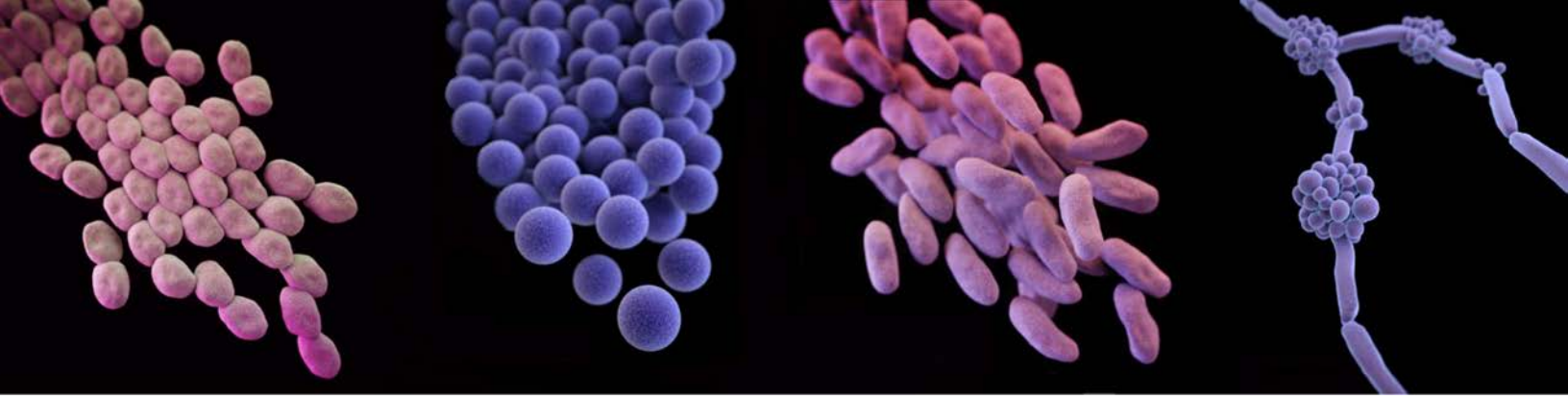

Hospital-Acquired Infections in New York State, 2021

Part 2: Technical Report

January 2025

NEW YORK STATE | Department of Health

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Introduction

In accordance with Public Health Law (PHL) § 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 the National Healthcare Safety Network (NHSN) for federal programs (e.g., Centers for Medicare and Medicaid Services [CMS]), regional collaboratives, and local surveillance. NYSDOH can access data not mandated by NYS through a data use agreement (DUA) with the Centers for Disease Control and Prevention (CDC). The DUA specifies that NYSDOH 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/nhsn/about-nhsn/dua.html.

COVID-19 disrupted nearly every aspect of life, including healthcare systems around the world. Hospitals were overwhelmed with very sick people requiring long hospital stays with severe co-morbidities requiring intensive care unit (ICU) admission with central lines or other devices. Most hospitals provided only emergent services and postponed elective surgeries, including many indicators monitored by NYSDOH. Due to these circumstances, CMS and CDC allowed hospitals to suspend HAI reporting from third quarter of 2019 and January through June 2020. NYSDOH did not require hospitals to report HAI data for first half of 2020 and decided not to publish a full annual report for 2020. Statewide data for 2020 are included in this 2021 report, and hospital specific HAI rates for 2020 are presented in an appendix.
Because of the incompleteness of 2020 data, hospital rates are not compared with the statewide rate, and the NYSDOH HAI Reporting Program's Policy for facilities with consecutive years of high HAI rates was not applied.

Table 1 summarizes the progression of NYS reporting requirements through 2022 and includes additional data available through the DUA.

Table 1. HAIs reported by NYS 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	P1	✓	✓	✓	✓	✓	✓	✓	✓	✓
Colon surgical site infections	P1	✓	✓	✓	✓	✓	✓	✓	✓	✓
Coronary artery bypass graft surgical site infections	P1	✓	✓	✓	✓	✓	✓	✓	✓	✓
Hip replacement surgical site infections		✓	✓	✓	✓	✓	✓	✓	✓	✓
Clostridioides difficile infections			P2	✓	✓	✓	✓	✓	✓	✓
Abdominal hysterectomy surgical site infections					✓	✓	✓	✓	✓	✓
Carbapenem-resistant Enterobacterales infections						P2	✓	✓	✓	✓
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)
P1 = pilot reporting full year (do not publish hospital specific rates)
P2 = pilot reporting half year from July (do not publish hospital specific rates)
DUA = Not required by NYS but reported for CMS programs and available through a DUA between CDC and NYS beginning May 2013.
* Reporting was suspended from January through June 2020 due to the COVID-19 pandemic.

This report focuses on HAI rates in 165 NYS hospitals in 2021. 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 2021. For information on HAI rates before 2015, please visit our website: (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 around 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 [PDS] and not readmitted). 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 2021, 158 hospitals reported a total of 1,147 colon SSIs out of 19,021 procedures, a rate of 6.03 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 1,147 infections, 337 (29%) were classified as PATOS. The PATOS SSIs were predominantly organ/space (89%). At completion of the surgery 82% were closed by primary intention. 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 810 infections, 38% were superficial, 8% were deep, and 54% were organ/space (Table 2). Half of the SSIs (55%) were detected during the initial hospitalization; 30% were identified upon readmission to the same hospital; 3% involved readmission to another hospital; and 12% were detected using post-discharge surveillance and not readmitted. The majority of the PDS infections were superficial. Detection of SSIs in outpatient locations is labor intensive and is not standardized across hospitals; therefore, the NYSDOH did not include these 97 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 SSI by depth of infection, New York State 2021

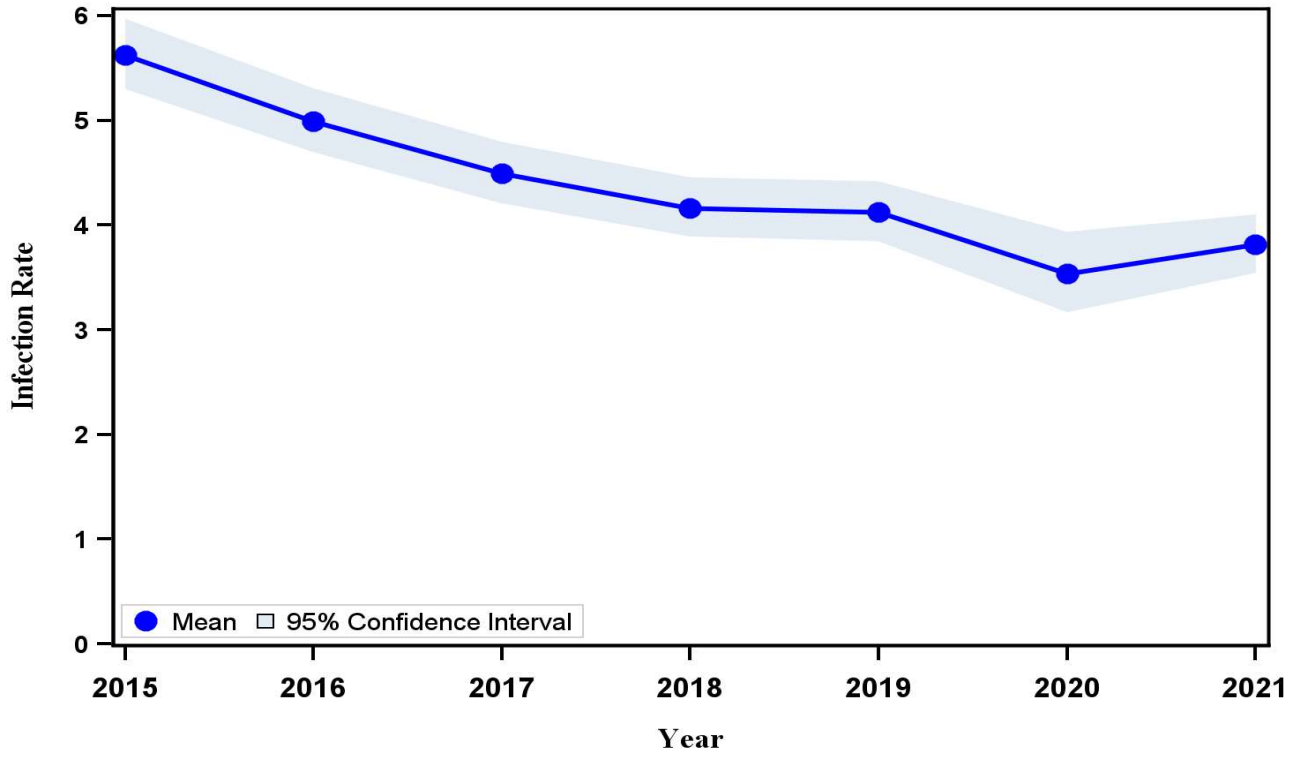
	When Detected				
Extent (Row%) (Column%)	**Initial hospitalization**	**Readmitted to the same hospital**	**Readmitted to another hospital**	**PDS not readmitted**	**Total**
Superficial Incisional	151 (49.5%) (34.0%)	64 (21.0%) (25.8%)	8 (2.6%) (38.1%)	82 (26.9%) (84.5%)	305 (37.6%)
Deep Incisional	28 (41.8%) (6.3%)	26 (38.8%) (10.5%)	1 (1.5%) (4.8%)	12 (17.9%) (12.4%)	67 (8.3%)
Organ/Space	265 (60.5%) (59.7%)	158 (36.1%) (63.7%)	12 (2.7%) (57.1%)	3 (0.7%) (3.1%)	438 (54.1%)
Total	444 (54.8%)	248 (30.6%)	21 (2.6%)	97 (12.0%)	810

PDS: Post discharge surveillance. NYS data reported as of August 15, 2022. Excludes infections present at time of surgery (PATOS).

Trends in colon SSI rates after deleting PATOS and PDS infections are shown in Figure 1. Between 2015 and 2021, the colon SSI rate declined 32%, from 5.63 infections per 100 procedures in 2015, to 3.82 infections per 100 procedures in 2021.

Figure 1. Trend in colon SSI rates, New York State 2015-2021

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)
2020	154	328	9,277	3.53 (3.17-3.92)
2021	152	713	18,684	3.82 (3.55-4.10)

New York State data reported as of August 15, 2022. 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 SSIs, New York State 2021

Microorganism	Number of Isolates	Percent of Infections
Escherichia coli	287	25.0
- CRE-*E. coli*	(5)	(0.4)
Enterococci	263	22.9
- VRE	(53)	(4.6)
Yeast	121	10.5
- *Candida auris*	(1)	(0.1)
Klebsiella spp.	103	9.0
- CRE-Klebsiella	(5)	(0.4)
Bacteroides spp.	99	8.6
Pseudomonas spp.	82	7.1
Streptococci	79	6.9
Staphylococcus aureus	67	5.8
- *Staphylococcus aureus*-MRSA	(40)	(3.5)
Coagulase negative staphylococci	49	4.3
Enterobacter spp.	38	3.3
- CRE-Enterobacter	(2)	(0.2)
Clostridioides spp.	29	2.5
Citrobacter spp.	22	1.9
Proteus spp.	17	1.5
Lactobacillus spp.	13	1.1
Morganella morganii	11	1.0
Acinetobacter spp.	2	0.2
- MDRO-Acinetobacter	(1)	(0.1)
Other	79	6.9

New York State data reported as of August 15, 2022
Out of 1147 infections (includes post-discharge surveillance).
No microorganisms identified for 328 infections. VRE: vancomycin-resistant enterococci; CRE: carbapenem-resistant Enterobacterales; 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:

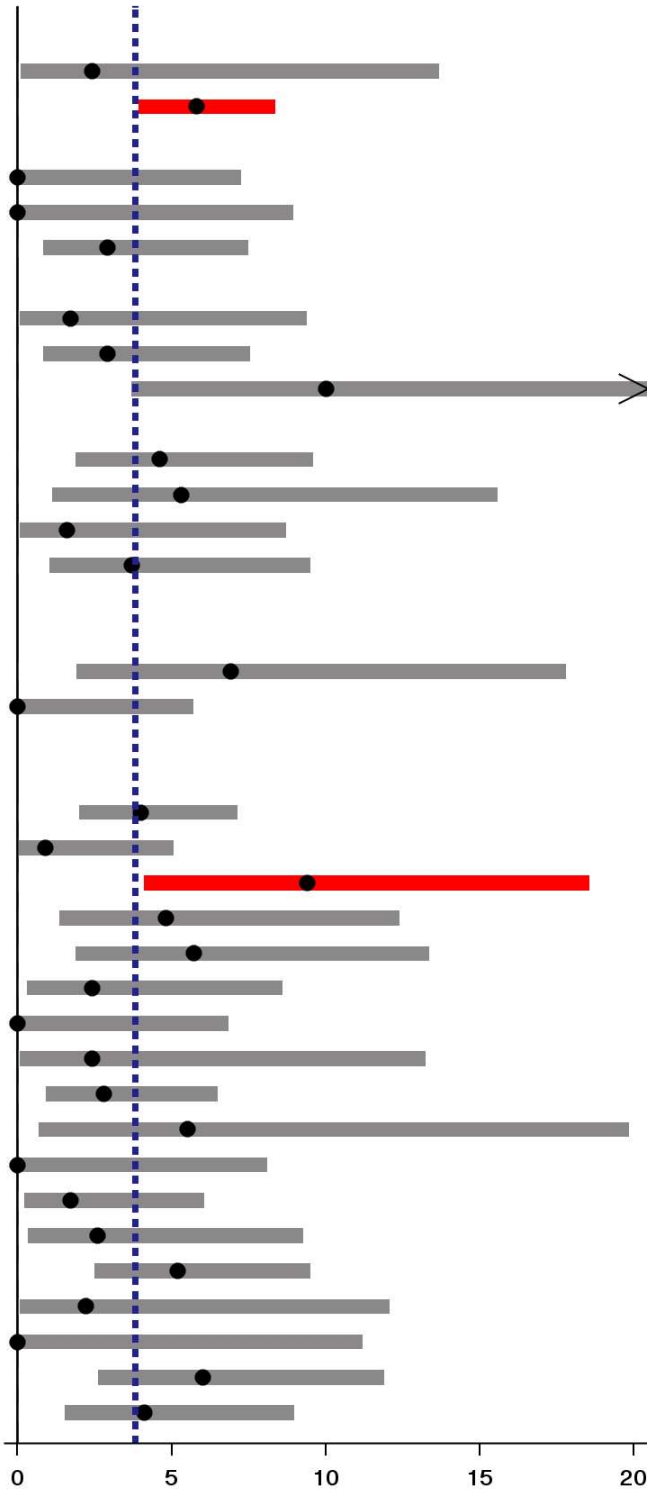
- For each increase in American Society of Anesthesiologists (ASA) score (1, 2, 3/4/5), a measure of systemic disease, patients were 1.5 times more likely to develop an SSI.
- Procedures that used traditional surgical incisions were 2.4 times more likely to result in SSI than procedures performed entirely with a laparoscopic instrument.
- Patients with obesity (with body mass index [BMI] greater than 30) were 1.2 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 1.1 times more likely to develop an SSI.

Hospital specific colon SSI rates

Hospital specific colon SSI rates are provided in Figure 2. Of the 123 hospitals that reported more than 20 procedures, 7 hospitals (6%) had colon SSI rates that were statistically higher than the state average. All 7 hospitals are required to 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.

Figure 2. Colon surgical site infection rates, New York 2021 (page 1 of 4)

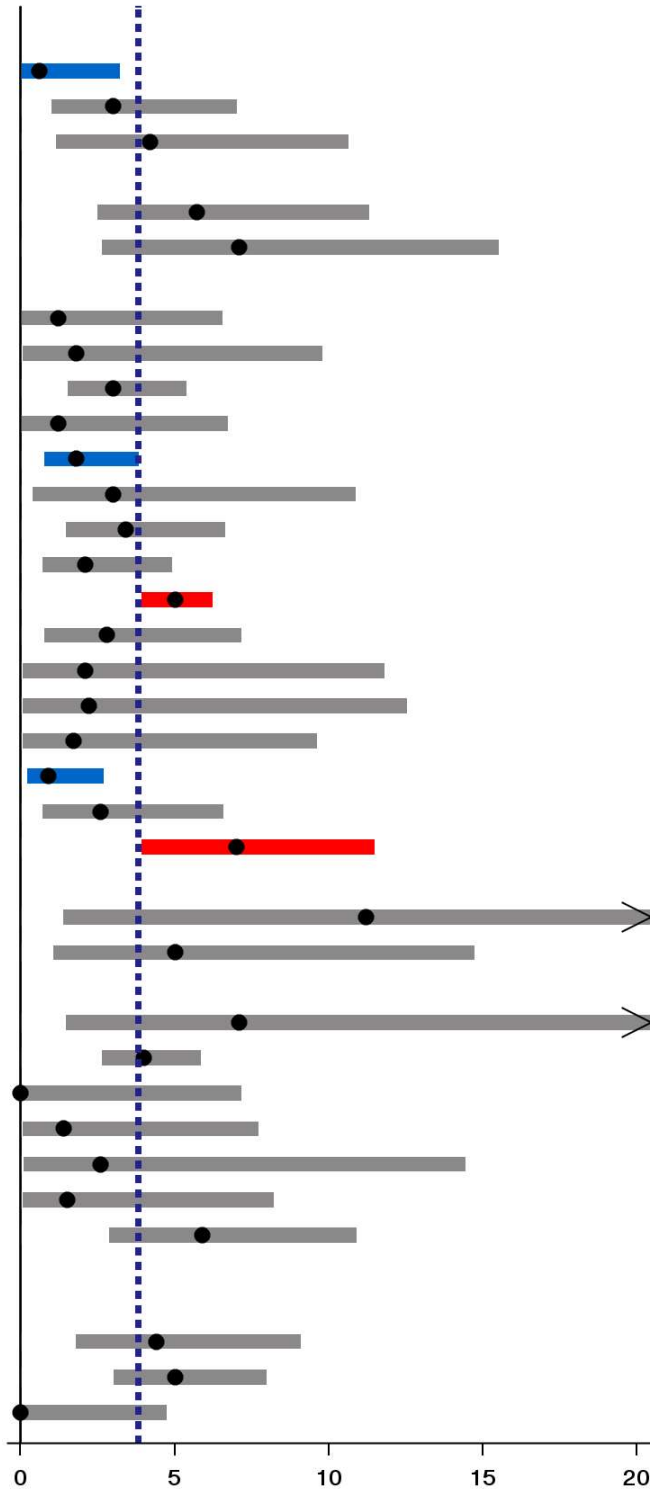
Hospital	# SSI	#PATOS excl.	#PDS excl.	# Procs	Raw Rate	Adj Rate
AO Fox Memorial	NA	NA	NA	NA	NA	NA
Adirondack Medical	1	1	0	46	2.2	2.4
Albany Med Ctr^	29	6	5	490	5.9	5.8
Alice Hyde Med Ctr	NA	NA	NA	NA	NA	NA
Arnot Ogden Med Ctr	0	0	0	40	0.0	0.0
Auburn Memorial	0	0	0	34	0.0	0.0
Bellevue Hospital	4	3	1	113	3.5	2.9
Bon Secours	NA	NA	NA	NA	NA	NA
Bronx-Lebanon	1	0	0	57	1.8	1.7
Brookdale Hospital	4	0	0	105	3.8	2.9
Brooklyn Hosp Ctr	6	0	0	60	10.0	10.0
Brooks Memorial	NA	NA	NA	NA	NA	NA
Buffalo General	7	1	0	127	5.5	4.6
Canton-Potsdam	3	0	0	47	6.4	5.3
Cayuga Medical Ctr	1	0	0	65	1.5	1.6
Champlain Valley	4	2	2	108	3.7	3.7
Claxton-Hepburn	NA	NA	NA	NA	NA	NA
Clifton Springs	NA	NA	NA	NA	NA	NA
Columbia Memorial	4	5	1	62	6.5	6.9
Coney Island Hosp	0	2	0	55	0.0	0.0
Corning Hospital	NA	NA	NA	NA	NA	NA
Cortland Reg Med	NA	NA	NA	NA	NA	NA
Crouse Hospital	11	7	0	278	4.0	4.0
Ellis Hospital	1	1	0	118	0.8	0.9
Elmhurst Hospital^	8	5	1	66	12.1	9.4
Erie County Med Ctr	4	2	0	69	5.8	4.8
FF Thompson	5	2	4	108	4.6	5.7
Faxton St. Lukes	2	1	0	80	2.5	2.4
Flushing Hospital	0	0	0	49	0.0	0.0
Garnet Catskills	1	1	1	36	2.8	2.4
Garnet Middletown	5	4	0	188	2.7	2.8
Geneva General	2	0	0	56	3.6	5.5
Glen Cove Hospital	0	0	0	30	0.0	0.0
Glens Falls Hospital	2	2	1	153	1.3	1.7
Good Samar. Suffern	2	0	0	98	2.0	2.6
Good Samar. W Islip	10	2	2	239	4.2	5.2
Harlem Hospital	1	0	0	34	2.9	2.2
HealthAlli Broadway	0	0	0	32	0.0	0.0
Highland Hospital	8	5	2	144	5.6	6.0
Huntington Hospital	6	5	0	224	2.7	4.1



Data reported as August 15, 2022. ┆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 2021 (page 2 of 4)

Hospital	# SSI	#PATOS excl.	#PDS excl.	# Procs	Raw Rate	Adj Rate
Interfaith Med Ctr	NA	NA	NA	NA	NA	NA
JT Mather Hospital*	1	0	0	175	0.6	0.6
Jacobi Med Ctr	5	4	1	124	4.0	3.0
Jamaica Hospital	4	2	0	84	4.8	4.2
Jones Memorial	NA	NA	NA	NA	NA	NA
Kenmore Mercy	8	1	1	125	6.4	5.7
Kings County Hosp	6	2	1	76	7.9	7.1
Kingsbrook Jewish MC	NA	NA	NA	NA	NA	NA
LIJ at Forest Hills	1	3	0	71	1.4	1.2
LIJ at Valley Stream	1	0	0	49	2.0	1.8
Lenox Hill Hospital	11	5	0	413	2.7	3.0
Lincoln Med Ctr	1	2	0	64	1.6	1.2
Long Isl Jewish(LIJ)*	7	9	0	359	1.9	1.8
Long Isl. Community	2	0	0	66	3.0	3.0
Maimonides Med Ctr	8	6	3	290	2.8	3.4
Mary Imogene Bassett	5	3	1	181	2.8	2.1
Memor SloanKettering^	76	7	15	1181	6.4	5.0
Mercy Hosp Buffalo	4	6	0	147	2.7	2.8
Mercy Med Ctr	1	0	0	46	2.2	2.1
Metropolitan Hosp	1	0	0	42	2.4	2.2
MidHudson Reg of WMC	1	0	0	45	2.2	1.7
Millard Fill. Suburb*	3	7	0	333	0.9	0.9
Montefiore-Einstein	4	0	0	149	2.7	2.6
Montefiore-Moses^	15	6	1	214	7.0	7.0
Montefiore-Mt Vernon	NA	NA	NA	NA	NA	NA
Montefiore-NewRochl	2	0	0	25	8.0	11.2
Montefiore-Nyack	3	2	0	68	4.4	5.0
Montefiore-Wakefield	NA	NA	NA	NA	NA	NA
Mount St. Marys	3	2	0	41	7.3	7.1
Mt Sinai	26	10	6	708	3.7	4.0
Mt Sinai Beth Israel	0	2	1	45	0.0	0.0
Mt Sinai Brooklyn	1	2	0	54	1.9	1.4
Mt Sinai Queens	1	0	0	38	2.6	2.6
Mt Sinai St Lukes	1	1	0	60	1.7	1.5
Mt Sinai West	10	1	0	175	5.7	5.9
NY Community Hosp	NA	NA	NA	NA	NA	NA
NYP-Allen	NA	NA	NA	NA	NA	NA
NYP-Brklyn Methodist	7	2	1	161	4.3	4.4
NYP-Columbia	18	9	0	409	4.4	5.0
NYP-Hudson Valley	0	0	0	68	0.0	0.0



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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 2021 (page 3 of 4)

Hospital	# SSI	#PATOS excl.	#PDS excl.	# Procs	Raw Rate	Adj Rate
NYP-Lawrence	1	0	0	64	1.6	1.6
NYP-Lower Manhattan	2	1	0	28	7.1	7.7
NYP-Morgan Stanley	0	0	0	23	0.0	0.0
NYP-Queens	4	4	0	211	1.9	2.1
NYP-Weill Cornell	13	10	0	486	2.7	3.0
NYU Langone Brooklyn	3	3	1	169	1.8	1.8
NYU Tisch	24	10	1	622	3.9	4.0
NYU Winthrop	8	8	0	360	2.2	2.0
Nassau University	NA	NA	NA	NA	NA	NA
Nathan Littauer	NA	NA	NA	NA	NA	NA
Newark Wayne	1	0	0	44	2.3	2.5
Niagara Falls	1	1	0	30	3.3	2.9
North Central Bronx	NA	NA	NA	NA	NA	NA
North Shore	11	9	1	443	2.5	2.4
Northern Dutchess	3	2	0	22	13.6	12.8
Northern Westchester	5	0	0	148	3.4	5.0
Noyes Memorial	1	0	0	32	3.1	3.2
Oishei Childrens	1	0	0	35	2.9	3.3
Olean General	0	0	0	36	0.0	0.0
Oneida Healthcare	5	2	0	104	4.8	4.9
Oswego Hospital	NA	NA	NA	NA	NA	NA
Our Lady of Lourdes	3	2	0	99	3.0	3.9
Peconic Bay Medical*	0	0	0	84	0.0	0.0
Phelps Memorial	0	1	0	62	0.0	0.0
Plainview Hospital	1	1	0	72	1.4	1.7
Putnam Hospital	3	1	0	48	6.3	8.1
Queens Hospital	3	2	0	66	4.5	3.5
Richmond Univ MC	6	0	0	76	7.9	7.7
Rochester General	14	9	6	333	4.2	4.3
Rome Memorial	NA	NA	NA	NA	NA	NA
Roswell Park	7	4	5	263	2.7	2.9
SUNY Downstate MedCr	2	0	0	60	3.3	2.4
Samaritan- Troy	6	1	1	96	6.3	6.0
Samaritan- Watertown	2	2	0	55	3.6	5.0
Saratoga Hospital	8	6	0	165	4.8	5.0
Sisters of Charity	6	1	1	134	4.5	3.9
South Nassau Comm.^	18	13	1	297	6.1	7.1
South Shore UHosp	3	7	0	202	1.5	1.4
St Anthony	NA	NA	NA	NA	NA	NA
St Barnabas	4	2	4	68	5.9	5.9

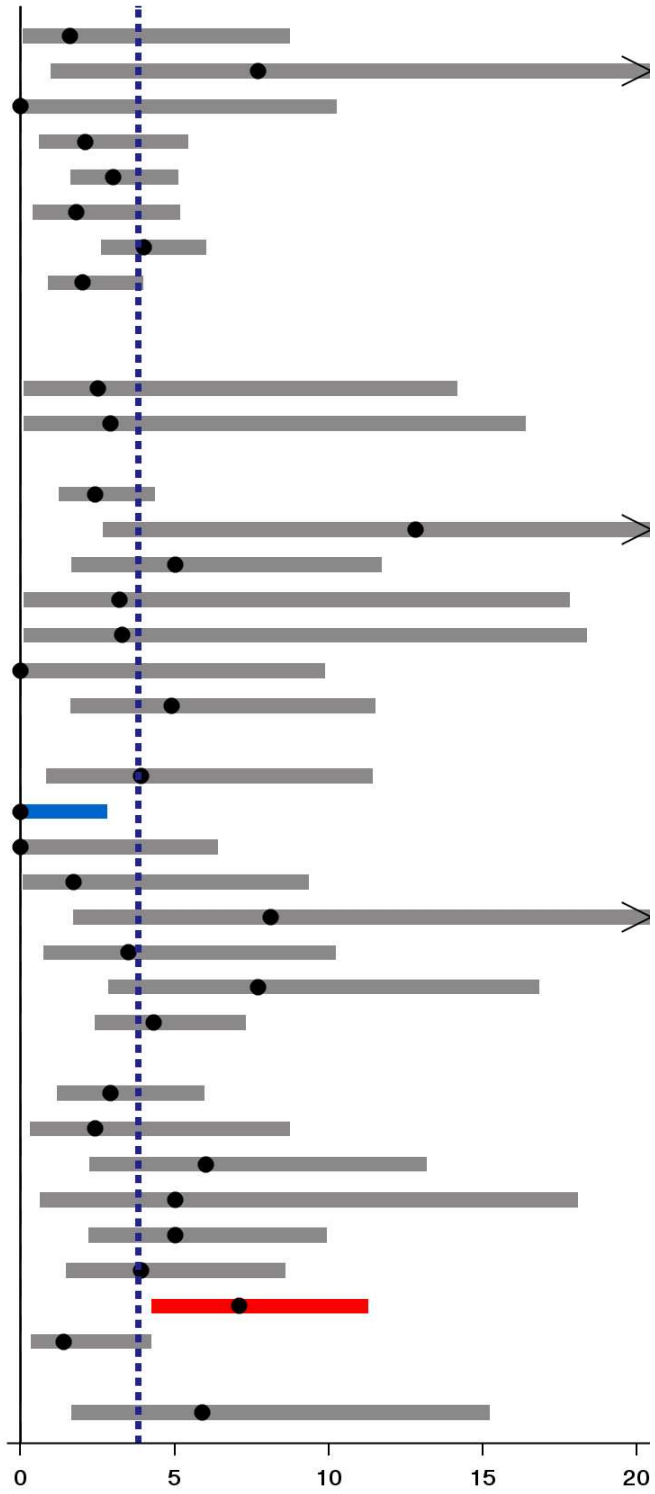

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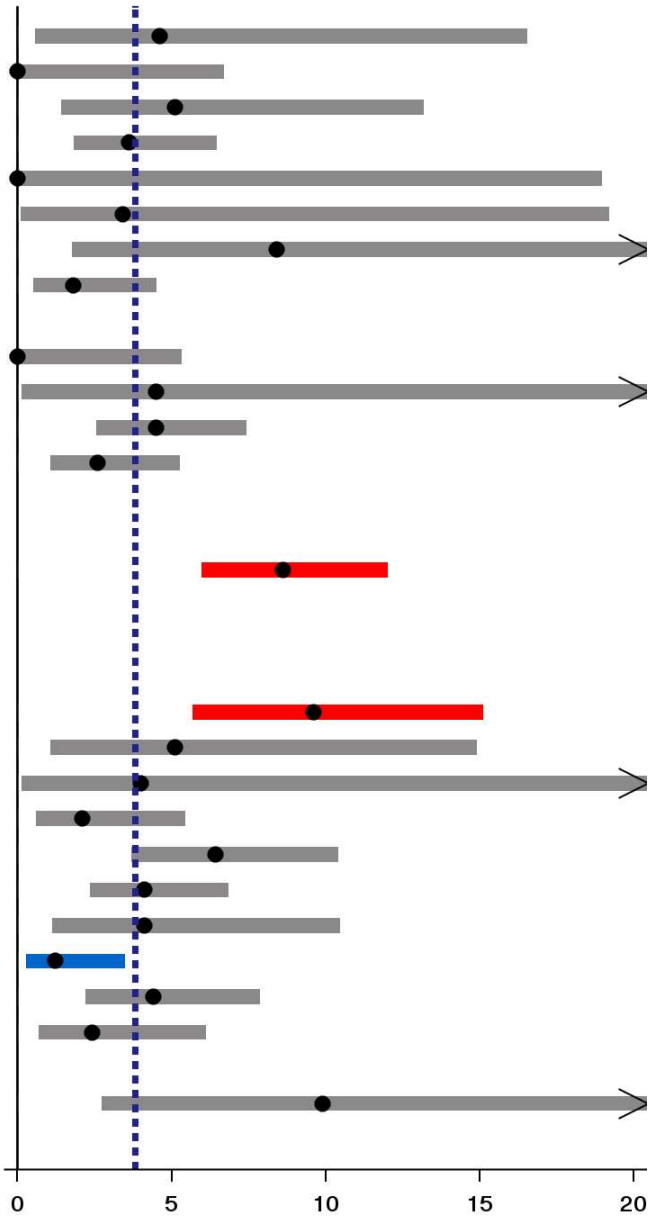
Figure 2. Colon surgical site infection rates, New York 2021 (page 4 of 4)

Hospital	# SSI	#PATOS excl.	#PDS excl.	# Procs	Raw Rate	Adj Rate
St Catherine Siena	2	2	0	49	4.1	4.6
St Charles Hospital	0	0	0	52	0.0	0.0
St Elizabeth Medical	4	3	1	77	5.2	5.1
St Francis- Roslyn	11	4	0	296	3.7	3.6
St Johns Episcopal	0	0	0	22	0.0	0.0
St Johns Riverside	1	1	0	32	3.1	3.4
St Joseph- Bethpage	3	3	0	39	7.7	8.4
St Josephs- Syracuse	4	1	0	254	1.6	1.8
St Josephs- Yonkers	NA	NA	NA	NA	NA	NA
St Lukes Cornwall	0	2	0	55	0.0	0.0
St Marys Amsterdam	1	1	0	39	2.6	4.5
St Peters Hospital	15	1	4	385	3.9	4.5
Staten Island U N	7	3	0	240	2.9	2.6
Staten Island U S	NA	NA	NA	NA	NA	NA
Stony Brk Southamptn	NA	NA	NA	NA	NA	NA
Strong Memorial^	34	22	1	433	7.9	8.6
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^	18	1	5	210	8.6	9.6
UPMC Chautauqua WCA	3	1	0	53	5.7	5.1
United Memorial	1	1	1	20	5.0	4.0
Unity Hosp Rochester	4	0	0	232	1.7	2.1
Univ Hosp SUNY Upst	16	10	2	214	7.5	6.4
Univ Hosp StonyBrook	15	9	9	309	4.9	4.1
Upst. Community Gen	4	2	0	93	4.3	4.1
Vassar Brothers*	3	0	1	277	1.1	1.2
Westchester Medical	11	4	1	200	5.5	4.4
White Plains Hosp	4	6	0	221	1.8	2.4
Woodhull Med Ctr	NA	NA	NA	NA	NA	NA
Wyckoff Heights	4	1	0	46	8.7	9.9
Wyoming County Comm.	NA	NA	NA	NA	NA	NA



Data reported as of August 15, 2022. 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 2021, 35 hospitals performing CABG procedures reported a total of 163 CABG chest SSIs out of 9,366 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 163 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 162 infections, 44% were superficial, 29% were deep, and 27% were organ/space (Table 4). Most of the SSIs (60%) were detected upon readmission to the same hospital; 22% were identified during the initial hospitalization; 5% involved readmission to another hospital; and 13% 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 21 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 SSIs by depth of infection, New York State 2021

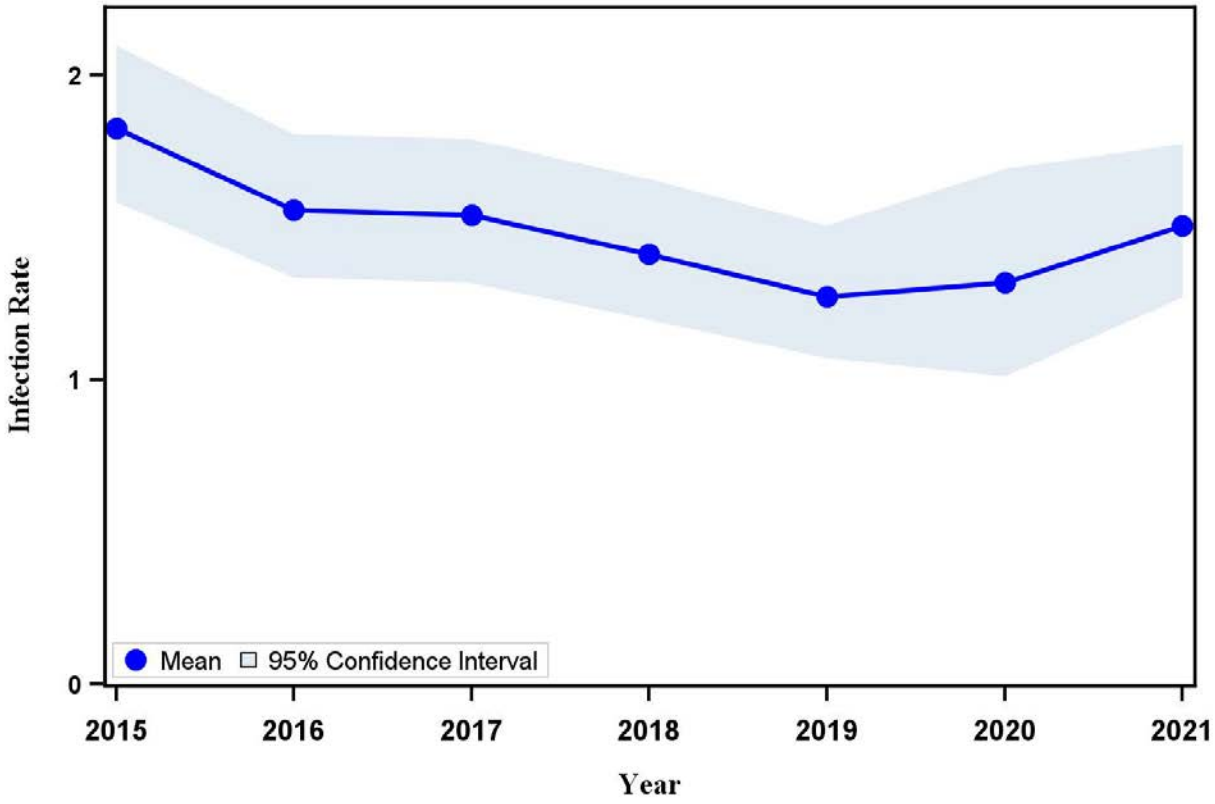
	When detected				
Extent (Row%) (Column%)	**Initial hospitalization**	**Readmitted to the same hospital**	**Readmitted to another hospital**	**PDS not readmitted**	**Total**
Superficial Incisional	15 (21.1%) (42.9%)	35 (49.3%) (36.1%)	1 (1.4%) (11.1%)	20 (28.2%) (95.2%)	71 (43.8%)
Deep Incisional	11 (23.4%) (31.4%)	32 (68.1%) (33.0%)	3 (6.4%) (33.3%)	1 (2.1%) (4.8%)	47 (29.0%)
Organ/Space	9 (20.4%) (25.7%)	30 (68.2%) (30.9%)	5 (11.4%) (55.6%	0 (0%) (0%)	44 (27.2%)
Total	35 (21.6%)	97 (59.9%)	9 (5.5%)	21 (13.0%)	162

PDS: Post discharge surveillance. New York State data reported as of August 15, 2022. 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 2021, the total number of CABG chest SSIs declined 17%, with 1.83 infections per 100 procedures in 2015, and 1.51 infections per 100 procedures in 2021.

Figure 3. Trend in coronary artery bypass graph chest site SSI rates, New York State 2015-2021

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)
2020	35	61	4,623	1.32 (1.01, 1.69)
2021	35	141	9,365	1.51 (1.27, 1.77)

New York State data reported as of August 15, 2022.
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 2021

Microorganism	Number of Isolates	Percent of Infections
Staphylococcus aureus	33	20.2
- *Staphylococcus aureus*-MRSA	(11)	(6.7)
Coagulase negative staphylococci	31	19.0
Klebsiella spp.	17	10.4
- CRE-Klebsiella	(1)	(0.6)
Pseudomonas spp.	11	6.7
Serratia spp.	11	6.7
Enterococci	7	4.3
- VRE	(3)	(1.8)
Escherichia coli	7	4.3
Enterobacter spp.	2	1.2
Acinetobacter spp.	1	0.6
Other	41	25.2

New York State data reported as of August 15, 2022. Out of 163 infections.
No microorganisms identified for 39 infections. MRSA: methicillin-resistant *Staphylococcus aureus;* MDR: multidrug resistant; VRE: vancomycin-resistant enterococci; CRE: carbapenem-resistant Enterobacterales; 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 2021, the following risk factors were associated with SSIs and were included in the risk adjustment:

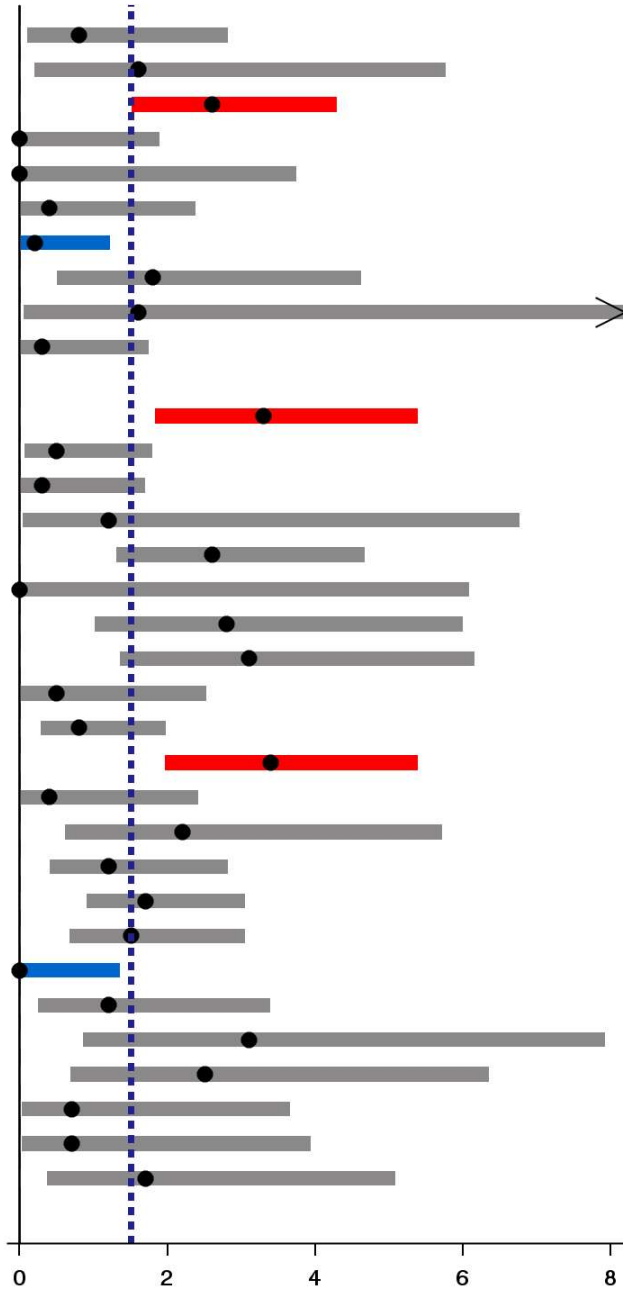
- Patients with diabetes were 2.6 times more likely to develop an SSI than patients without diabetes.
- Patients with obesity (with body mass index [BMI] greater than or equal to 30) were 1.7 times more likely to develop an SSI than patients with BMI less than 30.
- Females were 2.7 times more likely to develop an SSI than males.

Hospital specific CABG chest SSI rates

Hospital specific CABG chest SSI rates are provided in Figure 4. In 2021, of the 35 reporting hospitals, three (8%) had a CABG chest SSI rate that was statistically higher than the state average. These hospitals are required to submit improvement plans following the NYSDOH HAI Reporting Program's Policy for facilities with consecutive years of high HAI rates.
Two hospitals (6%) were statistically lower than the state average.

Figure 4. Coronary artery bypass graft chest site infection rates, New York 2021

Hospital	# SSI	#PATOS excl.	#PDS excl.	# Procs	Raw Rate	Adj Rate
Albany Med Ctr	2	0	0	263	0.8	0.8
Bellevue Hospital	2	0	0	118	1.7	1.6
Buffalo General^	16	1	0	578	2.8	2.6
Ellis Hospital	0	0	1	146	0.0	0.0
Good Samar. Suffern	0	0	0	88	0.0	0.0
Good Samar. W Islip	1	0	0	246	0.4	0.4
Lenox Hill Hospital*	1	0	0	469	0.2	0.2
Maimonides Med Ctr	4	0	1	221	1.8	1.8
Mary Imogene Bassett	1	0	0	71	1.4	1.6
Mercy Hosp Buffalo	1	0	0	338	0.3	0.3
Montefiore-Einstein	NA	NA	NA	NA	NA	NA
Montefiore-Moses^	15	0	1	385	3.9	3.3
Mt Sinai	2	0	1	383	0.5	0.5
Mt Sinai St Lukes	1	0	1	318	0.3	0.3
NYP-Brklyn Methodist	1	0	0	76	1.3	1.2
NYP-Columbia	11	0	0	438	2.5	2.6
NYP-Queens	0	0	0	62	0.0	0.0
NYP-Weill Cornell	6	0	0	308	1.9	2.8
NYU Tisch	8	0	3	288	2.8	3.1
NYU Winthrop	1	0	0	209	0.5	0.5
North Shore	5	0	0	589	0.8	0.8
Rochester General^	17	0	0	497	3.4	3.4
South Shore UHosp	1	0	0	241	0.4	0.4
St Elizabeth Medical	4	0	0	164	2.4	2.2
St Francis- Roslyn	5	0	0	504	1.0	1.2
St Josephs- Syracuse	12	0	1	657	1.8	1.7
St Peters Hospital	8	0	0	451	1.8	1.5
Staten Island U N*	0	0	0	208	0.0	0.0
Strong Memorial	3	0	2	262	1.1	1.2
UHS Wilson	4	0	8	121	3.3	3.1
Univ Hosp SUNY Upst	4	0	1	149	2.7	2.5
Univ Hosp StonyBrook	1	0	1	161	0.6	0.7
Vassar Brothers	1	0	0	155	0.6	0.7
Westchester Medical	3	0	0	180	1.7	1.7
White Plains Hosp	NA	NA	NA	NA	NA	NA



Data reported as of August 15, 2022. ┆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 2021, 35 hospitals performing CABG procedures reported a total of 34 CABG donor site infections out of 8,392 procedures, a rate of 0.41 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 34 infections, 79% were superficial, and 21% were deep (Table 6). Over half of the SSIs (56%) were detected upon readmission to the same hospital; 20% were identified during the initial hospitalization; 3% involved readmission to another hospital; and 21% 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 7 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 2021

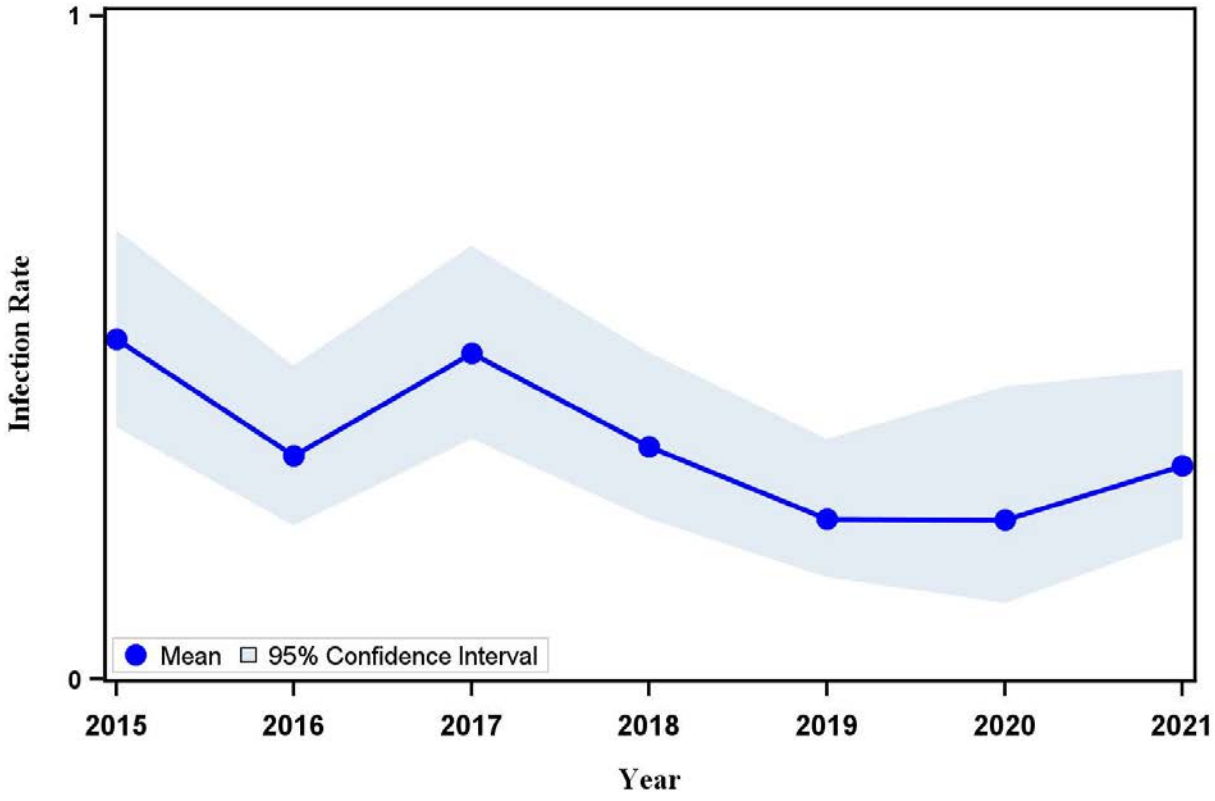
	When detected				
Extent (Row%) (Column%)	**Initial hospitalization**	**Readmitted to the same hospital**	**Readmitted to another hospital**	**PDS not readmitted**	**Total**
Superficial Incisional	5 (18.5%) (71.4%)	1 (3.7%) (100%	14 (51.8%) (73.7%)	7 (25.9%) (100%	27 (79.4%)
Deep Incisional	2 (28.6%) (28.6%)	0 (0%) (0%)	5 (71.4%) (26.3%)	0 (0%) (0%)	7 (20.6%)
Total	7 (20.6%)	1 (2.9%)	19 (55.9%)	7 (20.6%)	34

PDS: Post discharge surveillance. New York State data reported as of August 15, 2022. Excludes infections present at time of surgery.

Trends in CABG SSI rates are shown in Figure 5. Between 2015 and 2021, the total number of CABG donor site infection rate decreased 37%, from 0.51 infections per 100 procedures in 2015, to 0.32 infections per 100 procedures in 2021 but between 2019 and 2021 there was a 25% increase.

Figure 5. Trend in coronary artery bypass graft donor site surgical site infection rates, New York State 2015-2021

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



Year	# Hospitals	# Infections	# Procedures	Infection Rate (95% Confidence Interval)
2015	38	49	9,558	0.51 (0.38, 0.68)
2016	37	33	9,801	0.34 (0.23, 0.47)
2017	36	47	9,559	0.49 (0.36, 0.65)
2018	36	33	9,413	0.35 (0.24, 0.49)
2019	36	23	9,464	0.24 (0.15, 0.36)
2020	35	10	4,168	0.24 (0.12, 0.44)
2021	35	27	8,391	0.32 (0.21, 0.47)

New York State data reported as of August 15, 2022. Infection rate is the number of infections divided by the number of procedures, multiplied by 100.

Escherichia coli (11.8%), Klebsiella spp. (11.8%), and *Staphylococcus aureus* (8.8%) were the most common microorganisms associated with CABG donor site SSIs.

Risk adjustment for CABG donor site SSIs

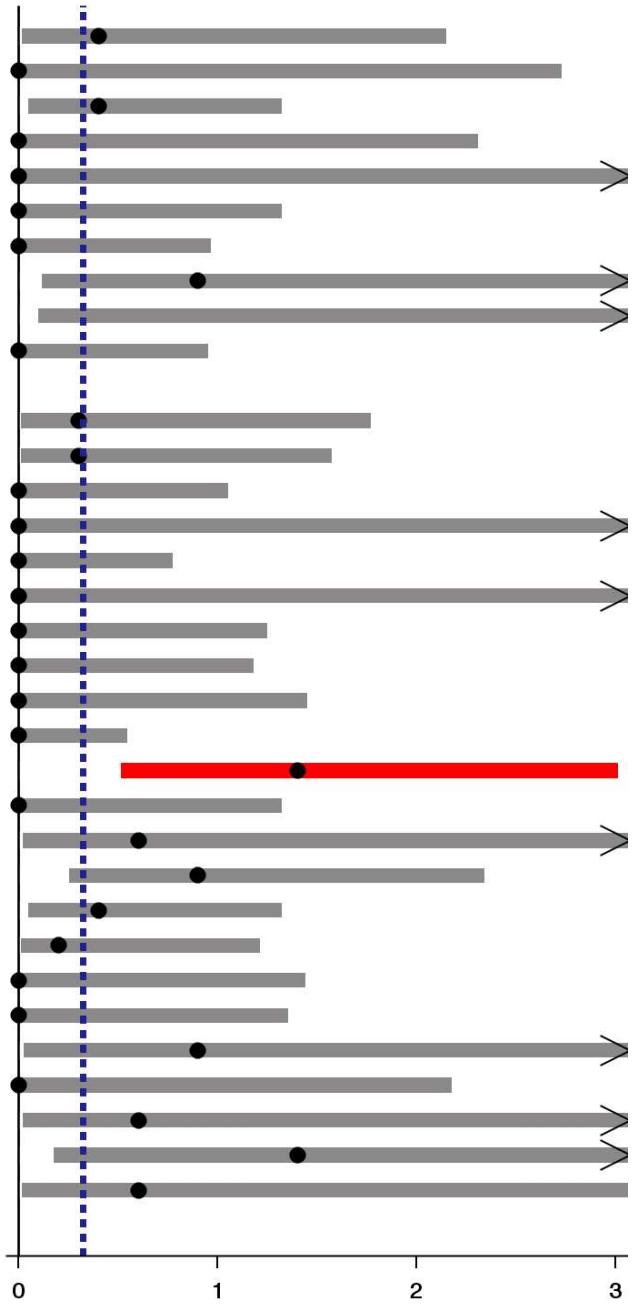
Certain patient and procedure-specific factors increased the risk of developing a donor site SSI following CABG surgery. In 2021, after excluding SSIs identified using PDS that did not result in hospitalization, the following risk factors were associated with SSI. These variables were used to risk-adjust hospital specific rates:

- Patients with obesity (with BMI at least 30) were 1.5 times more likely to develop an SSI than patients with BMI less than 30.
- Patients with diabetes were 1.6 times more likely to develop an SSI than patients without diabetes.

In 2021, one hospital was flagged for having a significantly high rate.

Coronary artery bypass graft donor site infection rates, New York 2021 (page 1 of 1)

Hospital	# SSI	#PATOS excl.	#PDS excl.	# Procs	Raw Rate	Adj Rate
Albany Med Ctr	1	0	0	254	0.4	0.4
Bellevue Hospital	0	0	0	113	0.0	0.0
Buffalo General	2	0	0	530	0.4	0.4
Ellis Hospital	0	0	0	127	0.0	0.0
Good Samar. Suffern	0	0	0	82	0.0	0.0
Good Samar. W Islip	0	0	0	228	0.0	0.0
Lenox Hill Hospital	0	0	0	320	0.0	0.0
Maimonides Med Ctr	2	0	0	210	1.0	0.9
Mary Imogene Bassett	1	0	0	30	3.3	3.6
Mercy Hosp Buffalo	0	0	0	317	0.0	0.0
Montefiore-Einstein	NA	NA	NA	NA	NA	NA
Montefiore-Moses	1	0	0	298	0.3	0.3
Mt Sinai	1	0	0	343	0.3	0.3
Mt Sinai St Lukes	0	0	0	289	0.0	0.0
NYP-Brklyn Methodist	0	0	0	75	0.0	0.0
NYP-Columbia	0	0	0	385	0.0	0.0
NYP-Queens	0	0	0	60	0.0	0.0
NYP-Weill Cornell	0	0	0	279	0.0	0.0
NYU Tisch	0	0	0	262	0.0	0.0
NYU Winthrop	0	0	0	207	0.0	0.0
North Shore	0	0	0	570	0.0	0.0
Rochester General^	6	0	0	446	1.3	1.4
South Shore UHosp	0	0	0	233	0.0	0.0
St Elizabeth Medical	1	0	0	147	0.7	0.6
St Francis- Roslyn	4	0	0	470	0.9	0.9
St Josephs- Syracuse	2	0	0	539	0.4	0.4
St Peters Hospital	1	0	0	429	0.2	0.2
Staten Island U N	0	0	0	199	0.0	0.0
Strong Memorial	0	0	0	217	0.0	0.0
UHS Wilson	1	0	0	105	1.0	0.9
Univ Hosp SUNY Upst	0	0	0	132	0.0	0.0
Univ Hosp StonyBrook	1	0	0	155	0.6	0.6
Vassar Brothers	2	0	0	145	1.4	1.4
Westchester Medical	1	0	0	180	0.6	0.6
White Plains Hosp	NA	NA	NA	NA	NA	NA



Data reported as of August 15, 2022. ┆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).

Hip replacement/revision SSIs

In 2021, 153 hospitals reported a total of 295 hip replacement/revision surgical site infections out of 29.143 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 295 infections, 9 were classified as PATOS and excluded from further analysis, because PATOS infections are more difficult to prevent.

Of the remaining 286 infections, 27% were superficial, 27% were deep, and 46% were organ/space (Table 7). Most of the SSIs (78%) were detected upon readmission to the same hospital; 5% were identified during the initial hospitalization; 8% involved readmission to another hospital; and 8% were detected using PDS and not readmitted. The majority (67%) 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 24 PDS infections in the final SSI rate so as not to penalize facilities with the best surveillance systems.

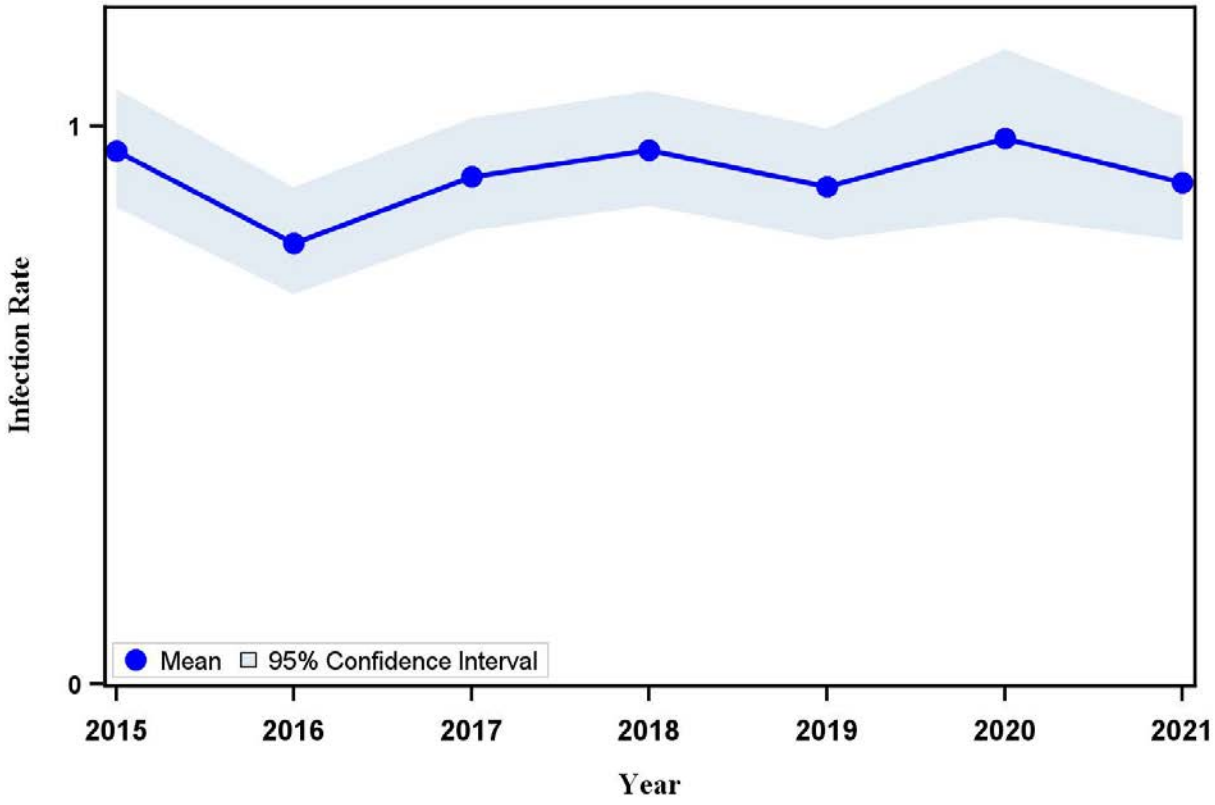
Table 7. Method of detection of hip surgical site infection by depth of infection, New York State 2021

	When detected				
Extent (Row%) (Column%)	**Initial hospitalization**	**Readmitted to the same hospital**	**Readmitted to another hospital**	**PDS not readmitted**	**Total**
Superficial Incisional	9 (11.7%) (60.0%)	48 (62.3%) (21.4%)	4 (5.2%) (17.4%)	16 (20.8%) (66.7%)	77 (26.9%)
Deep Incisional	3 (3.9%) (20.0%)	61 (79.2%) (27.2%)	7 (9.1%) (30.4%)	6 (7.8%) (25.0%)	77 (26.9%)
Organ/Space	3 (2.3%) (20.0%)	115 (87.1%) (51.3%)	12 (9.1%) (52.2%)	2 (1.5%) (8.3%)	132 (46.2%)
Total	15 (5.2%)	224 (78.3%)	23 (8.0%)	24 (8.4%)	286

PDS: Post discharge surveillance. New York State data reported as of August 15, 2022. 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 2021, the total number of hip SSIs declined 6%, with 0.96 infections per 100 procedures in 2015, and 0.90 infections per 100 procedures in 2021, though there was no statistically significant trend.

Figure 6. Trend in hip surgical site infection rates, New York State 2015-2021
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	0.96 (0.85, 1.07)
2016	157	267	33,812	0.79 (0.70, 0.89)
2017	157	317	34,884	0.91 (0.81, 1.01)
2018	154	337	35,290	0.96 (0.86, 1.06)
2019	153	310	35,216	0.88 (0.78, 0.98)
2020	153	166	16,971	0.98 (0.84, 1.14)
2021	153	262	29,134	0.90 (0.79, 1.01)

New York State Data reported as of August 15, 2022.
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 2021

Microorganism	Number of Isolates	Percent of Infections
Staphylococcus aureus	103	34.9
- *Staphylococcus aureus*-MRSA	(32)	(10.8)
Coagulase negative staphylococci	46	15.6
Enterococci	30	10.2
- VRE	(3)	(1.0)
Pseudomonas spp.	30	10.2
Escherichia coli	23	7.8
- CRE-*E. coli*	(1)	(0.3)
Streptococci	21	7.1
Klebsiella spp.	14	4.7
Proteus spp.	12	4.1
Enterobacter spp.	10	3.4
Other	28	9.5

New York State data reported as of August 15, 2022. Out of 295 infections. No microorganisms identified for 39 (13%) infections. CRE: carbapenem-resistant Enterobacterales; 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 2021, 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.

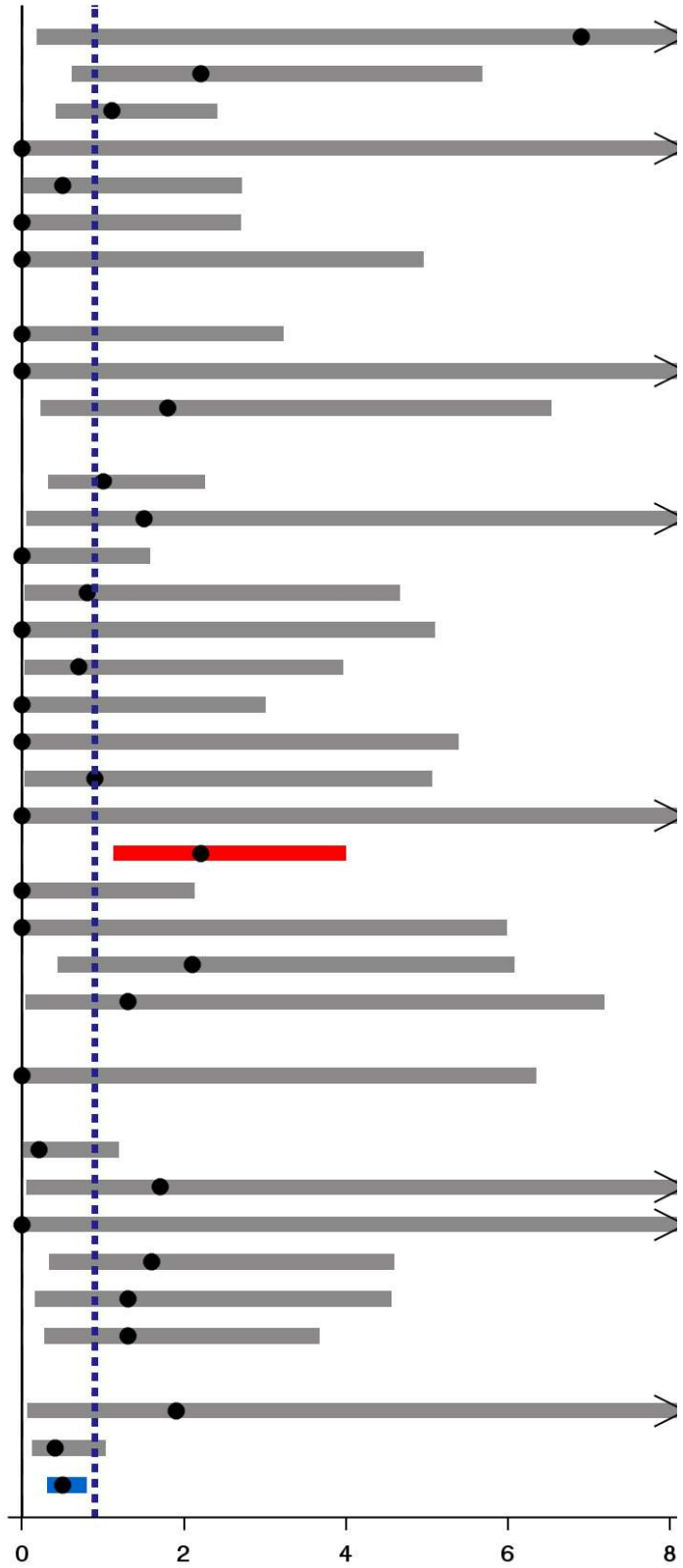
- Patients with severe systemic disease (ASA score of 3, 4, or 5) were 1.9 times more likely to develop an SSI than healthier patients (ASA score of 1 or 2).
- The risk of SSI varied by type of hip procedure. Compared to total and resurfacing primary hip replacement procedures, partial primary procedures were 1.4 times more likely to result in an SSI, revisions with no prior infection at the joint were 4.8 times more likely to result in an SSI, and revisions with prior infection at the joint were 3.3 times more likely to result in an SSI.
- Patients with severe obesity (BMI greater than or equal to 40) were 3.0 times more likely to develop an SSI, and patients with obesity (BMI between 30 and 39) were 1.5 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 136 hospitals that reported more than twenty hip procedures in 2021, four hospitals (3%) had hip SSI rates that were statistically higher than the state average. These hospitals are required to 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.

Figure 7. Hip replacement surgical site infection rates, New York 2021 (page 1 of 4)

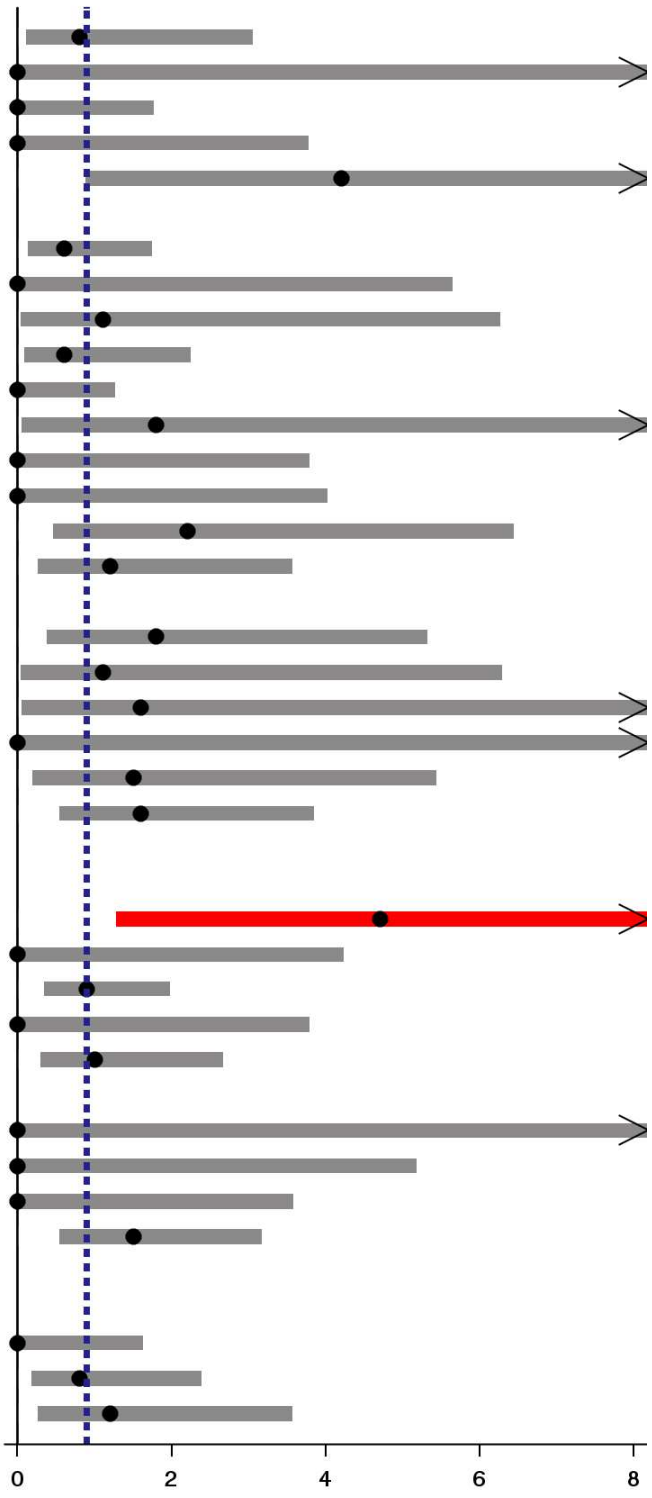
Hospital	# SSI	#PATOS excl.	#PDS excl.	# Procs	Raw Rate	Adj Rate
AO Fox Memorial	1	0	0	21	4.8	6.9
Adirondack Medical	4	0	0	167	2.4	2.2
Albany Med Ctr	6	0	0	492	1.2	1.1
Alice Hyde Med Ctr	0	0	0	25	0.0	0.0
Arnot Ogden Med Ctr	1	0	2	169	0.6	0.5
Auburn Memorial	0	0	1	109	0.0	0.0
Bellevue Hospital	0	0	0	85	0.0	0.0
Bon Secours	NA	NA	NA	NA	NA	NA
Bronx-Lebanon	0	0	0	78	0.0	0.0
Brookdale Hospital	0	0	0	26	0.0	0.0
Brooklyn Hosp Ctr	2	0	0	120	1.7	1.8
Brooks Memorial	NA	NA	NA	NA	NA	NA
Buffalo General	5	0	0	426	1.2	1.0
Canton-Potsdam	1	0	0	45	2.2	1.5
Cayuga Medical Ctr	0	0	0	221	0.0	0.0
Champlain Valley	1	0	0	102	1.0	0.8
Claxton-Hepburn	0	0	0	65	0.0	0.0
Clifton Springs	1	0	1	167	0.6	0.7
Columbia Memorial	0	0	0	98	0.0	0.0
Coney Island Hosp	0	0	0	48	0.0	0.0
Corning Hospital	1	0	0	108	0.9	0.9
Cortland Reg Med	0	0	0	22	0.0	0.0
Crouse Hospital^	11	0	0	460	2.4	2.2
Ellis Hospital	0	0	0	119	0.0	0.0
Elmhurst Hospital	0	0	0	61	0.0	0.0
Erie County Med Ctr	3	0	0	144	2.1	2.1
FF Thompson	1	0	0	85	1.2	1.3
Faxton St. Lukes	NA	NA	NA	NA	NA	NA
Flushing Hospital	0	0	0	64	0.0	0.0
Garnet Catskills	NA	NA	NA	NA	NA	NA
Garnet Middletown	1	0	0	459	0.2	0.2
Geneva General	1	0	1	61	1.6	1.7
Glen Cove Hospital	0	0	0	22	0.0	0.0
Glens Falls Hospital	3	0	1	199	1.5	1.6
Good Samar. Suffern	2	0	0	172	1.2	1.3
Good Samar. W Islip	3	0	0	208	1.4	1.3
Harlem Hospital	NA	NA	NA	NA	NA	NA
HealthAlli Broadway	1	0	0	46	2.2	1.9
Highland Hospital	4	0	1	1065	0.4	0.4
Hosp for Spec Surg*	18	3	5	4788	0.4	0.5



Data reported as of August 15, 2022. ¦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 2021 (page 2 of 4)

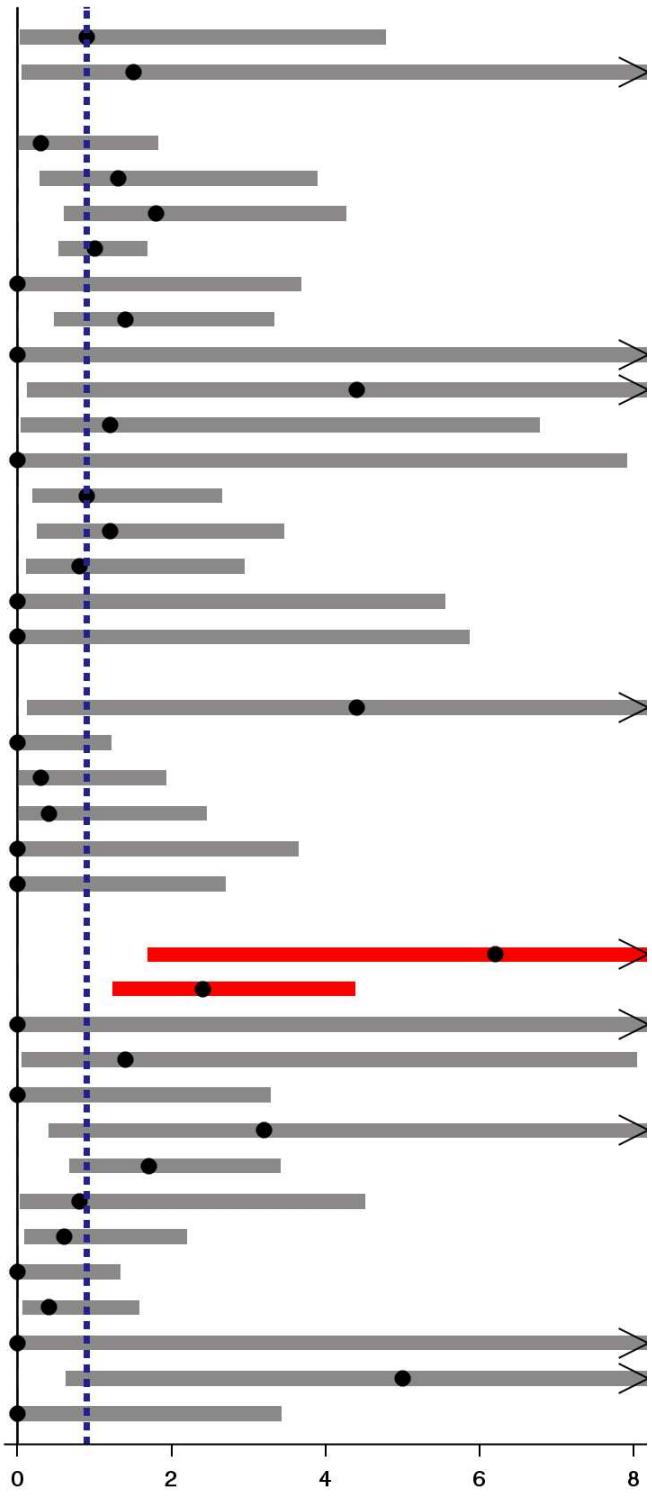
Hospital	# SSI	#PATOS excl.	#PDS excl.	# Procs	Raw Rate	Adj Rate
Huntington Hospital	2	0	0	235	0.9	0.8
Interfaith Med Ctr	0	0	0	28	0.0	0.0
JT Mather Hospital	0	0	0	103	0.0	0.0
Jacobi Med Ctr	0	0	0	66	0.0	0.0
Jamaica Hospital	3	1	0	62	4.8	4.2
Jones Memorial	NA	NA	NA	NA	NA	NA
Kenmore Mercy	3	0	0	475	0.6	0.6
Kings County Hosp	0	0	0	55	0.0	0.0
LIJ at Forest Hills	1	0	0	90	1.1	1.1
LIJ at Valley Stream	2	0	0	348	0.6	0.6
Lenox Hill Hospital	0	0	0	319	0.0	0.0
Lincoln Med Ctr	1	0	0	44	2.3	1.8
Long Isl Jewish(LIJ)	0	0	0	82	0.0	0.0
Long Isl. Community	0	0	0	84	0.0	0.0
Maimonides Med Ctr	3	0	0	121	2.5	2.2
Mary Imogene Bassett	3	0	1	205	1.5	1.2
Massena Memorial	NA	NA	NA	NA	NA	NA
Memor SloanKettering	3	1	0	115	2.6	1.8
Mercy Hosp Buffalo	1	0	1	83	1.2	1.1
Mercy Med Ctr	1	0	0	60	1.7	1.6
Metropolitan Hosp	0	0	0	32	0.0	0.0
MidHudson Reg of WMC	2	0	0	140	1.4	1.5
Millard Fill. Suburb	5	0	0	280	1.8	1.6
Montefiore-Moses	NA	NA	NA	NA	NA	NA
Montefiore-Mt Vernon	NA	NA	NA	NA	NA	NA
Montefiore-NewRochl^	4	0	0	108	3.7	4.7
Montefiore-Nyack	0	0	0	87	0.0	0.0
Montefiore-Wakefield	6	0	0	545	1.1	0.9
Mount St. Marys	0	0	0	74	0.0	0.0
Mt Sinai	4	0	0	403	1.0	1.0
Mt Sinai Beth Israel	NA	NA	NA	NA	NA	NA
Mt Sinai Brooklyn	0	0	0	30	0.0	0.0
Mt Sinai Queens	0	0	0	65	0.0	0.0
Mt Sinai St Lukes	0	0	0	72	0.0	0.0
Mt Sinai West	6	0	0	427	1.4	1.5
NY Community Hosp	NA	NA	NA	NA	NA	NA
NYP-Allen	NA	NA	NA	NA	NA	NA
NYP-Brklyn Methodist	0	0	0	162	0.0	0.0
NYP-Columbia	3	0	0	311	1.0	0.8
NYP-Hudson Valley	3	0	0	160	1.9	1.2



Data reported as of August 22, 2022. ┆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 2021 (page 3 of 4)

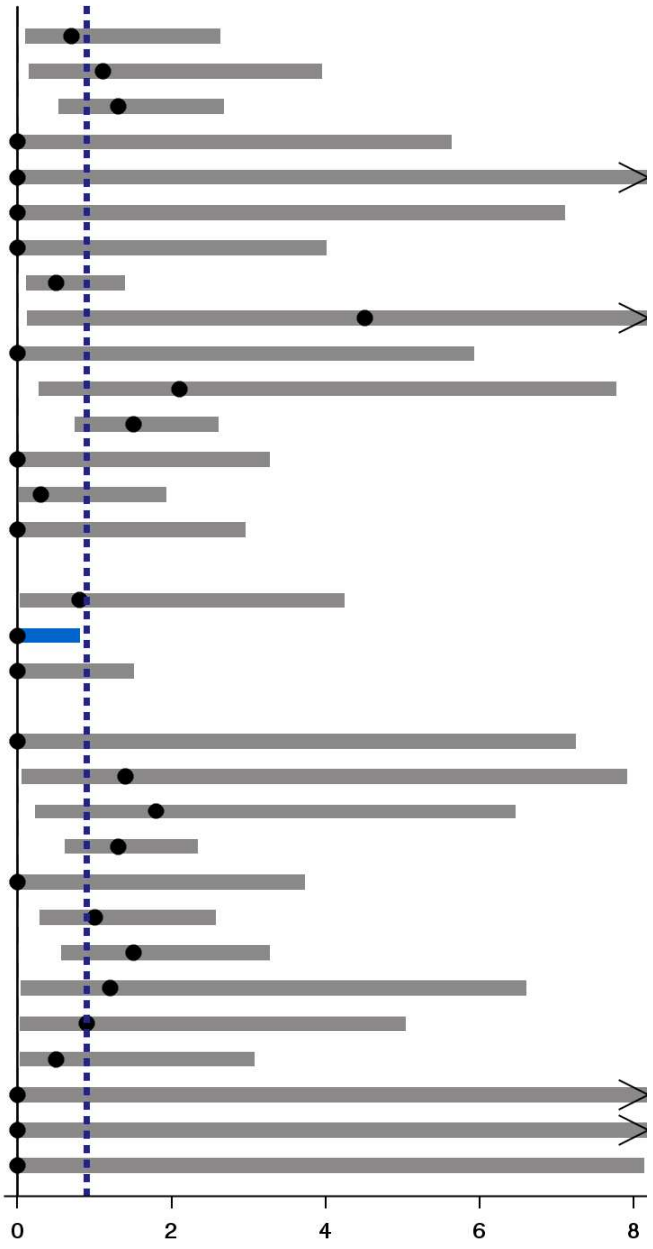
Hospital	# SSI	#PATOS excl.	#PDS excl.	# Procs	Raw Rate	Adj Rate
NYP-Lawrence	1	0	0	107	0.9	0.9
NYP-Lower Manhattan	1	0	0	63	1.6	1.5
NYP-Morgan Stanley	NA	NA	NA	NA	NA	NA
NYP-Queens	1	0	0	323	0.3	0.3
NYP-Weill Cornell	3	0	0	221	1.4	1.3
NYU Langone Brooklyn	5	0	0	238	2.1	1.8
NYU Orthopedic Hosp	13	0	0	1235	1.1	1.0
NYU Tisch	0	0	0	58	0.0	0.0
NYU Winthrop	5	0	0	325	1.5	1.4
Nassau University	0	0	1	37	0.0	0.0
Nathan Littauer	1	0	0	31	3.2	4.4
Newark Wayne	1	0	3	90	1.1	1.2
Niagara Falls	0	0	0	28	0.0	0.0
North Shore	3	0	0	369	0.8	0.9
Northern Dutchess	3	0	0	297	1.0	1.2
Northern Westchester	2	0	0	254	0.8	0.8
Noyes Memorial	0	0	0	61	0.0	0.0
Olean General	0	0	0	51	0.0	0.0
Oneida Healthcare	NA	NA	NA	NA	NA	NA
Oswego Hospital	1	0	0	22	4.5	4.4
Our Lady of Lourdes	0	0	1	220	0.0	0.0
Peconic Bay Medical	1	0	0	324	0.3	0.3
Phelps Memorial	1	0	1	281	0.4	0.4
Plainview Hospital	0	0	0	89	0.0	0.0
Putnam Hospital	0	0	0	120	0.0	0.0
Queens Hospital	NA	NA	NA	NA	NA	NA
Richmond Univ MC^	4	0	0	51	7.8	6.2
Rochester General^	11	2	0	454	2.4	2.4
Rome Memorial	0	0	0	26	0.0	0.0
SUNY Downstate MedCr	1	0	0	73	1.4	1.4
Samaritan- Troy	0	0	0	98	0.0	0.0
Samaritan- Watertown	2	0	0	52	3.8	3.2
Saratoga Hospital	7	0	0	365	1.9	1.7
Sisters of Charity	1	0	0	117	0.9	0.8
Sisters- St Joseph	2	0	0	315	0.6	0.6
South Nassau Comm.	0	0	0	168	0.0	0.0
South Shore UHosp	2	0	0	473	0.4	0.4
St Anthony	0	0	0	21	0.0	0.0
St Barnabas	2	0	0	35	5.7	5.0
St Catherine Siena	0	0	0	72	0.0	0.0



Data reported as of August 15, 2022. ┆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 2021 (page 4 of 4)

Hospital	# SSI	#PATOS excl.	#PDS excl.	# Procs	Raw Rate	Adj Rate
St Charles Hospital	2	0	0	269	0.7	0.7
St Elizabeth Medical	2	0	1	158	1.3	1.1
St Francis- Roslyn	7	1	0	430	1.6	1.3
St Johns Dobbs Ferry	0	0	0	67	0.0	0.0
St Johns Episcopal	0	0	0	20	0.0	0.0
St Johns Riverside	0	0	0	28	0.0	0.0
St Joseph- Bethpage	0	0	0	80	0.0	0.0
St Josephs- Syracuse	3	0	0	531	0.6	0.5
St Josephs- Yonkers	1	0	0	23	4.3	4.5
St Lukes Cornwall	0	0	0	53	0.0	0.0
St Marys Amsterdam	2	0	0	86	2.3	2.1
St Peters Hospital	11	0	0	653	1.7	1.5
Staten Island U N	0	0	0	83	0.0	0.0
Staten Island U S	1	0	0	282	0.4	0.3
Stony Brk Southamptn	0	0	0	46	0.0	0.0
Stony Brook ELIH	NA	NA	NA	NA	NA	NA
Strong Memorial	1	1	0	118	0.8	0.8
Syosset Hospital*	0	0	0	391	0.0	0.0
UHS Binghamton	0	0	1	211	0.0	0.0
UHS Chenango Memor	NA	NA	NA	NA	NA	NA
UHS Wilson	0	0	1	42	0.0	0.0
UPMC Chautauqua WCA	1	0	0	88	1.1	1.4
United Memorial	2	0	0	116	1.7	1.8
Unity Hosp Rochester	10	0	0	717	1.4	1.3
Univ Hosp SUNY Upst	0	0	0	58	0.0	0.0
Univ Hosp StonyBrook	4	0	0	394	1.0	1.0
Upst. Community Gen	6	0	0	320	1.9	1.5
Vassar Brothers	1	0	0	75	1.3	1.2
Westchester Medical	1	0	0	127	0.8	0.9
White Plains Hosp	1	0	0	209	0.5	0.5
Woodhull Med Ctr	0	0	0	23	0.0	0.0
Wyckoff Heights	0	0	0	25	0.0	0.0
Wyoming County Comm.	0	0	0	45	0.0	0.0



Data reported as of August 15, 2022. ┆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 2021, 145 hospitals reported a total of 250 abdominal hysterectomy SSIs out of 14,153 procedures, a rate of 1.8 infections per 100 procedures. NYSDOH excludes some of these SSIs and procedures from SSI rates before evaluating time trends and comparing hospital performance, as described below.

Of the 250 infections, 6 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 246 infections, 41% were superficial, 8% were deep, and 51% were organ/space (Table 9). Most of the SSIs (58%) were detected upon readmission to the same hospital; 8% were identified during the initial hospitalization; 8% involved readmission to another hospital; and 26% were detected using post-discharge surveillance and not readmitted. Most (84%) 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 64 PDS infections in the final SSI rate so as not to penalize facilities with the best surveillance systems.

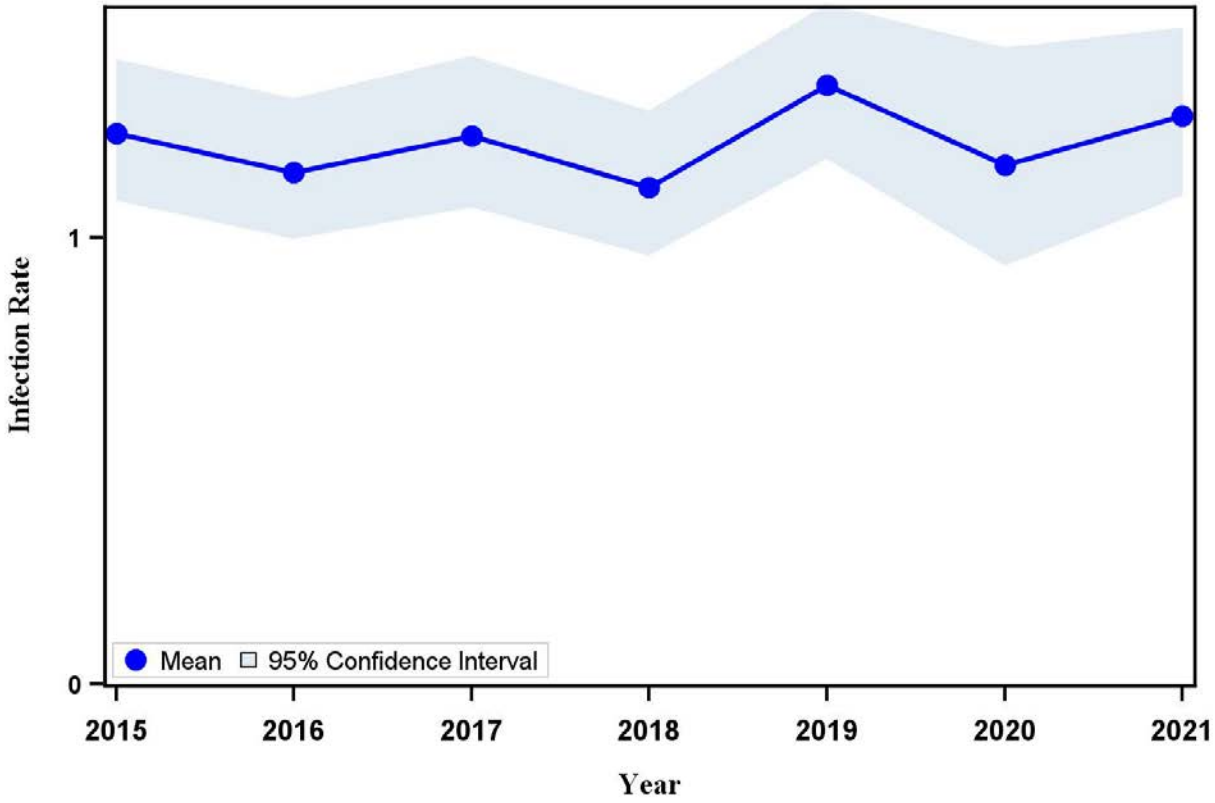
Table 9. Method of detection of abdominal hysterectomy surgical site infection by depth of infection, New York State 2021

	When Detected				
Extent (Row%) (Column%)	**Initial hospitalization**	**Readmitted to the same hospital**	**Readmitted to another hospital**	**PDS not readmitted**	**Total**
Superficial Incisional	9 (9.0%) (50.0%)	34 (34.0%) (23.9%)	3 (3.0%) (15.0%)	54 (54.0%) (84.4%)	100 (41.0%)
Deep Incisional	2 (10.0%) (11.1%)	12 (60.0%) (8.4%)	2 (10.0%) (10.0%)	4 (20.0%) (6.2%)	20 (8.2%)
Organ/Space	7 (5.6%) (38.9%)	96 (77.4%) (67.6%	15 (12.1%) (75.0%)	6 (4.8%) (9.4%)	124 (50.8%)
Total	18 (7.4%)	142 (58.2%)	20 (8.2%)	64 (26.2%)	244

PDS: Post discharge surveillance. New York State data reported as of August 15. 2022. 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 2021 the total number of abdominal hysterectomy SSIs increased 3%, from 1.23 infections per 100 procedures in 2015, to 1.27 infections per 100 procedures in 2021, though the increase was not statistically significant.

Figure 8. Trend in abdominal hysterectomy SSI rates, New York State 2015-2021
Excluding infections present at time of surgery or detected in outpatient settings without readmission



Year	# Hospitals	# Infections	# Procedures	Infection Rate (95% Confidence Interval)
2015	151	237	19,216	1.23 (1.08, 1.40)
2016	148	210	18,326	1.15 (1.00, 1.31)
2017	149	208	16,934	1.23 (1.07, 1.41)
2018	149	187	16,824	1.11 (0.96, 1.28)
2019	151	230	17,312	1.33 (1.16, 1.51)
2020	138	91	7,830	1.16 (0.94, 1.42)
2021	145	180	14,147	1.27 (1.09, 1.47)

New York State data reported as of August 15, 2022.
Infection rate is the number of infections divided by the number of procedures, multiplied by 100.

Microorganisms associated with abdominal hysterectomy SSIs

The most common microorganisms associated with hysterectomy SSIs were Enterococci and *E. coli* (Table 10).

Table 10. Microorganisms identified in abdominal hysterectomy SSIs, New York State 2021

Microorganism	Number of Isolates	Percent of Infections
Escherichia coli	39	15.6
Enterococci	36	14.4
- VRE	(2)	(0.8)
Staphylococcus aureus	29	11.6
- *Staphylococcus aureus*-MRSA	(14)	(5.6)
Klebsiella spp.	26	10.4
- CRE-Klebsiella	(1)	(0.4)
Coagulase negative staphylococci	20	8.0
Streptococci	19	7.6
Bacteroides spp.	18	7.2
Pseudomonas spp.	11	4.4
Enterobacter spp.	3	1.2
Acinetobacter spp.	2	0.8
- MDRO-Acinetobacter	(1)	(0.4)
Other	72	28.8

New York State data reported as of August 15, 2022. Out of 250 infections. No microorganisms identified for 77 (31%) infections. CRE: carbapenem-resistant Enterobacterales; MRSA: methicillin-resistant *Staphylococcus aureus;* VRE: vancomycin-resistant enterococci; spp: multiple species

Risk adjustment for abdominal hysterectomy SSIs

Certain patient and procedure-specific factors increased the risk of developing an SSI following abdominal hysterectomy. In 2021, 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.

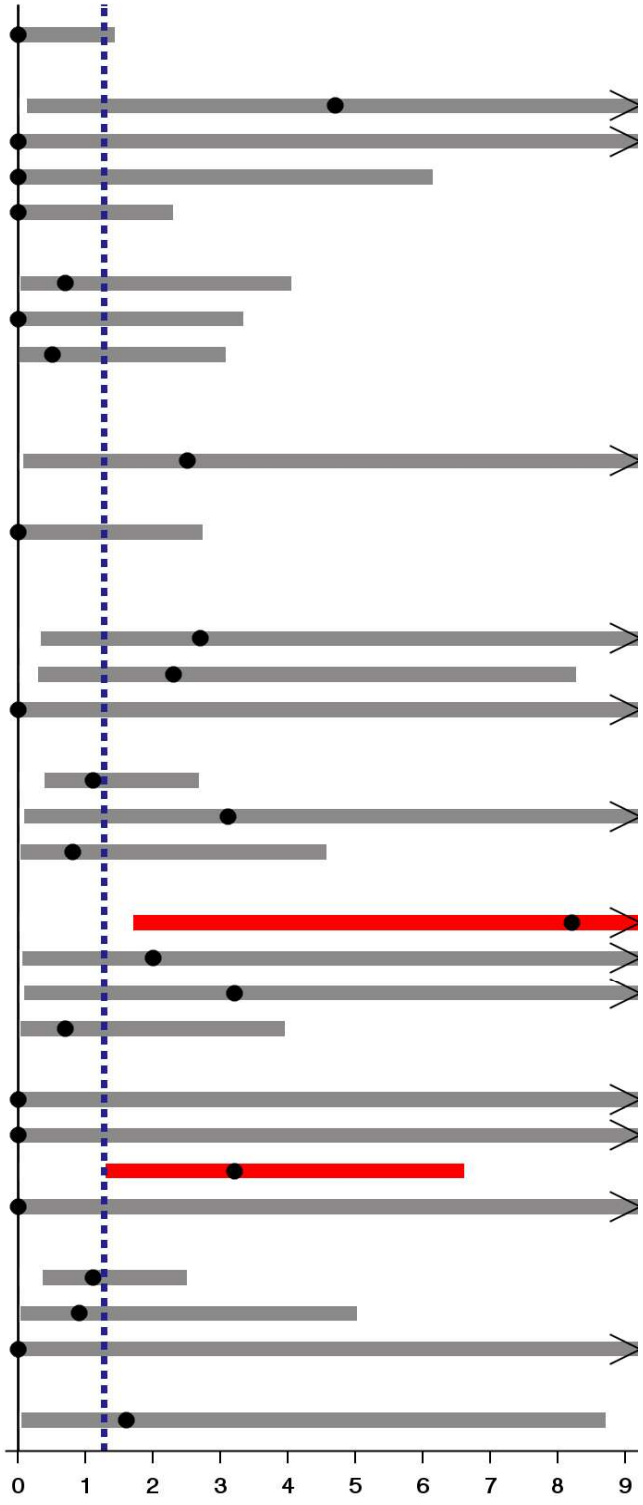
- Patients with an ASA score (a measure of systemic disease) of 3, 4, or 5 were 1.9 times more likely to develop an SSI than patients with an ASA score of 1 or 2.
- Procedures that involved traditional surgical incisions were 1.8 times more likely to result in an SSI than procedures performed entirely with a laparoscopic instrument.
- Patients with diabetes were 1.7 times more likely to develop an SSI than patients without diabetes.
- Patients with obesity (body mass index [BMI] greater than 30) were 1.7 times more likely to develop an SSI than patients with BMI less than or equal to 30.
- Procedures with duration greater than three hours were 1.8 times more likely to result in SSI than procedures less than three hours.

Hospital specific abdominal hysterectomy SSI rates

Hospital specific abdominal hysterectomy SSI rates are provided in Figure 9. Of the 101 hospitals that reported more than 20 procedures in 2021, 4 hospitals (4%) had a hysterectomy SSI rate that was statistically higher than the state average. These hospitals are required to 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 2021 (page 1 of 4)

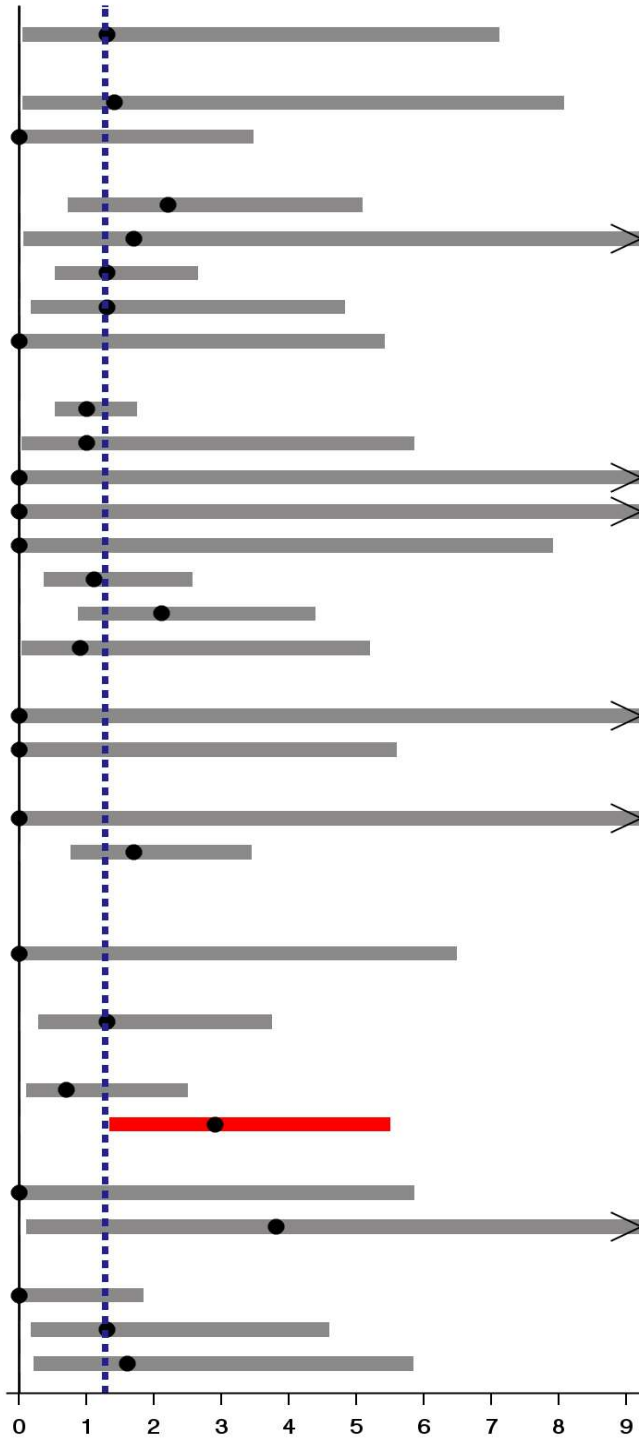
Hospital	# SSI	#PATOS excl.	#PDS excl.	# Procs	Raw Rate	Adj Rate
Albany Med Ctr	0	0	0	207	0.0	0.0
Alice Hyde Med Ctr	NA	NA	NA	NA	NA	NA
Arnot Ogden Med Ctr	1	0	0	25	4.0	4.7
Auburn Memorial	0	0	0	28	0.0	0.0
Bellevue Ellis	0	0	0	60	0.0	0.0
Bellevue Hospital	0	0	0	96	0.0	0.0
Bon Secours	NA	NA	NA	NA	NA	NA
Bronx-Lebanon	1	0	0	87	1.1	0.7
Brookdale Hospital	0	0	0	61	0.0	0.0
Brooklyn Hosp Ctr	1	0	2	194	0.5	0.5
Brooks Memorial	NA	NA	NA	NA	NA	NA
Buffalo General	NA	NA	NA	NA	NA	NA
Canton-Potsdam	1	0	0	60	1.7	2.5
Cayuga Medical Ctr	NA	NA	NA	NA	NA	NA
Champlain Valley	0	0	0	153	0.0	0.0
Claxton-Hepburn	NA	NA	NA	NA	NA	NA
Clifton Springs	NA	NA	NA	NA	NA	NA
Columbia Memorial	2	0	0	109	1.8	2.7
Coney Island Hosp	2	0	1	60	3.3	2.3
Corning Hospital	0	0	1	29	0.0	0.0
Cortland Reg Med	NA	NA	NA	NA	NA	NA
Crouse Hospital	5	0	1	468	1.1	1.1
Ellis Hospital	1	0	0	48	2.1	3.1
Elmhurst Hospital	1	0	2	103	1.0	0.8
FF Thompson	NA	NA	NA	NA	NA	NA
Faxton St. Lukes^	3	0	0	47	6.4	8.2
Flushing Hospital	1	0	0	58	1.7	2.0
Garnet Catskills	1	0	0	33	3.0	3.2
Garnet Middletown	1	0	0	141	0.7	0.7
Glen Cove Hospital	NA	NA	NA	NA	NA	NA
Glens Falls Hospital	0	0	0	28	0.0	0.0
Good Samar. Suffern	0	0	0	22	0.0	0.0
Good Samar. W Islip^	7	0	2	251	2.8	3.2
Harlem Hospital	0	0	0	24	0.0	0.0
HealthAlli Broadway	NA	NA	NA	NA	NA	NA
Highland Hospital	5	0	2	473	1.1	1.1
Huntington Hospital	1	0	1	145	0.7	0.9
Interfaith Med Ctr	0	0	0	32	0.0	0.0
JT Mather Hospital	NA	NA	NA	NA	NA	NA
Jacobi Med Ctr	1	0	0	45	2.2	1.6



Data reported as of August 15, 2022. 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 2021 (page 2 of 4)

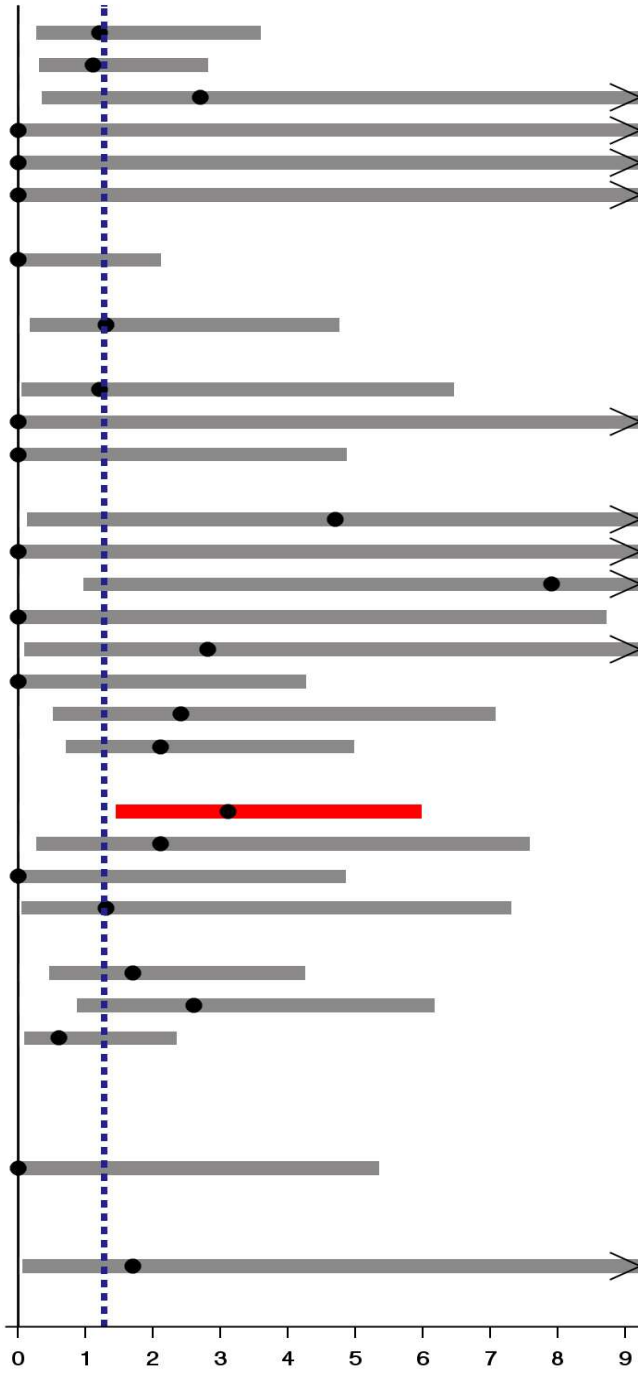
Hospital	# SSI	#PATOS excl.	#PDS excl.	# Procs	Raw Rate	Adj Rate
Jamaica Hospital	1	0	0	65	1.5	1.3
Jones Memorial	NA	NA	NA	NA	NA	NA
Kings County Hosp	1	1	2	52	1.9	1.4
LIJ at Forest Hills	0	0	0	113	0.0	0.0
LIJ at Valley Stream	NA	NA	NA	NA	NA	NA
Lenox Hill Hospital	5	0	0	281	1.8	2.2
Lincoln Med Ctr	1	0	2	38	2.6	1.7
Long Isl Jewish(LIJ)	7	0	0	425	1.6	1.3
Maimonides Med Ctr	2	0	2	143	1.4	1.3
Mary Imogene Bassett	0	0	0	64	0.0	0.0
Massena Memorial	NA	NA	NA	NA	NA	NA
Memor SloanKettering	12	0	7	1023	1.2	1.0
Mercy Hosp Buffalo	1	0	0	127	0.8	1.0
Mercy Med Ctr	0	0	0	26	0.0	0.0
Metropolitan Hosp	0	0	0	21	0.0	0.0
MidHudson Reg of WMC	0	0	0	49	0.0	0.0
Millard Fill. Suburb	5	0	0	541	0.9	1.1
Montefiore-Einstein	7	2	4	230	3.0	2.1
Montefiore-Moses	1	1	0	65	1.5	0.9
Montefiore-Mt Vernon	NA	NA	NA	NA	NA	NA
Montefiore-NewRochl	0	0	0	41	0.0	0.0
Montefiore-Nyack	0	0	0	62	0.0	0.0
Montefiore-Wakefield	NA	NA	NA	NA	NA	NA
Mount St. Marys	0	0	0	23	0.0	0.0
Mt Sinai	8	0	5	464	1.7	1.7
Mt Sinai Beth Israel	NA	NA	NA	NA	NA	NA
Mt Sinai Brooklyn	NA	NA	NA	NA	NA	NA
Mt Sinai Queens	0	0	0	33	0.0	0.0
Mt Sinai St Lukes	NA	NA	NA	NA	NA	NA
Mt Sinai West	3	0	0	232	1.3	1.3
NYP-Allen	NA	NA	NA	NA	NA	NA
NYP-Brklyn Methodist	2	0	1	216	0.9	0.7
NYP-Columbia^	9	1	1	259	3.5	2.9
NYP-Hudson Valley	NA	NA	NA	NA	NA	NA
NYP-Lawrence	0	0	0	52	0.0	0.0
NYP-Lower Manhattan	1	0	0	38	2.6	3.8
NYP-Morgan Stanley	NA	NA	NA	NA	NA	NA
NYP-Queens	0	0	0	145	0.0	0.0
NYP-Weill Cornell	2	0	0	161	1.2	1.3
NYU Langone Brooklyn	2	0	0	133	1.5	1.6



Data reported as of August 15, 2022. 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 2021 (page 3 of 4)

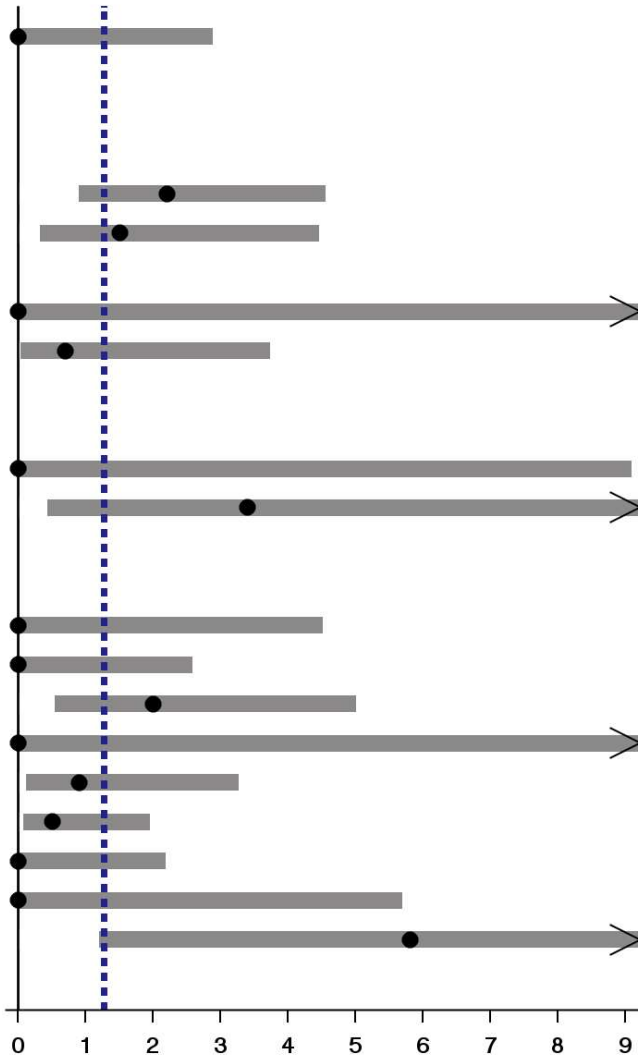
Hospital	# SSI	#PATOS excl.	#PDS excl.	# Procs	Raw Rate	Adj Rate
NYU Tisch	3	0	2	303	1.0	1.2
NYU Winthrop	4	0	1	345	1.2	1.1
Nassau University	2	0	0	74	2.7	2.7
Nathan Littauer	0	0	0	27	0.0	0.0
Newark Wayne	0	0	1	34	0.0	0.0
Niagara Falls	0	0	0	20	0.0	0.0
North Central Bronx	NA	NA	NA	NA	NA	NA
North Shore	0	0	0	148	0.0	0.0
Northern Dutchess	NA	NA	NA	NA	NA	NA
Northern Westchester	2	0	0	195	1.0	1.3
Noyes Memorial	NA	NA	NA	NA	NA	NA
Oishei Childrens	1	0	0	82	1.2	1.2
Olean General	0	0	0	39	0.0	0.0
Oneida Healthcare	0	0	0	66	0.0	0.0
Oswego Hospital	NA	NA	NA	NA	NA	NA
Our Lady of Lourdes	1	0	0	24	4.2	4.7
Peconic Bay Medical	0	0	0	22	0.0	0.0
Phelps Memorial	2	0	0	34	5.9	7.9
Plainview Hospital	0	0	0	31	0.0	0.0
Putnam Hospital	1	0	0	75	1.3	2.8
Queens Hospital	0	0	1	56	0.0	0.0
Richmond Univ MC	3	0	4	136	2.2	2.4
Rochester General	5	0	3	234	2.1	2.1
Rome Memorial	NA	NA	NA	NA	NA	NA
Roswell Park^	9	0	8	291	3.1	3.1
SUNY Downstate MedCr	2	0	0	73	2.7	2.1
Samaritan- Troy	0	0	1	68	0.0	0.0
Samaritan- Watertown	1	0	0	102	1.0	1.3
Saratoga Hospital	NA	NA	NA	NA	NA	NA
Sisters of Charity	4	0	0	262	1.5	1.7
South Nassau Comm.	5	1	0	244	2.0	2.6
South Shore UHosp	2	0	0	375	0.5	0.6
St Anthony	NA	NA	NA	NA	NA	NA
St Barnabas	NA	NA	NA	NA	NA	NA
St Catherine Siena	NA	NA	NA	NA	NA	NA
St Charles Hospital	0	0	0	71	0.0	0.0
St Francis- Roslyn	NA	NA	NA	NA	NA	NA
St Johns Episcopal	NA	NA	NA	NA	NA	NA
St Johns Riverside	1	0	0	81	1.2	1.7
St Joseph- Bethpage	NA	NA	NA	NA	NA	NA



Data reported as of August 15, 2022. ¦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 2021 (page 4 of 4)

Hospital	# SSI	#PATOS excl.	#PDS excl.	# Procs	Raw Rate	Adj Rate
St Josephs- Syracuse	0	0	0	140	0.0	0.0
St Josephs- Yonkers	NA	NA	NA	NA	NA	NA
St Lukes Cornwall	NA	NA	NA	NA	NA	NA
St Marys Amsterdam	NA	NA	NA	NA	NA	NA
St Peters Hospital	7	0	1	310	2.3	2.2
Staten Island U N	3	0	0	170	1.8	1.5
Staten Island U S	NA	NA	NA	NA	NA	NA
Stony Brk Southamptn	0	0	0	52	0.0	0.0
Strong Memorial	1	0	3	111	0.9	0.7
Syosset Hospital	NA	NA	NA	NA	NA	NA
UHS Binghamton	NA	NA	NA	NA	NA	NA
UHS Chenango Memor	0	0	0	34	0.0	0.0
UHS Wilson	2	0	1	66	3.0	3.4
UPMC Chautauqua WCA	NA	NA	NA	NA	NA	NA
United Memorial	NA	NA	NA	NA	NA	NA
Unity Hosp Rochester	0	0	0	83	0.0	0.0
Univ Hosp SUNY Upst	0	0	0	69	0.0	0.0
Univ Hosp StonyBrook	4	0	0	153	2.6	2.0
Upst. Community Gen	0	0	0	25	0.0	0.0
Vassar Brothers	2	0	0	279	0.7	0.9
Westchester Medical	2	0	0	234	0.9	0.5
White Plains Hosp	0	0	0	206	0.0	0.0
Woodhull Med Ctr	0	0	0	54	0.0	0.0
Wyckoff Heights	3	0	0	61	4.9	5.8
Wyoming County Comm.	NA	NA	NA	NA	NA	NA



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Spinal fusion surgical site infections

In 2021, 111 hospitals reported a total of 402 spinal fusion SSIs out of 25,928 procedures, a rate of 1.6 infections per 100 procedures. NYSDOH excludes some of these SSIs and procedures from SSI rates before evaluating time trends and comparing hospital performance, as described below.

Of the 402 infections, 20 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 382 infections, 24% were superficial, 49% were deep, and 27% were organ/space (Table 11). Most of the SSIs (68%) were detected upon readmission to the same hospital; 15% were identified during the initial hospitalization; 9% involved readmission to another hospital; and 8% were detected using post-discharge surveillance and not readmitted. Most (70%) 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 30 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 2021

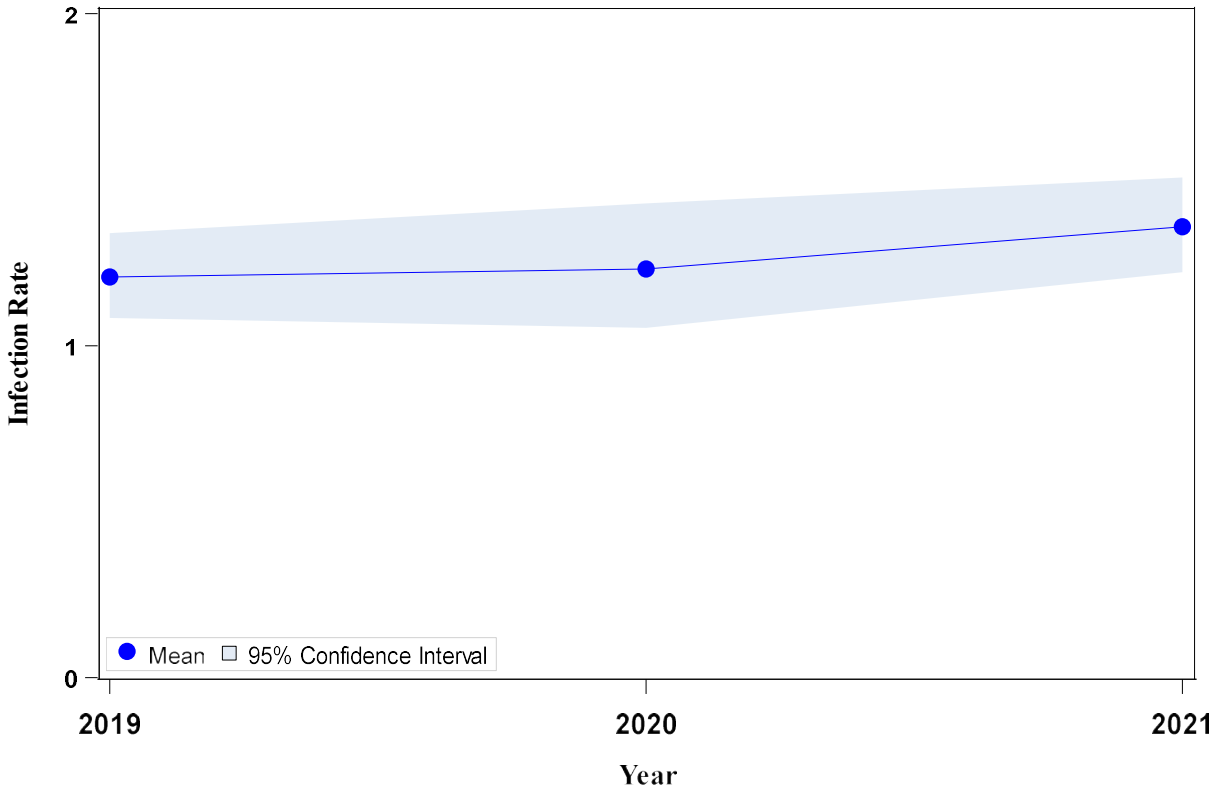
	When Detected				
Extent (Row%) (Column%)	**Initial hospitalization**	**Readmitted to the same hospital**	**Readmitted to another hospital**	**PDS not readmitted**	**Total**
Superficial Incisional	12 (13.2%) (21.0%)	51 (56.0%) (19.5%)	7 (7.7%) (20.6%)	21 (23.1%) (70.0%)	91 (23.8%)
Deep Incisional	23 (12.2%) (40.4%)	143 (75.7%) (54.8%)	15 (7.9%) (44.1%)	8 (4.2%) (26.7%)	189 (49.5%)
Organ/Space	22 (21.6%) (38.6%)	67 (65.7%) (25.7%)	12 (11.7%) (35.3%)	1 (1.0%) (3.3%)	102 (26.7%)
Total	57 (14.9%)	261 (68.3%)	34 (8.9%)	30 (7.8%)	382

PDS: Post discharge surveillance. New York State data reported as of August 15, 2022. Excludes infections present at time of surgery.

Trends in fusion SSI rates after deleting PATOS and PDS infections are shown in Figure 10. Between 2019 and 2021 the total number of fusion SSIs increased 13%, from 1.18 infections per 100 procedures in 2019, to 1.36 infections per 100 procedures in 2021, though the increase was not statistically significant.

Figure 10. Spinal fusion SSI rates, New York State 2019-2021

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)
2020	109	170	13,812	1.23 (1.05, 1.43)
2021	111	352	25,908	1.36 (1.22, 1.51)

New York State data reported as of August 15, 2022.
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 2021

Microorganism	Number of Isolates	Percent of Infections
Staphylococcus aureus	114	28.4
- *Staphylococcus aureus*-MRSA	(32)	(8.0)
Coagulase negative staphylococci	54	13.4
Pseudomonas spp.	36	9.0
Escherichia coli	31	7.7
Klebsiella spp.	28	7.0
- CRE-Klebsiella	(1)	(0.2)
Proteus spp.	25	6.2
Enterococci	22	5.5
- VRE	(5)	(1.2)
Streptococci	20	5.0
Enterobacter spp.	19	4.7
- CRE-Enterobacter	(1)	(0.2)
Cutibacterium spp.	16	4.0
Serratia spp.	11	2.7
Acinetobacter spp.	6	1.5
Other	42	10.4

New York State data reported as of August 15, 2022. Out of 402 infections. No microorganisms identified for 85 (21%) infections. CRE: carbapenem-resistant Enterobacterales; MRSA: methicillin-resistant *Staphylococcus aureus;* VRE: vancomycin-resistant enterococci; MDR: multi-drug resistant; spp: multiple species.

Risk adjustment for spinal fusion SSIs

Certain patient and procedure-specific factors increase the risk of developing an SSI following abdominal hysterectomy. In 2021, 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 1.7 times more likely to develop an SSI.
- Patients with diabetes were 1.2 times more likely to develop an SSI than patients without diabetes.
- Patients with severe obesity (BMI greater than or equal to 40) were 2.1 times more likely to develop an SSI, and patients with obesity (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 1.2 times more likely to develop an SSI.
- Patients who experienced trauma (i.e., a blunt or penetrating injury) before the procedure were 1.5 times more likely to develop an SSI.
- Procedures that involved a posterior or bidirectional approach were 2.5 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 1.5 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 95 hospitals that reported more than 20 procedures in 2021, 5 hospitals (5%) had a spinal fusion SSI rate that was statistically higher than the state average. These hospitals are required to 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 2021 (page 1 of 3)

Hospital	# SSI	#PATOS excl.	#PDS excl.	# Procs	Raw Rate	Adj Rate
Albany Med Ctr	12	1	0	498	2.4	1.9
Arnot Ogden Med Ctr	0	0	1	113	0.0	0.0
Bellevue Hospital	0	0	0	56	0.0	0.0
Bronx-Lebanon	3	0	0	76	3.9	5.1
Brookdale Hospital	0	0	0	58	0.0	0.0
Brooklyn Hosp Ctr	0	0	0	48	0.0	0.0
Buffalo General	18	0	0	1011	1.8	1.6
Cayuga Medical Ctr	0	0	0	45	0.0	0.0
Champlain Valley	NA	NA	NA	NA	NA	NA
Clifton Springs	NA	NA	NA	NA	NA	NA
Coney Island Hosp	3	0	0	59	5.1	5.9
Crouse Hospital	6	1	1	382	1.6	1.7
Ellis Hospital	NA	NA	NA	NA	NA	NA
Elmhurst Hospital	1	0	0	52	1.9	1.2
Erie County Med Ctr	8	0	4	355	2.3	1.8
FF Thompson	0	0	0	78	0.0	0.0
Faxton St. Lukes	2	0	0	81	2.5	3.2
Garnet Middletown	2	0	0	28	7.1	9.5
Geneva General	0	0	0	117	0.0	0.0
Glens Falls Hospital	NA	NA	NA	NA	NA	NA
Good Samar. Suffern	NA	NA	NA	NA	NA	NA
Good Samar. W Islip	2	0	0	465	0.4	0.5
Harlem Hospital	0	0	0	20	0.0	0.0
HealthAlli Broadway	NA	NA	NA	NA	NA	NA
Highland Hospital	3	0	1	267	1.1	1.2
Hosp for Spec Surg	19	1	1	2070	0.9	1.1
Huntington Hospital	4	0	0	287	1.4	1.3
JT Mather Hospital	1	0	0	293	0.3	0.3
Jacobi Med Ctr	2	0	0	46	4.3	3.2
Jamaica Hospital	4	0	0	70	5.7	2.8
Kenmore Mercy	5	0	0	844	0.6	0.9
Kings County Hosp^	3	0	0	32	9.4	8.4
LIJ at Forest Hills	NA	NA	NA	NA	NA	NA
LIJ at Valley Stream	1	0	0	154	0.6	0.9
Lenox Hill Hospital	13	0	0	1000	1.3	1.7
Lincoln Med Ctr	2	0	0	50	4.0	2.9
Long Isl Jewish(LIJ)^	14	2	0	359	3.9	3.0
Long Isl. Community	NA	NA	NA	NA	NA	NA
Maimonides Med Ctr	4	0	1	303	1.3	1.3
Mary Imogene Bassett	3	0	0	161	1.9	1.4

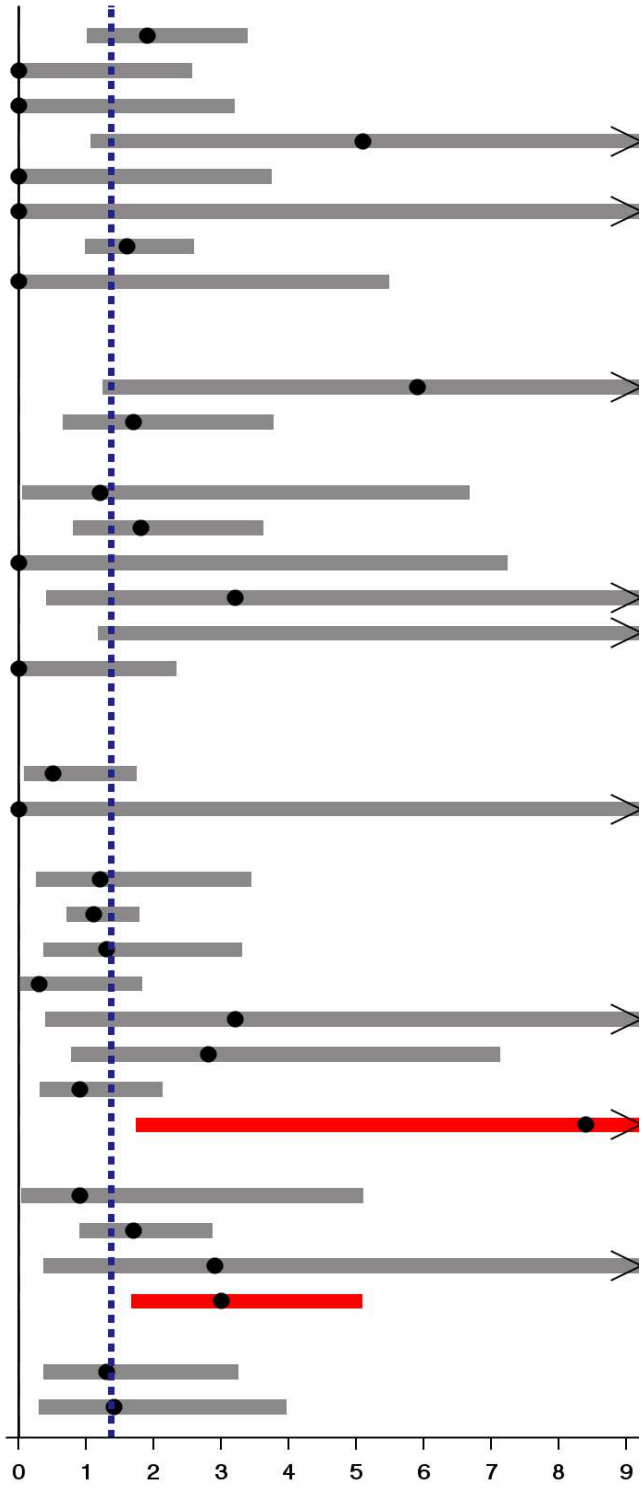


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Figure 11. Spinal fusion surgical site infection rates, New York 2021 (page 2 of 3)

Hospital	# SSI	#PATOS excl.	#PDS excl.	# Procs	Raw Rate	Adj Rate
Memor SloanKettering	6	0	1	183	3.3	2.2
Mercy Hosp Buffalo^	17	0	0	664	2.6	3.6
Mercy Med Ctr	3	1	0	455	0.7	1.0
MidHudson Reg of WMC	1	0	0	36	2.8	1.4
Millard Fill. Suburb	1	0	0	102	1.0	0.9
Montefiore-Moses^	15	2	1	377	4.0	2.8
Montefiore-NewRochl	0	0	1	52	0.0	0.0
Montefiore-Nyack	NA	NA	NA	NA	NA	NA
Mt Sinai	18	1	4	916	2.0	1.8
Mt Sinai St Lukes	1	0	0	59	1.7	1.2
Mt Sinai West	1	0	0	306	0.3	0.2
NYP-Allen*	5	0	0	678	0.7	0.6
NYP-Brklyn Methodist	3	0	0	111	2.7	2.6
NYP-Columbia	1	1	0	65	1.5	0.9
NYP-Hudson Valley	NA	NA	NA	NA	NA	NA
NYP-Lawrence	2	0	0	52	3.8	3.8
NYP-Lower Manhattan	4	0	0	548	0.7	1.2
NYP-Morgan Stanley	3	0	0	195	1.5	1.3
NYP-Queens	0	0	0	96	0.0	0.0
NYP-Weill Cornell*	0	0	0	453	0.0	0.0
NYU Langone Brooklyn	3	0	0	255	1.2	1.3
NYU Tisch	18	2	3	1571	1.1	1.0
NYU Winthrop	7	0	0	351	2.0	1.8
Nassau University	2	0	0	300	0.7	1.3
Nathan Littauer	0	0	0	51	0.0	0.0
Niagara Falls	0	0	0	193	0.0	0.0
North Shore	9	1	0	638	1.4	1.2
Northern Dutchess	0	0	0	108	0.0	0.0
Northern Westchester	3	0	0	163	1.8	2.4
Oishei Childrens	0	0	0	21	0.0	0.0
Our Lady of Lourdes	0	0	2	85	0.0	0.0
Phelps Memorial	1	0	0	118	0.8	0.9
Plainview Hospital	0	0	0	58	0.0	0.0
Putnam Hospital	2	0	0	71	2.8	3.3
Richmond Univ MC	1	0	0	54	1.9	2.3
Rochester General	7	0	2	342	2.0	2.0
Rome Memorial	2	0	0	107	1.9	2.8
Roswell Park	NA	NA	NA	NA	NA	NA
SUNY Downstate MedCr	1	0	0	40	2.5	2.1
Samaritan- Troy	0	0	0	109	0.0	0.0

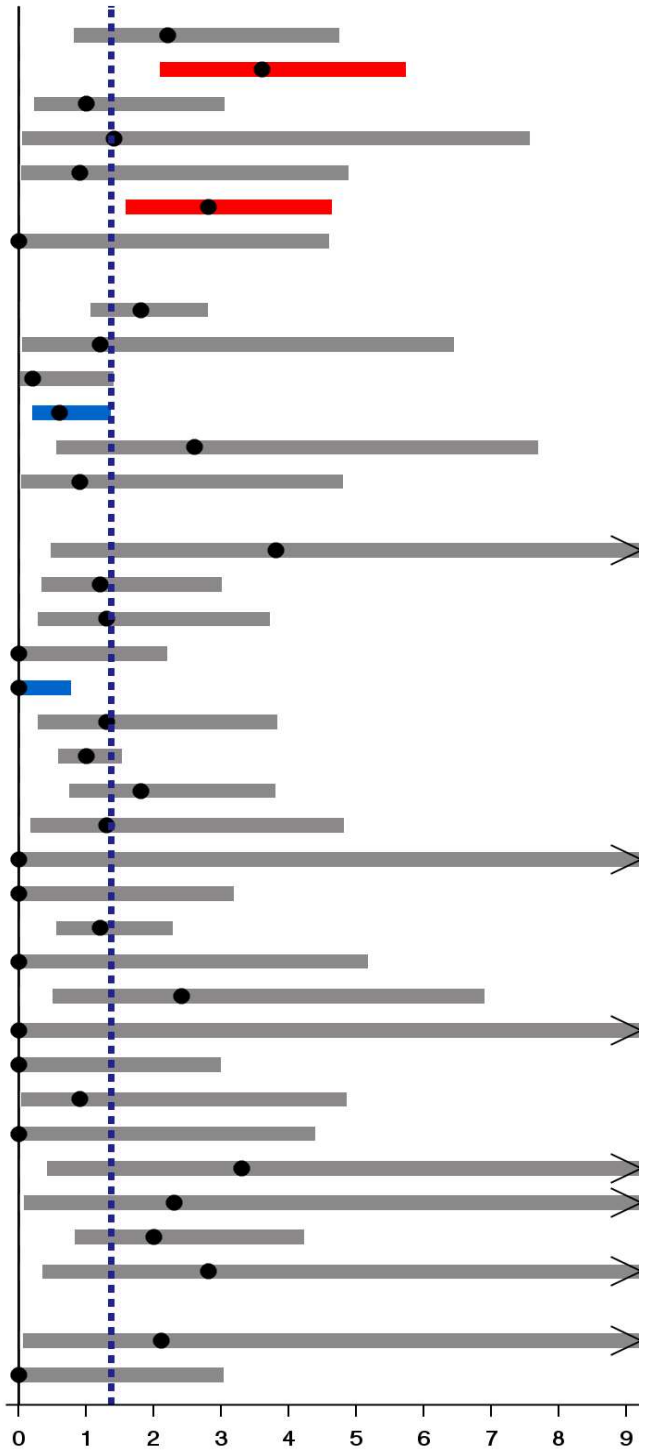

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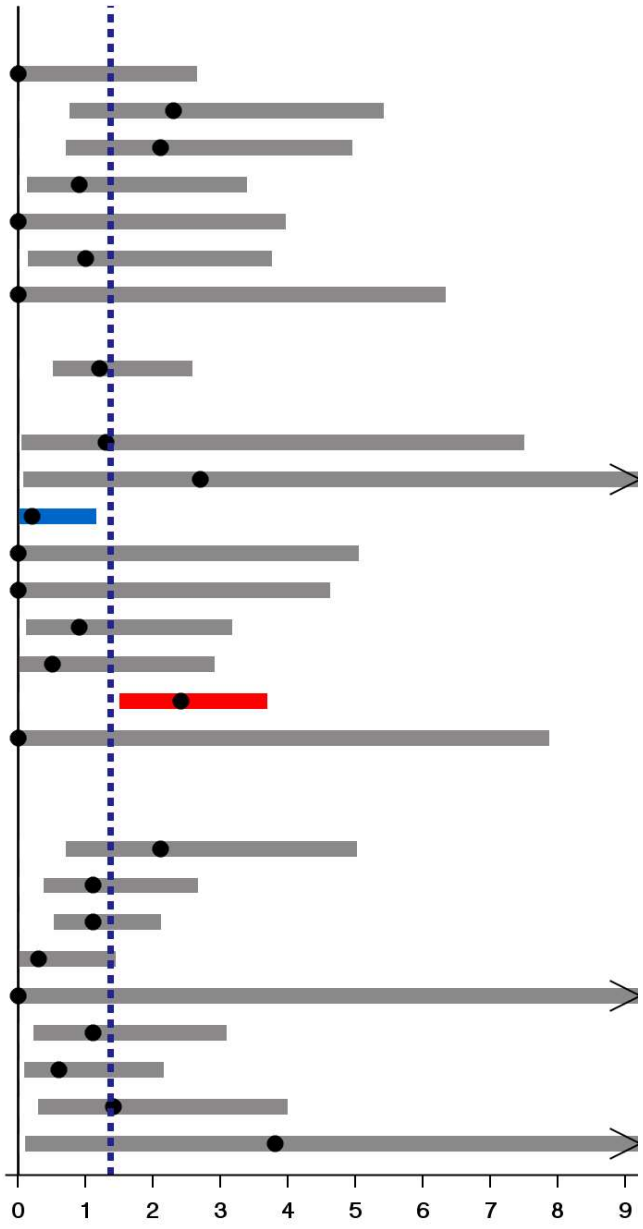
Figure 11. Spinal fusion surgical site infection rates, New York 2021 (page 3 of 3)

Hospital	# SSI	#PATOS excl.	#PDS excl.	# Procs	Raw Rate	Adj Rate
Samaritan- Watertown	NA	NA	NA	NA	NA	NA
Saratoga Hospital	0	0	0	125	0.0	0.0
Sisters of Charity	5	0	0	290	1.7	2.3
South Nassau Comm.	5	0	0	283	1.8	2.1
South Shore UHosp	2	0	0	212	0.9	0.9
St Barnabas	0	0	0	47	0.0	0.0
St Catherine Siena	2	0	0	236	0.8	1.0
St Charles Hospital	0	0	0	64	0.0	0.0
St Elizabeth Medical	NA	NA	NA	NA	NA	NA
St Francis- Roslyn	7	0	0	585	1.2	1.2
St Johns Dobbs Ferry	NA	NA	NA	NA	NA	NA
St Johns Riverside	1	0	0	87	1.1	1.3
St Joseph- Bethpage	1	0	0	46	2.2	2.7
St Josephs- Syracuse*	1	0	0	643	0.2	0.2
St Lukes Cornwall	0	0	0	39	0.0	0.0
St Marys Amsterdam	0	0	0	78	0.0	0.0
St Peters Hospital	2	0	0	257	0.8	0.9
Staten Island U N	1	0	0	140	0.7	0.5
Strong Memorial^	21	6	2	547	3.8	2.4
Syosset Hospital	0	0	0	44	0.0	0.0
UHS Binghamton	NA	NA	NA	NA	NA	NA
UHS Chenango Memor	NA	NA	NA	NA	NA	NA
UHS Wilson	5	1	1	330	1.5	2.1
Unity Hosp Rochester	5	0	1	501	1.0	1.1
Univ Hosp SUNY Upst	9	0	3	603	1.5	1.1
Univ Hosp StonyBrook	1	0	0	335	0.3	0.3
Upst. Community Gen	0	0	0	35	0.0	0.0
Vassar Brothers	3	0	0	307	1.0	1.1
Westchester Medical	2	0	0	173	1.2	0.6
White Plains Hosp	3	0	0	286	1.0	1.4
Wyckoff Heights	1	0	0	24	4.2	3.8



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Central line associated bloodstream infections (CLABSIs)

NYSDOH required the addition of reporting in oncology and mixed acuity units in 2019 and telemetry units in 2020. In 2021, a total of 2,225 CLABSIs were associated with 1,645,469 central line days, for an overall rate of 1.35 infections per 1,000 central line days in the selected ICUs and wards (Table 13). Of these, 372 (17%) were in patients with mucosal barrier injury (MBI). An MBI-CLABSI is a type of CLABSI that can occur mostly in patients with cancer. 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 in oncology wards. Oncology ICUs are not reported separately in this report because there are only two cancer hospitals in NYS; oncology medical-surgical critical care units were combined with medical/surgical ICUs, and oncology pediatric critical care units were combined with pediatric ICUs by NYSDOH beginning in 2017.

In 2018, NHSN began excluding BSIs occurring in patients with ventricular assist devices (VAD) and/or extracorporeal membrane oxygenation (ECMO) from CLABSI rates because patients with these devices are at increased risk of acquiring a BSI independent of the presence of a central line. Starting in 2019, observed or suspected patient injection into a vascular line (PATINJ), known or suspected Munchausen Syndrome by Proxy (MSP), epidermolysis bullosa (EB), 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 (IVPUS), and group B Streptococcus BSIs in infants during the first 6 days of life were excluded from infection rate calculation. In 2021, hospitals reported 85 ECMO BSIs, 29 VAD BSIs, 7 PATINJ BSI, one (1) EB BSI and two (2) IVPUS BIS.

The exclusions are 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 NHSN was updated such that future HAI reports will allow NYS to measure the BSIs excluded under these rules.
Table 13 summarizes the total number of CLABSIs reported in 2021 by unit. The CLABSI rate in ICUs (1.31/1,000 central line days) was higher than the rate in wards (0.92/1,000 central line days).

Table 13. Central line associated bloodstream infection (CLABSI) rates by unit, New York State 2021

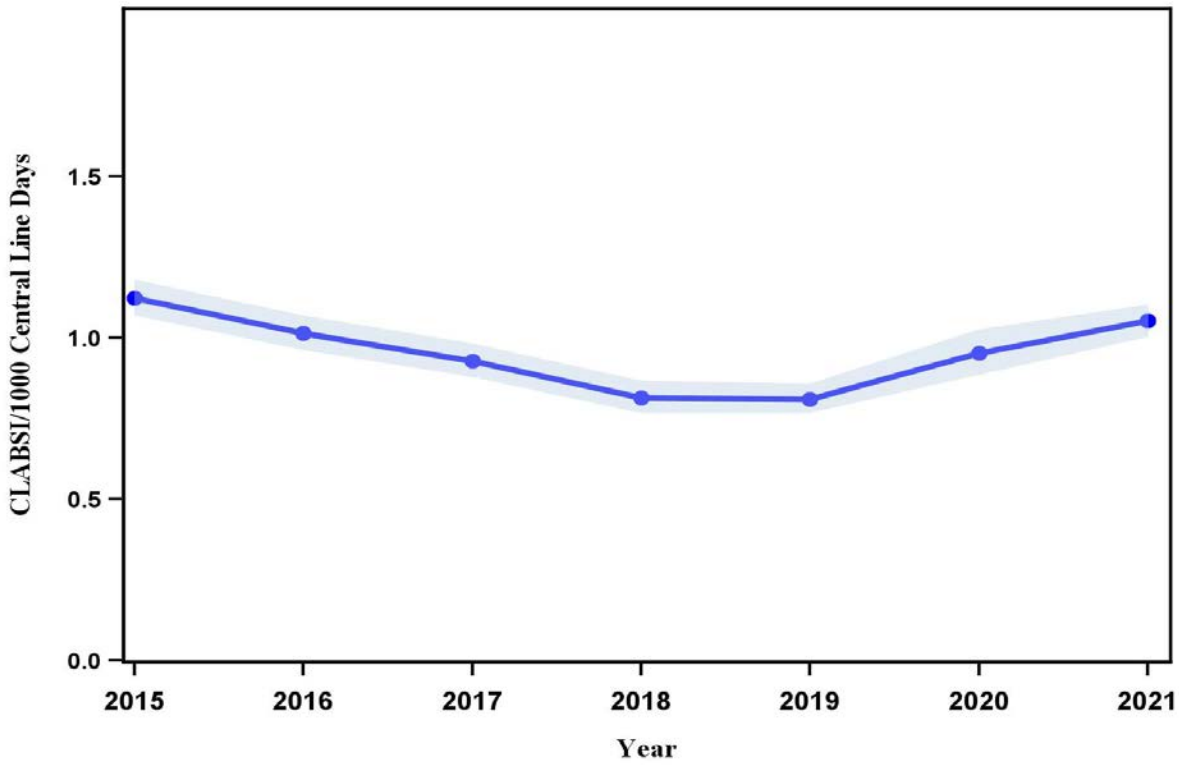
Unit	# Hospitals	# Exclusion	# CLABSI*	# Central line days	CLABSI rate	# Patient days	Device utilization ratio
Adult/Pediatric Intensive Care Units							
Cardiothoracic ICU	28	39	58	76,541	0.758	115,047	66.5
Coronary ICU	33	15	66	42,989	1.535	107,059	40.2
Medical ICU	67	53	256	161,430	1.586	323,979	49.8
Medical Surgical ICU	96	9	197	150,292	1.311	336,093	44.7
Neurosurgical ICU	14	2	25	20,121	1.242	64,362	31.3
Pediatric ICU	27	7	42	35,011	1.200	95,939	36.5
Surgical ICU	41	21	101	83,406	1.211	178,485	46.7
Subtotal adult/pediatric ICUs	154	146	745	569,790	1.307	1,220,964	46.7
Neonatal Intensive Care Units							
Neonatal ICU Level II/III	13	0	5	3,718	1.345	32,516	11.4
Neonatal ICU Level III	24	2	14	13,000	1.077	93,783	13.9
Neonatal ICU RPC	17	1	47	62,821	0.748	261,183	24.1
Subtotal neonatal ICUs	54	3	66	79,539	0.830	387,482	20.5
Adult/Pediatric Wards							
Medical surgical ward	130	6	186	262,546	0.708	2,654,273	9.9
Medical ward	88	37	296	272,040	1.088	2,577,811	10.6
Pediatric ward	46	20	23	35,225	0.653	239,891	14.7
Surgical ward	72	4	76	94,144	0.807	830,649	11.3
Step down unit	63	2	63	61,034	1.032	359,120	17.0
Mixed acuity ward	22	1	20	15,834	1.263	100,489	15.8
Oncology ward	24	274	238	227,235	1.047	455,388	49.9
Telemetry ward	27	1	18	28,082	0.641	352,985	8.0
Subtotal adult/pediatric wards	159	345	920	996,140	0.924	7,570,606	13.2
Total grand total	**160**	**494**	**1,731**	**1,645,469**	**1.052**	**9,179,052**	**17.9**

[1]Excluding MBI, VAD, ECMO, PATINJ, MSP, EB, IVPUS, and MSBP. New York State data as of August 15, 2022. 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 2021.

Between 2015 and 2021 the CLABSI rate decreased 6%, from 1.123 to 1.052 CLABSI per 1,000 central line days. However, CLABSI rates significantly increased between 2019 and 2021 by 22% from 0.823 in 2019. CLABSI rates were increased most likely because of issues related to the COVID-19 pandemic, such as longer hospital stays in patients with COVID-19 and severe co-morbidities requiring ICU admission with central lines. Both patient days and central line days increased in 2021 compared to previous years.

Figure 12. Trends in central line-associated bloodstream infection (CLABSI) rates, New York State 2015-2021



Year	# Hospitals	# CLABSI	# Central line days	CLABSI rate (95% CI)	# Patient days	Device utilization ratio
2015	167	1,590	1,415,710	1.12 (1.07, 1.18	8,178,130	17.3
2016	169	1,398	1,376,060	1.016 (0.96, 1.07)	8,122,132	16.9
2017	172	1,228	1,322,501	0.93 (0.88, 0.98)	8,077,737	16.4
2018	170	1,110	1,295,018	0.86 (0.81, 0.91)	8,248,580	15.7
2019	164	1,059	1,286,392	0.82 (0.77, 0.87)	8,244,594	15.6
2020	160	721	756,749	0.95 (0.88, 1.02)	4,171,360	18.1
2021	160	1731	1,645,469	1.05 (1.00, 1.10)	9,179,052	17.9

New York State data as of August 15, 2022. Rates are per 1,000 central line days. Device utilization = 100* central line days/patient days.

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 2021

Microorganism	Number of Isolates	Percent of Infections
Enterococci	524	24.3
- VRE	(205)	(9.5)
Yeast	508	23.5
- *Candida auris*	(32)	(1.5)
Coagulase negative staphylococci	280	13.0
Klebsiella spp.	206	9.5
- CRE-Klebsiella	(19)	(0.9)
Staphylococcus aureus	191	8.8
- *Staphylococcus aureus*-MRSA	(56)	(2.6)
Escherichia coli	162	7.5
- CRE-*E. coli*	(2)	(0.1)
Pseudomonas spp.	100	4.6
Streptococci	78	3.6
Enterobacter spp.	66	3.1
- CRE-Enterobacter	(4)	(0.2)
Serratia spp.	59	2.7
Proteus spp.	29	1.3
Bacteroides spp.	28	1.3
Acinetobacter spp.	26	1.2
- MDRO-Acinetobacter	(8)	0.4)
Stenotrophomonas spp.	26	1.2
Lactobacillus spp.	21	1.0
Citrobacter spp.	15	0.7
Clostridioides spp.	14	0.6
Other	132	6.1

New York State data reported as of August 15, 2022. Out of 2,160 infections. VRE: vancomycin-resistant enterococci; CRE: carbapenem-resistant Enterobacterales 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 2021

Microorganism	Number of Isolates	Percent of Infections
Staphylococcus aureus	16	23.2
- *Staphylococcus aureus*-MRSA	(2)	(2.9)
Coagulase negative staphylococci	15	21.7
Enterococci	11	15.9
Yeast	10	14.5
Escherichia coli	7	10.1
Klebsiella spp.	6	8.7
Enterobacter spp.	3	4.3
Other	5	7.2

New York State data reported as of August 15, 2022. Out of 69 infections. MRSA: methicillin-resistant *Staphylococcus aureus;* CRE: carbapenem-resistant Enterobacterales; 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 babies with lower birth weights are more susceptible to CLABSIs than babies with higher birth weights. No risk adjustment is performed by birth weight group in Level II/III facilities due to the small number of CLABSIs. In Regional Perinatal Centers (RPCs) or Level IV facilities, babies weighing less than or equal 1000 grams were 2.2 times more likely to develop a CLABSI than babies weighing 1001 grams or higher. In Level III NICUs, there was no difference by birth weight.

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 hospitals target their CLABSI reduction efforts to specific locations. Overall, 30 high-rate flags will be addressed in CLABSI improvement plans by twenty-four affected hospitals.

Table 16. Central line-associated bloodstream infection rates by intensive care unit type, New York State 2021

	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	**1.54**		**0.76**		**1.59**		**1.31**		**1.21**		**1.24**		**1.20**		**RPC 0.75/Lev 3 1.08/ Lev 2/3 1.34**		
Adirondack Medical							0/315	0.0									
Albany Med Ctr	1/2098	0.5	0/2584	0.0	7/4369	1.6			3/5751	0.5			0/2027	0.0	RPC	3/3490	0.8
Arnot Ogden Med Ctr							3/1500	2.0							Lev 3	2/1242	2.5
Auburn Memorial							0/1284	0.0									
Bellevue Hospital	10/3462	2.9	1/793	1.3	12/2763	^ 4.3	3/475	6.3	4/1672	2.4	0/55	0.0	0/168	0.0	RPC	2/1571	1.1
Bon Secours							0/372	0.0									
Bronx-Lebanon	2/826	2.4			6/3143	1.9							NA	NA	Lev 3	2/701	2.0
Brookdale Hospital	1/711	1.4			3/3913	0.8			2/2705	0.7			NA	NA	Lev 3	0/291	0.0
Brooklyn Hosp Ctr	2/428	4.7			1/1544	0.6							0/52	0.0	Lev 3	0/1230	0.0
Brooks Memorial							2/911	2.2									
Buffalo General			1/3493	0.3	8/7496	1.1			3/2707	1.1	2/2278	0.9					
Canton-Potsdam							1/416	2.4									
Cayuga Medical Ctr							1/966	1.0									
Champlain Valley							1/1818	0.6									
Claxton-Hepburn							2/771	2.6									
Clifton Springs					2/490	4.1											
Cohens Childrens													5/2906	1.7	RPC	4/5332	0.7
Columbia Memorial							0/1015	0.0									
Coney Island Hosp	1/845	1.2			7/2764	2.5	1/524	1.9	4/1425	2.8					Lev 2/3	NA	NA
Corning Hospital							0/418	0.0									
Cortland Reg Med					0/333	0.0											
Crouse Hospital							3/3599	0.8							RPC	7/5193	1.3
Ellis Hospital					4/2710	1.5			2/2832	0.7							
Elmhurst Hospital	1/464	2.2			2/1489	1.3			0/691	0.0					Lev 2/3	0/259	0.0
Erie County Med Ctr					4/4363	0.9											
FF Thompson					3/1851	1.6											
Faxton St. Lukes							3/2526	1.2									
Flushing Hospital					5/1454	3.4	1/441	2.3							Lev 3	0/360	0.0
Garnet Catskills							0/785	0.0									
Garnet Middletown							6/3155	1.9									
Geneva General							0/796	0.0									
Glen Cove Hospital							6/531	^11.3									
Glens Falls Hospital							0/1691	0.0									

Table 16. Central line-associated bloodstream infection rates by intensive care unit type, New York State 2021

	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	**1.54**		**0.76**		**1.59**		**1.31**		**1.21**		**1.24**		**1.20**		**RPC 0.75/Lev 3 1.08/ Lev 2/3 1.34**		
Good Samar. Suffern			0/539	0.0	4/1685	2.4			0/773	0.0							
Good Samar. W Islip			0/1222	0.0	3/3622	0.8			1/3282	0.3	0/647	0.0	0/97	0.0	Lev 3	0/851	0.0
Harlem Hospital	1/345	2.9					0/1916	0.0					NA	NA	Lev 3	0/256	0.0
HealthAlli Broadway							1/1027	1.0									
Highland Hospital							8/2292	^ 3.5									
Hosp for Spec Surg							0/127	0.0									
Huntington Hospital	0/871	0.0			0/77	0.0	2/921	2.2									
Interfaith Med Ctr							1/2046	0.5									
JT Mather Hospital							1/2072	0.5									
Jacobi Med Ctr	4/919	4.4			6/1681	3.6	0/69	0.0	2/1187	1.7			0/131	0.0	Lev 3	0/934	0.0
Jamaica Hospital					4/3410	1.2			2/1296	1.5					Lev 3	1/646	1.4
Jones Memorial							0/326	0.0									
Kenmore Mercy							0/1817	0.0									
Kings County Hosp					1/2319	0.4			1/1995	0.5			NA	NA	Lev 2/3	1/560	1.8
Kingsbrook Jewish							4/1125	3.6									
LIJ at Forest Hills					0/2193	* 0.0											
LIJ at Valley Stream							2/1445	1.4									
Lenox Hill Hospital	1/823	1.2	0/1084	0.0	4/1149	3.5	4/1115	3.6	2/1433	1.4					Lev 2/3	1/939	1.1
Lincoln Med Ctr					1/3861	* 0.3			4/1154	3.5					Lev 3	1/630	1.5
Long Isl Jewish(LIJ)	0/681	0.0			14/5926	2.4	0/618	0.0	0/1320	0.0							
Long Isl. Community	0/748	0.0			1/1249	0.8			3/1137	2.6							
Maimonides Med Ctr	1/1503	0.7	0/2068	0.0	1/1429	0.7			1/1155	0.9			1/489	2.0	RPC	2/1359	1.3
Mary Imogene Bassett							6/3391	1.8									
Memor SloanKettering							6/4985	1.2					0/924	0.0			
Mercy Hosp Buffalo			0/1579	0.0			3/3057	1.0									
Mercy Med Ctr							0/1315	0.0							Lev 3	1/166	4.9
Metropolitan Hosp							1/950	1.1							Lev 2/3	0/185	0.0
MidHudson Reg of							0/1796	0.0									
Millard Fill. Suburb							2/3703	0.5									
Montefiore-Einstein			5/2496	2.0	6/2726	2.2									RPC	4/3704	0.9
Montefiore-Moses	5/2221	2.3	5/2856	1.8	4/1854	2.2			5/2072	2.4			6/2342	2.6			
Montefiore-NewRochl							12/1671	^ 7.2									
Montefiore-Nyack					3/1348	2.2			1/1038	1.0							

Table 16. Central line-associated bloodstream infection rates by intensive care unit type, New York State 2021

	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	**1.54**		**0.76**		**1.59**		**1.31**		**1.21**		**1.24**		**1.20**		**RPC 0.75/Lev 3 1.08/ Lev 2/3 1.34**		
Montefiore-Wakefield					3/1506	2.0									Lev 2/3	1/365	2.7
Mount St. Marys					3/1533	2.0											
Mt Sinai	0/1087	0.0	2/5309	0.4	0/1562	0.0			1/1981	0.5	3/1312	2.3	2/2573	0.8	RPC	6/3947	1.7
Mt Sinai Beth Israel	1/433	2.3			0/223	0.0	1/1971	0.5									
Mt Sinai Brooklyn					2/275	7.3	3/1064	2.8									
Mt Sinai Queens							2/741	2.7									
Mt Sinai St Lukes	3/1264	2.4	0/1294	0.0	3/1949	1.5			2/319	6.3							
Mt Sinai West					2/587	3.4	1/1222	0.8			2/327	6.1			Lev 3	0/927	0.0
NY Community Hosp							1/811	1.2									
NYP-Allen							9/1585	^ 5.7									
NYP-Brklyn	0/956	0.0	0/1386	0.0			2/5011	0.4					0/80	0.0	Lev 3	0/926	0.0
NYP-Columbia	12/6505	1.8	9/8318	1.1	14/5298	2.6			9/3741	2.4	5/2392	2.1					
NYP-Hudson Valley							2/1208	1.7							Lev 2/3	NA	NA
NYP-Lawrence					0/1713	0.0											
NYP-Lower							3/2488	1.2									
NYP-Morgan Stanley													8/7394	1.1	RPC	6/8199	0.8
NYP-Queens	0/662	0.0	0/800	0.0	0/654	0.0	1/2663	0.4	0/64	0.0					Lev 3	0/398	0.0
NYP-Weill Cornell	11/4011	2.7	4/4993	0.8	12/4597	2.6			4/3604	1.1	6/1734	^ 3.5	2/1443	1.4	RPC	3/4685	0.7
NYU Langone					0/1087	0.0			5/758	^ 6.6	2/829	2.4			Lev 2/3	0/125	0.0
NYU Orthopedic Hosp									0/50	0.0							
NYU Tisch	3/2899	1.0			5/3990	1.3			5/6294	0.8	1/913	1.1	3/4527	0.7	RPC	1/2743	0.4
NYU Winthrop					3/2415	1.2			1/3173	0.3	1/519	1.9	0/341	0.0	RPC	0/1364	0.0
Nassau University	0/1075	0.0			0/1591	0.0			3/1098	2.7					Lev 3	3/309	^18.1
Nathan Littauer							1/333	3.0									
Newark Wayne					0/1306	0.0											
Niagara Falls							7/1700	^ 4.1									
North Central Bronx							3/1488	2.0									
North Shore	1/2419	0.4	2/5049	0.4	6/4678	1.3			0/1571	0.0	0/1231	0.0			RPC	0/1310	0.0
Northern Dutchess							1/371	2.7									
Northern Westchester							0/677	0.0							Lev 3	0/60	0.0
Noyes Memorial							0/550	0.0									
Oishei Childrens													1/1896	0.5	RPC	0/5143	* 0.0
Olean General							6/2491	2.4									

Table 16. Central line-associated bloodstream infection rates by intensive care unit type, New York State 2021

	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	**1.54**		**0.76**		**1.59**		**1.31**		**1.21**		**1.24**		**1.20**		**RPC 0.75/Lev 3 1.08/ Lev 2/3 1.34**		
Oneida Healthcare							0/370	0.0									
Oswego Hospital					0/423	0.0											
Our Lady of Lourdes							1/1013	1.0									
Peconic Bay Medical							0/1216	0.0									
Phelps Memorial							2/1332	1.5									
Plainview Hospital							3/1413	2.1									
Putnam Hospital							0/706	0.0									
Queens Hospital					0/2508	* 0.0									Lev 3	0/399	0.0
Richmond Univ MC	0/391	0.0			4/2761	1.4			4/1593	2.5			0/66	0.0	Lev 3	0/816	0.0
Rochester General	0/461	0.0	7/3579	^ 2.0	14/5215	2.7			3/2714	1.1							
Rome Memorial							1/616	1.6									
Roswell Park							3/2516	1.2									
SUNY Downstate	2/443	4.5			3/1026	2.9			0/110	0.0			0/123	0.0	RPC	1/636	1.4
Samaritan- Troy							2/3183	0.6									
Samaritan- Watertown							1/810	1.2									
Saratoga Hospital					2/1735	1.2											
Sisters of Charity							6/1580	^ 3.8							Lev 3	3/756	4.4
Sisters- St Joseph							2/799	2.5									
South Nassau Comm.							12/4678	^ 2.6									
South Shore UHosp			2/1187	1.7			1/2479	0.4									
St Anthony							0/179	0.0									
St Barnabas					0/1459	0.0			1/852	1.2					Lev 2/3	0/264	0.0
St Catherine Siena	0/794	0.0					0/773	0.0									
St Charles Hospital					4/878	4.6											
St Elizabeth Medical			0/1747	0.0			1/2741	0.4									
St Francis- Roslyn			4/4146	1.0	0/1725	0.0			0/2314	0.0							
St Johns Episcopal	0/556	0.0			1/715	1.4											
St Johns Riverside							6/1986	3.0									
St Joseph- Bethpage							1/2073	0.5									
St Josephs- Syracuse					5/4360	1.1			1/4554	0.2					Lev 2/3	0/263	0.0
St Josephs- Yonkers							0/749	0.0									
St Lukes Cornwall							0/4003	* 0.0									
St Marys Amsterdam							1/805	1.2									

Table 16. Central line-associated bloodstream infection rates by intensive care unit type, New York State 2021

	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	**1.54**		**0.76**		**1.59**		**1.31**		**1.21**		**1.24**		**1.20**		**RPC 0.75/Lev 3 1.08/ Lev 2/3 1.34**		
St Peters Hospital			2/2005	1.0	5/4099	1.2									Lev 3	1/437	2.1
Staten Island U N			0/1471	0.0	3/339	^ 8.8	2/5047	0.4	1/1396	0.7			0/127	0.0	Lev 3	0/258	0.0
Staten Island U S							1/1279	0.8									
Stony Brk Southamptn	0/77	0.0			4/724	5.5											
Stony Brook ELIH							NA	NA									
Strong Memorial			10/5478	^ 1.8	16/8997	1.8			16/5349	^ 3.0			9/4723	1.9	RPC	5/5550	1.0
Syosset Hospital							0/288	0.0									
UHS Binghamton							2/560	3.6									
UHS Chenango							0/144	0.0									
UHS Wilson			2/2595	0.8			7/2711	2.6							Lev 2/3	0/155	0.0
UPMC Chautauqua					2/1005	2.0											
United Memorial							0/1062	0.0									
Unity Hosp Rochester							2/5395	0.4									
Univ Hosp SUNY			0/3153	0.0	4/7762	* 0.5			1/2585	0.4	1/5268	* 0.2	1/760	1.3			
Univ Hosp	1/781	1.3	0/1715	0.0	7/1949	3.6			1/2258	0.4	1/539	1.9	0/602	0.0	RPC	0/3520	0.0
Upst. Community Gen							1/2075	0.5									
Vassar Brothers					0/315	0.0	4/4260	0.9							Lev 2/3	1/424	2.4
Westchester Medical	2/1230	1.6	2/3602	0.6	11/3176	^ 3.5			3/1403	2.1	1/2077	0.5	4/1169	3.4	RPC	3/5075	0.6
White Plains Hosp							1/1443	0.7							Lev 3	0/98	0.0
Woodhull Med Ctr							4/1418	2.8							Lev 2/3	1/178	5.6
Wyckoff Heights					2/2084	1.0									Lev 3	0/309	0.0
Wyoming County							1/121	8.3									

New York State data reported as of August 15, 2022. 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, observed or suspected patient injection into a vascular line, known or suspected Munchausen Syndrome by Proxy (MSP), epidermolysis bullosa (EB), pus at another vascular access device site matches an organism identified in the blood and Group B *Streptococcus* BSIs in infants during the first 6 days of life.

Table 17. Central line-associated bloodstream infection rates by ward type, New York State 2021

	Medical Wards		Medical Surgical Wards		Surgical Wards		Step Down Units		Pediatric Wards		Oncology Wards		Mixed Acuity Wards		Telemetry Wards	
Hospital	**CLABSI/ CLDays**	**Rate**	**CLABSI/ CLDays**	**Rate**	**CLABSI/ CLDays**	**Rate**	**CLABSI/ CLDays**	**Rate**	**CLABSI/ CLDays**	**Rate**	**CLABSI/ CLDays**	**Rate**	**CLABSI/ CLDays**	**Rate**	**CLABSI/ CLDays**	**Rate**
State average rate	**1.09**		**0.71**		**0.81**		**1.03**		**0.72**		**1.05**		**1.26**		**0.64**	
AO Fox Memorial	0/118	0.0	0/373	0.0	0/509	0.0										
Adirondack Medical			0/680	0.0												
Albany Med Ctr	9/15502	0.6	0/2061	0.0	3/6664	0.5	1/1365	0.7	0/2776	0.0						
Alice Hyde Med Ctr			0/227	0.0									NA	NA		
Arnot Ogden Med Ctr			1/1882	0.5												
Auburn Memorial			2/1290	1.6	1/874	1.1										
Bellevue Hospital	7/4998	1.4	1/1116	0.9	0/1231	0.0	0/498	0.0	0/310	0.0						
Blythedale Childrens									4/2104	1.9						
Bon Secours			0/285	0.0	NA	NA										
Bronx-Lebanon	1/2426	0.4	5/2197	^ 2.3			0/327	0.0	NA	NA					0/492	0.0
Brookdale Hospital	3/5262	0.6			0/1036	0.0	0/122	0.0	NA	NA						
Brooklyn Hosp Ctr	1/2582	0.4	0/665	0.0			1/1618	0.6	0/98	0.0					0/339	0.0
Brooks Memorial			1/586	1.7												
Buffalo General	15/13264	1.1	2/1448	1.4	3/1802	1.7	5/5524	0.9							1/3125	0.3
Canton-Potsdam			4/1449	^ 2.8												
Cayuga Medical Ctr			2/1487	1.3					NA	NA						
Champlain Valley			3/2528	1.2			1/1541	0.6								
Claxton-Hepburn			0/1583	0.0												
Clifton Springs	3/960	3.1														
Cohens Childrens									1/2076	0.5	2/5666	0.4				
Columbia Memorial	0/472	0.0	0/1717	0.0												
Coney Island Hosp	10/3964	^ 2.5	1/242	4.1	0/1000	0.0	1/264	3.8	NA	NA						
Corning Hospital	0/639	0.0			2/484	4.1										
Cortland Reg Med	0/308	0.0	1/396	2.5												
Crouse Hospital			4/8107	0.5												
East. Niag. Lockport			NA	NA												
Ellis Hospital	1/3598	0.3	NA	NA	0/644	0.0										
Elmhurst Hospital	0/2098	0.0	1/809	1.2	2/528	3.8			NA	NA			1/1185	0.8		
Erie County Med Ctr			7/9986	0.7			0/1594	0.0								
FF Thompson	2/1673	1.2	1/662	1.5												

Table 17. Central line-associated bloodstream infection rates by ward type, New York State 2021

	Medical Wards		Medical Surgical Wards		Surgical Wards		Step Down Units		Pediatric Wards		Oncology Wards		Mixed Acuity Wards		Telemetry Wards	
Hospital	**CLABSI/ CLDays**	**Rate**	**CLABSI/ CLDays**	**Rate**	**CLABSI/ CLDays**	**Rate**	**CLABSI/ CLDays**	**Rate**	**CLABSI/ CLDays**	**Rate**	**CLABSI/ CLDays**	**Rate**	**CLABSI/ CLDays**	**Rate**	**CLABSI/ CLDays**	**Rate**
State average rate	**1.09**		**0.71**		**0.81**		**1.03**		**0.72**		**1.05**		**1.26**		**0.64**	
Faxton St. Lukes			2/1820	1.1	3/1373	2.2	2/1792	1.1	0/116	0.0	1/1833	0.5			1/743	1.3
Flushing Hospital			2/2217	0.9					NA	NA						
Garnet Catskills			1/474	2.1	0/118	0.0										
Garnet Middletown	3/4265	0.7	0/849	0.0											1/1060	0.9
Geneva General	0/712	0.0	0/681	0.0			0/76	0.0								
Glen Cove Hospital			0/439	0.0	0/65	0.0										
Glens Falls Hospital	2/2141	0.9	NA	NA	1/706	1.4					2/1795	1.1				
Good Samar. Suffern			0/4150	0.0												
Good Samar. W Islip	1/2270	0.4	1/1273	0.8	0/468	0.0	NA	NA	0/80	0.0	0/1282	0.0			0/1293	0.0
Harlem Hospital	0/510	0.0			1/879	1.1			0/93	0.0						
HealthAlli Broadway	1/315	3.2	0/290	0.0	1/703	1.4										
Highland Hospital	5/3478	1.4	2/3766	0.5	3/2242	1.3							8/2815	2.8		
Hosp for Spec Surg			0/1582	0.0			0/160	0.0	NA	NA						
Huntington Hospital	1/679	1.5	0/1020	0.0	0/180	0.0			NA	NA	0/949	0.0			1/253	4.0
Interfaith Med Ctr			0/2352	0.0												
JT Mather Hospital			0/1823	0.0	0/588	0.0	0/1089	0.0								
Jacobi Med Ctr	2/2417	0.8	2/1763	1.1	0/514	0.0	0/161	0.0	0/75	0.0						
Jamaica Hospital			3/2903	1.0	0/679	0.0			NA	NA			1/805	1.2		
Jones Memorial			1/821	1.2												
Kenmore Mercy			1/2932	0.3	0/72	0.0										
Kings County Hosp	0/3271	* 0.0	4/4016	1.0	0/987	0.0			NA	NA						
Kingsbrook Jewish MC	2/1682	1.2														
LIJ at Forest Hills	2/1699	1.2	NA	NA	2/547	3.7									0/244	0.0
LIJ at Valley Stream			1/1331	0.8	NA	NA	NA	NA							1/243	4.1
Lenox Hill Hospital	2/2102	1.0	0/332	0.0	0/1481	0.0	0/753	0.0								
Lincoln Med Ctr	2/1009	2.0			1/1178	0.8	4/1722	2.3	NA	NA			NA	NA		
Long Isl Jewish(LIJ)	1/6649	* 0.2	1/1052	1.0	0/2109	0.0	NA	NA							2/2069	1.0
Long Isl. Community	3/2093	1.4	0/759	0.0									2/768	2.6		
Maimonides Med Ctr	24/5900	^ 4.1	0/638	0.0			2/725	2.8	0/520	0.0					2/1195	1.7

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	Medical Wards		Medical Surgical Wards		Surgical Wards		Step Down Units		Pediatric Wards		Oncology Wards		Mixed Acuity Wards		Telemetry Wards	
Hospital	**CLABSI/ CLDays**	**Rate**	**CLABSI/ CLDays**	**Rate**	**CLABSI/ CLDays**	**Rate**	**CLABSI/ CLDays**	**Rate**	**CLABSI/ CLDays**	**Rate**	**CLABSI/ CLDays**	**Rate**	**CLABSI/ CLDays**	**Rate**	**CLABSI/ CLDays**	**Rate**
State average rate	**1.09**		**0.71**		**0.81**		**1.03**		**0.72**		**1.05**		**1.26**		**0.64**	
Mary Imogene Bassett	0/1112	0.0	3/707	^ 4.2	0/2034	0.0	4/1752	2.3					NA	NA		
Massena Memorial			0/160	0.0												
Memor SloanKettering											**/81712	1.3				
Mercy Hosp Buffalo	0/355	0.0	3/4331	0.7	0/739	0.0	1/808	1.2								
Mercy Med Ctr	1/276	3.6	0/124	0.0	NA	NA	0/284	0.0			0/620	0.0			0/601	0.0
Metropolitan Hosp	0/1242	0.0			0/751	0.0			NA	NA						
MidHudson Reg of			1/1285	0.8			0/582	0.0	NA	NA						
Millard Fill. Suburb			2/8204	0.2												
Montefiore-Einstein	5/4613	1.1			2/2297	0.9					1/2344	0.4			3/2708	1.1
Montefiore-Moses	31/12059	^ 2.6	1/948	1.1	5/2977	1.7			2/4524	0.4	2/3800	0.5				
Montefiore-Mt Vernon			0/71	0.0			NA	NA								
Montefiore-NewRochl			0/743	0.0	1/636	1.6	2/775	2.6								
Montefiore-Nyack			2/1530	1.3			2/829	2.4	0/710	0.0						
Montefiore-Wakefield	4/3236	1.2	0/509	0.0											0/771	0.0
Mount St. Marys			0/1517	0.0												
Mt Sinai	7/4355	1.6	9/4745	^ 1.9	3/2647	1.1	5/2064	2.4	2/667	3.0	12/14748	0.8			0/482	0.0
Mt Sinai Beth Israel	0/1349	0.0	0/174	0.0	0/282	0.0	NA	NA					0/94	0.0	1/522	1.9
Mt Sinai Brooklyn	1/2250	0.4			0/600	0.0	0/152	0.0								
Mt Sinai Queens	2/1566	1.3	1/1205	0.8			1/372	2.7								
Mt Sinai St Lukes	5/2081	2.4	0/547	0.0	0/646	0.0										
Mt Sinai West	4/2494	1.6	2/1648	1.2	0/516	0.0										
NY Community Hosp			1/238	4.2			2/806	2.5								
NYP-Allen	2/2013	1.0	0/526	0.0												
NYP-Brklyn	1/2784	0.4	4/4610	0.9	1/973	1.0	0/229	0.0	0/366	0.0			NA	NA		
NYP-Columbia	30/11701	^ 2.6	7/7181	1.0	3/4727	0.6					3/10626	* 0.3				
NYP-Hudson Valley			1/1184	0.8									1/554	1.8		
NYP-Lawrence			5/2819	1.8					NA	NA						
NYP-Lower			1/1653	0.6												
NYP-Morgan Stanley									7/8930	0.8						
NYP-Queens	0/5535	* 0.0			1/1055	0.9	0/96	0.0								
NYP-Weill Cornell	19/9085	^ 2.1	1/3922	0.3	8/4163	^ 1.9	0/512	0.0	1/896	1.1	25/12247	^ 2.0				
NYU Langone Brklyn	3/3672	0.8			0/569	0.0	1/577	1.7	NA	NA						

Table 17. Central line-associated bloodstream infection rates by ward type, New York State 2021

	Medical Wards		Medical Surgical Wards		Surgical Wards		Step Down Units		Pediatric Wards		Oncology Wards		Mixed Acuity Wards		Telemetry Wards	
Hospital	**CLABSI/ CLDays**	**Rate**	**CLABSI/ CLDays**	**Rate**	**CLABSI/ CLDays**	**Rate**	**CLABSI/ CLDays**	**Rate**	**CLABSI/ CLDays**	**Rate**	**CLABSI/ CLDays**	**Rate**	**CLABSI/ CLDays**	**Rate**	**CLABSI/ CLDays**	**Rate**
State average rate	**1.09**		**0.71**		**0.81**		**1.03**		**0.72**		**1.05**		**1.26**		**0.64**	
NYU Orthopedic Hosp	NA	NA														
NYU Tisch	14/9715	1.4			6/7435	0.8			0/2207	0.0	2/4129	0.5				
NYU Winthrop	2/5697	0.4	0/578	0.0	3/2293	1.3			0/628	0.0						
Nassau University	4/2523	1.6	0/252	0.0	0/55	0.0			NA	NA						
Nathan Littauer			0/249	0.0												
Newark Wayne	0/1114	0.0													0/236	0.0
Niagara Falls					0/967	0.0	0/737	0.0								
North Central Bronx	0/515	0.0	0/152	0.0												
North Shore	2/6234	0.3	0/2160	0.0	2/4400	0.5	NA	NA			7/8977	0.8	NA	NA	0/1041	0.0
Northern Dutchess	0/72	0.0	0/963	0.0												
Northern Westchester	2/1447	1.4			0/578	0.0			NA	NA						
Noyes Memorial	0/475	0.0	NA	NA												
Oishei Childrens									0/1367	0.0	4/2032	2.0				
Olean General	0/2465	0.0			0/382	0.0										
Oneida Healthcare			0/678	0.0												
Oswego Hospital			0/508	0.0												
Our Lady of Lourdes	1/3258	0.3	0/473	0.0	1/1187	0.8										
Peconic Bay Medical			0/2147	0.0			0/346	0.0								
Phelps Memorial	0/1077	0.0	1/987	1.0									NA	NA		
Plainview Hospital	1/1011	1.0	0/434	0.0			NA	NA							0/836	0.0
Putnam Hospital			0/1071	0.0												
Queens Hospital	0/1909	0.0	0/1319	0.0	0/866	0.0	0/493	0.0								
Richmond Univ MC	8/2219	^ 3.6			0/332	0.0							2/437	4.6		
Rochester General	12/7637	1.6	24/10600	^ 2.3	8/5259	1.5	7/4034	1.7			8/5798	1.4	0/297	0.0	3/3658	0.8
Rome Memorial	0/79	0.0	1/450	2.2												
Roswell Park											33/27315	1.2				
SUNY Downstate MedCr	0/2117	0.0			1/611	1.6	0/423	0.0	0/76	0.0						
Samaritan- Troy			4/2327	1.7			1/1237	0.8								
Samaritan- Watertown	NA	NA	3/3192	0.9									NA	NA		

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Hospital	**CLABSI/ CLDays**	**Rate**	**CLABSI/ CLDays**	**Rate**	**CLABSI/ CLDays**	**Rate**	**CLABSI/ CLDays**	**Rate**	**CLABSI/ CLDays**	**Rate**	**CLABSI/ CLDays**	**Rate**	**CLABSI/ CLDays**	**Rate**	**CLABSI/ CLDays**	**Rate**
State average rate	**1.09**		**0.71**		**0.81**		**1.03**		**0.72**		**1.05**		**1.26**		**0.64**	
Saratoga Hospital	3/3683	0.8			0/106	0.0										
Sisters of Charity	0/1757	0.0	1/1532	0.7	0/904	0.0										
Sisters- St Joseph			0/154	0.0	NA	NA										
South Nassau Comm.			2/6445	0.3			8/4919	1.6	NA	NA						
South Shore UHosp	0/367	0.0	7/2901	^ 2.4			2/1610	1.2	NA	NA					NA	NA
St Anthony			0/258	0.0												
St Barnabas	0/110	0.0	1/2497	0.4	NA	NA	0/766	0.0								
St Catherine Siena	0/2131	0.0			0/282	0.0										
St Charles Hospital			0/825	0.0												
St Elizabeth Medical			0/1943	0.0			1/1846	0.5								
St Francis- Roslyn			6/6282	1.0			0/1243	0.0								
St Johns Episcopal			4/2084	1.9					NA	NA						
St Johns Riverside	0/1392	0.0	0/773	0.0											0/601	0.0
St Joseph- Bethpage			1/569	1.8			0/311	0.0					0/71	0.0	0/488	0.0
St Josephs- Syracuse	0/394	0.0	2/10688	* 0.2							1/1299	0.8			0/1786	0.0
St Josephs- Yonkers			0/822	0.0			NA	NA								
St Lukes Cornwall			1/3850	0.3									NA	NA		
St Marys Amsterdam			0/447	0.0	0/246	0.0	NA	NA								
St Peters Hospital	4/8204	0.5	0/3811	0.0			0/2631	0.0			0/1077	0.0	1/2926	0.3		
Staten Island U N			3/2838	1.1	0/652	0.0	NA	NA	0/230	0.0					1/504	2.0
Staten Island U S			1/429	2.3												
Stony Brk Southamptn			2/1273	1.6												
Stony Brook ELIH			0/64	0.0												
Strong Memorial	19/14799	1.3			7/4720	1.5	1/625	1.6	5/4035	1.2	12/15487	0.8				
Sunnyview Rehab Hosp			0/114	0.0												
Syosset Hospital	0/197	0.0	NA	NA	NA	NA										
UHS Binghamton			0/1316	0.0												
UHS Chenango Memor			0/138	0.0												
UHS Wilson	NA	NA	1/1768	0.6			2/1196	1.7			0/2002	0.0	0/345	0.0	1/1993	0.5

Table 17. Central line-associated bloodstream infection rates by ward type, New York State 2021

	Medical Wards		Medical Surgical Wards		Surgical Wards		Step Down Units		Pediatric Wards		Oncology Wards		Mixed Acuity Wards		Telemetry Wards	
Hospital	**CLABSI/ CLDays**	**Rate**	**CLABSI/ CLDays**	**Rate**	**CLABSI/ CLDays**	**Rate**	**CLABSI/ CLDays**	**Rate**	**CLABSI/ CLDays**	**Rate**	**CLABSI/ CLDays**	**Rate**	**CLABSI/ CLDays**	**Rate**	**CLABSI/ CLDays**	**Rate**
State average rate	**1.09**		**0.71**		**0.81**		**1.03**		**0.72**		**1.05**		**1.26**		**0.64**	
UPMC Chautauqua WCA	0/1506	0.0	0/1331	0.0									0/202	0.0		
United Memorial	0/642	0.0			0/365	0.0										
Unity Hosp Rochester			2/17974	* 0.1												
Univ Hosp SUNY Upst	1/8024	* 0.1	0/5771	* 0.0			0/2184	0.0	1/893	1.1	10/9036	1.1				
Univ Hosp StonyBrook	5/4595	1.1			0/6355	* 0.0	0/232	0.0	0/567	0.0	2/5089	0.4	1/1255	0.8		
Upst. Community Gen	0/1919	0.0	0/1319	0.0												
Vassar Brothers			5/5704	0.9			NA	NA					3/3909	0.8		
Westchester Medical	0/1867	0.0	7/7980	0.9	0/521	0.0	3/4084	0.7	4/2787	1.4	7/7372	0.9				
White Plains Hosp			2/3371	0.6			1/1848	0.5								
Woodhull Med Ctr			0/2160	0.0	1/294	3.4	2/482	4.1	NA	NA						
Wyckoff Heights			4/2960	1.4			0/400	0.0	NA	NA					0/799	0.0

New York State data reported as of August 15, 2022. — 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, observed or suspected patient injection into a vascular line, known or suspected Munchausen Syndrome by Proxy (MSP), epidermolysis bullosa (EB), pus at another vascular access device site matches an organism identified in the blood and Group B *Streptococcus* BSIs in infants during the first 6 days of life.

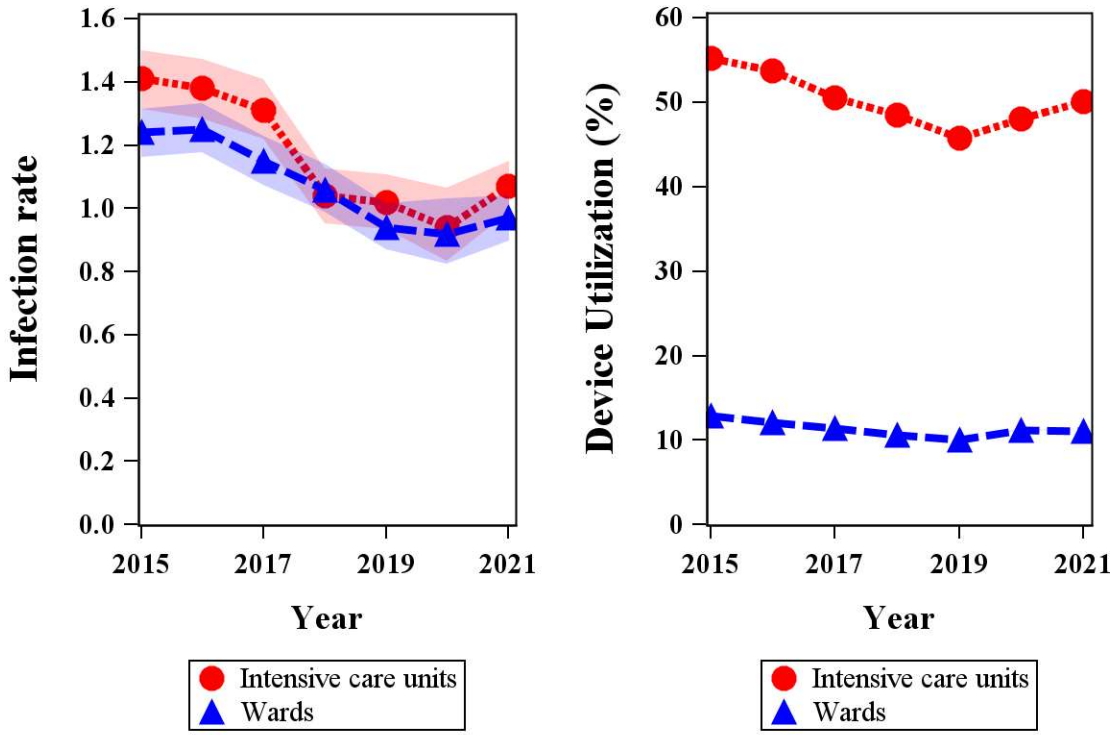
Catheter associated urinary tract infections (CAUTIs)

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 Data Use Agreement (DUA). This DUA prohibits NYSDOH from publishing hospital specific rates. NYSDOH does not audit this data.

Between 2015 and 2021, the CAUTI rate declined 23%, from 1.30 infections per 1,000 catheter days in 2015, to 1.01 infections per 1,000 catheter days in 2021. The decline was slightly greater in ICUs (24%) than in wards (22%). Catheter utilization decreased from 55% to 50% in ICUs, and from 13% to 11% in wards (Figure 13). Between 2019 and 2021 CAUTI rates and device utilization increased slightly both in ICUs and wards.

Figure 13. Catheter associated urinary tract infection and device utilization rates, New York State 2015-2021



Year	Location	# Hospitals	# CAUTIs	# Urinary catheter days	CAUTI rate[1]	# Patient days	Device utilization rate[2]
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
2020	Intensive Care Unit	155	263	278,647	0.94	579,465	48.1
2021	Intensive Care Unit	154	675	632,372	1.07	1,262,015	50.1
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
2020	Medical and Surgical Ward	159	317	343,187	0.92	3,055,956	11.2
2021	Medical and Surgical Ward	161	725	749,647	0.97	6,766,240	11.1
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
2020	TOTAL	163	580	621,834	0.93	3,635,421	17.1
2021	TOTAL	164	1400	1,382,019	1.01	8,028,255	17.2

[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 August 15, 2022.

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 2021

Microorganism	Number of Isolates	Percent of Infections
Escherichia coli	432	31.8
- CRE-*E. coli*	(2)	(0.1)
Klebsiella spp.	273	20.1
- CRE-Klebsiella	(15)	(1.1)
Enterococci	263	19.3
- VRE	(85)	(6.3)
Pseudomonas spp.	237	17.4
Proteus spp.	67	4.9
Enterobacter spp.	52	3.8
- CRE-Enterobacter	(4)	(0.3)
Coagulase negative staphylococci	37	2.7
Citrobacter spp.	25	1.8
Serratia spp.	25	1.8
Staphylococcus aureus	22	1.6
- *Staphylococcus aureus*-MRSA	(9)	(0.7)
Acinetobacter spp.	8	0.6
- MDRO-Acinetobacter	(5)	(0.4)
Other	44	3.2

New York State data reported as of August 15, 2022. Out of 1,360 infections.
CRE: carbapenem-resistant Enterobacterales.
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 (CDIs) and carbapenem-resistant Enterobacterales (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 CMS certification numbers. The NHSN reporting areas are:

- Outpatient departments/units (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 do not 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.

Clostridioides difficile Infections (CDI)

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

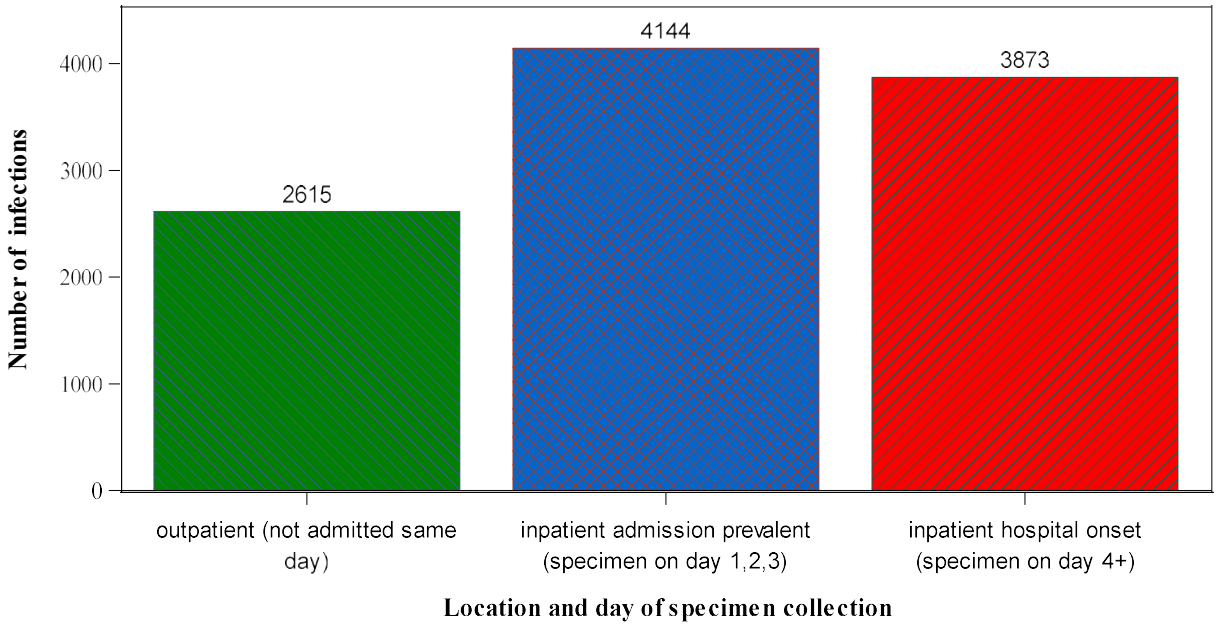
- Cases termed "outpatient" are cases where the positive stool sample was obtained in the emergency department (ED) or observation unit (OBS).
- Cases termed "admission prevalent" are cases where the positive stool sample was obtained during the first three days of the patient's inpatient stay.
- Cases termed "community onset - possibly my hospital (CO-PMH)" are admission prevalent cases Where 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 where the patient was not discharged from the same hospital within the previous 4 weeks.
- Cases termed "hospital-onset (HO)" are cases where the positive stool sample was obtained on day 4 or later of 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 starting with 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 prevalence rate) were not recalculated.

CDI cases are also classified based on whether the patient recently had another positive CDI test. Cases occurring more than 8 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 2 weeks and less than or equal to 8 weeks after a previous positive test are considered "recurrent". Cases occurring less than or equal to 2 weeks after a previous positive are considered duplicates. In 2021, 10,632 CDI events were reported by acute care hospitals: 25% were identified in ED/OBS units (outpatient), 39% were identified in the facility wide inpatient (FWI) areas during the first 3 days of hospitalization, and 36% were identified in the FWI areas after the first 3 days of inpatient stay (Figure 14).

Figure 14. *Clostridioides difficile* onset, New York State, 2021



Data reported as of August 15, 2022. Includes recurrent cases. Excludes inpatient rehabilitation and inpatient psychiatric facilities.

Laboratory testing for CDI

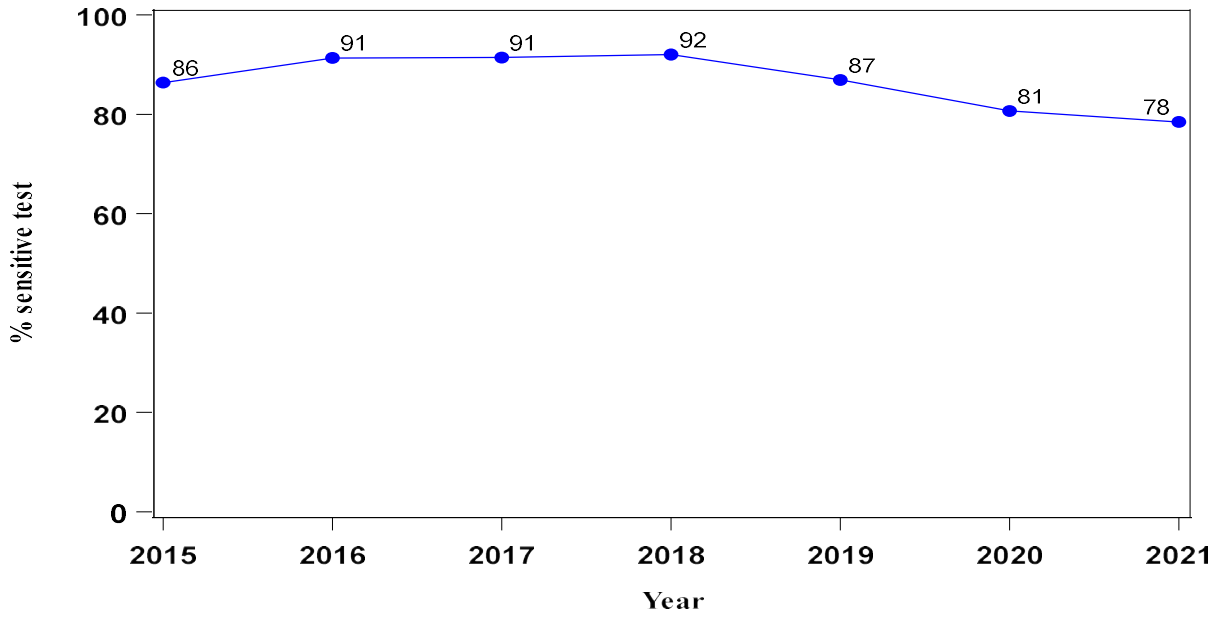
Several CDI laboratory testing methods are available. The methods vary in sensitivity (ability to detect a true positive), specificity (ability to detect a true negative), timeliness, and cost. Testing methods may have an impact on observed CDI rates, with an increased number of cases detected with a change to a more sensitive test method such as nucleic acid amplification tests (NAAT). Table 19 summarizes the testing methods reported by hospitals in December 2021.

Table 19. *C. difficile* test method, New York State hospitals, December 2021

Test method	More or less sensitive	Number (%) of hospitals
Enzyme immunoassay (EIA) for toxin	less	8 (5%)
Glutamate dehydrogenase (GDH) antigen plus EIA for toxin (2-step algorithm)	less	11 (7%)
Nucleic acid amplification tests (NAAT) plus EIA, if NAAT-positive (2-step algorithm)	less	25 (15%)
GDH plus EIA for toxin, followed by NAAT for discrepant results	more	46 (28%)
GDH plus NAAT (2-step algorithm)	more	1 (0.5%)
NAAT	more	73 (44%)
Other (e.g. toxigenic culture)	less	1 (0.5%)

The percentage of patient days surveilled using more sensitive tests decreased by 9% between 2019 and 2021 (Figure 15).

Figure 15. Percent of patient days using sensitive laboratory test method for *C. difficile*, New York State 2015-2021

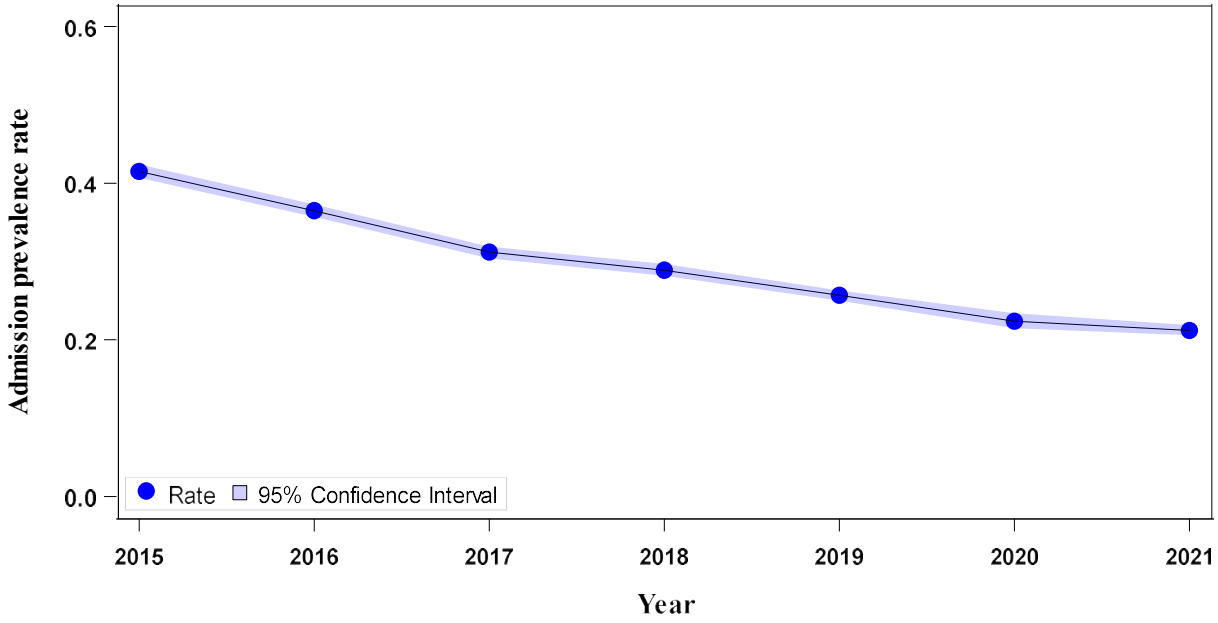


Data reported as of August 15, 2022.

Admission prevalence

The admission prevalence rate describes the percentage of patients admitted to hospitals with CDIs. In 2021, there were 4,157 of these cases out of 1,960,606 admissions, for a rate of 0.21% (Figure 16). This was a decrease of 49% compared to 2015.

Figure 16. Trend in *C. difficile* admission prevalence rate, New York State 2015-2021



Year	# Hospitals	# Admission prevalent infections	# admissions	Admission prevalence rate	% Discharged from same hospital in previous 28 Days
2015	175	8,746	2,106,161	0.42	26%
2016	178	7,698	2,111,418	0.36	24%
2017	177	6,756	2,167,024	0.31	25%
2018	175	6,237	2,157,554	0.29	26%
2019	167	5,476	2,133,298	0.26	24%
2020	165	2,139	952,832	0.22	25%
2021	165	4,157	1,960,606	0.21	24%

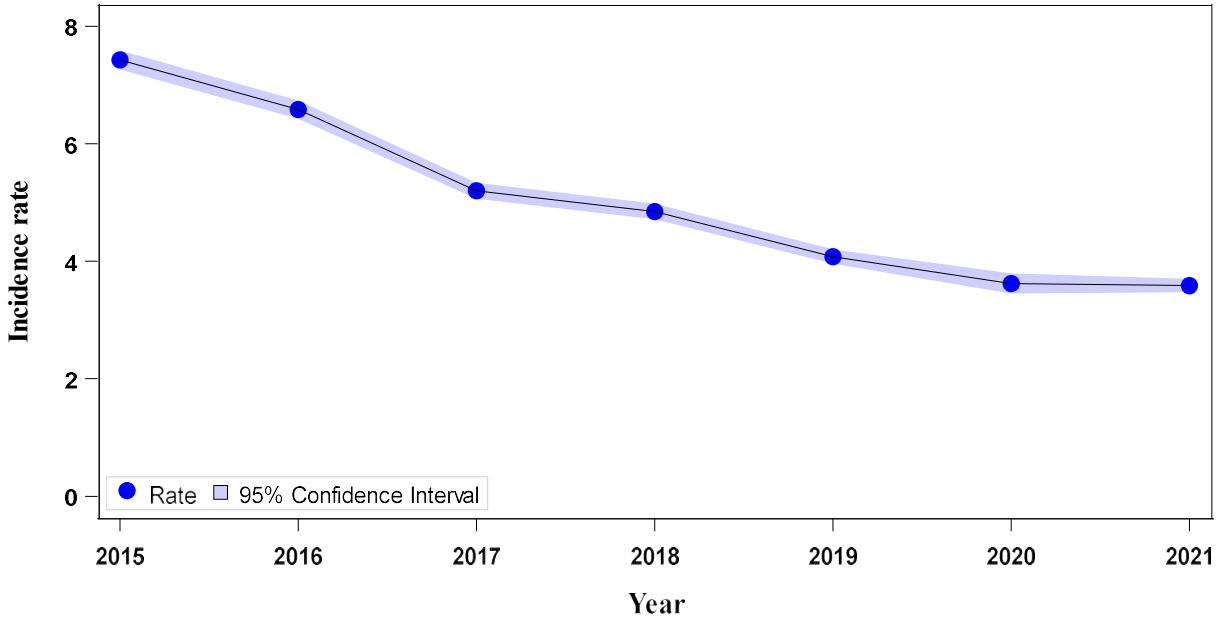
Data reported as of August 15, 2022. Excludes cases identified in the emergency room, inpatient rehabilitation facilities, and inpatient psychiatric facilities. Rate is number of nonduplicate CDI events per patient per month identified ≤3 days after admission to the facility per 100 admissions.

Hospital onset CDI rates

The longer a person stays in the hospital, the higher the cumulative risk of acquiring an infection in the hospital becomes, 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 3 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 3.59 per 10,000 patient-days in 2021 (Figure 17), a decrease of 51% compared to 2015.

Figure 17. Trend in *C. difficile* hospital onset rates, New York State 2015-2021



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
2020	165	1,708	4,717,353	3.62
2021	165	3,708	10,342,872	3.59

Data reported as of August 15, 2022. 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 1.7. (The CO-NMH rate ranged from 0 to 0.9 case per 100 admissions.)

- Hospital bed size, as reported in the 2021 NHSN survey – The HO rate at hospitals with 100 to 424 beds was 1.2 times higher than the rate at hospitals with fewer than 100 beds, and the HO rate at hospitals with more than 424 beds was 1.5 times higher than the rate at hospitals with fewer than 100 beds.

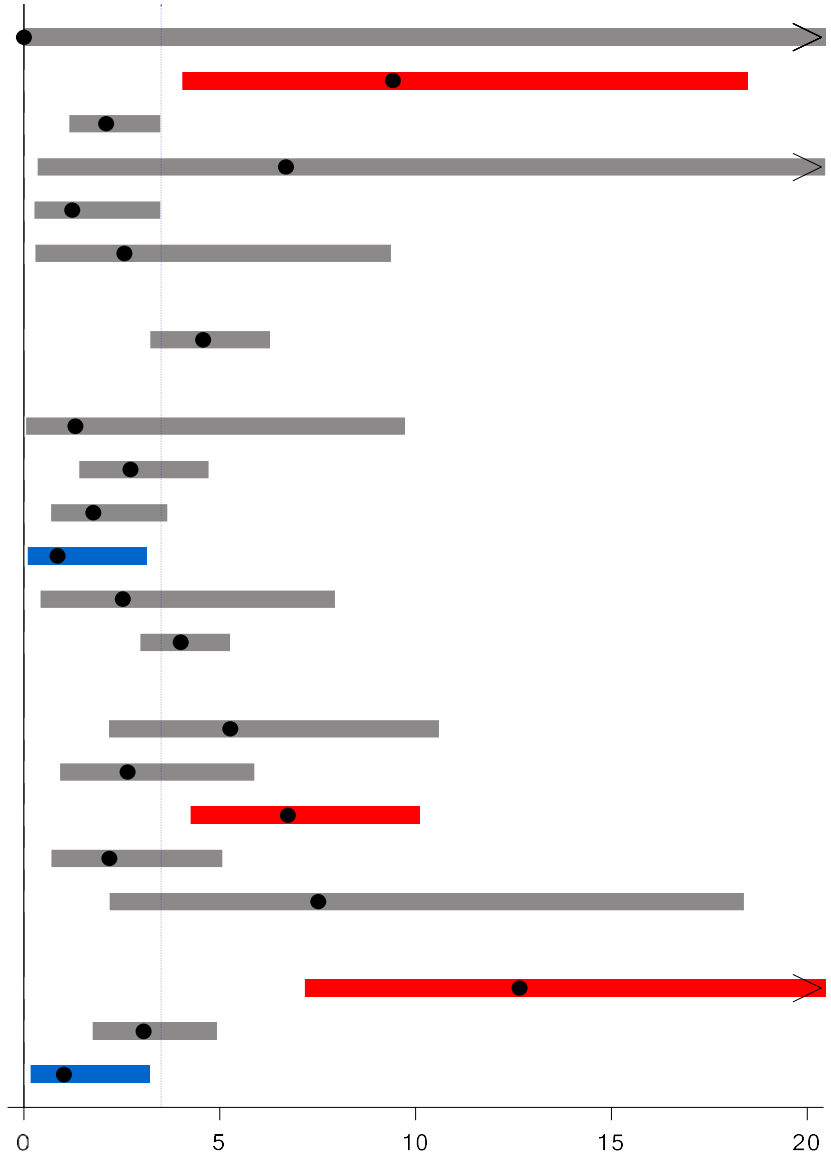
- Percent of patient days in adult ICUs – This was calculated by dividing the number of adult ICU patient days (from the CLABSI summary data) by the number of CDI patient days (from the MDRO summary data). As percent ICU days increased 10%, the HO rate increased by a factor of 1.4.

Hospital specific FWI HO CDI rates are summarized in Figure 18. 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 153 hospitals contributed 3,384 HO CDIs among 9,790,151 patient days, for an average HO rate of 3.46 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 2021, 14 out of 153 hospitals (9%) were flagged with adjusted rates significantly higher than the state average; These hospitals are required to 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.

Figure 18. Hospital onset facility-wide inpatient *C. difficile* rates, New York State 2021 (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	N	0	0	0	0	6,991	0.0	0.0	0.0
Adirondack Medical^	S	11	9	1	13	7,588	0.5	17.1	9.4
Albany Med Ctr	N	14	24	7	24	187,372	0.1	1.3	2.1
Alice Hyde Med Ctr	N	5	5	0	2	6,985	0.2	2.9	6.7
Arnot Ogden Med Ctr	S	5	14	3	5	37,620	0.2	1.3	1.2
Auburn Memorial	N	6	8	1	3	19,275	0.2	1.6	2.6
Bellevue Ellis	N	NA	0	NA	NA	4,427	0.0	NA	NA
Bellevue Hospital	S	33	17	6	63	120,300	0.1	5.2	4.6
Blythedale Childrens	S	NA	0	NA	NA	29,320	0.0	NA	NA
Bon Secours	S	4	3	1	1	8,180	0.1	1.2	1.3
Bronx-Lebanon	S	3	10	6	20	117,991	0.0	1.7	2.7
Brookdale Hospital	N	3	3	0	11	83,207	0.1	1.3	1.8
Brooklyn Hosp Ctr*	S	14	6	2	3	59,038	0.1	0.5	0.9
Brooks Memorial	S	4	9	1	4	9,363	0.4	4.3	2.5
Buffalo General	S	33	38	13	85	146,477	0.2	5.8	4.0
Calvary Hospital	N	NA	4	NA	NA	76,655	0.1	NA	NA
Canton-Potsdam	S	35	15	4	12	18,896	0.4	6.4	5.3
Cayuga Medical Ctr	S	11	16	3	9	30,712	0.3	2.9	2.6
Champlain Valley^	S	35	20	5	38	56,524	0.3	6.7	6.7
Claxton-Hepburn	S	22	13	2	8	10,583	0.6	7.6	2.2
Clifton Springs	S	4	3	0	7	14,461	0.1	4.8	7.5
Cohens Childrens	S	NA	41	NA	NA	40,972	0.4	NA	NA
Columbia Memorial^	S	35	6	2	26	20,549	0.2	12.7	12.7
Coney Island Hosp	S	24	23	2	27	75,208	0.2	3.6	3.1
Corning Hospital*	S	15	31	2	4	18,503	0.6	2.2	1.0



Data reported as of August 15, 2022. ┆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 18. Hospital onset facility-wide inpatient *C. difficile* rates, New York State 2021 (Page 2 of 7)

HOSPITAL	TEST METH	# OP	# CO-NMH	# CO-PMH	# HO	# PATDAYS	CO-NMH RATE	RAW HO RATE	ADJ HO RATE
Cortland Reg Med	S	19	18	4	8	14,319	0.5	5.6	3.3
Crouse Hospital	S	21	11	6	16	88,922	0.1	1.8	2.7
East. Niag. Lockport	N	0	1	0	0	9,020	0.1	0.0	0.0
Ellis Hospital	N	22	16	6	12	67,748	0.1	1.8	2.7
Elmhurst Hospital	S	13	4	0	18	86,504	0.0	2.1	2.7
Erie County Med Ctr	S	21	19	5	55	101,103	0.2	5.4	4.5
FF Thompson	S	33	16	4	7	30,705	0.2	2.3	2.7
Faxton St. Lukes^	N	14	41	11	37	57,489	0.4	6.4	6.3
Flushing Hospital	N	0	18	3	14	54,164	0.1	2.6	4.9
Garnet Catskills	S	17	15	5	8	17,733	0.4	4.5	2.3
Garnet Middletown^	S	0	46	8	63	98,511	0.2	6.4	6.0
Geneva General	S	38	14	1	7	15,082	0.5	4.6	2.3
Glen Cove Hospital*	S	2	19	0	3	16,641	0.6	1.8	0.7
Glens Falls Hospital	N	22	12	3	8	52,696	0.1	1.5	3.0
Good Samar. Suffern	S	6	9	2	11	53,909	0.1	2.0	2.7
Good Samar. Wlslip	S	36	20	6	30	104,766	0.1	2.9	2.8
Harlem Hospital	S	2	6	2	6	49,638	0.1	1.2	1.9
HealthAlli Broadway	N	9	13	1	4	28,909	0.2	1.4	2.2
Henry J. Carter	S	NA	0	NA	NA	47,776	0.0	NA	NA
Highland Hospital	S	58	37	3	36	92,899	0.2	3.9	5.2
Hosp for Spec Surg	S	NA	0	NA	NA	41,613	0.0	NA	NA
Huntington Hospital	S	42	36	17	26	76,585	0.2	3.4	3.6
Interfaith Med Ctr	N	0	0	0	1	30,839	0.0	0.3	0.8
JT Mather Hospital	N	17	29	11	5	43,648	0.3	1.1	1.3
Jacobi Med Ctr	N	6	10	3	15	87,108	0.1	1.7	3.6

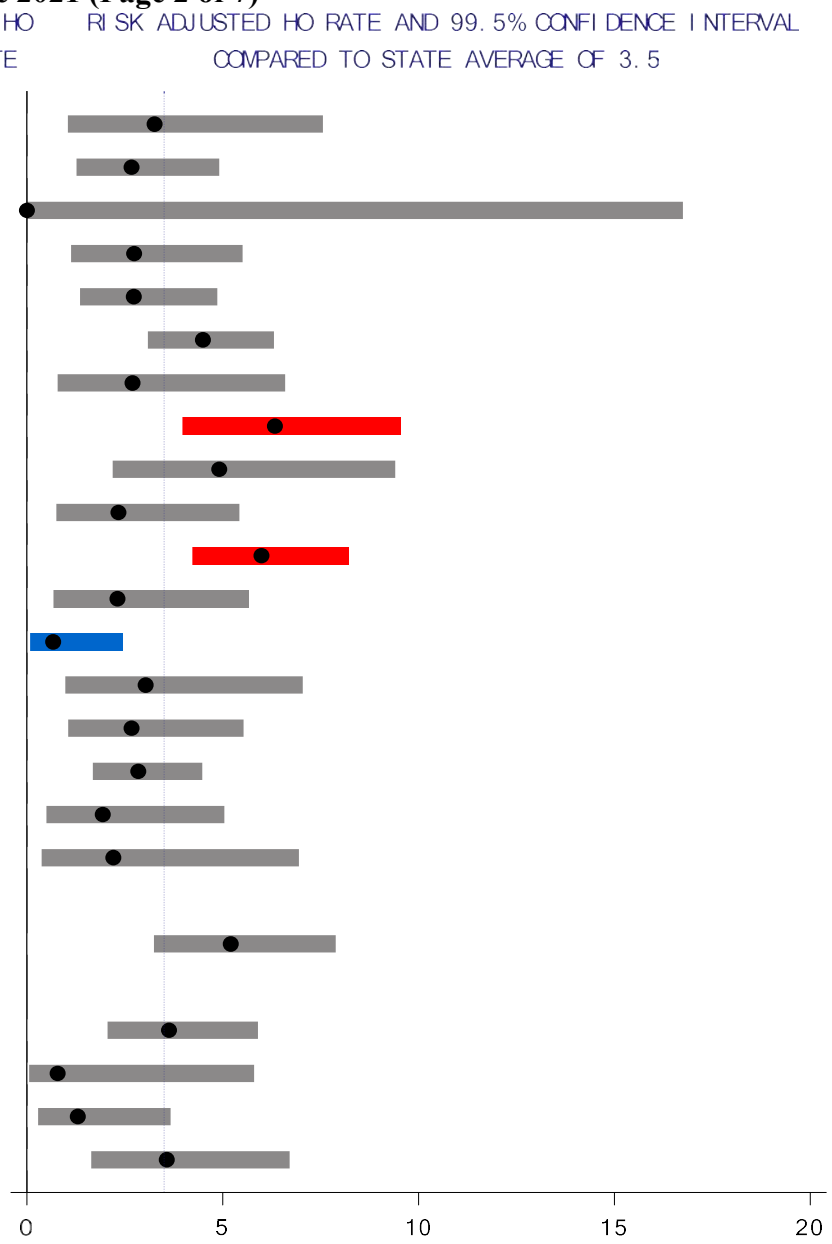


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Figure 18. Hospital onset facility-wide inpatient *C. difficile* rates, New York State 2021 (Page 3 of 7)

HOSPITAL	TEST METH	# OP	# CO-NMH	# CO-PMH	# HO	# PATDAYS	CO-NMH RATE	RAW HO RATE	ADJ HO RATE
Jamaica Hospital	S	4	14	3	29	75,020	0.1	3.9	4.5
Jones Memorial	S	3	6	1	1	7,104	0.3	1.4	1.0
Kenmore Mercy	S	29	14	11	12	32,973	0.3	3.6	3.3
Kings County Hosp	S	9	15	4	29	101,565	0.1	2.9	3.1
Kingsbrook Jewish MC	S	0	0	0	4	16,895	0.0	2.4	3.6
LIJ at Forest Hills	S	6	23	4	14	62,328	0.2	2.2	2.8
LIJ at Valley Stream	S	6	11	2	9	47,128	0.1	1.9	2.7
Lenox Hill Hospital	S	18	39	9	30	111,130	0.1	2.7	2.3
Lincoln Med Ctr	S	2	10	1	19	75,412	0.1	2.5	3.3
Long Isl Jewish(LIJ)	S	16	55	10	63	212,504	0.1	3.0	2.9
Long Isl. Community	S	39	33	9	26	52,267	0.4	5.0	2.5
Maimonides Med Ctr^	N	18	47	13	66	167,067	0.1	4.0	5.7
Mary Imogene Bassett	N	6	12	5	9	47,069	0.1	1.9	3.7
Massena Memorial	N	2	6	2	1	4,149	0.5	2.4	2.6
Memor SloanKettering	S	NA	114	NA	NA	163,617	0.5	NA	NA
Mercy Hosp Buffalo	S	33	24	10	31	94,314	0.1	3.3	3.9
Mercy Med Ctr	S	17	15	7	7	41,276	0.2	1.7	2.0
Metropolitan Hosp	S	0	5	6	6	28,635	0.1	2.1	3.0
MidHudson Reg of WMC	S	4	8	2	6	27,134	0.1	2.2	2.6
Millard Fill. Suburb	S	57	47	11	33	71,793	0.3	4.6	3.7
Montefiore-Einstein	S	22	31	15	58	129,642	0.1	4.5	4.5
Montefiore-Moses^	S	52	57	39	137	238,781	0.2	5.7	5.7
Montefiore-Mt Vernon	S	1	3	0	0	5,011	0.2	0.0	0.0
Montefiore-NewRochl	S	10	12	0	15	28,170	0.2	5.3	5.6
Montefiore-Nyack	S	13	13	4	14	67,908	0.1	2.1	2.9

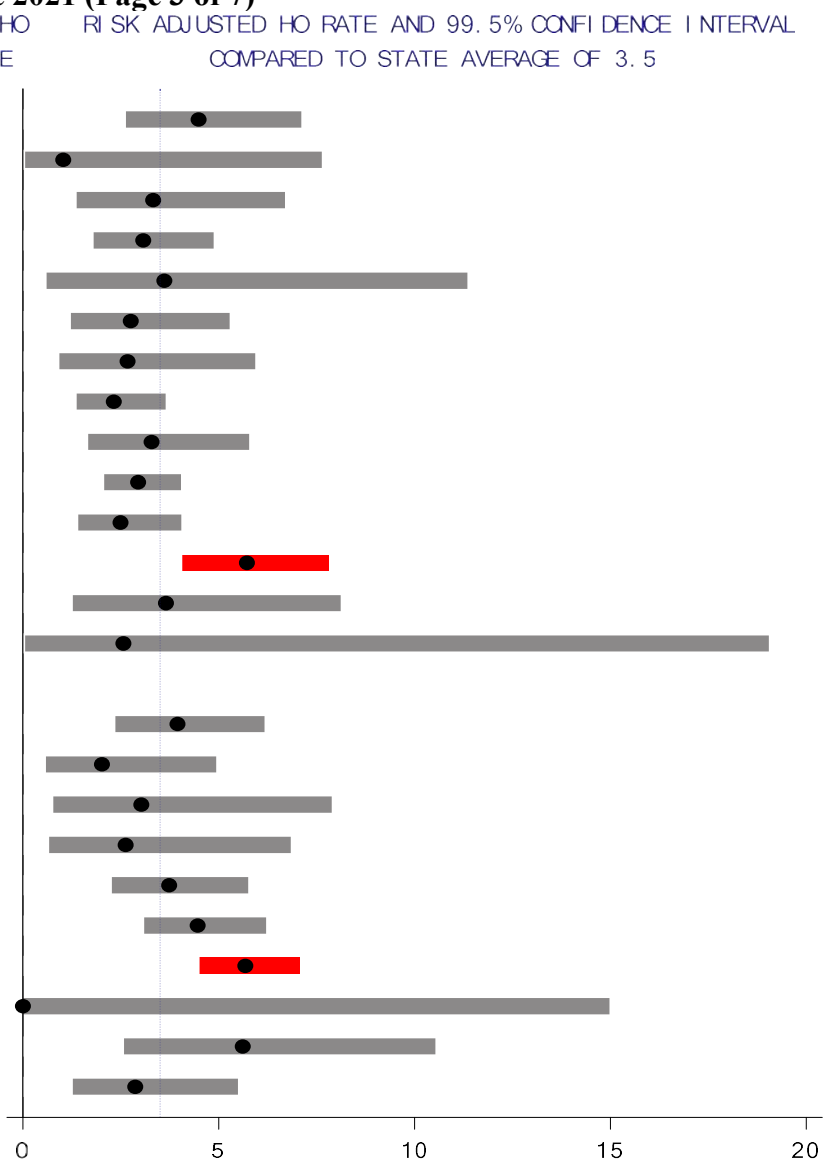

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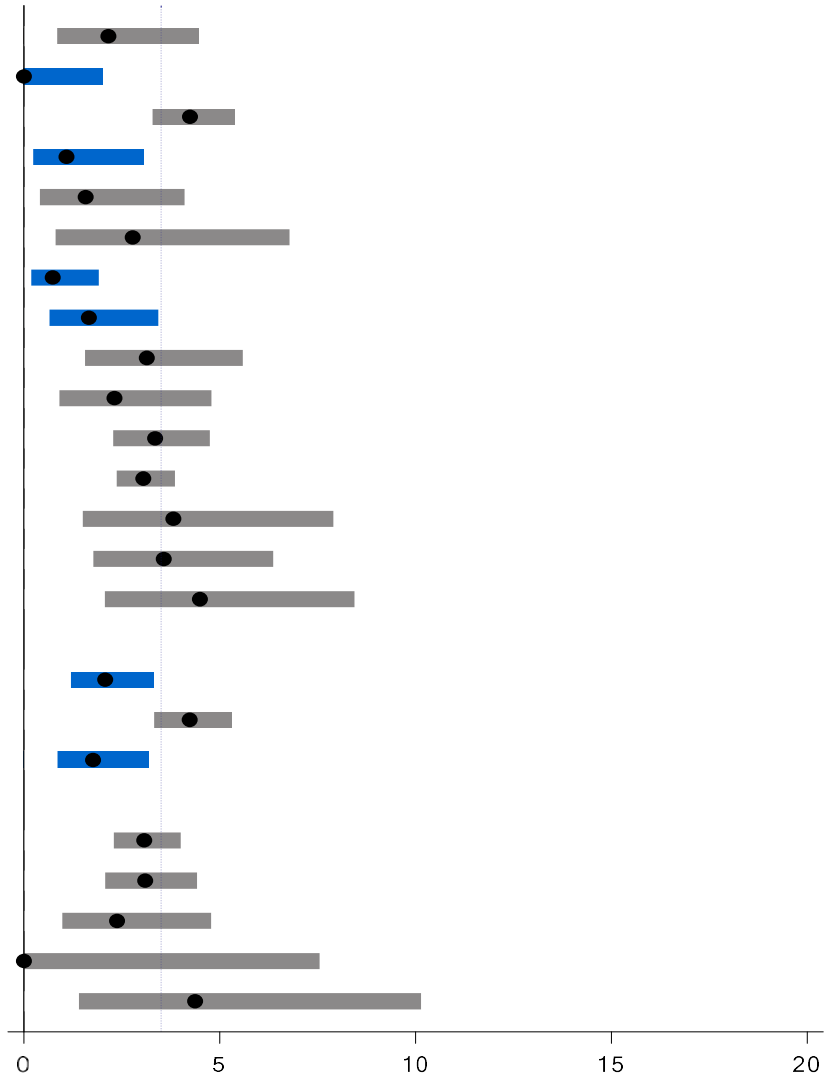
Figure 18. Hospital onset facility-wide inpatient *C. difficile* rates, New York State 2021 (Page 4 of 7)

HOSPITAL	TEST METH	# OP	# CO-NMH	# CO-PMH	# HO	# PATDAYS	CO-NMH RATE	RAW HO RATE	ADJ HO RATE
Montefiore-Wakefield	S	8	20	3	11	70,341	0.1	1.6	2.2
Mount St. Marys*	S	3	5	1	0	32,327	0.1	0.0	0.0
Mt Sinai	S	50	49	17	114	283,136	0.1	4.0	4.2
Mt Sinai Beth Israel*	S	15	10	2	5	60,337	0.1	0.8	1.1
Mt Sinai Brooklyn	S	14	6	0	6	57,727	0.1	1.0	1.6
Mt Sinai Queens	S	14	3	1	7	47,602	0.0	1.5	2.8
Mt Sinai St Lukes*	S	8	5	1	6	85,983	0.0	0.7	0.7
Mt Sinai West*	S	7	4	3	11	87,921	0.0	1.3	1.7
NY Community Hosp	S	0	27	2	18	36,612	0.4	4.9	3.1
NYP-Allen	S	7	28	2	11	47,706	0.3	2.3	2.3
NYP-Brklyn Methodist	S	21	41	5	52	142,646	0.2	3.6	3.3
NYP-Columbia	S	66	69	26	116	217,578	0.2	5.3	3.0
NYP-Hudson Valley	S	32	16	4	11	30,926	0.2	3.6	3.8
NYP-Lawrence	S	12	19	4	18	56,531	0.2	3.2	3.6
NYP-Lower Manhattan	S	13	14	1	15	34,477	0.2	4.4	4.5
NYP-Morgan Stanley	S	NA	4	NA	NA	59,377	0.0	NA	NA
NYP-Queens*	S	62	30	5	28	151,676	0.1	1.8	2.1
NYP-Weill Cornell	S	103	64	25	126	222,602	0.2	5.7	4.2
NYU Langone Brooklyn*	S	33	37	7	17	91,718	0.2	1.9	1.8
NYU Orthopedic Hosp	S	NA	0	NA	NA	11,864	0.0	NA	NA
NYU Tisch	S	102	66	27	90	186,296	0.2	4.8	3.1
NYU Winthrop	S	94	56	16	49	140,317	0.2	3.5	3.1
Nassau University	N	2	16	3	12	66,140	0.1	1.8	2.4
Nathan Littauer	N	2	4	1	0	8,144	0.2	0.0	0.0
Newark Wayne	S	6	10	2	8	20,910	0.1	3.8	4.4



Data reported as of August 15, 2022. ┆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.

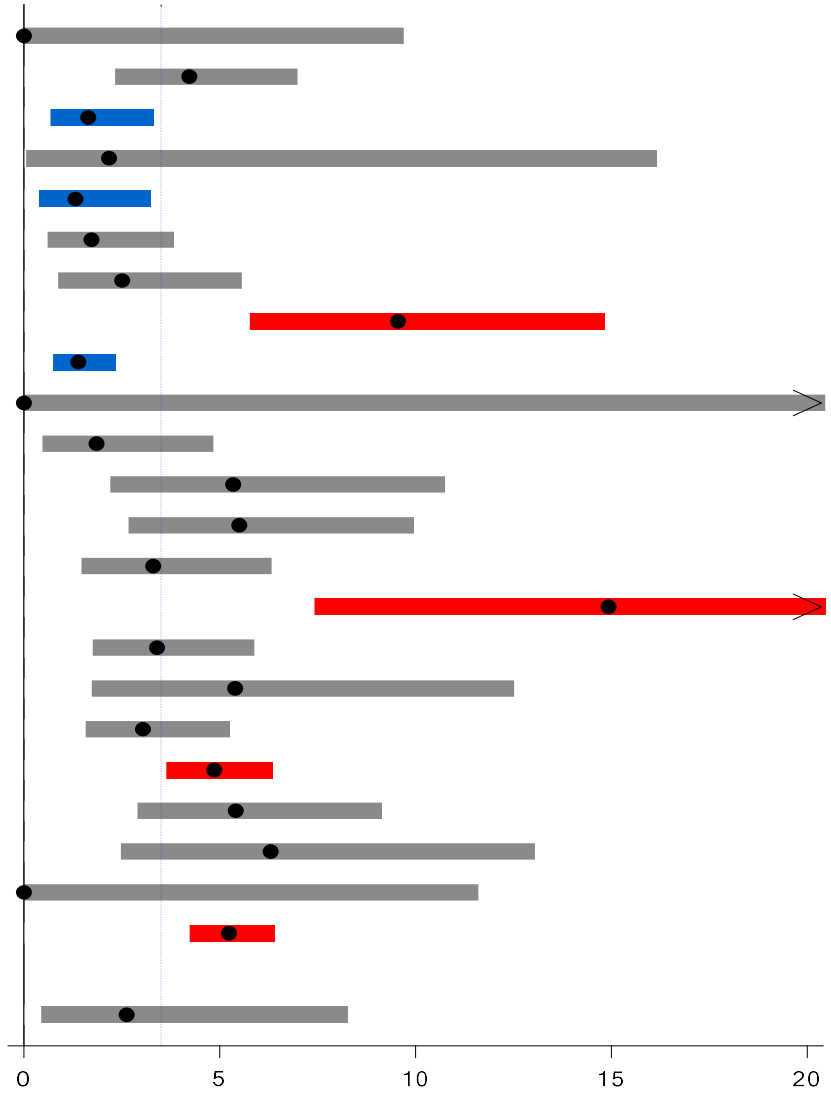
Figure 18. Hospital onset facility-wide inpatient *C. difficile* rates, New York State 2021 (Page 5 of 7)

HOSPITAL	TEST METH	# OP	# CO-NMH	# CO-PMH	# HO	# PATDAYS	CO-NMH RATE	RAW HO RATE	ADJ HO RATE
Niagara Falls	S	3	5	1	5	25,069	0.1	2.0	2.4
North Central Bronx	N	2	5	3	4	27,888	0.1	1.4	1.8
North Shore*	S	1	86	0	77	262,552	0.2	2.9	2.5
Northern Dutchess	N	3	16	3	3	17,883	0.4	1.7	1.9
Northern Westchester	S	17	13	6	3	29,038	0.2	1.0	1.1
Noyes Memorial	S	3	10	1	2	11,234	0.4	1.8	1.3
Oishei Childrens	N	NA	1	NA	NA	31,968	0.0	NA	NA
Olean General	S	3	28	4	31	30,639	0.5	10.1	5.1
Oneida Healthcare	S	11	15	9	7	10,250	0.6	6.8	3.0
Oswego Hospital	S	0	9	4	5	13,875	0.3	3.6	3.0
Our Lady of Lourdes	S	31	28	6	29	48,389	0.3	6.0	5.8
Peconic Bay Medical	S	20	34	10	24	42,600	0.4	5.6	4.1
Phelps Memorial	S	9	16	5	8	32,458	0.3	2.5	2.4
Plainview Hospital	S	2	32	5	17	41,759	0.4	4.1	2.5
Putnam Hospital	N	5	9	2	5	15,608	0.2	3.2	4.3
Queens Hospital	S	3	13	3	19	50,014	0.1	3.8	5.0
Richmond Univ MC	S	6	10	4	18	46,653	0.1	3.9	4.3
Rochester General^	S	58	36	13	93	173,441	0.1	5.4	6.2
Rome Memorial	S	9	4	0	7	24,774	0.2	2.8	4.0
Roswell Park	S	NA	30	NA	NA	43,488	0.6	NA	NA
SUNY Downstate MedCr	S	13	11	3	18	44,533	0.1	4.0	5.1
Samaritan-Troy	N	6	18	4	10	46,182	0.1	2.2	3.8
Samaritan-Watertown	S	45	40	7	15	33,351	0.6	4.5	2.2
Saratoga Hospital	N	17	5	4	10	56,583	0.0	1.8	4.4
Sisters of Charity	N	26	29	10	16	49,981	0.3	3.2	4.6

Data reported as of August 15, 2022. ┆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 18. Hospital onset facility-wide inpatient *C. difficile* rates, New York State 2021 (Page 6 of 7)

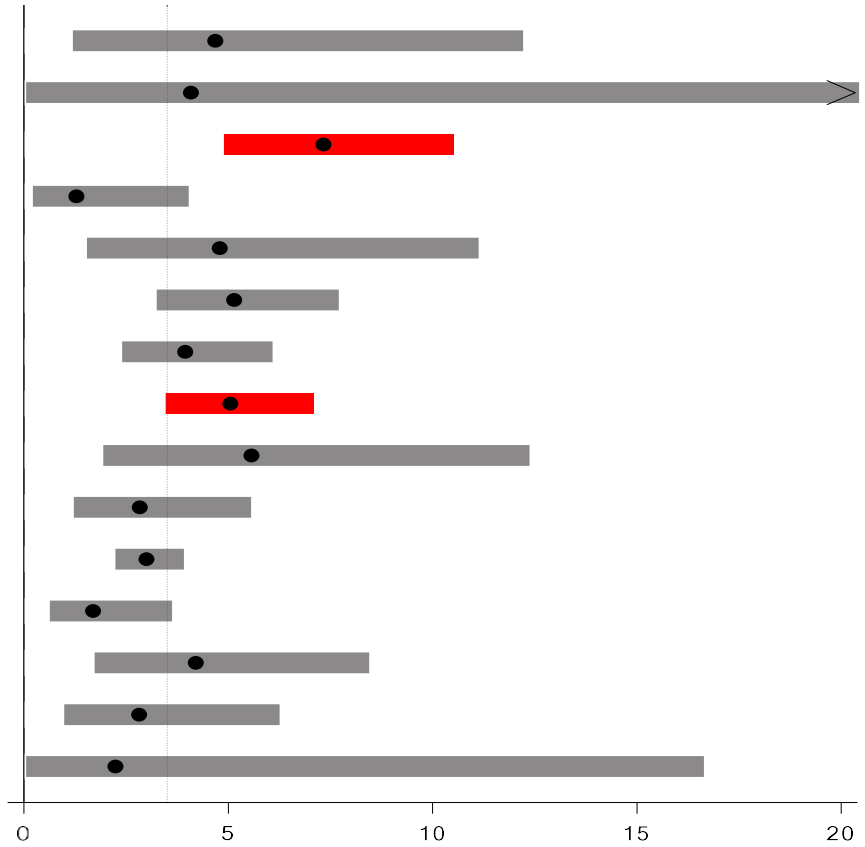
HOSPITAL	TEST METH	# OP	# CO-NMH	# CO-PMH	# HO	# PATDAYS	CO-NMH RATE	RAW HO RATE	ADJ HO RATE
Sisters- St Joseph	N	2	2	0	0	7,394	0.2	0.0	0.0
South Nassau Comm	N	42	31	6	24	92,130	0.2	2.6	4.2
South Shore UHosp*	S	29	17	7	12	103,113	0.1	1.2	1.6
St Anthony	S	1	1	1	1	7,039	0.0	1.4	2.2
St Barnabas*	S	4	17	2	7	71,606	0.1	1.0	1.3
St Catherine Siena	S	1	29	13	9	46,737	0.2	1.9	1.7
St Charles Hospital	S	4	14	2	9	45,240	0.2	2.0	2.5
St Elizabeth Medical^	N	10	11	6	32	46,197	0.1	6.9	9.6
St Francis- Roslyn*	S	24	60	16	22	98,232	0.3	2.2	1.4
St Johns Dobbs Ferry	N	1	0	0	0	2,119	0.0	0.0	0.0
St Johns Episcopal	S	5	9	3	6	37,987	0.1	1.6	1.9
St Johns Riverside	N	4	11	4	12	46,812	0.1	2.6	5.3
St Joseph- Bethpage	S	10	13	4	17	28,988	0.2	5.9	5.5
St Josephs- Syracuse	N	17	8	3	14	105,033	0.0	1.3	3.3
St Josephs- Yonkers^	S	0	5	3	18	14,937	0.2	12.1	14.9
St Lukes Cornwall	S	10	31	14	20	48,508	0.3	4.1	3.4
St Marys Amsterdam	N	7	11	2	8	20,191	0.3	4.0	5.4
St Peters Hospital	N	24	22	11	20	124,254	0.1	1.6	3.0
Staten Island U N^	S	28	42	13	89	150,211	0.2	5.9	4.9
Staten Island U S	S	15	21	4	22	29,100	0.3	7.6	5.4
Stony Brk Southampt n	N	13	13	3	11	19,447	0.3	5.7	6.3
Stony Brook ELIH	N	0	3	1	0	10,764	0.2	0.0	0.0
Strong Memorial^	S	55	56	26	160	247,101	0.2	6.5	5.2
Sunnyview Rehab Hosp	N	NA	0	NA	NA	1,644	0.0	NA	NA
Syosset Hospital	S	3	11	4	4	11,734	0.3	3.4	2.6



Data reported as of August 15, 2022. ┆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 18. Hospital onset facility-wide inpatient *C. difficile* rates, New York State 2021 (Page 7 of 7)

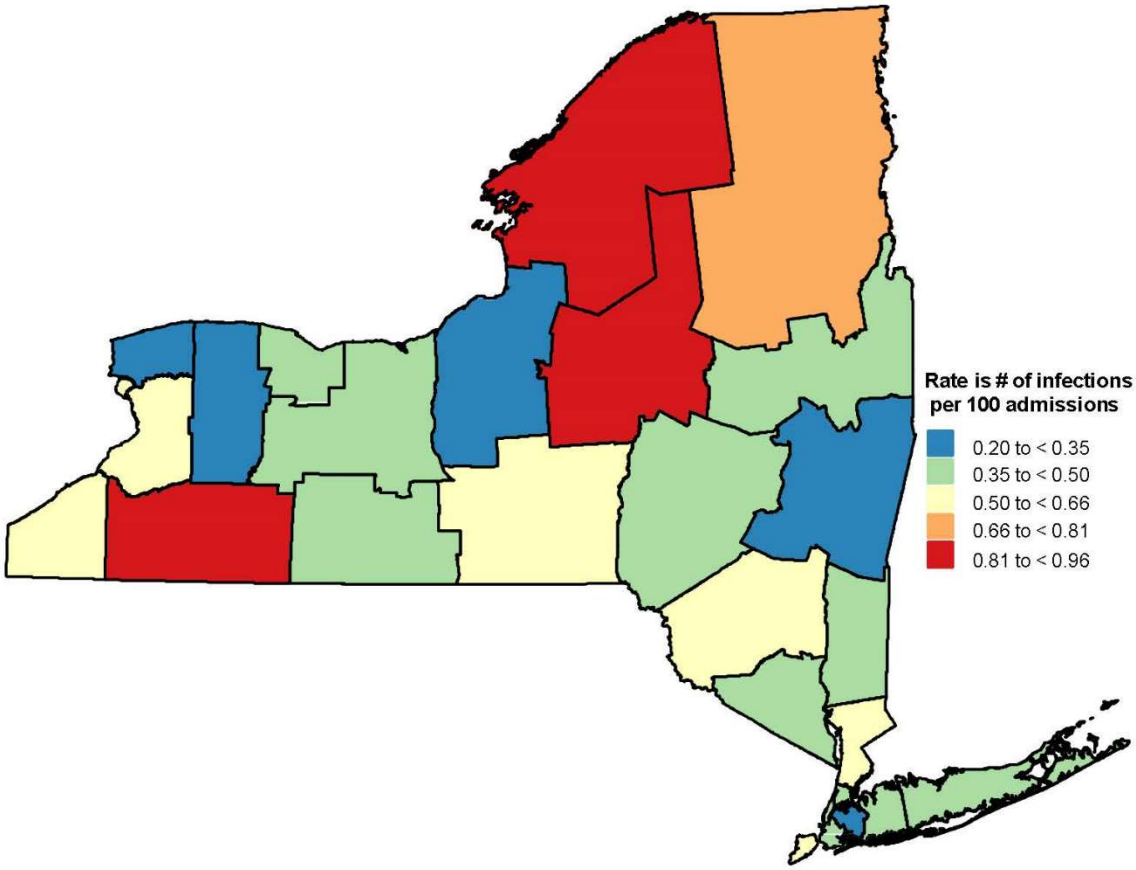
HOSPITAL	TEST METH	# OP	# CO-NMH	# CO-PMH	# HO	# PATDAYS	CO-NMH RATE	RAW HO RATE	ADJ HO RATE
UHS Binghamton	S	4	5	1	6	13,089	0.2	4.6	4.7
UHS Chenango Memor	S	2	0	0	1	4,380	0.0	2.3	4.1
UHS Wilson^	S	51	24	6	48	67,437	0.2	7.1	7.3
UPMC Chautauqua WCA	S	13	11	4	4	23,898	0.3	1.7	1.3
United Memorial	S	8	11	5	8	17,896	0.2	4.5	4.8
Unity Hosp Rochester	S	62	31	4	38	94,729	0.2	4.0	5.1
Univ Hosp SUNY Upst	N	10	16	6	33	125,321	0.1	2.6	3.9
Univ Hosp StonyBrook^	N	28	22	15	55	170,547	0.1	3.2	5.0
Upst. Community Gen	N	15	7	2	9	35,106	0.1	2.6	5.6
Vassar Brothers	N	3	23	7	13	94,228	0.1	1.4	2.8
Westchester Medical	S	8	59	23	89	141,384	0.3	6.3	3.0
White Plains Hosp	S	18	23	5	10	88,187	0.1	1.1	1.7
Woodhull Med Ctr	S	3	8	0	12	44,993	0.1	2.7	4.2
Wyckoff Heights	S	6	7	2	9	49,754	0.1	1.8	2.8
Wyoming County Comm	N	4	3	0	1	9,885	0.1	1.0	2.2



Data reported as of August 15, 2022. ┆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 shows the FWI CDI overall patient prevalence rate by county (or merged county for those with few or no hospitals). The prevalence of CDI is low in New York City (NYC) and varies in the upstate area.

Figure 19. Facility-wide inpatient *Clostridioides difficile* prevalence rate, New York State 2021



Data reported as of August 15, 2022. 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.

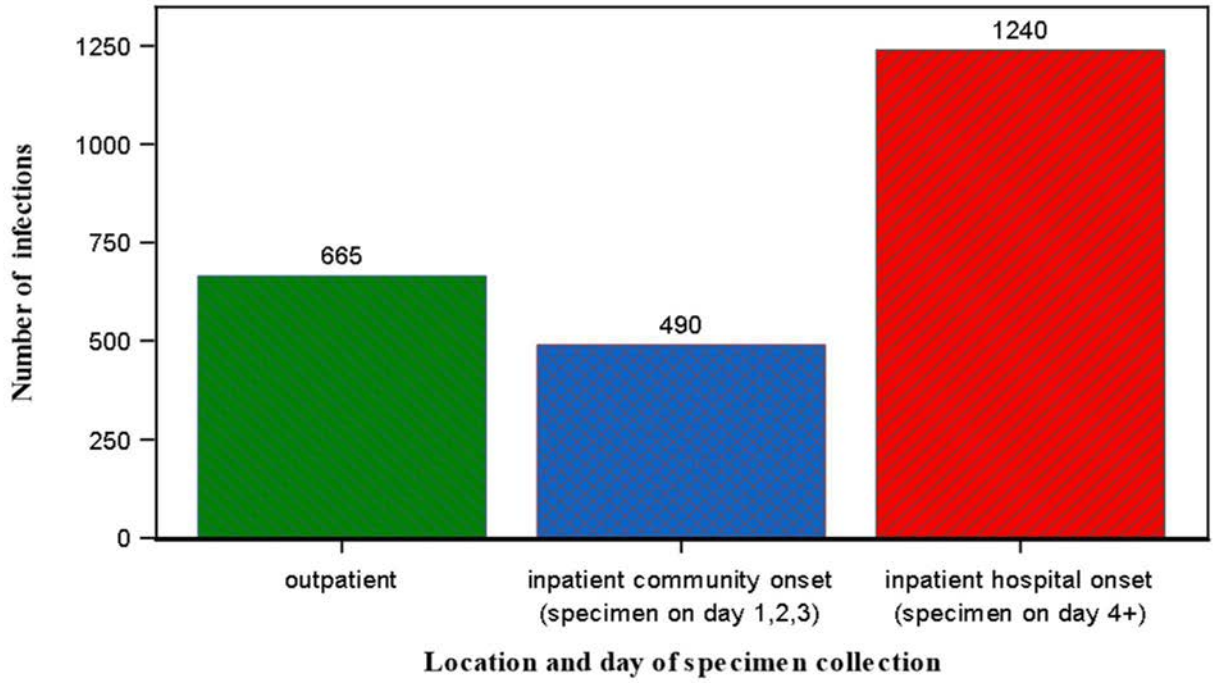
Carbapenem resistant Enterobacterales (CRE) infections

The NHSN LabID CRE surveillance definition is:

> Any *Escherichia coli*, *Klebsiella oxytoca, Klebsiella pneumoniae*, or *Enterobacter* spp. testing showing resistance to imipenem, meropenem, doripenem, or ertapenem by standard susceptibility testing methods (i.e., minimum inhibitory concentrations (MICs) 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 2021, 2,311 CRE cases were reported: 33% were identified in ED/OBS units, 23% were identified in the FWI area during the first 3 days of hospitalization, and 43% were identified in the FWI area after the first 3 days of inpatient stay (Figure 20).

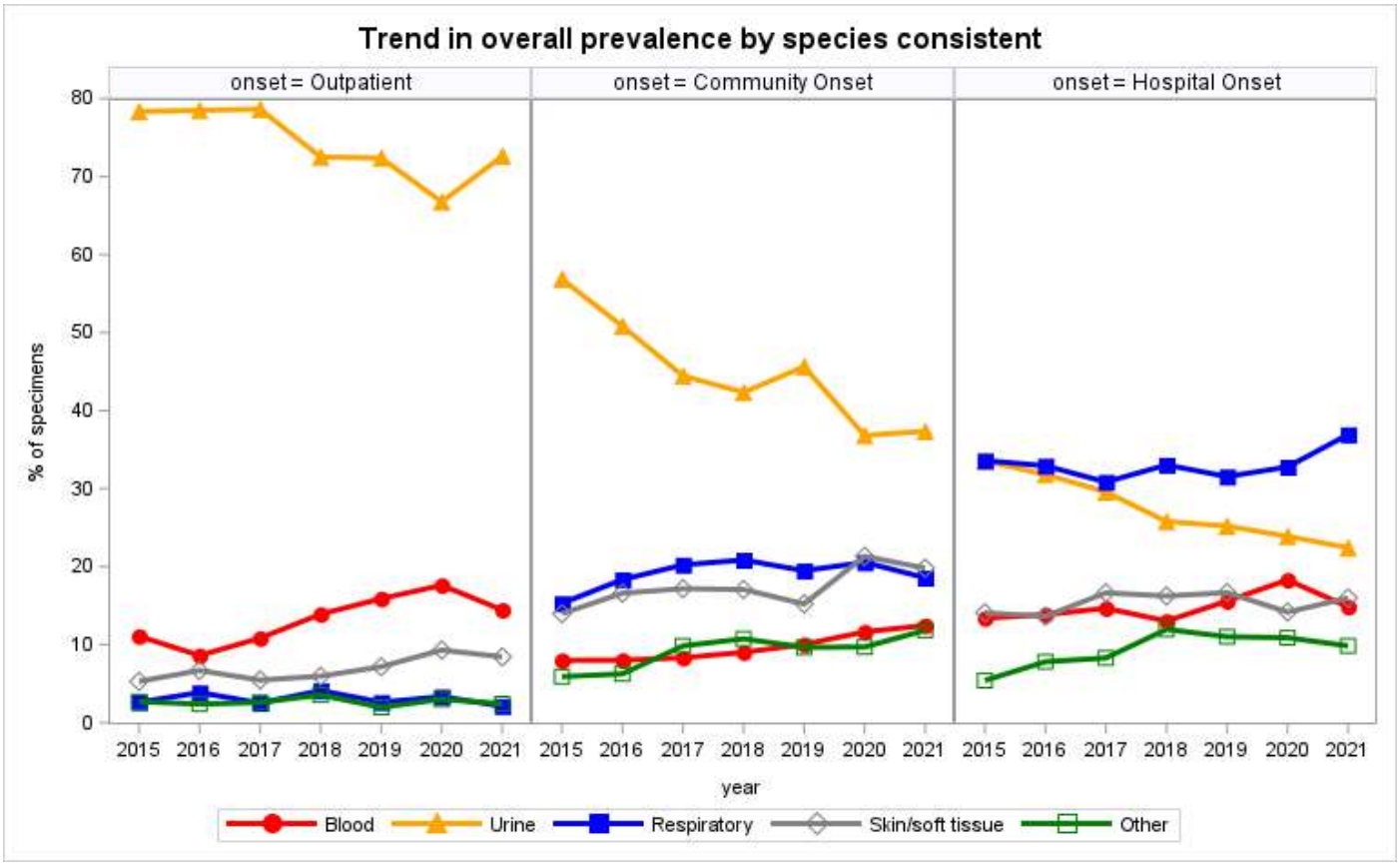
Figure 20. Carbapenem-resistant Enterobacterales infection onset, NYS 2021



Data reported as of August 15, 2022. 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 21).

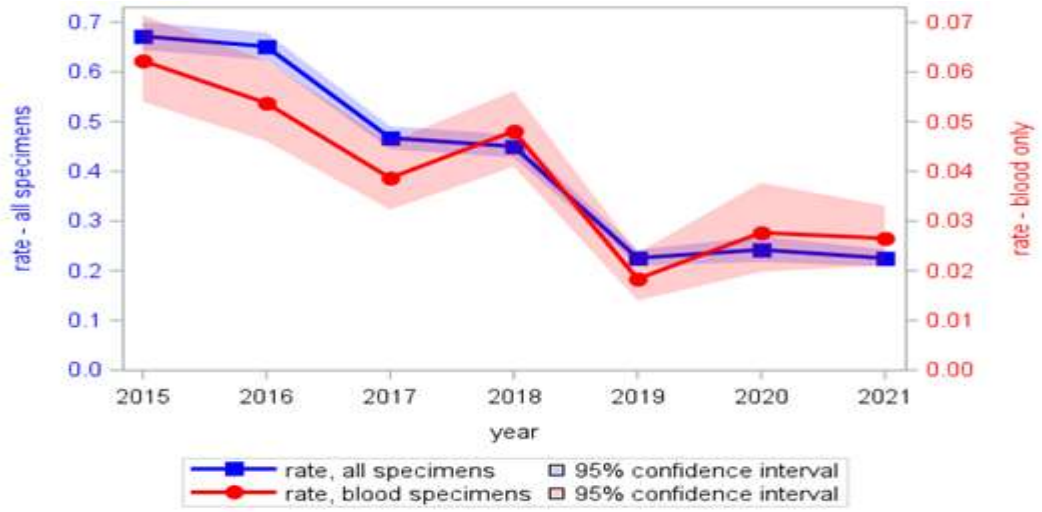
Figure 21. Carbapenem resistant Enterobacterales by specimen site, NYS 2015-2021



Data reported as of August 15, 2022.

The admission prevalence rate describes the percentage of patients admitted to hospitals with CRE. In 2021, there were 484 of these cases out of 2,149,402 admissions, for a rate of 0.22 infections per 1,000 admissions. The overall admission prevalence rate decreased 66% between 2015 and 2021 although there was no change in rates between 2019 and 2021. The BSI rate decreased 57% over the same time but there was 42% increase between 2019 and 2021. (Figure 22). The 2021 all-specimen admission prevalence rate was 8.5 times higher than the BSI rate.

Figure 22. Facility-wide inpatient carbapenem resistant Enterobacterales admission prevalence infection rates, New York State 2015-2021

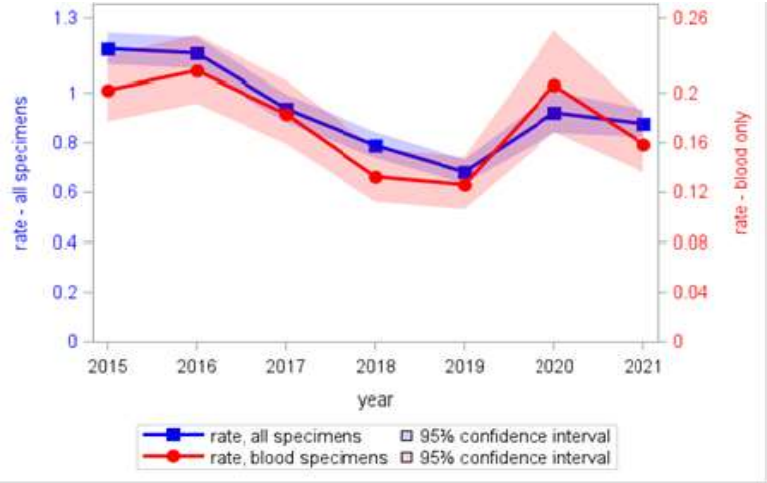


Year	# Blood stream infections (BSI)	# Total infections	# Admissions	BSI admission prevalence rate	All admission prevalence rate
2015	145	1,565	2,329,051	0.062	0.672
2016	125	1,515	2,326,264	0.054	0.651
2017	92	1,112	2,379,863	0.039	0.467
2018	113	1,069	2,375,584	0.048	0.450
2019	44	530	2,347,976	0.019	0.226
2020	29	254	1,048,540	0.028	0.242
2021	57	484	2,149,402	0.026	0.225

Data reported as of August 15, 2022. 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 and cases identified in the emergency room if admitted the same day.

The longer a person stays in the hospital, the higher the cumulative 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 21% between 2015 and 2021, and the all-specimen incidence rate significantly decreased 25% between 2015 and 2021. Both all-specimen incidence and BSI incidence increased between 2019 and 2021. (Figure 23). The 2021 all-specimen incidence rate was 5.5 times higher than the BSI incidence rate.

Figure 23. Facility wide inpatient carbapenem resistant Enterobacterales infection incidence rates, New York State 2015-2021

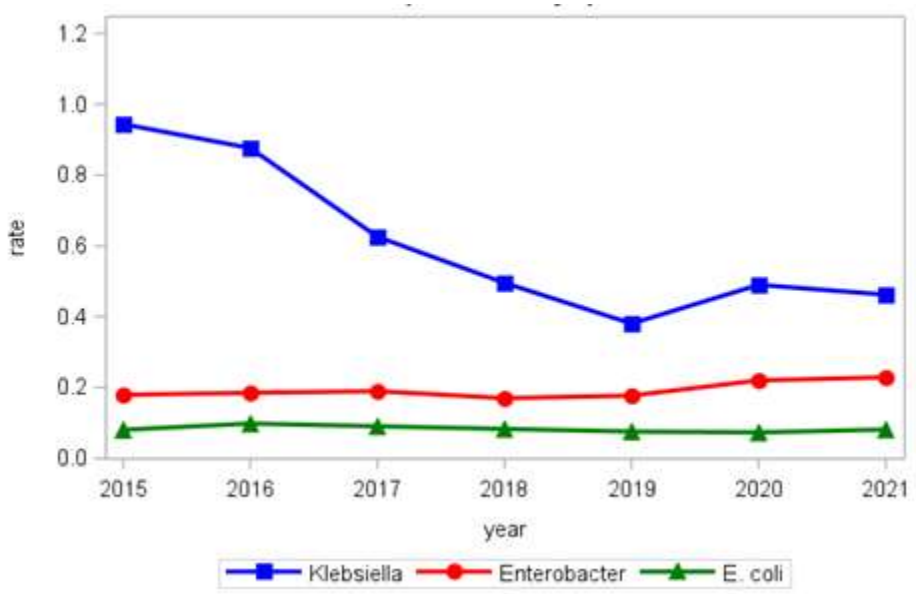


Year	# Bloodstream infections (BSI)	# Total infections	# Patient days	BSI incidence rate	All incidence rate
2015	232	1,349	11,466,593	0.202	1.176
2016	248	1,321	11,397,102	0.218	1.159
2017	208	1,064	11,355,485	0.183	0.937
2018	150	892	11,328,988	0.132	0.787
2019	142	767	11,262,506	0.126	0.681
2020	105	469	5,091,653	0.206	0.921
2021	176	972	11,089,397	0.159	0.877

Data reported as of August 15, 2022. Bloodstream Infection Incidence Rate = Number of all unique (no others in previous 14 days) blood source infections per patient per month identified > 3 days after admission to the hospital / Number of patient days x 10,000. All Specimen Infection/Colonization Incidence Rate = Number of first events per patient among those with no event with this specific organism type reported in a previous month at this hospital and identified > 3 days after admission to the hospital / Number of patient days x 10,000. Excludes inpatient rehabilitation and inpatient psychiatric locations.

Overall patient prevalence includes both admission prevalent and hospital onset cases. Overall patient prevalence rates by year and species are summarized in Figure 24. Between 2015 and 2021, the prevalence of *Klebsiella* decreased 51%, the prevalence of *Enterobacter* spp. increased 27%. The prevalence of *E. coli* increased 10% between 2019 and 2021, returning to the 2015 level.

Figure 24. Trends in overall patient prevalence carbapenem resistant Enterobacterales infection rates by species, NYS 2015-2021



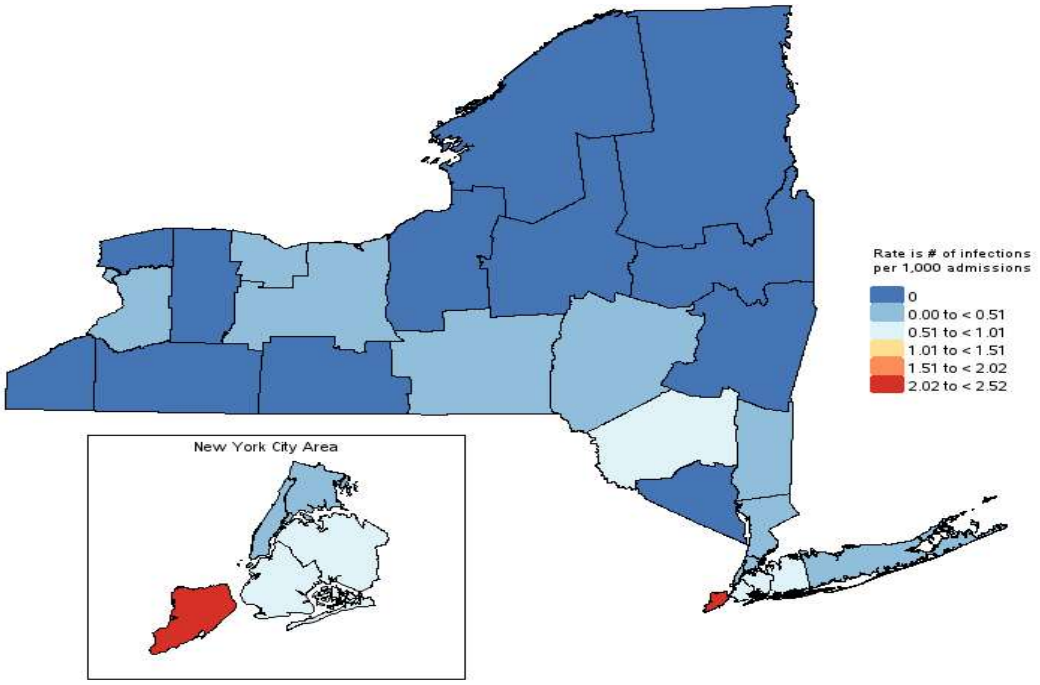
Year	*Klebsiella oxytoca and pneumoniae*	*Enterobacter* spp.	*E. coli*	Total
2015	0.944	0.179	0.081	1.204
2016	0.877	0.185	0.098	1.160
2017	0.626	0.190	0.091	0.907
2018	0.495	0.170	0.083	0.748
2019	0.380	0.176	0.076	0.632
2020	0.490	0.220	0.073	0.784
2021	0.463	0.229	0.081	0.773

Data reported as of August 15, 2022. 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).

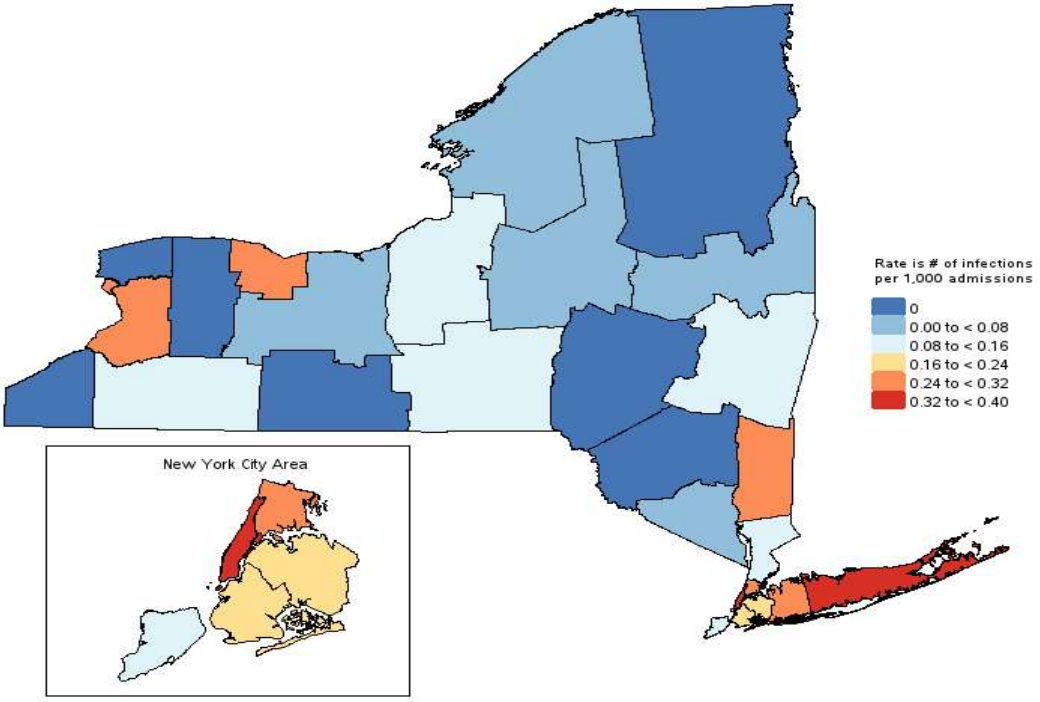
Figures 25 (a, b, and c) show the FWI CRE patient prevalence rate by species and county (or merged county for those with few or no hospitals). FWI CRE-*Klebsiella* and CRE-*E. coli* patient prevalence rates are highest in the NYC area. CRE-*Enterobacter* rates showed some spikes in western and northern 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 25 a-c. Facility wide inpatient carbapenem resistant Enterobacterales patient prevalence rates, New York State 2021

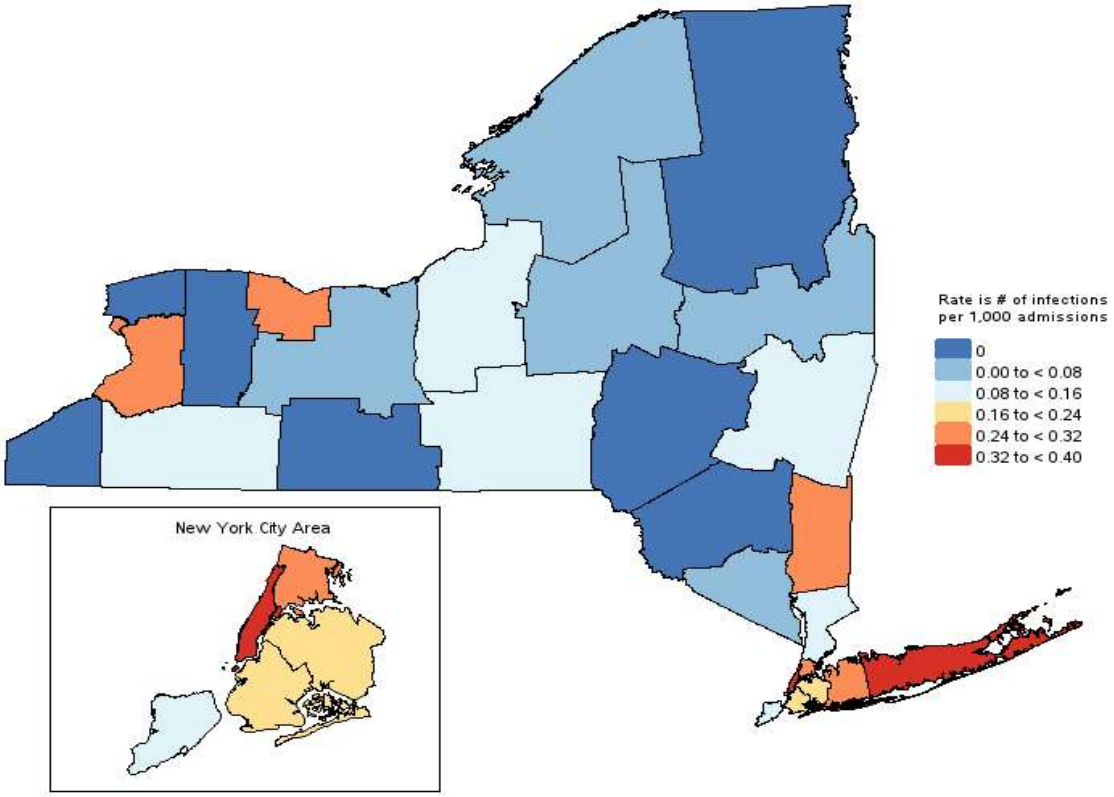
(a) CRE-*Klebsiella* overall patient prevalence rate 2021



(b) CRE-*Enterobacter* overall patient prevalence rate 2021



(c) CRE-*E. coli* overall patient prevalence rate 2021



Data reported as of August 15, 2022. Small counties have been merged.

Laboratory testing methods

Breakpoints for determining whether a microorganism 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 (FDA). According to the 2021 NHSN survey, 93% of facilities used the newer more sensitive breakpoints (CLSI M22 or M23 standard) in 2021, while 7% continued to use the former breakpoints. The facilities using the former 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 2021 NHSN survey, 34% of facilities reported that their labs perform a special test for carbapenemase production. However, based on the list of 2021 CRE infections reported to NHSN, approximately 31% of specimens were tested for the presence of a carbapenemase. Among those tested, a carbapenemase was identified 67% of the time.

Facilities using the former breakpoints or not detecting carbapenemases might be undercounting CRE, and testing differences might reduce the inter-facility comparability of CRE rates.

There might 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 healthcare facility laboratories. As such, hospital specific CRE rates, particularly in non-blood specimens, may vary based on testing methods.

Hospital specific CRE rates

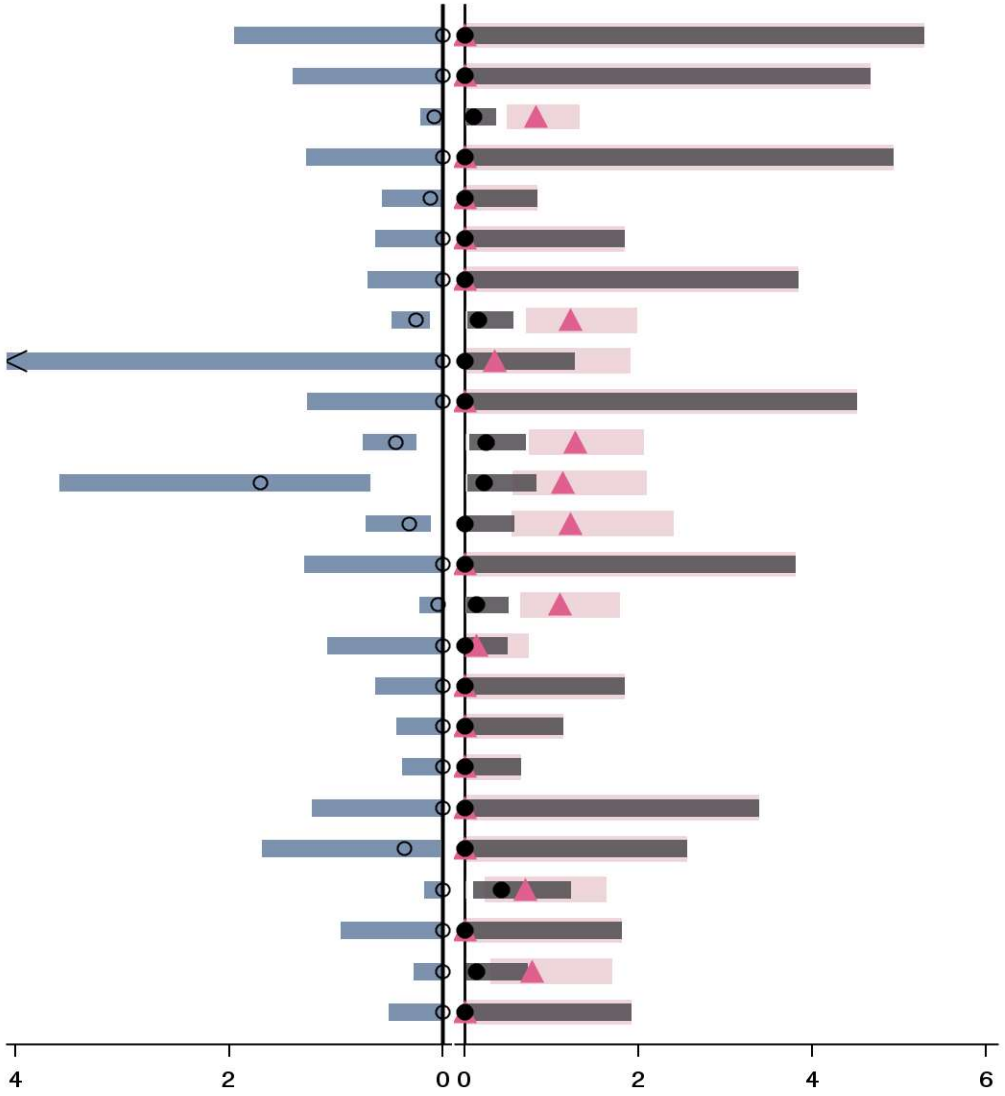
The primary HAI indicator of interest for evaluating hospital performance is the hospital onset BSI rate, because 1) blood specimens are more consistently screened by laboratories; and 2) bloodstream infections are very serious and more likely reflect clinical disease than CRE detected from nonsterile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

Hospitals should review their HO BSI rates in relation to their admission prevalence rates as shown in Figure 26. For example, 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. For example, some hospitals reported a large proportion of urinary tract infections/colonizations, others reported a 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 predict the HO BSI rate strongly; 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 compliance with proper hand hygiene; environmental cleaning and disinfection; selection and use of personal protective equipment and barrier precautions; delays and/or variations in implementing Contact Precautions and appropriate patient cohorting; delays in discontinuing medical devices when 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 with promptly communicating infection control issues at the time of inter-facility transfer lead to further complexities of CRE containment and prevention.

Figure 26. Hospital carbapenem resistant Enterobacterales infection rates, NYS 2021 (Page 1 of 7)

Hospital Name	# All AdmPrev	# Adms	AdmPrev Rate	HO-All Rate	HO-BSI Rate	# Patdays	# All	# BSI
AO Fox Memorial	0	1531	0.0	0.0	0.0	6991	0	0
Adirondack Medical	0	2139	0.0	0.0	0.0	7911	0	0
Albany Med Ctr	3	37124	0.1	0.8	0.1	207597	17	2
Alice Hyde Med Ctr	0	2336	0.0	0.0	0.0	7494	0	0
Arnot Ogden Med Ctr	1	8322	0.1	0.0	0.0	44770	0	0
Auburn Memorial	0	4725	0.0	0.0	0.0	20180	0	0
Bellevue Ellis	0	4292	0.0	0.0	0.0	9639	0	0
Bellevue Hospital	7	27455	0.3	1.2	0.2	131582	16	2
Blythedale Childrens	0	394	0.0	0.3	0.0	29320	1	0
Bon Secours	0	2365	0.0	0.0	0.0	8180	0	0
Bronx-Lebanon	10	22628	0.4	1.3	0.2	126300	16	3
Brookdale Hospital	5	2926	1.7	1.1	0.2	88363	10	2
Brooklyn Hosp Ctr	4	12720	0.3	1.2	0.0	65730	8	0
Brooks Memorial	0	2315	0.0	0.0	0.0	9713	0	0
Buffalo General	1	21550	0.0	1.1	0.1	146477	16	2
Calvary Hospital	0	2771	0.0	0.1	0.0	76655	1	0
Canton-Potsdam	0	4736	0.0	0.0	0.0	20168	0	0
Cayuga Medical Ctr	0	7000	0.0	0.0	0.0	32809	0	0
Champlain Valley	0	8018	0.0	0.0	0.0	57796	0	0
Claxton-Hepburn	0	2441	0.0	0.0	0.0	10905	0	0
Clifton Springs	1	2801	0.4	0.0	0.0	14461	0	0
Cohens Childrens	0	17871	0.0	0.7	0.4	72005	5	3
Columbia Memorial	0	3150	0.0	0.0	0.0	20549	0	0
Coney Island Hosp	0	11262	0.0	0.8	0.1	77225	6	1
Corning Hospital	0	5934	0.0	0.0	0.0	19302	0	0



Data reported as of August 15, 2022. Facility-wide inpatient only, rehab and behavioral health units excluded

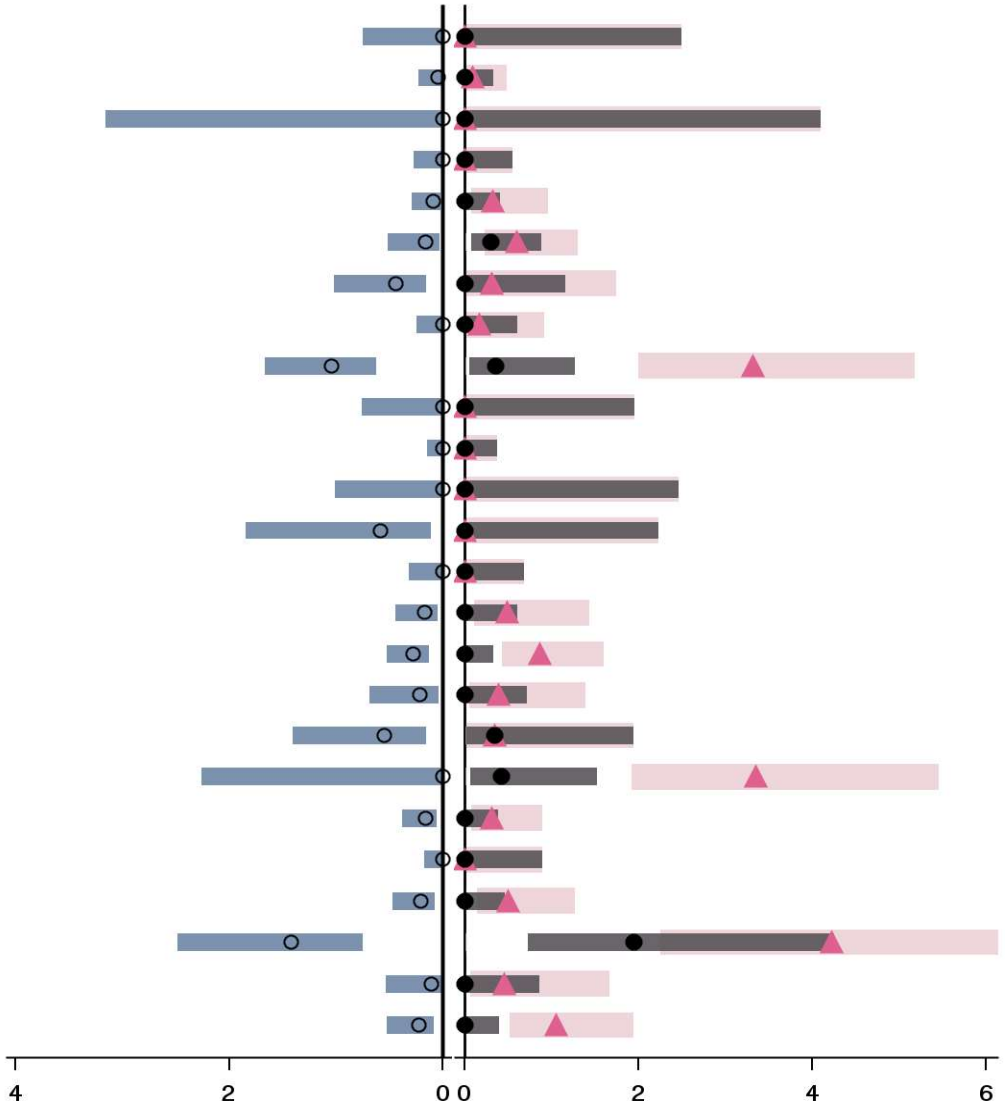
HO-All: hospital onset CRE incidence rate all sites per 10,000 patient days and 95% confidence interval (state average = 0.9)

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

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

Figure 26. Hospital carbapenem resistant Enterobacterales infection rates, NYS 2021 (Page 2 of 7)

Hospital Name	# All AdmPrev	# Adms	AdmPrev Rate	HO-All Rate	HO-BSI Rate	# Patdays	# All	# BSI
Cortland Reg Med	0	3987	0.0	0.0	0.0	14833	0	0
Crouse Hospital	1	20958	0.0	0.1	0.0	117010	1	0
East. Niag. Lockport	0	948	0.0	0.0	0.0	9020	0	0
Ellis Hospital	0	11146	0.0	0.0	0.0	67748	0	0
Elmhurst Hospital	2	22143	0.1	0.3	0.0	92722	3	0
Erie County Med Ctr	2	12179	0.2	0.6	0.3	101103	6	3
FF Thompson	4	9021	0.4	0.3	0.0	32165	1	0
Faxton St. Lukes	0	12238	0.0	0.2	0.0	61643	1	0
Flushing Hospital	13	12414	1.0	3.3	0.3	57458	19	2
Garnet Catskills	0	3956	0.0	0.0	0.0	18937	0	0
Garnet Middletown	0	20749	0.0	0.0	0.0	100474	0	0
Geneva General	0	2963	0.0	0.0	0.0	15082	0	0
Glen Cove Hospital	2	3404	0.6	0.0	0.0	16641	0	0
Glens Falls Hospital	0	9494	0.0	0.0	0.0	54935	0	0
Good Samar. Suffern	3	17720	0.2	0.5	0.0	61692	3	0
Good Samar. W Islip	7	25322	0.3	0.9	0.0	115406	10	0
Harlem Hospital	2	9236	0.2	0.4	0.0	52301	2	0
HealthAlli Broadway	3	5505	0.5	0.3	0.3	28909	1	1
Henry J. Carter	0	1324	0.0	3.3	0.4	47776	16	2
Highland Hospital	4	24096	0.2	0.3	0.0	98640	3	0
Hosp for Spec Surg	0	17330	0.0	0.0	0.0	41613	0	0
Huntington Hospital	4	19554	0.2	0.5	0.0	81173	4	0
Interfaith Med Ctr	9	6319	1.4	4.2	1.9	30839	13	6
JT Mather Hospital	1	8937	0.1	0.5	0.0	43648	2	0
Jacobi Med Ctr	4	17501	0.2	1.0	0.0	95389	10	0



Data reported as of August 15, 2022 Facility-wide inpatient only, rehab and behavioral health units excluded

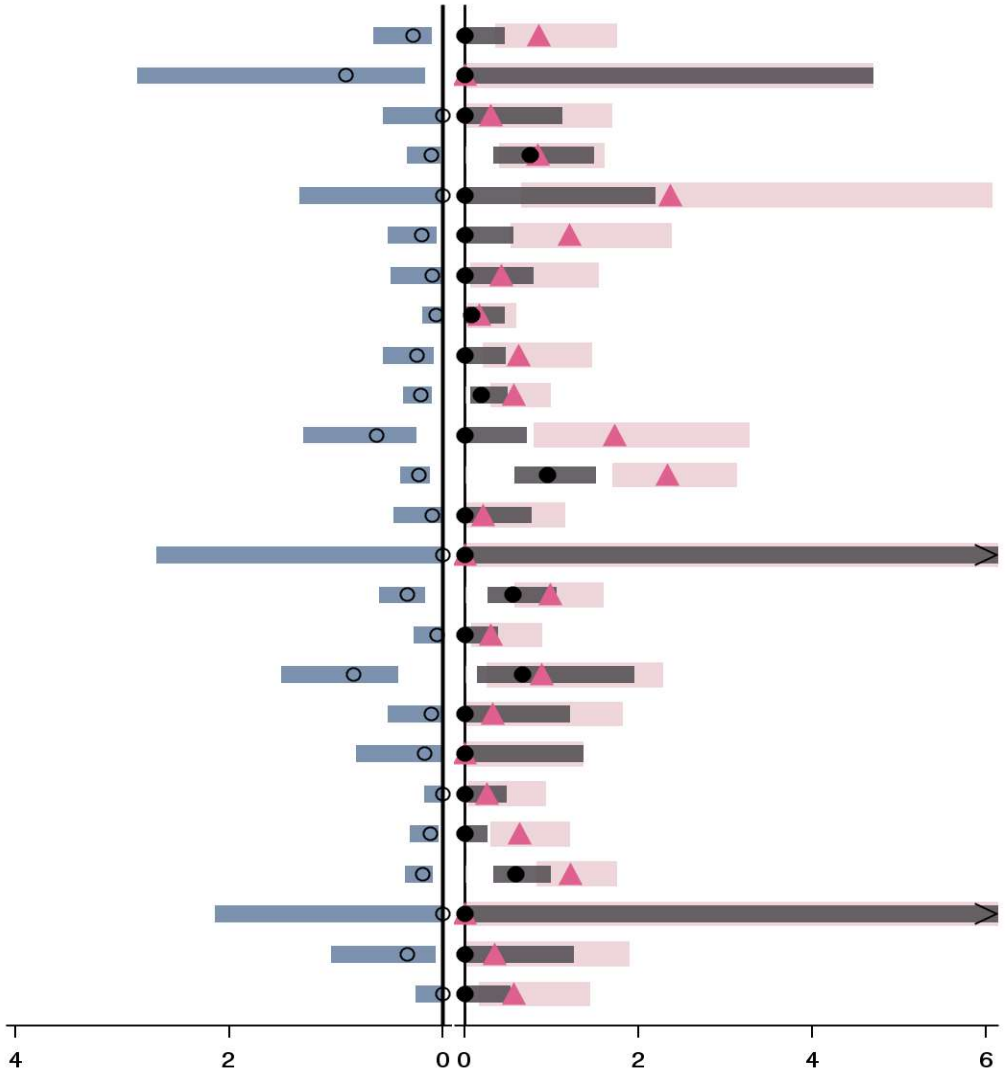
HO-All: hospital onset CRE incidence rate all sites per 10,000 patient days and 95% confidence interval (state average = 0.9)

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

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

Figure 26. Hospital carbapenem resistant Enterobacterales infection rates, NYS 2021 (Page 3 of 7)

Hospital Name	# All AdmPrev	# Adms	AdmPrev Rate	HO-All Rate	HO-BSI Rate	# Patdays	# All	# BSI
Jamaica Hospital	4	14206	0.3	0.8	0.0	82428	7	0
Jones Memorial	2	2196	0.9	0.0	0.0	7857	0	0
Kenmore Mercy	0	5401	0.0	0.3	0.0	32973	1	0
Kings County Hosp	2	19071	0.1	0.8	0.7	106814	9	8
Kingsbrook Jewish MC	0	2238	0.0	2.4	0.0	16895	4	0
LIJ at Forest Hills	3	15056	0.2	1.2	0.0	66404	8	0
LIJ at Valley Stream	1	9764	0.1	0.4	0.0	47128	2	0
Lenox Hill Hospital	2	32980	0.1	0.2	0.1	123328	2	1
Lincoln Med Ctr	4	16521	0.2	0.6	0.0	80230	5	0
Long Isl Jewish(LIJ)	8	39002	0.2	0.6	0.2	212504	12	4
Long Isl. Community	5	8063	0.6	1.7	0.0	52267	9	0
Maimonides Med Ctr	9	39416	0.2	2.3	1.0	189111	44	18
Mary Imogene Bassett	1	10273	0.1	0.2	0.0	48634	1	0
Massena Memorial	0	1117	0.0	0.0	0.0	4149	0	0
Memor SloanKettering	8	24157	0.3	1.0	0.6	163617	16	9
Mercy Hosp Buffalo	1	17860	0.1	0.3	0.0	99050	3	0
Mercy Med Ctr	8	9554	0.8	0.9	0.7	45013	4	3
Metropolitan Hosp	1	9306	0.1	0.3	0.0	30712	1	0
MidHudson Reg of WMC	1	5832	0.2	0.0	0.0	27134	0	0
Millard Fill. Suburb	0	17409	0.0	0.3	0.0	77520	2	0
Montefiore-Einstein	3	25712	0.1	0.6	0.0	142513	9	0
Montefiore-Moses	7	37162	0.2	1.2	0.6	238792	29	14
Montefiore-Mt Vernon	0	1403	0.0	0.0	0.0	5590	0	0
Montefiore-NewRochl	2	6012	0.3	0.3	0.0	29550	1	0
Montefiore-Nyack	0	11871	0.0	0.6	0.0	71541	4	0



Data reported as of August 15, 2022. Facility-wide inpatient only, rehab and behavioral health units excluded

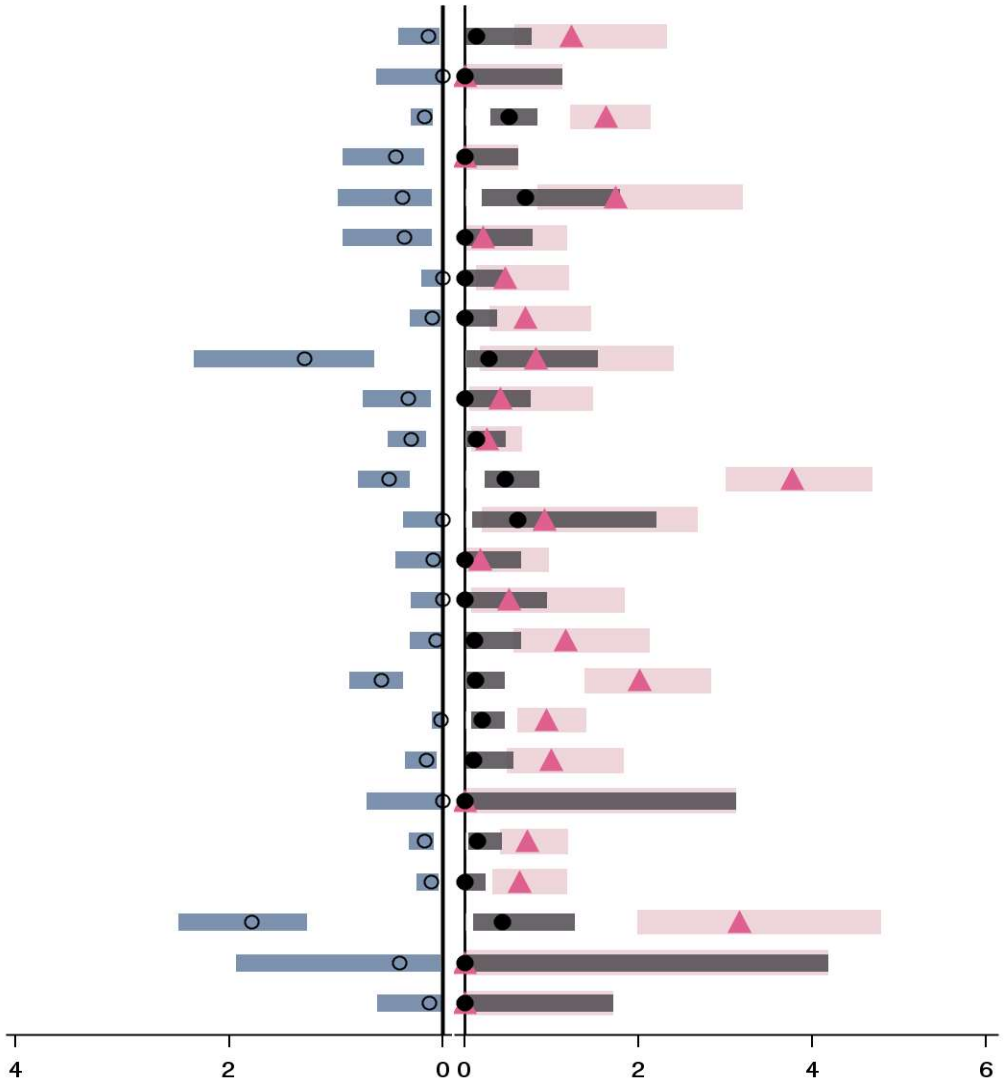
HO-All: hospital onset CRE incidence rate all sites per 10,000 patient days and 95% confidence interval (state average = 0.9)

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

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

Figure 26. Hospital carbapenem resistant Enterobacterales infection rates, NYS 2021 (Page 4 of 7)

Hospital Name	# All AdmPrev	# Adms	AdmPrev Rate	HO-All Rate	HO-BSI Rate	# Patdays	# All	# BSI
Montefiore-Wakefield	2	15074	0.1	1.2	0.1	73581	9	1
Mount St. Marys	0	4830	0.0	0.0	0.0	33023	0	0
Mt Sinai	9	53251	0.2	1.6	0.5	314129	51	16
Mt Sinai Beth Israel	5	11225	0.4	0.0	0.0	60337	0	0
Mt Sinai Brooklyn	3	7909	0.4	1.7	0.7	57727	10	4
Mt Sinai Queens	3	8277	0.4	0.2	0.0	47602	1	0
Mt Sinai St Lukes	0	15157	0.0	0.5	0.0	85983	4	0
Mt Sinai West	2	20379	0.1	0.7	0.0	99984	7	0
NY Community Hosp	8	6194	1.3	0.8	0.3	36612	3	1
NYP-Allen	4	12189	0.3	0.4	0.0	49343	2	0
NYP-Brklyn Methodist	9	30497	0.3	0.3	0.1	157255	4	2
NYP-Columbia	14	27696	0.5	3.8	0.5	217578	82	10
NYP-Hudson Valley	0	8087	0.0	0.9	0.6	32872	3	2
NYP-Lawrence	1	10755	0.1	0.2	0.0	57710	1	0
NYP-Lower Manhattan	0	10121	0.0	0.5	0.0	39439	2	0
NYP-Morgan Stanley	1	15699	0.1	1.2	0.1	86618	10	1
NYP-Queens	17	29343	0.6	2.0	0.1	159542	32	2
NYP-Weill Cornell	1	46279	0.0	0.9	0.2	257212	24	5
NYU Langone Brooklyn	4	26019	0.2	1.0	0.1	100711	10	1
NYU Orthopedic Hosp	0	4208	0.0	0.0	0.0	11864	0	0
NYU Tisch	7	41337	0.2	0.7	0.1	208991	15	3
NYU Winthrop	4	38151	0.1	0.6	0.0	157819	10	0
Nassau University	27	15067	1.8	3.2	0.4	69726	22	3
Nathan Littauer	1	2453	0.4	0.0	0.0	8847	0	0
Newark Wayne	1	7755	0.1	0.0	0.0	21729	0	0



Data reported as of August 15, 2022. Facility-wide inpatient only, rehab and behavioral health units excluded

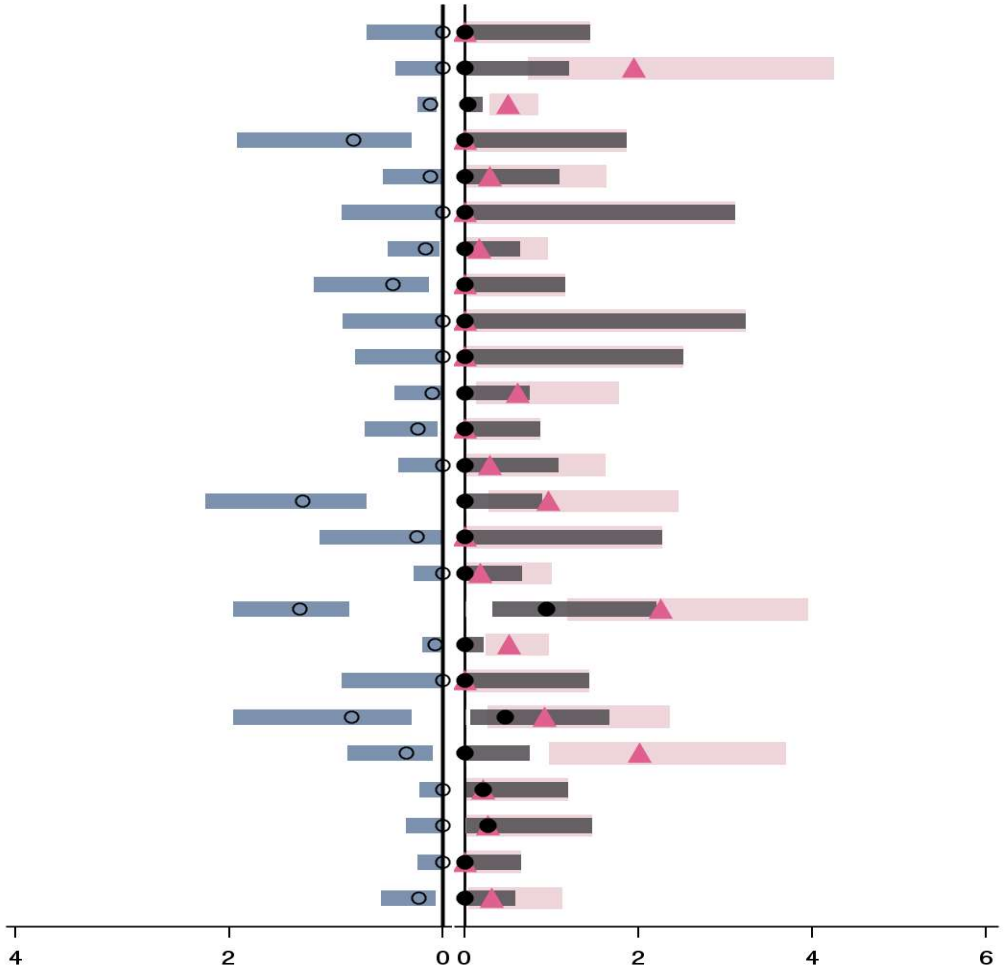
HO-All: hospital onset CRE incidence rate all sites per 10,000 patient days and 95% confidence interval (state average = 0.7)

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 26. Hospital carbapenem resistant Enterobacterales infection rates, NYS 2021 (Page 5 of 7)

Hospital Name	# All AdmPrev	# Adms	AdmPrev Rate	HO-All Rate	HO-BSI Rate	# Patdays	# All	# BSI
Niagara Falls	0	4215	0.0	0.0	0.0	25714	0	0
North Central Bronx	0	6834	0.0	1.9	0.0	30803	6	0
North Shore	6	50293	0.1	0.5	0.0	280837	14	1
Northern Dutchess	4	4755	0.8	0.0	0.0	19885	0	0
Northern Westchester	1	8441	0.1	0.3	0.0	34239	1	0
Noyes Memorial	0	3178	0.0	0.0	0.0	11873	0	0
Oishei Childrens	2	12246	0.2	0.2	0.0	58542	1	0
Olean General	3	6413	0.5	0.0	0.0	32190	0	0
Oneida Healthcare	0	3209	0.0	0.0	0.0	11424	0	0
Oswego Hospital	0	3672	0.0	0.0	0.0	14714	0	0
Our Lady of Lourdes	1	10518	0.1	0.6	0.0	49584	3	0
Peconic Bay Medical	2	8591	0.2	0.0	0.0	42600	0	0
Phelps Memorial	0	7196	0.0	0.3	0.0	34512	1	0
Plainview Hospital	10	7623	1.3	1.0	0.0	41759	4	0
Putnam Hospital	1	4115	0.2	0.0	0.0	16305	0	0
Queens Hospital	0	10920	0.0	0.2	0.0	56189	1	0
Richmond Univ MC	19	14201	1.3	2.3	0.9	53193	12	5
Rochester General	3	40841	0.1	0.5	0.0	177824	9	0
Rome Memorial	0	3177	0.0	0.0	0.0	25893	0	0
Roswell Park	4	4674	0.9	0.9	0.5	43488	4	2
SUNY Downstate MedCr	3	8737	0.3	2.0	0.0	49843	10	0
Samaritan- Troy	0	13593	0.0	0.2	0.2	47336	1	1
Samaritan- Watertown	0	8754	0.0	0.3	0.3	38108	1	1
Saratoga Hospital	0	12828	0.0	0.0	0.0	58026	0	0
Sisters of Charity	3	13565	0.2	0.3	0.0	64759	2	0



Data reported as of August 15, 2022Facility-wide inpatient only, rehab and behavioral health units excluded

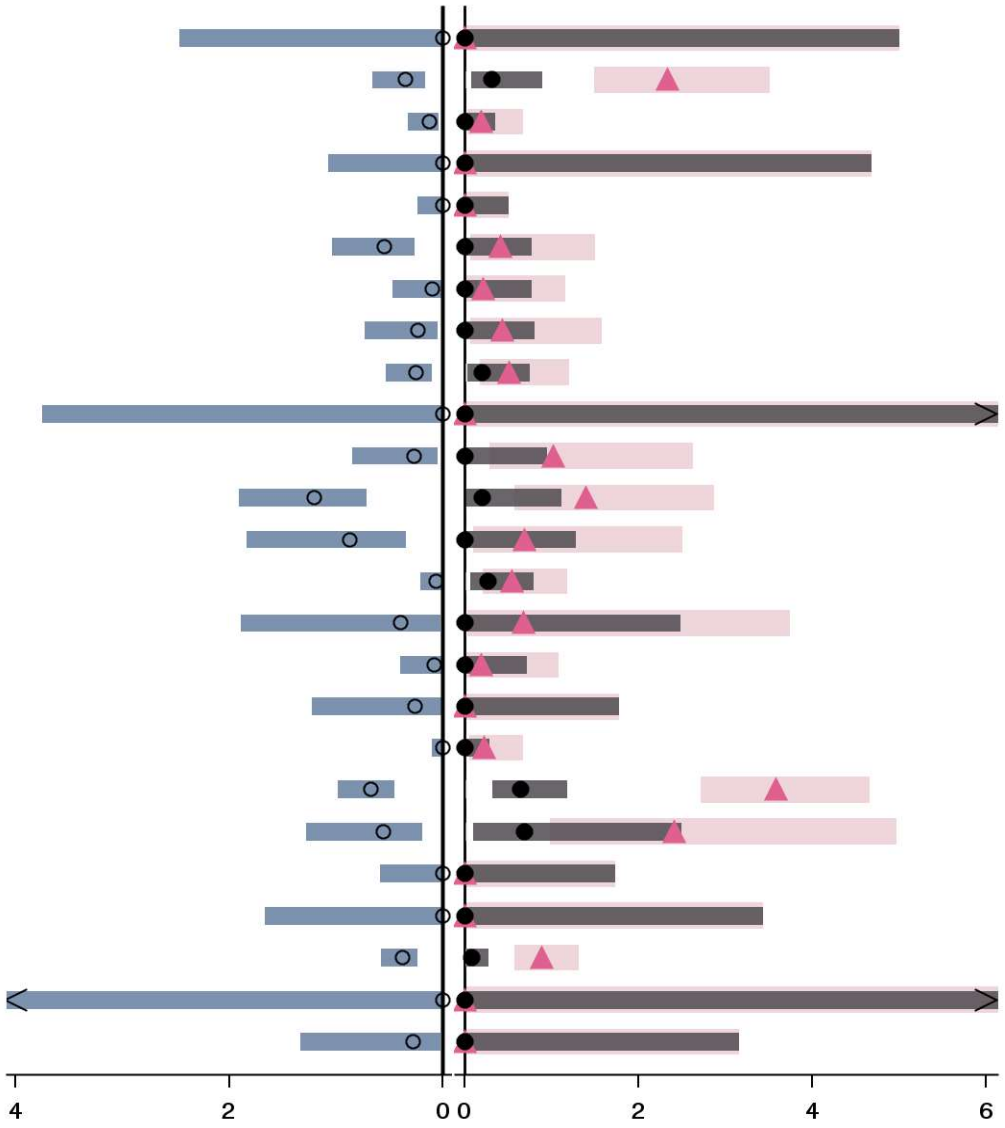
HO-All: hospital onset CRE incidence rate all sites per 10,000 patient days and 95% confidence interval (state average = 0.9)

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

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

Figure 26. Hospital carbapenem resistant Enterobacterales infection rates, NYS 2021 (Page 6 of 7)

Hospital Name	# All AdmPrev	# Adms	AdmPrev Rate	HO-All Rate	HO-BSI Rate	# Patdays	# All	# BSI
Sisters- St Joseph	0	1214	0.0	0.0	0.0	7394	0	0
South Nassau Comm.	7	19913	0.4	2.3	0.3	98680	23	3
South Shore UHosp	3	23928	0.1	0.2	0.0	108986	2	0
St Anthony	0	2807	0.0	0.0	0.0	7898	0	0
St Barnabas	0	13044	0.0	0.0	0.0	74744	0	0
St Catherine Siena	7	12720	0.6	0.4	0.0	48515	2	0
St Charles Hospital	1	10128	0.1	0.2	0.0	48636	1	0
St Elizabeth Medical	2	8658	0.2	0.4	0.0	46197	2	0
St Francis- Roslyn	5	19904	0.3	0.5	0.2	98232	5	2
St Johns Dobbs Ferry	0	796	0.0	0.0	0.0	2119	0	0
St Johns Episcopal	2	7420	0.3	1.0	0.0	39194	4	0
St Johns Riverside	13	10809	1.2	1.4	0.2	50456	7	1
St Joseph- Bethpage	5	5737	0.9	0.7	0.0	28988	2	0
St Josephs- Syracuse	2	31057	0.1	0.5	0.3	111670	6	3
St Josephs- Yonkers	1	2511	0.4	0.7	0.0	14937	1	0
St Lukes Cornwall	1	11920	0.1	0.2	0.0	51876	1	0
St Marys Amsterdam	1	3874	0.3	0.0	0.0	20860	0	0
St Peters Hospital	0	30945	0.0	0.2	0.0	132920	3	0
Staten Island U N	20	29751	0.7	3.6	0.6	156567	56	10
Staten Island U S	4	7162	0.6	2.4	0.7	29100	7	2
Stony Brk Southamptn	0	5133	0.0	0.0	0.0	21373	0	0
Stony Brook ELIH	0	1796	0.0	0.0	0.0	10764	0	0
Strong Memorial	15	40101	0.4	0.9	0.1	273382	24	2
Sunnyview Rehab Hosp	0	159	0.0	0.0	0.0	1644	0	0
Syosset Hospital	1	3562	0.3	0.0	0.0	11734	0	0



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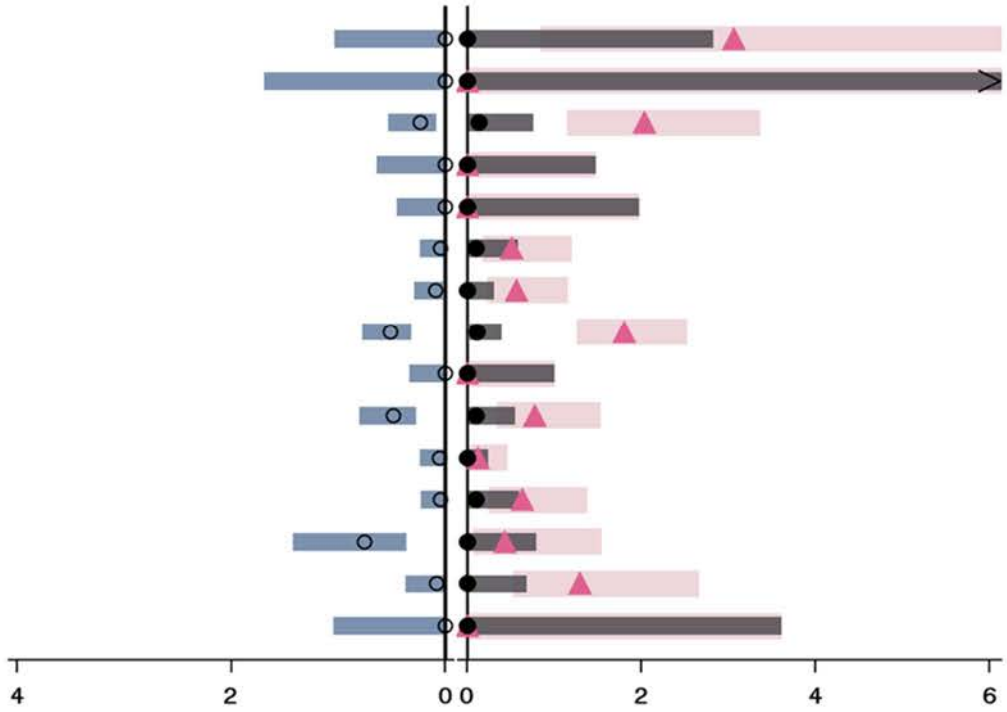
HO-BSI: hospital onset CRE blood incidence rate per 10,000 patient days and 95% confidence interval (state average = 0.1)

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

Figure 26. Hospital carbapenem resistant Enterobacterales infection rates, NYS 2021 (Page 7 of 7)

Hospital Name	# All AdmPrev	# Adms	AdmPrev Rate	HO-All Rate	HO-BSI Rate	# Patdays	# All	# BSI
UHS Binghamton	0	2901	0.0	3.1	0.0	13089	4	0
UHS Chenango Memor	0	1769	0.0	0.0	0.0	4765	0	0
UHS Wilson	4	17307	0.2	2.0	0.1	73801	15	1
UPMC Chautauqua WCA	0	4677	0.0	0.0	0.0	25092	0	0
United Memorial	0	6655	0.0	0.0	0.0	18747	0	0
Unity Hosp Rochester	1	20449	0.0	0.5	0.1	97712	5	1
Univ Hosp SUNY Upst	2	21670	0.1	0.6	0.0	125321	7	0
Univ Hosp StonyBrook	16	31442	0.5	1.8	0.1	188531	34	2
Upst. Community Gen	0	8964	0.0	0.0	0.0	37225	0	0
Vassar Brothers	11	22756	0.5	0.8	0.1	103145	8	1
Westchester Medical	1	20044	0.0	0.1	0.0	161283	2	0
White Plains Hosp	1	21390	0.0	0.6	0.1	95288	6	1
Woodhull Med Ctr	7	9224	0.8	0.4	0.0	47007	2	0
Wyckoff Heights	1	12852	0.1	1.3	0.0	54354	7	0
Wyoming County Comm.	0	2880	0.0	0.0	0.0	10264	0	0



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

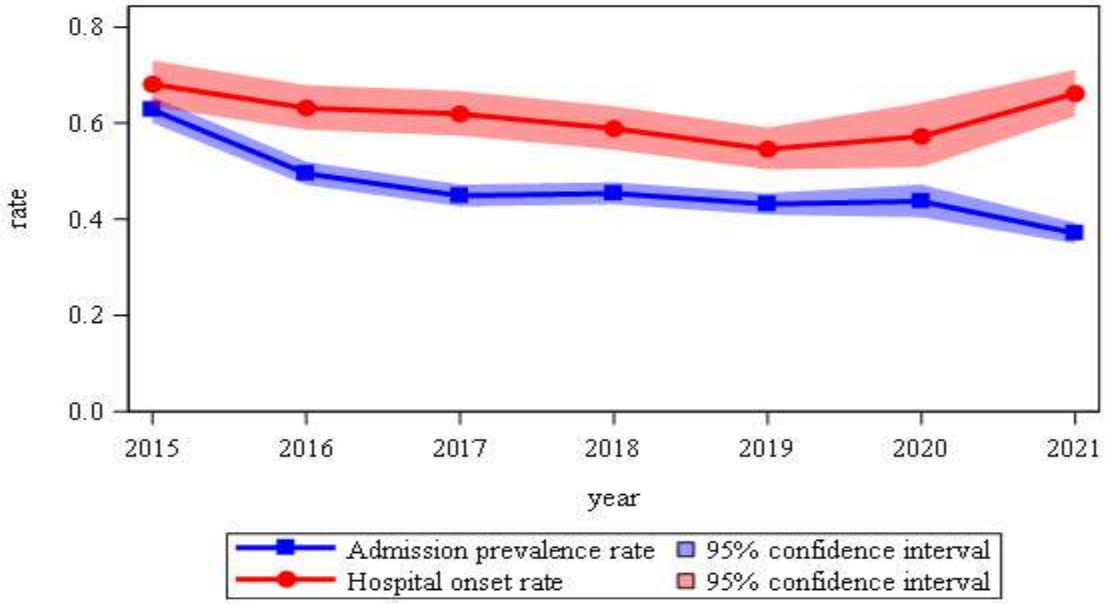
All-Admprev: all body site CRE admissions prevalence rate per 1,000 admissions and 95% confidence interval (state average = 0.2)

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 2021, 165 hospitals were required to report MRSA BSIs for participation in CMS incentive programs; small hospitals that do not meet NYS reporting requirements were excluded. While MRSA reporting is not required by NYS, NYSDOH has access to these data through the DUA and therefore NYSDOH does not audit the data and hospital specific MRSA rates cannot be published by NYSDOH.

Between 2015 and 2019, the admission prevalence MRSA BSI rate decreased 30% and decreased further between 2019 and 2021 by 15%. The hospital onset MRSA rate decreased 20% between 2015 and 2019 but increased 21% between 2019 and 2021 (Figure 27).

Figure 27. MRSA bloodstream infections, New York State 2015-2021

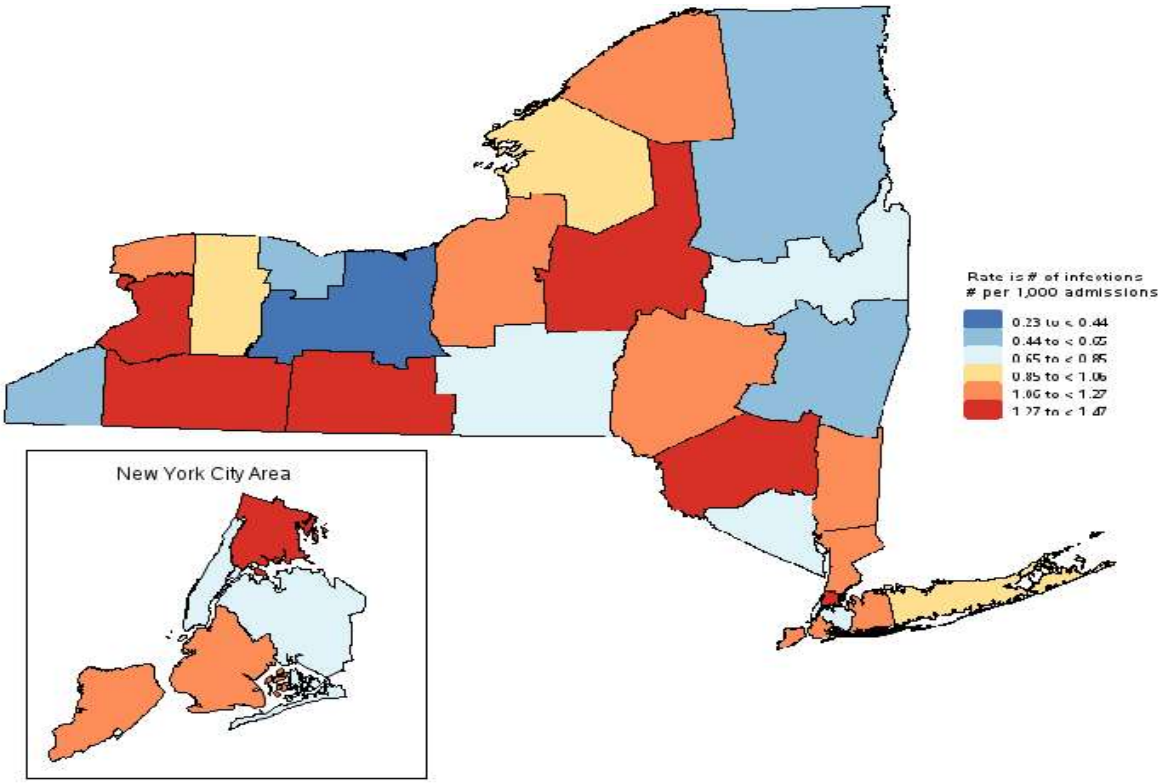


Year	# Hosp	# Emergency Dept. infections	# Admission prevalent infections	# Admissions	Admission prevalence rate (per 1,000 admissions)	# Hospital onset (HO) infections	# Patient days	HO incidence Rate (per 10,000 patient days)
2015	174	1,464	1,459	2,325,035	0.628	777	11,410,301	0.681
2016	177	1,921	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	0.546
2020	165	1,124	747	1,047,398	0.437	289	5,047,808	0.572
2021	165	2,293	1,523	2,146,879	0.371	727	10,986,148	0.662

Facility-wide inpatient data reported as of August 15, 2022.

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

Figure 28. Facility wide inpatient MRSA bloodstream infection patient prevalence rates, New York State, 2021



Facility-wide inpatient data reported as of August 15, 2022. 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.

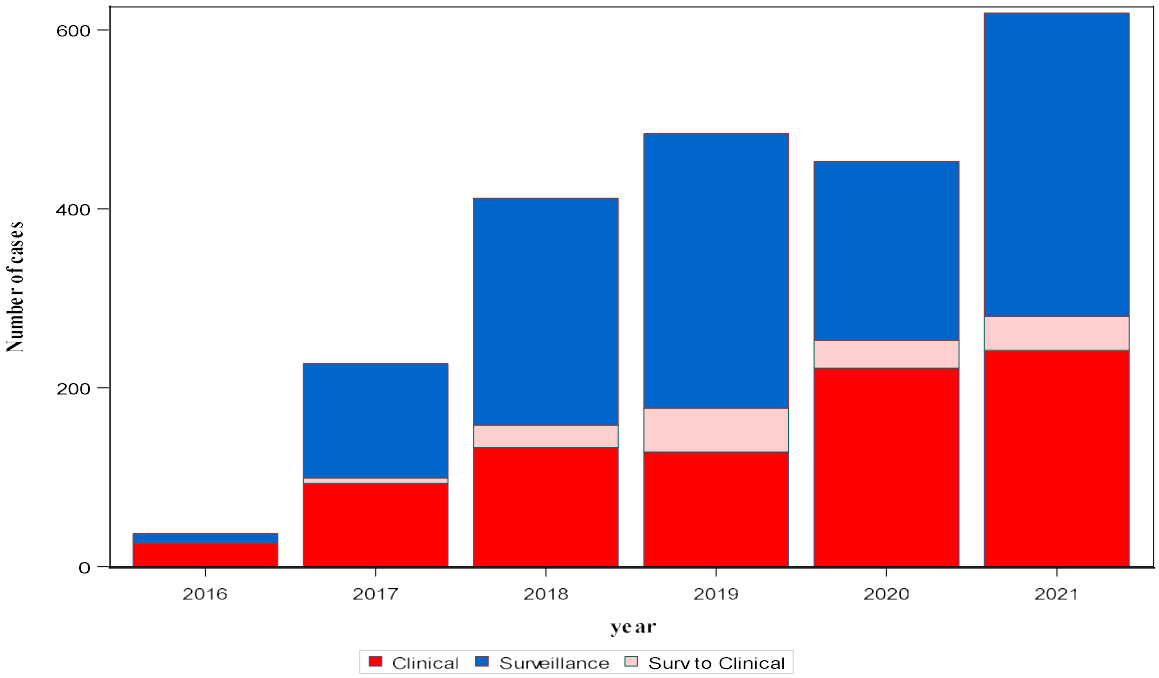
Epidemiologic and laboratory evidence continue to show that *C. auris* has been transmitted within healthcare facilities in NYC and the surrounding Metropolitan area of NYS. The NYC/Metropolitan area is one of the areas in the United States where the most *C. auris* cases have been detected; *C. auris* may already be endemic in healthcare facilities in some of the most impacted localities. Other upstate regions have begun to see *C. auris* cases, with at least one case identified in every region of NYS.

To curb further spread of *C. auris*, NYS developed a special team to address *C. auris* activity in the NYC/Metropolitan 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 medical records; developing lists of close contacts of confirmed cases; providing infection prevention and control education and recommendations to facilities with cases of *C. auris*; collecting laboratory specimens from patients/residents and environmental surfaces in facilities; monitoring to ensure facility compliance with infection prevention and control recommendations; and implementing training programs on infection prevention and control issues, including training for hospitals, nursing homes, and other health care facilities, focusing on multidrug resistant fungi and general infection prevention and control; and providing guidance on environmental cleaning and disinfection.

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 signs or symptoms of infection but have 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 2020 then develops clinical illness in 2021, the person is counted both as a 2020 surveillance case and as a surveillance-to-clinical case in 2021. For consistency, if a person is identified as a surveillance case in 2021 and develops clinical illness later in 2021, the person is counted as both a surveillance case and as a surveillance-to-clinical case in 2021.

In 2021 there were 339 surveillance cases, 242 clinical cases, and 38 clinical cases that were also previously counted as surveillance cases (Figure 29). A total of 135 patients had bloodstream infections. The average patient age was 65 (range 20 to 102 years). Cases were first identified by hospitals 78% of the time, though patients transfer frequently between hospitals and LTCFs.

Figure 29. *Candida auris* cases, New York State facilities 2016-2021



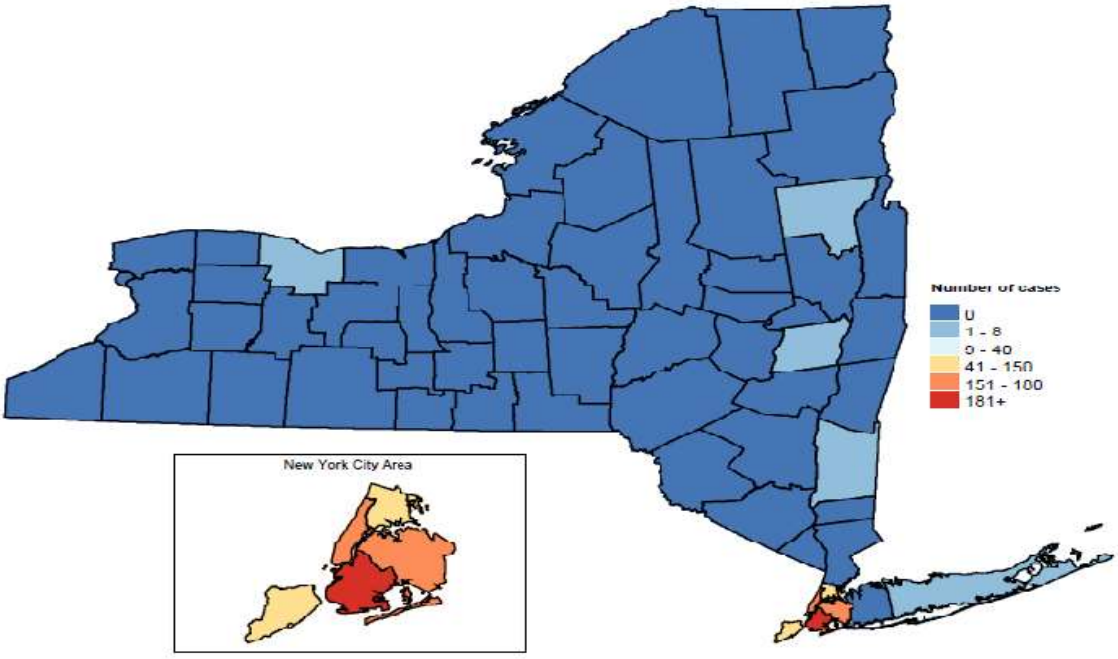
year	# clinical cases	# surveillance to clinical	# surveillance cases	# total
2016	26	0	11	37
2017	93	6	128	227
2018	133	25	254	412
2019	128	49	307	484
2020	222	21	200	453
2021	242	38	339	619

Samples reported as of November 30, 2022. First positive per person per specimen type (clinical/surveillance). Includes cases identified in hospitals, nursing homes, and other facility types.

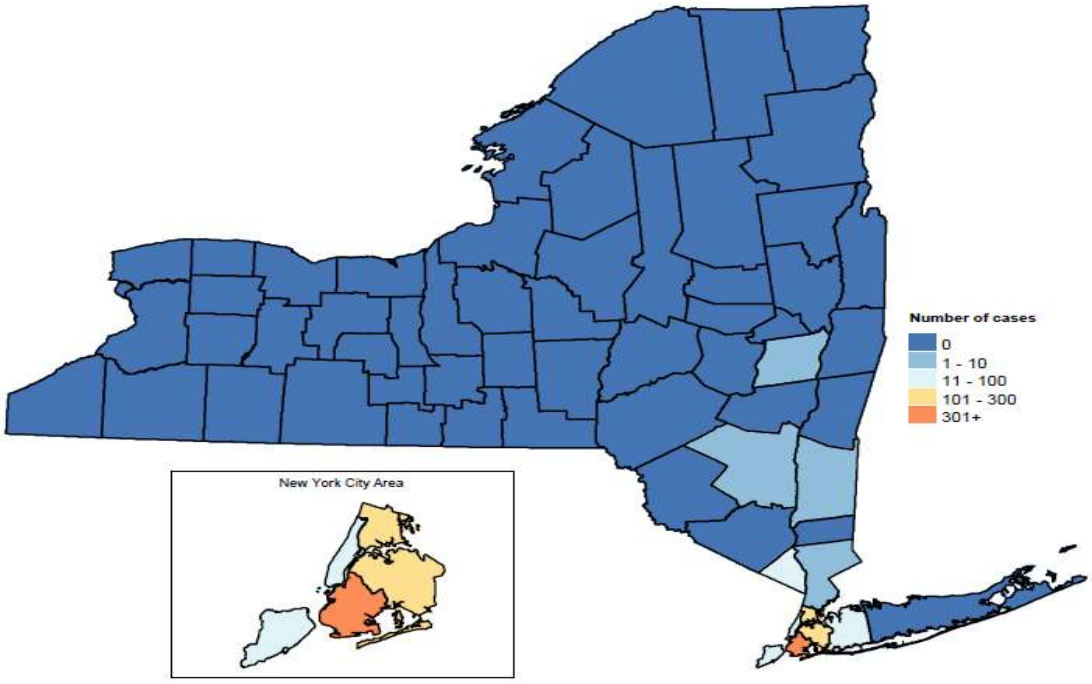
Clinical and surveillance cases are mapped by county of diagnosis in Figure 30. Cases were concentrated in Brooklyn.

Figure 30. Cumulative number of patients colonized or infected with *Candida auris*, New York State 2016-2021

a) Clinical cases



b) Surveillance cases



Samples reported as of November 30, 2022. First positive per person per specimen type (clinical/surveillance). Includes cases identified in hospitals and LTCFs.

In 2021, 51 hospitals and 27 LTCFs 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 prevention and 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 three 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 (813), 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, 2021

Infection[1]	% Attributable deaths[2]	# Cases total[3]	# Hospital onset (HO) cases	# Deaths total	# Deaths from HO Cases
Clostridioides difficile	6%	7,149	3,384	429	203
MRSA BSI	20%	1,523	727	305	145
CRE BSI	34%	234	176	80	60
Total		8,906	4,288	813	408

NHSN facility-wide inpatient data downloaded August 15, 2022. 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 2021 survey results related to MDRO prevention practices.

Table 21. MDRO Prevention Practice Survey, New York State Hospitals 2021

Patients infected or colonized with MRSA are routinely placed on Contact Precautions?	
No	22%
Yes, all infected or colonized	42%
Yes, only all infected	18%
Yes, only those with high risk	18%
Patients infected or colonized with CRE are routinely placed on Contact Precautions?	
No	0%
Yes, all infected or colonized	92%
Yes, only all infected	4%
Yes, only those with high risk	4%
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)	30%
Facility routinely performs screening cultures for MRSA in patients admitted to NICUs	20%
Facility routinely uses chlorhexidine gluconate bathing to prevent transmission of MDROs?	78%
Facility routinely uses a combination of topical chlorhexidine gluconate and intranasal mupirocin to prevent transmission of MRSA? (Note: this does not include the use of these agents in preoperative patients or dialysis patients.)	39%

National Healthcare Safety Network Surveys, downloaded August 15, 2022. All 165 hospitals responded.

Although 92% of facilities responded that they put all patients colonized and/or infected with CRE 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/eye protection), has many variations between and even within facilities. Some policies require all persons, i.e., healthcare workers and visitors, who enter the room of someone on Contact Precautions to don PPE; others exclude visitors from wearing PPE.

Antimicrobial stewardship and use

Appropriate use of antimicrobials is a recognized element of global efforts to combat antimicrobial resistance. In 2021, 96.6% of NYS hospitals reported meeting all seven elements of the CDC Core Elements of Antimicrobial Stewardship Programs (ASPs)[4,5] (Table 22). In 2021, 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 required to have ASPs in place and should focus efforts on ensuring effectiveness of the programs.

Table 22. Antimicrobial stewardship practices in NYS hospitals, 2021 survey (NHSN)

CDC Core Elements of antimicrobial stewardship program	% met
1. Hospital Leadership Commitment*	**100%**
Facility leadership providing a formal statement of support for antibiotic stewardship	86.4%
Hospital leadership communicates to staff about stewardship activities	83.0%
Hospital leadership provides opportunities for staff training and development	79.7%
Hospital leadership allocates information technology resources	83.6%
Annually Presenting information on stewardship activities and outcomes to facility leadership/board	82.5%
- Ensuring that staff from key support departments and groups	76.8%
Leadership dedicate time, have a champion, and ensure opportunity to discuss resource needs	93.8%
Physician leader has antibiotic stewardship responsibilities in job description/contract	58.2%
Pharmacist leader has antibiotic stewardship responsibilities in job description/contract	66.7%
2. Accountability	**99.4%**
A leader is responsible for program outcomes of stewardship activities.	99.4%
3. Drug Expertise*	**98.9%**
Antibiotic stewardship outcomes are lead/co-lead by pharmacist	87.1%
Lead/co-lead is not pharmacist, but at least one pharmacist is responsible for improving antibiotic use	11.2%
4. Action (Implementing recommended interventions) *	**100%**
Early administration of effective antibiotics to optimize the treatment of sepsis	87.0%
Treatment protocols for Staphylococcus aureus bloodstream infection	50.3%
Stopping unnecessary antibiotic(s) in new cases of Clostridioides difficile infection (CDI)	57.6%
Review of culture-proven invasive (e.g., bloodstream) infections	63.3%
Review of planned outpatient parenteral antibiotic therapy (OPAT)	20.3%
Assess and clarify documented penicillin allergy	54.8%
Prospective audit and feedback for specific antibiotic agents.	85.9%
Preauthorization for specific antibiotic agents.	77.4%
Facility-specific treatment recommendations, based on national guidelines and local pathogen	81.9%
The treating team to review antibiotics 48-72 hours after initial order (i.e., antibiotic time-out).	53.1%
Using the shortest effective duration of antibiotics at discharge for common clinical conditions	45.2%
Our facility has in place the following specific 'pharmacy-based' interventions	93.2%
Our facility has in place the following specific 'nursing-based' interventions	19.1%
5. Tracking*	**100%**
Our stewardship program monitors adherence to our facility's treatment recommendations for antibiotic selection for common clinical conditions	84.8%
Our antibiotic stewardship program monitors prospective audit and feedback interventions	96.7%
Our antibiotic stewardship program monitors preauthorization interventions	77.4%
Our stewardship program monitors to use of shortest effective duration of antibiotics at discharge	65.0%

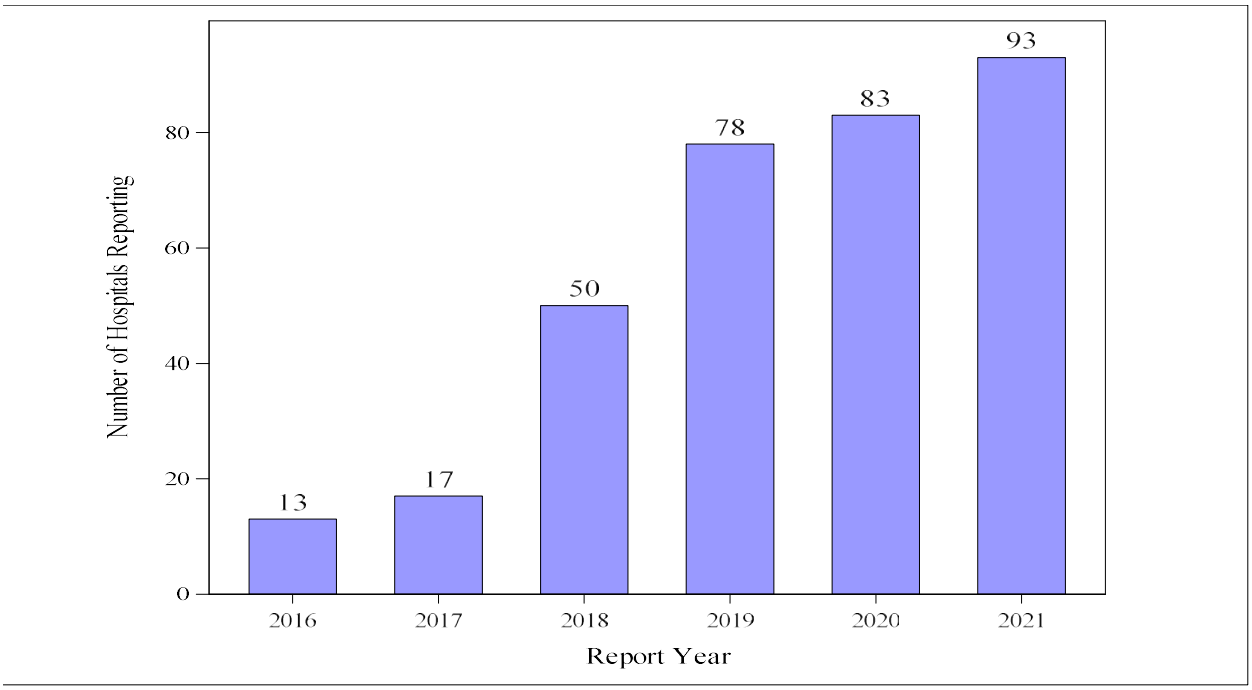
Stewardship team monitors antibiotic resistance patterns (either facility- or region-specific)	92.7%
Stewardship team monitors antibiotic use in days of therapy (DOT) per 1000 patient days or days present	79.1%
Stewardship team monitors antibiotic use in defined daily doses (DDT) per 1000 patient days	18.6%
Stewardship team monitors antibiotic expenditures	52.5%
6. Reporting*	**97.8%**
Stewardship team provides prospective audit and feedback to treatment team (also counted as an action)	85.9%
Stewardship team provides facility/unit/service-specific reports on antibiotics with prescribers	42.7%
Our facility distributes an antibiogram to prescribers, at least annually	94.4%
Information on antibiotic use, antibiotic resistance, and stewardship efforts is reported to staff	91.0%
7. Education*	**98.9%**
Stewardship program provides education to prescribers on improving antibiotic prescribing	81.4%
Stewardship program provides education to nurses on improving antibiotic prescribing	55.4%
Stewardship program provides education to pharmacists on improving antibiotic prescribing	80.2%
Total:** Met all 7 Core Elements above	**96.6%**

Annual survey data downloaded from National Healthcare Safety Network on August 15, 2022.
* 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 antimicrobial use as part of an ASP. Between 2015 and 2021, the number NYS of hospitals that submitted AU data to NHSN increased from 13 to 93 (56% of the 165 hospitals included in this report, Figure 31). These data are visible to NYSDOH via the CDC-NYS DUA, but the DUA prohibits NYSDOH from publishing hospital specific data.

Figure 31. Number of hospitals reporting antimicrobial use data to the National Healthcare Safety Network, New York State 2015-2021



In 2021, NYS hospitals participating in NHSN reported an average antimicrobial usage rate of 546 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 2021 NYS SAAR of 0.93 (Table 23) indicates that NYS antimicrobial use data was 7% 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 2021, 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	3,438,779	3,691,429	546.3	0.93
[2] Broad spectrum antibacterial agents predominantly used for hospital-onset	688,370	869,621	109.4	0.79
[3] Broad spectrum antibacterial agents predominantly used for community-acquired infections	1,013,740	970,378	161.1	1.04
[4] Antibacterial agents predominantly used for resistant Gram-positive infections (e.g.,	485,723	630,088	77.2	0.77
[5] Narrow spectrum beta-lactam agents	497,664	558,798	79.1	0.89
[6] Antibacterial agents posing the highest risk for CDI	908,588	1,091,385	144.3	0.83
[7] Antifungal agents predominantly used for invasive candidiasis	136,604	160,826	21.7	0.85

National Healthcare Safety Network data reported as of August 15, 2022.

[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

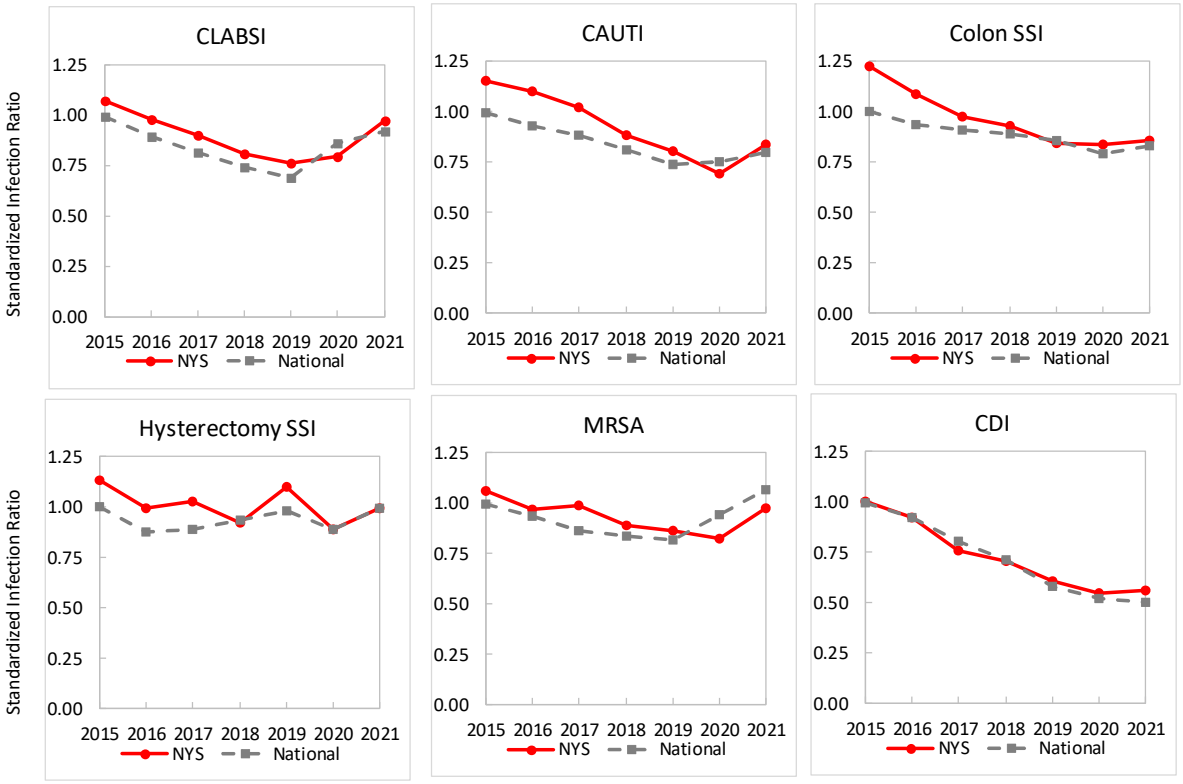
Measurement of antibiotic use and evaluation and intervention to ensure appropriate use are important in healthcare, including hospitals, long term care, and ambulatory/outpatient care settings.[6,7,8] Guidelines and numerous training programs are available through federal and state partners, as well 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. 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[9]. Figure 32 summarizes data from the 2015-2021 CDC reports.

Figure 32. Trends in New York State and National Standardized Infection Ratios



Type of Hospital-Acquired Infection	2021 New York SIR^	2021 National SIR^
Central-line associated bloodstream infections (CLABSIs)*	0.974	0.921
Catheter-associated urinary tract infections (CAUTI)	0.835	0.795
Colon surgical site infections (SSIs)*	0.855	0.831
Abdominal hysterectomy SSIs*	0.996	0.993
MRSA bacteremia	0.975	1.071
Clostridioides difficile infections (CDI)*	0.558	0.501

Source of data: CDC. 2015, 2016, 2017, 2018, 2019, 2020 and 2021 National and State Healthcare-associated Infection Data Reports.
^ Standardized Infection Ratio is compared to national 2015 baseline
* Data audited by New York State

Between 2015 and 2021 both state and national HAI rates improved or remained without significant change for all indicators except CLABSI, CAUTI and MRSA BSIs. Figure 32 shows that most rates in NYS tend to track slightly higher than national rates, except for MRSA BSI. Multiple factors may affect this trend:

1. Many states do not audit NHSN data, thereby missing infections that would be found on audit.

2. NYSDOH audit protocols may be more rigorous than those of 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.
3. Data validation processes, e.g., routinely reviewing NHSN data, often identify additional infections that were missed by hospital IPs. These missed infections are then reported through NHSN, resulting in higher reported rates.
4. Training conducted during audits may increase the skills of the hospital IPs, leading to better identification of HAIs, and therefore higher reported case rates.
5. The presence of a validation process in a state might encourage increased care and thoroughness in reporting, which could result in higher reported case rates.
6. NYS might truly have higher rate(s).

Summary

Table 24 summarizes the total number of each type of HAI for NYS in 2021. The table is sorted from most common to least common.

Table 24. Inpatient infections reported by New York State hospitals in 2021

Type of infection	Number	Rate
Hospital onset *Clostridioides difficile* infections (CDIs)	3,708	3.58/10,000 patient days
Surgical site infections (SSIs) following		
Colon surgery[B]	713	3.82/100 procedures
Spinal fusion surgery[N]	352	1.36/100 procedures
Hip replacement or revision surgery[N]	262	0.90/100 procedures
Abdominal hysterectomy surgery[B]	180	1.27/100 procedures
Coronary artery bypass graft (CABG) - chest site[N]	141	1.50/100 procedures
CABG - donor site[N]	27	0.32/100 procedures
Central line-associated bloodstream infections (CLABSIs) in intensive care units and medical and surgical wards[B] and step down, oncology, and mixed acuity and telemetry units[N]	1,731	1.05/1,000 line days
Catheter-associated urinary tract infections (CAUTIs) in intensive care units, and medical/surgical wards	1,400	1.01/1,000 catheter days
Hospital onset methicillin-resistant *Staphylococcus aureus* (MRSA) bloodstream infections[C]	727	0.66/10,000 patient days
Hospital onset carbapenem-resistant *Klebsiella, E. coli,* and *Enterobacter* (CRE) bloodstream infections[N]	176	0.16/10,000 patient days

N = required by NYS, C = required by Centers for Medicare and Medicaid Services (CMS; these data are accessible through a data use agreement but cannot be used for public reporting or regulatory action), B = required by both NYS and CMS. CDI, CRE, and MRSA events are from facility-wide inpatient location only. Data reported August 15, 2022. 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 51% 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 2021, 18,950 infections were prevented because of reductions in HAI rates; this was related to a cost savings of $220 to $407 million.

Table 25 also compares NYS progress to national and state prevention goals. NYS met the 2021 CDI and colon SSI goals but did not meet goals for the other indicators.

Table 25. Cost savings associated with change in HAI rates between 2015 and 2021

Type of Infection	National/State 2015-2019 prevention goal	2021 Improvement since 2015 (compared to 2019 goal)	# Prevented infections	Direct cost savings (in millions)	
				Min	Max
Hospital onset *Clostridioides difficile* infections (CDI)	30%	improved 51% (met goal)	15,202	$161.2	$229.6
Colon surgery SSIs	30%	improved 32% (met goal)	1,469	$28.9	$84.3
Central line-associated bloodstream infections (CLABSIs)	50%	improved 6% (missed goal)	1381	$16.7	$66.6
Hospital onset carbapenem-resistant Enterobacterales (CRE) bloodstream infections	25%	improved 20% (missed goal)	216	$7.0	$8.4
Coronary artery bypass graft chest SSIs	30%	improved 6% (missed goal)	171	$4.3	$12.6
Hip replacement or revision surgery SSIs	30%	improved 6% (missed goal)	111	$2.2	$6.4
Abdominal hysterectomy surgery SSIs	30%	worsened 3% (missed goal)	21*	$0.4	$1.2
Total			18,571	$220.1	$409.1

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 Enterobacterales (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 because of improvements in 2016 and 2018.

Table 26. Summary of Hospital-Acquired Infections, New York State, 2019 and 2021.

Type of Hospital-Acquired Infection	2019 Rate	2021 Rate	Change
Central-line associated bloodstream infections (CLABSIs)*	0.82	1.05	22% worse
Surgical site infections (SSIs)			
Colon surgery	4.04	3.82	5% improve
Coronary Artery Bypass Graft (Chest)	1.24	1.51	21% worse
Hip replacement/revision surgery	0.88	0.90	No change
Abdominal hysterectomy	1.33	1.27	4% improve
Spinal fusion surgery	1.18	1.36	13% worse
Hospital onset *Clostridioides difficile* infections (CDI)	4.07	3.59	12% improve
Hospital onset carbapenem-resistant Enterobacterales (CRE)	0.68	0.88	13% worse

Compared to 2015 data, most HAI rates showed some improvements in 2021. But there was a significant increase in overall CLABSI rates between 2019 and 2021. Hospital onset CRE rates increased significantly from 0.68 to 0.88 per 10,000 patient days. However, hospital onset CDI rate showed a significant improvement between 2019 and 2021 (Table 26).

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 of 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 assist as needed.

Appendix 1: List of Abbreviations

AIDS – Acquired immune deficiency syndrome
ASA – American Society of Anesthesiologists'
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 Enterobacterales
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 before 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 an 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: the weight of an 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): a measure of the relationship between a person's weight and their height. The formula to calculate BMI is weight (kg)/[height (m)]^2.

Catheter-associated urinary tract infection (CAUTI): 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.

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

Carbapenem-resistant Enterobacterales (CRE): Bacteria in the Enterobacterales 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 used to compare NYS to the National standard. 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

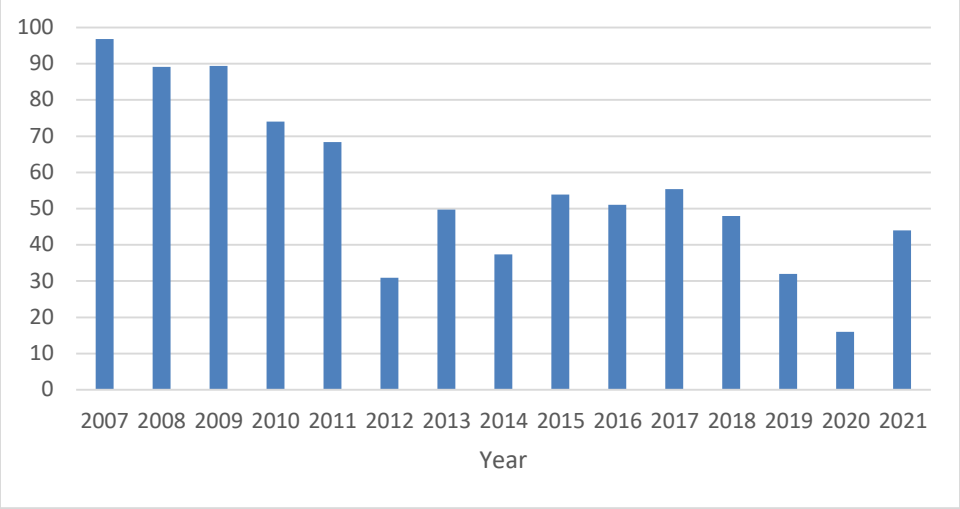
Data reported to the NHSN are validated by the NYSDOH using several methods.

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 33 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. Audits for 2019 and 2020 data were disrupted by pandemics and only small percentage of hospitals were audited.

Figure 33. 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 2021 audit results will be summarized in the next annual report. In 2019, NYSDOH staff reviewed 4,571 records and agreed with the hospital-reported infection status 96.7 % of the time. In 2020, NYSDOH staff reviewed 2,742 records and agreed with the hospital-reported infection status 95.4 % of the time. Disagreements were discussed with the IPs and corrected in NHSN. Table 27 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 27. Brief summary of 2019 HAI audit

Type of infection	# Qualified[1] records Rrviewed	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	431	58	1	340	32	92.3 %
CABG SSI	80	14	0	66	0	100.0 %
Hyst SSI	359	34	1	315	9	97.2 %
Hip SSI	400	44	1	349	6	98.3 %
CLABSI	498	118	2	347	31	93.4 %
CDI	2,165	2,013	0	92	60	97.2 %
CRE	322	295	0	26	1	99.7 %
Total	4,571	2,607	5	1812	147	96.7 %

Brief summary of 2020 HAI audit

Type of infection	# Qualified[1] records Rrviewed	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	198	38	2	135	23	87.4 %
CABG SSI	48	12	0	33	3	93.8 %
Hyst SSI	149	14	1	123	11	91.9 %
Hip SSI	173	24	1	144	4	97.1 %
CLABSI	341	112	0	190	39	88.6 %
CDI	1,407	1,342	0	32	33	97.7 %
CRE	259	243	4	12	0	98.5 %
Total	2,742	1,806	8	809	119	95.4 %

SSI = surgical site infection; CLABSI = central line associated bloodstream infection; CDI = *Clostridioides difficile* infection; CRE = carbapenem resistant Enterobacterales.

[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).

The 2019 audit was conducted between October 2019 and February 2021 (with interruptions because of pandemics), and predominantly covered 2019 data. The 2020 audit was conducted between March 2021 and August 2021.

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 165 hospitals reporting complete data for 2021. 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.

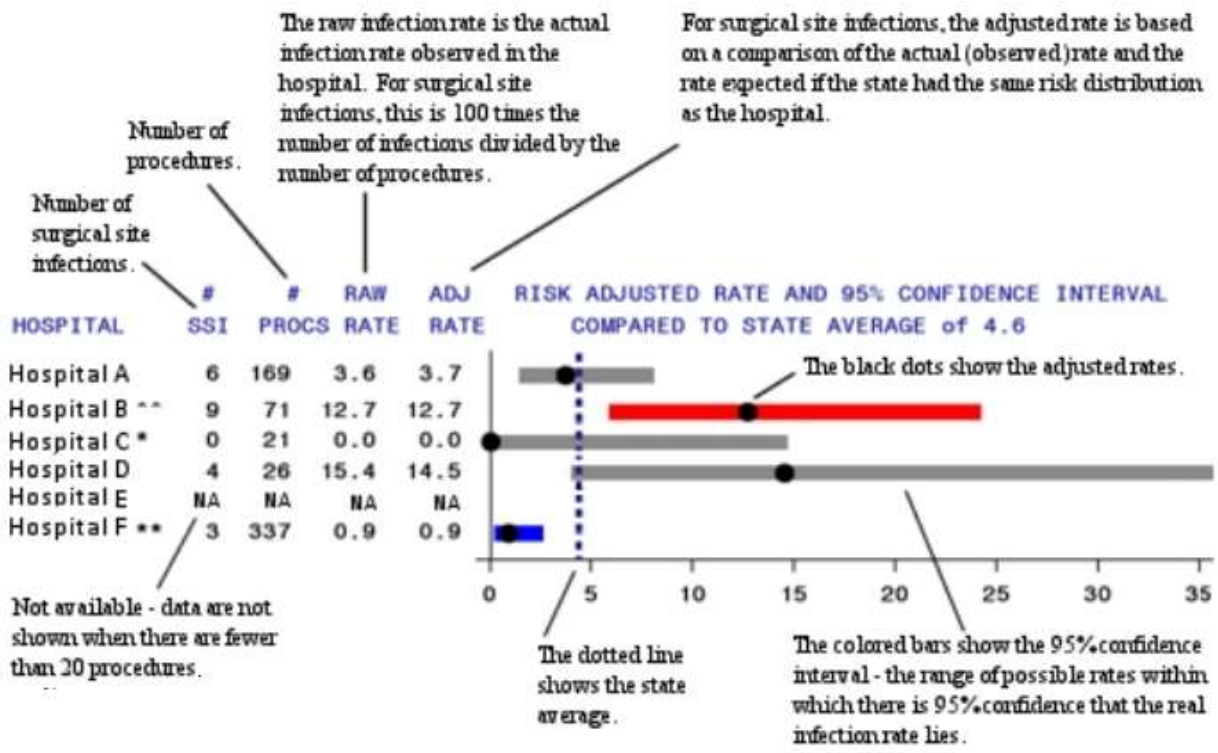
- For surgical site infections there must be a minimum of 20 patients undergoing a surgical procedure.
- For CLABSIs there must be a minimum of 50 central line days. Central line days are the total number of days central lines are used for each patient in a location over a given period of time.
- For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

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 34 provides an example of how to interpret the hospital specific SSI infection rate tables.

Figure 34. How to read hospital specific SSI 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 previous reports, we summarized the CLABSI results for ICUs and wards into the CLABSI SIR, which described the average performance for each hospital across the units. For example, if a hospital performed significantly better than average for medical ICU and significantly worse than surgical ICU, the hospital CLABSI SIR would be average (1.) If a hospital performed somewhat worse than average for medical ICU even without unit-specific flags, the CLABSI SIR might flag the hospital as significantly worse than average overall because the confidence interval decreases when all the units are combined.

The advantages of the SIR are that it summarizes unit specific infections 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 CLABSI rates. The disadvantages are that one cannot tell which unit has a problem without drilling down to the unit-specific adjusted rates, and some prevention strategies or bundles are not location- specific. In particular, hospitals that were flagged with a high CLABSI SIRs and no unit-specific high rates found it difficult to write improvement plans. In conclusion, after discussing we decided to remove the CLABSI SIR from the 2021 report.

Attributable mortality of CDI/MDROs

Attributable mortality rates were calculated using the data in Table 28. 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 28. Attributable mortality estimates from literature review

MDRO	Reference	# MDROs	% Deaths MDROs	% Deaths controls	Attributable mortality %
CDI	Dodek 2013[10]	227	29	27	2.0
	Gravel 2009[11]	1430	N/A	N/A	5.7
	Kenneally 2007[12]	278	36.7	30.6	6.1
	Loo 2005[13]	1703	N/A	N/A	6.9
	Pepin 2005[14]	161	23	7	16.0
	Tabak 2013[15]	255	11.8	7.3	4.5
	Dubberke 2008[16]	353	36	30.3	5.7
	Hensgens 2013[17]	317	14.8	5.4	9.4
	Barbut 2017[18]	482	9	5	4.0
	Weighted average				**6**
CRE	Borer 2009[19]	32	71.9	21.9	50.0
	Mouloudi 2014[20]	37	NA	NA	27.0
	Gallagher 2014[21]	43	45	18	27
	Weighted average				**34**
MRSA	Harbarth 1998[22]	39	36	28	8.0
	DeKraker 2011[23]	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 2021 report, each hospital's 2021 data is compared to 2021 data reported by other hospitals in NYS.

- In CMS Hospital Compare, each hospital's 2021 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 2021.
Finally, the statistical models used to predict HAI rates in NYS and CMS models are slightly different. These differences are described in Table 29. 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.[24]
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[25].

Table 29. Comparison of New York State and Centers for Medicare and Medicaid Services (CMS) Methods for 2021 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 2021 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 2021 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 2021 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 2021 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 21 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 2021 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 2021 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 30 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 30. 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
	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	Bronx-Lebanon
	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 Memorial
Chautauqua	0103	330239	UPMC Chautauqua at WCA	UPMC Chautauqua WCA
	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	Champlain Valley
Columbia	0146	330094	Columbia Memorial Hospital	Columbia Memorial
Cortland	0158	330175	Guthrie Cortland Medical Center	Cortland Reg Med
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

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Franklin	0324	330079	Adirondack Medical Center-Saranac Lake Site	Adirondack Medical
	0325	330084	The University of Vermont Health Network - Alice Hyde Medical Center	Alice Hyde Med Ctr
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 MedCr
	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
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	South Nassau Comm.
	0563	330182	St Francis Hospital	St Francis- Roslyn
	0511	330167	NYU Winthrop Hospital	NYU Winthrop
	0513	330259	Mercy Medical Center	Mercy Med Ctr

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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 St Lukes
	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
Niagara	0583	330188	Mount St Marys Hospital and Health Center	Mount St. Marys
	0565	330163	Eastern Niagara Hospital - Lockport Division	East. Niag. Lockport
	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	Univ Hosp SUNY Upst
	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	Garnet Middletown
	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

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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	Long Isl Jewish(LIJ)
	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	Cohen Childrens Hospital	Cohens Childrens
Rensselaer	0756	330180	Samaritan Hospital	Samaritan- Troy
Richmond	1740	330160	Staten Island University Hosp-North	Staten Island U N
	1738	330028	Richmond University Medical Center	Richmond Univ MC
	1737	330160	Staten Island University Hosp-South	Staten Island U S
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	Stony Brook ELIH
	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 UHosp
	0889	330340	Stony Brook Southampton Hospital	Stony Brk Southamptn
	0245	330393	Stony Brook University Hospital	Univ Hosp StonyBrook
	0913	330045	Huntington Hospital	Huntington Hospital
	0895	330185	John T Mather Memorial Hospital of Port Jefferson New York Inc	JT Mather Hospital
Sullivan	0971	330386	Garnet Health Medical Center - Catskills	Garnet Catskills
Tompkins	0977	330307	Cayuga Medical Center at Ithaca	Cayuga Medical Ctr
Ulster	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	St Johns Riverside
	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 Pavilion	St Johns Dobbs Ferry
Wyoming	1153	330008	Wyoming County Community Hospital	Wyoming County Comm.

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References

[1] Cohen AL, Calfee D, Fridkin SK, Huang SS, Jernigan JA, et al. Recommendations for metrics for multidrug-resistance organisms in healthcare settings: SHEA/HICPAC position paper. Infect Control Hosp Epidemiol. 2008. 29: 901-913.

[2] Chitnis AS, Caruthers PS, Rao AK, Lamb JA, Lurvey R, De Rochars VB, Kitchel B, Cancio M, Török TJ, Guh AY, Gould CV, and Wise ME. Outbreak of carbapenem-resistant Enterobacteriaceae at a long-term acute care hospital: sustained reductions in transmission through active surveillance and targeted interventions. Infect Control Hosp Epidemiol. 2012. 33: 984-992.

[3] New York State Department of Health. Vital statistics of New York State 2018. Table 33a: Deaths and death rates by selected causes and race New York State 2018. https://www.health.ny.gov/statistics/vital_statistics/2018/table33a.htm. Accessed 5/21/2021.

[4] Centers for Disease Control and Prevention. Core elements of hospital antibiotic stewardship programs. https://www.cdc.gov/antibiotic-use/healthcare/implementation/core-elements.html. Accessed 10/15/2022.

[5] Centers for Disease Control and Prevention. Hospital Stewardship Implementation Resources Webpage. https://www.cdc.gov/antibiotic-use/core-elements/implementation.html. Accessed 10/15/2022.

[6] Centers for Disease Control and Prevention. The Core Elements of Antibiotic Stewardship for Nursing Homes. https://www.cdc.gov/longtermcare/prevention/antibiotic-stewardship.html. Accessed 10/15/2022.

[7] Centers for Disease Control and Prevention. Implementation of Antibiotic Stewardship Core Elements at Small and Critical Access Hospitals. Available at https://www.cdc.gov/antibiotic-use/healthcare/implementation/core-elements-small-critical.html. Accessed 10/15/2022.

[8] Centers for Disease Control and Prevention. Core Elements of Outpatient Antibiotic Stewardship. https://www.cdc.gov/antibiotic-use/community/improving-prescribing/core-elements/core-outpatient-stewardship.html. Accessed 10/15/2022.

[9] CDC. The 2019 National and State Healthcare-associated Infection Data Report. https://www.cdc.gov/hai/data/portal/progress-report.html. Accessed 12/7/2020.

[10] Dodek PM, Norena M, Ayas NT, Romney M, Wong H. Length of stay and mortality due to *Clostridioides difficile* infection acquired in the intensive care unit. Journal of Critical Care. 2013; 28: 335-340.

[11] Gravel D, Miller M, Simor A, Taylor G, Gardam M, McGeer A, Hutchinson J, Moore D, Kelly S, Boyd D, Mulvey M, Canadian Nosocomial Infection Surveillance Program. Health care-associated *Clostridioides difficile* infection in adults admitted to acute care hospitals in Canada: a Canadian Nosocomial Infection Surveillance Program study. Clinical Infectious Diseases. 2009; 48:568-576.

[12] Kenneally C, Rosini JM, Skrupky LP, Doherty JA, Hollands JM, Martinez E, McKenzie W, Murphy T, Smith JR, Micek ST, Kollef MH. Analysis of 30-Day mortality for *Clostridioides difficile*-associated disease in the ICU setting. Chest. 2007; 132:418-424.

[13] Loo VG, Poirier L, Miller MA, Oughton M, Libman MD, Michaud S, Bourgault A, Nguyen T, Frenette C, Kelly M, Vibien A, Brassard P, Fenn S, Dewar K, Hudson TJ, Horn R, René P, Monczak Y, Dascal A. A predominantly clonal multi-institutional outbreak of *Clostridioides difficile*-associated diarrhea with high morbidity and mortality. New England Journal of Medicine. 2005; 353:2442-2449.

[14] Pépin J, Valiquette L, Cossette B. Mortality attributable to nosocomial *Clostridioides difficile*-associated disease during an epidemic caused by a hypervirulent strain in Quebec. Canadian Medical Association Journal. 2005: 173(9).

[15] Tabak YP, Zilberberg MD, Johannes RS, Sun X, McDonald LC. Attributable burden of hospital-onset *Clostridioides difficile* infection: a propensity score matching study. Infection Control and Hospital Epidemiology. 2013; 34:588-596.

[16] Dubberke ER, Butler AM, Reske KA, Agniel D, Olsen MA, D'Angelo G, McDonald LC, Fraser VJ. Attributable Outcomes of Endemic Clostridioides difficile–associated Disease in Nonsurgical Patients. Emerging Infectious Diseases 2008; 14:1031-1038.

[17]Hensgens MP, Goorhuis A, Dekkers OM, van Benthem BH, Kuijper EJ. All-cause and disease-specific mortality in hospitalized patients with Clostridioides difficile infection: a multicenter cohort study.
Clinical Infectious Diseases. 2013; 56:1108-16.

[18] Barbut F, Bouée S, Longepierre L, Goldberg M, Bensoussan C, Levy-Bachelot L. Excess mortality between 2007 and 2014 among patients with Clostridioides difficile infection: a French health insurance database analysis. Journal of Hospital Infection. 2017. pii: S0195-6701(17)30388-2.

[19] Borer A, Saidel-Odes L, Riesenberg K, Eskira S, Peled N, Nativ R, Schlaeffer F, Sherf M. Attributable mortality rate for carbapenem-resistant *Klebsiella pneumoniae* bacteremia. Infect Control Hosp Epidemiol. 2009; 30: 972-976.

[20] Mouloudi E, Protonotariou E, Zagorianou A, Iosifidis E, Karapanagiotou A, Giasnetsova T, Tsioka A, Roilides E, Sofianou D, Gritsi-Gerogianni N. Bloodstream infections caused by metallo-β-lactamase/*Klebsiella penumoniae* carbapenemase-producing *K. pneumoniae* among intensive care unit patients in Greece: risk factors for infection and impact of type of resistance on outcomes. Infect Control Hosp Epidemiol. 2010; 31:1250-1256.

[21] Gallagher JC, Kuriakose S, Haynes K, Axelrod P. Case-case-control study of patients with carbapenem-resistant and third-generation-cephalosporin-resistant Klebsiella pneumoniae bloodstream infections.
Antimicrobial Agents Chemotherapy. 2014; 58:5732-5735.

[22] Harbarth S, Rutschmann O, Sudre P, Pittet D. Impact of methicillin resistance on the outcome of patients with bacteremia caused by *Staphylococcus aureus*. Archives of Internal Medicine. 1998; 158:182-189.

[23] DeKraker MEA, Wolkewitz M, Davey PG, Grundmann H. Clinical impact of antimicrobial resistance in European hospitals: excess mortality and length of hospital stay related to methicillin-resistant *Staphylococcus aureus* bloodstream infections. Antimicrobial Agents and Chemotherapy. 2011; 55:1598-1605.

[24] CDC. The NHSN Standardized Infection Ratio: A Guide to the SIR (Updated March 2019). Available at https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/nhsn-sir-guide.pdf.

[25] March M, Haley V, Lutterloh E. Analysis of the impact of surgical site infections on post-operative length of stay following hip replacements and revisions in New York State, 2008–2012. Poster, 2014 CSTE Conference, Nashville.