November 23, 2021. Includes recurrent cases. Excludes inpatient rehabilitation and inpatient psychiatric facilities.

Laboratory Testing for CDI

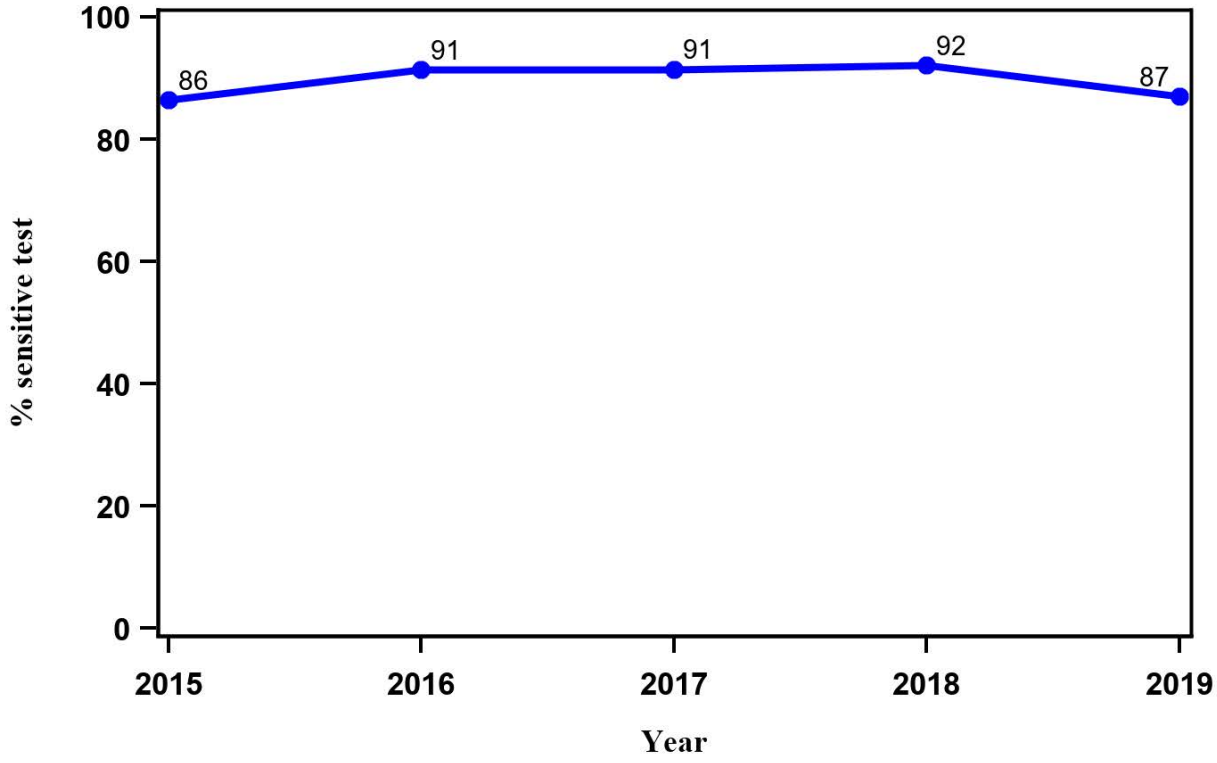
Several CDI laboratory testing methods are available. The methods vary in sensitivity (ability to detect a true positive), specificity (ability to detect a true negative), timeliness, and cost. Testing methods may have an impact on observed CDI rates, with an increased number of cases detected with a change to a more sensitive test method (i.e. nucleic acid amplification tests (NAAT)). Table 19 summarizes the testing methods reported by hospitals in December 2019.

Table 19. *C. difficile* test method, New York State Hospitals, December 2019

Test method	More or less sensitive	Number (%) of hospitals
Enzyme immunoassay (EIA) for toxin	less	9 (5%)
Glutamate dehydrogenase (GDH) antigen plus EIA for toxin (2-step algorithm)	less	10 (6%)
Nucleic acid amplification tests (NAAT) plus EIA, if NAAT-positive (2-step algorithm)	less	9 (5%)
GDH plus EIA for toxin, followed by NAAT for discrepant results	more	44 (26%)
GDH plus NAAT (2-step algorithm)	more	7 (4%)
NAAT	more	88 (53%)

The percentage of patient days surveilled using more sensitive tests decreased by 5 percentage points between 2018 and 2019 (Figure 16).

Figure 16. Percent of patient days using sensitive laboratory test method for *C. difficile*, New York State 2015-2019

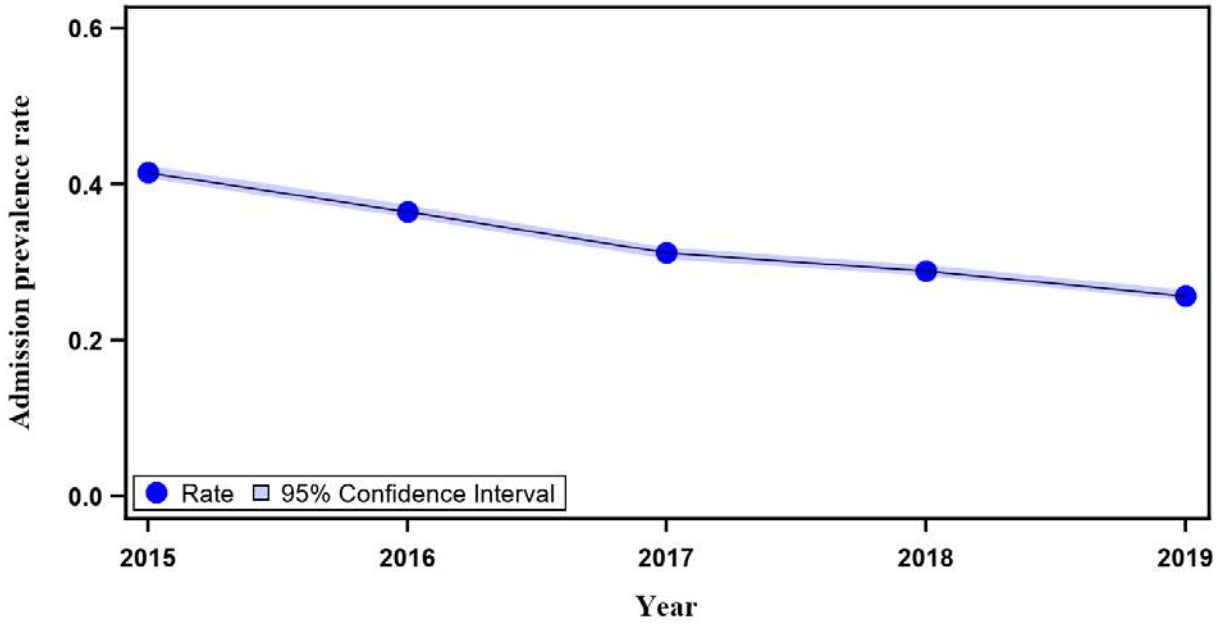


Data reported as of November 23, 2020.

Admission Prevalence

The admission prevalence rate describes the percentage of patients admitted to hospitals with CDIs. In 2019, there were 5,476 of these cases out of 2,133,298 admissions, for a rate of 0.26% (Figure 17). This was a decrease of 38% compared to 2015.

Figure 17. Trend in *C. difficile* admission prevalence rate, New York State 2015-2019



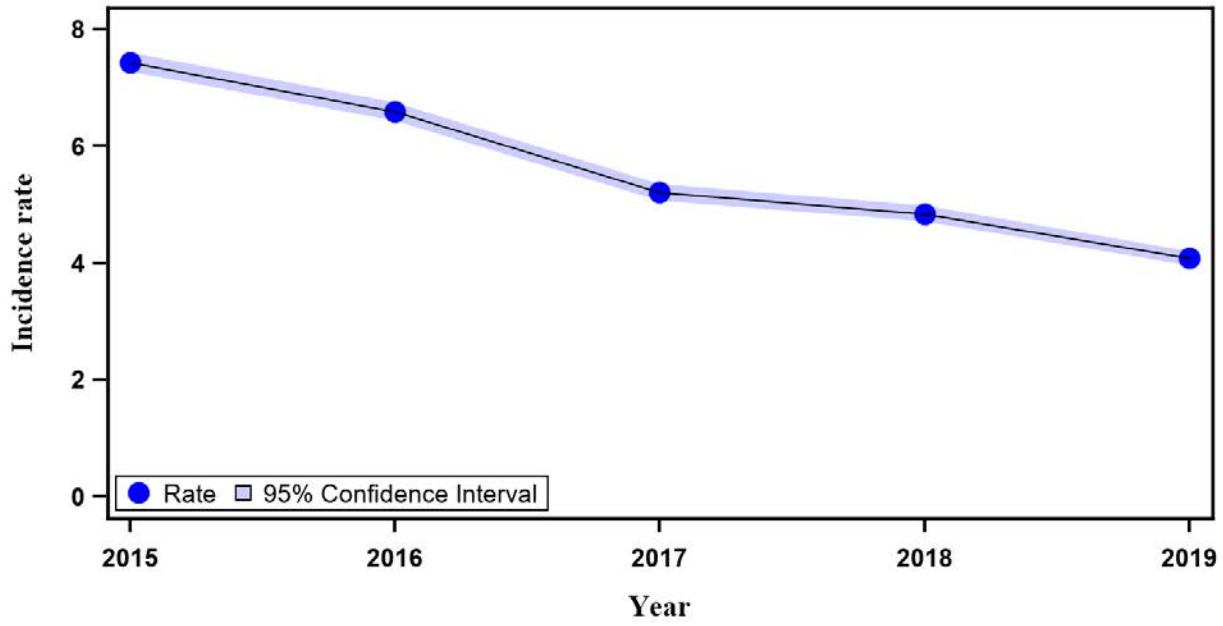
Year	# Hospitals	# Admission Prevalent Infections	# Admissions	Admission Prevalence Rate	% Discharged from Same Hospital in Previous 28 Days
2015	175	8,746	2,106,161	0.415	26%
2016	178	7,698	2,111,418	0.365	24%
2017	177	6,756	2,167,024	0.312	25%
2018	175	6,237	2,157,554	0.289	26%
2019	167	5,476	2,133,298	0.257	24%

Data reported as of November 23, 2020. Excludes cases identified in the emergency room, inpatient rehabilitation facilities, 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.

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 4.07 per 10,000 patient days in 2019 (Figure 18), a decrease of 45% compared to 2015.

Figure 18. Trend in *Clostridioides difficile* hospital onset rates, New York State 2015-2019



Year	# Hospitals	# Hospital Onset Infections	# Patient Days	Hospital Onset Rate
2015	175	7,870	10,590,347	7.43
2016	178	6,932	10,525,449	6.59
2017	177	5,449	10,470,731	5.20
2018	175	5,058	10,450,692	4.84
2019	167	4,241	10,412,350	4.07

Data reported as of November 23, 2020. 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 *a priori* to 1.5 times higher than hospitals performing less sensitive tests.

- Hospital CO-NMH prevalence rate – As the CO-NMH rate increased by 0.2 cases per 100 admissions, the HO rate increased by a factor of 1.5. (The CO-NMH rate ranged from 0 to 0.9 case per 100 admissions.)

- Hospital bed size, as reported in 2019 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 1.9 times higher than the rate at hospitals with less than 100 beds.

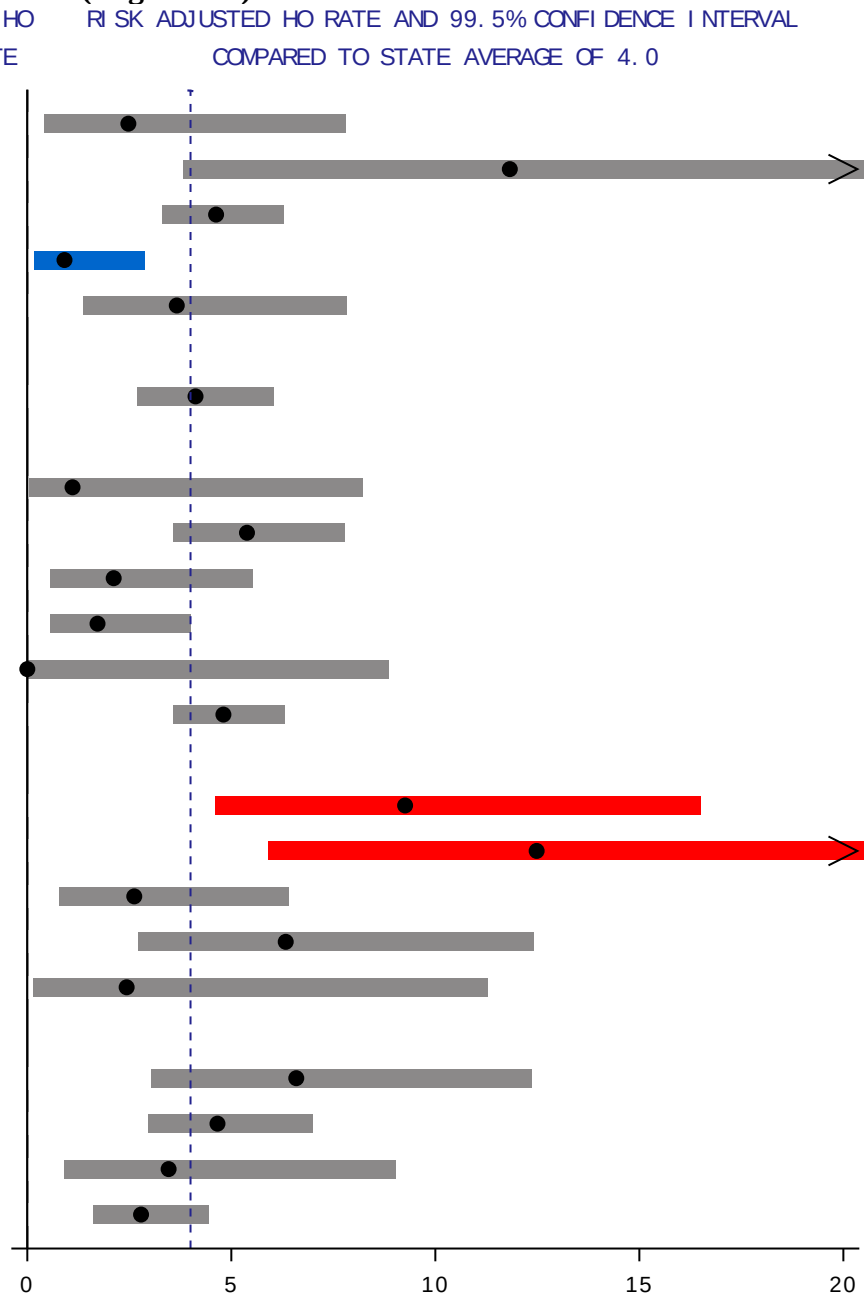
- Percent of patient days in adult intensive care units – This was calculated by dividing the number of adult ICU patient days (from the CLABSI summary data) by the number of CDI patient days (from the MDRO summary data). As percent ICU days increased 10%, the HO rate increased by a factor of 1.1.

Hospital-specific FWI HO CDI rates are summarized in Figure 19. Twelve specialty hospitals (e.g. children's, maternity, orthopedic/surgical, oncology, long term acute care, and freestanding rehabilitation) were excluded from the risk adjustment model because there was insufficient data to compare the hospital rates. The remaining 155 hospitals contributed 3,895 HO CDIs among 9,847,680 patient days, for an average HO rate of 3.96 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 2019, 15 out of 155 hospitals (10%) were flagged with adjusted rates significantly higher than the state average; Montefiore Moses Medical Center was flagged high for four consecutive years, New York Presbyterian/Weill Cornell was flagged high for five 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. Thirteen hospitals (8%) were flagged significantly lower than average. Mount Sinai West and Mount Sinai Beth Israel were low for the last four consecutive years, and Mt. Sinai Morningside, Mount Sinai Brooklyn, New York Presbyterian/Queens, and Montefiore-Nyack Hospital were significantly lower than average for the last three consecutive years.

Figure 19. Hospital onset facility-wide inpatient *C. difficile* rates, New York State 2019 (Page 1 of 7)

HOSPITAL	TEST METH	# OP	# CO-NMH	# CO-PMH	# HO	# PATDAYS	CO-NMH RATE	RAW HO RATE	ADJ HO RATE
AO Fox Memorial	S	3	0	0	4	8,172	0.9	4.9	2.5
Adirondack Medical	S	14	0	4	8	8,274	0.3	9.7	11.8
Albany Med Ctr	N	24	0	17	67	191,560	0.1	3.5	4.6
Arnot Ogden Med Ctr*	S	22	0	6	4	44,113	0.3	0.9	0.9
Auburn Community Hos	S	14	0	5	10	15,373	0.7	6.5	3.7
Bellevue Ellis	S	NA	NA	NA	NA	6,692	0.0	NA	NA
Bellevue Hospital	S	21	0	6	43	102,218	0.1	4.2	4.1
Blythedale Childrens	S	NA	NA	NA	NA	27,875	0.0	NA	NA
Bon Secours	S	8	0	3	1	7,245	0.5	1.4	1.1
BronxCare HealthSyst	S	5	0	16	46	111,727	0.2	4.1	5.4
Brookdale Hospital	N	4	0	1	6	68,515	0.0	0.9	2.1
Brooklyn Hosp Ctr	S	16	0	2	8	77,321	0.0	1.0	1.7
Brooks Memorial	S	7	0	1	0	6,847	0.3	0.0	0.0
Buffalo General	S	38	0	11	86	143,433	0.2	6.0	4.8
Calvary Hospital	N	NA	NA	NA	NA	77,817	0.0	NA	NA
Canton-Potsdam^	S	25	0	8	18	16,862	0.5	10.7	9.3
Catskill Regional MC^	S	14	0	4	16	15,591	0.3	10.3	12.5
Cayuga Medical Ctr	S	18	0	10	7	28,677	0.3	2.4	2.6
Claxton-Hepburn	S	26	0	1	13	10,585	0.6	12.3	6.3
Clifton Springs	S	2	0	1	2	15,986	0.1	1.3	2.4
Cohens Childrens	S	NA	NA	NA	NA	39,175	0.1	NA	NA
Columbia Memorial	S	57	0	3	15	20,593	0.4	7.3	6.6
Coney Island Hosp	S	21	0	8	38	82,660	0.3	4.6	4.7
Corning Hospital	S	16	0	2	6	14,434	0.5	4.2	3.5
Crouse Hospital	S	42	0	14	28	76,580	0.3	3.7	2.8



Data reported as of November 23, 2020. ┆ 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, CO-NMH: community onset-not my hospital, CO-PMH: incident 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, number of beds, and percent of patient days in adult intensive care units.

Figure 19. Hospital onset facility-wide inpatient *C. difficile* rates, New York State 2019 (Page 2 of 7)

HOSPITAL	TEST METH	# OP	# CO-NMH	# CO-PMH	# HO	# PATDAYS	CO-NMH RATE	RAW HO RATE	ADJ HO RATE
Eastern Niagara Hosp	N	3	0	0	8	22,487	0.3	3.6	7.6
Ellis Hospital	S	43	0	5	22	86,894	0.2	2.5	2.8
Elmhurst Hospital	S	16	0	3	22	91,898	0.1	2.4	2.7
Erie County Med Ctr	S	31	0	7	35	101,549	0.1	3.4	3.7
FF Thompson	S	25	0	5	5	25,712	0.1	1.9	2.8
Faxton St. Lukes^	S	32	0	14	44	62,976	0.3	7.0	6.8
Flushing Hospital	N	0	0	2	9	58,026	0.1	1.6	3.6
Geneva General	S	27	0	3	6	15,403	0.4	3.9	2.6
Glen Cove Hospital	S	3	0	2	2	14,139	0.2	1.4	1.5
Glens Falls Hospital	N	22	0	3	10	50,230	0.1	2.0	3.7
Good Samar. Suffern	S	36	0	12	22	55,068	0.2	4.0	4.9
Good Samar. Wlslip	S	53	0	11	42	106,560	0.2	3.9	3.6
Guthrie Cortland MC*	S	10	0	7	4	13,995	0.7	2.9	1.1
Harlem Hospital	S	0	0	3	13	54,649	0.1	2.4	3.7
HealthAlli Broadway	N	9	0	7	15	28,822	0.3	5.2	8.3
HealthAlli MarysAve	N	0	0	0	1	7,426	0.0	1.3	4.0
Henry J. Carter	S	NA	NA	NA	NA	42,788	0.0	NA	NA
Highland Hospital	S	44	0	4	35	91,572	0.1	3.8	5.5
Hosp for Spec Surg	N	NA	NA	NA	NA	47,051	0.0	NA	NA
Huntington Hospital	S	41	0	14	24	69,781	0.3	3.4	3.7
Interfaith Med Ctr	N	1	0	0	4	28,799	0.0	1.4	3.5
Jacobi Med Ctr	S	10	0	2	29	91,460	0.1	3.2	4.1
Jamaica Hospital	S	16	0	4	27	70,826	0.2	3.8	4.7
Jones Memorial	S	3	0	0	1	6,708	0.3	1.5	1.9
Kenmore Mercy	S	9	0	16	17	30,028	0.4	5.7	4.9

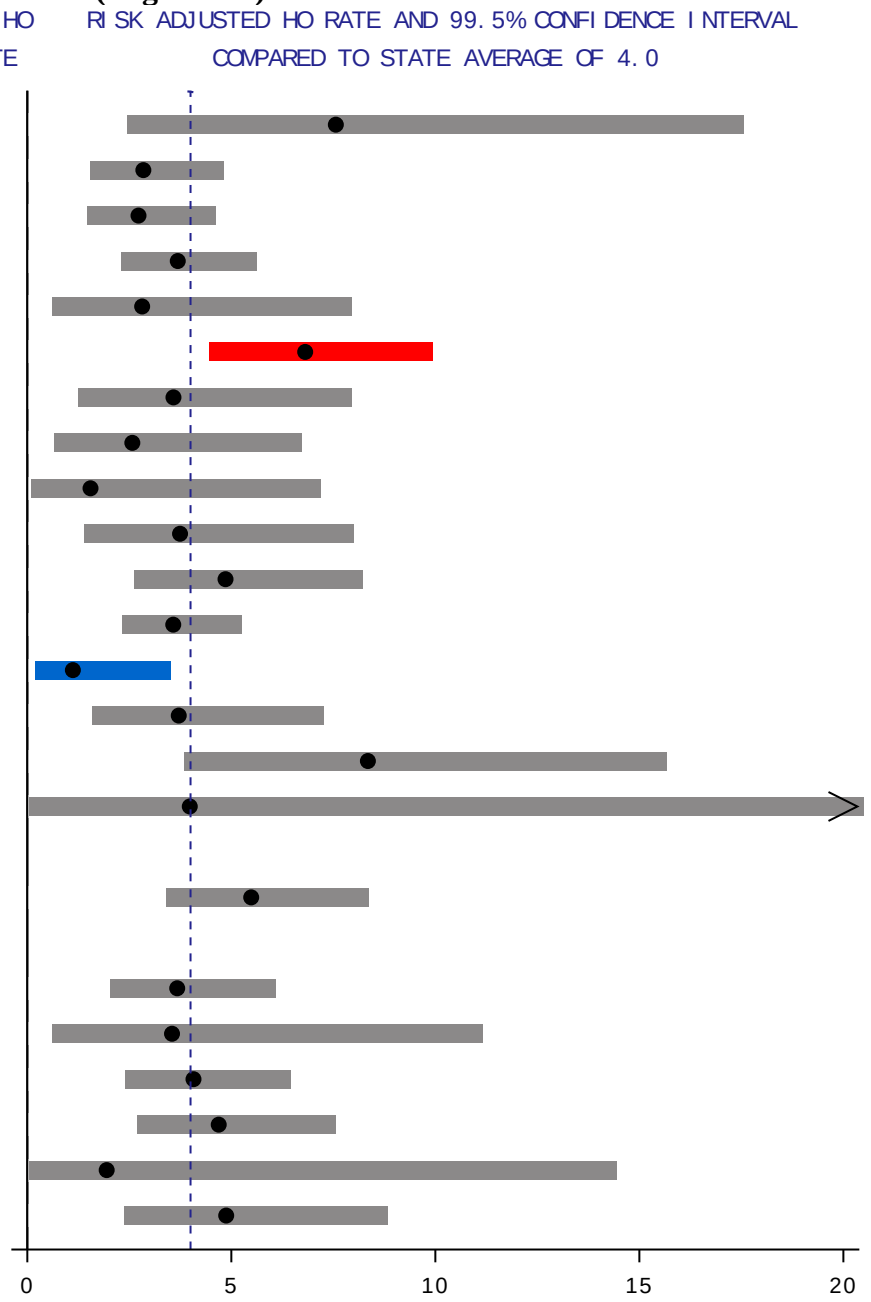


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Figure 19. Hospital onset facility-wide inpatient *C. difficile* rates, New York State 2019 (Page 3 of 7)

HOSPITAL	TEST METH	# OP	# CO-NMH	# CO-PMH	# HO	# PATDAYS	CO-NMH RATE	RAW HO RATE	ADJ HO RATE
Kings County Hosp	S	16	0	3	33	92,741	0.0	3.6	4.2
Kingsbrook Jewish MC	S	0	0	3	8	42,774	0.2	1.9	2.1
LIJ at Forest Hills*	S	4	0	10	9	66,578	0.3	1.4	1.5
LIJ at Valley Stream*	S	5	0	6	6	45,980	0.2	1.3	1.5
LIJ(Long Isl Jewish)	S	59	0	16	69	198,952	0.1	3.5	3.7
Lenox Hill Hospital	S	29	0	6	36	112,231	0.1	3.2	3.5
Lincoln Med Ctr	N	1	0	2	9	77,103	0.0	1.2	3.0
Long Isl. Community	S	50	0	10	32	64,044	0.3	5.0	5.0
Maimonides Med Ctr	N	17	0	13	47	166,373	0.1	2.8	4.6
Mary Imogene Bassett	S	24	0	6	23	47,149	0.3	4.9	4.8
Massena Memorial	N	1	0	4	2	6,007	0.3	3.3	5.7
Mather Hospital	N	36	0	4	20	50,752	0.3	3.9	5.5
Memor SloanKettering	S	NA	NA	NA	NA	165,172	0.4	NA	NA
Mercy Hosp Buffalo	S	15	0	21	34	94,497	0.3	3.6	3.4
Mercy Med Ctr	S	19	0	7	11	43,781	0.3	2.5	2.8
Metropolitan Hosp	S	0	0	1	5	24,165	0.1	2.1	3.1
MidHudson Reg of WMC	N	1	0	0	11	19,233	0.3	5.7	8.7
Millard Fill. Suburb	S	51	0	19	34	61,929	0.5	5.5	4.1
Montefiore-Einstein	S	53	0	15	77	142,913	0.1	5.4	5.4
Montefiore-Moses^	S	41	0	33	204	269,330	0.2	7.6	6.5
Montefiore-Mt Vernon	S	1	0	3	4	12,351	0.3	3.2	5.0
Montefiore-NewRochl	S	5	0	6	10	29,400	0.4	3.4	4.2
Montefiore-Nyack*	S	42	0	4	8	57,721	0.3	1.4	1.5
Montefiore-Wakefield	S	14	0	7	29	69,579	0.2	4.2	5.6
Mount St. Marys*	S	2	0	0	5	33,386	0.4	1.5	1.3

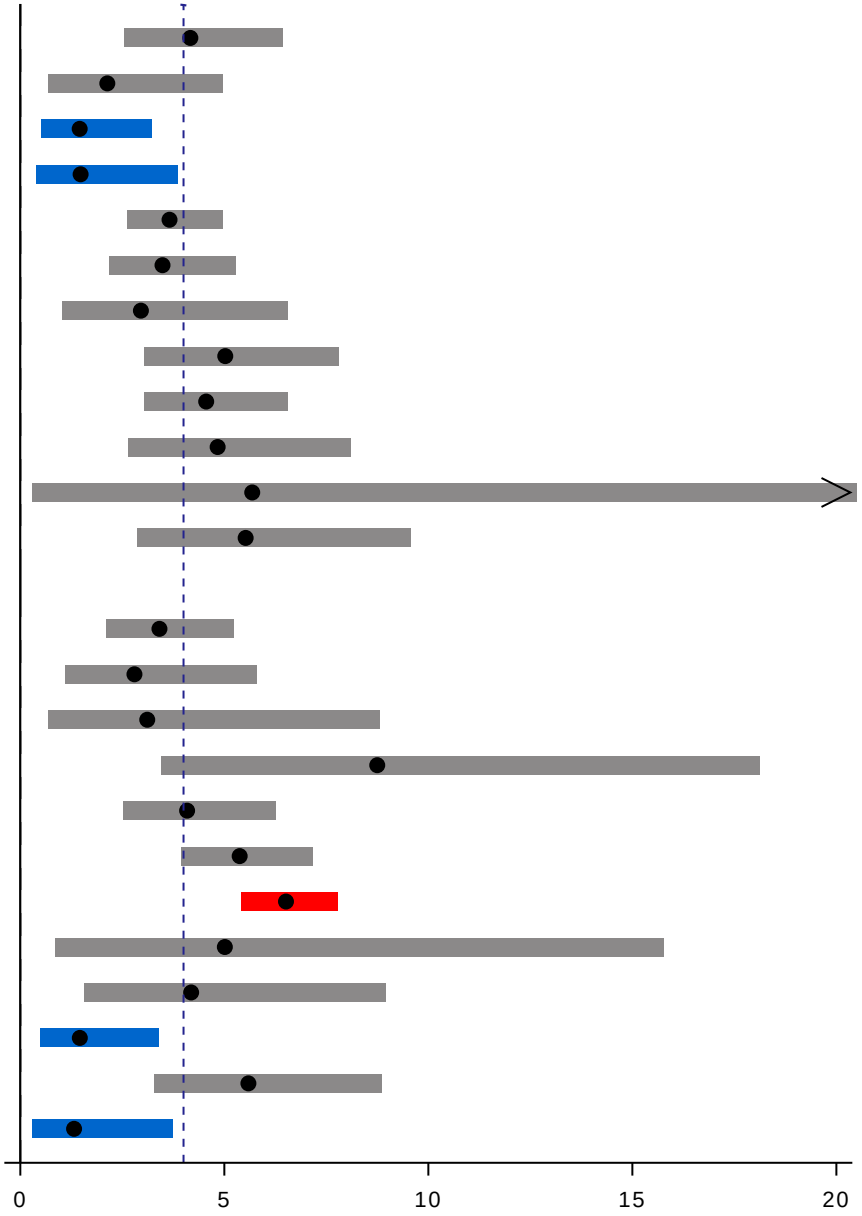

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Figure 19. Hospital onset facility-wide inpatient *C. difficile* rates, New York State 2019 (Page 4 of 7)

HOSPITAL	TEST METH	# OP	# CO-NMH	# CO-PMH	# HO	# PATDAYS	CO-NMH RATE	RAW HO RATE	ADJ HO RATE
Mt Sinai	S	70	0	16	112	283,726	0.1	3.9	3.9
Mt Sinai Beth Israel*	S	19	0	1	3	67,595	0.1	0.4	0.6
Mt Sinai Brooklyn*	S	9	0	2	1	60,352	0.0	0.2	0.3
Mt Sinai Morningside*	S	8	0	2	9	83,249	0.0	1.1	1.2
Mt Sinai Queens	S	25	0	4	7	50,278	0.1	1.4	2.1
Mt Sinai S Nassau*	S	115	0	9	25	92,027	0.4	2.7	2.2
Mt Sinai West*	S	11	0	2	4	81,390	0.1	0.5	0.5
NY Community Hosp	S	10	0	3	26	35,690	0.3	7.3	7.0
NYP-Allen	S	6	0	5	10	46,696	0.2	2.1	2.7
NYP-Brklyn Methodist^	S	23	0	18	93	156,954	0.2	5.9	5.4
NYP-Columbia	S	49	0	17	104	215,123	0.2	4.8	3.8
NYP-Hudson Valley	S	27	0	1	15	31,377	0.3	4.8	4.9
NYP-Lawrence	S	16	0	6	23	54,282	0.3	4.2	4.6
NYP-Lower Manhattan	S	6	0	2	13	44,559	0.1	2.9	4.1
NYP-Morgan Stanley	S	NA	NA	NA	NA	65,512	0.1	NA	NA
NYP-Queens*	S	76	0	9	34	153,933	0.2	2.2	2.1
NYP-Weill Cornell^	S	154	0	22	148	233,621	0.2	6.3	5.1
NYU Langone Brooklyn	S	43	0	6	31	83,151	0.1	3.7	4.0
NYU Orthopedic Hosp	S	NA	NA	NA	NA	13,556	0.0	NA	NA
NYU Tisch	S	147	0	26	74	168,428	0.2	4.4	3.8
NYU Winthrop	S	79	0	11	77	147,442	0.1	5.2	5.1
Nassau University	N	1	0	1	11	63,880	0.0	1.7	2.9
Nathan Littauer	N	4	0	3	5	7,520	0.3	6.6	12.7
Newark Wayne	S	10	0	6	5	19,816	0.2	2.5	3.1
Niagara Falls	S	4	0	1	4	22,216	0.0	1.8	2.9

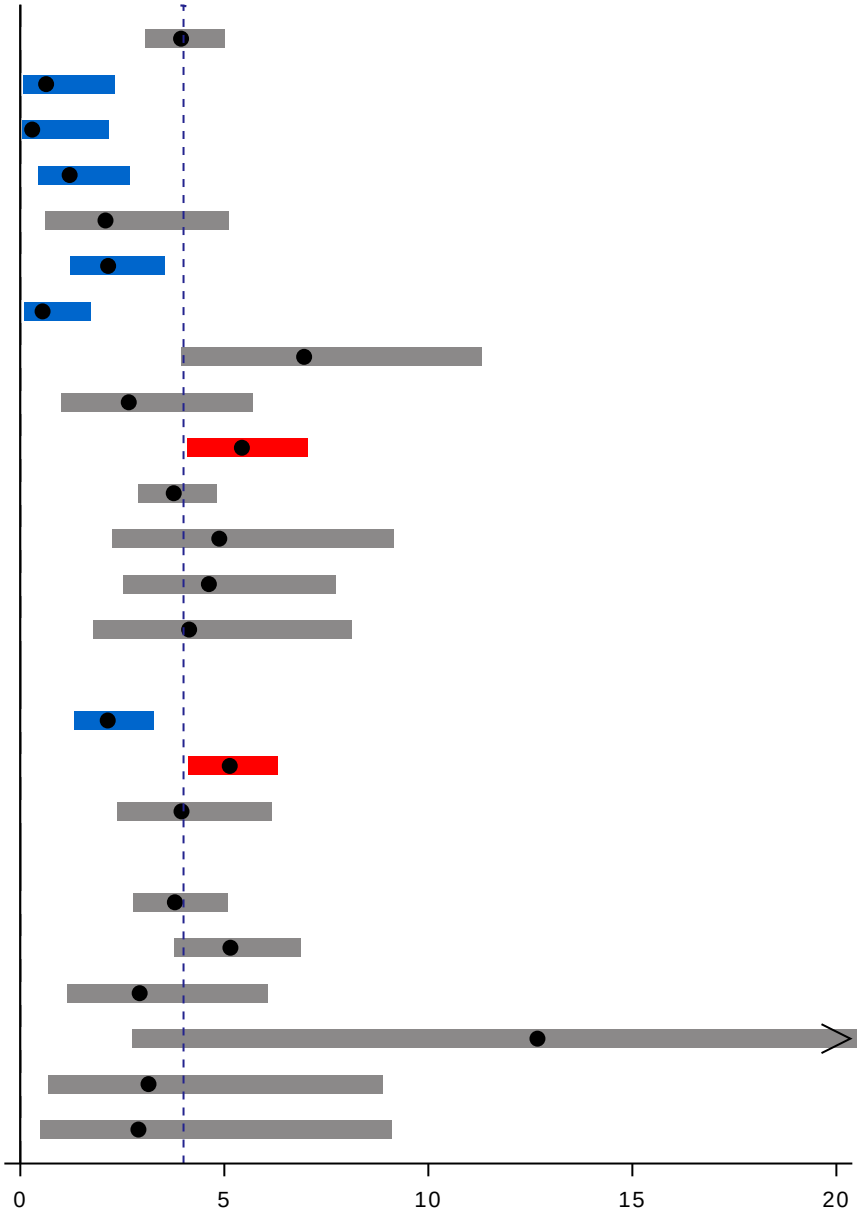

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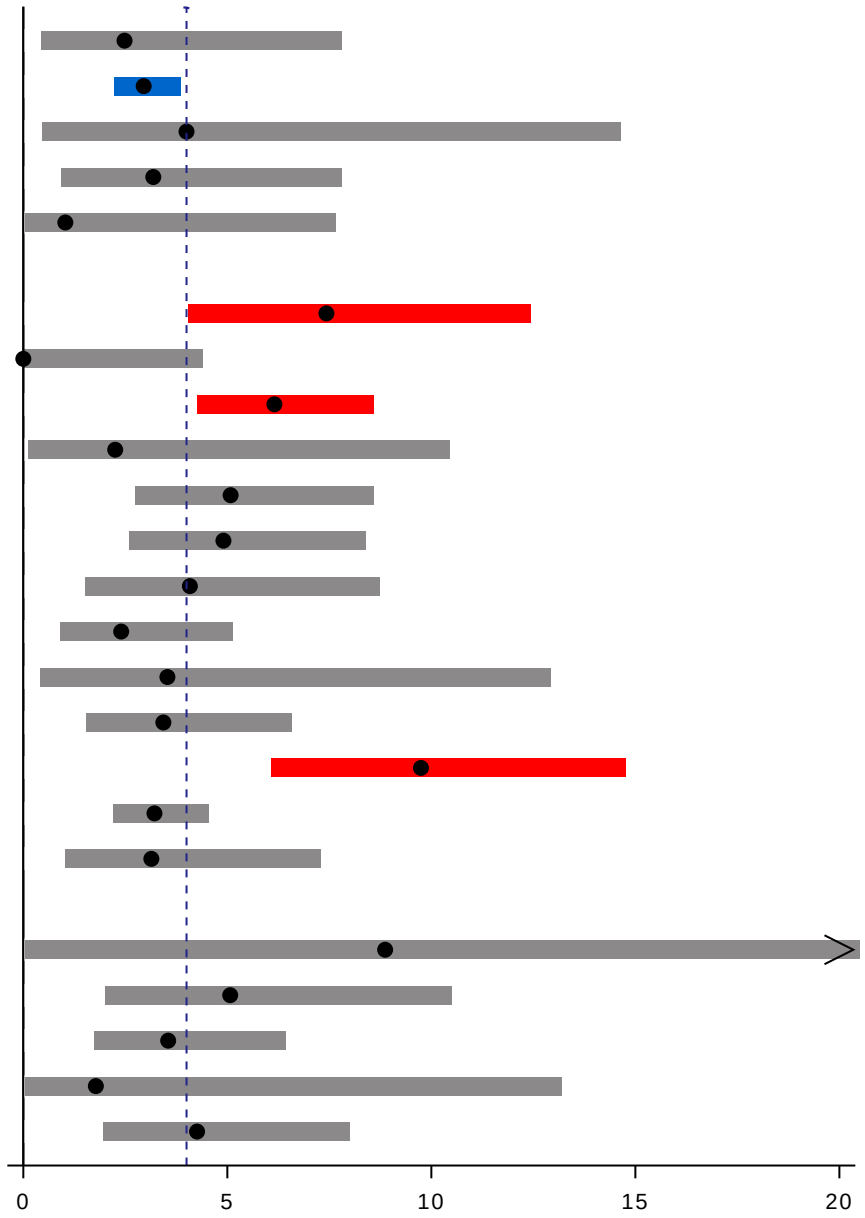
Figure 19. Hospital onset facility-wide inpatient *C. difficile* rates, New York State 2019 (Page 5 of 7)

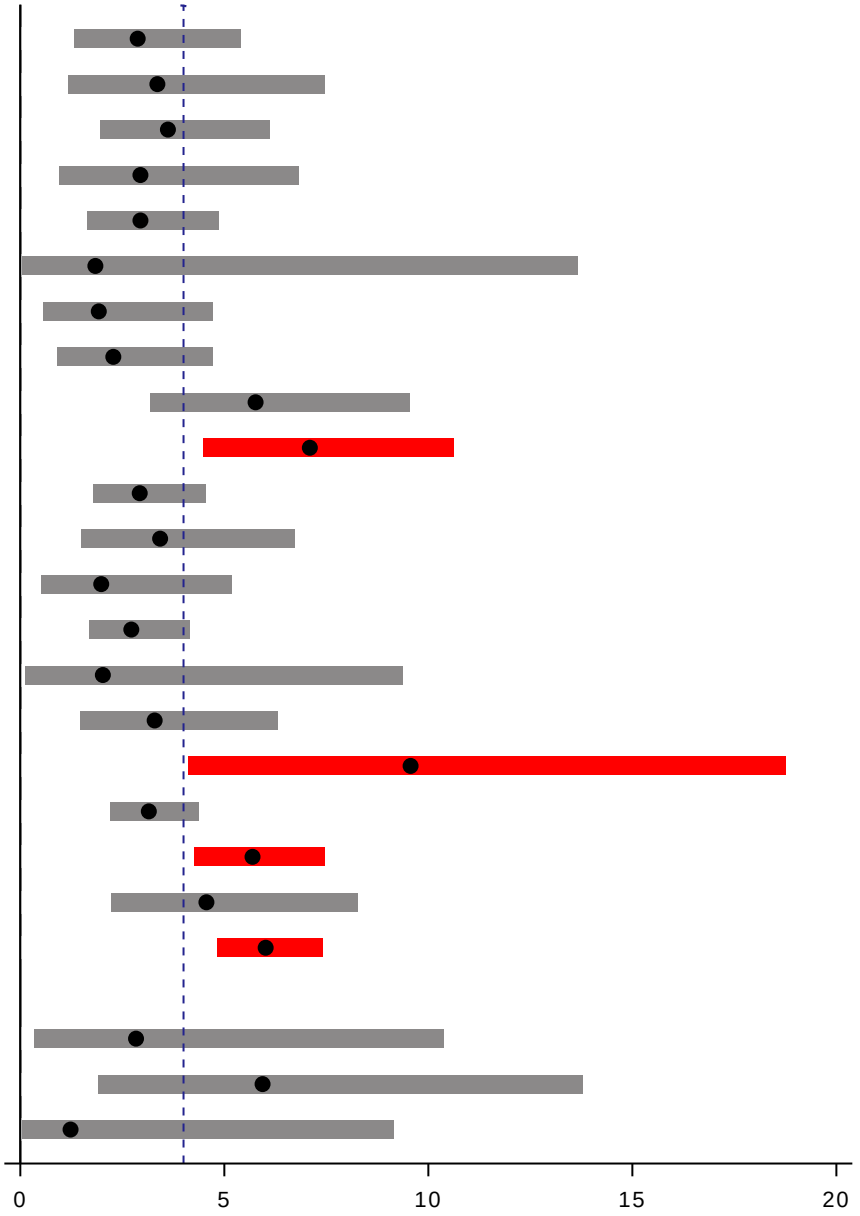
HOSPITAL	TEST METH	# OP	# CO-NMH	# CO-PMH	# HO	# PATDAYS	CO-NMH RATE	RAW HO RATE	ADJ HO RATE
North Central Bronx	S	5	0	0	4	21,405	0.2	1.9	2.5
North Shore*	S	0	0	0	90	266,249	0.2	3.4	2.9
Northern Dutchess	N	0	0	5	3	18,713	0.2	1.6	4.0
Northern Westchester	S	24	0	5	7	29,710	0.2	2.4	3.2
Noyes Memorial	S	3	0	2	1	8,832	0.5	1.1	1.0
Oishei Childrens	S	NA	NA	NA	NA	32,215	0.0	NA	NA
Olean General ^	S	19	0	10	23	33,637	0.3	6.8	7.4
Oneida Healthcare	S	7	0	2	0	7,586	0.6	0.0	0.0
Orange Regional ^	S	70	0	24	57	99,719	0.3	5.7	6.2
Oswego Hospital	S	0	0	1	2	12,017	0.2	1.7	2.3
Our Lady of Lourdes	S	28	0	9	22	46,319	0.4	4.7	5.1
Peconic Bay Medical	S	26	0	5	21	37,183	0.4	5.6	4.9
Phelps Memorial	S	20	0	3	10	38,835	0.1	2.6	4.1
Plainview Hospital	S	5	0	6	10	38,268	0.3	2.6	2.4
Putnam Hospital	N	6	0	3	3	17,846	0.1	1.7	3.5
Queens Hospital	S	3	0	5	14	54,893	0.1	2.6	3.4
Richmond Univ MC^	S	20	0	2	36	55,332	0.1	6.5	9.7
Rochester General	S	61	0	23	53	162,274	0.1	3.3	3.2
Rome Memorial	S	10	0	4	8	12,281	0.8	6.5	3.1
Roswell Park	S	NA	NA	NA	NA	43,120	0.8	NA	NA
SJRH Dobbs Ferry	N	0	0	0	1	2,821	0.2	3.5	8.9
SJRH St Johns	N	7	0	4	11	47,085	0.1	2.3	5.1
SUNY Downstate MC	S	18	0	3	17	55,235	0.2	3.1	3.6
Samaritan AlbanyMem	S	3	0	0	1	6,296	0.4	1.6	1.8
Samaritan Hosp Troy	S	18	0	11	15	44,112	0.2	3.4	4.3



Data reported as of November 23, 2020. ┆ 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, CO-NMH: community onset-not my hospital, CO-PMH: incident 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, number of beds, and percent of patient days in adult intensive care units.

Figure 19. Hospital onset facility-wide inpatient *C. difficile* rates, New York State 2019 (Page 6 of 7)

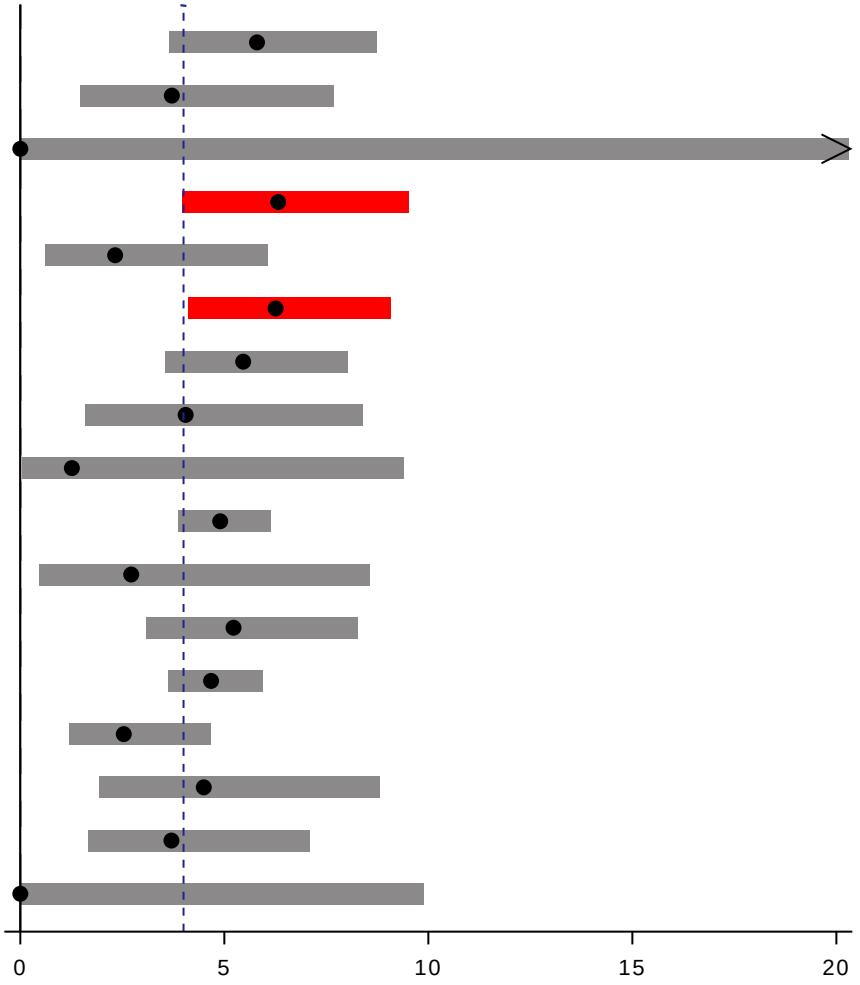
HOSPITAL	TEST METH	# OP	# CO-NMH	# CO-PMH	# HO	# PATDAYS	CO-NMH RATE	RAW HO RATE	ADJ HO RATE
Samaritan- Watertown	S	57	0	3	15	34,979	0.5	4.3	2.9
Saratoga Hospital	N	18	0	9	9	57,084	0.1	1.6	3.4
Sisters of Charity	S	8	0	12	22	44,920	0.5	4.9	3.6
Sisters- St Joseph	S	4	0	4	8	16,751	0.7	4.8	2.9
South Shore UH	S	34	0	6	24	96,458	0.2	2.5	2.9
St Anthony	S	2	0	1	1	6,960	0.3	1.4	1.8
St Barnabas	S	9	0	5	7	60,055	0.0	1.2	1.9
St Catherine Siena	S	2	0	9	11	51,109	0.3	2.2	2.3
St Charles Hospital	S	6	0	4	24	46,230	0.2	5.2	5.8
St Elizabeth Medical^	S	29	0	3	38	48,363	0.3	7.9	7.1
St Francis- Roslyn	S	10	0	17	32	99,188	0.3	3.2	2.9
St Johns Episcopal	S	17	0	4	13	42,006	0.2	3.1	3.4
St Joseph- Bethpage	S	8	0	5	6	28,947	0.3	2.1	2.0
St Josephs- Syracuse	S	81	0	15	35	116,426	0.2	3.0	2.7
St Josephs- Yonkers	N	0	0	0	2	17,482	0.2	1.1	2.0
St Lukes Cornwall	S	24	0	7	14	43,037	0.3	3.3	3.3
St Marys Amsterdam^	N	6	0	6	13	22,508	0.3	5.8	9.6
St Peters Hospital	S	64	0	30	59	115,987	0.4	5.1	3.1
Staten Island UNorth^	S	101	0	10	87	142,577	0.1	6.1	5.7
Staten Island USouth	S	16	0	2	17	39,759	0.3	4.3	4.6
Strong Memorial^	S	101	0	15	148	239,183	0.1	6.2	6.0
Sunnyview Rehab Hosp	S	NA	NA	NA	NA	3,697	0.2	NA	NA
Syosset Hospital	S	6	0	3	3	14,772	0.2	2.0	2.8
UHS Binghamton	S	11	0	0	8	16,352	0.2	4.9	5.9
UHS Chenango Memor	S	3	0	2	1	3,322	0.9	3.0	1.2



Data reported as of November 23, 2020. ┆ 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, CO-NMH: community onset-not my hospital, CO-PMH: incident 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, number of beds, and percent of patient days in adult intensive care units.

Figure 19. Hospital onset facility-wide inpatient *C. difficile* rates, New York State 2019 (Page 7 of 7)

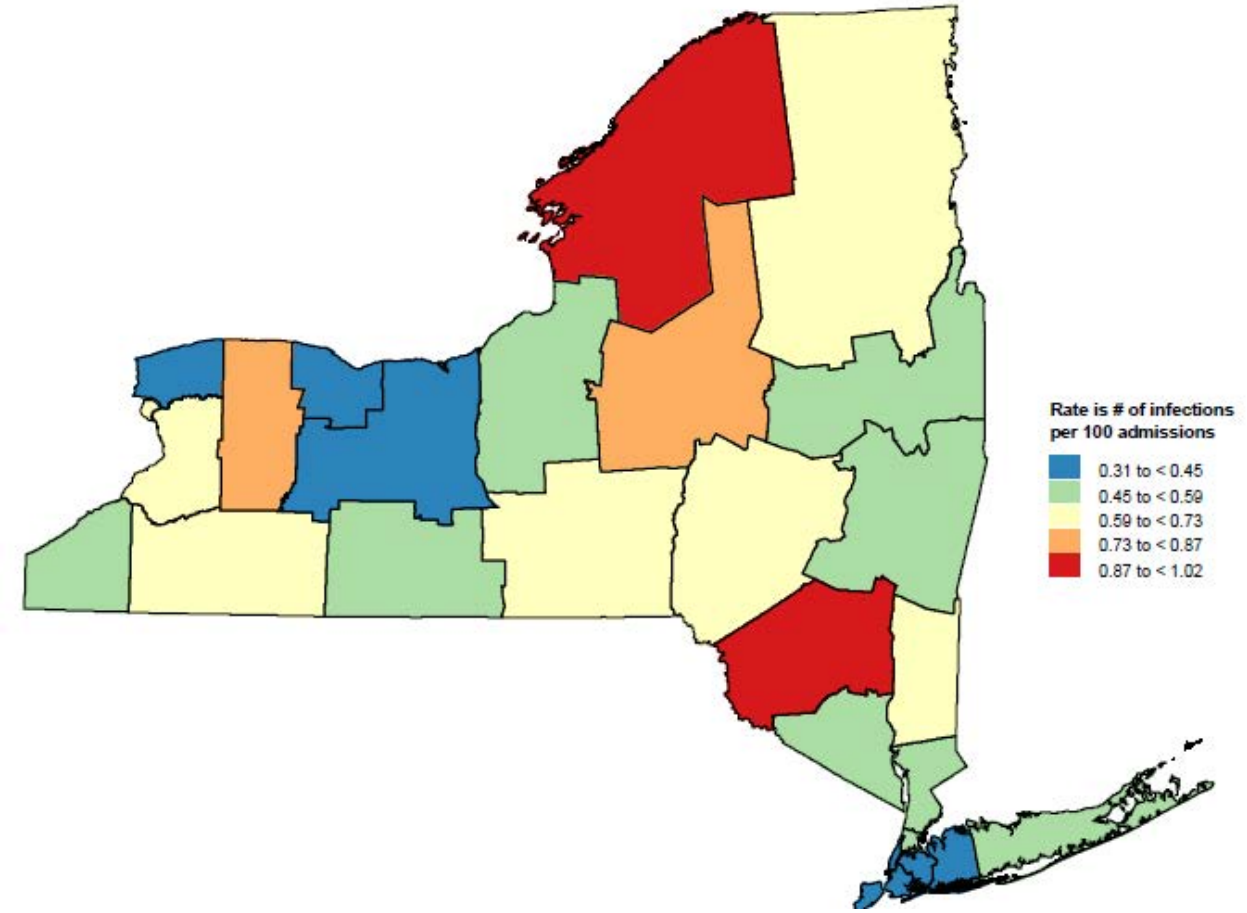
HOSPITAL	TEST METH	# OP	# CO-NMH	# CO-PMH	# HO	# PATDAYS	CO-NMH RATE	RAW HO RATE	ADJ HO RATE
UHS Wilson	S	38	0	5	37	67,125	0.2	5.5	5.8
UPMC Chautauqua	S	20	0	2	11	22,975	0.4	4.8	3.7
UVM Alice Hyde	N	3	0	0	0	7,457	0.1	0.0	0.0
UVM Champlain Valley^	S	62	0	9	37	53,206	0.4	7.0	6.3
United Memorial	S	7	0	6	6	15,940	0.5	3.8	2.3
Unity Hosp Rochester^	S	60	0	9	45	85,900	0.2	5.2	6.3
UnivHSUNY Upstate	N	38	0	14	42	127,619	0.2	3.3	5.5
UnivHStonyBrkSoutham	S	24	0	5	11	18,416	0.5	6.0	4.1
UnivHStonyBrookELI	S	1	0	0	1	11,691	0.3	0.9	1.3
UnivHStonyBrookU	S	118	0	26	128	176,699	0.3	7.2	4.9
Upst. Community Gen	N	7	0	4	4	29,605	0.1	1.4	2.7
Vassar Brothers	N	6	0	13	29	96,659	0.2	3.0	5.2
Westchester Medical	S	28	0	29	112	145,584	0.3	7.7	4.7
White Plains Hosp	S	38	0	13	16	83,640	0.2	1.9	2.5
Woodhull Med Ctr	S	3	0	3	13	42,139	0.1	3.1	4.5
Wyckoff Heights	S	7	0	4	14	51,592	0.1	2.7	3.7
Wyoming County Comm	N	3	0	1	0	6,282	0.5	0.0	0.0



Data reported as of November 23, 2020. ┆ 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, CO-NMH: community onset-not my hospital, CO-PMH: incident 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, number of beds, and percent of patient days in adult intensive care units.

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

Figure 20. Facility-wide inpatient *Clostridioides difficile* prevalence rate, New York State 2019



Data reported as of November 23, 2020. Excludes specialty hospitals, inpatient rehabilitation facilities, and inpatient psychiatric facilities. Specimens identified in the outpatient setting 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.

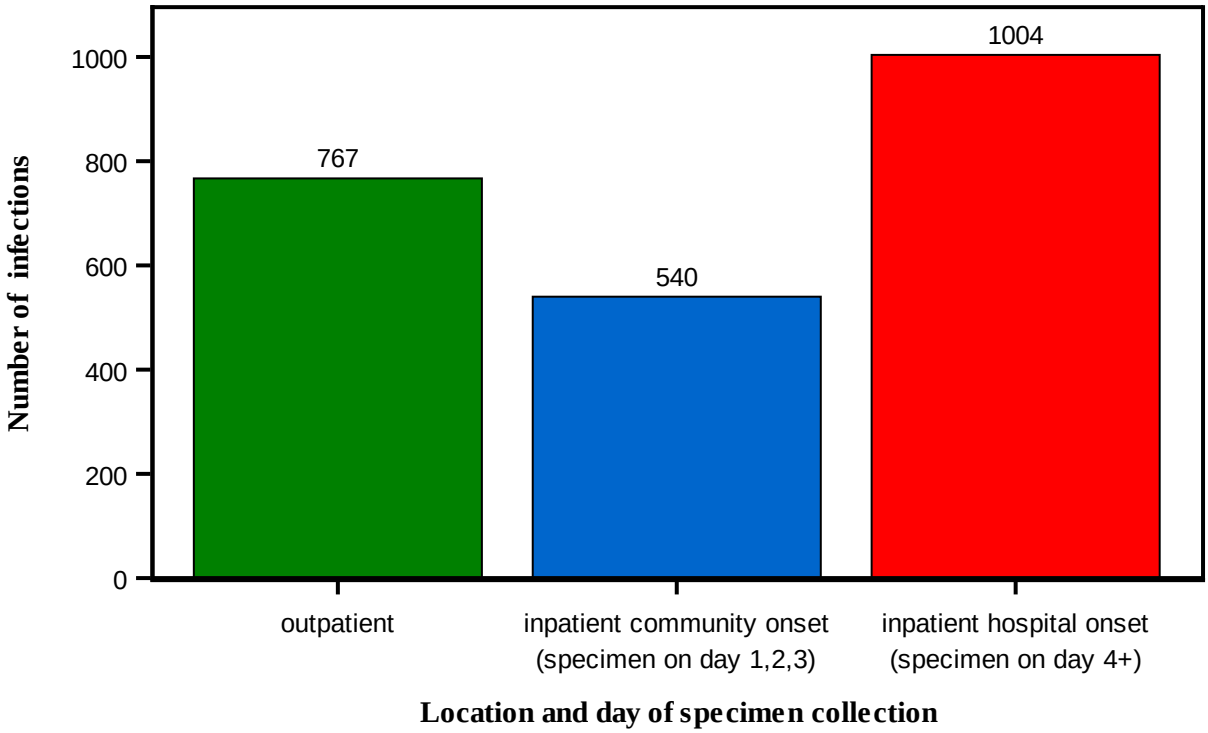
Carbapenem-resistant Enterobacteriaceae (CRE) Infections

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 2019, 2,311 CRE cases were reported: 33% were identified in ED/OBS units, 23% were identified in the FWI area during the first three days of hospitalization, and 43% were identified in the FWI area after the first three days of inpatient stay (Figure 21).

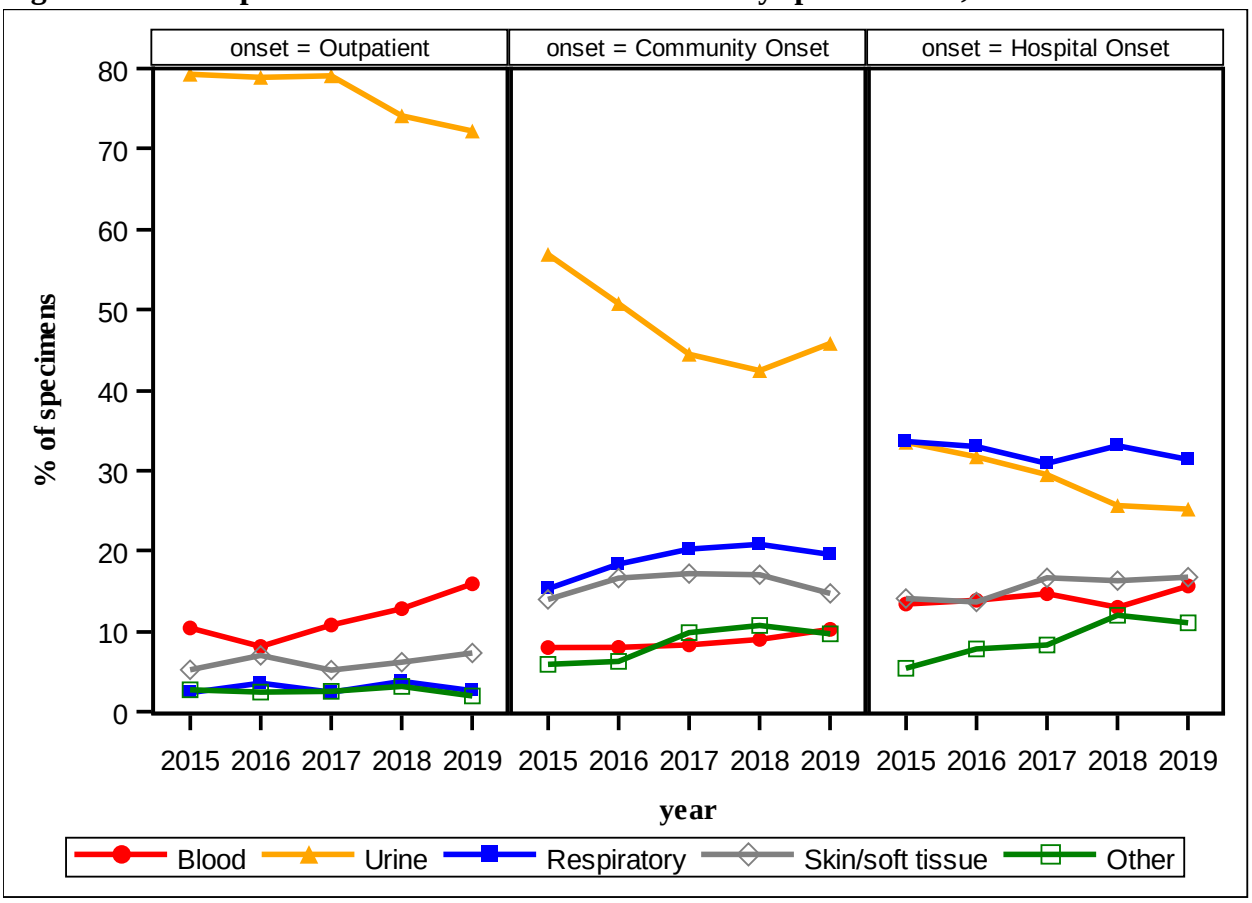
Figure 21. Carbapenem-resistant Enterobacteriaceae infection onset, NYS 2019



Data reported as of November 23, 2020. Excludes cases identified in inpatient rehabilitation facilities and inpatient psychiatric facilities. Specimens identified in the outpatient setting and admitted the next day are counted as outpatient.

In outpatient and community onset cases, the most common specimen site was by far the urinary tract; among hospital onset cases, respiratory specimens were most common (Figure 22).

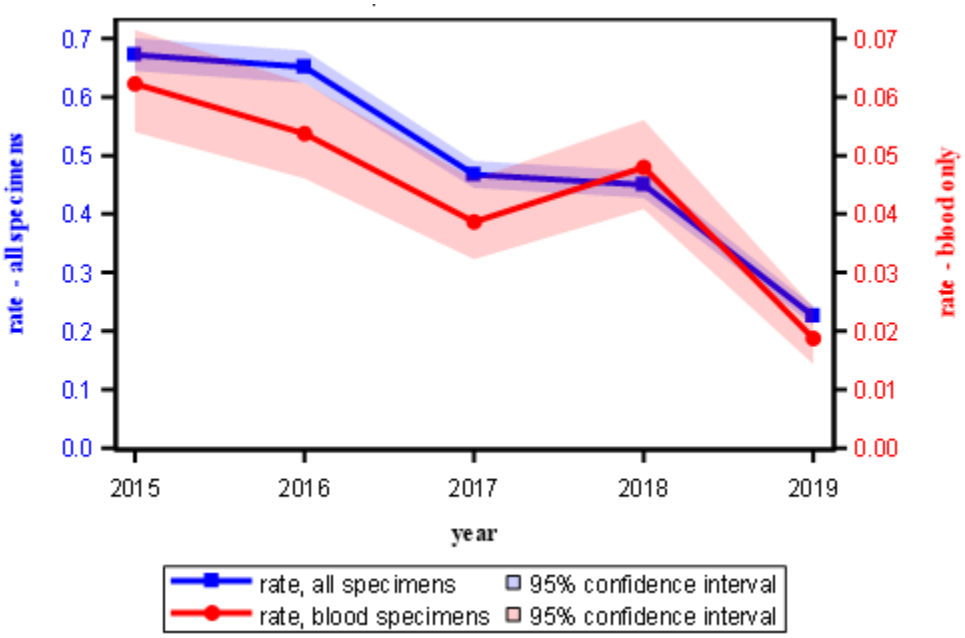
Figure 22. Carbapenem-resistant Enterobacteriaceae by specimen site, NYS 2015-2019



Data reported as of November 23, 2020.

The admission prevalence rate describes the percentage of patients admitted to hospitals with CRE. In 2019, there were 530 of these cases out of 2,347,976 admissions, for a rate of 0.23 infections per 1,000 admissions. The overall admission prevalence rate decreased 66% between 2015 and 2019. The BSI rate decreased 70% over the same time period (Figure 23). The 2019 all-specimen admission prevalence rate was 12 times higher than the BSI rate.

Figure 23. Facility-wide inpatient carbapenem-resistant Enterobacteriaceae admission prevalence infection rates, New York State 2015-2019

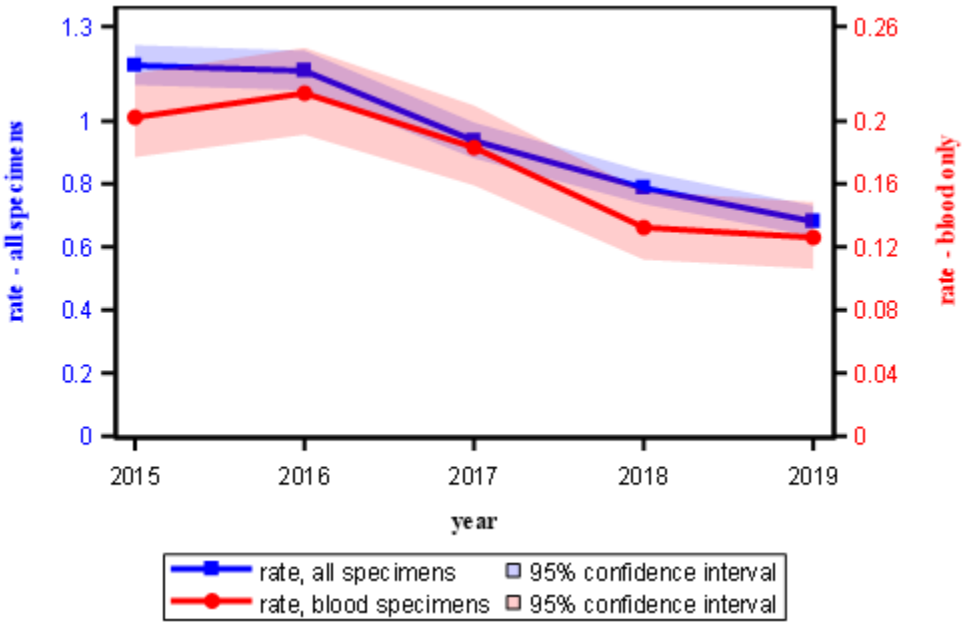


Year	# Bloodstream infections	# Total Infections	# Admissions	Bloodstream Infection Admission Prevalence Rate	All-Specimen Admission Prevalence Rate
2015	145	1,565	2,329,051	0.0623	0.672
2016	125	1,515	2,326,264	0.0537	0.651
2017	92	1,112	2,379,863	0.0387	0.467
2018	113	1,069	2,375,584	0.0476	0.450
2019	44	530	2,347,976	0.0187	0.226

Data reported as of November 23, 2020. 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. Excludes inpatient rehabilitation and inpatient psychiatric locations. Does NOT include cases identified in the emergency room if admitted the same day (a change from previous reports).

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 38% between 2015 and 2019, and the all-specimen incidence rate significantly decreased 42% between 2015 and 2019 (Figure 24). The 2019 all-specimen incidence rate was 5 times higher than the BSI incidence rate.

Figure 24. Facility-wide inpatient carbapenem-resistant Enterobacteriaceae infection incidence rates, New York State 2015-2019

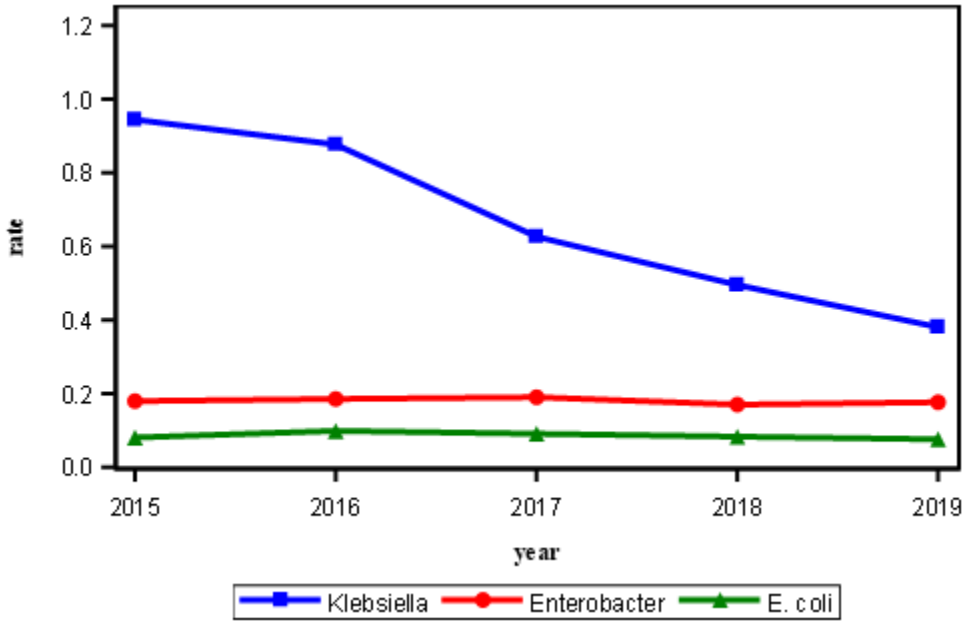


Year	# Bloodstream Infections	# Total Infections	# Patient Days	Bloodstream Infection Incidence Rate	All Specimen Infection/Colonization Incidence Rate
2015	232	1,349	11,466,593	0.202	1.176
2016	248	1,321	11,397,102	0.218	1.159
2017	208	1,064	11,355,485	0.183	0.937
2018	150	892	11,328,988	0.132	0.787
2019	142	767	11,262,506	0.126	0.681

Data reported as of November 23, 2020. Bloodstream Infection Incidence Rate = Number of all unique (no others in previous 14 days) blood source infections per patient per month identified > 3 days after admission to the hospital / Number of patient days x 10,000. All Specimen Infection/Colonization Incidence Rate = Number of first events per patient among those with no event with this specific organism type reported in a previous month at this hospital, and identified > 3 days after admission to the hospital / Number of patient days x 10,000. Excludes inpatient rehabilitation and inpatient psychiatric locations.

Overall patient prevalence includes both admission prevalent and hospital onset cases. Overall patient prevalence rates by year and species are summarized in Figure 25. Between 2015 and 2019, the prevalence of *Klebsiella* decreased 60%, the prevalence of *Enterobacter* spp. decreased 2%, and the prevalence of *E. coli* decreased 6%. A small percentage (2%) of patients harbored more than one type of organism.

Figure 25. Trends in overall patient prevalence carbapenem-resistant Enterobacteriaceae infection rates by species, NYS 2015-2019



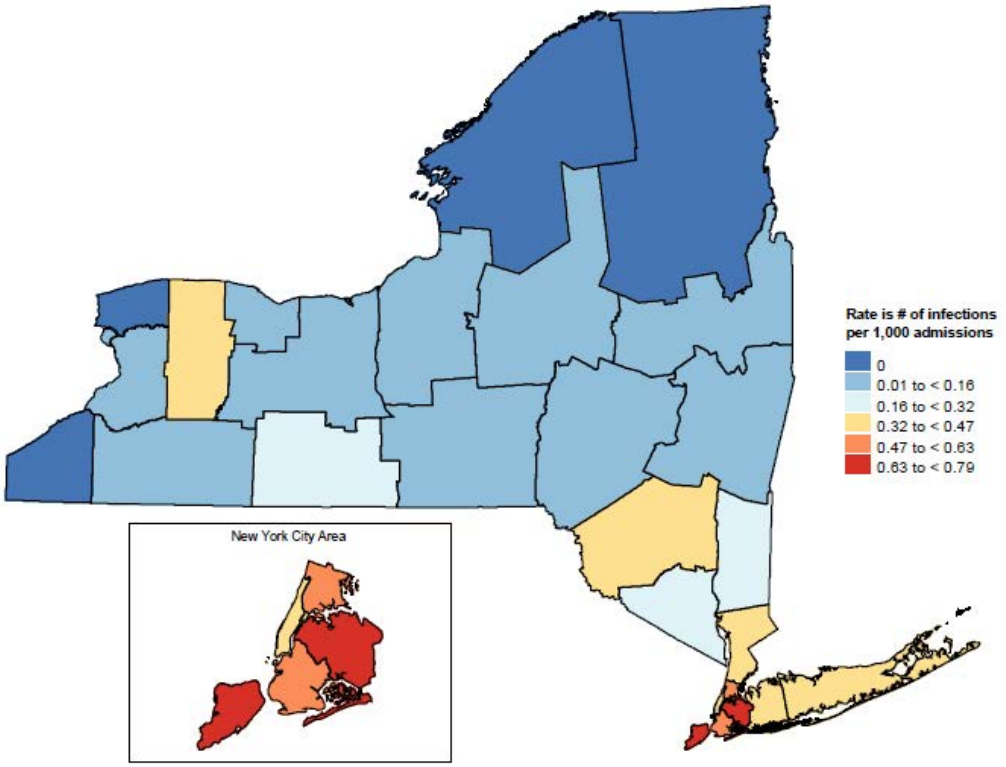
Year	*Klebsiella oxytoca and pneumoniae*	*Enterobacter* spp.	*E. coli*	Total
2015	0.944	0.179	0.081	1.204
2016	0.877	0.185	0.098	1.160
2017	0.626	0.190	0.091	0.907
2018	0.495	0.170	0.083	0.748
2019	0.380	0.176	0.076	0.632

Data reported as of November 23, 2020. 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. Does NOT include cases identified in the emergency room if admitted the same day (a change from previous reports).

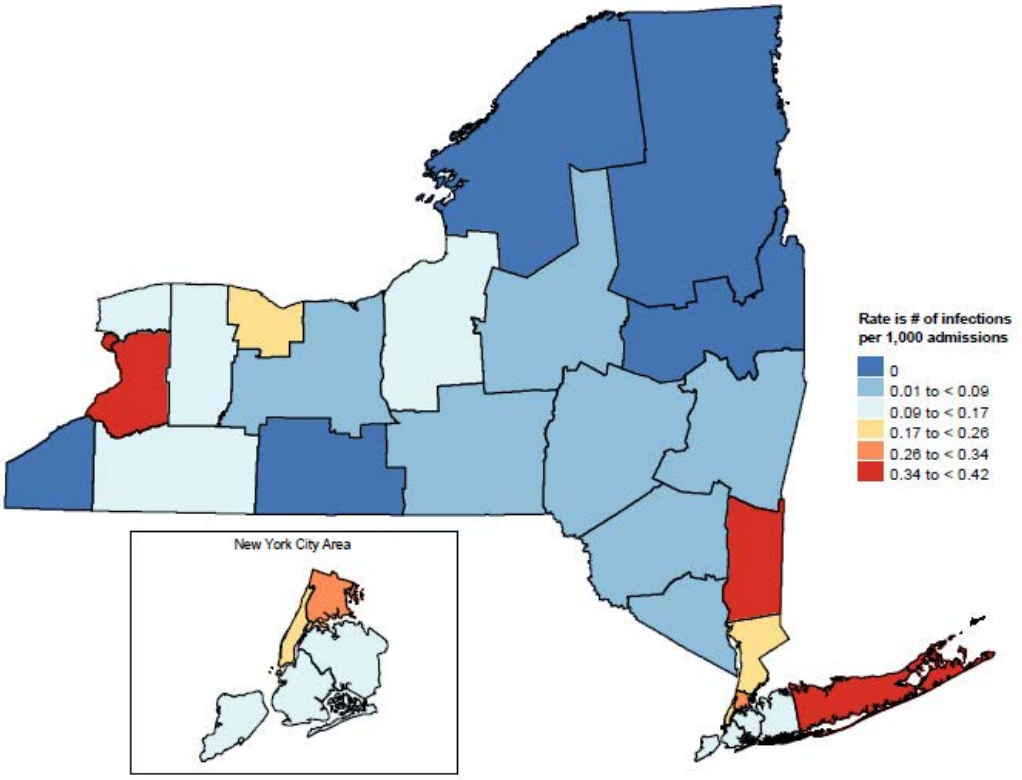
Figures 26 (a,b,c) show the FWI CRE patient prevalence rate by species and county (or merged county for those with few or no hospitals). FWI CRE-*Klebsiella* and CRE-*E. coli* patient prevalence rates are highest in the New York City area. CRE-*Enterobacter* rates showed some spikes in western and northern 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-*E. coli* map used the same scale as the CRE-*Klebsiella* map, it would be entirely in the three shades of blue.

Figure 26 a-c. Facility-wide inpatient carbapenem-resistant Enterobacteriaceae patient prevalence rates, New York State 2019

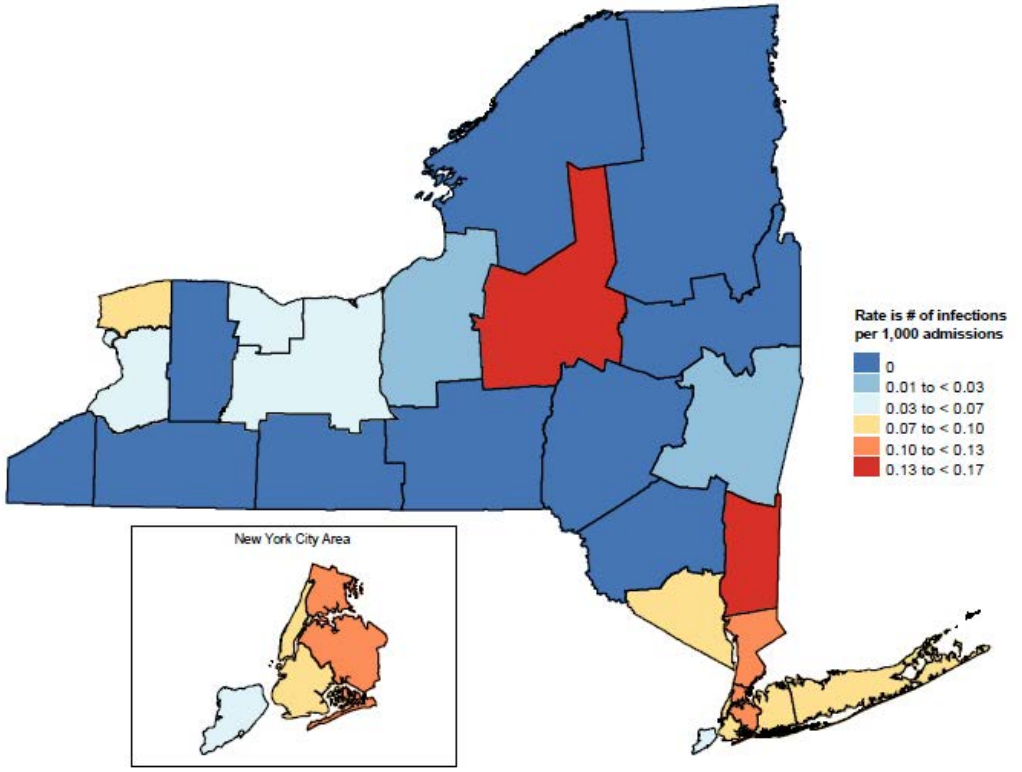
(a) CRE-*Klebsiella* overall patient prevalence rate 2019



(b) CRE-*Enterobacter* overall patient prevalence rate 2019



(c) CRE-*E. coli* overall patient prevalence rate 2019



Data reported as of November 23, 2020. 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 2019 NHSN survey, 93% of facilities used the newer more sensitive (CLSI M22 or M23 standard) breakpoints in 2019, while 7% 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 2019 NHSN survey, 47% of facilities reported that their labs perform a special test for carbapenemase production. However, based on the list of 2019 CRE infections reported to NHSN, approximately 23% of specimens were tested for the presence of a carbapenemase. Among those tested, a carbapenemase was identified 71% of the time.

Facilities using the older breakpoints or not detecting carbapenemases may be undercounting CRE, and testing differences may reduce the comparability of CRE rates between facilities.

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

Hospital-specific CRE rates

The primary HAI indicator of interest for evaluating hospital performance is the hospital onset BSI rate, because 1) blood specimens are more consistently screened by laboratories across the state; 2) bloodstream infections are very serious and more likely reflect clinical disease than CRE detected from nonsterile body sites such as wounds[1]. The prevalence of CRE among patients newly admitted to facilities is also reported because this burden of admission prevalent cases is related to the risk of spread within the facility.

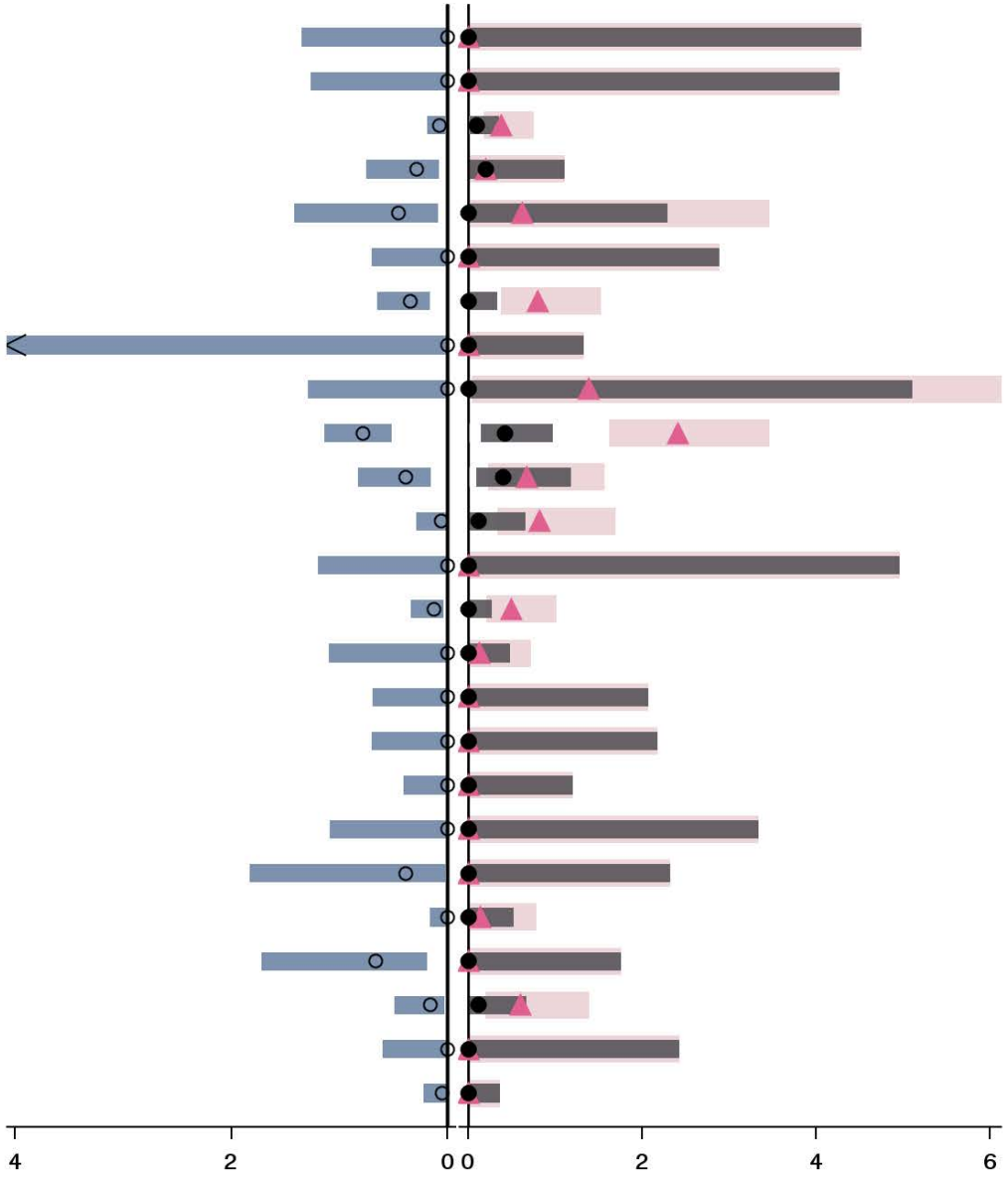
Hospitals should review their HO BSI rates in relation to their admission prevalence rates as shown in Figure 27, e.g. hospitals with high HO rates and low admission prevalence rates should examine whether they are testing patients promptly (days 1-3) and if their cases were clustered. With respect to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

reported among hospitals, e.g. some hospitals have reported a very large proportion of urinary tract infections/colonizations, others reported a very large proportion of skin or respiratory infections/colonizations. The hospital- and region-specific admission prevalence rate, bed size, and percent intensive care unit patient days do not strongly predict the HO BSI rate; therefore, risk-adjusted rates are not presented. More research is needed on CRE risk adjustment to balance the importance of accuracy and fairly comparing rates with the need for having a measure to identify hospitals with higher than predicted rates for public health assistance and quality improvement programs.

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

Figure 27. Hospital carbapenem-resistant Enterobacteriaceae infection rates, NYS 2019 (Page 1 of 7)

Hospital Name	# All AdmPrev	# Adms	AdmPrev Rate	HO-All Rate	HO-BSI Rate	# Patdays	# All	# BSI
AO Fox Memorial	0	2225	0.0	0.0	0.0	8172	0	0
Adirondack Medical	0	2361	0.0	0.0	0.0	8655	0	0
Albany Med Ctr	3	41405	0.1	0.4	0.1	212248	8	2
Arnot Ogden Med Ctr	3	10372	0.3	0.2	0.2	50699	1	1
Auburn Community Hos	2	4432	0.5	0.6	0.0	16144	1	0
Bellevue Ellis	0	4288	0.0	0.0	0.0	12814	0	0
Bellevue Hospital	7	20356	0.3	0.8	0.0	112964	9	0
Blythedale Childrens	0	408	0.0	0.0	0.0	27875	0	0
Bon Secours	0	2322	0.0	1.4	0.0	7245	1	0
BronxCare HealthSyst	20	25570	0.8	2.4	0.4	120766	29	5
Brookdale Hospital	5	12770	0.4	0.7	0.4	74903	5	3
Brooklyn Hosp Ctr	1	16486	0.1	0.8	0.1	85480	7	1
Brooks Memorial	0	2501	0.0	0.0	0.0	7457	0	0
Buffalo General	3	23072	0.1	0.5	0.0	143433	7	0
Calvary Hospital	0	2734	0.0	0.1	0.0	77817	1	0
Canton-Potsdam	0	4319	0.0	0.0	0.0	17898	0	0
Catskill Regional MC	0	4270	0.0	0.0	0.0	17015	0	0
Cayuga Medical Ctr	0	7421	0.0	0.0	0.0	30838	0	0
Claxton-Hepburn	0	2746	0.0	0.0	0.0	11084	0	0
Clifton Springs	1	2595	0.4	0.0	0.0	15986	0	0
Cohens Childrens	0	19146	0.0	0.1	0.0	72265	1	0
Columbia Memorial	3	4510	0.7	0.0	0.0	21085	0	0
Coney Island Hosp	2	12772	0.2	0.6	0.1	84383	5	1
Corning Hospital	0	5011	0.0	0.0	0.0	15239	0	0
Crouse Hospital	1	21517	0.0	0.0	0.0	103539	0	0



Data reported as of November 23, 2020. Facility-wide inpatient only, rehab and behavioral health units excluded

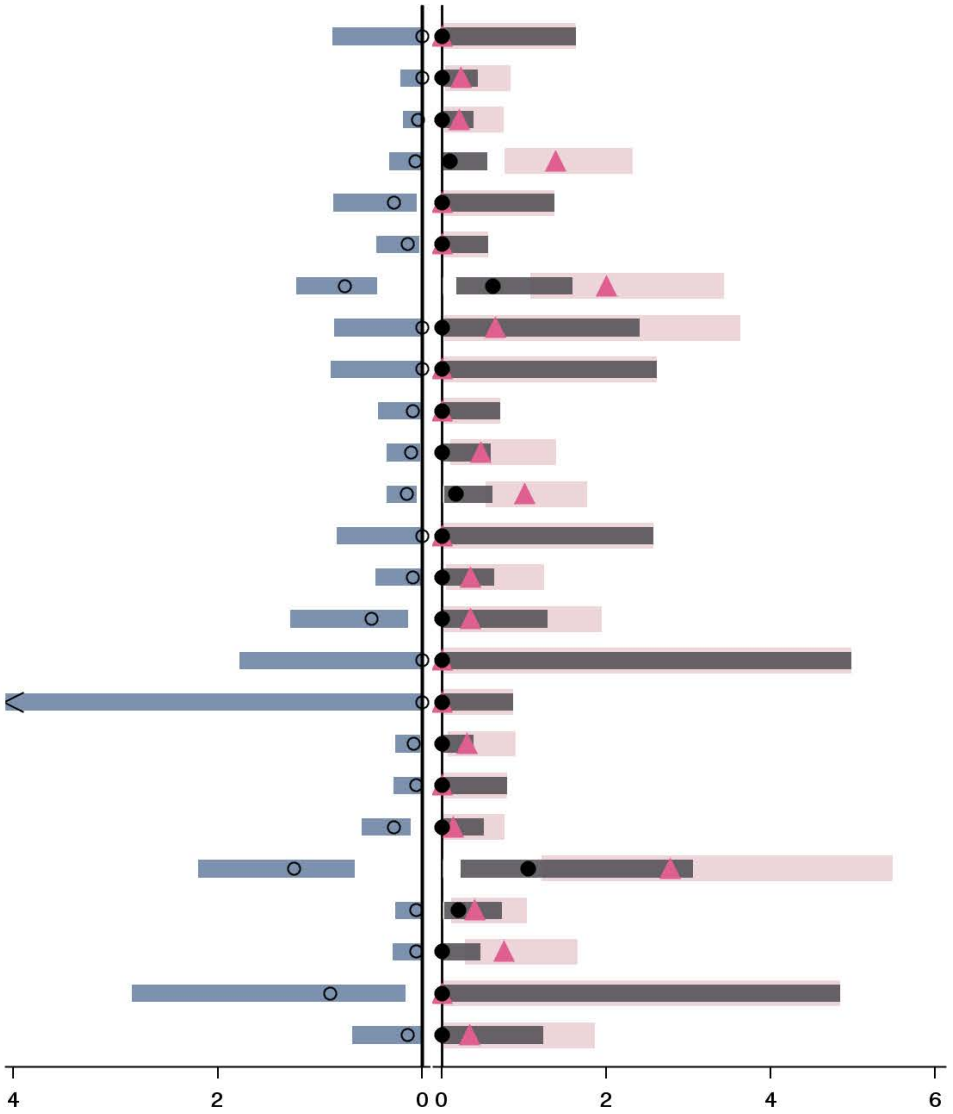
HO-All: hospital onset CRE incidence rate all sites per 10,000 patient days and 95% confidence interval (state average = 0.7)

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 = 0.2)

Figure 27. Hospital carbapenem-resistant Enterobacteriaceae infection rates, NYS 2019 (Page 2 of 7)

Hospital Name	# All AdmPrev	# Adms	AdmPrev Rate	HO-All Rate	HO-BSI Rate	# Patdays	# All	# BSI
Eastern Niagara Hosp	0	3400	0.0	0.0	0.0	22776	0	0
Ellis Hospital	0	14049	0.0	0.2	0.0	86894	2	0
Elmhurst Hospital	1	25373	0.0	0.2	0.0	97759	2	0
Erie County Med Ctr	1	14946	0.1	1.4	0.1	101549	14	1
FF Thompson	2	7272	0.3	0.0	0.0	27020	0	0
Faxton St. Lukes	2	14151	0.1	0.0	0.0	66282	0	0
Flushing Hospital	12	15784	0.8	2.0	0.6	64952	13	4
Geneva General	0	3479	0.0	0.6	0.0	15403	1	0
Glen Cove Hospital	0	3350	0.0	0.0	0.0	14139	0	0
Glens Falls Hospital	1	11024	0.1	0.0	0.0	52906	0	0
Good Samar. Suffern	2	18377	0.1	0.5	0.0	63317	3	0
Good Samar. W Islip	4	26497	0.2	1.0	0.2	118980	12	2
Guthrie Cortland MC	0	3586	0.0	0.0	0.0	14383	0	0
Harlem Hospital	1	10429	0.1	0.3	0.0	58282	2	0
HealthAlli Broadway	3	5998	0.5	0.3	0.0	28852	1	0
HealthAlli MarysAve	0	1676	0.0	0.0	0.0	7426	0	0
Henry J. Carter	0	335	0.0	0.0	0.0	42788	0	0
Highland Hospital	2	24210	0.1	0.3	0.0	98658	3	0
Hosp for Spec Surg	1	16866	0.1	0.0	0.0	47051	0	0
Huntington Hospital	5	17898	0.3	0.1	0.0	73791	1	0
Interfaith Med Ctr	9	7153	1.3	2.8	1.0	28799	8	3
Jacobi Med Ctr	1	17933	0.1	0.4	0.2	100197	4	2
Jamaica Hospital	1	16625	0.1	0.8	0.0	79460	6	0
Jones Memorial	2	2212	0.9	0.0	0.0	7633	0	0
Kenmore Mercy	1	6957	0.1	0.3	0.0	30028	1	0



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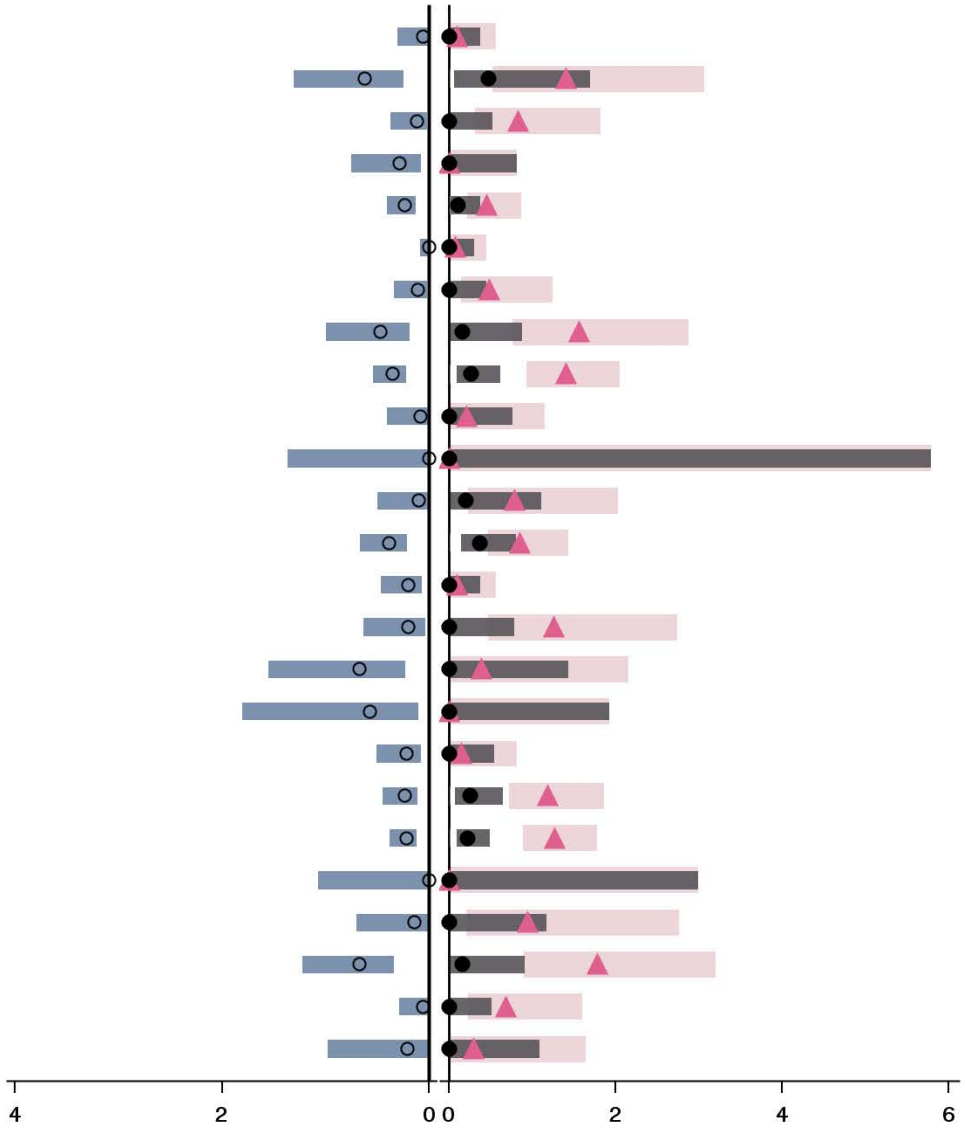
HO-BSI: hospital onset CRE blood incidence rate per 10,000 patient days and 95% confidence interval (state average = 0.1)

All-Admprev: all body site CRE admissions prevalence rate per 1,000 admissions and 95% confidence interval (state average = 0.2)

Figure 27. Hospital carbapenem-resistant Enterobacteriaceae infection rates, NYS 2019 (Page 3 of 7)

Hospital Name	# All AdmPrev	# Adms	AdmPrev Rate	HO-All Rate	HO-BSI Rate	# Patdays	# All	# BSI
Kings County Hosp	1	15819	0.1	0.1	0.0	100733	1	0
Kingsbrook Jewish MC	5	8050	0.6	1.4	0.5	42774	6	2
LIJ at Forest Hills	2	17035	0.1	0.8	0.0	72241	6	0
LIJ at Valley Stream	3	10376	0.3	0.0	0.0	45980	0	0
LIJ(Long Isl Jewish)	10	41786	0.2	0.5	0.1	198952	9	2
Lenox Hill Hospital	0	34779	0.0	0.1	0.0	127607	1	0
Lincoln Med Ctr	2	18494	0.1	0.5	0.0	83006	4	0
Long Isl. Community	5	10593	0.5	1.6	0.2	64044	10	1
Maimonides Med Ctr	15	42765	0.4	1.4	0.3	192569	27	5
Mary Imogene Bassett	1	11705	0.1	0.2	0.0	48757	1	0
Massena Memorial	0	2199	0.0	0.0	0.0	6392	0	0
Mather Hospital	1	9571	0.1	0.8	0.2	50752	4	1
Memor SloanKettering	10	25611	0.4	0.8	0.4	165172	14	6
Mercy Hosp Buffalo	4	19653	0.2	0.1	0.0	100556	1	0
Mercy Med Ctr	2	9938	0.2	1.3	0.0	47803	6	0
Metropolitan Hosp	4	5901	0.7	0.4	0.0	26009	1	0
MidHudson Reg of WMC	2	3495	0.6	0.0	0.0	19233	0	0
Millard Fill. Suburb	4	18121	0.2	0.1	0.0	68707	1	0
Montefiore-Einstein	7	29635	0.2	1.2	0.2	160445	19	4
Montefiore-Moses	10	45030	0.2	1.3	0.2	269330	34	6
Montefiore-Mt Vernon	0	2796	0.0	0.0	0.0	12351	0	0
Montefiore-NewRochl	1	6799	0.1	0.9	0.0	31868	3	0
Montefiore-Nyack	8	11819	0.7	1.8	0.2	61666	11	1
Montefiore-Wakefield	1	16433	0.1	0.7	0.0	73305	5	0
Mount St. Marys	1	4831	0.2	0.3	0.0	34230	1	0



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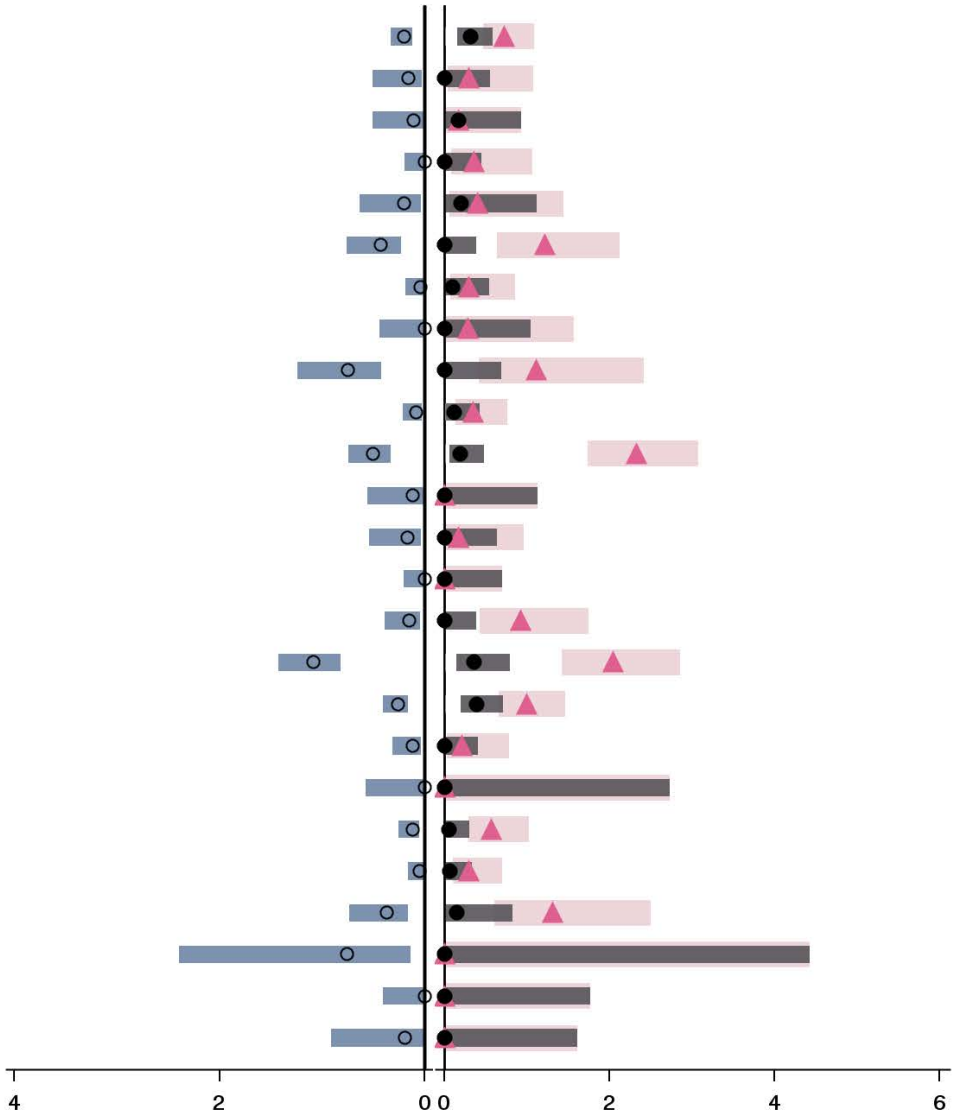
HO-BSI: hospital onset CRE blood incidence rate per 10,000 patient days and 95% confidence interval (state average = 0.1)

All-Admprev: all body site CRE admissions prevalence rate per 1,000 admissions and 95% confidence interval (state average = 0.2)

Figure 27. Hospital carbapenem-resistant Enterobacteriaceae infection rates, NYS 2019 (Page 4 of 7)

Hospital Name	# All AdmPrev	# Adms	AdmPrev Rate	HO-All Rate	HO-BSI Rate	# Patdays	# All	# BSI
Mt Sinai	12	58596	0.2	0.7	0.3	319084	23	10
Mt Sinai Beth Israel	2	12409	0.2	0.3	0.0	67595	2	0
Mt Sinai Brooklyn	1	9309	0.1	0.2	0.2	60352	1	1
Mt Sinai Morningside	0	15299	0.0	0.4	0.0	83249	3	0
Mt Sinai Queens	2	9933	0.2	0.4	0.2	50278	2	1
Mt Sinai S Nassau	9	20730	0.4	1.2	0.0	99190	12	0
Mt Sinai West	1	25102	0.0	0.3	0.1	103807	3	1
NY Community Hosp	0	6813	0.0	0.3	0.0	35690	1	0
NYP-Allen	11	14682	0.7	1.1	0.0	54203	6	0
NYP-Brklyn Methodist	3	37315	0.1	0.3	0.1	174481	6	2
NYP-Columbia	19	37582	0.5	2.3	0.2	215123	50	4
NYP-Hudson Valley	1	8501	0.1	0.0	0.0	32998	0	0
NYP-Lawrence	2	11716	0.2	0.2	0.0	58460	1	0
NYP-Lower Manhattan	0	14525	0.0	0.0	0.0	53356	0	0
NYP-Morgan Stanley	3	19932	0.2	0.9	0.0	98138	9	0
NYP-Queens	38	34954	1.1	2.0	0.4	166911	34	6
NYP-Weill Cornell	14	53530	0.3	1.0	0.4	261054	26	10
NYU Langone Brooklyn	3	25112	0.1	0.2	0.0	93621	2	0
NYU Orthopedic Hosp	0	5228	0.0	0.0	0.0	13556	0	0
NYU Tisch	5	41115	0.1	0.6	0.1	193152	11	1
NYU Winthrop	2	38510	0.1	0.3	0.1	169164	5	1
Nassau University	6	16157	0.4	1.3	0.1	68643	9	1
Nathan Littauer	2	2626	0.8	0.0	0.0	8362	0	0
Newark Wayne	0	7445	0.0	0.0	0.0	20931	0	0
Niagara Falls	1	5222	0.2	0.0	0.0	23098	0	0



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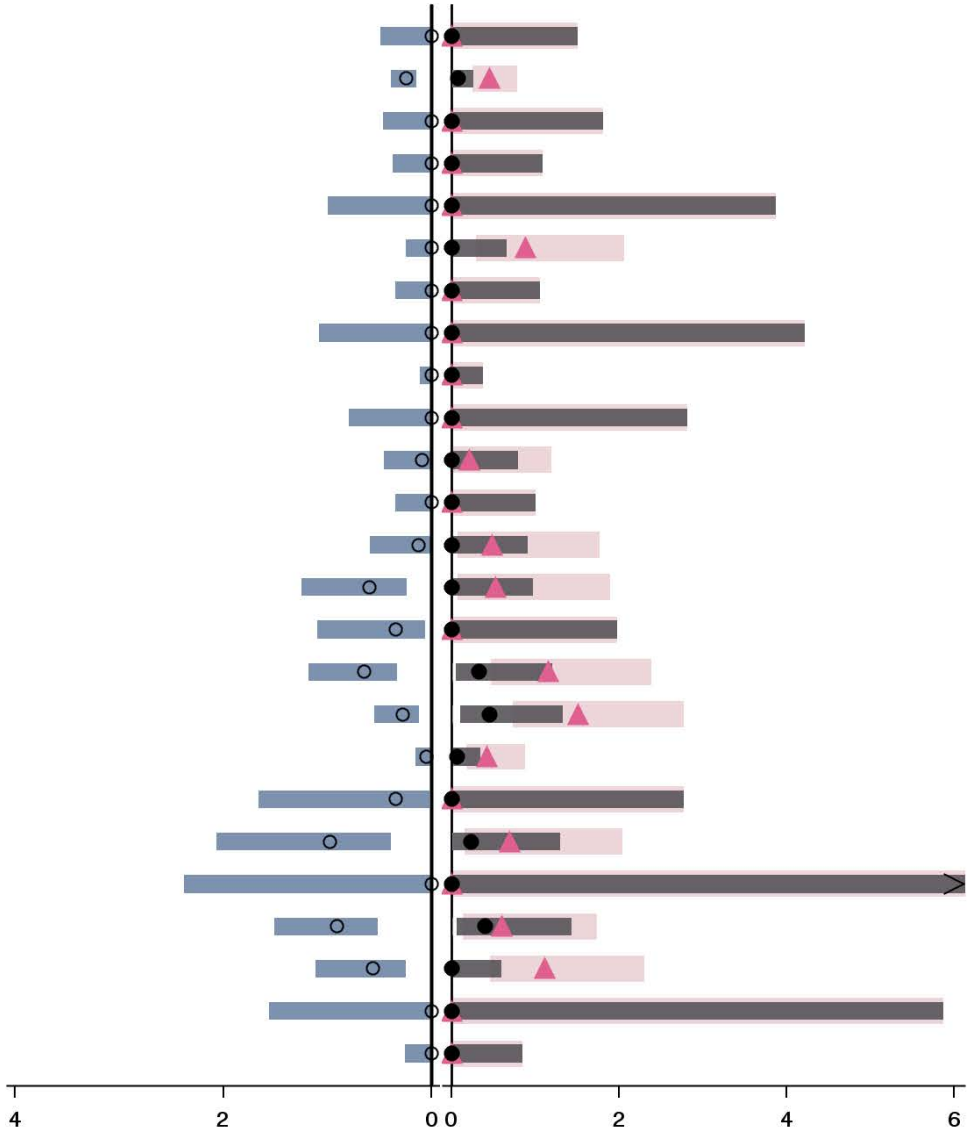
HO-BSI: hospital onset CRE blood incidence rate per 10,000 patient days and 95% confidence interval (state average = 0.1)

All-Admprev: all body site CRE admissions prevalence rate per 1,000 admissions and 95% confidence interval (state average = 0.2)

Figure 27. Hospital carbapenem-resistant Enterobacteriaceae infection rates, NYS 2019 (Page 5 of 7)

Hospital Name	# All AdmPrev	# Adms	AdmPrev Rate	HO-All Rate	HO-BSI Rate	# Patdays	# All	# BSI
North Central Bronx	0	6145	0.0	0.0	0.0	24708	0	0
North Shore	13	53367	0.2	0.5	0.1	288592	13	2
Northern Dutchess	0	6442	0.0	0.0	0.0	20487	0	0
Northern Westchester	0	8140	0.0	0.0	0.0	34256	0	0
Noyes Memorial	0	3001	0.0	0.0	0.0	9552	0	0
Oishei Childrens	0	12292	0.0	0.9	0.0	56865	5	0
Olean General	0	8757	0.0	0.0	0.0	35098	0	0
Oneida Healthcare	0	2771	0.0	0.0	0.0	8768	0	0
Orange Regional	0	28046	0.0	0.0	0.0	102108	0	0
Oswego Hospital	0	3766	0.0	0.0	0.0	13140	0	0
Our Lady of Lourdes	1	10442	0.1	0.2	0.0	47234	1	0
Peconic Bay Medical	0	8583	0.0	0.0	0.0	37183	0	0
Phelps Memorial	1	8004	0.1	0.5	0.0	41217	2	0
Plainview Hospital	5	8396	0.6	0.5	0.0	38268	2	0
Putnam Hospital	2	5723	0.3	0.0	0.0	18781	0	0
Queens Hospital	8	12265	0.7	1.2	0.3	60685	7	2
Richmond Univ MC	6	21509	0.3	1.5	0.5	66539	10	3
Rochester General	2	41436	0.0	0.4	0.1	166281	7	1
Rome Memorial	1	2860	0.3	0.0	0.0	13349	0	0
Roswell Park	5	5092	1.0	0.7	0.2	43120	3	1
SJRH Dobbs Ferry	0	1261	0.0	0.0	0.0	2821	0	0
SJRH St Johns	11	12057	0.9	0.6	0.4	50661	3	2
SUNY Downstate MC	6	10608	0.6	1.1	0.0	63014	7	0
Samaritan AlbanyMem	0	1923	0.0	0.0	0.0	6296	0	0
Samaritan Hosp Troy	0	12036	0.0	0.0	0.0	44112	0	0



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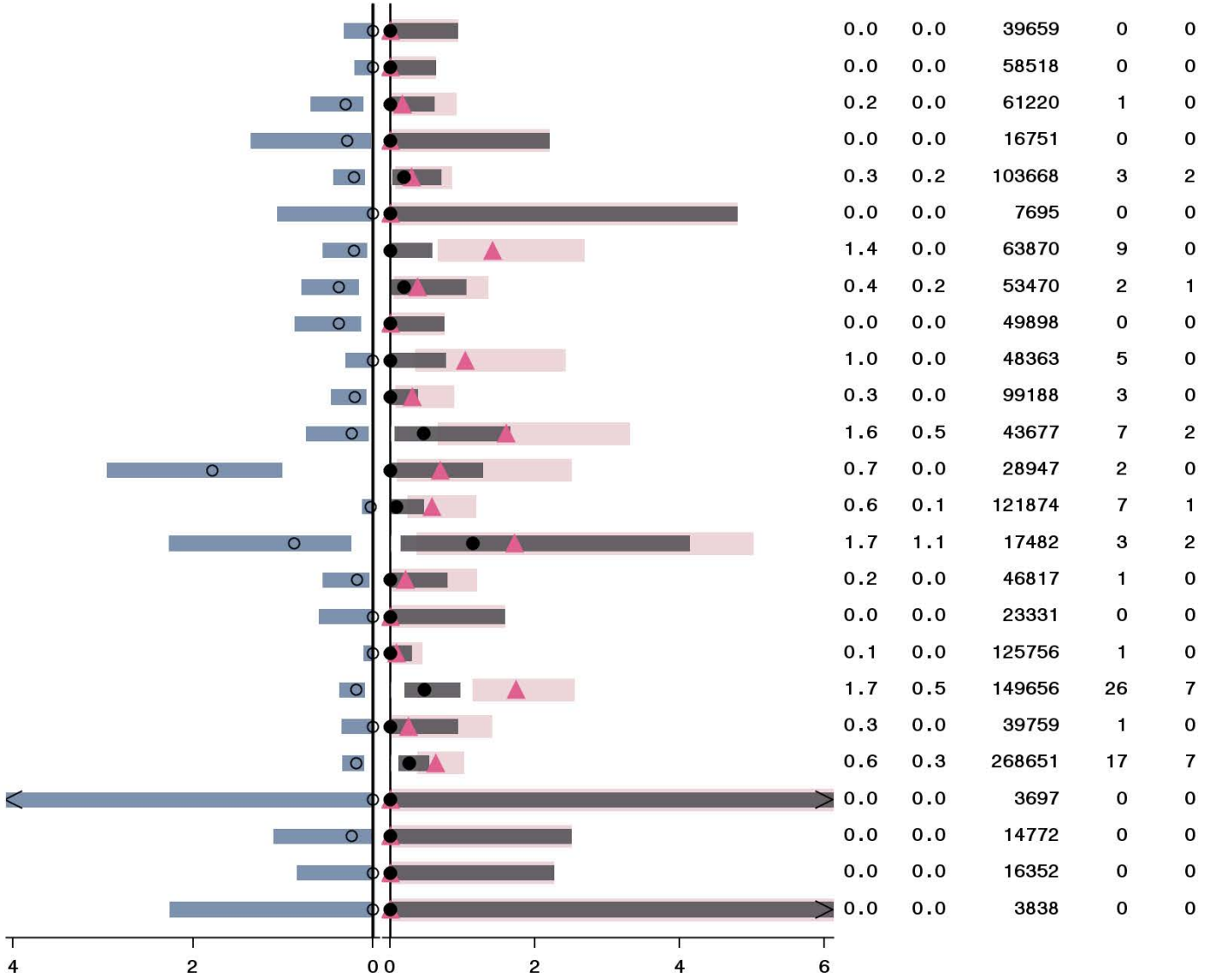
HO-BSI: hospital onset CRE blood incidence rate per 10,000 patient days and 95% confidence interval (state average = 0.1)

All-Admprev: all body site CRE admissions prevalence rate per 1,000 admissions and 95% confidence interval (state average = 0.2)

Figure 27. Hospital carbapenem-resistant Enterobacteriaceae infection rates, NYS 2019 (Page 6 of 7)

Hospital Name	# All AdmPrev	# Adms	AdmPrev Rate	HO-All Rate	HO-BSI Rate	# Patdays	# All	# BSI
Samaritan- Watertown	0	9254	0.0	0.0	0.0	39659	0	0
Saratoga Hospital	0	14637	0.0	0.0	0.0	58518	0	0
Sisters of Charity	4	13197	0.3	0.2	0.0	61220	1	0
Sisters- St Joseph	1	3492	0.3	0.0	0.0	16751	0	0
South Shore UH	5	24192	0.2	0.3	0.2	103668	3	2
St Anthony	0	2818	0.0	0.0	0.0	7695	0	0
St Barnabas	3	14018	0.2	1.4	0.0	63870	9	0
St Catherine Siena	5	13296	0.4	0.4	0.2	53470	2	1
St Charles Hospital	4	10579	0.4	0.0	0.0	49898	0	0
St Elizabeth Medical	0	10001	0.0	1.0	0.0	48363	5	0
St Francis- Roslyn	4	19802	0.2	0.3	0.0	99188	3	0
St Johns Episcopal	2	8493	0.2	1.6	0.5	43677	7	2
St Joseph- Bethpage	11	6149	1.8	0.7	0.0	28947	2	0
St Josephs- Syracuse	1	39165	0.0	0.6	0.1	121874	7	1
St Josephs- Yonkers	3	3412	0.9	1.7	1.1	17482	3	2
St Lukes Cornwall	2	11235	0.2	0.2	0.0	46817	1	0
St Marys Amsterdam	0	5035	0.0	0.0	0.0	23331	0	0
St Peters Hospital	0	30089	0.0	0.1	0.0	125756	1	0
Staten Island UNorth	6	32060	0.2	1.7	0.5	149656	26	7
Staten Island USouth	0	8688	0.0	0.3	0.0	39759	1	0
Strong Memorial	8	42570	0.2	0.6	0.3	268651	17	7
Sunnyview Rehab Hosp	0	416	0.0	0.0	0.0	3697	0	0
Syosset Hospital	1	4298	0.2	0.0	0.0	14772	0	0
UHS Binghamton	0	3557	0.0	0.0	0.0	16352	0	0
UHS Chenango Memor	0	1327	0.0	0.0	0.0	3838	0	0



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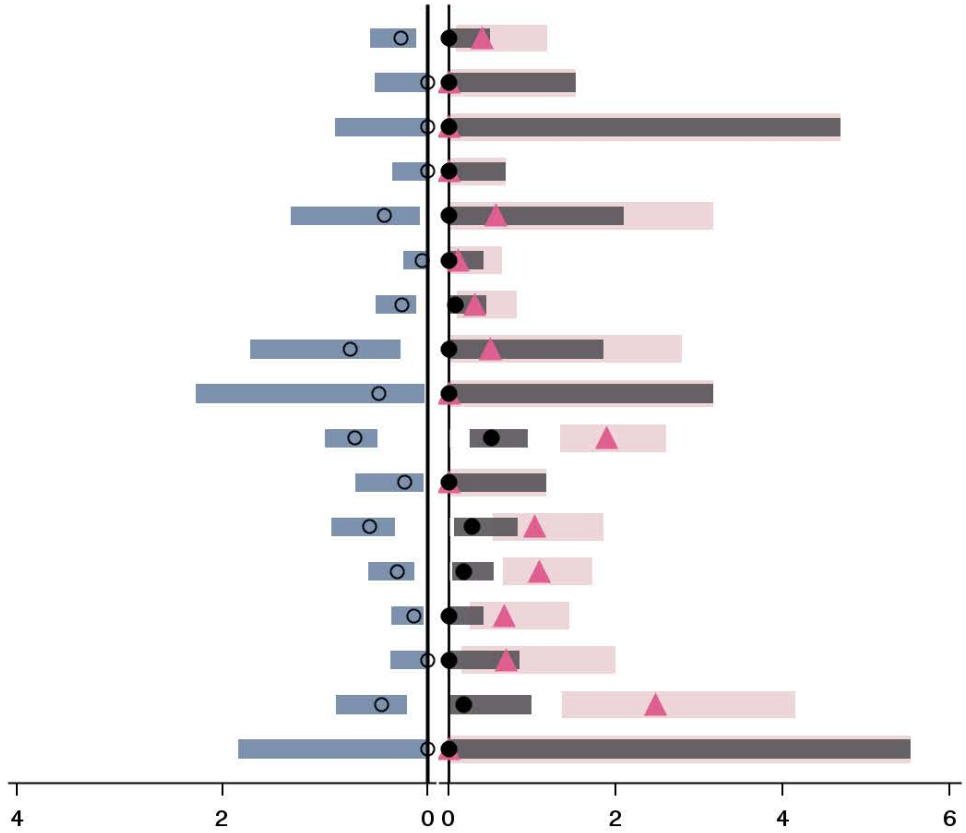
All-Admprev: all body site CRE admissions prevalence rate per 1,000 admissions and 95% confidence interval (state average = 0.2)

Figure 27. Hospital carbapenem-resistant Enterobacteriaceae infection rates, NYS 2019 (Page 7 of 7)

Hospital Name	# All AdmPrev	# Adms	AdmPrev Rate	HO-All Rate	HO-BSI Rate	# Patdays	# All	# BSI
UHS Wilson	5	18945	0.3	0.4	0.0	75139	3	0
UPMC Chautauqua	0	5835	0.0	0.0	0.0	24407	0	0
UVM Alice Hyde	0	3340	0.0	0.0	0.0	7877	0	0
UVM Champlain Valley	0	8646	0.0	0.0	0.0	54708	0	0
United Memorial	2	4710	0.4	0.6	0.0	17669	1	0
Unity Hosp Rochester	1	20082	0.0	0.1	0.0	89239	1	0
UnivHSUNY Upstate	6	23700	0.3	0.3	0.1	127619	4	1
UnivHStonyBrkSoutham	4	5284	0.8	0.5	0.0	20025	1	0
UnivHStonyBrookELI	1	2099	0.5	0.0	0.0	11691	0	0
UnivHStonyBrookU	24	33896	0.7	1.9	0.5	196159	37	10
Upst. Community Gen	2	8924	0.2	0.0	0.0	31814	0	0
Vassar Brothers	11	19443	0.6	1.0	0.3	106844	11	3
Westchester Medical	6	20425	0.3	1.1	0.2	166155	18	3
White Plains Hosp	3	21943	0.1	0.7	0.0	91308	6	0
Woodhull Med Ctr	0	8381	0.0	0.7	0.0	44099	3	0
Wyckoff Heights	6	13232	0.5	2.5	0.2	56718	14	1
Wyoming County Comm.	0	1623	0.0	0.0	0.0	6684	0	0



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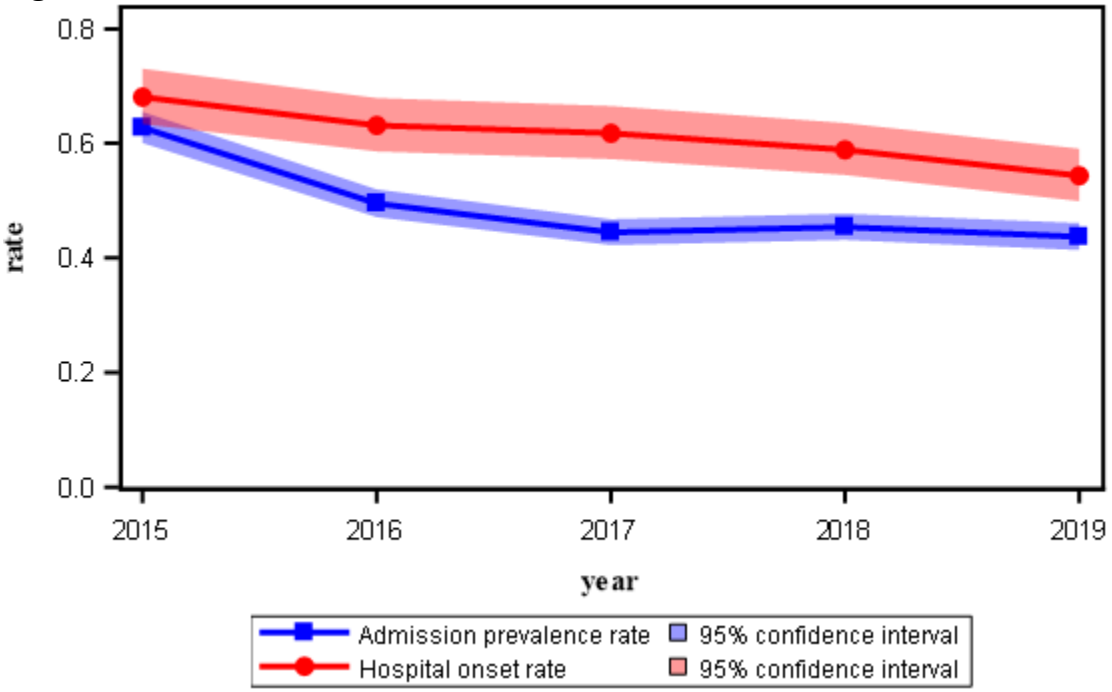
Methicillin-resistant *Staphylococcus aureus* (MRSA) bloodstream infections

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 2019, 165 hospitals reported MRSA BSIs for participation in CMS incentive programs; small hospitals that do not meet NYS reporting requirements were excluded. 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 2019, the admission prevalence MRSA BSI rate decreased 30% and the hospital onset MRSA rate decreased 20% (Figure 28).

Figure 28. MRSA bloodstream infections, New York State 2015-2019

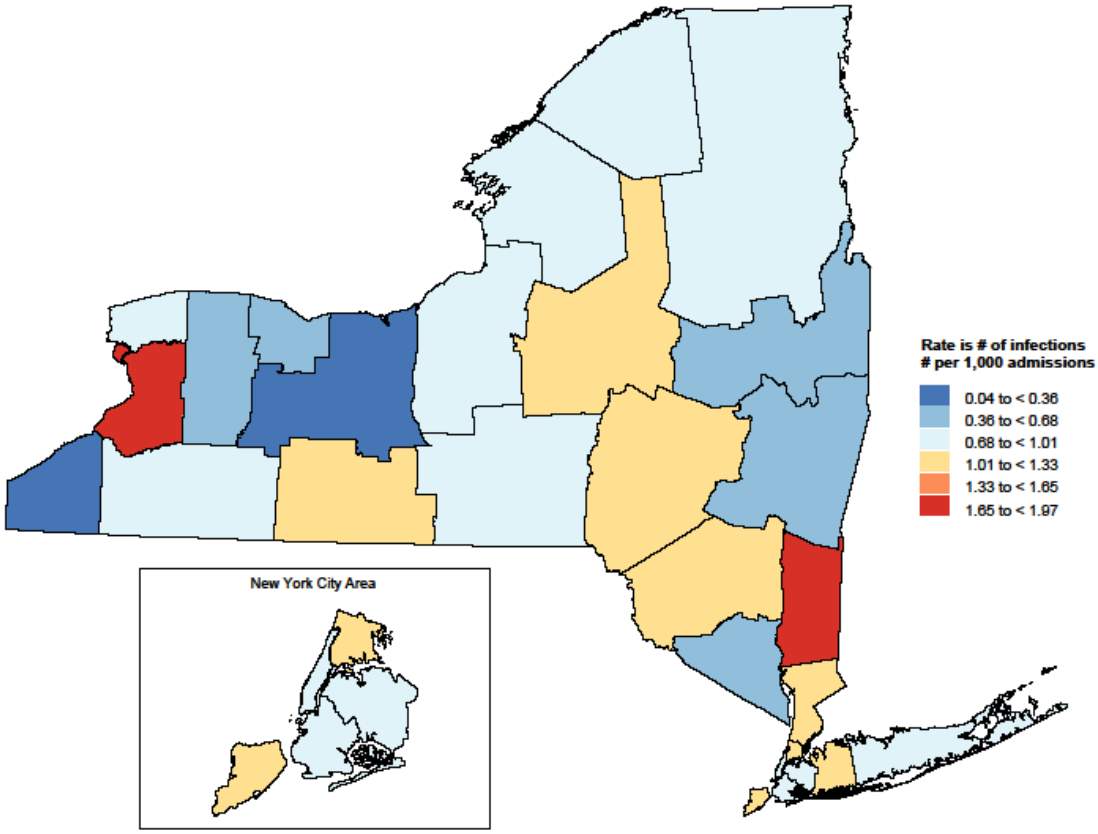


Year	# Hosp	# Emergency Dept. Infections	# Admission Prevalent Infections	# Admissions	Admission Prevalence Rate (per 1,000 admissions)	# Hospital Onset Infections	# Patient Days	Hospital Onset Incidence Rate (per 10,000 patient days)
2015	174	1,464	1,459	2,325,035	0.628	777	11,410,301	0.681
2016	177	1,921	1,154	2,330,860	0.495	718	11,369,649	0.632
2017	175	2,069	1,057	2,376,628	0.445	695	11,250,134	0.618
2018	173	2,239	1,077	2,372,129	0.454	661	11,222,947	0.589
2019	165	2,010	938	2,148,918	0.436	554	10,214,721	0.54

Facility-wide inpatient data reported as of November 12, 2020.

Figure 29 shows the FWI MRSA patient prevalence rate by county (or merged county for those with few or no hospitals).

Figure 29. Facility-wide inpatient MRSA bloodstream infection patient prevalence rates, New York State 2019



Facility-wide inpatient data reported as of November 12, 2020. 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.

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. 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.

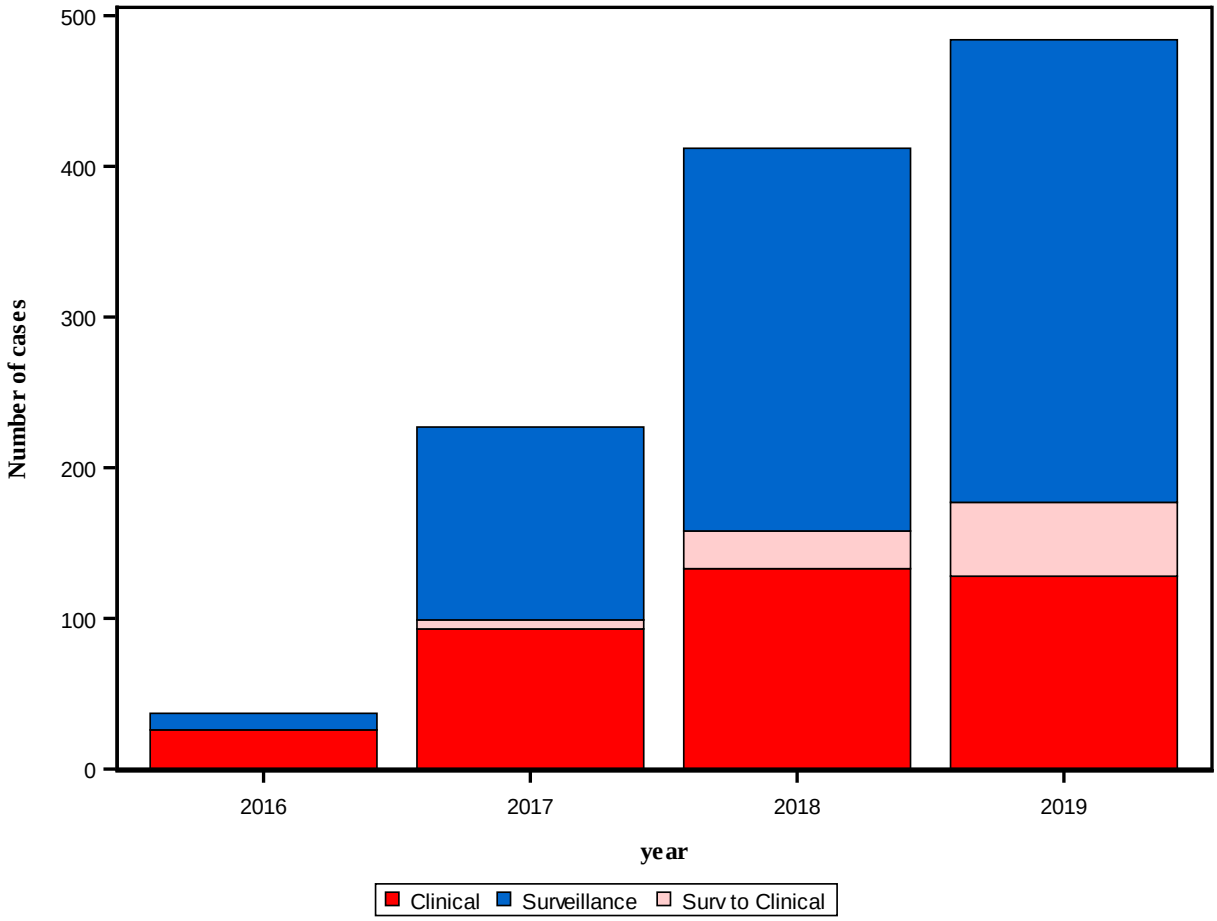
To curb further spread of *C. auris*, NYS developed a special team to handle *C. auris* activity in the region. Working with senior staff in both regional and central offices, this team has been investigating cases of *C. auris*. Activities include conducting on-site investigations; reviewing patient 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.

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. Starting in 2019, this includes specimens from non-invasive sites such as wounds, urine, and the respiratory tract, where presence of *C. auris* may simply represent colonization and not true infection. 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 2019 there were 307 surveillance cases, 128 clinical cases, and 49 clinical cases that were also previously counted as surveillance cases (Figure 30). Ninety patients had bloodstream infections. The average patient age was 68 (range 20 to 102 years). Cases were first identified by hospitals 74% of the time, and by LTCFs 26% of the time, though patients transfer frequently between these two types of facilities.

Figure 30. *Candida auris* cases, New York State facilities 2016-2019

year	# clinical cases	# surveillance to clinical	# surveillance cases	# total
2016	26	0	11	37
2017	93	6	128	227
2018	133	25	254	412
2019	128	49	307	484

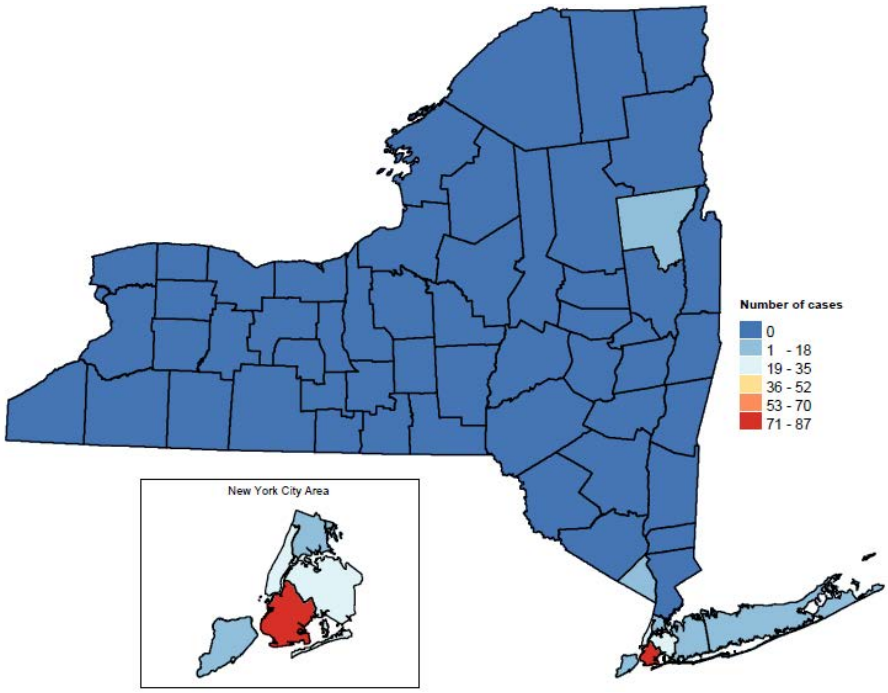


Samples reported as of January 8, 2021. First positive per person per specimen type (clinical/surveillance). Includes cases identified in hospitals, nursing homes, and other facility types.

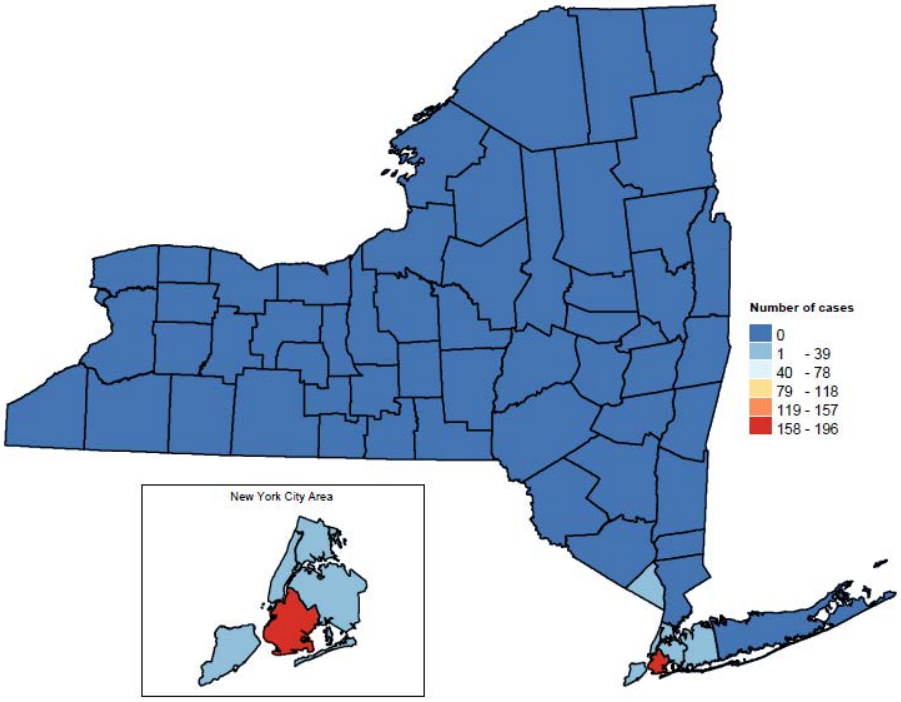
Clinical and surveillance cases are mapped by county of diagnosis in Figure 31. Cases were concentrated in Brooklyn.

Figure 31. Number of patients colonized or infected with *Candida auris*, New York State 2019

a) Clinical cases



b) Surveillance cases



Samples reported as of January 8, 2021. First positive per person per specimen type (clinical/surveillance). Includes cases identified in hospitals and LTCFs.

Between 2016 and 2019, 76 hospitals, 123 LTCFs, and 3 hospices were known to have cared for a person infected, colonized, or possibly colonized with *C. auris* within 90 days before diagnosis. This count is likely underestimated because of the resource-intensive nature of patient tracking. *C. auris* 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.

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* was not included because the data are not reported by onset the same way as the other indicators. 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, 428) and influenza (512), reported in NYS in 2018.[3]

Table 20. New York State hospital mortality estimates, 2019

Infection[1]	% Attributable Deaths[2]	# Cases Total[3]	# Hospital Onset Cases	# Deaths Total	# Deaths from Hospital Onset Cases
Clostridioides difficile	6%	9,868	4,241	592	254
MRSA BSI	20%	1,492	554	298	111
CRE BSI	34%	186	142	63	48
Total		11,546	4,937	954	414

NHSN facility-wide inpatient data downloaded November 2020. 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 2019 survey results related to MDRO prevention practices.

Table 21. MDRO Prevention Practice Survey, New York State Hospitals 2019

Patients infected or colonized with MRSA are routinely placed on contact precautions?	
No	19%
Yes, all infected or colonized	52%
Yes, only all infected	18%
Yes, only those with high risk	11%
Patients infected or colonized with CRE are routinely placed on contact precautions?	
No	0%
Yes, all infected or colonized	95%
Yes, only all infected	3%
Yes, only those with high risk	2%
Facility routinely performs screening cultures for CRE?	11%
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)	35%
Facility routinely performs screening cultures for MRSA in patients admitted to NICUs	24%
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.)	19%

National Healthcare Safety Network Surveys, downloaded November 12, 2020. All 167 hospitals responded.

Although 95% of facilities responded that they put all 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 2019, 94.6% of NYS hospitals reported meeting all seven elements of the CDC Core Elements of Antimicrobial Stewardship Programs (ASPs)[4,5] (Table 22). In 2019, the Centers for Medicare and Medicaid Conditions of Participation added a requirement for hospitals to have an ASP that meets one of several possible sets of national standards. Flexibility to tailor ASPs to local needs, plus incorporating process and outcome measures for evaluation, continues to be important to achieve optimal results. Hospitals are now required to have ASPs in place and should focus efforts on ensuring effectiveness of the programs.

Table 22. Antimicrobial stewardship practices in NYS hospitals, 2019 survey

CDC Core Elements of antimicrobial stewardship program	% met
1. Hospital Leadership Commitment*	**99.4%**
Formal statement of support for antibiotic stewardship (e.g. a written policy or statement approved by board)	97.6%
Hospital leadership communicates to staff about stewardship activities	85.6%
Hospital leadership provides opportunities for staff training and development	71.3%
Hospital leadership allocates information technology resources	85.0%
Committee responsible for antibiotic stewardship	98.8%
Physician leader has antibiotic stewardship responsibilities in job description/contract	57.5%
Pharmacist leader has antibiotic stewardship responsibilities in job description/contract	57.5%
2. Accountability	**99.4%**
A leader is responsible for program outcomes of stewardship activities.	99.4%
3. Drug Expertise*	**99.4%**
Antibiotic stewardship outcomes are lead/co-lead by pharmacist	82.6%
Lead/co-lead is not pharmacist, but at least one pharmacist is responsible for improving antibiotic use	16.8%
4. Action (Implementing recommended interventions)*	**100%**
Require documentation of indication for antibiotic orders	71.3%
Require documentation of duration for antibiotic orders	52.7%
Review antibiotics 48-72 hours after initial order (i.e. antibiotic time-out)	56.9%
Stewardship team provides prospective audit and feedback to treatment team	79.4%
Require prior authorization before restricted antibiotics can be dispensed	58.1%
Providers have access to facility- or region-specific treatment guidelines or recommendations for commonly encountered infections	90.4%
Target select diagnoses for active interventions to optimize antibiotic use	80.2%
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	61.7%
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	70.0%
Stewardship team monitors antibiotic resistance patterns (either facility- or region-specific)	93.4%
Stewardship team monitors antibiotic use in days of therapy (DOT) per 1000 patient days or days present	80.8%

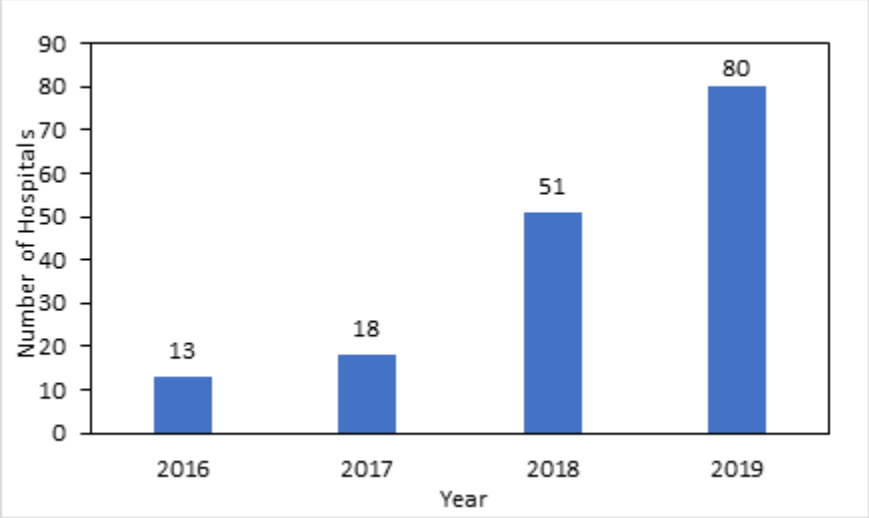
Stewardship team monitors antibiotic use in defined daily doses (DDT) per 1000 patient days	22.2%
Stewardship team monitors antibiotic expenditures	61.7%
6. Reporting*	**98.8%**
Stewardship team provides prospective audit and feedback to treatment team (also counted as an action)	79.6%
Stewardship team provides facility/unit/service-specific reports on antibiotics with prescribers	55.1%
Stewardship team provides updates to facility leadership on antibiotic use and stewardship efforts	95.8%
Stewardship team provides outcomes for antibiotic stewardship interventions to staff	68.3%
7. Education*	**94.6%**
Stewardship program provides education to prescribers on improving antibiotic prescribing	86.2%
Stewardship program provides education to nurses on improving antibiotic prescribing	63.5%
Stewardship program provides education to pharmacists on improving antibiotic prescribing	84.4%
Total:** Met all 7 Core Elements above	**94.6%**

Annual survey data downloaded from National Healthcare Safety Network on November 9, 2020. 100% of 173 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).

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. 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. Eighty one percent of hospitals reported using DOT per 1000 patient days or days present to track antibiotic use as part of an ASP. Between 2015 and 2019, the number NYS of hospitals that submitted AU data to NHSN increased from 13 to 80 (48% of the 167 hospitals included in this report, 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 2015-2019



In 2019, NYS hospitals participating in NHSN reported an average antimicrobial usage rate of 565 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 2019 NYS SAAR of 0.97 (Table 23) indicates that NYS antimicrobial use data was 3% 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 2019, 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	2,852,429	2939823	564.6	0.97
[2] Broad spectrum antibacterial agents predominantly used for hospital-onset	814,641	775,422	161.2	1.05
[3] Broad spectrum antibacterial agents predominantly used for community-acquired infections	558,968	717,493	110.6	0.78
[4] Antibacterial agents predominantly used for resistant Gram-positive infections (e.g.,	425,949	501,692	84.3	0.85
[5] Narrow spectrum beta-lactam agents	410,529	437,995	81.3	0.94
[6] Antibacterial agents posing the highest risk for CDI	725,876	889,836	143.7	0.82
[7] Antifungal agents predominantly used for invasive candidiasis	112,164	120,846	22.2	0.93

National Healthcare Safety Network data reported as of December 3, 2020.

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

[2] amikacin (intravenous (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

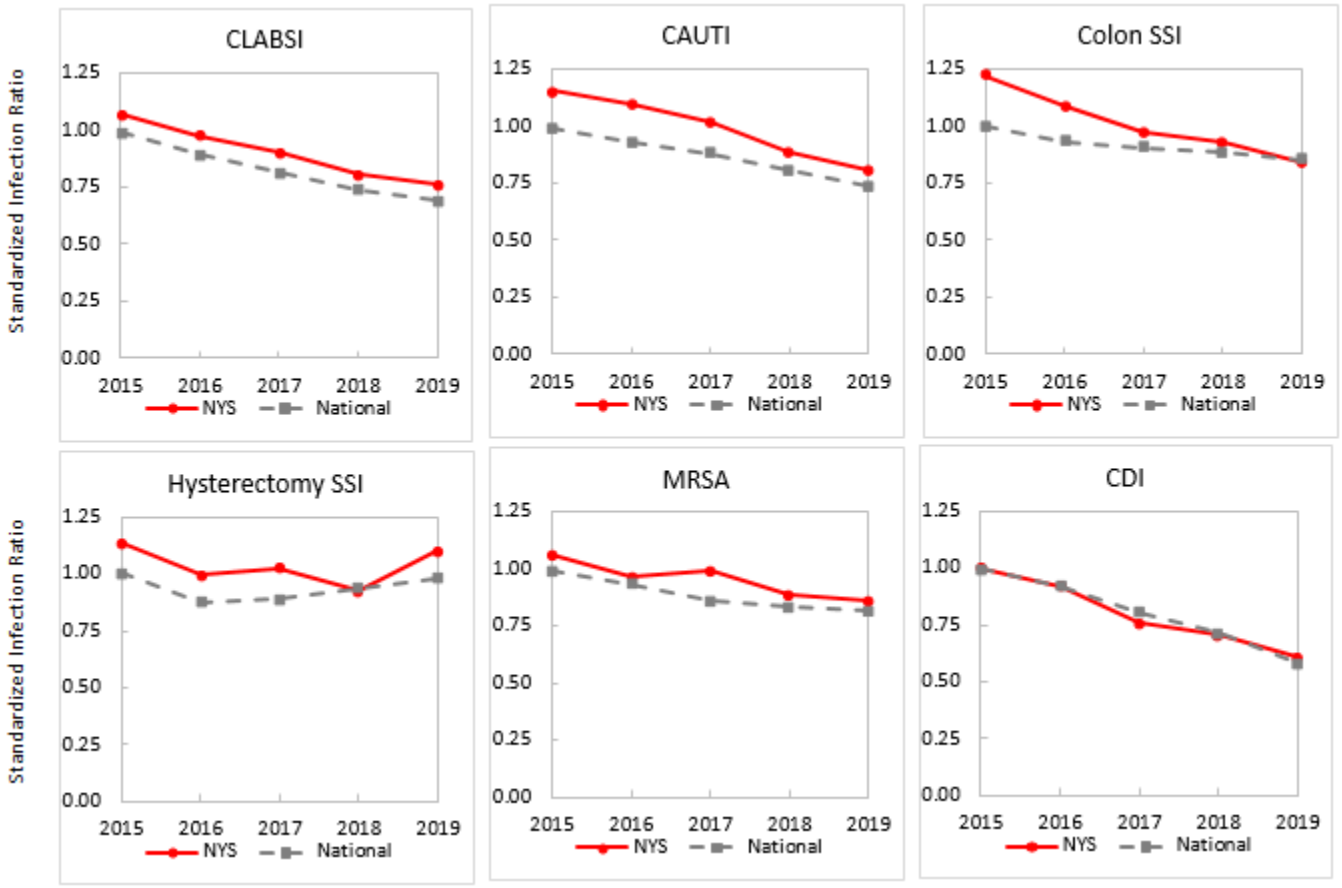
Measurement of antibiotic use and evaluation and intervention to ensure appropriate use are important in healthcare, including hospitals, long term care, and ambulatory/outpatient care settings.[6,7,8] Guidelines and numerous training programs are available through federal and state partners, as well 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 *C. difficile*, and experiencing adverse reactions (e.g. allergic reactions or diarrhea) to the medication[9]. 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[10]. Figure 33 summarizes data from the 2015-2019 CDC reports.

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



Type of Hospital-Acquired Infection	2019 New York SIR^	2019 National SIR^
Central-line associated bloodstream infections (CLABSIs)*	0.761	0.689
Catheter-associated urinary tract infections (CAUTI)	0.805	0.741
Colon surgical site infections (SSIs)*	0.846	0.855
Abdominal hysterectomy SSIs*	1.098	0.979
MRSA bacteremia	0.860	0.817
Clostridioides difficile infections (CDI)*	0.609	0.583

Source of data: CDC. 2015, 2016, 2017, 2018, and 2019 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 rates in NYS tend to track slightly higher than national rates, with the exception of CDI. Between 2015 and 2019 both state and National HAI rates improved for all indicators except abdominal hysterectomy SSIs. NYS colon SSI rates improved faster than the other indicators when compared to National rates of improvement.

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.

Summary

Table 24 summarizes the total number of each type of HAI for NYS in 2019. The table is sorted from most common to least common.

Table 24. Inpatient infections reported by New York State hospitals in 2019

Type of infection	Number	Rate
Hospital onset *Clostridioides difficile* infections (CDIs)	4,241	4.1/10,000 patient days
Surgical site infections (SSIs) following		
Colon surgery[B]	776	4.0/100 procedures
Spinal fusion surgery[N]	343	1.2/100 procedures
Hip replacement or revision surgery[N]	310	0.9/100 procedures
Abdominal hysterectomy surgery[B]	230	1.3/100 procedures
Coronary artery bypass graft (CABG) - chest site[N]	132	1.2/100 procedures
CABG - donor site[N]	23	0.2/100 procedures
Central line-associated bloodstream infections (CLABSIs) in intensive care units and medical and surgical wards[B] and step down, oncology, and mixed acuity units[N]	1,244	0.8/1,000 line days
Catheter-associated urinary tract infections (CAUTIs) in intensive care units, and medical/surgical wards	1,143	1.0/1,000 catheter days
Hospital onset methicillin-resistant *Staphylococcus aureus* (MRSA) bloodstream infections[C]	554	0.54/10,000 patient days
Hospital onset carbapenem-resistant *Klebsiella, E. coli,* and *Enterobacter* (CRE) bloodstream infections[N]	142	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 data reported as of 12/8/20; CLABSI/CDI/CRE reported as of 11/23/20; CAUTI and MRSA data reported as of 11/12/20. 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 45% 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 2019, 11,954 infections were prevented because of reductions in HAI rates; this was related to a cost savings of $143 to $274 million.

Table 25 also compares NYS progress to National and State Prevention Goals. NYS met the 2019 CDI and CRE goals, but did not meet goals for the other indicators.

Table 25. Cost savings associated with change in HAI rates between 2015 and 2019

Type of Infection	National/State 2015-2019 Prevention Goal	2019 Improvement Since 2015 (Compared to 2019 Goal)	# Prevented Infections	Direct Cost Savings (in millions)	
				Min	Max
Hospital onset *Clostridioides difficile* infections (CDI)	30%	improved 45% (met goal)	9,427	$100.0	$142.3
Colon surgery SSIs	30%	improved 28% (missed goal)	937	$18.4	$53.8
Central line-associated bloodstream infections (CLABSIs)	50%	improved 27% (missed goal)	1135	$13.7	$54.8
Hospital onset carbapenem-resistant Enterobacteriaceae (CRE) bloodstream infections	25%	improved 38% (met goal)	169	$5.5	$6.6
Coronary artery bypass graft chest SSIs	30%	improved 23% (missed goal)	166	$3.3	$9.5
Hip replacement or revision surgery SSIs	30%	improved 8% (missed goal)	99	$1.9	$5.7
Abdominal hysterectomy surgery SSIs	30%	worsened 8% (missed goal)	21*	$0.4	$1.2
Total			11,954	$143.2	$273.9

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. * Number is positive as a result of improvements in 2016 and 2018.

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
ASA – American Society of Anesthesiologists' classification of physical status
ASP – Antimicrobial stewardship program
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
CRE – Carbapenem-resistant Enterobacteriaceae
DOH – Department of Health
DOT – Days of therapy
DUA – Data use agreement
EB – Epidermolysis bullosa
ECMO – Extracorporeal membrane oxygenation
ED – Emergency department
EIA – Enzyme immunoassay
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
IV – Intravenous
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.

Epidermolysis bullosa (EB): a group of genetic disorders characterized by blister formation after minor trauma to the skin.

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.

Munchausen Syndrome by Proxy (MSP): a condition where a patient or caregiver makes up or causes an illness, for example deliberate contamination of a sterile device such as a central line.

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

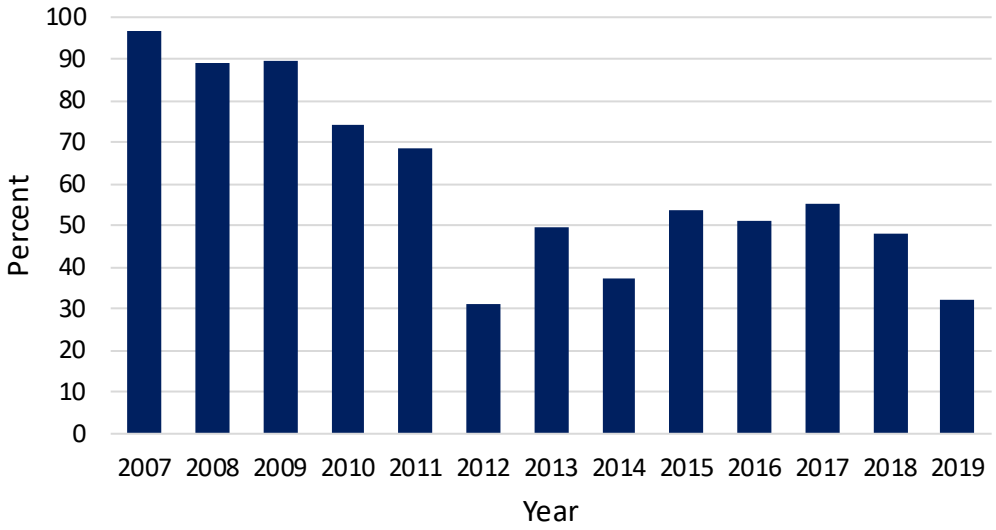
Data reported to the NHSN are validated by the NYSDOH using several methods.

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 34 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 34. 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 2019 audit results will be summarized in the next annual report. In 2018, NYSDOH staff reviewed 6,413 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 2018 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	693	110	6	541	36	93.9 %
CABG SSI	198	36	0	159	3	98.5 %
Hyst SSI	576	55	1	512	8	98.4 %
Hip SSI	685	65	0	611	9	98.7 %
CLABSI	801	198	6	558	39	94.4 %
CDI	2,646	2,572	2	0	72	97.2 %
CRE	814	768	4	0	42	94.3 %
Total	6,413	3,804	19	2,381	209	96.4 %

The 2018 audit was conducted between September 2018 and July 2019, and predominantly covered 2018 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 167 hospitals reporting complete data for 2019. 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.

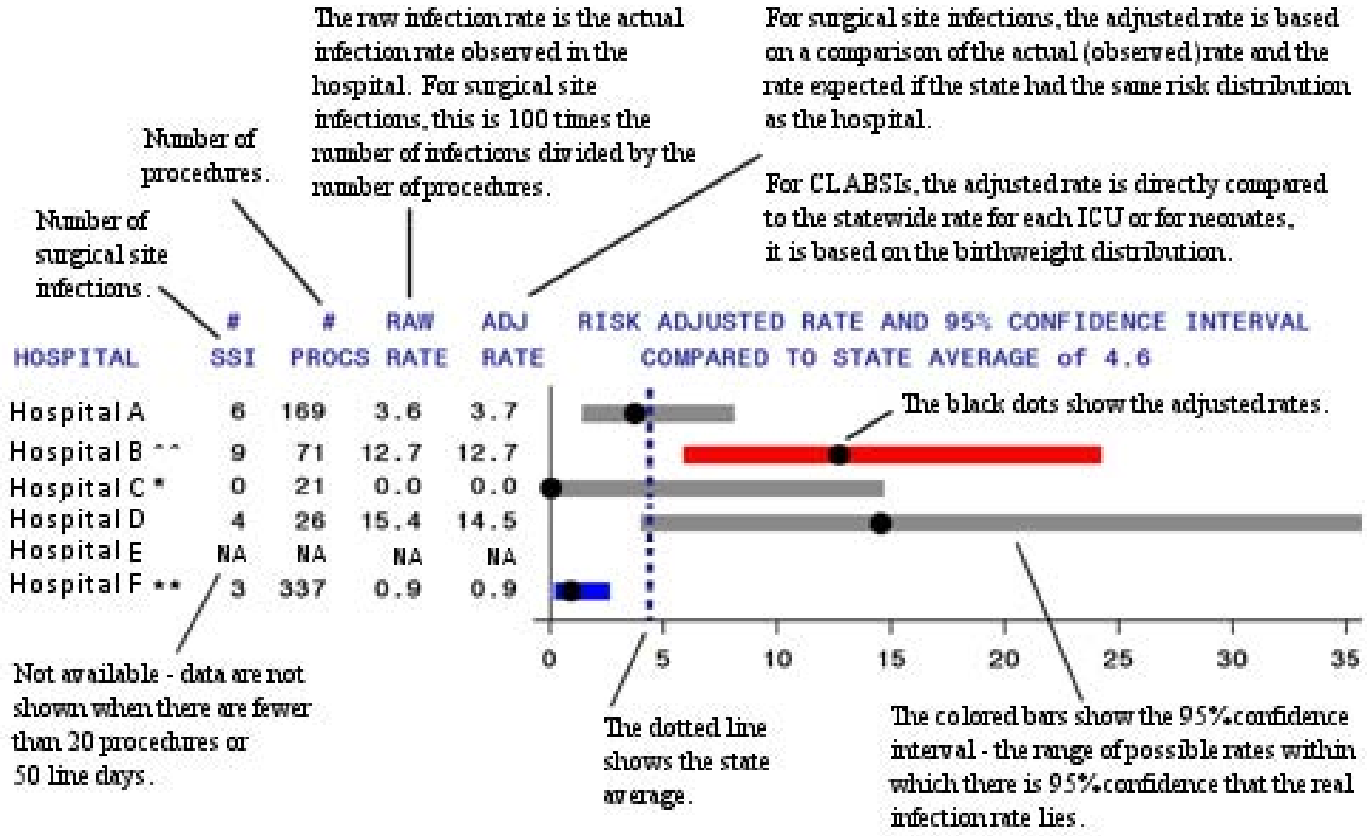
NYSDOH tracks hospital performance over time. Hospitals flagged high or low for at least three consecutive years (i.e. 2017, 2018, 2019) are specifically named in this report.

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

Figure 35. 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[11]	227	29	27	2.0
	Gravel 2009[12]	1430	N/A	N/A	5.7
	Kenneally 2007[13]	278	36.7	30.6	6.1
	Loo 2005[14]	1703	N/A	N/A	6.9
	Pepin 2005[15]	161	23	7	16.0
	Tabak 2013[16]	255	11.8	7.3	4.5
	Dubberke 2008[17]	353	36	30.3	5.7
	Hensgens 2013[18]	317	14.8	5.4	9.4
	Barbut 2017[19]	482	9	5	4.0
	Weighted average				**6**
CRE	Borer 2009[20]	32	71.9	21.9	50.0
	Mouloudi 2014[21]	37	NA	NA	27.0
	Gallagher 2014[22]	43	45	18	27
	Weighted average				**34**
MRSA	Harbarth 1998[23]	39	36	28	8.0
	DeKraker 2011[24]	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 2019 report, each hospital's 2019 data is compared to 2019 data reported by other hospitals in NYS.

- In CMS Hospital Compare, each hospital's 2019 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 have been several small changes and clarifications in the protocol between 2015 and 2019.

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.[25]

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[26].

Table 28. Comparison of New York State and Centers for Medicare and Medicaid Services (CMS) Methods for 2019 Hospital-Acquired Infection Reports

Indicator	Report	Exclusions	Risk Adjustment
CLABSI	NYS	Mucosal barrier injury-, extracorporeal membrane oxygenation-, and ventricular assist device- associated bloodstream infections; neurologic, burn, trauma, and respiratory ICUs, and some other wards that are included in CDC model for which NYS does not require reporting	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 2019 average.
	CMS	Mucosal barrier injury-, extracorporeal membrane oxygenation-, and ventricular assist device- associated bloodstream infections;	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, laparoscope. Hospital compared to NYS 2019 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 2019 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 2019 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. Hospital compared to NYS 2019 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 2019 average.
	NHSN	No model	No model
Clostridium difficile	NYS	Outlier community onset (CO) prevalence rate	CDI test type, CO admission prevalence rate, hospital bed size, % patient days in adult ICUs. Hospital compared to NYS 2019 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	Hospital name in the report
Albany	0001	330013	Albany Medical Center Hospital	Albany Med Ctr
	0004	330003	Samaritan Hospital - Albany Memorial Campus	Samaritan AlbanyMem
	0005	330057	St. Peter's Hospital	St Peters Hospital
Allegany	0039	330096	Memorial Hosp of Wm F & Gertrude F Jones A/K/A Jones Memorial Hosp	Jones Memorial
Bronx	1169	330059	Montefiore Medical Center - Henry & Lucy Moses Div	Montefiore-Moses
	1178	330009	BronxCare Hospital Center	BronxCare HealthSyst
	1176	330399	SBH Health System	St Barnabas
	1186	330385	North Central Bronx Hospital	North Central Bronx
	1165	330127	Jacobi Medical Center	Jacobi Med Ctr
	1168	330059	Montefiore Medical Center-Wakefield Hospital	Montefiore-Wakefield
	1172	330080	Lincoln Medical & Mental Health Center	Lincoln Med Ctr
	3058	330059	Montefiore Med Center - Jack D Weiler Hosp of A Einstein College Div	Montefiore-Einstein
	1175	332006	Calvary Hospital Inc	Calvary Hospital
Broome	0058	330394	United Health Services Hospitals Inc. - Wilson Medical Center	UHS Wilson
	0043	330011	Our Lady of Lourdes Memorial Hospital	Our Lady of Lourdes
	0042	330394	United Health Services Hospitals Inc. - Binghamton General Hospital	UHS Binghamton
Cattaraugus	0066	330103	Olean General Hospital	Olean General
Cayuga	0085	330235	Auburn Community Hospital	Auburn Community Hos
Chautauqua	0103	330239	UPMC Chautauqua at WCA	UPMC Chautauqua
	0098	330229	Brooks-TLC Hospital System, Inc.	Brooks Memorial
Chemung	0116	330090	Arnot Ogden Medical Center	Arnot Ogden Med Ctr
Chenango	0128	330033	Chenango Memorial Hospital Inc	UHS Chenango Memor
Clinton	0135	330250	The University of Vermont Health Network - Champlain Valley Physicians Hospital	UVM Champlain Valley
Columbia	0146	330094	Columbia Memorial Hospital	Columbia Memorial
Cortland	0158	330175	Guthrie Cortland Medical Center	Guthrie Cortland MC

County	PFI	CMS ID	Hospital name	Hospital name in the report
Dutchess	0192	330049	Northern Dutchess Hospital	Northern Dutchess
	0180	330067	Mid-Hudson Valley Division of Westchester Medical Center	MidHudson Reg of WMC
	0181	330023	Vassar Brothers Medical Center	Vassar Brothers
Erie	0292	330078	Sisters of Charity Hospital - St. Joseph Campus	Sisters- St Joseph
	0213	330279	Mercy Hospital of Buffalo	Mercy Hosp Buffalo
	0267	330102	Kenmore Mercy Hospital	Kenmore Mercy
	0218	330078	Sisters of Charity Hospital	Sisters of Charity
	0207	330005	Buffalo General Medical Center	Buffalo General
	3067	330005	Millard Fillmore Suburban Hospital	Millard Fill. Suburb
	0208	330005	John R. Oishei Children's Hospital	Oishei Childrens
	0210	330219	Erie County Medical Center	Erie County Med Ctr
	0216	330354	Roswell Park Cancer Institute	Roswell Park
Franklin	0324	330079	Adirondack Medical Center-Saranac Lake Site	Adirondack Medical
	0325	330084	The University of Vermont Health Network - Alice Hyde Medical Center	UVM Alice Hyde
Fulton	0330	330276	Nathan Littauer Hospital	Nathan Littauer
Genesee	0339	330073	United Memorial Medical Center North Street Campus	United Memorial
Jefferson	0367	330157	Samaritan Medical Center	Samaritan- Watertown
Kings	1320	330350	University Hospital of Brooklyn	SUNY Downstate MC
	1324	330169	Mount Sinai Brooklyn	Mt Sinai Brooklyn
	1301	330202	Kings County Hospital Center	Kings County Hosp
	1306	330236	NewYork-Presbyterian Brooklyn Methodist Hospital	NYP-Brklyn Methodist
	1305	330194	Maimonides Medical Center	Maimonides Med Ctr
	1294	330196	Coney Island Hospital	Coney Island Hosp
	1315	330201	Kingsbrook Jewish Medical Center	Kingsbrook Jewish MC
	1304	330306	NYU Langone Hospital-Brooklyn	NYU Langone Brooklyn
	1318	330221	Wyckoff Heights Medical Center	Wyckoff Heights
	1692	330396	Woodhull Medical & Mental Health Center	Woodhull Med Ctr
	1286	330233	Brookdale Hospital Medical Center	Brookdale Hospital
	1288	330056	Brooklyn Hospital Center - Downtown Campus	Brooklyn Hosp Ctr
	1309	330397	Interfaith Medical Center	Interfaith Med Ctr
	1293	330019	New York Community Hospital of Brooklyn, Inc	NY Community Hosp
Livingston	0393	330238	Nicholas H. Noyes Memorial Hospital	Noyes Memorial
Madison	0397	330115	Oneida Health Hospital	Oneida Healthcare

County	PFI	CMS ID	Hospital name	Hospital name in the report
Monroe	0411	330125	Rochester General Hospital	Rochester General
	0413	330285	Strong Memorial Hospital	Strong Memorial
	0409	330164	Highland Hospital	Highland Hospital
	0471	330226	The Unity Hospital of Rochester	Unity Hosp Rochester
Montgomery	0484	330047	St. Mary's Healthcare	St Marys Amsterdam
Nassau	0528	330027	Nassau University Medical Center	Nassau University
	0550	330106	Syosset Hospital	Syosset Hospital
	0552	330331	Plainview Hospital	Plainview Hospital
	0490	330181	Glen Cove Hospital	Glen Cove Hospital
	0518	330372	Long Island Jewish Valley Stream	LIJ at Valley Stream
	0541	330106	North Shore University Hospital	North Shore
	0551	330332	St. Joseph Hospital	St Joseph- Bethpage
	0527	330198	Mount Sinai South Nassau	Mt Sinai S Nassau
	0563	330182	St Francis Hospital	St Francis- Roslyn
	0511	330167	NYU Winthrop Hospital	NYU Winthrop
	0513	330259	Mercy Medical Center	Mercy Med Ctr
New York	1438	330204	Bellevue Hospital Center	Bellevue Hospital
	1439	330169	Mount Sinai Beth Israel	Mt Sinai Beth Israel
	1454	330199	Metropolitan Hospital Center	Metropolitan Hosp
	1469	330046	Mount Sinai Morningside	Mt Sinai Morningside
	1466	330046	Mount Sinai West	Mt Sinai West
	1450	330119	Lenox Hill Hospital	Lenox Hill Hospital
	1437	330064	New York-Presbyterian/Lower Manhattan Hospital	NYP-Lower Manhattan
	1456	330024	Mount Sinai Hospital	Mt Sinai
	1463	330214	NYU Langone Hospitals	NYU Tisch
	1453	330154	Memorial Hospital for Cancer and Allied Diseases	Memor SloanKettering
	1464	330101	New York-Presbyterian Hospital - Columbia Presbyterian Center	NYP-Columbia
	3975	330101	New York-Presbyterian Hospital - Allen Hospital	NYP-Allen
	1464	330101	New York-Presbyterian Hospital - Columbia Presbyterian Center	NYP-Morgan Stanley
	1458	330101	New York-Presbyterian Hospital - New York Weill Cornell Center	NYP-Weill Cornell
	1445	330240	Harlem Hospital Center	Harlem Hospital
	1446	330214	NYU Langone Orthopedic Hospital	NYU Orthopedic Hosp
	1447	330270	Hospital for Special Surgery	Hosp for Spec Surg
	1486	332008	Henry J. Carter Specialty Hospital	Henry J. Carter

County	PFI	CMS ID	Hospital name	Hospital name in the report
Niagara	0583	330188	Mount St Marys Hospital and Health Center	Mount St. Marys
	0565	330163	Eastern Niagara Hospital - Lockport Division	Eastern Niagara Hosp
	0574	330065	Niagara Falls Memorial Medical Center	Niagara Falls
Oneida	0598	330245	St Elizabeth Medical Center	St Elizabeth Medical
	0599	330044	Faxton-St Lukes Healthcare St Lukes Division	Faxton St. Lukes
	0589	330215	Rome Memorial Hospital, Inc	Rome Memorial
Onondaga	0636	330203	Crouse Hospital	Crouse Hospital
	0635	330241	University Hospital SUNY Health Science Center	UnivHSUNY Upstate
	0628	330241	UPSTATE University Hospital at Community General	Upst. Community Gen
	0630	330140	St. Joseph's Hospital Health Center	St Josephs- Syracuse
Ontario	0678	330074	F.F. Thompson Hospital	FF Thompson
	0676	330265	Clifton Springs Hospital and Clinic	Clifton Springs
	0671	330058	Geneva General Hospital	Geneva General
Orange	0699	330126	Garnet Health Medical Center	Orange Regional
	0694	330264	St Luke's Cornwall Hospital/Newburgh	St Lukes Cornwall
	0708	330135	Bon Secours Community Hospital	Bon Secours
	0704	330205	St Anthony Community Hospital	St Anthony
Oswego	0727	330218	Oswego Hospital	Oswego Hospital
Otsego	0746	330136	Mary Imogene Bassett Hospital	Mary Imogene Bassett
	0739	330085	A.O. Fox Memorial Hospital	AO Fox Memorial
Putnam	0752	330273	Putnam Hospital	Putnam Hospital
Queens	1633	330231	Queens Hospital Center	Queens Hospital
	1635	330395	St Johns Episcopal Hospital So Shore	St Johns Episcopal
	1638	330353	Long Island Jewish Forest Hills	LIJ at Forest Hills
	1630	330195	Long Island Jewish Medical Center	LIJ(Long Isl Jewish)
	1629	330014	Jamaica Hospital Medical Center	Jamaica Hospital
	1628	330193	Flushing Hospital Medical Center	Flushing Hospital
	1639	330024	Mount Sinai Hospital - Mount Sinai Hospital of Queens	Mt Sinai Queens
	1637	330055	NewYork-Presbyterian/Queens	NYP-Queens
	1626	330128	Elmhurst Hospital Center	Elmhurst Hospital
	3376	330195	Cohens Childerns Hospital	Cohens Childrens
Rensselaer	0756	330180	Samaritan Hospital	Samaritan Hosp Troy
Richmond	1740	330160	Staten Island University Hosp-North	Staten Island UNorth
	1738	330028	Richmond University Medical Center	Richmond Univ MC
	1737	330160	Staten Island University Hosp-South	Staten Island USouth

County	PFI	CMS ID	Hospital name	Hospital name in the report
Rockland	0779	330158	Good Samaritan Hospital of Suffern	Good Samar. Suffern
	0776	330104	Montefiore Nyack	Montefiore-Nyack
Saratoga	0818	330222	Saratoga Hospital	Saratoga Hospital
Schenectady	0829	330153	Ellis Hospital	Ellis Hospital
	0831	330406	Sunnyview Hospital and Rehabilitation Center	Sunnyview Rehab Hosp
	0848	330153	Ellis Hospital - Bellevue Woman's Care Center Division	Bellevue Ellis
St.Lawrence	0798	330211	Claxton-Hepburn Medical Center	Claxton-Hepburn
	0815	330197	Canton-Potsdam Hospital	Canton-Potsdam
	0804	330223	Massena Hospital, Inc.	Massena Memorial
Steuben	0866	330277	Corning Hospital	Corning Hospital
Suffolk	0885	330141	Long Island Community Hospital	Long Isl. Community
	0938	330107	Peconic Bay Medical Center	Peconic Bay Medical
	0891	330088	Stony Brook Eastern Long Island Hospital	UnivHStonyBrookELI
	0925	330286	Good Samaritan Hospital Medical Center	Good Samar. W Islip
	0943	330401	St Catherine of Siena Hospital	St Catherine Siena
	0896	330246	St. Charles Hospital	St Charles Hospital
	0924	330043	South Shore University Hospital	South Shore UH
	0889	330340	Stony Brook Southampton Hospital	UnivHStonyBrkSoutham
	0245	330393	Stony Brook University Hospital	UnivHStonyBrookU
	0913	330045	Huntington Hospital	Huntington Hospital
	0895	330185	John T Mather Memorial Hospital of Port Jefferson New York Inc	Mather Hospital
Sullivan	0971	330386	Garnet Health Medical Center - Catskills	Catskill Regional MC
Tompkins	0977	330307	Cayuga Medical Center at Ithaca	Cayuga Medical Ctr
Ulster	0989	330224	HealthAlliance Hospital Mary's Avenue Campus	HealthAlli MarysAve
	0990	330004	HealthAlliance Hospital Broadway Campus	HealthAlli Broadway
Warren	1005	330191	Glens Falls Hospital	Glens Falls Hospital
Wayne	1028	330030	Newark-Wayne Community Hospital	Newark Wayne

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Westchester	1045	330304	White Plains Hospital Center	White Plains Hosp
	1139	330234	Westchester Medical Center	Westchester Medical
	1129	330261	Phelps Hospital	Phelps Memorial
	1117	330162	Northern Westchester Hospital	Northern Westchester
	1039	330267	NewYork-Presbyterian/Hudson Valley Hospital	NYP-Hudson Valley
	1097	330208	SJRH - St Johns Division	SJRH St Johns
	1061	330086	Montefiore Mount Vernon Hospital	Montefiore-Mt Vernon
	1098	330006	St. Joseph's Medical Center	St Josephs- Yonkers
	1122	330061	New York-Presbyterian Lawrence Hospital	NYP-Lawrence
	1072	330184	Montefiore New Rochelle Hospital	Montefiore-NewRochl
	1138	333301	Blythedale Childrens Hospital	Blythedale Childrens
	1124	330208	SJRH - Dobbs Ferry Pavillion	SJRH Dobbs Ferry
Wyoming	1153	330008	Wyoming County Community Hospital	Wyoming County Comm.

Acknowledgements

New York State Department of Health Staff
Director, Bureau of Healthcare-Associated Infections – Emily Lutterloh, MD, MPH
Director, Data Analysis Unit, Bureau of HAIs – Valerie Haley, PhD
Metropolitan Area HAI Reporting Program Representative – Marie Tsivitis, MPH, CIC, FAPIC
Metropolitan Area HAI Reporting Program Representative – Antonella Eramo, MS, CIC
Central and Western Regions HAI Reporting Program Representative – Robin Knab, CLT, M(ASCP)^{CM}, CIC
Capital Region HAI Reporting Program Representative – Martha Luzinas, MT(ASCP)^{SM}
Data Analyst – Boldtsetseg Tserenpuntsag, DrPH
Data Analyst – Jiankun Kuang, MS
Antimicrobial Resistance/CRE Coordinator – Rosalie Giardina, MT(ASCP), CIC
Research Scientist – Sarah Kogut, MPH, CIC
Research Scientist – Monica Quinn, RN, MS, CIC
Research Scientist – Coralie Bucher, MPH
State HAI Plan Coordinator – Karyn Langguth McCloskey
Health Program Administrator – Sallie Ann Avery

Technical Advisory Workgroup

Physicians
Maria Basile, MD, John T. Mather Hospital (2015-current)
John Crane, MD, Erie County Medical Center (2012-current)
Paul Graman, MD, Strong Memorial Hospital (2006-current)
Mini Kamboj, MD, Memorial Sloan-Kettering Cancer Center (2015-current)
Gopi Patel, MD, Mount Sinai Hospital (2017-current)
Lisa Saiman, MD, MPH, Columbia University Medical Center (2008-current)
Krystina Woods, MD, Mt. Sinai West (2018-current)

Infection Preventionists
Susan Bayh-Martino, RN MBA, Broadlawn Manor Nursing and Rehabilitation Center (2015-current)
Terry Hammill, RN, ICP, Oswego Health (2015-current)
Mary Ann Haran, RN, CIC, Long Island Jewish Medical Center (2017-current)
Charlene Ludlow, RN, MHA, CIC, Erie County Medical Center (2008-current)
Veronica Mataprasad, MT, MPH, CIC, Northwell Health-Lenox Hill Hospital (2017-current)
Judith Medefindt, RN, CIC, NYU Lutheran Medical Center (2017-current)
Michelle Vignari, RN, CIC Director IP, FF Thompson Health (2017-current)
Gina DiMonica, RN, MSN, CIC, St. Francis Hospital (2018-current)

Consumer: Dale Ann Micalizzi, Task Force for Global Health (2017-current)

Preparedness Representatives:
Shannon Ethier, NSYDOH Office of Health Emerg. Prep. (2015-current)
Mary Foote, MD, MPH, New York City Department of Health (2015-current)

Healthcare Organization Representatives
Joy Cesareo, RN, MS, CIC, NYC Health & Hospitals Corporation (2017-current)
Ellen Lee, MD, NYC Department of Health and Mental Hygiene (2015-current)
Kathy Rauch, , Healthcare Association of New York State (2020-current)
Rodolfo Simons, Jr., New York State New York State APIC Coordinating Council (2017-current)
Zeynep Sumer, MS, Greater New York Hospital Association (2009–current)

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