HOSPITAL-ACQUIRED INFECTIONS

New York State

2013

New York State Department of Health, Albany, NY
September 2014

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Executive Summary

Hospital-acquired infections (HAIs) result in prolonged hospital stays, unnecessary deaths, increased antimicrobial resistance, greater healthcare costs, and added emotional and personal costs to patients and their families. This report summarizes HAI rates in New York State (NYS) hospitals in 2013. It is the seventh annual report to be issued since reporting began in 2007 following the implementation of Public Health Law 2819. All NYS HAI reports are available at http://www.health.ny.gov/statistics/facilities/hospital/hospital_acquired_infections/. These data are available for download at https://health.data.ny.gov/.

In 2013, 170 NYS acute care hospitals reported HAI data to meet NYS requirements. Table 1 summarizes the number of infections and infection rates by type of infection in 2013 and identifies whether the data were required by NYSDOH, the Centers for Medicare and Medicaid Services (CMS), or both. Community-onset infections (i.e. infections identified on the first three days of a hospital admission and therefore likely acquired before admission) are not the primary focus of the HAI Reporting Program, but they impact the development of HAIs in the hospital setting. The most common type of HAI reported was *Clostridium difficile* infections (CDIs), followed by surgical site infections (SSIs), catheter-associated urinary tract infections (CAUTIs), methicillin-resistant *Staphylococcus aureus* (MRSA) bloodstream infections (BSI), central line-associated bloodstream infections (CLABSIs), and carbapenem-resistant Enterobacteriaceae (CRE) bloodstream infections.

Table 1. Infections reported by New York State hospitals in 2013

Type of infection	Number	Rate
Clostridium difficile infections (CDIs) among inpatients[B]		
Hospital-onset, incident	9,341	7.6/10,000 patient days
Community onset	10,333	0.5/100 admissions
Surgical site infections (SSIs) following		
Colon surgery[B]	1,317	7.4/100 procedures
Abdominal hysterectomy surgery[B]	377	2.0/100 procedures
Hip replacement or revision surgery[N]	289	1.0/100 procedures
Coronary artery bypass graft (CABG) - chest site[N]	171	1.6/100 procedures
CABG - donor site[N]	48	0.5/100 procedures
Catheter-associated urinary tract infections (CAUTIs) in intensive care units[C]	1,952	2.9/1,000 catheter days
Methicillin-resistant *Staphylococcus aureus* (MRSA) bloodstream infections among inpatients[C]		
Hospital-onset	858	0.66/10,000 patient days
Community-onset	2,564	0.1/100 admissions
Central line-associated bloodstream infections (CLABSIs) in intensive care units[B]	612	1.0/1,000 line days
Carbapenem-resistant *Klebsiella* and *E. coli* bloodstream infections among inpatients[N]		
Hospital-onset	278	0.22/10,000 patient days
Community-onset	162	0.008/100 admissions

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. Data available only for part of the year have been annualized.

Trends

CLABSI rates, SSI rates, and CDI rates declined since public reporting of these indicators began. Declines in CLABSIs leveled off in 2013, but compared to 2007 there was a 52% decrease, resulting in approximately 2,700 CLABSIs prevented and a direct cost savings of $20 million to $79 million. SSI rates decreased 23%, resulting in approximately 800 infections prevented and a total savings of $9.5 to $27.7 million. CDI rates decreased 25%, resulting in approximately 8,000 fewer HO infections and an associated cost savings of $52 million to $74 million. Many factors have likely contributed to the decline, including the attention drawn to HAIs through public reporting, ongoing efforts by infection preventionists (IPs) and other healthcare workers to improve infection prevention practices, and the support of external partners including professional societies, government agencies, and other associations.

Data Validation

Since HAI reporting began in 2007, NYSDOH has validated the accuracy of the data by reviewing medical records during audits. In 2013, 50% of hospitals were audited. The intensity of the auditing performed by NYSDOH exceeds the intensity of auditing performed by most 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. NYSDOH continues to take advantage of technological developments in healthcare information by performing off-site audits through remote access to electronic medical records (EMRs) and through the use of regional health information systems (RHIOs), saving travel time and money. In 2012, NYSDOH staff agreed with the hospital-reported infection status 94% of the time. Discordant results were discussed and corrected in the National Healthcare Safety Network (NHSN). Some inaccuracies continue to occur because of misunderstanding of NHSN definitions, incomplete surveillance, and data entry errors. Recommendations for improving SSI surveillance accuracy were reviewed with all hospitals in January 2013 during regional conference calls.

Hospital Rate Summary

Table 2 summarizes HAI rates by hospital in 2012 and 2013. The 2012 data are included again this year in order to visualize patterns of repeated high and low performance and because there have been some modifications as a result of further auditing of the data. The table highlights hospitals that performed significantly better (shaded blue) or worse (shaded red) than the NYS average, after adjusting for differences in patients' risk for infection. Table 2 provides a summary of all hospital rates at a glance. More detailed figures in the body of this report plot each hospital rate and confidence interval (the range around the measurement that shows how precise the measurement is). Those graphs can make it easier to understand why similar rates may or may not be flagged as significantly different because they graphically show the rate and width of the confidence interval compared to the state average. No hospital was flagged high for all indicators. NYSDOH works with hospitals that are flagged in the same category for multiple years to investigate reasons for continued high rates.

Recommendations and Next Steps

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

to educate hospitals on current issues in surveillance and infection prevention practice through regional conference calls.

NYSDOH works closely with the HAI Technical Advisory Workgroup (TAW) to seek guidance on the selection of reporting indicators, methods of risk adjustment, and presentation of hospital-identified data. In late 2013 the TAW recommended that hospitals report CLABSIs in medical, surgical, medical/surgical wards, and step-down units beginning in January 2015. NYSDOH posted this recommendation for public comment in September 2014. Expanding CLABSI surveillance is important to decrease morbidity and mortality associated with these preventable infections. Evidence-based central line insertion and maintenance practices to reduce the risk of CLABSIs are applicable to central line use across hospital locations. Standardized surveillance allows hospitals to track their progress over time and compared to other facilities.

NYSDOH will continue to conduct medical record audits to verify appropriate use of surveillance definitions and accurate reporting by hospitals. The latest year of auditing results showed that NYS hospitals under reported HAIs by approximately 6%. Valid data are important both for the analysis of variation in HAI rates within the state, as well for the analysis of NYS rates in comparison with other states' rates. Differences in audit coverage and thoroughness across the country currently result in inequitable comparisons of hospital and state average rates. NYSDOH will continue to discuss audit methodology with CDC and CMS and advocate that information on auditing be incorporated into performance evaluations.

As CDI impacts the greatest number of people in NYS, reducing CDI rates continues to be a priority. NYSDOH recently applied for and received grant funding from CDC to continue efforts to reduce CDI rates. New activities may include targeting communities with high CDI rates and instituting measures to improve those rates, such as improving communication and coordination between facilities and improving prevention practices within facilities.

Multidrug resistant organisms (MDROs) are a growing concern in NYS. There were approximately 3,422 BSIs and 684 deaths attributable to MRSA, as well as 460 BSIs and 175 deaths attributable to CRE in 2013. Antimicrobial resistance occurs due to both natural factors (e.g. natural selection, genetic mutations) and societal factors (e.g. inappropriate antibiotic use, close contact of very ill patients in hospitals). CDC recommends that all hospitals have antimicrobial stewardship programs.[1] Only 53% of NYS hospitals reported having a formal, written statement of support from leadership that supports efforts to improve antibiotic use. More improvement is needed to slow the spread of antimicrobial resistance.

CRE is a particular problem in the New York City (NYC) area, where the CRE BSI prevalence rate is 20 times higher than in the Capital District. Hospitals continue to experience challenges in preventing CRE transmission, including imperfect compliance with handwashing, delays in implementing contact precautions and appropriately cohorting patients, delays in discontinuing devices when they are no longer needed, and lack of established protocols to screen

epidemiologically linked contacts and perform active surveillance testing in high-risk areas. NYSDOH recently applied for and received grant funding from CDC to focus additional attention on CRE in the NYC area. Grant related efforts will include working with hospitals and nursing homes to improve recognition of clusters, visiting facilities with high rates to assess compliance with recommended prevention and control practices, and facilitating communication between facilities.

NYSDOH will continue to disseminate data on hospital-specific HAI rates in multiple formats, including annual reports and downloadable spreadsheets. Decisions regarding healthcare quality should not be based on these data alone. Consumers should consult with doctors, healthcare facilities, health insurance carriers, and reputable healthcare websites before deciding where to receive care.

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Table 2: Summary of Hospital-Acquired Infection Data by Hospital, New York State 2012-2013

		Surgical Site Infections											Blood Stream Infections																		*C. difficile*	
		Colon		Hip		Hyst		CABG Chest		CABG Donor		All SSI	Coronary ICU		Cardiothoracic ICU		Medical ICU		Medical Surgical ICU		Surgical ICU		Neurosurgical ICU		Pediatric ICU		Neonatal ICU		All BSI	Hospital Onset	
Hospital	Yr	SSI/ procs	Adj. Rate	SSI/ procs	Adj. Rate	SSI/ procs	Adj. Rate	SSI/ procs	Adj. Rate	SSI/ procs	Adj. Rate	SIR	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Adj rate	SIR	HO/patdays	Adj rate
State average	**12**	**4.7**		**1.1**		**1.7**		**2.0**		**0.5**		**1.0**	**1.3**		**0.9**		**1.2**		**1.0**		**1.1**		**1.4**		**1.9**		**RPC/Level3/Lev2/3= 1.3/2.1/3.8**		**1.0**	**12.5**	
State average	**13**	**6.8**		**0.9**		**1.5**		**1.6**		**0.5**		**1.0**	**1.0**		**0.8**		**1.2**		**0.9**		**1.0**		**1.1**		**1.3**		**1.1/1.0/2.4**		**1.0**	**11.3**	
AO Fox Memorial	12	NA / NA	NA	NA	NA	0/ 24	* 0.0					0.69							0/ 499	* 0.0									* 0.00	5/ 14885	5.9
	13	NA / NA	NA	NA	NA	NA	NA					* 0.00							0/ 245	* 0.0									* 0.00	6/ 12586	8.2
Adirondack Medical	12	2/ 84	2.6	0/ 60	* 0.0	0/ 52	* 0.0					0.41							0/ 456	* 0.0									* 0.00	8/ 12841	8.9
	13	9/ 141	6.8	0/ 63	* 0.0	0/ 54	* 0.0					0.91							0/ 383	* 0.0									* 0.00	6/ 12138	7.7
Albany Medical	12	14/ 360	4.0	3/ 397	0.8	2/ 239	0.8	7/ 312	2.2	1/ 282	0.3	0.82	2/2674	0.7	4/3175	1.3	2/3309	0.6			3/5307	0.6	0/1195	* 0.0	1/2173	0.5	0/4041	** 0.0	**0.44	183/183307	13.4
	13	31/ 364	9.4	12/ 589	^^ 2.2	3/ 195	1.3	6/ 290	1.7	1/ 247	0.3	^^1.42	4/2518	1.6	0/3596	* 0.0	1/3296	0.3	0/ 360	* 0.0	3/5664	0.5	0/ 951	* 0.0	3/2042	1.5	3/3875	0.9	0.61	151/178616	11.4
Albany Memorial	12	4/ 68	6.4	1/ 58	1.8	NA	NA					1.37							2/ 642	3.1									3.21	6/ 25549	** 3.4
	13	1/ 61	2.0	0/ 44	* 0.0	NA	A					0.24							0/ 677	* 0.0									* 0.00	7/ 22129	** 4.4
Alice Hyde	12	NA / NA	NA	0/ 36	* 0.0	NA	NA					* 0.00							0/ 64	* 0.0									* 0.00	1/ 9830	2.1
	13	0/ 26	0.0	1/ 32	2.9	NA	NA					0.40							0/ 79	* 0.0									* 0.00	2/ 8596	5.4
Arnot Ogden	12	4/ 66	5.4	1/ 168	0.6	0/ 26	* 0.0	3/ 96	3.6	1/ 82	1.1	1.13							3/3671	0.8							0/1019	* 0.0	0.57	38/ 48675	9.7
	13	9/ 86	8.9	1/ 200	0.4	1/ 38	2.2	2/ 82	2.3	2/ 70	3.2	1.35							4/3561	1.1							1/1400	0.8	1.12	39/ 48609	10.5
Auburn Memorial	12	0/ 33	0.0	0/ 48	* 0.0	NA	NA					* 0.00							0/ 688	* 0.0									* 0.00	12/ 26924	** 6.0
	13	1/ 32	3.1	1/ 51	1.6	NA	NA					0.72							1/ 747	1.3									1.50	16/ 21956	10.0
Bellevue Hospital	12	5/ 76	6.6	0/ 48	* 0.0	1/ 124	0.7	1/ 98	1.1	0/ 91	* 0.0	0.78	1/ 953	1.0	0/ 820	* 0.0	3/1177	2.5			2/1590	1.3	2/ 604	3.3	0/ 131	* 0.0	3/ 665	3.9	1.52	61/186976	** 8.5
	13	5/ 91	5.0	2/ 67	2.3	2/ 121	1.4	4/ 108	3.8	1/ 100	1.2	1.19	0/1150	* 0.0	1/ 721	1.4	1/1344	0.7			2/1595	1.3	1/ 614	1.6	0/ 76	* 0.0	1/ 695	1.2	0.91	86/188461	11.3
Bertrand Chaffee	12	NA / NA	NA									NA																		2/ 3455	9.9
	13	NA / NA	NA									NA																		1/ 2996	5.4
Bon Secours	12	2/ 25	9.4	NA	NA	NA	NA					1.91							0/ 302	* 0.0									* 0.00	5/ 22411	** 4.2
	13	1/ 26	5.2	2/ 30	4.5	NA	NA					1.73							0/ 614	* 0.0									* 0.00	8/ 24468	7.6
Bronx-Lebanon	12	5/ 80	6.1	1/ 48	1.5	4/ 127	2.4					1.36	0/ 532	* 0.0					5/5121	1.0							1/ 510	1.8	0.89	61/151973	** 6.9
	13	2/ 89	2.4	2/ 53	3.7	2/ 120	1.3					0.72	0/ 856	* 0.0					5/5121	1.0							1/ 339	2.6	1.04	71/146913	** 8.1
Brookdale Hospital	12	5/ 83	4.9	NA	NA	1/ 61	1.4					0.96	0/ 281	* 0.0			9/2384	^^ 3.8			2/ 522	3.8			0/ 60	* 0.0	2/ 446	4.0	^^2.62	39/ 93857	8.4
	13	2/ 56	3.0	NA	NA	1/ 103	0.9					0.46	0/ 451	* 0.0			9/2509	^^ 3.6			2/ 703	2.8			NA	NA	2/ 609	2.6	^^2.67	27/ 97715	** 5.9
Brookhaven Memorial	12	3/ 97	3.0	3/ 109	1.9							0.94	3/1467	2.0			2/1586	1.3			0/1754	* 0.0							0.87	159/ 95003	^ 17.9
	13	9/ 94	10.1	1/ 70	0.9							1.44	0/1498	* 0.0			1/1559	0.6			2/1871	1.1							0.58	141/ 93035	^ 16.7

**Significantly lower than state average. ^^Signif. higher than state average. *Zero infections, not signif. NA: Fewer than 20 procedures or 50 line days.

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Hospital	Yr	SSI/ procs	Adj. Rate	SSI/ procs	Adj. Rate	SSI/ procs	Adj. Rate	SSI/ procs	Adj. Rate	SSI/ procs	Adj. Rate	SIR	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Adj rate	SIR	HO/patdays	Adj rate
State average	**12**	**4.7**		**1.1**		**1.7**		**2.0**		**0.5**		**1.0**	**1.3**		**0.9**		**1.2**		**1.0**		**1.1**		**1.4**		**1.9**		RPC/Level3/Lev2/3= 1.3/2.1/3.8		**1.0**	**12.5**	
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Brooklyn Hospital Downtown	12	7/ 80	7.7	3/ 70	2.8	5/ 207	2.1					1.59					5/2188	2.3			1/1551	0.6			0/ 244	* 0.0	3/1234	2.3	1.20	78/ 95259	13.8
	13	6/ 93	5.6	1/ 88	1.1	2/ 229	0.8					0.78					8/1941	^^ 4.1			4/1575	2.5			1/ 138	7.2	1/ 811	1.1	^^2.84	70/ 89692	14.6
Brooks Memorial	12	1/ 21	5.9	0/ 78	* 0.0	0/ 25	* 0.0					0.56							0/ 345	* 0.0									* 0.00	1/ 11051	** 1.5
	13	NA / NA	NA	0/ 81	* 0.0	0/ 23	* 0.0					* 0.00							0/ 227	* 0.0									* 0.00	4/ 9891	6.7
Buffalo General	12	22/ 166	^^13.2	6/ 735	0.7	NA	NA	7/ 503	1.4	3/ 456	0.7	1.29	1/ 893	1.1	3/3021	1.0	4/4126	1.0			9/2344	^^ 3.8	4/ 985	4.1					^^1.64	168/161899	^ 16.0
	13	28/ 186	^^13.6	4/ 640	0.7	NA	NA	9/ 582	1.7	2/ 485	0.5	^^1.45			2/4167	0.5	8/5580	1.4			3/2305	1.3	3/1828	1.6					1.12	196/155934	^ 17.7
Canton-Potsdam	12	1/ 38	2.5	1/ 56	1.2	NA	NA					0.69							0/ 96	* 0.0									* 0.00	8/ 14599	15.2
	13	3/ 54	5.5	0/ 48	* 0.0	0/ 31	* 0.0					0.65							0/ 79	* 0.0									* 0.00	5/ 15009	8.8
Carthage Area	12	NA / NA	NA			NA	NA					NA																		0/ 5891	* 0.0
	13	NA / NA	NA			NA	NA					NA																		0/ 5289	* 0.0
Catskill Regional	12	0/ 31	0.0	0/ 24	* 0.0	0/ 68	* 0.0					**0.00							0/ 847	* 0.0									* 0.00	13/ 18564	17.7
	13	1/ 31	3.3	0/ 20	* 0.0	0/ 95	* 0.0					0.30							1/ 658	1.5									1.70	13/ 21097	14.5
Cayuga Medical Center	12	2/ 64	2.7	2/ 92	1.9	0/ 21	* 0.0					0.84							1/1061	0.9									0.97	6/ 28850	** 3.7
	13	4/ 68	6.5	0/ 93	* 0.0	1/ 28	5.1					0.96							4/1206	^^ 3.3									^^3.71	9/ 28759	5.9
Champlain Valley	12	5/ 89	5.8	2/ 107	1.6	1/ 65	1.9	3/ 85	4.0	0/ 81	* 0.0	1.34							1/1731	0.6									0.60	33/ 63202	8.6
	13	9/ 84	10.6	0/ 138	* 0.0	0/ 62	* 0.0	2/ 70	3.1	0/ 66	* 0.0	1.19							3/1851	1.6									1.81	29/ 56272	** 6.4
Chenango Memorial	12	NA / NA	NA	0/ 48	* 0.0	NA	NA					* 0.00							0/ 126	* 0.0									* 0.00	4/ 7074	10.2
	13	NA / NA	NA	0/ 59	* 0.0	1/ 20	6.1					0.67							0/ 91	* 0.0									* 0.00	1/ 6227	2.1
Claxton-Hepburn	12	0/ 28	0.0	0/ 28	* 0.0	0/ 43	* 0.0					* 0.00							0/ 560	* 0.0									* 0.00	8/ 23892	6.8
	13	1/ 24	4.0	0/ 39	* 0.0	0/ 47	* 0.0					0.39							0/ 180	* 0.0									* 0.00	8/ 22499	7.1
Clifton Springs	12	2/ 27	8.7	NA	NA							1.74							0/ 291	* 0.0									* 0.00	9/ 9735	16.7
	13	2/ 27	9.7	NA	NA							1.24							0/ 164	* 0.0									* 0.00	4/ 7479	14.2
Columbia Memorial	12	3/ 62	5.5	5/ 77	^^ 5.5	5/ 90	^^ 6.7					^^2.73							2/ 585	3.4									3.53	24/ 31630	17.9
	13	2/ 52	4.1	1/ 75	1.0	2/ 84	3.6					1.02							0/ 675	* 0.0									* 0.00	19/ 30050	15.1

**Significantly lower than state average. ^^Signif. higher than state average. *Zero infections, not signif. NA: Fewer than 20 procedures or 50 line days.

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Hospital	Yr	SSI/ procs	Adj. Rate	SSI/ procs	Adj. Rate	SSI/ procs	Adj. Rate	SSI/ procs	Adj. Rate	SSI/ procs	Adj. Rate	SIR	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Adj rate	SIR	HO/patdays	Adj rate
State average	**12**	**4.7**		**1.1**		**1.7**		**2.0**		**0.5**		**1.0**	**1.3**		**0.9**		**1.2**		**1.0**		**1.1**		**1.4**		**1.9**		**RPC/Level3/Lev2/3= 1.3/2.1/3.8**		**1.0**	**12.5**	
State average	**13**	**6.8**		**0.9**		**1.5**		**1.6**		**0.5**		**1.0**	**1.0**		**0.8**		**1.2**		**0.9**		**1.0**		**1.1**		**1.3**		**1.1/1.0/2.4**		**1.0**	**11.3**	
Community Memorial	12	NA / NA	NA	0/ 209	* 0.0	NA	NA					* 0.00							0/ 55	* 0.0									* 0.00	2/ 5318	9.8
	13	NA / NA	NA	0/ 169	* 0.0	NA	NA					* 0.00							NA	NA									* NA	0/ 4412	* 0.0
Coney Island	12	1/ 31	2.9	1/ 53	1.0	0/ 36	* 0.0					0.58	0/ 198	* 0.0			0/1314	* 0.0			1/ 693	1.4							0.38	63/ 94841	** 8.1
	13	0/ 24	0.0	NA	NA	NA	NA					0.46	1/ 537	1.9			8/1860	^^ 4.3			6/ 806	^^ 7.4							^^4.27	62/ 75834	11.1
Corning Hospital	12	0/ 22	0.0	0/ 52	* 0.0	0/ 27	* 0.0					* 0.00							0/ 287	* 0.0									* 0.00	16/ 15386	13.4
	13	0/ 36	0.0	0/ 52	* 0.0	2/ 32	6.9					0.58							1/ 341	2.9									3.28	12/ 14899	9.7
Cortland Regional Med	12	0/ 25	0.0	0/ 25	* 0.0	1/ 63	2.0					0.38					0/ 501	* 0.0											* 0.00	9/ 20944	7.7
	13	0/ 21	0.0	NA	NA	0/ 55	* 0.0					* 0.00					1/ 560	1.8											1.53	17/ 22595	11.6
Crouse Hospital	12	7/ 259	2.6	3/ 259	1.4	9/ 550	2.1					0.86							1/2967	0.3							6/3038	2.1	1.04	59/ 83769	9.7
	13	24/ 267	8.2	4/ 298	1.3	7/ 544	1.5					1.19							5/2509	2.0							6/3190	1.8	1.87	56/ 81630	9.8
DeGraff Memorial	12	2/ 35	6.7	0/ 36	* 0.0							1.15							0/ 449	* 0.0									* 0.00	24/ 16158	22.2
	13	2/ 26	8.2	0/ 44	* 0.0							0.95							0/ 249	* 0.0									* 0.00	13/ 11270	15.5
Eastern Niagara Lockport	12	1/ 30	3.2	NA	NA	0/ 53	* 0.0					0.40							1/ 436	2.3									2.37	17/ 17749	24.8
	13	5/ 29	17.4	NA	NA	0/ 44	* 0.0					1.92							0/ 503	* 0.0									* 0.00	14/ 35604	10.4
Eastern Niagara Newfane	12	NA / NA	NA	NA	NA	NA	NA					NA							0/ 314	* 0.0									* 0.00	3/ 8644	5.5
	13	NA / NA	NA	NA	NA							NA							0/ 120	* 0.0									* 0.00	2/ 8499	3.7
Eastern Long Island	12	NA / NA	NA	NA	NA							1.70							0/ 70	* 0.0									* 0.00	4/ 19005	5.0
	13	NA / NA	NA	NA	NA							* 0.00							0/ 140	* 0.0									* 0.00	1/ 18136	1.6
Ellis Hospital	12	8/ 193	4.7	0/ 225	* 0.0	1/ 230	0.5	4/ 233	1.9	1/ 224	0.6	0.73							9/5624	1.6									1.65	49/ 97289	8.8
	13	5/ 153	3.5	1/ 232	0.3	1/ 103	1.2	6/ 227	2.8	1/ 218	0.5	0.79							5/5527	0.9									1.01	51/ 90656	** 7.7
Elmhurst	12	4/ 44	8.8	1/ 66	0.8	1/ 94	1.0					1.15	0/ 369	* 0.0			5/1132	^^ 4.4			6/ 956	^^ 6.3					0/ 352	* 0.0	^^2.54	65/ 87256	^ 28.6
	13	8/ 50	13.4	0/ 47	* 0.0	1/ 88	0.9					1.43	1/ 314	3.2			0/1319	* 0.0			2/ 816	2.5					1/ 486	2.1	1.04	44/140496	10.3
Erie Medical Center	12	5/ 74	6.6	1/ 182	0.4	NA	NA	0/ 75	* 0.0	1/ 53	2.1	0.91			1/ 769	1.3	7/2474	2.8											2.19	90/ 77584	^ 20.7
	13	3/ 59	5.1	4/ 262	1.7			NA	NA	NA	NA	1.13			0/ 146	* 0.0	0/2931	** 0.0											**0.00	101/131315	^ 15.2
FF Thompson	12	NA / NA	NA	1/ 139	0.9	0/ 28	* 0.0					1.23							0/ 499	* 0.0									* 0.00	14/ 25728	** 5.2
	13	4/ 30	11.6	0/ 143	* 0.0	1/ 42	2.6					1.26							0/ 589	* 0.0									* 0.00	12/ 19204	7.1

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		Surgical Site Infections											Blood Stream Infections																		*C. difficile*	
		Colon		Hip		Hyst		CABG Chest		CABG Donor		All SSI	Coronary ICU		Cardiothoracic ICU		Medical ICU		Medical Surgical ICU		Surgical ICU		Neurosurgical ICU		Pediatric ICU		Neonatal ICU		All BSI	Hospital Onset	
Hospital	Yr	SSI/ procs	Adj. Rate	SSI/ procs	Adj. Rate	SSI/ procs	Adj. Rate	SSI/ procs	Adj. Rate	SSI/ procs	Adj. Rate	SIR	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Adj rate	SIR	HO/patdays	Adj rate
State average	**12**	**4.7**		**1.1**		**1.7**		**2.0**		**0.5**		**1.0**	**1.3**		**0.9**		**1.2**		**1.0**		**1.1**		**1.4**		**1.9**		RPC/Level3/Lev2/3= 1.3/2.1/3.8		**1.0**	**12.5**	
State average	**13**	**6.8**		**0.9**		**1.5**		**1.6**		**0.5**		**1.0**	**1.0**		**0.8**		**1.2**		**0.9**		**1.0**		**1.1**		**1.3**		**1.1/1.0/2.4**		**1.0**	**11.3**	
Faxton St. Lukes	12	5/ 139	3.5	2/ 127	1.1	4/ 83	5.6					1.12	7/2402	2.9					3/1828	1.6									2.08	145/ 74304	^ 24.3
	13	6/ 113	5.8	1/ 102	0.6	2/ 145	1.8					0.90	1/2188	0.5					1/ 443	2.3									0.80	120/ 75492	^ 18.0
Flushing Hospital	12	5/ 58	8.9	0/ 29	* 0.0	4/ 188	2.6					1.63	2/ 483	4.1			4/1326	3.0			0/ 497	* 0.0					1/1131	1.0	1.47	62/ 70425	15.4
	13	9/ 50	^^17.3	2/ 40	4.4	2/ 195	1.1					^^1.97	0/ 523	* 0.0			4/1490	2.7			1/ 688	1.5					1/1450	0.7	1.37	37/ 86575	** 5.9
Forest Hills Hosp	12	4/ 103	3.7	0/ 110	* 0.0	0/ 131	* 0.0					0.45							1/2578	0.4									0.40	89/ 73730	13.8
	13	6/ 101	5.9	2/ 115	1.5	2/ 132	1.5					1.00							1/2706	0.4									0.41	76/ 72724	11.8
Franklin	12	1/ 71	1.5	2/ 125	1.2	NA	NA					0.60							3/2506	1.2									1.24	51/ 61615	9.8
	13	0/ 52	** 0.0	0/ 113	* 0.0	NA	NA					**0.00							2/1909	1.0									1.17	31/ 51063	7.8
Geneva General	12	1/ 56	1.6	0/ 129	* 0.0	0/ 35	* 0.0					0.21							0/ 664	* 0.0									* 0.00	16/ 17691	18.3
	13	3/ 48	6.4	3/ 154	1.8	NA	NA					1.49							0/ 622	* 0.0									* 0.00	15/ 17004	17.7
Glen Cove Hospital	12	1/ 34	2.7	5/ 458	1.3							1.03							0/1449	* 0.0									* 0.00	29/ 59663	** 7.6
	13	1/ 40	2.0	2/ 473	0.6							0.47							2/1074	1.9									2.08	34/ 53879	12.1
Glens Falls	12	5/ 182	3.7	6/ 156	^^ 3.7	2/ 59	3.6					1.45							1/2114	0.5									0.49	37/ 81488	** 6.7
	13	5/ 179	4.0	1/ 166	0.6	0/ 90	* 0.0					0.54	1/ 266	3.8					2/1630	1.2									1.75	43/ 71337	7.8
Good Samaritan Suffern	12	1/ 90	1.0	2/ 111	1.9	0/ 37	* 0.0	2/ 133	1.5	1/ 127	0.6	0.61			0/ 622	* 0.0	3/1085	2.8			2/ 753	2.7							1.85	36/ 59753	11.2
	13	1/ 116	** 0.7	0/ 107	* 0.0	0/ 30	* 0.0	4/ 119	3.5	0/ 113	* 0.0	**0.39			0/ 651	* 0.0	1/ 949	1.1			1/ 697	1.4							0.85	32/ 57836	10.5
Good Samaritan W Islip	12	10/ 196	5.6	2/ 115	1.0	4/ 302	1.6					1.09							3/4467	0.7					0/ 109	* 0.0	1/ 509	1.6	0.69	194/122721	^ 17.6
	13	21/ 197	^^11.6	1/ 120	0.6	2/ 402	0.7					1.34							2/3955	0.5					0/ 149	* 0.0	0/ 703	* 0.0	0.45	130/105187	13.9
Harlem Hospital	12	5/ 48	10.3	NA	NA	0/ 57	* 0.0					1.43	0/ 154	* 0.0					0/1090	* 0.0					NA	NA	0/ 265	* 0.0	* 0.00	23/ 68437	9.9
	13	3/ 29	10.9	NA	NA	0/ 40	* 0.0					1.11	0/ 127	* 0.0					0/1743	* 0.0					0/ 75	* 0.0	0/ 614	* 0.0	* 0.00	18/ 68860	7.2
HealthAlliance Broadway	12	0/ 72	** 0.0	1/ 43	1.8	NA	NA					0.26							0/1609	* 0.0									* 0.00	20/ 40485	8.7
	13	0/ 64	** 0.0	1/ 47	1.1	NA	NA					0.19							0/2091	* 0.0									* 0.00	25/ 38234	11.1
HealthAlliance MarysAve	12	0/ 24	0.0	0/ 137	* 0.0							* 0.00							0/ 157	* 0.0									* 0.00	3/ 28319	3.5
	13	NA / NA	NA	0/ 121	* 0.0							* 0.00							0/ 51	* 0.0									* 0.00	4/ 27451	5.5

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		Colon		Hip		Hyst		CABG Chest		CABG Donor		All SSI	Coronary ICU		Cardiothoracic ICU		Medical ICU		Medical Surgical ICU		Surgical ICU		Neurosurgical ICU		Pediatric ICU		Neonatal ICU		All BSI	Hospital Onset	
Hospital	Yr	SSI/ procs	Adj. Rate	SSI/ procs	Adj. Rate	SSI/ procs	Adj. Rate	SSI/ procs	Adj. Rate	SSI/ procs	Adj. Rate	SIR	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Adj rate	SIR	HO/patdays	Adj rate
State average	**12**	**4.7**		**1.1**		**1.7**		**2.0**		**0.5**		**1.0**	**1.3**		**0.9**		**1.2**		**1.0**		**1.1**		**1.4**		**1.9**		**RPC/Level3/Lev2/3= 1.3/2.1/3.8**		**1.0**	**12.5**	
State average	**13**	**6.8**		**0.9**		**1.5**		**1.6**		**0.5**		**1.0**	**1.0**		**0.8**		**1.2**		**0.9**		**1.0**		**1.1**		**1.3**		**1.1/1.0/2.4**		**1.0**	**11.3**	
Highland Hospital	12	10/ 188	5.7	3/ 742	0.5	16/ 690	2.6					1.13							6/2755	2.2									2.25	74/ 76234	10.6
	13	16/ 190	9.0	4/ 800	0.5	7/ 690	1.1					0.95							4/2186	1.8									2.05	74/ 78138	10.2
Hosp for Special Surgery	12			16/4336	** 0.6							**0.58																		31/ 55144	10.1
	13			14/4553	** 0.4							**0.47							1/ 64	15.6									17.47	37/ 53429	14.0
Hudson Valley	12	1/ 57	1.6	0/ 135	* 0.0	0/ 27	* 0.0					0.19							0/1359	* 0.0									* 0.00	27/ 34730	10.5
	13	1/ 71	1.3	1/ 134	0.6	0/ 32	* 0.0					0.28							3/1049	2.9									3.20	18/ 32732	7.5
Huntington	12	6/ 93	5.9	2/ 218	0.9	0/ 199	* 0.0					0.86	2/ 516	3.9					0/ 977	* 0.0									1.25	43/ 76362	** 7.2
	13	10/ 119	8.5	2/ 232	0.7	2/ 222	1.5					1.13	1/ 622	1.6					0/ 862	* 0.0									0.73	52/ 71977	10.4
Interfaith Medical	12	2/ 24	7.5	NA	NA	0/ 21	* 0.0					1.08							2/2236	0.9									0.92	25/ 87975	8.4
	13	NA / NA	NA	NA	NA	NA	NA					* 0.00							3/2863	1.0									1.17	15/ 78519	6.7
Ira Davenport	12	NA / NA	NA									NA					NA	NA											* NA	2/ 2390	13.1
	13	NA / NA	NA									NA																		2/ 2068	16.0
JT Mather	12	2/ 73	3.1	0/ 71	* 0.0	2/ 50	4.4					0.85	3/ 781	3.8					1/1307	0.8									1.77	34/ 60589	9.8
	13	7/ 122	6.5	2/ 86	2.0	1/ 38	2.3					1.14	3/ 813	3.7					1/1232	0.8									2.12	58/ 68964	15.6
Jacobi Medical	12	2/ 30	5.7	2/ 62	1.7	4/ 78	3.4					1.65	1/ 650	1.5			0/1378	* 0.0			0/ 396	* 0.0			0/ 170	* 0.0	3/1583	1.6	0.70	101/135207	^ 19.8
	13	4/ 86	3.9	0/ 56	* 0.0	5/ 99	3.2					0.90	0/ 593	* 0.0			2/1477	1.4			0/ 480	* 0.0			0/ 175	* 0.0	3/ 934	2.8	1.19	69/129954	10.2
Jamaica Hospital	12	2/ 44	4.1	1/ 40	1.8	3/ 107	2.9					1.30					4/2257	1.8			9/1549	^^ 5.8					4/ 553	6.4	^^2.96	42/ 83795	14.3
	13	4/ 53	7.5	3/ 47	4.0	1/ 134	0.6					1.18					6/2625	2.3			9/1393	^^ 6.5					0/ 379	* 0.0	^^3.06	44/113577	11.2
Jones Memorial	12	NA / NA	NA			NA	NA					* 0.00							0/ 373	* 0.0									* 0.00	3/ 6723	8.9
	13	0/ 22	0.0	NA	NA	NA	NA					* 0.00							0/ 384	* 0.0									* 0.00	3/ 6816	8.1
Kenmore Mercy	12	8/ 135	6.4	2/ 389	0.8	NA	NA					1.15							2/1385	1.4									1.49	37/ 38356	13.1
	13	10/ 156	7.8	7/ 517	1.9	NA	NA					1.43							0/1357	* 0.0									* 0.00	38/ 36643	12.6
Kings County	12	2/ 54	3.0	1/ 59	0.9	5/ 135	2.9					1.12	3/ 994	3.0			0/1125	* 0.0			0/ 956	* 0.0	2/ 754	2.7	1/ 99	10.1	3/ 805	3.0	1.11	29/107924	9.3
	13	3/ 81	3.4	2/ 52	2.6	2/ 113	1.2					0.76	4/1148	3.5			0/1236	* 0.0			3/1360	2.2	8/1328	^^ 6.0	0/ 93	* 0.0	1/ 538	1.9	^^2.35	27/121491	7.8
Kingsbrook Jewish	12	NA / NA	NA	0/ 22	* 0.0	1/ 45	2.4					0.49	5/ 953	^^ 5.2					4/1433	2.8									^^3.47	26/ 52637	9.5
	13	4/ 39	9.4	1/ 22	2.9	0/ 25	* 0.0					1.39	0/1089	* 0.0					6/1575	^^ 3.8									2.44	26/ 69112	7.6

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Hospital	Yr	SSI/ procs	Adj. Rate	SSI/ procs	Adj. Rate	SSI/ procs	Adj. Rate	SSI/ procs	Adj. Rate	SSI/ procs	Adj. Rate	SIR	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Adj rate	SIR	HO/patdays	Adj rate
State average	**12**	**4.7**		**1.1**		**1.7**		**2.0**		**0.5**		**1.0**	**1.3**		**0.9**		**1.2**		**1.0**		**1.1**		**1.4**		**1.9**		**RPC/Level3/Lev2/3= 1.3/2.1/3.8**		**1.0**	**12.5**	
State average	**13**	**6.8**		**0.9**		**1.5**		**1.6**		**0.5**		**1.0**	**1.0**		**0.8**		**1.2**		**0.9**		**1.0**		**1.1**		**1.3**		**1.1/1.0/2.4**		**1.0**	**11.3**	
Lenox Hill	12	3/ 145	2.0	8/ 659	1.2	4/ 339	1.1	10/ 295	3.4	1/ 229	0.4	0.95	0/1041	* 0.0	1/2069	0.5			6/2643	2.3	0/1711	* 0.0					2/ 816	2.9	0.92	81/135557	11.9
	13	14/ 172	8.5	6/ 753	0.9	3/ 331	0.9	4/ 280	1.5	1/ 213	0.4	1.04	1/1317	0.8	0/1900	* 0.0			3/2575	1.2	2/1565	1.3					3/1097	2.7	0.95	92/134227	14.9
Lewis County	12	NA / NA	NA	NA	NA	0/ 20	* 0.0					* 0.00							0/ 128	* 0.0									* 0.00	1/ 5681	5.6
	13	NA / NA	NA			0/ 23	* 0.0					1.78							0/ 68	* 0.0									* 0.00	0/ 4486	* 0.0
Lincoln Medical	12	0/ 31	0.0	1/ 25	3.0	1/ 66	1.1					0.56	1/ 755	1.3			0/1490	* 0.0			3/1154	2.6			NA	NA	6/1166	4.1	1.41	18/ 92317	** 5.3
	13	6/ 45	11.3	0/ 27	* 0.0	4/ 91	3.7					1.82	1/ 635	1.6			2/1274	1.6			5/1394	^^ 3.6			NA	NA	3/ 991	2.5	^^2.33	22/ 89577	8.1
Long Island Jewish	12	10/ 329	2.6	8/ 295	^^ 2.5	6/ 403	1.3	5/ 251	2.0	3/ 235	1.6	0.92	1/ 647	1.5	0/1377	* 0.0	4/2183	1.8			0/2009	* 0.0			2/3034	0.7	5/4216	1.2	0.65	213/204730	^ 18.5
	13	15/ 315	4.5	1/ 216	0.5	7/ 416	1.5	2/ 250	0.8	1/ 234	0.5	0.72	1/ 644	1.6	0/1405	* 0.0	0/1504	* 0.0			0/1383	* 0.0			1/2752	0.4	3/4068	0.8	**0.39	185/203413	^ 18.6
Lutheran Medical	12	5/ 165	2.7	3/ 148	1.6	0/ 166	* 0.0					0.60					4/2053	1.9			0/2253	* 0.0							0.80	130/112217	^ 19.5
	13	3/ 142	** 1.9	3/ 171	1.3	2/ 191	1.0					0.52					7/2101	^^ 3.3			0/1774	* 0.0							1.64	103/121876	12.2
Maimonides	12	4/ 79	5.5	2/ 133	0.9	2/ 248	0.8	6/ 312	1.8	3/ 291	1.2	0.93	0/ 881	* 0.0	0/2285	* 0.0	0/2831	** 0.0			1/1537	0.7			1/ 625	1.6	0/2432	** 0.0	**0.16	159/202035	14.4
	13	19/ 180	10.6	1/ 194	0.3	9/ 267	2.8	10/ 311	3.2	0/ 296	* 0.0	^^1.53	0/ 903	* 0.0	0/2625	* 0.0	1/2421	0.4			0/1410	* 0.0			0/ 456	* 0.0	0/2441	** 0.0	**0.09	69/198712	** 6.1
Mary Imogene Bassett	12	8/ 77	9.5	5/ 221	1.3	0/ 66	* 0.0	1/ 109	1.0	1/ 101	0.9	1.29							3/2278	1.3									1.36	35/ 48987	11.7
	13	4/ 119	3.2	0/ 202	* 0.0	3/ 75	3.7	0/ 97	* 0.0	0/ 77	* 0.0	0.49							2/2483	0.8									0.90	27/ 47682	7.8
Massena Memorial	12	NA / NA	NA	NA	NA	0/ 26	* 0.0					* 0.00							NA	NA									* NA	11/ 10210	25.6
	13	NA / NA	NA	NA	NA	1/ 24	5.6					^^3.84							NA	NA									* NA	6/ 10040	14.4
Medina Memorial	12	NA / NA	NA	NA	NA							NA							0/ 165	* 0.0									* 0.00	6/ 19276	** 3.7
	13	NA / NA	NA	NA	NA	NA	NA					* 0.00							0/ 94	* 0.0									* 0.00	7/ 12606	8.6
Memorial Sloan Kettering	12	42/ 575	^^ 6.6	5/ 101	2.3	7/ 614	** 0.7					1.12																		265/144473	^ 17.2
	13	68/ 633	^^ 9.3	0/ 105	* 0.0	13/ 471	1.4					1.26																		267/138337	^ 16.1
Mercy Medical	12	8/ 83	8.8	2/ 61	3.6	3/ 102	4.1					^^2.15							0/1462	* 0.0							0/ 317	* 0.0	* 0.00	67/ 40382	^ 31.4
	13	5/ 75	6.3	2/ 93	1.9	0/ 74	* 0.0					0.98							0/1438	* 0.0							0/ 317	* 0.0	* 0.00	60/ 59977	^ 16.3
Mercy- Buffalo	12	15/ 282	7.0	1/ 151	0.5	3/ 279	1.6	10/ 361	3.2	3/ 321	1.3	1.40	6/2050	2.9	0/1513	* 0.0			4/2722	1.5									1.52	86/ 94311	12.2
	13	14/ 284	6.0	2/ 155	0.9	2/ 219	1.3	8/ 386	2.5	0/ 343	* 0.0	0.98	2/2126	0.9	0/1365	* 0.0			0/2797	* 0.0									0.35	109/ 96833	13.9

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Table 2: Summary of Hospital-Acquired Infection Data by Hospital, New York State 2012-2013

		Surgical Site Infections											Blood Stream Infections																		*C. difficile*	
		Colon		Hip		Hyst		CABG Chest		CABG Donor		All SSI	Coronary ICU		Cardiothoracic ICU		Medical ICU		Medical Surgical ICU		Surgical ICU		Neurosurgical ICU		Pediatric ICU		Neonatal ICU		All BSI	Hospital Onset	
Hospital	Yr	SSI/ procs	Adj. Rate	SSI/ procs	Adj. Rate	SSI/ procs	Adj. Rate	SSI/ procs	Adj. Rate	SSI/ procs	Adj. Rate	SIR	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Adj rate	SIR	HO/patdays	Adj rate
State average	**12**	**4.7**		**1.1**		**1.7**		**2.0**		**0.5**		**1.0**	**1.3**		**0.9**		**1.2**		**1.0**		**1.1**		**1.4**		**1.9**		**RPC/Level3/Lev2/3= 1.3/2.1/3.8**		**1.0**	**12.5**	
State average	**13**	**6.8**		**0.9**		**1.5**		**1.6**		**0.5**		**1.0**	**1.0**		**0.8**		**1.2**		**0.9**		**1.0**		**1.1**		**1.3**		**1.1/1.0/2.4**		**1.0**	**11.3**	
Metropolitan	12	2/ 31	5.5	0/ 27	* 0.0	2/ 49	3.8					1.42					0/1031	* 0.0			0/ 406	* 0.0					2/ 304	6.8	0.76	6/ 81964	** 2.7
	13	5/ 31	13.7	2/ 27	6.6	0/ 24	* 0.0					2.23					3/ 811	3.7			0/ 309	* 0.0					0/ 244	* 0.0	1.62	14/ 80985	** 5.8
MidHudson Regional Hospital of WMC	12	0/ 55	0.0	6/ 120	^^ 4.7	NA	NA					1.37							0/1929	* 0.0									* 0.00	8/ 55385	** 3.8
	13	4/ 80	4.9	2/ 140	1.0	0/ 59	* 0.0					0.77							1/2266	0.4									0.49	12/ 56323	7.5
Millard Fill. Suburb	12	21/ 301	7.0	3/ 461	0.8	8/ 619	1.6					1.20							2/2516	0.8									0.82	87/ 73167	14.1
	13	13/ 274	5.0	1/ 443	0.3	5/ 495	1.2					0.70							5/3061	1.6									1.83	69/ 65725	11.2
Montefiore-Einstein	12	6/ 86	6.4	0/ 219	** 0.0	10/ 253	2.6	9/ 182	4.2	0/ 113	* 0.0	1.32			1/1991	0.5	4/2317	1.7									4/2313	1.6	1.15	134/122153	12.0
	13	8/ 219	3.8	2/ 200	1.0	9/ 309	2.1	6/ 234	2.4	0/ 179	* 0.0	0.92			1/2260	0.4	2/2599	0.8									8/2482	^^ 3.0	1.40	150/136252	11.6
Montefiore-Moses	12	6/ 176	3.1	0/ 137	* 0.0	6/ 167	3.3	13/ 248	^^ 4.4	1/ 226	0.5	1.22	1/1363	0.7	0/2914	* 0.0	1/4075	0.2			1/2420	0.4			7/2593	2.7			0.59	323/254200	13.3
	13	11/ 220	4.6	0/ 129	* 0.0	3/ 201	1.4	3/ 249	1.1	0/ 226	* 0.0	0.65	0/1474	* 0.0	0/3313	* 0.0	0/3986	** 0.0			0/2080	* 0.0			3/3021	1.0			**0.20	322/273880	11.4
Montifiore-Mt Vernon	12	NA / NA	NA	NA	NA	1/ 45	3.1					1.35							0/ 424	* 0.0									* 0.00	20/ 23735	11.8
	13	NA / NA	NA	NA	NA	0/ 31	* 0.0					0.82							0/ 400	* 0.0									* 0.00	15/ 23417	10.3
Montifiore-New Rochelle	12	1/ 23	4.4	3/ 161	1.7	0/ 72	* 0.0					0.96							1/1059	0.9							0/ 52	* 0.0	0.89	45/ 38849	12.3
	13	2/ 58	3.4	3/ 151	1.9	1/ 80	1.5					0.95							0/1032	* 0.0							0/ 93	* 0.0	* 0.00	29/ 34202	9.8
Montifiore-Wakefield	12	1/ 23	4.1	1/ 31	2.7	3/ 166	1.8					1.16							0/3412	** 0.0							1/ 573	1.8	0.20	58/ 60434	12.1
	13	2/ 24	6.6	1/ 170	0.6	1/ 194	0.5					0.63							1/3194	0.3							3/ 603	5.0	0.93	79/ 84540	11.5
Mount St. Marys	12	5/ 71	7.7	0/ 97	* 0.0	4/ 31	^^12.5					1.74					0/ 476	* 0.0											* 0.00	6/ 24309	6.1
	13	12/ 69	^^18.8	0/ 88	* 0.0	NA	NA					^^2.33					0/ 408	* 0.0											* 0.00	17/ 26381	14.4
Mt Sinai	12	30/ 705	4.3	12/ 356	^^ 2.1	2/ 453	** 0.4	17/ 486	3.4	1/ 486	0.2	1.03	3/2130	1.4	5/3619	1.4	1/3457	0.3			1/3890	0.3	4/2098	1.9	4/2113	1.9	9/1774	^^ 4.6	1.12	273/262304	14.5
	13	101/ 801	^^12.0	4/ 366	0.9	5/ 522	0.8	17/ 543	^^ 2.9	1/ 491	0.2	^^1.58	0/1819	* 0.0	4/3582	1.1	1/3407	0.3			2/3799	0.5	0/2102	* 0.0	6/1847	3.2	2/1984	0.9	0.76	285/303042	^ 13.9
Mt Sinai BI-Bklyn	12	3/ 51	5.4	1/ 54	1.1	0/ 40	* 0.0					0.94							1/1108	0.9									0.93	91/ 68914	^ 17.6
	13	5/ 59	8.1	2/ 55	2.2	0/ 29	* 0.0					1.30							0/1055	* 0.0									* 0.00	43/ 66359	** 7.1
Mt Sinai Beth Israel	12	9/ 262	3.7	5/ 415	1.1	4/ 171	2.0	7/ 180	3.9	0/ 167	* 0.0	1.04	1/ 772	1.3	3/1272	2.4	1/2822	0.4			3/1749	1.7			1/ 115	8.7	0/ 486	* 0.0	0.95	140/229709	^ 15.8
	13	12/ 320	4.0	2/ 463	0.4	4/ 183	1.9	5/ 196	2.4	0/ 191	* 0.0	0.73	2/ 758	2.6	2/ 891	2.2	1/2520	0.4			2/1840	1.1			0/ 55	* 0.0	1/ 388	2.6	1.09	105/216857	10.6

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Hospital	Yr	SSI/ procs	Adj. Rate	SSI/ procs	Adj. Rate	SSI/ procs	Adj. Rate	SSI/ procs	Adj. Rate	SSI/ procs	Adj. Rate	SIR	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Adj rate	SIR	HO/patdays	Adj rate
State average	**12**	**4.7**		**1.1**		**1.7**		**2.0**		**0.5**		**1.0**	**1.3**		**0.9**		**1.2**		**1.0**		**1.1**		**1.4**		**1.9**		RPC/Level3/Lev2/3= 1.3/2.1/3.8		**1.0**	**12.5**	
State average	**13**	**6.8**		**0.9**		**1.5**		**1.6**		**0.5**		**1.0**	**1.0**		**0.8**		**1.2**		**0.9**		**1.0**		**1.1**		**1.3**		**1.1/1.0/2.4**		**1.0**	**11.3**	
Mt Sinai Queens	12	3/ 68	3.9	3/ 67	2.8	1/ 48	2.5					1.29							2/1634	1.2									1.26	68/ 54458	12.2
	13	3/ 66	4.5	0/ 51	* 0.0	0/ 64	* 0.0					0.50							0/1324	* 0.0									* 0.00	49/ 55240	8.7
Mt Sinai Roosevelt	12	8/ 187	4.2	3/ 108	2.3	3/ 230	1.3					0.99							0/1422	* 0.0			2/ 602	3.3	1/ 63	15.9	2/2013	1.1	0.81	42/110899	11.7
	13	7/ 164	3.9	0/ 83	* 0.0	4/ 225	1.6					0.66							0/1830	* 0.0			0/ 553	* 0.0	0/ 145	* 0.0	2/1869	1.1	0.47	35/116715	8.4
Mt Sinai St Lukes	12	4/ 69	5.2	2/ 195	0.8	1/ 109	1.0	2/ 151	1.2	0/ 136	* 0.0	0.76					8/1974	^^ 4.1	2/1938	1.0	1/ 978	1.0							^^2.05	57/115823	11.1
	13	3/ 51	5.2	2/ 144	1.4	2/ 69	3.2	1/ 145	0.6	1/ 129	0.7	0.96					1/2390	0.4	3/2042	1.5	0/ 921	* 0.0							0.72	40/109511	** 7.0
NY Community Brooklyn	12	0/ 34	0.0	0/ 74	* 0.0	NA	NA					**0.00							1/ 603	1.7									1.71	34/ 45906	10.0
	13	3/ 33	8.6	0/ 33	* 0.0	NA	NA					1.01							3/ 701	4.3									4.78	47/ 45585	14.1
NY Hosp Queens	12	24/ 256	^^ 9.2	5/ 241	1.5	3/ 167	1.4	1/ 118	1.0	0/ 115	* 0.0	^^1.50	1/ 884	1.1	0/1027	* 0.0	0/2298	* 0.0			1/1807	0.6			0/ 92	* 0.0	1/ 235	3.7	0.40	322/174421	^ 18.5
	13	27/ 250	^^10.9	1/ 252	0.3	5/ 189	1.9	1/ 98	0.9	0/ 74	* 0.0	1.33	0/ 993	* 0.0	0/ 850	* 0.0	2/2355	0.8			2/1692	1.2			NA	NA	1/ 287	3.7	0.77	258/159316	^ 15.5
NY Methodist	12	6/ 148	4.3	4/ 171	1.6	4/ 420	0.9	3/ 101	2.9	0/ 97	* 0.0	0.90	0/ 594	* 0.0	2/1486	1.3			4/4581	0.9					0/ 82	* 0.0	4/1477	2.5	1.00	150/174797	10.7
	13	5/ 164	2.9	7/ 192	^^ 3.3	7/ 440	1.7	0/ 119	* 0.0	0/ 113	* 0.0	0.86	1/ 574	1.7	0/1271	* 0.0			4/4591	0.9					0/ 88	* 0.0	1/1503	0.6	0.81	143/194817	9.4
NYP-Allen	12	1/ 23	4.0	1/ 30	2.7	NA	NA					1.14							1/ 883	1.1									1.17	25/ 49984	8.1
	13	2/ 23	9.2	0/ 23	* 0.0	NA	NA					1.03							1/ 776	1.3									1.44	25/ 54985	7.3
NYP-Columbia/ Morgan Stanley	12	16/ 211	7.5	4/ 329	1.1	3/ 236	0.9	13/ 671	1.9	0/ 555	* 0.0	1.00	5/4837	1.0	13/7631	^^ 1.7	5/4399	1.1			0/3329	** 0.0	2/2843	0.7	14/5331	2.6	6/6254	1.0	0.93	271/257328	12.5
	13	16/ 259	5.7	5/ 343	1.4	4/ 275	1.2	13/ 607	2.0	0/ 499	* 0.0	0.95	4/4831	0.8	12/7025	^^ 1.7	4/5074	0.8			2/3340	0.6	2/3442	0.6	10/6690	1.5	7/7592	1.0	1.04	285/267066	12.4
NYP-Lawrence	12	5/ 82	6.4	1/ 126	0.8	1/ 40	3.5					1.29					3/1824	1.6											1.37	55/ 36305	^ 22.6
	13	5/ 85	6.8	5/ 131	^^ 3.1	0/ 47	* 0.0					1.48					2/1713	1.2											1.00	50/ 36186	^ 21.8
NYP-Lower Manhattan	12	3/ 32	7.1	2/ 44	2.8	2/ 126	1.3					1.33							4/2039	2.0									2.02	21/ 40054	11.0
	13	4/ 63	5.8	4/ 61	^^ 5.4	1/ 61	1.6					1.44							3/1657	1.8									2.02	18/ 39253	9.4
NYP-Weill Cornell	12	17/ 578	3.2	4/ 119	2.1	6/ 247	1.9	6/ 318	2.2	2/ 294	0.9	0.90	2/3210	0.6	6/4309	1.4	3/3402	0.9			8/3078	2.6	6/1775	3.4	1/2776	0.4	0/3740	** 0.0	0.95	274/246630	12.6
	13	46/ 605	8.0	0/ 133	* 0.0	3/ 274	0.9	4/ 301	1.3	2/ 285	0.8	1.07	4/3346	1.2	8/4297	1.9	12/3773	^^ 3.2			6/2635	2.3	1/2024	0.5	3/3198	0.9	0/3449	** 0.0	1.43	275/252761	11.6
NYU Joint Disease	12			11/1118	1.3							1.22																		5/ 30019	** 3.3
	13			10/1358	1.0							1.16																		12/ 31649	7.8
NYU Medical Center	12	13/ 252	4.9	2/ 108	1.0	3/ 226	1.1	4/ 183	2.5	1/ 143	0.7	1.00			0/1082	* 0.0	5/3027	1.7			7/2895	2.4	0/ 497	* 0.0	4/1773	2.3	2/1706	1.3	1.29	137/130711	^ 16.3
	13	38/ 349	^^10.6	1/ 71	0.9	1/ 284	0.3	5/ 217	2.9	0/ 173	* 0.0	1.35			1/ 742	1.3	2/3021	0.7			1/2576	0.4	0/ 639	* 0.0	1/2149	0.5	1/1168	0.9	0.52	127/108745	^ 22.1

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Hospital	Yr	SSI/ procs	Adj. Rate	SSI/ procs	Adj. Rate	SSI/ procs	Adj. Rate	SSI/ procs	Adj. Rate	SSI/ procs	Adj. Rate	SIR	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Adj rate	SIR	HO/patdays	Adj rate
State average	**12**	**4.7**		**1.1**		**1.7**		**2.0**		**0.5**		**1.0**	**1.3**		**0.9**		**1.2**		**1.0**		**1.1**		**1.4**		**1.9**		**RPC/Level3/Lev2/3= 1.3/2.1/3.8**		**1.0**	**12.5**	
State average	**13**	**6.8**		**0.9**		**1.5**		**1.6**		**0.5**		**1.0**	**1.0**		**0.8**		**1.2**		**0.9**		**1.0**		**1.1**		**1.3**		**1.1/1.0/2.4**		**1.0**	**11.3**	
Nassau University	12	3/ 38	6.9	5/ 59	^^ 5.6	3/ 109	2.9					^^2.33	0/ 498	* 0.0			4/1450	2.8			0/ 481	* 0.0			NA	NA	0/ 754	* 0.0	0.90	8/ 68795	** 4.7
	13	0/ 38	** 0.0	0/ 54	* 0.0	2/ 100	1.7					0.36	2/ 533	3.8			1/1524	0.7			0/ 572	* 0.0			0/ 124	* 0.0	0/ 407	* 0.0	0.86	18/130418	** 4.9
Nathan Littauer	12	NA / NA	NA	1/ 56	1.9	0/ 22	* 0.0					0.73							0/ 191	* 0.0									* 0.00	11/ 13313	15.4
	13	NA / NA	NA	1/ 56	1.3	NA	NA					1.15							0/ 91	* 0.0									* 0.00	1/ 11103	1.9
Newark Wayne	12	3/ 42	8.0	1/ 62	2.6	NA	NA					1.73							3/1160	2.6									2.67	18/ 18597	14.4
	13	4/ 44	10.2	2/ 76	2.8	1/ 49	2.3					1.79							0/1117	* 0.0									* 0.00	9/ 21863	6.1
Niagara Falls	12	0/ 26	0.0	0/ 23	* 0.0	4/ 51	^^11.2					1.91							2/ 750	2.7									2.75	11/ 31704	9.4
	13	4/ 36	11.2	0/ 33	* 0.0	5/ 37	^^20.3					^^2.87							0/ 832	* 0.0									* 0.00	10/ 23151	11.2
North Central Bronx	12	NA / NA	NA			NA	NA					1.04							1/ 356	2.8									2.90	13/ 49980	8.1
	13	NA / NA	NA			0/ 25	* 0.0					1.21							0/ 371	* 0.0									* 0.00	12/ 43047	6.4
North Shore	12	18/ 465	3.3	3/ 383	0.7	12/ 565	1.9	19/ 409	^^ 4.6	4/ 349	1.0	1.09	1/ 848	1.2	5/2834	1.8	6/3384	1.8			4/2753	1.5	1/1861	0.5	0/ 99	* 0.0	2/2086	0.9	1.16	252/254962	10.9
	13	26/ 546	** 4.1	0/ 371	** 0.0	8/ 523	1.3	8/ 371	2.3	3/ 324	0.8	**0.72	0/ 848	* 0.0	4/2859	1.4	0/2715	** 0.0			1/2418	0.4	3/1696	1.8	0/ 82	* 0.0	1/2104	0.5	0.69	239/241890	12.1
Northern Dutchess	12	NA / NA	NA	3/ 257	1.4	0/ 52	* 0.0					1.01							0/ 294	* 0.0									* 0.00	9/ 14499	11.1
	13	3/ 21	12.5	1/ 230	0.5	NA	NA					1.09							0/ 234	* 0.0									* 0.00	12/ 15632	12.6
Northern Westchester	12	7/ 135	5.8	1/ 172	0.6	3/ 205	2.2					1.14							0/1022	* 0.0							0/ 131	* 0.0	* 0.00	24/ 42762	11.2
	13	7/ 137	6.8	2/ 200	1.1	6/ 243	3.6					1.36							2/ 876	2.3							0/ 54	* 0.0	2.43	14/ 36637	8.8
Noyes Memorial	12	1/ 20	5.0	0/ 34	* 0.0	0/ 39	* 0.0					0.50							2/ 321	6.2									6.43	2/ 6631	7.2
	13	0/ 29	0.0	0/ 36	* 0.0	1/ 51	1.7					0.33							1/ 313	3.2									3.57	3/ 6431	9.9
Nyack Hospital	12	3/ 78	4.2	2/ 134	1.4	0/ 61	* 0.0					0.88					4/1635	2.4			2/ 797	2.5							2.09	54/ 58752	13.9
	13	6/ 112	6.1	2/ 161	1.1	0/ 35	* 0.0					0.93					5/1151	^^ 4.3			1/ 679	1.5							^^2.94	59/ 57278	11.1
Olean General	12	5/ 69	7.8	0/ 71	* 0.0	2/ 94	2.5					1.35							0/ 770	* 0.0									* 0.00	25/ 30271	10.6
	13	6/ 81	7.6	1/ 59	1.5	2/ 100	2.3					1.25							1/1149	0.9									0.97	35/ 32707	10.9
Oneida Healthcare	12	1/ 63	2.0	0/ 21	* 0.0	3/ 52	^^ 9.6					1.31							0/ 296	* 0.0									* 0.00	10/ 12383	10.7
	13	2/ 86	3.3	NA	NA	0/ 61	* 0.0					0.42							0/ 188	* 0.0									* 0.00	5/ 10638	6.5

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		Colon		Hip		Hyst		CABG Chest		CABG Donor		All SSI	Coronary ICU		Cardiothoracic ICU		Medical ICU		Medical Surgical ICU		Surgical ICU		Neurosurgical ICU		Pediatric ICU		Neonatal ICU		All BSI	Hospital Onset	
Hospital	Yr	SSI/ procs	Adj. Rate	SSI/ procs	Adj. Rate	SSI/ procs	Adj. Rate	SSI/ procs	Adj. Rate	SSI/ procs	Adj. Rate	SIR	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Adj rate	SIR	HO/patdays	Adj rate
State average	**12**	**4.7**		**1.1**		**1.7**		**2.0**		**0.5**		**1.0**	**1.3**		**0.9**		**1.2**		**1.0**		**1.1**		**1.4**		**1.9**		RPC/Level3/Lev2/3= 1.3/2.1/3.8		**1.0**	**12.5**	
State average	**13**	**6.8**		**0.9**		**1.5**		**1.6**		**0.5**		**1.0**	**1.0**		**0.8**		**1.2**		**0.9**		**1.0**		**1.1**		**1.3**		**1.1/1.0/2.4**		**1.0**	**11.3**	
Orange Regional Goshen-Middletn	12	6/ 190	3.4	2/ 285	0.8	1/ 128	1.0					0.72							0/3199	** 0.0									**0.00	89/ 77330	^ 25.8
	13	4/ 159	3.0	3/ 269	1.0	1/ 74	1.7					0.64							2/2850	0.7									0.78	57/ 89947	14.3
Oswego Hospital	12	0/ 32	0.0	NA	NA	3/ 34	^^10.0					1.16					0/ 485	* 0.0											* 0.00	8/ 19698	8.5
	13	1/ 40	2.4	0/ 27	* 0.0	0/ 50	* 0.0					0.26					0/ 492	* 0.0											* 0.00	9/ 19191	5.3
Our Lady of Lourdes	12	5/ 122	4.0	1/ 258	0.4	0/ 42	* 0.0					0.67							0/1619	* 0.0									* 0.00	28/ 46564	** 6.9
	13	9/ 161	6.0	3/ 260	1.0	1/ 111	1.4					0.95							0/1257	* 0.0									* 0.00	42/ 47201	8.9
Peconic Bay Medical	12	0/ 61	** 0.0	4/ 302	1.0	0/ 53	* 0.0					0.48							0/ 437	* 0.0									* 0.00	54/ 31850	^ 21.3
	13	0/ 72	** 0.0	1/ 343	0.3	0/ 33	* 0.0					**0.11							0/ 481	* 0.0									* 0.00	58/ 29347	^ 23.3
Phelps Memorial	12	2/ 58	5.5	1/ 257	0.6	0/ 55	* 0.0					0.71							2/ 722	2.8									2.86	37/ 59177	10.7
	13	1/ 26	5.0	4/ 246	2.1	0/ 48	* 0.0					1.41							3/ 767	3.9									4.37	23/ 51863	9.0
Plainview Hospital	12	7/ 114	5.6	3/ 149	1.4	1/ 99	1.3					1.16							4/2725	1.5									1.51	65/ 57381	11.3
	13	5/ 111	4.1	1/ 165	0.5	1/ 112	1.1					0.61							0/2111	* 0.0									* 0.00	50/ 50904	9.9
Putnam Hospital	12	3/ 105	4.3	0/ 234	* 0.0	1/ 72	2.1					0.65							3/ 501	^^ 6.0									^^6.18	29/ 34218	15.2
	13	5/ 113	6.4	2/ 277	0.9	0/ 56	* 0.0					0.91							1/ 495	2.0									2.26	27/ 32125	13.5
Queens Hospital	12	4/ 51	6.6			0/ 128	* 0.0					0.71							2/1445	1.4							3/ 527	5.1	1.92	15/ 54921	** 5.9
	13	2/ 36	4.5			2/ 121	1.4					0.78					1/1650	0.6									0/ 460	* 0.0	0.42	22/ 85968	** 4.9
Richmond Univ	12	1/ 98	1.1	0/ 75	* 0.0	0/ 108	* 0.0					**0.13					0/2861	** 0.0			3/1487	2.0			NA	NA	3/1276	2.0	0.73	63/104041	** 6.0
	13	4/ 104	4.1	0/ 83	* 0.0	2/ 227	1.0					0.58					4/2576	1.6			1/1460	0.7			0/ 71	* 0.0	1/1143	0.9	1.06	56/161602	** 3.8
Rochester General	12	12/ 317	4.5	7/ 393	2.4	17/ 468	^^ 5.4	5/ 449	1.2	2/ 445	0.7	^^1.39			1/2602	0.4	2/3462	0.6			0/2112	* 0.0							**0.34	144/168483	12.9
	13	28/ 426	7.5	4/ 457	0.9	12/ 443	^^ 3.6	1/ 471	** 0.2	5/ 464	1.2	1.18			0/2847	* 0.0	0/3327	** 0.0			0/2287	* 0.0							**0.00	163/200926	** 8.6
Rome Memorial	12	0/ 48	0.0	1/ 40	2.2	0/ 29	* 0.0					0.35							0/ 670	* 0.0									* 0.00	24/ 18059	20.5
	13	1/ 39	2.7	0/ 41	* 0.0	0/ 23	* 0.0					0.31							0/ 753	* 0.0									* 0.00	22/ 21087	16.1
Roswell Park	12	8/ 123	5.9			8/ 282	2.6					1.41							5/2257	2.2									2.29	12/ 39037	** 3.7
	13	8/ 115	6.1			7/ 286	2.3					1.12																		21/ 37765	** 6.5
Samaritan- Troy	12	6/ 71	8.8	1/ 51	1.9	0/ 130	* 0.0					1.31							1/1296	0.8									0.80	12/ 46015	** 6.1
	13	3/ 80	4.0	3/ 113	2.4	2/ 98	2.9					1.12							1/1114	0.9									1.00	9/ 50777	** 5.0

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Table 2: Summary of Hospital-Acquired Infection Data by Hospital, New York State 2012-2013

		Surgical Site Infections											Blood Stream Infections																		*C. difficile*	
		Colon		Hip		Hyst		CABG Chest		CABG Donor		All SSI	Coronary ICU		Cardiothoracic ICU		Medical ICU		Medical Surgical ICU		Surgical ICU		Neurosurgical ICU		Pediatric ICU		Neonatal ICU		All BSI	Hospital Onset	
Hospital	Yr	SSI/ procs	Adj. Rate	SSI/ procs	Adj. Rate	SSI/ procs	Adj. Rate	SSI/ procs	Adj. Rate	SSI/ procs	Adj. Rate	SIR	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Adj rate	SIR	HO/patdays	Adj rate
State average	**12**	**4.7**		**1.1**		**1.7**		**2.0**		**0.5**		**1.0**	**1.3**		**0.9**		**1.2**		**1.0**		**1.1**		**1.4**		**1.9**		RPC/Level3/Lev2/3= 1.3/2.1/3.8		**1.0**	**12.5**	
State average	**13**	**6.8**		**0.9**		**1.5**		**1.6**		**0.5**		**1.0**	**1.0**		**0.8**		**1.2**		**0.9**		**1.0**		**1.1**		**1.3**		**1.1/1.0/2.4**		**1.0**	**11.3**	
Samaritan-Watertown	12	3/ 76	3.6	2/ 125	1.6	1/ 62	1.9					0.99							0/ 945	* 0.0									* 0.00	12/ 28720	8.6
	13	2/ 54	3.6	2/ 133	1.8	2/ 84	3.1					1.05							0/ 792	* 0.0									* 0.00	24/ 28055	16.1
Saratoga Hospital	12	4/ 114	3.9	8/ 245	^^ 3.9	0/ 49	* 0.0					1.58							2/1501	1.3									1.37	14/ 48194	** 5.0
	13	4/ 135	3.4	1/ 287	0.4	0/ 24	* 0.0					0.48							1/1326	0.8									0.84	8/ 45768	** 2.3
Sisters of Charity	12	4/ 85	4.9	1/ 152	0.9	3/ 312	1.1					0.83							1/1581	0.6							5/1204	3.9	1.43	34/ 49251	11.1
	13	5/ 67	8.5	1/ 162	0.8	3/ 296	1.2					1.03							0/1318	* 0.0							0/ 798	* 0.0	* 0.00	22/ 51172	** 5.8
Sisters- St Joseph	12	6/ 82	7.4	4/ 155	2.7	NA	NA					1.76							5/1230	^^ 4.1									^^4.19	22/ 29776	7.5
	13	8/ 76	10.7	0/ 176	* 0.0	0/ 35	* 0.0					1.16							0/1364	* 0.0									* 0.00	28/ 27063	8.7
South Nassau Community	12	15/ 156	7.9	3/ 329	0.8	3/ 197	1.6					1.33							3/2994	1.0									1.03	157/ 95925	^ 23.7
	13	5/ 163	** 2.5	7/ 449	1.3	1/ 213	0.5					0.62							2/3658	0.5									0.61	183/110850	^ 18.0
Southampton	12	2/ 44	3.9	NA	NA	0/ 42	* 0.0					0.63					0/ 750	* 0.0											* 0.00	25/ 20602	15.4
	13	3/ 37	9.1	NA	NA	0/ 53	* 0.0					0.93					0/ 916	* 0.0											* 0.00	18/ 19892	10.3
Southside	12	7/ 128	5.3	1/ 183	0.5	1/ 174	0.8	2/ 170	1.1	1/ 109	0.9	0.83			1/1586	0.6			1/2515	0.4									0.52	73/ 85927	13.1
	13	8/ 133	5.7	2/ 225	0.9	3/ 204	2.2	6/ 221	2.8	2/ 171	1.1	1.19			2/1811	1.1			2/3033	0.7									0.95	65/ 92933	11.0
St Anthony	12	NA / NA	NA	0/ 46	* 0.0	0/ 71	* 0.0					* 0.00							0/ 530	* 0.0									* 0.00	4/ 10870	5.4
	13	NA / NA	NA	1/ 52	1.8	0/ 58	* 0.0					1.45							2/ 500	4.0									4.47	3/ 9761	** 2.7
St Barnabas	12	4/ 36	8.9	NA	NA	1/ 51	1.4					1.34							1/1507	0.7							2/ 635	3.4	0.90	38/ 95871	11.2
	13	1/ 32	2.5	NA	NA	3/ 49	4.2					1.29							4/1833	2.2							0/ 836	* 0.0	1.09	85/ 86638	^ 27.3
St Catherine Siena	12	12/ 118	^^10.1	6/ 106	^^ 4.6	1/ 95	1.7					^^2.40	0/1062	* 0.0					1/1234	0.8									0.39	81/ 77698	12.7
	13	7/ 78	8.6	0/ 88	* 0.0	0/ 64	* 0.0					1.00	0/ 713	* 0.0					1/1134	0.9									0.59	65/ 69304	12.7
St Charles Hospital	12	0/ 64	** 0.0	2/ 198	1.3	1/ 47	2.5					0.55					2/1813	1.1											0.92	27/ 35703	^ 25.4
	13	2/ 41	3.8	2/ 215	1.1	0/ 46	* 0.0					0.72					6/1818	^^ 3.3											^^2.83	44/ 58205	14.7
St Elizabeth Medical	12	10/ 74	^^14.3	1/ 220	0.5	NA	NA	2/ 245	0.8	0/ 207	* 0.0	1.16			0/1739	* 0.0			1/2583	0.4									0.25	106/ 60085	^ 34.1
	13	6/ 81	8.4	3/ 292	1.0	NA	NA	3/ 250	1.2	0/ 213	* 0.0	1.03			1/1746	0.6			3/2637	1.1									1.05	69/ 53476	^ 27.7

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		Colon		Hip		Hyst		CABG Chest		CABG Donor		All SSI	Coronary ICU		Cardiothoracic ICU		Medical ICU		Medical Surgical ICU		Surgical ICU		Neurosurgical ICU		Pediatric ICU		Neonatal ICU		All BSI	Hospital Onset	
Hospital	Yr	SSI/ procs	Adj. Rate	SSI/ procs	Adj. Rate	SSI/ procs	Adj. Rate	SSI/ procs	Adj. Rate	SSI/ procs	Adj. Rate	SIR	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Adj rate	SIR	HO/patdays	Adj rate
State average	**12**	**4.7**		**1.1**		**1.7**		**2.0**		**0.5**		**1.0**	**1.3**		**0.9**		**1.2**		**1.0**		**1.1**		**1.4**		**1.9**		RPC/Level3/Lev2/3= 1.3/2.1/3.8		**1.0**	**12.5**	
State average	**13**	**6.8**		**0.9**		**1.5**		**1.6**		**0.5**		**1.0**	**1.0**		**0.8**		**1.2**		**0.9**		**1.0**		**1.1**		**1.3**		**1.1/1.0/2.4**		**1.0**	**11.3**	
St Francis- Roslyn	12	8/ 121	8.6	3/ 199	1.2	NA	NA	9/ 846	1.1	10/ 807	^^ 1.1	1.06			2/5457	0.4	3/3611	0.8			2/2849	0.7							0.57	107/ 96349	** 9.6
	13	10/ 154	8.3	2/ 315	0.6	NA	NA	6/ 870	** 0.7	8/ 818	0.9	0.91			2/5587	0.4	2/2621	0.8			3/3047	1.0							0.65	107/ 97792	9.4
St James Mercy	12	NA / NA	NA	NA	NA	0/ 27	* 0.0					0.77							0/ 410	* 0.0									* 0.00	2/ 9905	8.3
	13	NA / NA	NA	NA	NA	0/ 40	* 0.0					0.77							0/ 233	* 0.0									* 0.00	0/ 13050	* 0.0
St Johns Episcopal	12	2/ 34	5.4	0/ 30	* 0.0	1/ 53	1.8					0.97	2/ 888	2.3			5/1093	^^ 4.6											^^2.87	34/ 61764	** 7.8
	13	5/ 37	11.7	1/ 24	3.0	2/ 57	3.7					2.00	2/ 896	2.2			5/1258	^^ 4.0											^^3.00	26/ 68226	** 4.8
St Johns Riverside	12	1/ 67	1.6	0/ 54	* 0.0	2/ 100	2.7					0.61							1/1596	0.6									0.65	24/105670	** 3.3
	13	6/ 61	11.3	1/ 89	1.0	1/ 137	1.0					1.35							4/1406	2.8									3.18	18/103591	** 2.2
St Joseph -Bethpage	12	2/ 51	4.1	1/ 101	1.1	NA	NA					0.88							2/1706	1.2									1.21	63/ 34763	16.7
	13	4/ 60	7.2	0/ 98	* 0.0	NA	NA					0.83							1/1910	0.5									0.59	36/ 32700	9.9
St Josephs- Elmira	12	NA / NA	NA	1/ 50	1.7	NA	NA					2.41							0/ 667	* 0.0									* 0.00	24/ 19780	20.9
	13			NA	NA	NA	NA					4.61							0/ 472	* 0.0									* 0.00	12/ 22648	8.7
St Josephs- Syracuse	12	13/ 246	5.4	8/1021	1.0	4/ 51	^^ 7.6	9/ 561	1.5	1/ 489	0.2	1.00					3/3432	0.9			6/5688	1.1					1/ 325	7.1	0.91	114/130638	10.5
	13	29/ 249	^^12.8	10/1159	1.0	2/ 47	4.0	5/ 589	0.8	2/ 512	0.4	1.32					1/3602	0.3			3/5518	0.5					1/ 203	4.9	0.48	126/130168	11.1
St Josephs- Yonkers	12	NA / NA	NA	0/ 34	* 0.0	NA	NA					* 0.00							3/ 595	^^ 5.0									^^5.20	10/ 44266	** 4.7
	13	0/ 25	0.0	0/ 29	* 0.0	NA	NA					* 0.00							1/ 766	1.3									1.46	10/ 41889	6.2
St Lukes Newburgh-Cornw	12	3/ 71	5.1	1/ 152	0.6	1/ 51	2.2					0.96							1/1286	0.8									0.80	28/ 47147	8.9
	13	3/ 77	4.4	0/ 136	* 0.0	3/ 69	5.1					0.88							1/1117	0.9									1.00	30/ 43171	10.2
St Marys Amsterdam	12	3/ 39	11.6	3/ 70	^^ 5.4	2/ 22	13.4					^^3.88							0/ 120	* 0.0									* 0.00	20/ 29488	17.4
	13	3/ 37	12.6	0/ 97	* 0.0	0/ 22	* 0.0					1.20							0/ 169	* 0.0									* 0.00	17/ 26208	16.4
St Marys Troy	12	2/ 57	3.1	1/ 83	1.1	0/ 42	* 0.0					0.65							0/ 945	* 0.0									* 0.00	12/ 31242	7.3
	13	1/ 48	2.2	NA	NA	1/ 52	2.9					0.52							0/1027	* 0.0									* 0.00	7/ 27530	6.3
St Peters Hospital	12	16/ 340	5.7	9/ 847	1.5	16/ 633	2.7	6/ 457	1.2	1/ 419	0.3	1.15	1/1247	0.8	4/2183	1.8			5/2011	2.5							1/ 834	1.2	1.54	67/114488	** 8.9
	13	39/ 376	^^12.3	15/ 853	^^ 1.9	11/ 808	1.4	0/ 433	** 0.0	0/ 399	* 0.0	^^1.32	1/1434	0.7	0/1853	* 0.0			2/2903	0.7							1/ 611	1.7	0.66	109/112556	11.3
Staten Island U N-S	12	12/ 209	5.5	3/ 210	1.0	2/ 191	0.9	1/ 215	0.5	0/ 207	* 0.0	0.81	0/2440	** 0.0	1/2188	0.5			0/4687	** 0.0					0/ 77	* 0.0	4/ 387	^^ 8.7	0.47	135/158536	15.8
	13	14/ 238	5.4	2/ 149	1.1	3/ 177	1.4	6/ 268	2.3	1/ 238	0.4	0.95	0/2644	* 0.0	4/2062	1.9			2/4601	0.4					NA	NA	1/ 736	1.3	0.76	101/211230	10.8

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Hospital	Yr	SSI/ procs	Adj. Rate	SSI/ procs	Adj. Rate	SSI/ procs	Adj. Rate	SSI/ procs	Adj. Rate	SSI/ procs	Adj. Rate	SIR	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Adj rate	SIR	HO/patdays	Adj rate
State average	**12**	**4.7**		**1.1**		**1.7**		**2.0**		**0.5**		**1.0**	**1.3**		**0.9**		**1.2**		**1.0**		**1.1**		**1.4**		**1.9**		RPC/Level3/Lev2/3= 1.3/2.1/3.8		**1.0**	**12.5**	
State average	**13**	**6.8**		**0.9**		**1.5**		**1.6**		**0.5**		**1.0**	**1.0**		**0.8**		**1.2**		**0.9**		**1.0**		**1.1**		**1.3**		**1.1/1.0/2.4**		**1.0**	**11.3**	
Strong Memorial	12	5/ 297	** 1.8	2/ 49	2.4	3/ 328	1.3	10/ 357	2.9	4/ 326	1.5	0.92			4/4372	0.9	1/3298	0.3			3/2982	1.0	2/1080	1.9	7/3227	2.2	7/5700	1.3	0.92	240/232827	12.5
	13	24/ 350	6.7	0/ 67	* 0.0	4/ 307	1.9	8/ 275	2.8	1/ 241	0.4	1.09			7/4338	1.6	5/3153	1.6			4/2640	1.5	2/1212	1.7	6/3262	1.8	4/5551	0.8	1.31	241/243180	12.7
Syosset Hospital	12	0/ 34	0.0	NA	NA	0/ 37	* 0.0					* 0.00							1/ 798	1.3									1.29	13/ 19327	11.3
	13	0/ 26	0.0	0/ 26	* 0.0	0/ 29	* 0.0					* 0.00							0/ 566	* 0.0									* 0.00	10/ 18275	10.8
TLC Lake Shore	12	NA / NA	NA	0/ 53	* 0.0							* 0.00							0/ 68	* 0.0									* 0.00	4/ 5962	22.1
	13	NA / NA	NA	0/ 49	* 0.0							* 0.00							NA	NA									* NA	3/ 4127	29.5
United Health Bing-Wilson	12	1/ 114	1.1	2/ 231	1.0	2/ 111	2.4	3/ 182	2.0	2/ 173	1.4	0.88	0/1562	* 0.0	0/1927	* 0.0			0/ 468	* 0.0							0/ 139	* 0.0	**0.00	52/ 76570	13.0
	13	5/ 96	5.5	6/ 279	^^ 2.8	2/ 109	2.6	2/ 178	1.3	2/ 148	1.6	1.41	3/1357	2.2	0/2159	* 0.0			0/ 605	* 0.0							0/ 165	* 0.0	0.74	76/ 90569	12.7
United Memorial	12	3/ 30	9.7	2/ 89	2.3	1/ 43	3.3					2.06							0/ 430	* 0.0									* 0.00	11/ 16713	7.3
	13	NA / NA	NA	2/ 101	2.0	0/ 30	* 0.0					^^2.56							0/ 459	* 0.0									* 0.00	13/ 14601	9.5
Unity Hosp Rochester	12	1/ 176	** 0.6	3/ 571	0.6	5/ 248	2.7					0.55							1/2842	0.4									0.36	83/ 67532	15.7
	13	11/ 179	7.0	3/ 640	0.5	4/ 256	2.3					0.97							1/3166	0.3									0.35	38/ 63915	8.7
Univ Hosp Brooklyn	12	0/ 36	0.0	0/ 53	* 0.0	3/ 192	1.0	0/ 64	* 0.0	0/ 59	* 0.0	**0.30	1/ 414	2.4	2/1101	1.8			6/2062	^^ 2.9					0/ 103	* 0.0	2/ 907	1.8	^^2.13	39/ 99509	9.0
	13	2/ 60	3.0	0/ 69	* 0.0	1/ 258	0.3	0/ 54	* 0.0	0/ 50	* 0.0	**0.25	0/ 225	* 0.0	0/ 925	* 0.0			2/1531	1.3					0/ 129	* 0.0	0/1581	* 0.0	0.44	43/ 89704	9.0
Univ Hosp SUNY Upst	12	5/ 163	2.8	1/ 84	0.8	NA	NA	4/ 151	2.1	0/ 133	* 0.0	0.66	1/1323	0.8	3/3218	0.9	4/4069	1.0	1/ 672	1.5	2/3317	0.6	1/2402	0.4	0/ 672	* 0.0			0.65	127/124068	14.2
	13	7/ 172	3.5	1/ 71	0.9	1/ 21	3.0	0/ 80	* 0.0	0/ 66	* 0.0	0.53	0/1964	* 0.0	2/3205	0.6	1/3724	0.3	3/ 846	3.5	4/3175	1.3	1/2704	0.4	2/ 694	2.9			0.78	151/134121	^ 15.8
Univ Hosp Stony Brook	12	9/ 177	4.6	4/ 297	1.0	4/ 305	1.0	3/ 271	1.1	0/ 252	* 0.0	0.72	0/1161	* 0.0	1/2115	0.5	3/3617	0.8			2/2322	0.9			2/ 532	3.8	2/2355	0.9	0.70	221/178117	^ 15.9
	13	13/ 225	5.1	1/ 350	0.2	7/ 307	1.6	4/ 347	1.2	5/ 324	1.3	0.86	2/1238	1.6	9/2366	^^ 3.8	5/3511	1.4			1/1994	0.5			2/ 553	3.6	5/3015	1.8	^^1.84	267/166349	^ 20.7
Upst. Community Gen	12	9/ 84	9.2	1/ 150	0.8	0/ 145	* 0.0					1.31							0/ 757	* 0.0									* 0.00	14/ 35585	6.6
	13	4/ 79	4.7	1/ 143	0.7	0/ 129	* 0.0					0.60							1/1083	0.9									1.03	20/ 36381	10.5
Vassar Brothers	12	3/ 99	2.6	2/ 110	1.8	0/ 237	** 0.0	0/ 276	** 0.0	3/ 276	0.6	**0.41	1/1104	0.9	1/ 904	1.1			1/1487	0.7							2/ 507	3.6	0.92	89/ 92485	12.8
	13	2/ 192	** 0.8	1/ 156	0.7	2/ 200	1.1	0/ 224	** 0.0	0/ 224	* 0.0	**0.19	0/1134	* 0.0	0/ 806	* 0.0			1/1680	0.6							0/ 373	* 0.0	0.24	102/ 88319	12.9
Westchester Medical	12	3/ 56	4.5	0/ 90	* 0.0	15/ 152	^^ 6.0	5/ 258	1.7	0/ 243	* 0.0	1.36	1/ 771	1.3	3/2549	1.2	0/2429	* 0.0			2/1114	1.8	1/1196	0.8	3/1436	2.1	6/6757	0.9	0.76	124/165451	10.0
	13	10/ 99	8.2	0/ 77	* 0.0	9/ 178	3.2	7/ 283	2.4	2/ 272	0.6	1.45	2/1156	1.7	2/3558	0.6	0/2671	** 0.0			0/1377	* 0.0	3/1671	1.8	2/1720	1.2	4/5868	0.7	0.68	132/179926	10.9

**Significantly lower than state average. ^^Signif. higher than state average. *Zero infections, not signif. NA: Fewer than 20 procedures or 50 line days.

Table 2: Summary of Hospital-Acquired Infection Data by Hospital, New York State 2012-2013

		Surgical Site Infections											Blood Stream Infections																		*C. difficile*	
		Colon		Hip		Hyst		CABG Chest		CABG Donor		All SSI	Coronary ICU		Cardiothoracic ICU		Medical ICU		Medical Surgical ICU		Surgical ICU		Neurosurgical ICU		Pediatric ICU		Neonatal ICU		All BSI	Hospital Onset	
Hospital	Yr	SSI/ procs	Adj. Rate	SSI/ procs	Adj. Rate	SSI/ procs	Adj. Rate	SSI/ procs	Adj. Rate	SSI/ procs	Adj. Rate	SIR	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Rate	CLABSI/ CLDays	Adj rate	SIR	HO/patdays	Adj rate
State average	**12**	**4.7**		**1.1**		**1.7**		**2.0**		**0.5**		**1.0**	**1.3**		**0.9**		**1.2**		**1.0**		**1.1**		**1.4**		**1.9**		RPC/Level3/Lev2/3= 1.3/2.1/3.8		**1.0**	**12.5**	
State average	**13**	**6.8**		**0.9**		**1.5**		**1.6**		**0.5**		**1.0**	**1.0**		**0.8**		**1.2**		**0.9**		**1.0**		**1.1**		**1.3**		**1.1/1.0/2.4**		**1.0**	**11.3**	
White Plains	12	2/ 108	2.2	0/ 176	* 0.0	2/ 153	1.8					0.51							0/2845	* 0.0							0/ 224	* 0.0	**0.00	62/ 72545	9.3
	13	4/ 129	3.6	2/ 219	0.9	2/ 218	1.4					0.70							4/2877	1.4							0/ 225	* 0.0	1.44	49/ 67224	8.1
Winthrop University	12	5/ 324	** 1.6	1/ 286	0.3	2/ 417	0.5	6/ 316	1.9	0/ 260	* 0.0	**0.42					5/2493	2.0			2/4308	0.5	0/1392	* 0.0	0/ 564	* 0.0	2/1701	1.1	0.68	140/155987	10.3
	13	9/ 328	** 3.1	1/ 323	0.3	2/ 281	0.7	3/ 310	1.1	0/ 256	* 0.0	**0.46					1/2349	0.4			1/4868	0.2	0/1618	* 0.0	0/ 516	* 0.0	2/1584	1.2	**0.33	131/151834	10.2
Woman and Childrens	12	0/ 27	0.0			0/ 79	* 0.0					* 0.00													10/2162	^^ 4.6	14/5980	2.3	^^2.00	10/ 34966	** 5.3
	13	3/ 32	9.4			2/ 79	3.3					1.63													2/1729	1.2	11/5260	2.2	1.66	8/ 33636	** 3.9
Womans Christian	12	5/ 47	12.9	3/ 93	2.8	NA	NA					^^2.61							2/ 888	2.3									2.32	8/ 27852	** 5.0
	13	2/ 66	3.6	3/ 106	2.3	NA	NA					0.99							1/ 874	1.1									1.28	16/ 29093	9.8
Woodhull Medical	12	6/ 56	8.6	NA	NA	2/ 82	2.7					1.69							7/2093	^^ 3.3							2/ 467	4.0	^^2.49	34/ 98776	10.8
	13	7/ 39	14.1	NA	NA	1/ 83	1.3					1.74							2/1948	1.0							3/ 578	5.2	1.59	19/ 92233	7.7
Wyckoff Heights	12	3/ 43	5.9	0/ 21	* 0.0	4/ 121	2.5					1.29	2/1083	1.8					0/1223	* 0.0							0/ 264	* 0.0	0.62	30/ 75803	** 7.3
	13	14/ 55	^^23.4	NA	NA	5/ 97	4.1					^^3.12	3/1123	2.7					0/1092	* 0.0							0/ 53	* 0.0	1.41	14/ 65577	** 3.9
Wyoming County Comm.	12	NA / NA	NA	0/ 34	* 0.0	NA	NA					* 0.00							0/ 68	* 0.0									* 0.00	5/ 11872	9.8
	13	NA / NA	NA	1/ 25	3.5	NA	NA					1.45							NA	NA									* NA	2/ 10288	5.2

SSI notes: Colon/hip/hysterectomy data reported as of June 30, 2014 and CABG data reported as of September 25, 2014. SSI: surgical site infection; Procs: procedures; Adj. rate: risk adjusted rate (# infections per 100 procedures if the state had the same risk distribution as the hospital).
SSI data exclude non-readmitted cases identified using post discharge surveillance.
Colon data adjusted using ASA score, duration, wound class, and laparoscope.
Hip data adjusted using ASA score, duration, trauma, and type of procedure.
Hysterectomy data adjusted using ASA score, duration, and laparoscope.
CABG chest data adjusted using diabetes, body mass index, gender, end stage renal disease, congestive heart failure, peripheral artery disease, and duration.
CABG donor data adjusted using body mass index, end stage renal disease, and blood transfusion.
SIR: standardized infection ratio: compares observed number of colon, CABG, hysterectomy, and hip infections to the statistically predicted number of infections based on the NYS average in the given year, after adjusting for the risk factors listed above.

CLABSI notes: Data reported as of July 10, 2014. CLABSI: central line-associated bloodstream infection; CLDays: central line days. CLABSI in which multiple blood cultures were obtained, only one specimen was positive, the one positive was considered a contaminant and no treatment was given were excluded from data between 2008 and 2013. Adult CLABSI rates are # infections per 1000 line days; no additional adjustment is performed because the data are stratified by ICU type. Neonatal CLABSI rates are adjusted by birth weight. SIR: compares observed number of CLABSI to statistically predicted number of infections based on the NYS average infection rate in each ICU/birth weight group in the given year.

C. difficile notes: Data reported as of July 24, 2014. *HO:* Number of hospital-onset infections; Patdays = Inpatient days, excluding newborns and NICU; Rate is per 10,000 patient days.
Adjusted using laboratory testing method, CDI risk index from previous year's billing discharge codes, and patient days at risk.

Each hospital-specific adjusted SSI, CLABSI, and CDI rate should only be compared with the New York State average in that category in that year.

**Significantly lower than state average. ^^Signif. higher than state average. *Zero infections, not signif. NA: Fewer than 20 procedures or 50 line days.

Background

Hospital-acquired infections (HAIs) are an important cause of morbidity and mortality, affecting approximately four percent of inpatients.[2] In accordance with Public Health Law 2819, New York State (NYS) has been tracking HAIs since 2007. This law was created to provide the public with fair, accurate, and reliable HAI data to compare hospital infection rates and to support quality improvement and infection prevention activities in hospitals.

Hospitals report to NYS using the Centers for Disease Control and Prevention's (CDC's) National Healthcare Safety Network (NHSN). This online system allows hospitals, NYS, and CDC to concurrently monitor the same data. All states follow the same surveillance methods. Additional information about the NHSN can be found at http://www.cdc.gov/nhsn/.

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

Between July and December 2013, carbapenem-resistant Enterobacteriaceae (CRE) infections were added as a pilot. The pilot provided time for NYSDOH to train facilities, validate the completeness and accuracy of reporting, evaluate the impact of differences in laboratory testing and patient risk factors on rates, and determine the feasibility of a transition to full reporting. Full reporting began in January 2014. Aggregate CRE data are summarized in this report; hospital-specific data will be provided for infections occurring in 2014.

In addition to reporting the HAI data mandated by NYS, hospitals enter data into NHSN for federal programs, regional collaboratives, and local surveillance. The Centers for Medicare and Medicaid Services (CMS) Hospital Inpatient Quality Reporting (IQR) Program provides higher reimbursement to hospitals that report certain types of HAI data, including catheter-associated urinary tract infections (CAUTIs) in ICUs and methicillin-resistant *Staphylococcus aureus* (MRSA) bacteremia. All NYS hospitals that are eligible to participate in this incentive program do so. NYS entered into a data use agreement (DUA) with CDC that allows NYS HAI staff to see all NHSN data for surveillance or prevention purposes. The DUA implemented in May 2013 prohibits the use of the data for public reporting of facility-specific data or for regulatory action. More information about the DUA is available on the CDC website http://www.cdc.gov/hai/pdfs/stateplans/New-York_DUA.pdf.

Table 3 summarizes the progression of NYS reporting requirements through 2013 and includes additional data visible through the DUA since May 2013.

Table 3. Hospital-acquired infections reported by New York State hospitals, by year

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

✓ = full reporting (publish hospital-specific rates)
P1 = pilot reporting full year (do not publish hospital-specific rates)
P2 = pilot reporting half year from July (do not publish hospital-specific rates)
DUA = Not required by New York, but reported for Centers for Medicare and Medicaid Services Inpatient Prospective Payment System and visible through data use agreement between CDC and NYS

This report summarizes HAI rates in NYS hospitals in 2013. This report, as well as reports from previous years, is available on the NYSDOH website, at: http://www.health.ny.gov/statistics/facilities/hospital/hospital_acquired_infections/. In addition, the NYS data are available electronically on Health Data NY (https://health.data.ny.gov/).

Hospital-Acquired Surgical Site Infections (SSIs)

SSIs are infections that occur after an operation in the part of the body where the surgery took place. NYS requires hospitals to report SSIs associated with four types of surgery:

- Colon: Colon surgery is a procedure performed on the lower part of the digestive tract, called the large intestine or colon.

- Coronary artery bypass graft (CABG): CABG surgery is a procedure performed for heart disease in which a vein or artery from the chest or another part of the body (termed the "donor site") is used to create an alternate path for blood to flow to the heart, bypassing a blocked artery.

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

- Abdominal hysterectomy: Abdominal hysterectomy is the surgical removal of a woman's uterus through an incision in the abdominal wall.

These procedures were selected because of the frequency of infections, severity of infection-related complications, ability to perform risk adjustment, and potential for quality improvement.

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

- Superficial Incisional SSI - This infection occurs in the area of the skin where the surgical incision was made. The patient may have pus draining from the incision or laboratory-identified pathogens from the incision.

- Deep Incisional SSI - This infection occurs beneath the incision area in muscle tissue. Pus may drain from the deep 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.

According to the October 2013 NYSDOH survey, hospital infection preventionists (IPs) implemented a wide variety of SSI surveillance methods. For example, 40% of IPs routinely reviewed all procedures for SSIs, while others reviewed a subset of procedures that were flagged based on data mining systems, wound culture reports, readmission, return to surgery, and discharge coding. IPs identified SSIs using the following sources: lab reports (99%), operative

report (95%), physician dictated operative notes (92%), progress notes (92%), discharge notes (90%), history and physical examination documentation (89%), return to surgery (88%), radiology reports (88%), infectious disease consultations (86%), intraoperative report (82%), outpatient/emergency room visits (82%), documentation of vital signs (75%), antibiotic prescriptions (64%), coding summary sheet (54%).

SSIs may be detected on the original hospital admission, readmission to the same hospital, readmission to a different hospital, or in outpatient settings (post-discharge surveillance, PDS). PDS is labor-intensive and is not standardized across hospitals. PDS infections are included in statewide rates, but excluded from hospital-specific comparisons in this report so as not to penalize facilities with the best surveillance systems.

In January 2013, NHSN changed some aspects of SSI definitions. Table 4 summarizes the key changes and their projected impacts.

Table 4. Changes to surgical site surveillance protocol in 2013

Change	2006-2012 protocol	2013 protocol	Impact of change
Expand definition of primary closure	If the skin incision edges do not meet because of wires or devices or other objects extruding through the incision, the incision is not considered primarily closed and therefore the procedure is not reported to NHSN.	Primary closure is defined as closure of all tissue levels, regardless of the presence of wires, wicks, drains, or other devices extruding through the incision. Procedures are reported to NHSN if any portion of the incision is closed at the skin level, in any manner.	Increase number of procedures reported (particularly colon). Impact on SSI rate is unknown.
Change order of hierarchy (if multiple procedures performed through the same incision, and it is not clear which procedure was associated with infection, the SSI is attributed to the procedure closest to top of list)	Hierarchy begins: Small bowel surgery Kidney transplant Liver transplant Bile duct, liver, pancreas Rectal surgery **Colon surgery** Gastric surgery Cesarean section Spleen surgery Appendix surgery **Abdominal hysterectomy**	Hierarchy begins: Liver transplant **Colon surgery** Bile duct, liver, pancreas Small bowel surgery Rectal surgery Kidney transplant Gastric surgery Abdominal aortic aneurysm **Abdominal hysterectomy** Cesarean section Laparotomy	Increase colon and abdominal hysterectomy SSI rates.
Surveillance time	Track CABG and hip surgeries for one year after procedure	Track CABG and hip surgeries for 90 days after procedure	Decrease CABG and hip SSI rates, unless historical data are adjusted by deleting SSIs identified after 90 days.

For additional information on the surveillance definitions, see http://www.cdc.gov/nhsn/PDFs/pscManual/9pscSSIcurrent.pdf.

For each type of SSI, the following pages describe trends in infections, the severity (depth) of infections, microorganisms involved, and individual hospitals' risk-adjusted infection rates compared to the state average. At the end of this section, overall trends in SSIs are summarized.

Colon Surgical Site Infections

Among 17,775 colon procedures performed in 2013, 1,317 (7.4%) developed SSIs. Of these infections, 42% were superficial, 17% were deep, and 42% were organ/space (Table 5). The majority of the SSIs (60%) were detected during the initial hospitalization; 29% were identified upon readmission to the same hospital; 2% involved readmission to another hospital; and 9% were detected using post-discharge surveillance (PDS) 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 116 infections for hospital-specific comparisons.

Table 5. Method of detection of colon surgical site infection by depth of infection, New York State 2013

	When Detected				
Extent (Row%) (Column%)	**Initial Hospitalization**	**Readmitted to the Same Hospital**	**Readmitted to Another Hospital**	**Post-Discharge Surveillance Not Readmitted**	**Total**
Superficial Incisional	337 (61.1%) (42.5%)	110 (19.9%) (28.9%)	7 (1.3%) (25.0%)	98 (17.8%) (84.5%)	552 (41.9%)
Deep Incisional	131 (60.1%) (16.5%)	69 (31.7%) (18.2%)	4 (1.8%) (14.3%)	14 (6.4%) (12.1%)	218 (16.6%)
Organ/Space	325 (59.4%) (41.0%)	201 (36.7%) (52.9%)	17 (3.1%) (60.7%)	4 (0.7%) (3.4%)	547 (41.5%)
Total	793 (60.2%)	380 (28.9%)	28 (2.1%)	116 (8.8%)	1,317

New York State data reported as of June 30, 2014.

The most common microorganisms associated with colon SSIs were Enterococci and *Escherichia coli* (Table 6). The distribution of microorganisms associated with colon SSIs is consistent with previously published NYS HAI public reports.

Table 6. Microorganisms identified in colon surgical site infections, New York State 2013

Microorganism	Number of Isolates	Percent of Infections
Enterococci	409	31.1
(VRE)	(88)	(6.7)
Escherichia coli	359	27.3
(CRE-E. coli)	(2)	(0.2)
Staphylococcus aureus	130	9.9
(MRSA)	(74)	(5.6)
(MSSA)	(51)	(3.9)
Bacteroides	113	8.6
Pseudomonas spp.	96	7.3
Klebsiella spp.	87	6.6
(CRE-*Klebsiella*)	(3)	(0.2)
(CephR-*Klebsiella*)	(3)	(0.2)
Streptococci	79	6.0
Coagulase negative Staphylococci	76	5.8
Enterobacter spp.	57	4.3
Yeast	50	3.8
Proteus spp.	43	3.3
Citrobacter spp.	25	1.9
Morganella morganii	25	1.9
Gram-negative bacilli	13	1.0
Clostridia spp.	12	0.9
Prevotella spp.	11	0.8
Corynebacteria	7	0.5
Serratia spp.	6	0.5
Acinetobacter spp.	5	0.4
(MDR-*Acinetobacter*)	(3)	(0.2)
Other	57	4.3

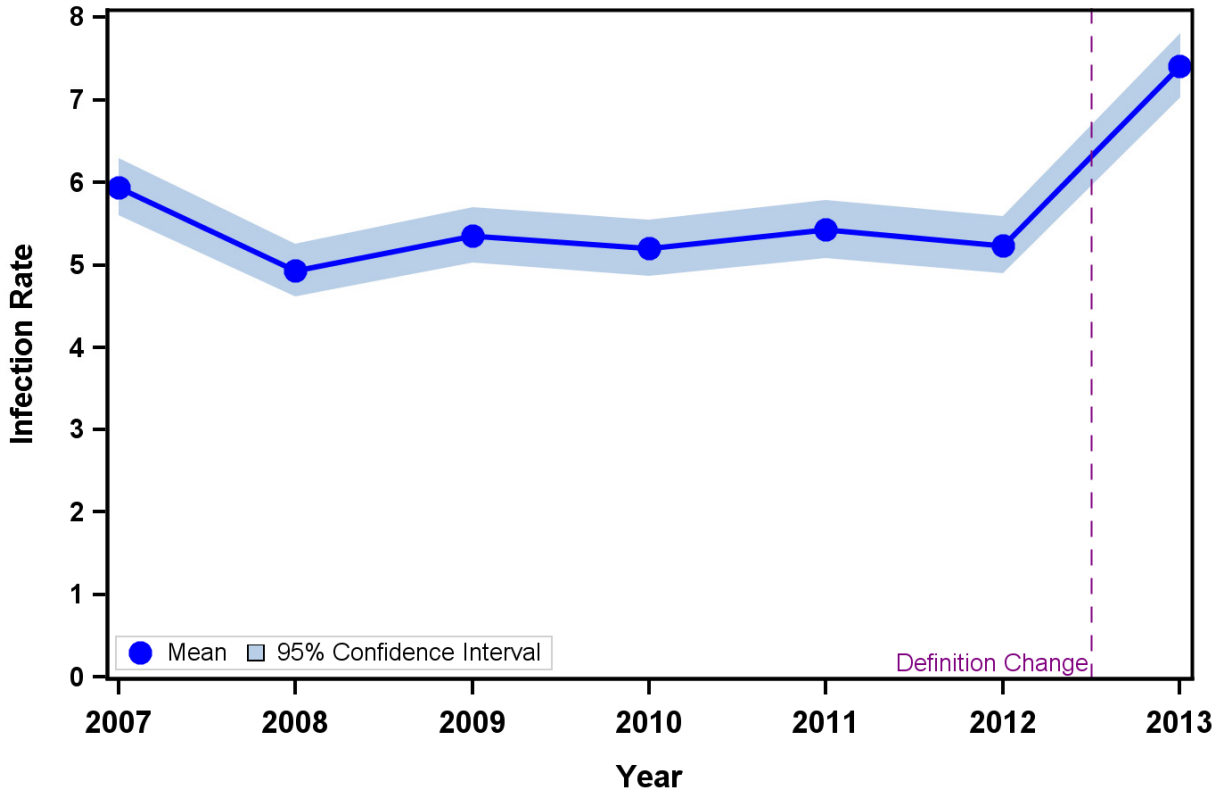
New York State data reported as of June 30, 2014. Out of 1,317 infections, no microorganisms identified for 292(22%) infections.
VRE: vancomycin-resistant enterococci; CephR: cephalosporin-resistant; CRE: carbapenem-resistant Enterobacteriaceae; MDR: multidrug resistant; MRSA: methicillin-resistant *Staphylococcus aureus;* MSSA: methicillin-susceptible *Staphylococcus aureus;* spp: multiple species

Time trends

Between 2012 and 2013, the number of procedures reported increased by 9% as the definition of primarily closed procedures was expanded. In the NYS Statewide Planning and Research Cooperative System (SPARCS)[3] billing data, 23% of patients had colon, small bowel, rectal, and bile duct, liver, or pancreas procedures on the same day. Because SSIs associated with these procedures are now more likely to be attributed to the colon procedure, the definition change may have a significant impact on trends. The colon SSI rate increased by 42% between 2012 and

2013. Because of the definition changes, the time trend should be interpreted with caution (Figure 1).

Figure 1. Trend in colon surgical site infection rates, New York State 2007-2013



Year	# Hospitals	# Procedures	For statewide trend[2]		For hospital comparisons[3]	
			Total # Infections	Total Infection Rate[1]	# Infections excluding PDS	Infection Rate[1] excluding PDS
2007	183	17,965	1,067	5.94	1,067	5.94
2008	179	18,135	894	4.93	804	4.43
2009	174	17,439	934	5.36	848	4.86
2010	173	16,884	878	5.20	803	4.76
2011	173	16,230	880	5.42	804	4.95
2012	173	16,339	855	5.23	763	4.67
2013	168	17,775	1,317	7.41	1,201	6.76

New York State Data reported as of June 30, 2014. PDS=post-discharge surveillance.
[1] Infection rate is the number of infections divided by the number of procedures, multiplied by 100.
[2]To assess trends, all NHSN data are included and graphed in the figure.
[3]To compare a hospital to the state average in a given year, follow that year's surveillance definition. Beginning in 2008, SSIs detected by PDS were excluded because PDS methods are not standardized across hospitals.

Risk-Adjustment for Colon SSIs

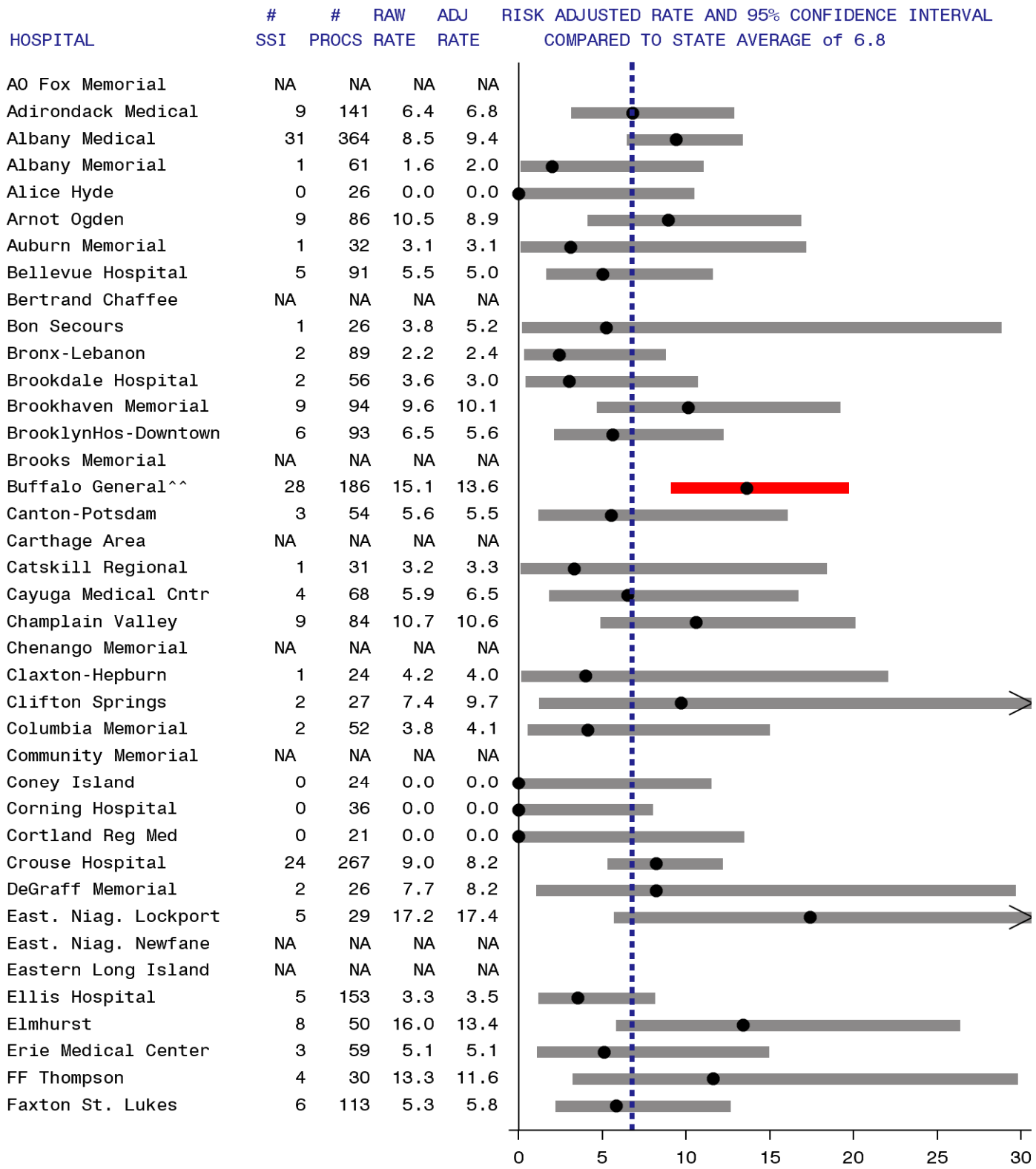
In 2013, after excluding SSIs reported as part of PDS methods that did not result in hospitalization, the following risk factors were associated with SSIs and included in the risk-adjustment model.

- Patients with an American Society of Anesthesiologists (ASA) score of 3, 4, or 5 were 1.2 times more likely to develop an SSI than patients with an ASA score of 1 or 2.
- Procedures with duration greater than three hours were 1.9 times more likely to result in SSI than procedures less than two hours. Procedures with duration between two and three hours were 1.3 times more likely to result in SSI than procedures less than two hours.
- Procedures on contaminated or dirty intraoperative surgical sites were 1.2 times more likely to result in SSI than procedures on clean-contaminated sites.
- Procedures that used traditional surgical incisions were 1.7 times more likely to result in SSI than procedures performed entirely with a laparoscopic instrument.

Hospital-Specific Colon SSI Rates

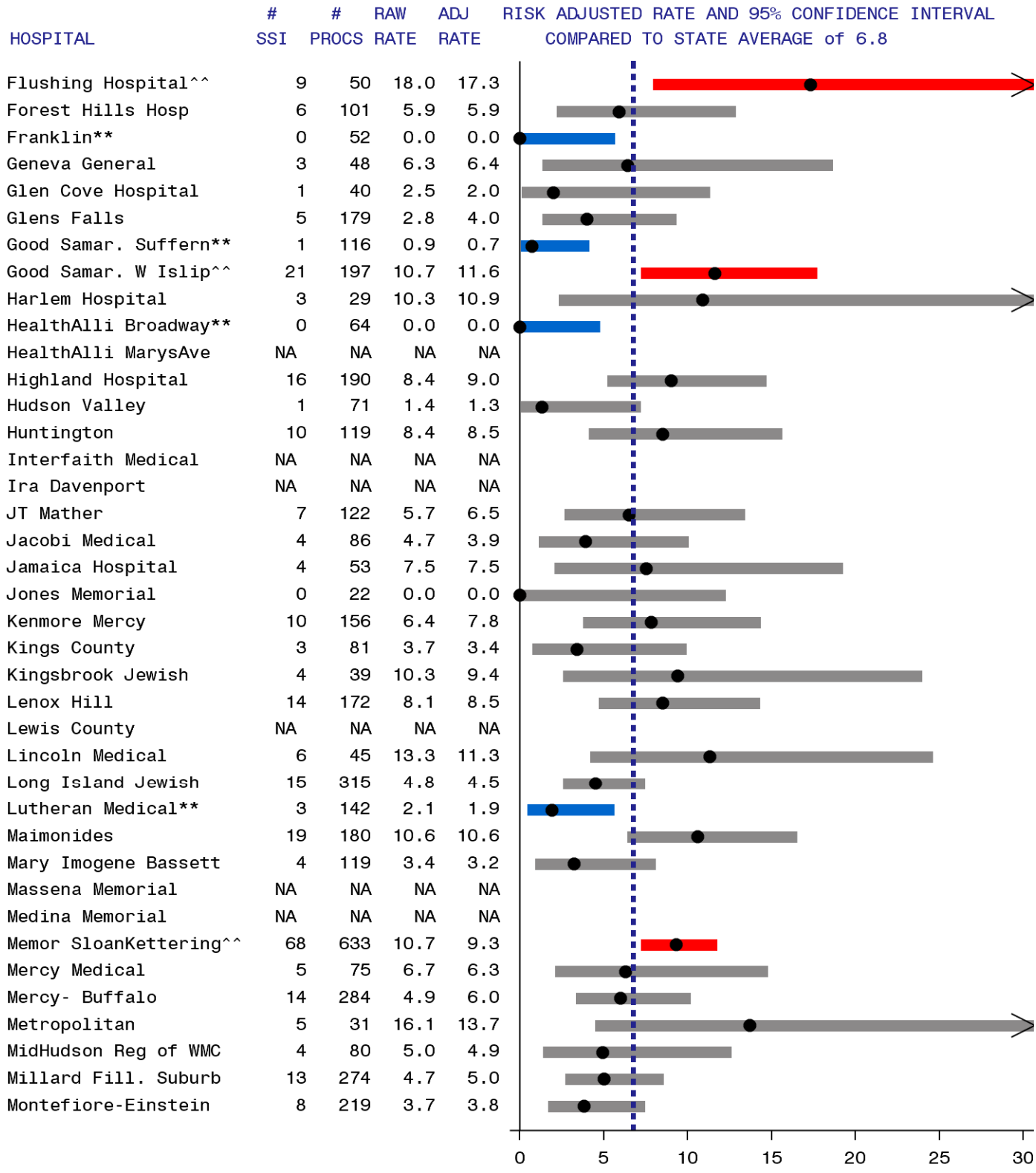
Hospital-specific colon SSI rates are provided in Figure 2. Refer to Appendix 3 for more information about reading this figure. Eleven hospitals (7%) had colon SSI rates that were statistically higher than the state average; New York Hospital Queens and Buffalo General were significantly higher for three years in a row (2011-2013). Ten hospitals (6%) had rates that were statistically lower than the state average; HealthAlliance of the Hudson Valley Broadway Campus was significantly lower for four years in a row (2010-2013).

Figure 2. Colon surgical site infection rates, New York 2013 (page 1 of 5)



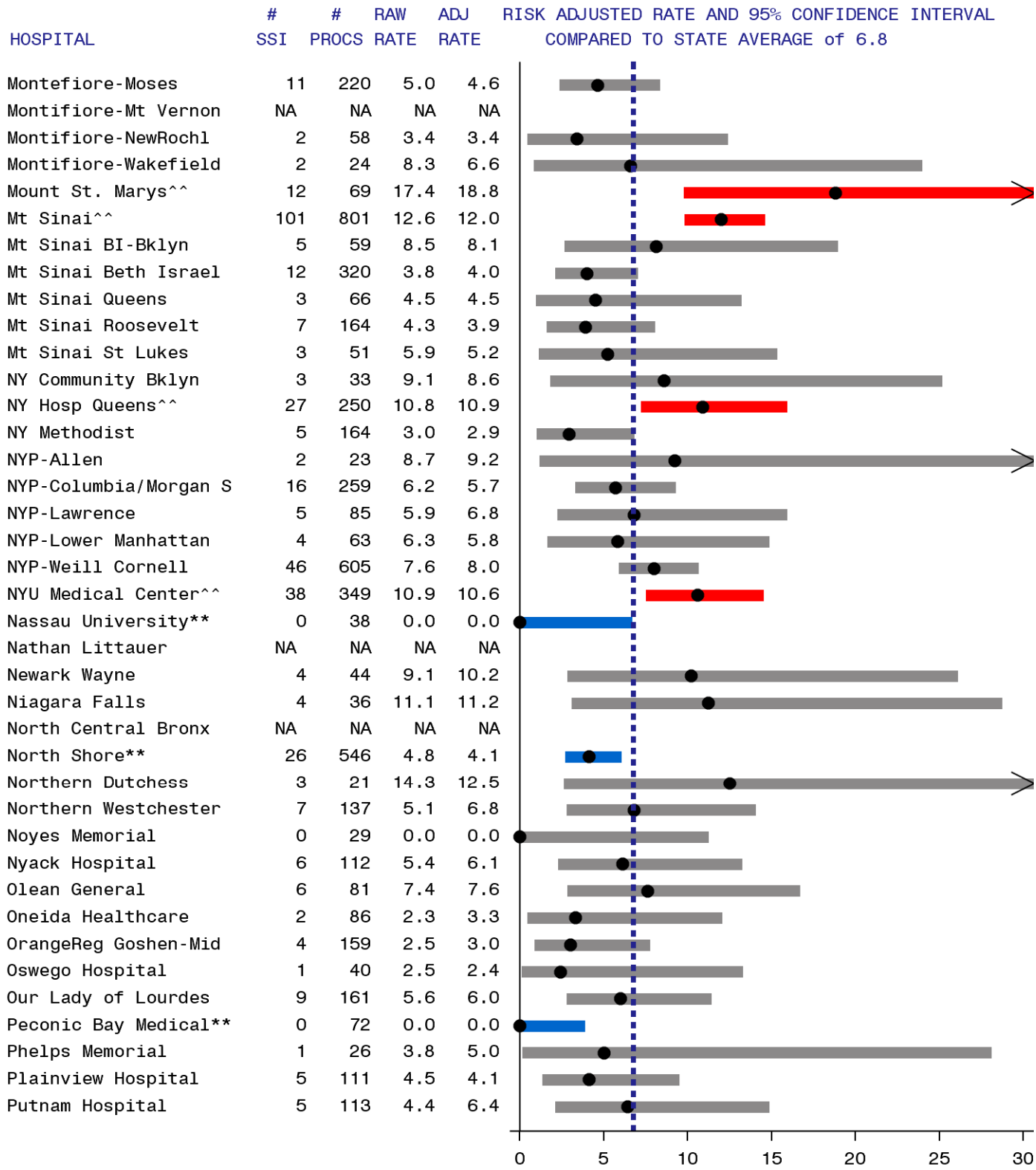
State average. ●Risk-adjusted infection rate. > Upper confidence limit exceeds graph area. ^^Significantly higher than state average. **Significantly lower than state average. Average. *Zero infections, not significant. NA: Hospitals with less than 20 procedures.
SSI: surgical site infections, Procs: procedures. Rates are per 100 procedures.
Data reported as of June 30, 2014. Excludes non-readmitted cases identified using post discharge surveillance.
Adjusted using ASA score, duration, contamination of intraoperative site, and laparoscope.

Figure 2. Colon surgical site infection rates, New York 2013 (page 2 of 5)



State average. ●Risk-adjusted infection rate. > Upper confidence limit exceeds graph area. —^^Significantly higher than state average. —**Significantly lower than state average. —Average. —*Zero infections, not significant. NA: Hospitals with less than 20 procedures.
SSI: surgical site infections, Procs: procedures. Rates are per 100 procedures.
Data reported as of June 30, 2014. Excludes non-readmitted cases identified using post discharge surveillance.
Adjusted using ASA score, duration, contamination of intraoperative site, and laparoscope.

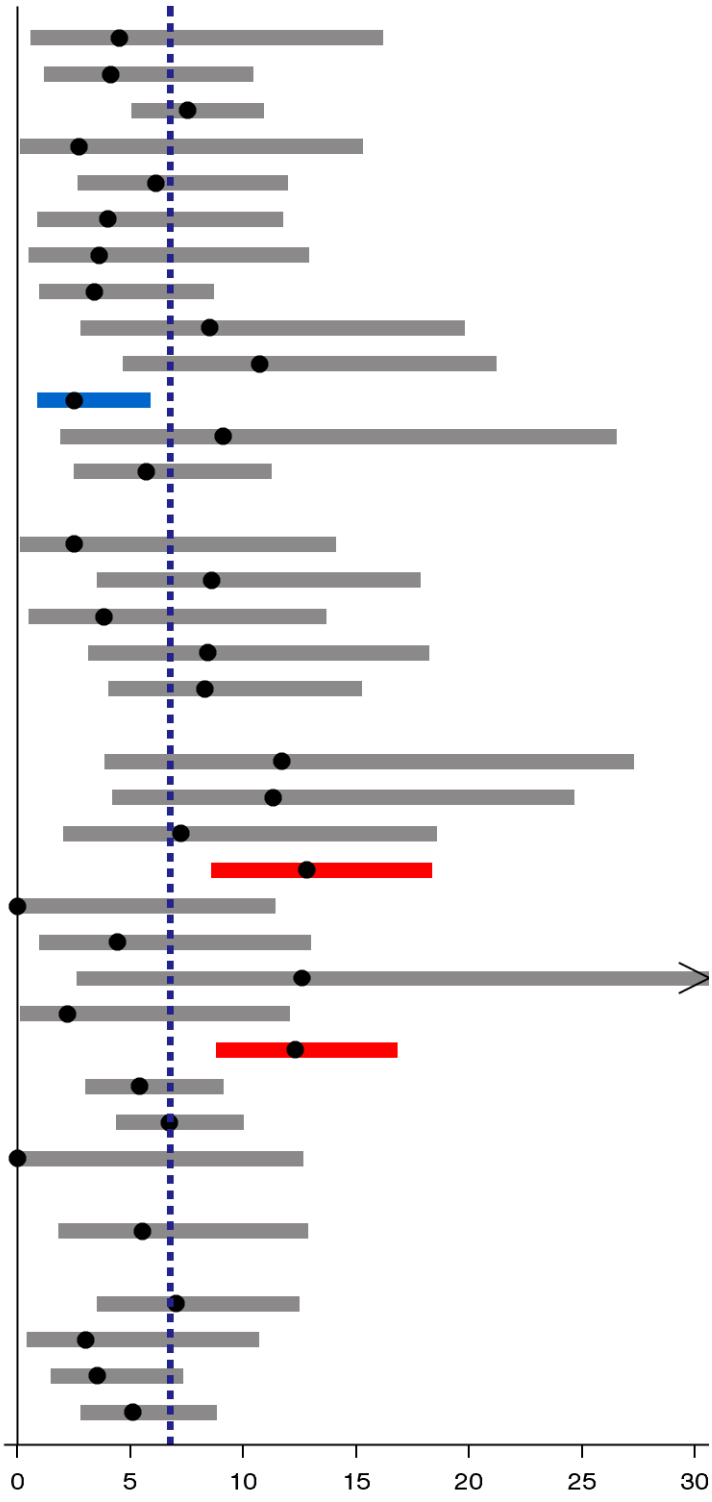
Figure 2. Colon surgical site infection rates, New York 2013 (page 3 of 5)



State average. ●Risk-adjusted infection rate. > Upper confidence limit exceeds graph area. —^^Significantly higher than state average. —**Significantly lower than state average. —Average. —*Zero infections, not significant. NA: Hospitals with less than 20 procedures.
SSI: surgical site infections, Procs: procedures. Rates are per 100 procedures.
Data reported as of June 30, 2014. Excludes non-readmitted cases identified using post discharge surveillance.
Adjusted using ASA score, duration, contamination of intraoperative site, and laparoscope.

Figure 2. Colon surgical site infection rates, New York 2013 (page 4 of 5)

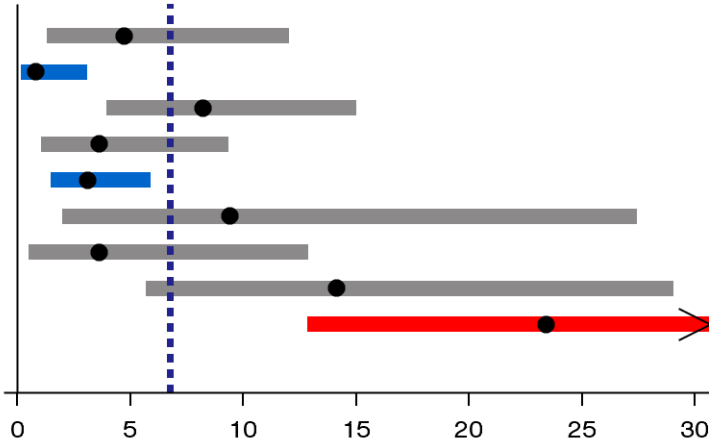
HOSPITAL	# SSI	# PROCS	RAW RATE	ADJ RATE
Queens Hospital	2	36	5.6	4.5
Richmond Univ	4	104	3.8	4.1
Rochester General	28	426	6.6	7.5
Rome Memorial	1	39	2.6	2.7
Roswell Park	8	115	7.0	6.1
Samaritan- Troy	3	80	3.8	4.0
Samaritan- Watertown	2	54	3.7	3.6
Saratoga Hospital	4	135	3.0	3.4
Sisters of Charity	5	67	7.5	8.5
Sisters- St Joseph	8	76	10.5	10.7
South Nassau Comm.**	5	163	3.1	2.5
Southampton	3	37	8.1	9.1
Southside	8	133	6.0	5.7
St Anthony	NA	NA	NA	NA
St Barnabas	1	32	3.1	2.5
St Catherine Siena	7	78	9.0	8.6
St Charles Hospital	2	41	4.9	3.8
St Elizabeth Medical	6	81	7.4	8.4
St Francis- Roslyn	10	154	6.5	8.3
St James Mercy	NA	NA	NA	NA
St Johns Episcopal	5	37	13.5	11.7
St Johns Riverside	6	61	9.8	11.3
St Joseph -Bethpage	4	60	6.7	7.2
St Josephs- Syracuse^^	29	249	11.6	12.8
St Josephs- Yonkers	0	25	0.0	0.0
St LukesNewburgh-Cor	3	77	3.9	4.4
St Marys Amsterdam	3	37	8.1	12.6
St Marys Troy	1	48	2.1	2.2
St Peters Hospital^^	39	376	10.4	12.3
Staten Island U N-S	14	238	5.9	5.4
Strong Memorial	24	350	6.9	6.7
Syosset Hospital	0	26	0.0	0.0
TLC Lake Shore	NA	NA	NA	NA
U Health Bing-Wilson	5	96	5.2	5.5
United Memorial	NA	NA	NA	NA
Unity Hosp Rochester	11	179	6.1	7.0
Univ Hosp Brooklyn	2	60	3.3	3.0
Univ Hosp SUNY Upst	7	172	4.1	3.5
Univ HospStony Brook	13	225	5.8	5.1



State average. ●Risk-adjusted infection rate. > Upper confidence limit exceeds graph area. ^^Significantly higher than state average. **Significantly lower than state average. Average. *Zero infections, not significant. NA: Hospitals with less than 20 procedures.
SSI: surgical site infections, Procs: procedures. Rates are per 100 procedures.
Data reported as of June 30, 2014. Excludes non-readmitted cases identified using post discharge surveillance.
Adjusted using ASA score, duration, contamination of intraoperative site, and laparoscope.

Figure 2. Colon surgical site infection rates, New York 2013 (page 5 of 5)

HOSPITAL	# SSI	# PROCS	RAW RATE	ADJ RATE
Upst. Community Gen	4	79	5.1	4.7
Vassar Brothers**	2	192	1.0	0.8
Westchester Medical	10	99	10.1	8.2
White Plains	4	129	3.1	3.6
Winthrop University**	9	328	2.7	3.1
Woman and Childrens	3	32	9.4	9.4
Womans Christian	2	66	3.0	3.6
Woodhull Medical	7	39	17.9	14.1
Wyckoff Heights^^	14	55	25.5	23.4
Wyoming County Comm.	NA	NA	NA	NA



State average. ●Risk-adjusted infection rate. > Upper confidence limit exceeds graph area. —^^Significantly higher than state average. —**Significantly lower than state average. —Average. —*Zero infections, not significant. NA: Hospitals with less than 20 procedures.
SSI: surgical site infections, Procs: procedures. Rates are per 100 procedures.
Data reported as of June 30, 2014. Excludes non-readmitted cases identified using post discharge surveillance.
Adjusted using ASA score, duration, contamination of intraoperative site, and laparoscope.

Coronary Artery Bypass Graft (CABG) Surgical Site Infections

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

CABG Chest Infections

Among 10,751 CABG procedures performed in 2013, 173 (1.6%) developed SSIs within 90 days. Of these infections, 32% were superficial, 37% were deep, and 31% were organ/space (Table 7). The majority of the SSIs (75%) were detected upon readmission to the same hospital, 17% were identified during the initial hospitalization, 6% involved readmission to another hospital, and 1% were detected in outpatient settings. Detection of SSIs in outpatient locations is labor intensive and is not standardized across hospitals; therefore, the NYSDOH did not include these two infections for hospital-specific comparisons. The detection and depth of CABG chest SSIs is consistent with previous published NYS HAI public reports.

Table 7. Method of detection of coronary artery bypass graft chest site infection by depth of infection, New York State 2013

	When Detected				
Extent (Row%) (Column%)	**Initial Hospitalization**	**Readmitted to the Same Hospital**	**Readmitted to Another Hospital**	**Post-Discharge Surveillance Not Readmitted**	**Total**
Superficial Incisional	14 (25.5%) (46.7%)	39 (70.9%) (30.0%)	2 (3.6%) (18.2%)	0 (0.0%) (0.0%)	55 (31.8%)
Deep Incisional	6 (9.4%) (20.0%)	51 (79.7%) (39.2%)	5 (7.8%) (45.5%)	2 (3.1%) (100%)	64 (37.0%)
Organ/Space	10 (18.5%) (33.3%)	40 (74.1%) (30.8%)	4 (7.4) (36.4%)	0 (0.0%) (0.0%)	54 (31.2%)
Total	30 (17.3%)	130 (75.1%)	11 (6.4%)	2 (1.2%)	173

New York State data reported as of September 25, 2014.

Microorganisms Associated with CABG Chest SSIs

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

Table 8. Microorganisms identified in coronary artery bypass chest site infections, New York State 2013

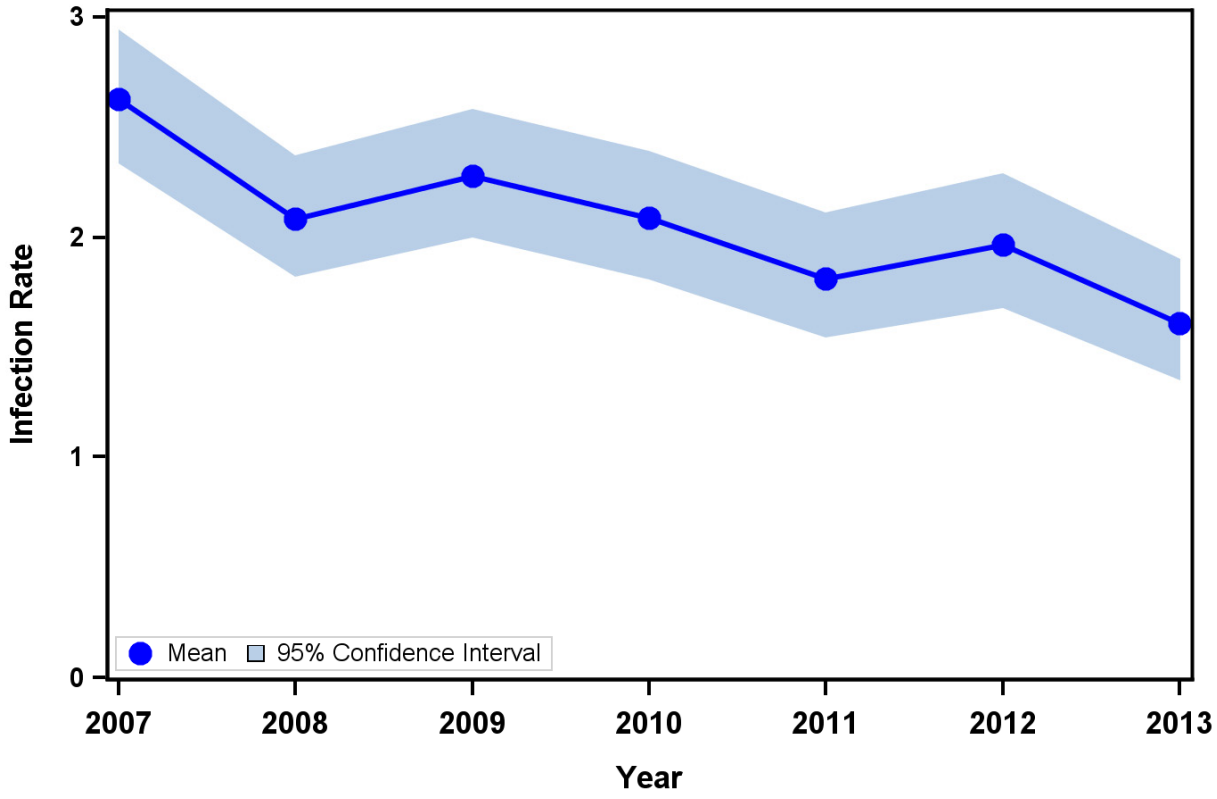
Microorganism	Number of Isolates	Percent of Infections
Staphylococcus aureus	48	27.7
(MRSA)	(19)	(11.0)
(MSSA)	(29)	(16.8)
Coagulase negative Staphylococci	20	11.6
Pseudomonas spp.	19	11.0
Klebsiella spp.	16	9.2
(CephR *Klebsiella*)	(1)	(0.6)
Serratia spp.	13	7.5
Escherichia coli	11	6.4
Proteus spp.	11	6.4
Enterobacter spp.	9	5.2
Enterococci	8	4.6
(VRE)	(1)	(0.6)
Streptococci	5	2.9
Other	10	5.8

New York State data reported as of September 25, 2014. Out of 173 infections (includes post-discharge surveillance). No microorganisms identified for 32 (18.5%) infections. VRE: vancomycin-resistant enterococci; MRSA: methicillin-resistant *Staphylococcus aureus;* MSSA: methicillin-susceptible *Staphylococcus aureus;* CephR: cephalosporin-resistant*;* spp: multiple species

Time Trends in CABG Chest SSIs

To account for the decrease in follow-up from one year to 90 days following CABG procedures as of January 2013, infections that occurred after 90 days were excluded from the 2007-2012 data, shifting the historical mean down by 6%. Between 2007 and 2013, the CABG chest SSI rate decreased 40%, from 2.6 to 1.6 infections per 100 procedures (Figure 3). This resulted in 465 prevented SSIs and a direct cost savings estimated to be between $5.5 million and $16.1 million since 2007.[4]

Figure 3. Trend in coronary artery bypass graft chest site infection rates, New York State 2007-2013



Year	# Hospitals	# Procedures	For statewide trend-excluded infections detected past 90 days[2]		For hospital comparisons[3]	
			# Infections	Infection Rate[1]	# Infections excluding PDS	Infection Rate[1] excluding PDS
2007	40	14,266	375	2.63	385	2.70
2008	40	13,967	291	2.08	301	2.16
2009	40	13,438	306	2.28	304	2.26
2010	39	12,409	259	2.09	275	2.22
2011	40	11,525	209	1.81	221	1.92
2012	39	10,728	211	1.97	218	2.03
2013	39	10,751	173	1.61	171	1.59

New York State Data reported as of September 25, 2014. PDS=post-discharge surveillance.
[1] Infection rate is the number of infections divided by the number of procedures, multiplied by 100.
[2]To assess trends, infections identified more than 90 days after the procedure were excluded from 2007-2012 data to match the 2013 surveillance definition; this data is graphed in the figure.
[3]To compare a hospital to the state average in a given year, follow that year's surveillance definition. Beginning in 2008, SSIs detected by PDS were excluded because PDS methods are not standardized across hospitals.

Risk Adjustment for CABG Chest SSIs

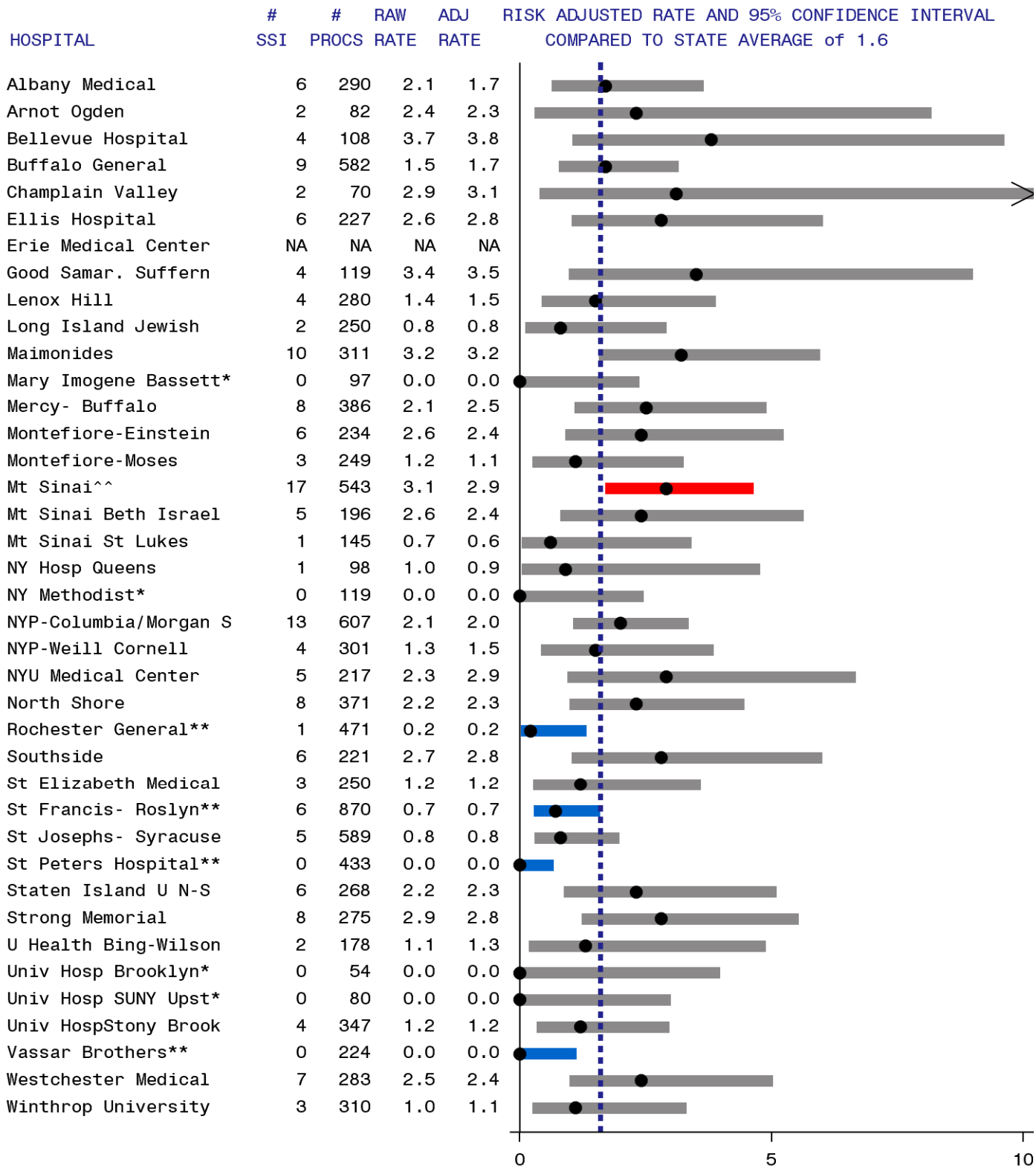
Certain patient and procedure-specific risk factors increased the risk of developing a chest SSI following CABG surgery. In 2013, the following risk factors were associated with SSIs and were included in the risk-adjustment:

- Patients with diabetes were 1.9 times more likely to develop an SSI than patients without diabetes.
- Very obese patients (with body mass index [BMI] greater than or equal to 40) were 3.7 times more likely to develop an SSI, and obese patients (with BMI between 30 and 39) were 1.5 times more likely to develop an SSI than patients with BMI less than 30.
- Females were 1.6 times more likely to develop an SSI than males.
- Patients with renal failure were 1.6 times more likely to develop an SSI than patients without renal failure.
- Patients with congestive heart failure (CHF) were 1.2 times more likely to develop an SSI than patients without CHF.
- Patients with peripheral artery disease (PAD) were 1.7 times more likely to develop an SSI than patients without PAD.
- Patients who underwent procedures with a total duration longer than five hours were 1.5 times more likely to develop an SSI than patients undergoing shorter procedures.

Hospital-Specific CABG Chest SSI Rates

Hospital-specific CABG chest SSI rates are provided in Figure 4. In 2013, of the 39 reporting hospitals, one had a CABG chest SSI rate that was statistically higher than the state average. Four hospitals (10%) were statistically lower than the state average. Vassar Brothers Medical Center had a rate statistically lower than the state average for five years in a row (2009-2013).

Figure 4. Coronary artery bypass graft chest site infection rates, New York 2013 (page 1 of 1)



State average. ●Risk-adjusted infection rate. > Upper confidence limit exceeds graph area. —^^Significantly higher than state average. —**Significantly lower than state average. —Average. —*Zero infections, not significant.
SSI: surgical site infections. Procs: procedures. Rates are per 100 procedures.
Data reported as of September 25, 2014. NHSN Codes CBGB and CBGC. Excludes non-readmitted cases identified using post discharge surveillance. Adjusted using diabetes, body mass index, gender, end stage renal disease, CHF, peripheral artery disease, and duration.

CABG Donor Site infections

Among 9,556 CABG procedures that involved donor sites in 2013, 48 (0.5%) developed SSIs. Of these infections, 69% were superficial and 31% were deep (Table 9). The majority of the SSIs (62%) were detected during readmission to the same hospital, 21% were identified during the initial hospitalization, 8% involved readmission to another hospital, and 8% were detected in outpatient locations. The majority of infections detected in outpatient locations were superficial. Detection of SSIs in outpatient locations using PDS is labor intensive and is not standardized across hospitals; therefore, the NYSDOH did not include these four infections in hospital-specific comparisons.

Table 9. Method of detection for coronary artery bypass graft donor site infection by depth of infection, New York State 2013

	When Detected				
Extent (Row%) (Column%)	**Initial Hospitalization**	**Readmitted to the Same Hospital**	**Readmitted to Another Hospital**	**Post-Discharge Surveillance Not Readmitted**	**Total**
Superficial Incisional	6 (18.2%) (60.0%)	21 (63.6%) (70.0%)	2 (6.1%) (50.0%)	4 (12.1%) (100%)	33 (68.8%)
Deep Incisional	4 (26.7%) (40.0%)	9 (60.0%) (30.0%)	2 (13.3%) (50.0%)	0 (0%) (0%)	15 (31.2%)
Total	10 (20.8%)	30 (62.5%)	4 (8.3%)	4 (8.3%)	48

New York State data reported as of September 25, 2014.

Microorganisms Associated with CABG Donor SSIs

In NYS, the most common microorganisms associated with CABG donor SSIs were *E. coli* and *Staphylococcus aureus* (Table 10). The percentage of *E. coli* has been steadily increasing: 7% in 2011, 16% in 2012, and 27% in 2013.

Table 10. Microorganisms identified in coronary artery bypass donor site infections, New York State 2013

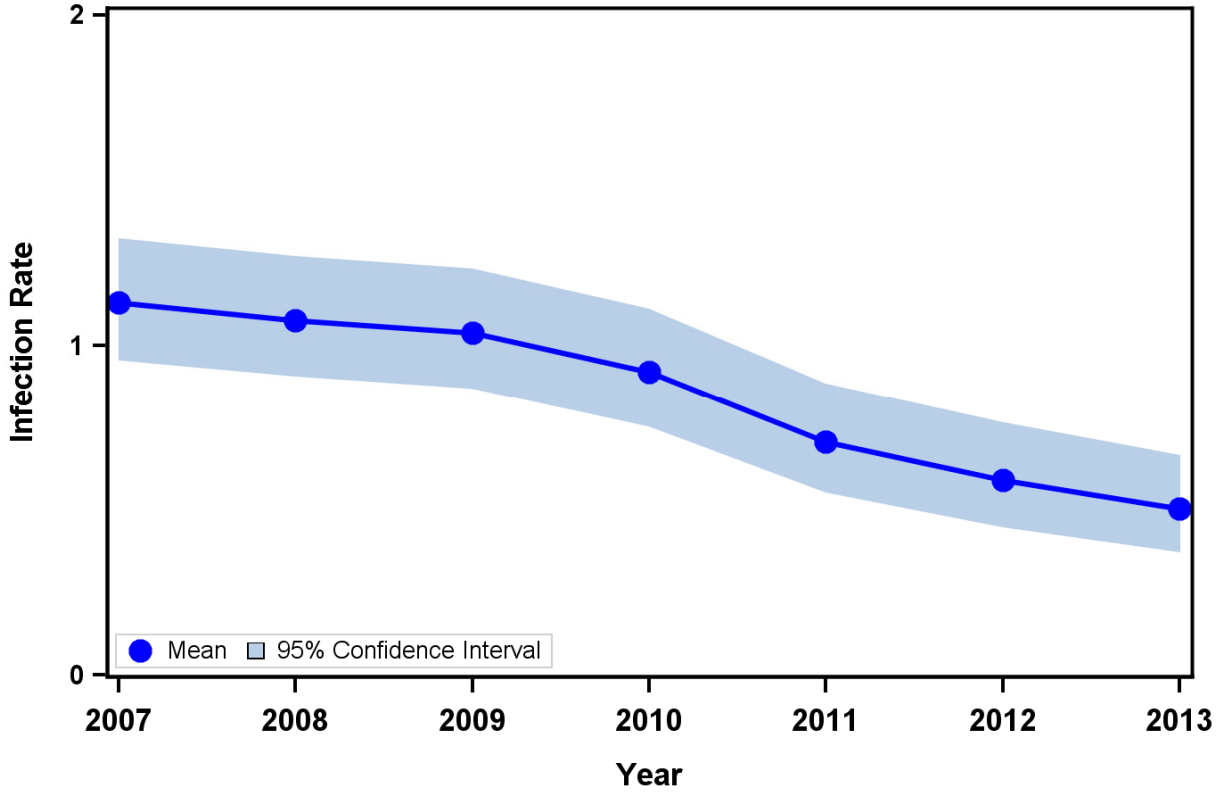
Microorganism	Number of Isolates	Percent of Infections
Escherichia coli	13	27.1
(CRE-*E. coli*)	(1)	(2.1)
Staphylococcus aureus	11	22.9
(MRSA)	(5)	(10.4)
(MSSA)	(6)	(12.5)
Pseudomonas spp.	8	16.7
Proteus spp.	5	10.4
Enterococci	3	6.3
Klebsiella spp.	2	4.2
(CRE-*Klebsiella*)	(1)	(2.1)
(CephR-*Klebsiella*)	(1)	(2.1)
Other	9	18.8

New York State data reported as of September 25, 2014. Out of 48 infections. No microorganisms identified for 12 (25%) infections.
MRSA: methicillin-resistant *Staphylococcus aureus;* MSSA: methicillin-susceptible *Staphylococcus aureus;* VRE: vancomycin-resistant enterococci;
CephR: cephalosporin-resistant; CRE: carbapenem-resistant Enterobacteriaceae; spp: multiple species.

Time Trends in CABG Donor SSIs

Between 2007 and 2013, the NYS CABG donor surgical site infection rate significantly declined 56%, from 1.1 infections per 100 procedures in 2007 to 0.5 infections per 100 procedures in 2013 (Figure 5). This resulted in 197 prevented SSIs and a direct cost savings estimated to be between $2.3 million and $6.8 million since 2007.[4]

Figure 5. Trend in coronary artery bypass graft donor site infection rates, New York State 2007-2013



Year	# Hospitals	# Procedures	For Statewide Trend[2]		For Hospital Comparisons[3]	
			# Infections	Infection Rate[1]	# Infections excluding PDS	Infection Rate[1] excluding PDS
2007	40	13,203	149	1.13	148	1.12
2008	40	12,905	139	1.08	128	0.99
2009	40	12,416	129	1.04	109	0.88
2010	39	11,429	105	0.92	92	0.80
2011	40	10,364	73	0.70	66	0.64
2012	39	9,659	57	0.59	52	0.54
2013	39	9,556	48	0.50	44	0.46

New York State Data reported as of September 25, 2014. PDS=post-discharge surveillance.
[1] Infection rate is the number of infections divided by the number of procedures, multiplied by 100.
[2]To assess trends, all NHSN data are included and graphed in the figure.
[3]To compare a hospital to the state average in a given year, follow that year's surveillance definition. Beginning in 2008, SSIs detected by PDS were excluded because PDS methods are not standardized across hospitals.

Risk Adjustment for CABG Donor SSIs

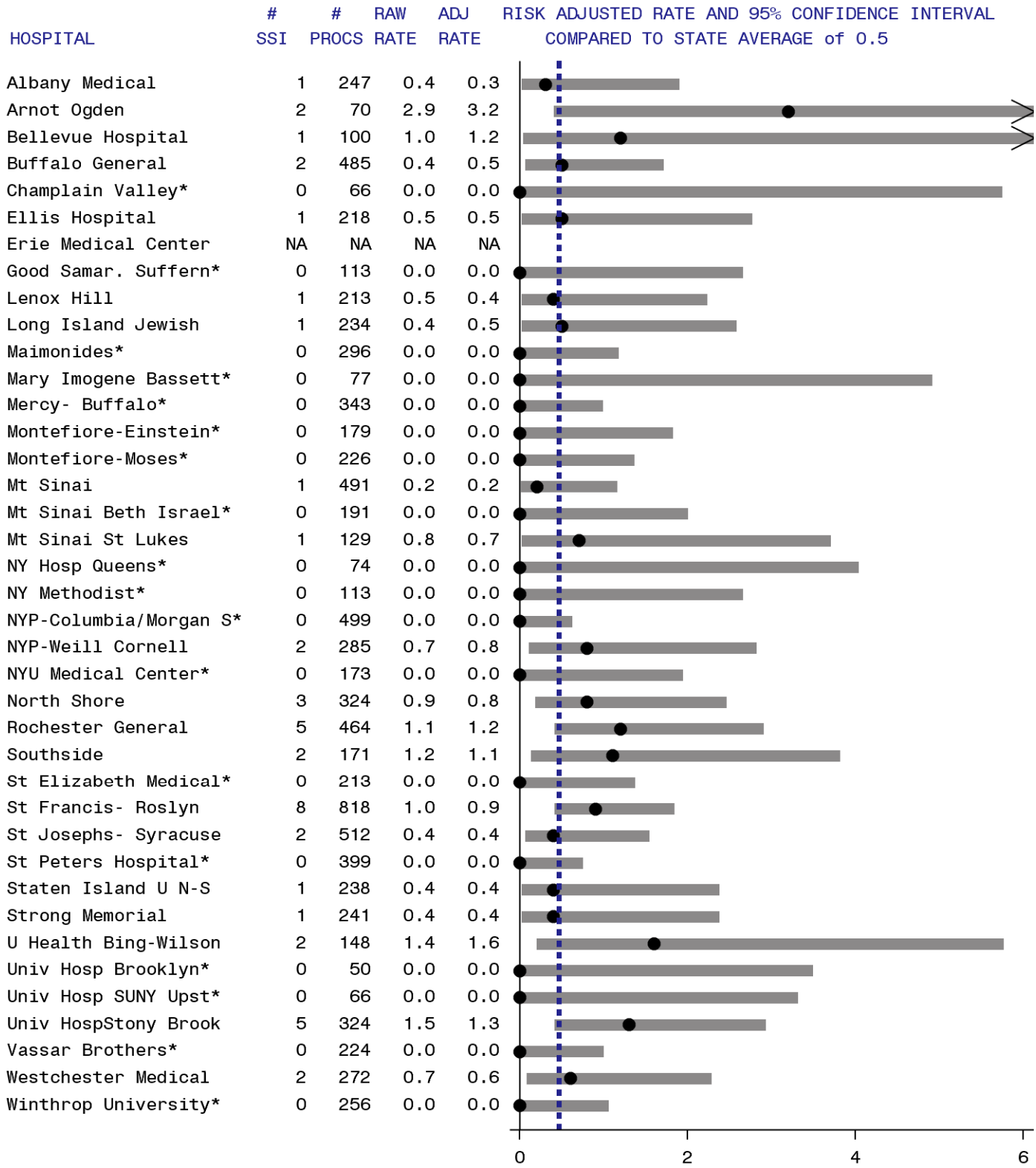
Certain patient and procedure-specific factors increased the risk of developing a donor-site SSI following CABG surgery. In 2013, after excluding SSIs identified using PDS that did not result in hospitalization, the following risk factors were associated with SSI. These variables were used to risk-adjust hospital-specific rates:

- Obese patients (with BMI greater than or equal to 30) were 1.7 times more likely to develop an SSI than patients with BMI less than 30.
- Patients with renal failure were 3.2 times more likely to develop an SSI than patients without renal failure.
- Patients undergoing non-autologous intraoperative blood transfusion were 2.5 times more likely to develop an SSI than patients without this type of transfusion.

Hospital-Specific CABG Donor SSI rates

Hospital-specific CABG donor-site SSI rates are provided in Figure 6. In 2013, no hospitals were flagged for having rates statistically higher or lower than the state average.

Figure 6. Coronary artery bypass graft donor site infection rates, New York 2013 (page 1 of 1)



State average. ●Risk-adjusted infection rate. > Upper confidence limit exceeds graph area. ^^Significantly higher than state average. **Significantly lower than state average. Average. *Zero infections, not significant.

SSI: surgical site infections. Procs: procedures. Rates are per 100 procedures. Only one donor site infection per person is counted. Data Reported as of September 25, 2014. NHSN Code CBGB. Excludes non-readmitted cases identified using post discharge surveillance.

Adjusted using body mass index, renal failure, and transfusion.

Hip Replacement/Revision Surgical Site Infections

Among 30,415 hip procedures performed in 2013, 289 (0.95%) developed SSIs within 90 days. Of these infections, 30% were superficial, 38% were deep, and 32% were organ/space (Table 11). The majority of the SSIs (77%) were detected upon readmission to the same hospital, 5% were identified during the initial hospitalization, 8% involved readmission to another hospital, and 9% were detected in outpatient settings. Detection of SSIs in outpatient locations is labor intensive and is not standardized across hospitals; therefore, the NYSDOH did not include these 27 infections for hospital-specific comparisons. The detection and depth of hip SSIs is consistent with previous published NYS HAI public reports. In an analysis of 2008-2012 hip procedures by depth of infection, the following characteristics were similar among superficial, deep, and organ/space infections, demonstrating the importance of including superficial infections in SSI rates: post-operative length of stay, reason for readmission, and infectious etiologies.[5]

Table 11. Method of detection of hip surgical site infection by depth of infection, New York State 2013

	When Detected				
Extent (Row%) (Column%)	**Initial Hospitalization**	**Readmitted to the Same Hospital**	**Readmitted to Another Hospital**	**Post-Discharge Surveillance Not Readmitted**	**Total**
Superficial Incisional	7 (8.0%) (46.7%)	62 (70.5%) (27.8%)	6 (6.8%) (25.0%)	13 (14.8%) (48.1%)	88 (30.4%)
Deep Incisional	5 (4.6%) (33.3%)	84 (77.1%) (37.7%)	8 (7.3%) (33.3%)	12 (11.0%) (44.4%)	109 (37.7%)
Organ/Space	3 (3.3%) (20.0%)	77 (83.7%) (34.5%)	10 (10.9%) (41.7%)	2 (2.2%) (7.4%)	92 (31.8%)
Total	15 (5.2%)	223 (77.2%)	24 (8.3%)	27 (9.3%)	289

New York State data reported as of June 30, 2014.

The most common microorganisms associated with hip SSIs were *Staphylococcus aureus,* coagulase-negative Staphylococci, Enterococci, and *Escherichia coli* (Table 12). The distribution of microorganisms associated with hip replacement SSIs is consistent with previous NYS HAI public reports.

Table 12. Microorganisms identified in hip replacement surgical site infections, New York State 2013

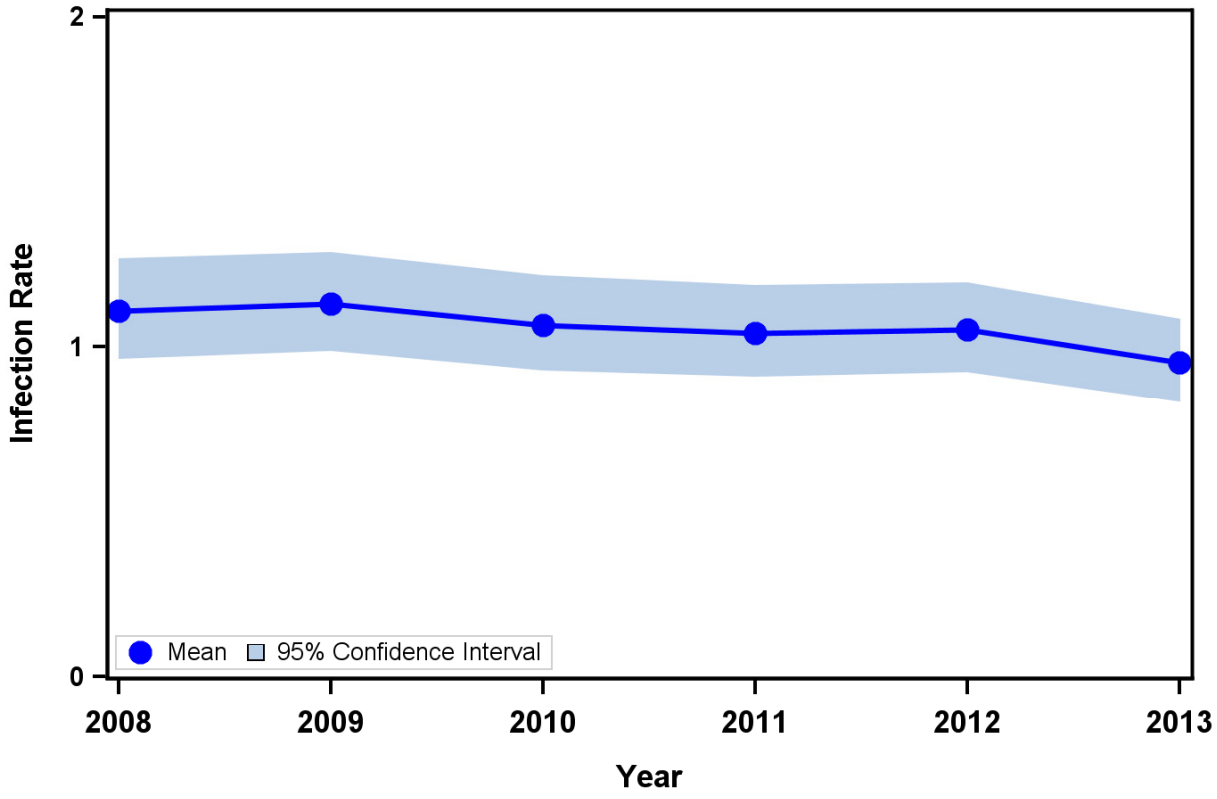
Microorganism	Number of Isolates	Percent of Infections
Staphylococcus aureus	127	43.9
(MRSA)	(51)	(17.6)
(MSSA)	(72)	(24.9)
Coagulase negative Staphylococci	42	14.5
Enterococci	35	12.1
(VRE)	(6)	(2.1)
Escherichia coli	32	11.1
(CRE-E. coli)	(1)	(0.3)
Proteus spp.	19	6.6
Pseudomonas spp.	16	5.5
Streptococci	15	5.2
Klebsiella spp.	14	4.8
(CRE-*Klebsiella*)	(2)	(0.7)
(CephR-*Klebsiella*)	(1)	(0.3)
Enterobacter spp.	8	2.8
Acinetobacter spp.	2	0.7
(MDR-*Acinetobacter*)	(2)	(0.7)
Other	20	6.9

New York State data reported as of June 30, 2014. Out of 289 infections. No microorganisms identified for 38 (13%) infections.
VRE: vancomycin-resistant enterococci; CephR: cephalosporin-resistant; CRE: carbapenem-resistant; MDR: multidrug resistant; MRSA: methicillin-resistant *Staphylococcus aureus;* MSSA: methicillin-susceptible *Staphylococcus aureus;* spp: multiple species

Time trends

To account for the decrease in follow-up from one year to 90 days following hip procedures as of January 2013, infections that occurred after 90 days were excluded from the 2008-2012 data, shifting the historical mean down by 10%. Between 2008 and 2013, the hip SSI rate decreased 14%, from 1.11 to 0.95 infections per 100 procedures (Figure 7). This resulted in approximately 90 prevented SSIs and a direct cost savings estimated to be between $1 million and $3 million since 2008.[4]

Figure 7. Trend in hip surgical site infection rates, New York State 2008-2013



Year	# Hospitals	# Procedures	For statewide trend-excluded infections detected past 90 days[2]		For hospital comparisons[3]	
			# Infections	Infection Rate[1]	# Infections excluding PDS	Infection Rate[1] excluding PDS
2008	172	24,357	270	1.11	273	1.12
2009	169	25,847	292	1.13	295	1.14
2010	167	26,290	280	1.07	290	1.10
2011	167	27,300	284	1.04	316	1.16
2012	165	28,423	299	1.05	309	1.09
2013	162	30,415	289	0.95	262	0.86

New York State Data reported as of June 30, 2014. PDS=post-discharge surveillance.
[1] Infection rate is the number of infections divided by the number of procedures, multiplied by 100.
[2]To assess trends, infections identified more than 90 days after the procedure were excluded from 2008-2012 data to match the 2013 surveillance definition; this data is graphed in the figure.
[3]To compare a hospital to the state average in a given year, follow that year's surveillance definition. Beginning in 2008, SSIs detected by PDS were excluded because PDS methods are not standardized across hospitals.

Risk Adjustment for Hip Surgical Site Infections

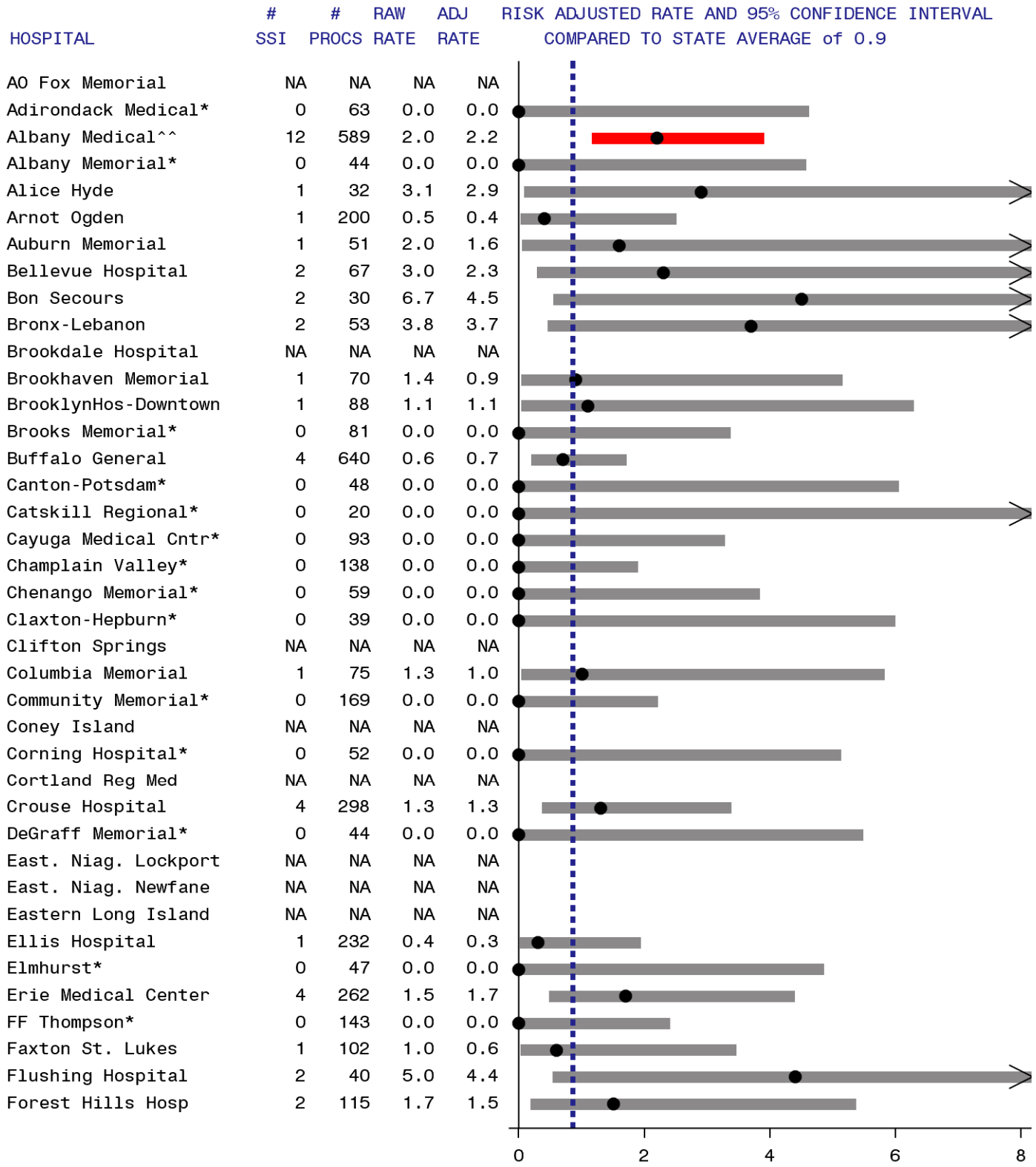
Certain patient and procedure-specific factors increased the risk of developing an SSI following hip surgery. In 2013, after excluding SSIs identified using PDS that did not result in hospitalization, the following risk factors were associated with SSIs. These variables were used to risk-adjust hospital-specific rates.

- Patients with an ASA score of 3, 4, or 5 were 2.1 times more likely to develop an SSI than patients with an ASA score of 1 or 2.
- The risk of SSI varied by type of hip procedure. Compared to total primary hip replacement procedures, partial revisions were 2.8 times more likely to result in an SSI, and total revisions were 2.4 times more likely to result in an SSI.
- Procedures with duration longer than the 75th percentile (by type of hip procedure) were 1.2 times more likely to result in an SSI than procedures of shorter duration.
- Procedures that were the result of a broken hip bone/joint or other traumatic injury to the patient were 1.9 times more likely to result in an SSI than elective surgeries.

Hospital-Specific Hip SSI Rates

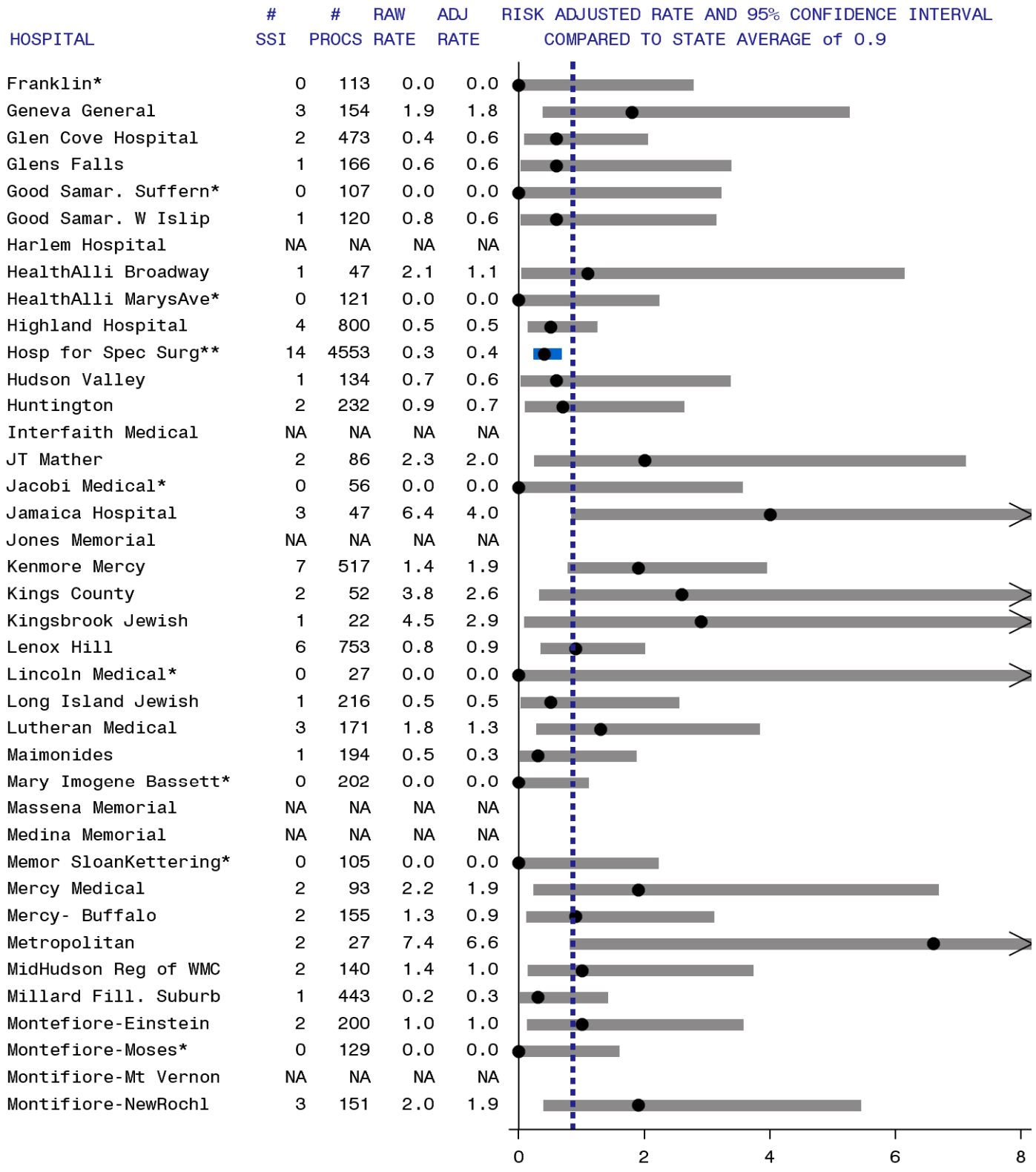
Hospital-specific hip SSI rates are provided in Figure 8. In 2013, six hospitals (4%) had hip SSI rates that were statistically higher than the state average. Two hospitals (1%) had SSI rates that were significantly lower than the state average; Hospital for Special Surgery was significantly lower in all of the past six years (2008-2013).

Figure 8. Hip replacement surgical site infection rates, New York 2013 (page 1 of 5)



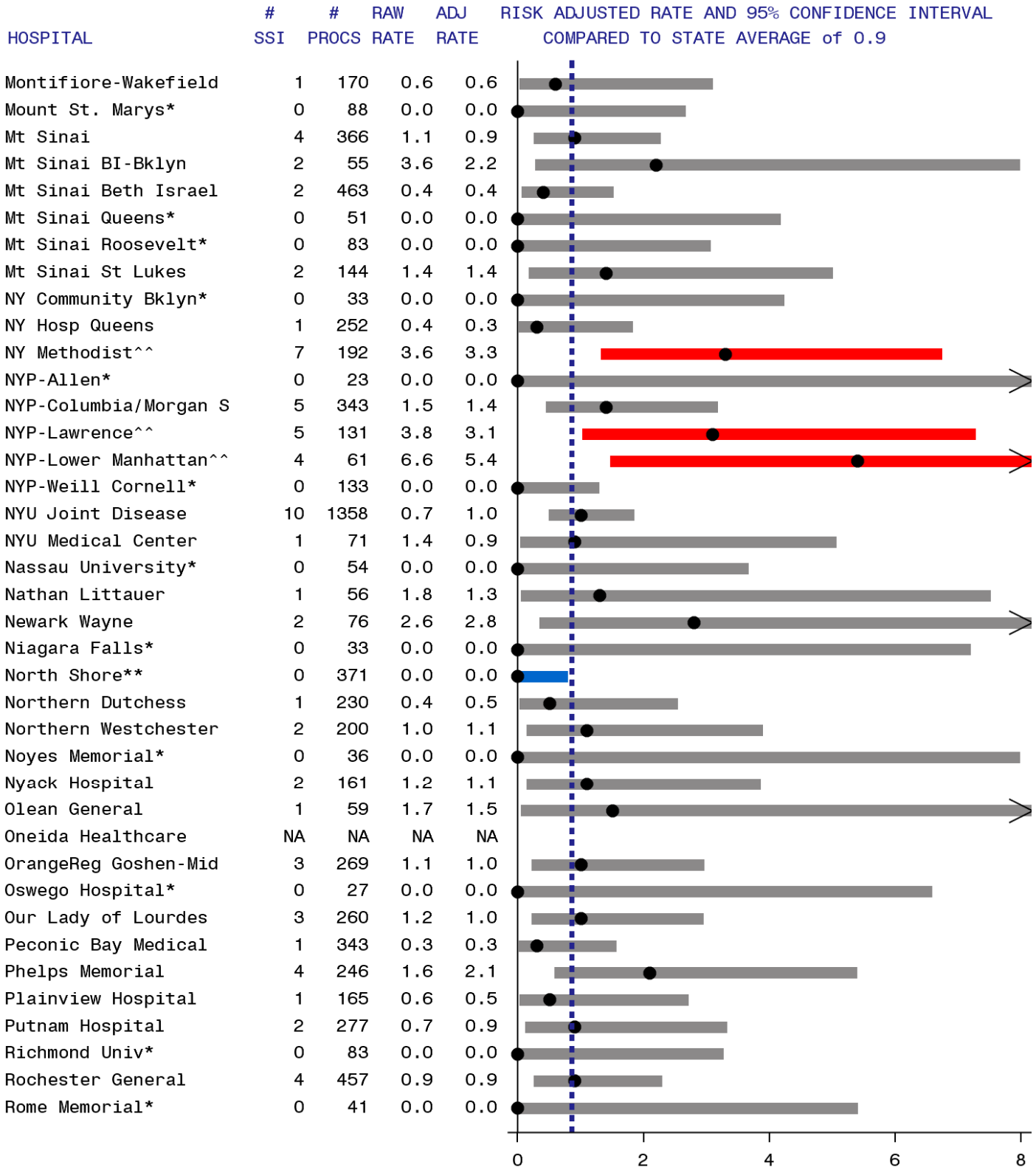
State average. ●Risk-adjusted infection rate. > Upper confidence limit exceeds graph area. —^^Significantly higher than state average. —**Significantly lower than state average. —Average. —*Zero infections, not significant. NA: Hospitals with less than 20 procedures.
SSI: surgical site infections. Procs: procedures. Rates are per 100 procedures.
Data reported as of June 30, 2014. Excludes non-readmitted cases identified using post discharge surveillance.
Adjusted using ASA score, procedure type (initial/revision, total/partial), duration, and trauma.

Figure 8. Hip replacement surgical site infection rates, New York 2013 (page 2 of 5)



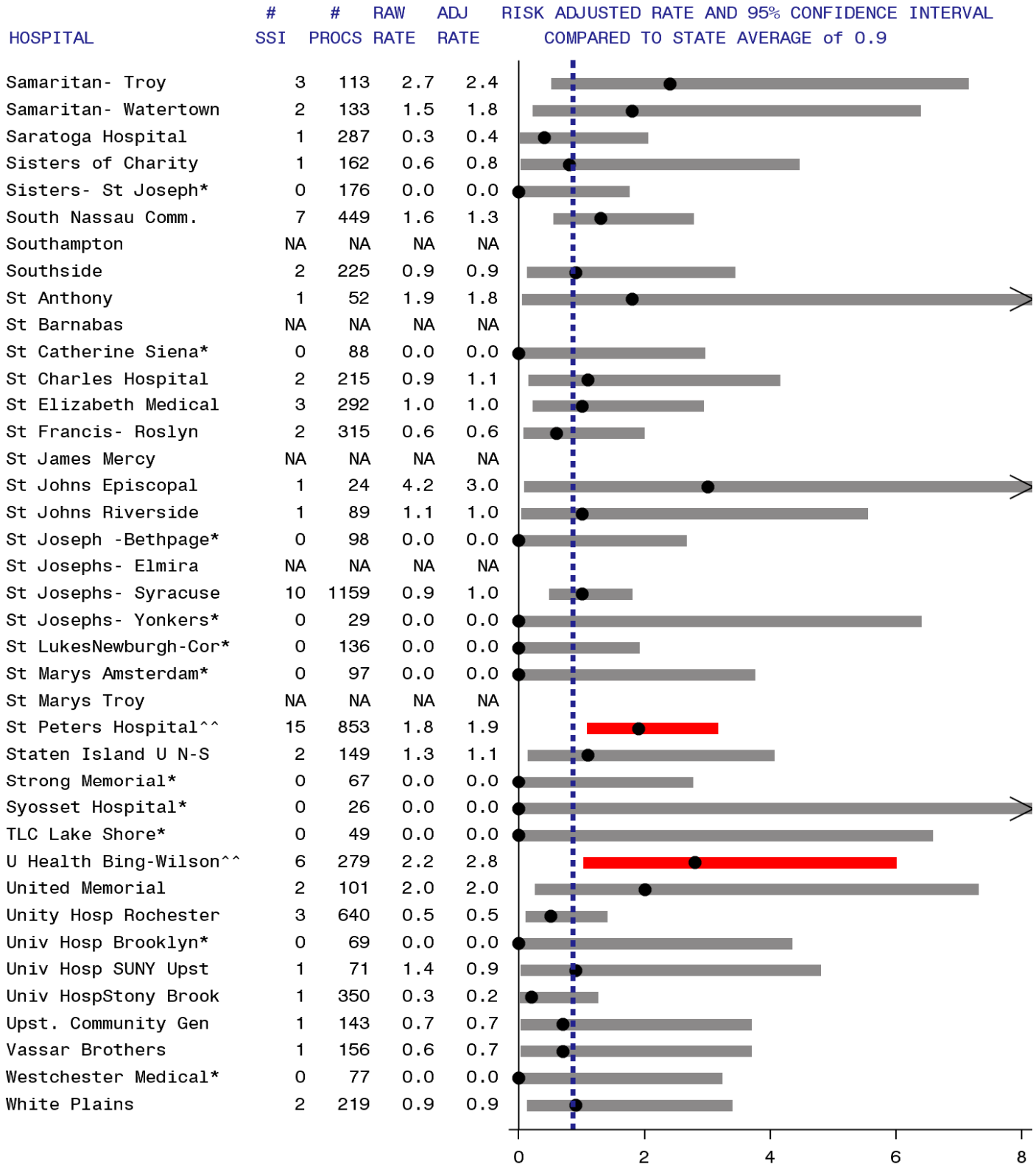
State average. ●Risk-adjusted infection rate. > Upper confidence limit exceeds graph area. —^^Significantly higher than state average. —**Significantly lower than state average. —Average. —*Zero infections, not significant. NA: Hospitals with less than 20 procedures.
SSI: surgical site infections. Procs: procedures. Rates are per 100 procedures.
Data reported as of June 30, 2014. Excludes non-readmitted cases identified using post discharge surveillance.
Adjusted using ASA score, procedure type (initial/revision, total/partial), duration, and trauma.

Figure 8. Hip replacement surgical site infection rates, New York 2013 (page 3 of 5)



State average. ●Risk-adjusted infection rate. > Upper confidence limit exceeds graph area. —^^Significantly higher than state average. —**Significantly lower than state average. —Average. —*Zero infections, not significant. NA: Hospitals with less than 20 procedures.
SSI: surgical site infections. Procs: procedures. Rates are per 100 procedures.
Data reported as of June 30, 2014. Excludes non-readmitted cases identified using post discharge surveillance.
Adjusted using ASA score, procedure type (initial/revision, total/partial), duration, and trauma.

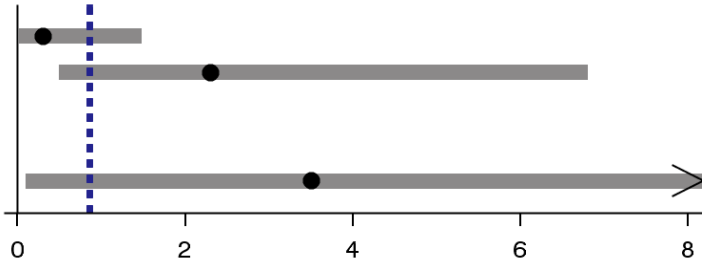
Figure 8. Hip replacement surgical site infection rates, New York 2013 (page 4 of 5)



State average. ●Risk-adjusted infection rate. > Upper confidence limit exceeds graph area. ^^Significantly higher than state average. **Significantly lower than state average. Average. *Zero infections, not significant. NA: Hospitals with less than 20 procedures.
SSI: surgical site infections. Procs: procedures. Rates are per 100 procedures.
Data reported as of June 30, 2014. Excludes non-readmitted cases identified using post discharge surveillance.
Adjusted using ASA score, procedure type (initial/revision, total/partial), duration, and trauma.

Figure 8. Hip replacement surgical site infection rates, New York 2013 (page 5 of 5)

HOSPITAL	# SSI	# PROCS	RAW RATE	ADJ RATE
Winthrop University	1	323	0.3	0.3
Womans Christian	3	106	2.8	2.3
Woodhull Medical	NA	NA	NA	NA
Wyckoff Heights	NA	NA	NA	NA
Wyoming County Comm.	1	25	4.0	3.5



State average. ●Risk-adjusted infection rate. > Upper confidence limit exceeds graph area. ^^Significantly higher than state average. **Significantly lower than state average. Average. *Zero infections, not significant. NA: Hospitals with less than 20 procedures.
SSI: surgical site infections. Procs: procedures. Rates are per 100 procedures.
Data reported as of June 30, 2014. Excludes non-readmitted cases identified using post discharge surveillance.
Adjusted using ASA score, procedure type (initial/revision, total/partial), duration, and trauma.

Abdominal Hysterectomy Surgical Site Infections

Among 19,164 abdominal hysterectomy procedures performed in 2013, 377 (2.0%) developed SSIs. Of these infections, 38% were superficial, 19% were deep, and 43% were organ/space (Table 13). Half of the SSIs (55%) were detected upon readmission to the same hospital, 24% were detected in outpatient settings, 14% were identified during the initial hospitalization, and 7% involved readmission to another hospital. The majority of the infections detected in outpatient locations were superficial. Detection of SSIs in outpatient locations is labor intensive and is not standardized across hospitals; therefore, the NYSDOH did not include these 92 infections for hospital-specific comparisons. The detection and depth of hysterectomy SSIs is consistent with the previous NYS HAI public report.

Table 13. Method of detection of hysterectomy surgical site infection by depth of infection, New York State 2013

	When Detected				
Extent (Row%) (Column%)	**Initial Hospitalization**	**Readmitted to the Same Hospital**	**Readmitted to Another Hospital**	**Post-Discharge Surveillance Not Readmitted**	**Total**
Superficial Incisional	17 (11.9%) (33.3%)	54 (37.8%) (25.8%)	10 (7.0%) (40.0%)	62 (43.4%) (67.4%)	143 (37.9%)
Deep Incisional	8 (11.0%) (15.7%)	45 (61.6%) (21.5%)	5 (6.8%) (20.0%)	15 (20.5%) (16.3%)	73 (19.4%)
Organ/Space	26 (16.1%) (51.0%)	110 (68.3%) (52.6%)	10 (6.2%) (40.0%)	15 (9.3%) (16.3%)	161 (42.7%)
Total	51 (13.5%)	209 (55.4%)	25 (6.6%)	92 (24.4%)	377

New York State data reported as of June 30, 2014.

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

Table 14. Microorganisms identified in hysterectomy surgical site infections, New York State 2013

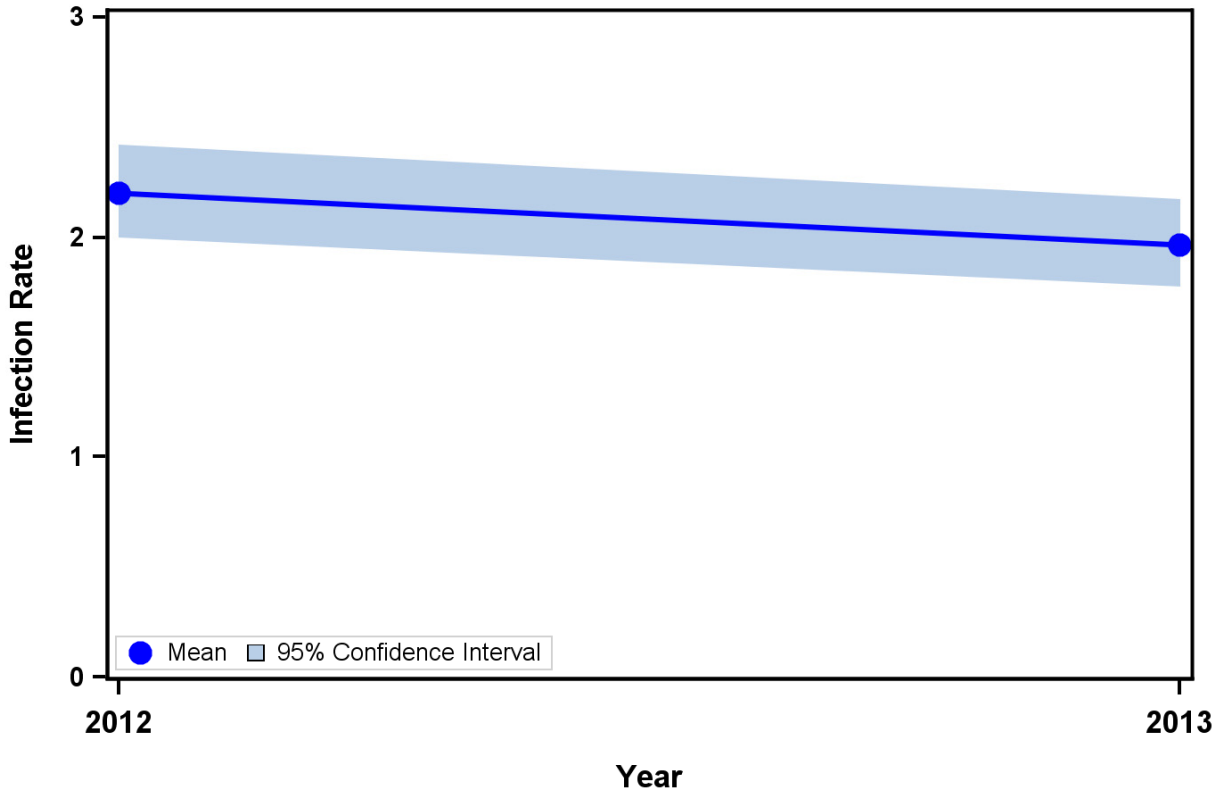
Microorganism	Number of Isolates	Percent of Infections
Staphylococcus aureus	58	15.4
(MRSA)	(25)	(6.6)
(MSSA)	(30)	(8.0)
Enterococci	52	13.8
(VRE)	(4)	(1.1)
Escherichia coli	52	13.8
Streptococci	38	10.1
Bacteroides	24	6.4
Coagulase negative Staphylococci	18	4.8
Pseudomonas spp.	15	4.0
Proteus spp.	13	3.4
Enterobacter spp.	12	3.2
Klebsiella spp.	11	2.9
(CephR *Klebsiella*)	(2)	(0.5)
Corynebacteria	8	2.1
Citrobacter spp.	7	1.9
Prevotella spp.	6	1.6
Yeast	11	2.7
Other	30	10.4

New York State data reported as of June 30, 2014. Out of 377 infections. No microorganisms identified for 129 (34%) infections.
VRE: vancomycin-resistant enterococci; MDRO: multidrug resistant; MRSA: methicillin-resistant *Staphylococcus aureus;* MSSA: methicillin-susceptible *Staphylococcus aureus;* CephR: cephalosporin-resistant; spp: multiple species

Time trends

Between 2012 and 2013, the hysterectomy SSI rate decreased by 11% (Figure 9). This decrease far exceeds the small increase expected due to the 2013 hierarchy definition change. In the SPARCS billing data, only 1% of patients had hysterectomy and cesarean section procedures on the same day. Because this proportion is small, and the SSI rate is low, the definition change likely has a very small impact on the hysterectomy rates. Assuming no definitional change, the 11% decrease resulted in 45 prevented SSIs and a direct cost savings estimated to be between $0.5 million and $1.5 million since 2012.[4]

Figure 9. Trend in hysterectomy surgical site infection rates, New York State 2012-2013



Year	# Hospitals	# Procedures	For Statewide Trends[2]		For Hospital Comparisons[3]	
			Total # Infections	Total Infection Rate[1]	# Infections excluding PDS*	Infection Rate[1] excluding PDS*
2012	162	19,065	420	2.20	317	1.66
2013	158	19,164	377	1.97	285	1.49

New York State Data reported as of June 30, 2014. PDS=post-discharge surveillance.
[1] Infection rate is the number of infections divided by the number of procedures, multiplied by 100.
[2]To assess trends, all NHSN data are included and graphed in the figure.
[3]To compare a hospital to the state average in a given year, follow that year's surveillance definition. SSIs detected by PDS were excluded because PDS methods are not standardized across hospitals.

Risk Adjustment for Hysterectomy Surgical Site Infections

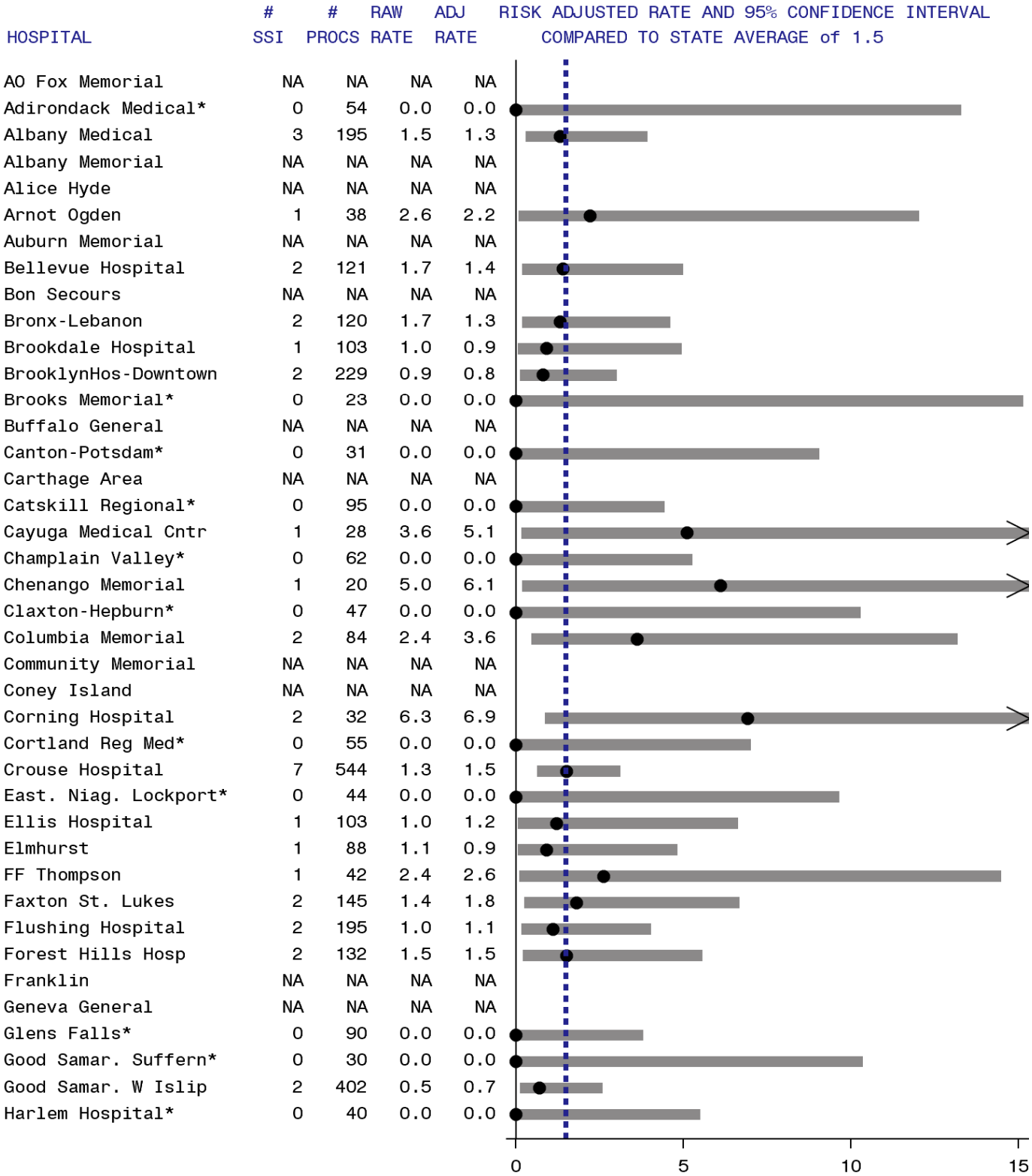
Certain patient and procedure-specific factors increased the risk of developing an SSI following abdominal hysterectomy. In 2013, after excluding SSIs identified using PDS that did not result in hospitalization, the following risk factors were associated with SSIs. These variables were used to risk-adjust hospital-specific rates.

- Patients with an ASA score of 3, 4, or 5 were 2.5 times more likely to develop an SSI than patients with an ASA score of 1 or 2.
- Procedures with duration greater than three hours were 2.2 times more likely to result in SSI than procedures less than two hours. Procedures with duration between two and three hours were 1.5 times more like to result in SSI than procedures less than two hours.
- Procedures that involved traditional surgical incisions were 1.6 times more likely to result in SSI than procedures performed entirely with a laparoscopic instrument.

Hospital-Specific Hysterectomy SSI Rates

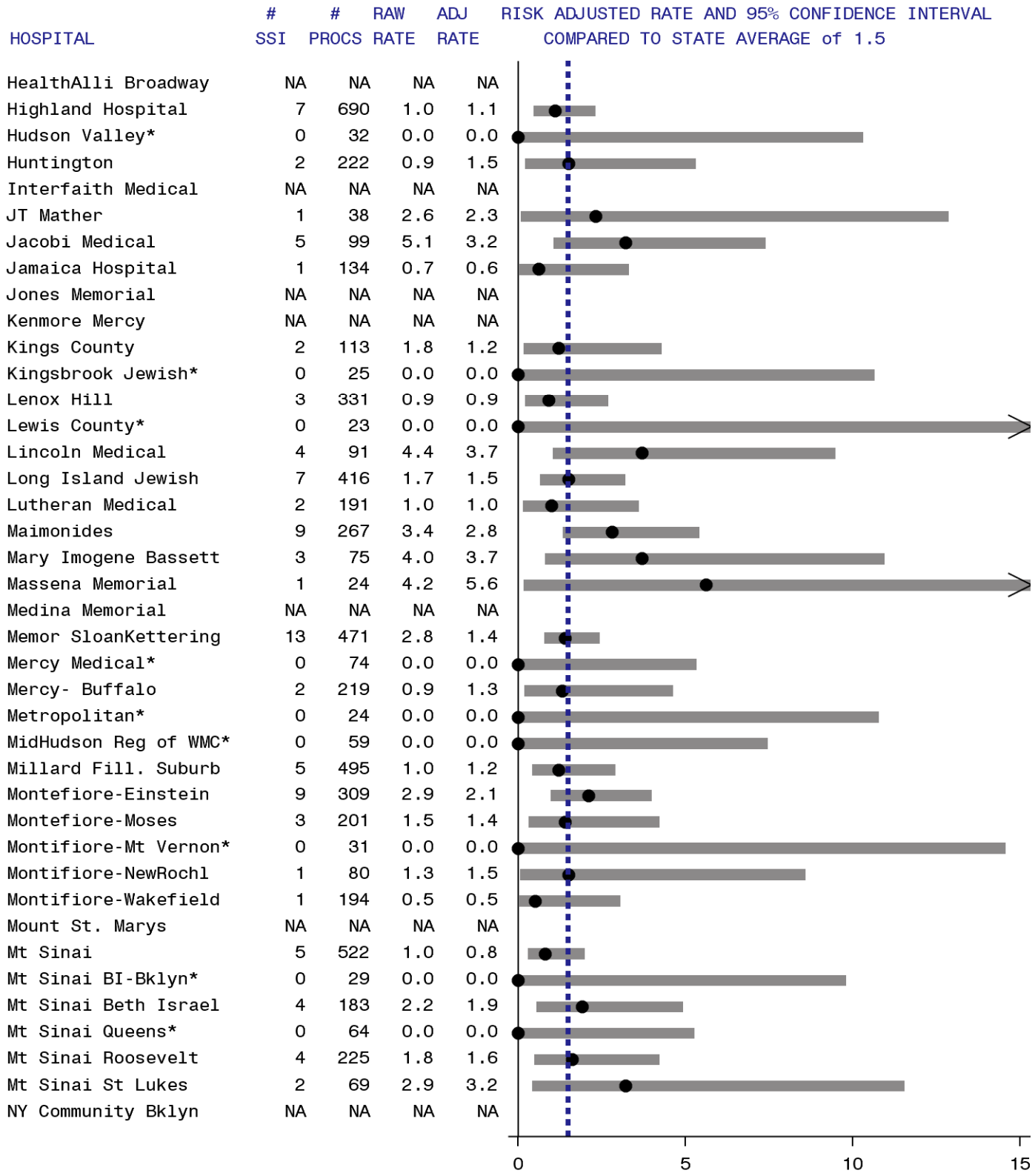
Hospital-specific hysterectomy SSI rates are provided in Figure 10. In 2013, two hospitals (1%) had hysterectomy SSI rates that were statistically higher than the state average. No hospitals had SSI rates that were significantly lower than the state average.

Figure 10. Abdominal hysterectomy surgical site infection rates, New York 2013 (page 1 of 4)



State average. ●Risk-adjusted infection rate. > Upper confidence limit exceeds graph area. —^^Significantly higher than state average. —**Significantly lower than state average. —Average. —*Zero infections, not significant. NA: Hospitals with less than 20 procedures.
SSI: surgical site infections. Procs: procedures. Rates are per 100 procedures.
Data reported as of June 30, 2014. Excludes non-readmitted cases identified using post discharge surveillance.
Adjusted using ASA score, duration, and endoscope.

Figure 10. Abdominal hysterectomy surgical site infection rates, New York 2013 (page 2 of 4)



State average. ●Risk-adjusted infection rate. > Upper confidence limit exceeds graph area. —^^Significantly higher than state average. —**Significantly lower than state average. —Average. —*Zero infections, not significant. NA: Hospitals with less than 20 procedures.
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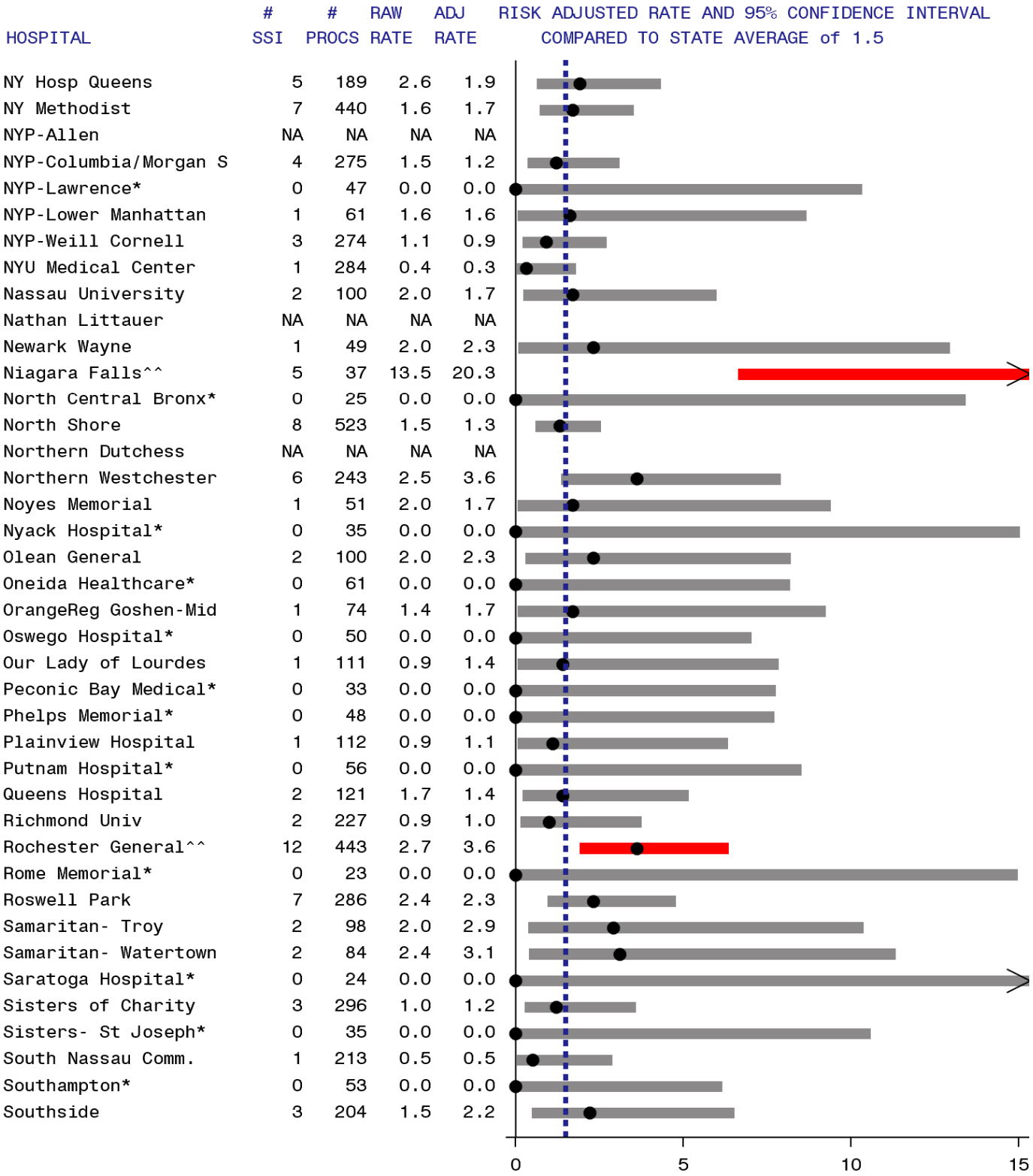
Adjusted using ASA score, duration, and endoscope.

Figure 10. Abdominal hysterectomy surgical site infection rates, New York 2013 (page 3 of 4)



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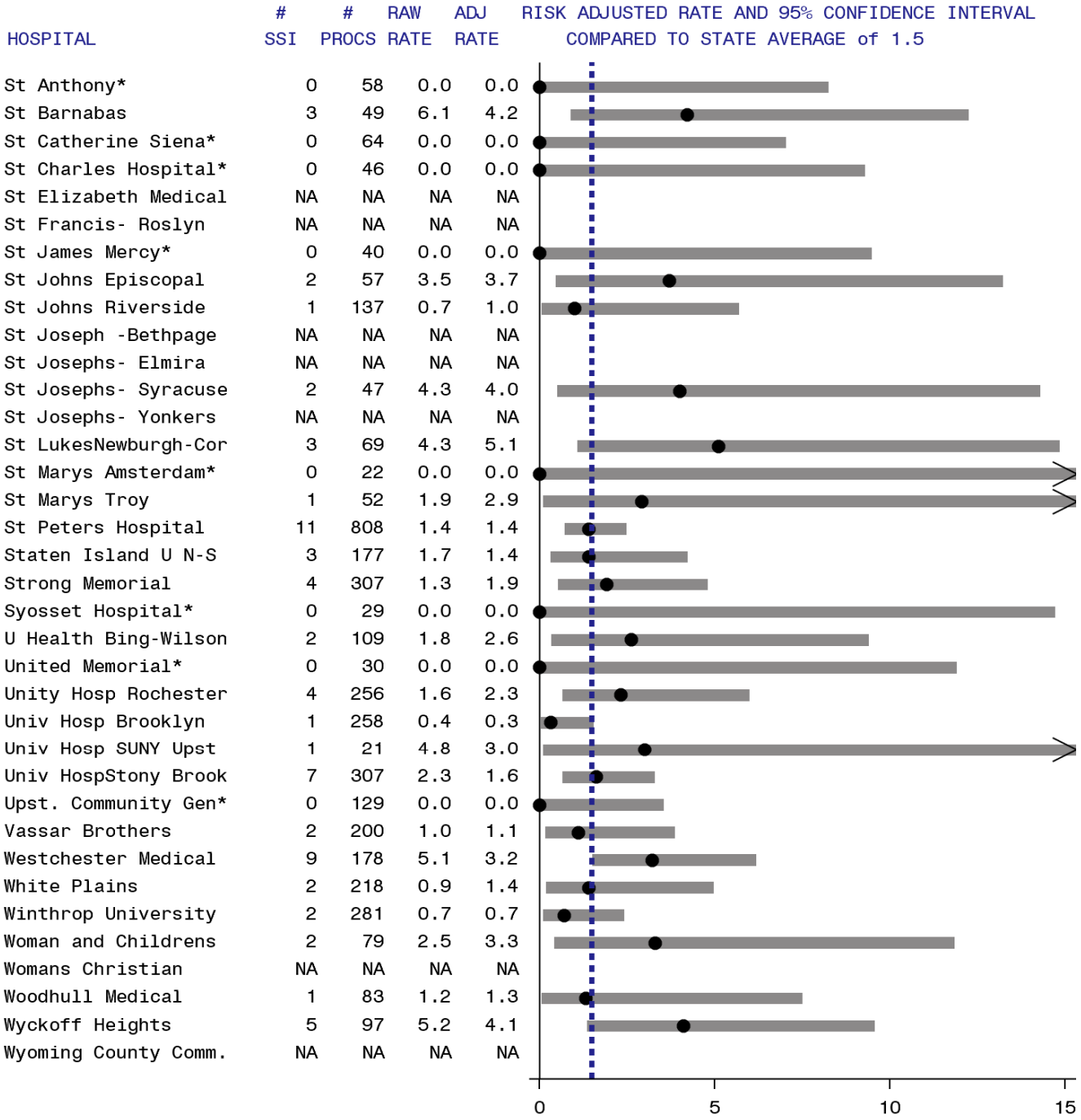


State average. ●Risk-adjusted infection rate. > Upper confidence limit exceeds graph area. —^^Significantly higher than state average. —**Significantly lower than state average. —Average. —*Zero infections, not significant. NA: Hospitals with less than 20 procedures.
SSI: surgical site infections. Procs: procedures. Rates are per 100 procedures.
Data reported as of June 30, 2014. Excludes non-readmitted cases identified using post discharge surveillance.
Adjusted using ASA score, duration, and endoscope.

Summary across SSIs

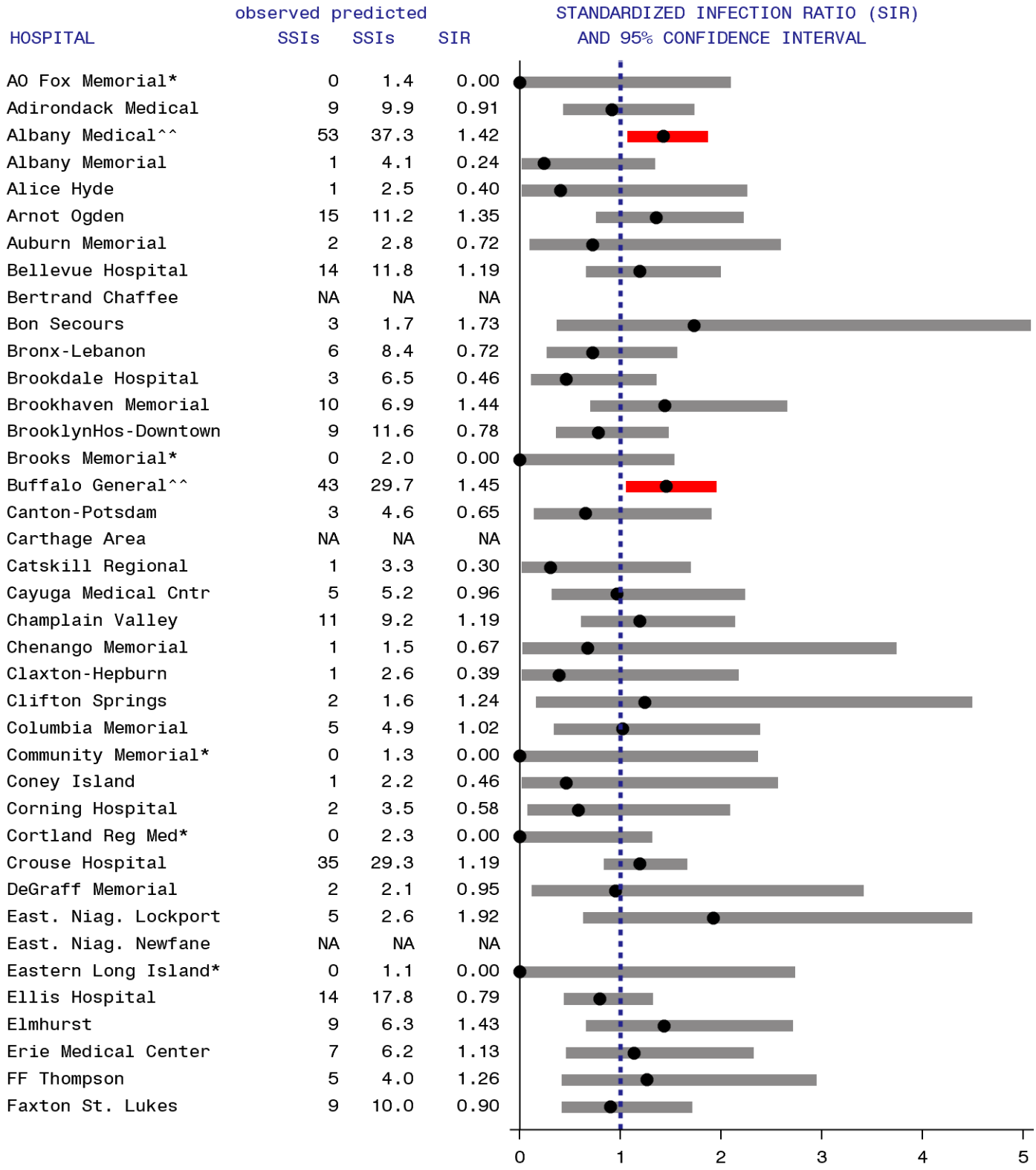
The standardized infection ratio (SIR) is a summary measure used to compare infection data from one population to data from a "standard" population. When calculating hospital-specific SIRs in NYS reports, the standard population is all NYS hospitals reporting data to NHSN in the current year. The SSI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

- A SIR of 1.0 means the observed number of infections is equal to the number of predicted infections.
- A SIR above 1.0 means that the infection rate is higher than that found in the standard population. The difference above 1.0 is the percentage by which the infection rate exceeds that of the standard population.
- A SIR below 1.0 means that the infection rate is lower than that of the standard population. The difference below 1.0 is the percentage by which the infection rate is lower than that experienced by the standard population.

Figure 11 provides hospital-specific SSI SIRs for each hospital. The SSI SIRs combine results across the five different types of SSIs, showing the average performance of each hospital. In two cases, hospitals that received no individual area performance flag were significantly higher or lower than the state average overall; combining data results in narrower confidence intervals, so hospitals that perform slightly better in many areas may look significantly better than the state average overall. On the other hand, fifteen hospitals (9%) that received a performance flag for one type of procedure had average SIRs; combining data can smooth away unusual performance in one area.

Between 2013 and the NYS baseline years, there has been a 23% decrease in hip, hysterectomy, and CABG SSIs, resulting in approximately 800 prevented infections with a total savings of between $9.5 and $27.7 million. Colon SSIs were excluded from this total because of the definition change.

Figure 11. Surgical site infection (SSI) summary for colon, coronary artery bypass, hip, and hysterectomy procedures standardized infection ratio (SIR), New York 2013 (page 1 of 5)



State average. ●SIR. > Upper confidence limit exceeds graph area. —^^Significantly higher than state average. —**Significantly lower than state average. —Average. —*Zero Infections, not significant. NA: Hospitals with < 20 procedures. Data reported as of June 30, 2014 (colon, hysterectomy, hip) and September 25, 2014 (CABG). Expected based on NYS 2013 average, adjusting for patient risk factors. Excludes non-readmitted cases identified using post discharge surveillance.

Figure 11. Surgical site infection (SSI) summary for colon, coronary artery bypass, hip, and hysterectomy procedures standardized infection ratio (SIR), New York 2013 (page 2 of 5)

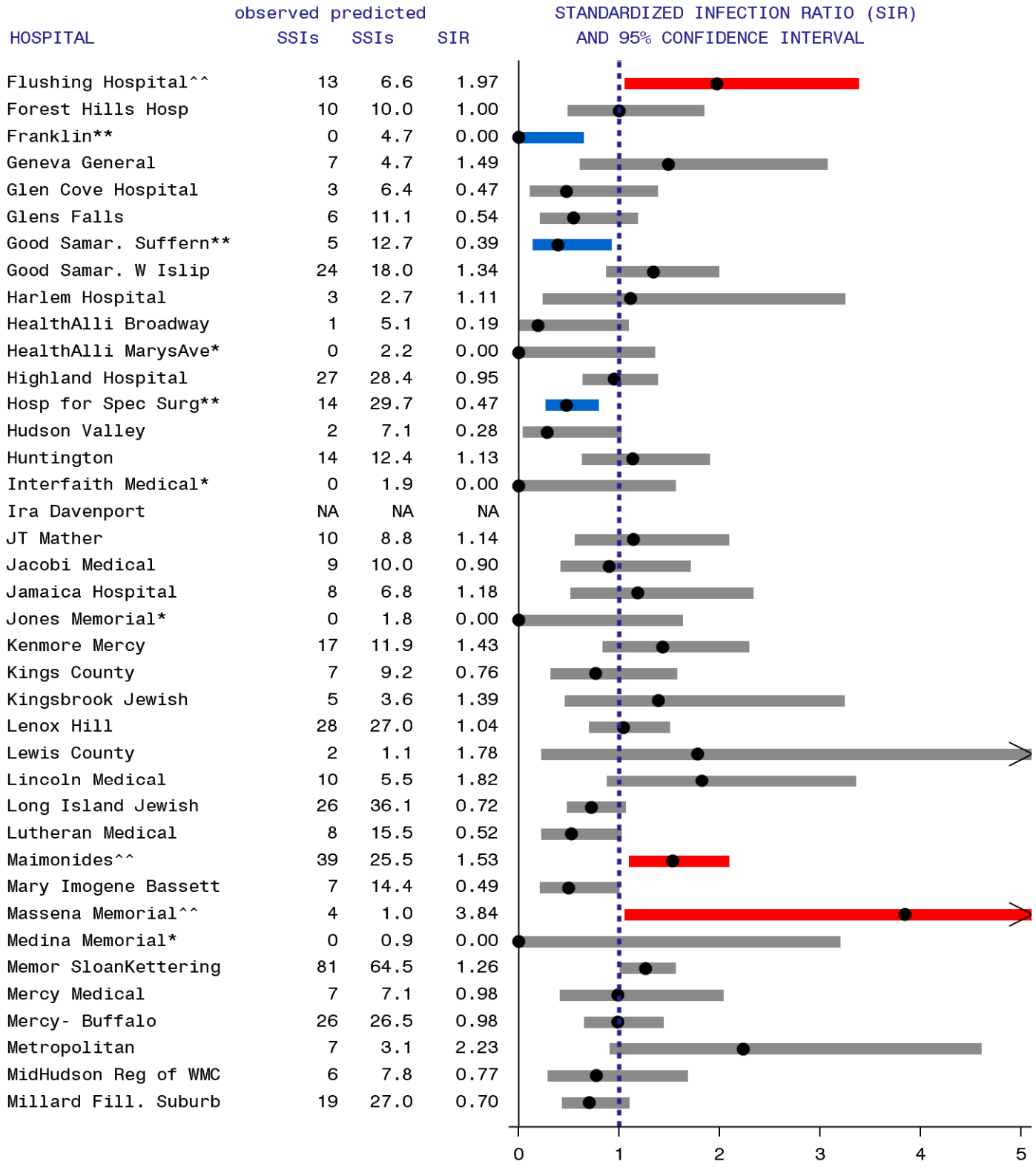


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Figure 11. Surgical site infection (SSI) summary for colon, coronary artery bypass, hip, and hysterectomy procedures standardized infection ratio (SIR), New York 2013 (page 3 of 5)

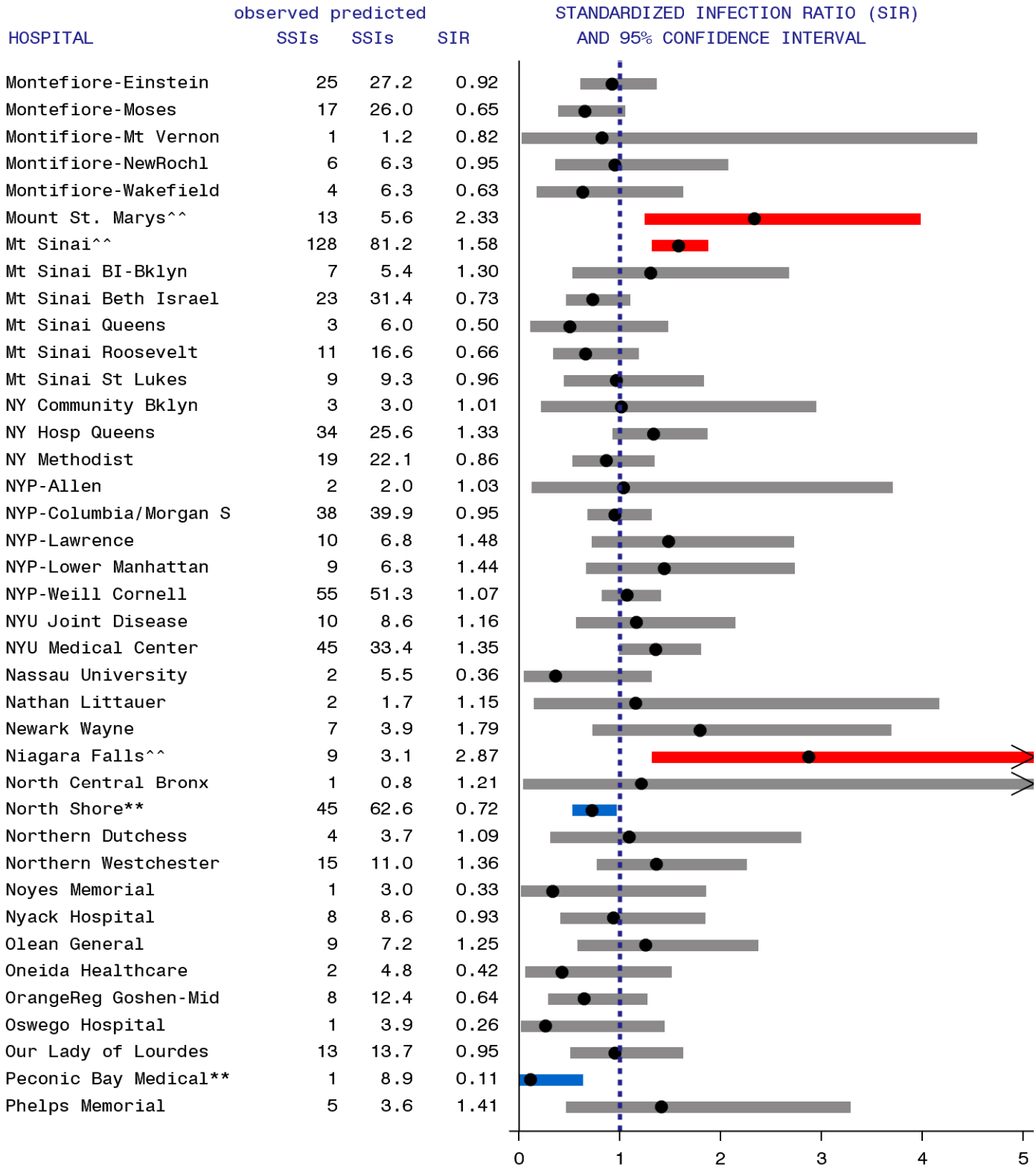

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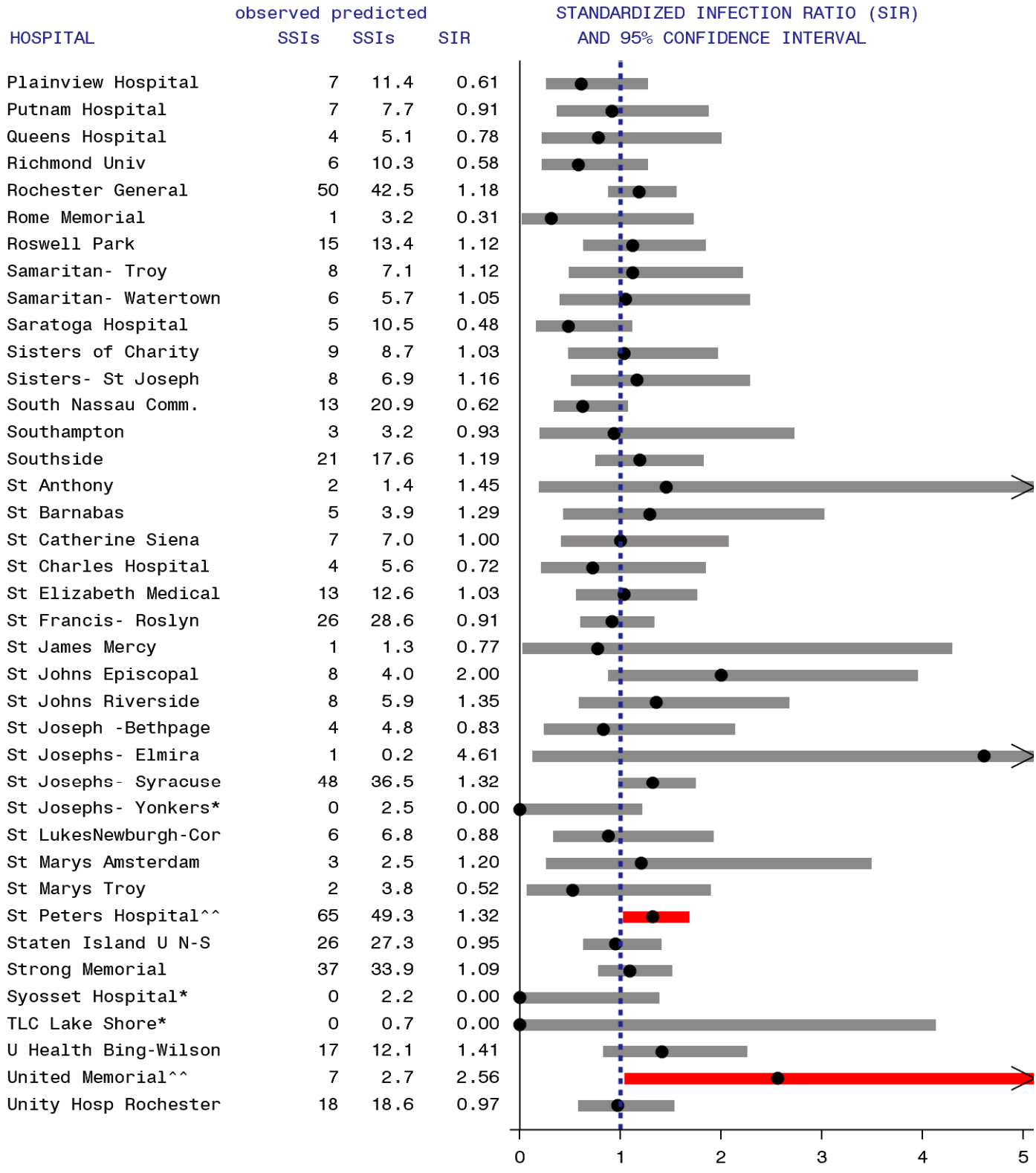
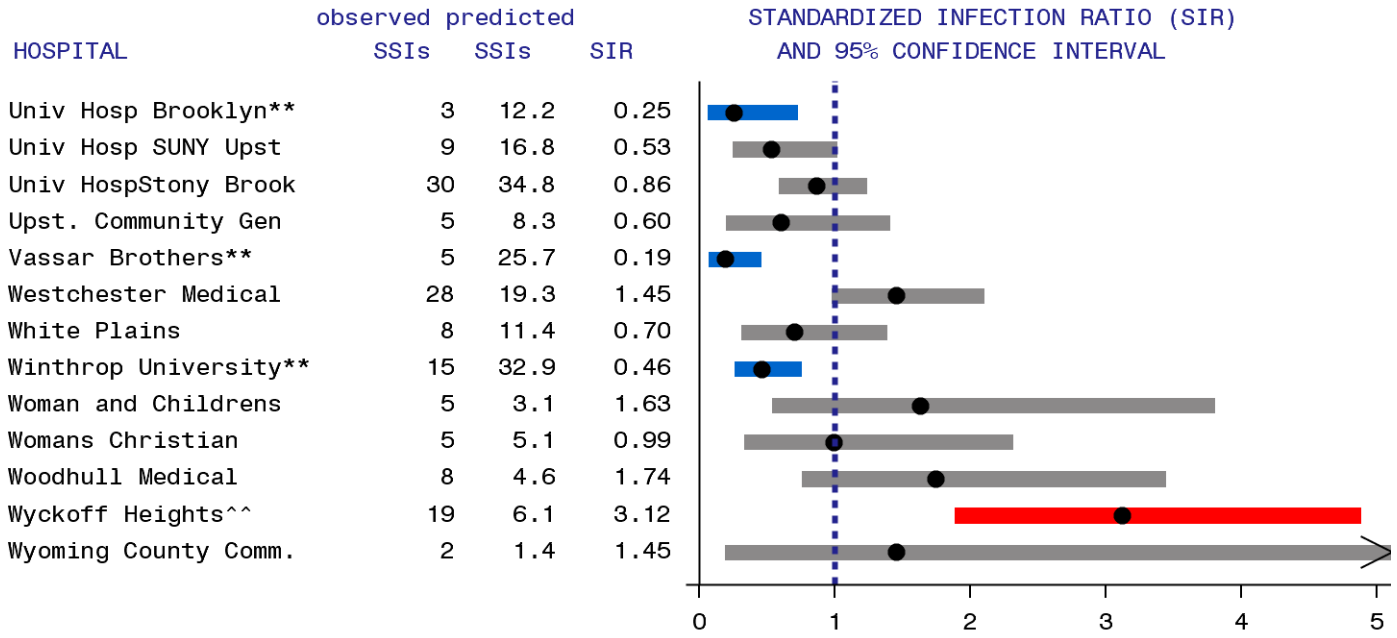
Figure 11. Surgical site infection (SSI) summary for colon, coronary artery bypass, hip, and hysterectomy procedures standardized infection ratio (SIR), New York 2013 (page 4 of 5)



State average. ●SIR. > Upper confidence limit exceeds graph area. ^^Significantly higher than state average. **Significantly lower than state average. Average. *Zero Infections, not significant. NA: Hospitals with < 20 procedures. Data reported as of June 30, 2014 (colon, hysterectomy, hip) and September 25, 2014 (CABG). Expected based on NYS 2013 average, adjusting for patient risk factors. Excludes non-readmitted cases identified using post discharge surveillance.

Figure 11. Surgical site infection (SSI) summary for colon, coronary artery bypass, hip, and hysterectomy procedures standardized infection ratio (SIR), New York 2013 (page 5 of 5)



State average. ●SIR. > Upper confidence limit exceeds graph area. ^^Significantly higher than state average. **Significantly lower than state average. Average. *Zero Infections, not significant. NA: Hospitals with < 20 procedures. Data reported as of June 30, 2014 (colon, hysterectomy, hip) and September 25, 2014 (CABG). Expected based on NYS 2013 average, adjusting for patient risk factors. Excludes non-readmitted cases identified using post discharge surveillance.

Central Line-Associated Bloodstream Infections (CLABSIs)

A central line (CL) is a tube that is placed into a large vein, usually in the neck, chest, arm or groin, that is used to give fluids and medications, withdraw blood, and monitor the patient's condition. A CL is different than a standard, peripheral intravenous line because it goes farther into the body, terminating near the heart, and because it may be used for weeks or even months. A bloodstream infection can occur when microorganisms (e.g., bacteria, fungi) travel around or through the tube, attach and multiply on the tubing or in fluid administered through the tubing, and then enter the blood.

NYS hospitals are required to track CLABSIs in intensive care units (ICUs). ICUs are hospital units that provide intensive observation and treatment for patients either suffering from, or at risk of developing, life threatening problems. ICUs are categorized by the type of patients in the unit.

In 2013, 612 CLABSIs were associated with 598,510 days of central line use, for an overall rate of 1.0 infection per 1,000 central line days in ICUs. The 2013 CLABSI and device utilization data are summarized by ICU type in Table 15. CLABSI rates were highest in Level II/III neonatal ICUs, although device utilization was also lowest in this area.

Table 15. Central line-associated bloodstream infections in adult, pediatric, and neonatal intensive care units, New York State 2013

ICU Type	# Hospitals	# CLABSI	# Line days	CLABSI rate	# Patient days	% Device utilization
Cardiothoracic	32	64	76,929	0.83	107,251	71.7
Coronary	42	48	49,615	0.97	135,191	36.7
Medical	48	127	109,091	1.16	214,144	50.9
Medical/Surgical	118	137	153,170	0.89	348,648	43.9
Neonatal- Level II/III	12	14	5,753	2.43	45,268	12.7
Neonatal- Level III	24	23	23,444	0.98	132,829	17.6
Neonatal- Regional Perinatal	17	54	49,249	1.10	207,539	23.7
Neurosurgical	14	24	22,382	1.07	61,664	36.3
Pediatric	32	42	32,171	1.31	87,781	36.6
Surgical	39	79	76,706	1.03	148,809	51.5
ALL	164	612	598,510	1.03	1,489,124	40.2

New York State data as of July 10, 2014. Rates are per 1,000 central line days.
Device utilization = 100* central line days/patient days.

Expanding CLABSI surveillance to other hospital areas is important to decrease morbidity and mortality associated with these preventable infections. Evidence-based central line insertion and maintenance practices to reduce the risk of CLABSIs are applicable to central line use across hospital locations. Many hospitals have already begun CLABSI surveillance in these locations.

Summary data for this group of voluntarily-reporting hospitals are shown in Table 16 to provide current baseline data to hospitals as they embark on CLABSI reduction projects outside of ICUs. It is important to consider that hospitals that voluntarily report these data might not be representative of all hospitals in NYS.

Table 16. Central line-associated bloodstream infections in wards, New York State 2013

Ward Type	# Hospitals	# CLABSI	# Line days	CLABSI rate	# Patient days	Device utilization
Medical	36	132	93,021	1.42	834,209	11.15
Medical Surgical	77	170	154,032	1.10	1,429,823	10.77
Surgical	31	47	52,941	0.89	423,618	12.50
Step down unit	30	33	31,739	1.04	186,233	17.04

New York State data as of June 19, 2014. Rates are per 1,000 central line days.
Device utilization = 100* central line days/patient days.

Microorganisms Associated with CLABSIs

The most common microorganisms identified in adult/pediatric ICU-related CLABSIs were Enterococci, yeast, and coagulase-negative Staphylococci (Table 17). The distribution of microorganisms associated with CLABSIs is similar to the distribution reported last year.

Table 17. Microorganisms identified in central line-associated bloodstream infections, adult and pediatric intensive care units, New York State 2013

Microorganism	Number of Isolates	Percent of Infections
Enterococci	104	20.0
(VRE)	(49)	(9.4)
Yeast	90	17.3
Coagulase negative Staphylococci	83	15.9
Klebsiella spp.	63	12.1
(CRE-*Klebsiella*)	(15)	(2.9)
(CephR-*Klebsiella*)	(15)	(2.9)
Staphylococcus aureus	54	10.4
(MRSA)	(20)	(3.8)
(MSSA)	(30)	(5.8)
Enterobacter spp.	33	6.3
Acinetobacter spp.	28	5.4
(MDR-*Acinetobacter*)	(19)	(3.6)
Pseudomonas spp.	28	5.4
Serratia spp.	20	3.8
Escherichia coli	13	2.5
Proteus spp.	12	2.3
Streptococci	11	2.1
Other	29	5.6

New York State data reported as of July 10, 2014. Out of 521 infections.
CephR: cephalosporin-resistant; CRE: carbapenem-resistant Enterobacteriaceae;
MDR: multidrug resistant; MRSA: methicillin-resistant *Staphylococcus aureus;*
MSSA: methicillin-susceptible *Staphylococcus aureus*
VRE: vancomycin-resistant Enterococci; spp: multiple species

The most common microorganisms identified in NICU-related CLABSIs were *Staphylococcus aureus* and coagulase-negative Staphylococci (Table 18). The percentage of MRSA infections increased from 5% to 11% between 2012 and 2013.

Table 18. Microorganisms associated with central line-associated bloodstream infections, neonatal intensive care units, New York State 2013

Microorganism	Number of Isolates	Percent of Infections
Staphylococcus aureus	33	36.3
(MRSA)	(10)	(11.0)
(MSSA)	(21)	(23.1)
Coagulase negative Staphylococci	28	30.8
Klebsiella spp.	8	8.8
Yeast	7	7.7
Enterococci	6	6.6
Escherichia coli	6	6.6
Other	8	8.8

New York State data reported as of July 10, 2014. Out of 91 infections.
MRSA: methicillin-resistant *Staphylococcus aureus;* MSSA: methicillin-susceptible *Staphylococcus aureus;* spp: multiple species.

Time Trends for Intensive Care Unit CLABSIs

In January 2013, NHSN refined CLABSI definitions to reduce misclassification of CLABSIs, particularly misclassification that could incorrectly penalize hospitals. Table 19 summarizes the main changes and the projected impact on CLABSI rates.

Table 19. Changes to central line-associated bloodstream infection surveillance definitions between 2012 and 2013

2012 definition	2013 definition	Impact
No minimum hospital stay	Infection occurs on or after the 3rd hospital day	Decrease rates
There is no minimum period of time that the central line must be in place	A central line was in place for greater than 2 calendar days	Decrease rates
A central line was in place within 48 hours of the onset of the event.	A central line was in place on the date of event or the day before.	Decrease rates
Common commensals: Blood cultures must be collected within two days of each other (e.g. Monday and Wednesday are acceptable)	Common commensals: Blood cultures must be collected on the same or consecutive calendar days	Decrease rates

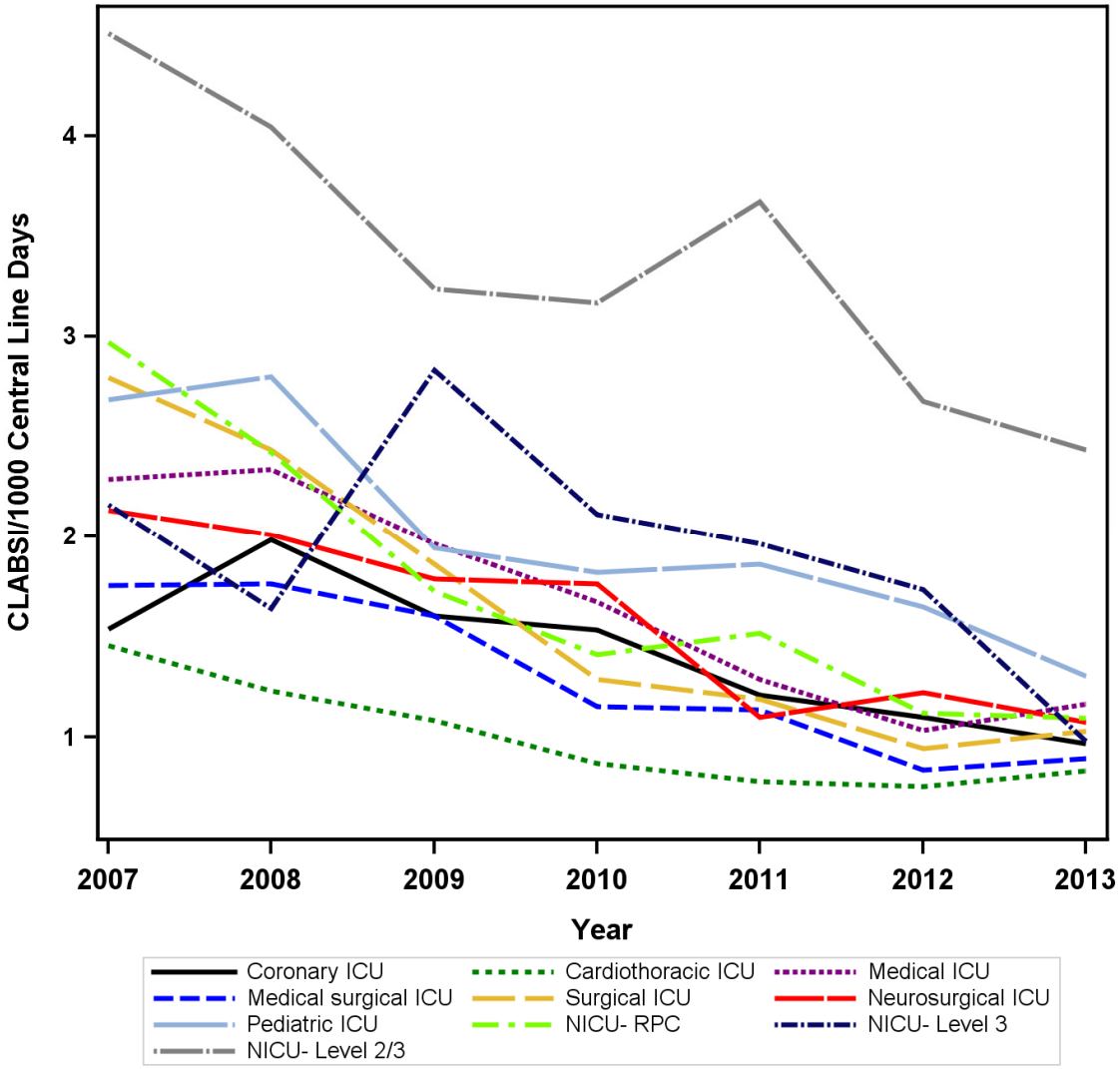
To quantify the impact of these changes, blood cultures reviewed during the 2013 NYS audit were evaluated following both the 2012 and 2013 CLABSI definitions. Of 106 audited medical records that met the 2012 CLABSI definition, 89 (84%) met the 2013 definition. Thus, the 2013 CLABSI rate may be 16% lower than the 2012 CLABSI rates due to these definition changes. Approximately 15% of the reported 2013 CLABSIs were audited.

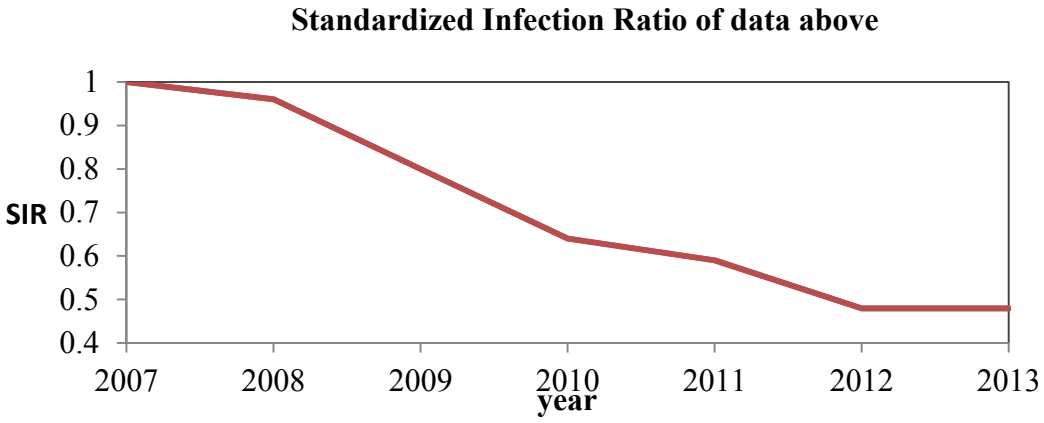
To visualize trends while correcting for the definition change, the 2007-2012 rates were multiplied by a definition change correction factor:

$$\text{Historic rate}_{\text{new definition}} = .84 * \text{historic rate}_{\text{old definition}}$$

Trends in adult, pediatric, and neonatal ICUs are shown in Figure 12. Across ICUs there was no improvement in CLABSI rates in 2013 compared to 2012, after adjusting for the definition change. The lower plot in Figure 12 shows that in both 2012 and 2013, the CLABSI SIR was 0.48, indicating a 52% decline in CLABSIs compared to the NYS 2007 baseline.

Figure 12. Trend in central line-associated bloodstream infection rates in intensive care units, New York State 2007-2013, corrected for 2013 definition change





New York State data as of July 10, 2014. Standardized Infection Ratio (SIR) compared each year to the NYS 2007 baseline. Pre-2013 rates were multiplied by 0.84.

CLABSI Surveillance and Prevention Practices

According to the most recent NYSDOH CLABSI survey (October 2013), 85% of hospitals continue to manually collect CL denominator data in ICUs. More attention to quality control of the reported data may be necessary, as 49% of hospitals reported that they have no mechanism in place to periodically verify the manually or electronically collected denominator data, and 12% of hospitals reported no periodic verification that all CLABSIs have been reviewed and entered into NHSN. A total of 75% of hospitals reported that they have already implemented hospital-wide surveillance of CLABSIs. Moving from manual to electronic capture of denominator data will increase efficiency in this process as reporting requirements expand.

IPs use multiple sources to identify CLABSIs, including microbiology reports (98%), hospital tracking systems (15%), and data mining systems (15%). Use of root-cause analysis (i.e. a systematic review to identify the underlying reason the infection occurred) for all CLABSIs increased from 45% to 62% between 2012 and 2013; and root-cause analysis on selected CLABSIs increased from 15% to 18%. With respect to prevention practices, 64% of hospitals reported routinely bathing adult ICU patients with chlorhexidine, and 84% use antiseptic-impregnated central lines. Almost all adult ICUs (99%) reported using a standardized insertion bundle checklist, and 79% reported tracking compliance of insertion bundle documentation. Similarly, 96% of NICUs use an insertion checklist, and 89% track compliance. In both adult and neonatal ICUs, approximately 91% review line necessity every day, and of these facilities, 70% document this in the medical record. Approximately 79% of adult and neonatal ICUs use a maintenance bundle, and of these, 62% document compliance in the medical record.

Risk Factors for CLABSIs

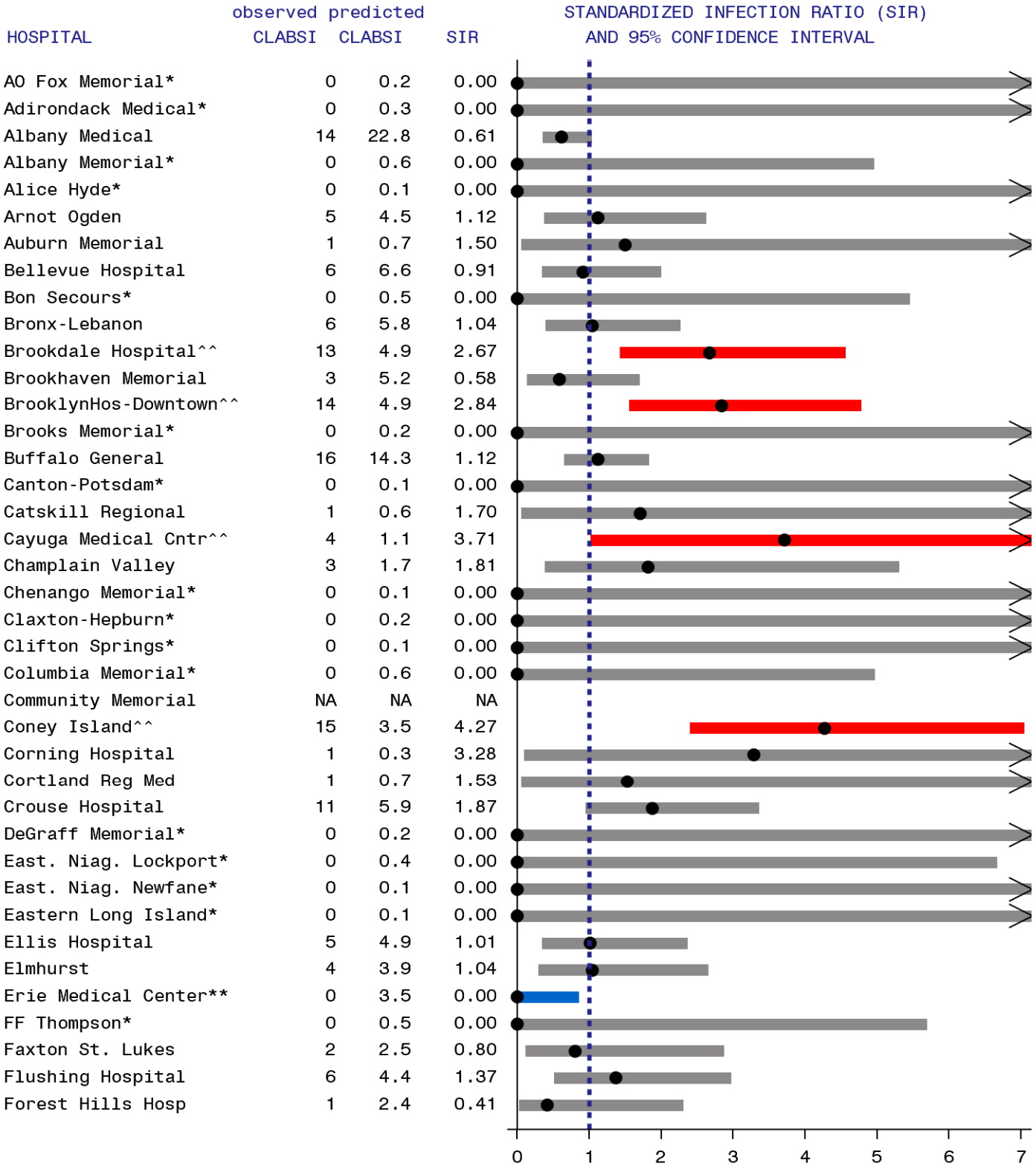
Hospitals do not collect patient-specific risk factors for CLABSIs in adult and pediatric ICUs; NHSN requires reporting of only the total number of patient days and total number of central line days per month within each type of ICU. CLABSI rates are stratified by type of ICU. For BSIs in NICUs, the data are collected by birth weight group, because lower birth weight babies are more susceptible to CLABSIs than higher birth weight babies. As CLABSI rates decline, risk adjustment NICU rates becomes more difficult. In 2013, no risk adjustment could be performed by birthweight group in Level II/III facilities because there were only 14 CLABSIs. Level III data were risk-adjusted using two birthweight groups divided at 1000 grams. RPC data were risk-adjusted by three birthweight groups, partitioned at 750 grams and 1000 grams.

Hospital-Specific, ICU-Specific CLABSI Rates

Within NYS, hospital-specific CLABSI rates were compared to the state average for the specific type of ICU. Figure 13 provides hospital-specific CLABSI SIRs for each hospital. Between 2008 and 2012, NYS hospital-specific comparisons excluded bloodstream events in which multiple blood cultures were obtained, only one blood specimen was positive for a single pathogen, and no treatment was given. In 2013, NYSDOH no longer deleted these contaminants to be more consistent with national reports.

CLABSI SIRs combine results across the eight different types of ICUs to show the average performance of each hospital for CLABSIs. Eleven hospitals had high SIR flags in 2013; of these, Jamaica Hospital had a significantly high CLABSI SIR for the past three years, and Brookdale Hospital had a significantly high CLABSI SIR for the past four years. Six hospitals had low SIR flags in 2013; no hospitals had low flags for more than two consecutive years.

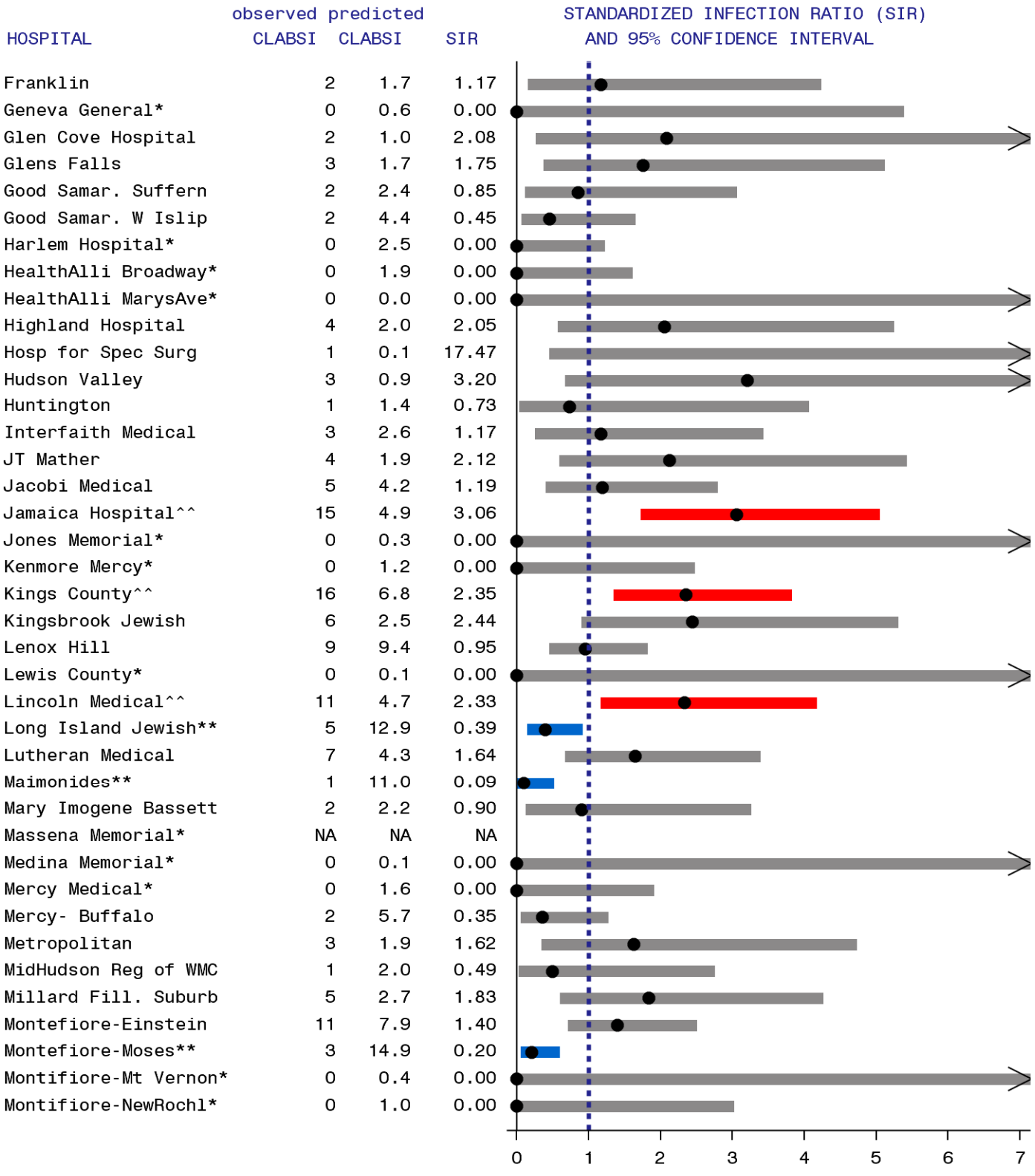
Figure 13. Central line-associated bloodstream infection (CLABSI) summary for adult, pediatric, and neonatal ICUs: standardized infection ratio (SIR), New York 2013 (page 1 of 5)



HOSPITAL	observed CLABSI	predicted CLABSI	SIR
AO Fox Memorial*	0	0.2	0.00
Adirondack Medical*	0	0.3	0.00
Albany Medical	14	22.8	0.61
Albany Memorial*	0	0.6	0.00
Alice Hyde*	0	0.1	0.00
Arnot Ogden	5	4.5	1.12
Auburn Memorial	1	0.7	1.50
Bellevue Hospital	6	6.6	0.91
Bon Secours*	0	0.5	0.00
Bronx-Lebanon	6	5.8	1.04
Brookdale Hospital^^	13	4.9	2.67
Brookhaven Memorial	3	5.2	0.58
BrooklynHos-Downtown^^	14	4.9	2.84
Brooks Memorial*	0	0.2	0.00
Buffalo General	16	14.3	1.12
Canton-Potsdam*	0	0.1	0.00
Catskill Regional	1	0.6	1.70
Cayuga Medical Cntr^^	4	1.1	3.71
Champlain Valley	3	1.7	1.81
Chenango Memorial*	0	0.1	0.00
Claxton-Hepburn*	0	0.2	0.00
Clifton Springs*	0	0.1	0.00
Columbia Memorial*	0	0.6	0.00
Community Memorial	NA	NA	NA
Coney Island^^	15	3.5	4.27
Corning Hospital	1	0.3	3.28
Cortland Reg Med	1	0.7	1.53
Crouse Hospital	11	5.9	1.87
DeGraff Memorial*	0	0.2	0.00
East. Niag. Lockport*	0	0.4	0.00
East. Niag. Newfane*	0	0.1	0.00
Eastern Long Island*	0	0.1	0.00
Ellis Hospital	5	4.9	1.01
Elmhurst	4	3.9	1.04
Erie Medical Center**	0	3.5	0.00
FF Thompson*	0	0.5	0.00
Faxton St. Lukes	2	2.5	0.80
Flushing Hospital	6	4.4	1.37
Forest Hills Hosp	1	2.4	0.41

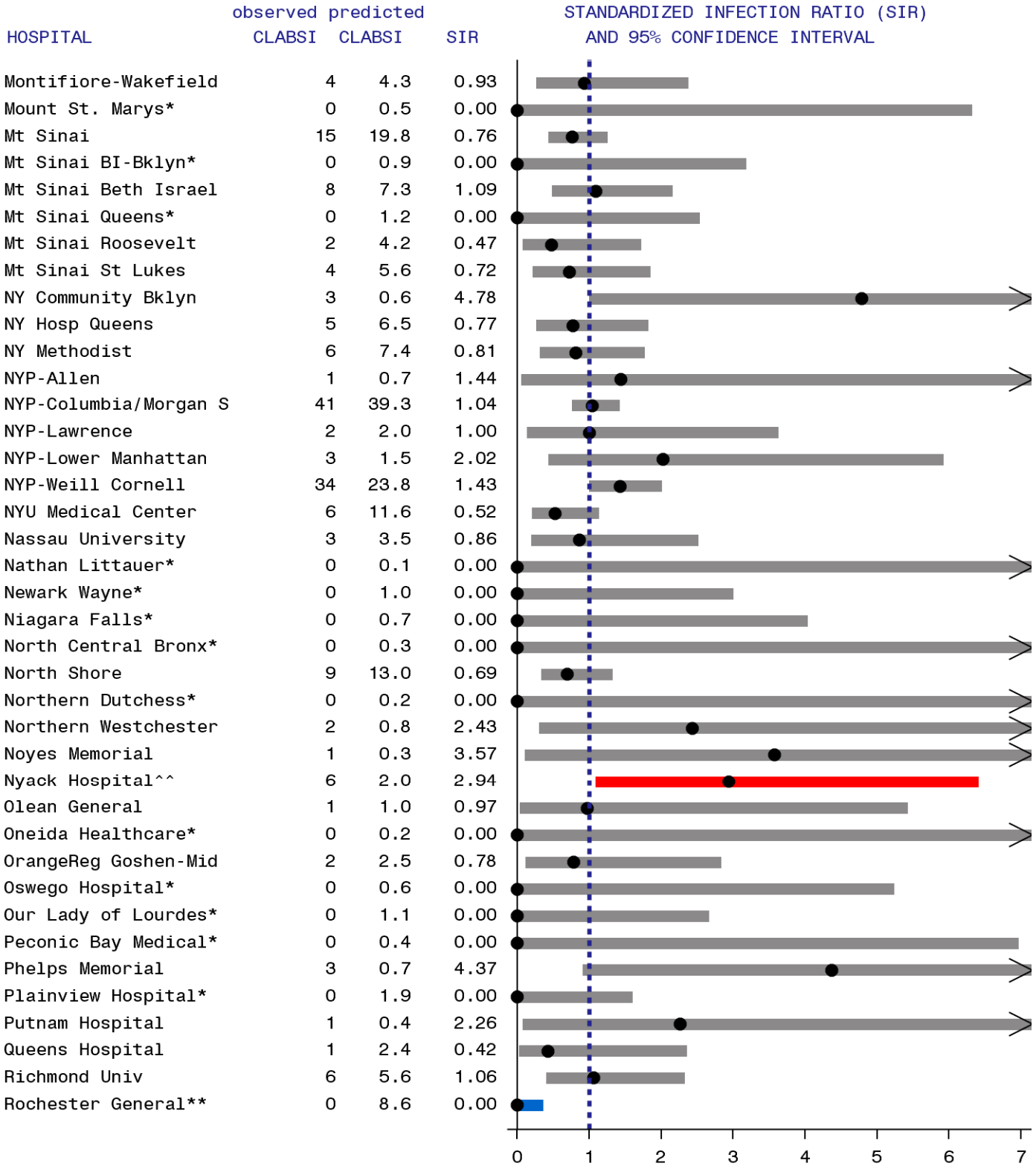
State average. ●SIR. > Upper confidence limit exceeds graph area. ^^Significantly higher than state average. **Significantly lower than state average. Average. *Zero infections, not significant. NA: Hospitals with <50 central line days.
Data reported as of July 10, 2014. Expected based on NYS 2013 average, adjusting for ICU type and birthweight.

Figure 13. Central line-associated bloodstream infection (CLABSI) summary for adult, pediatric, and neonatal ICUs: standardized infection ratio (SIR), New York 2013 (page 2 of 5)



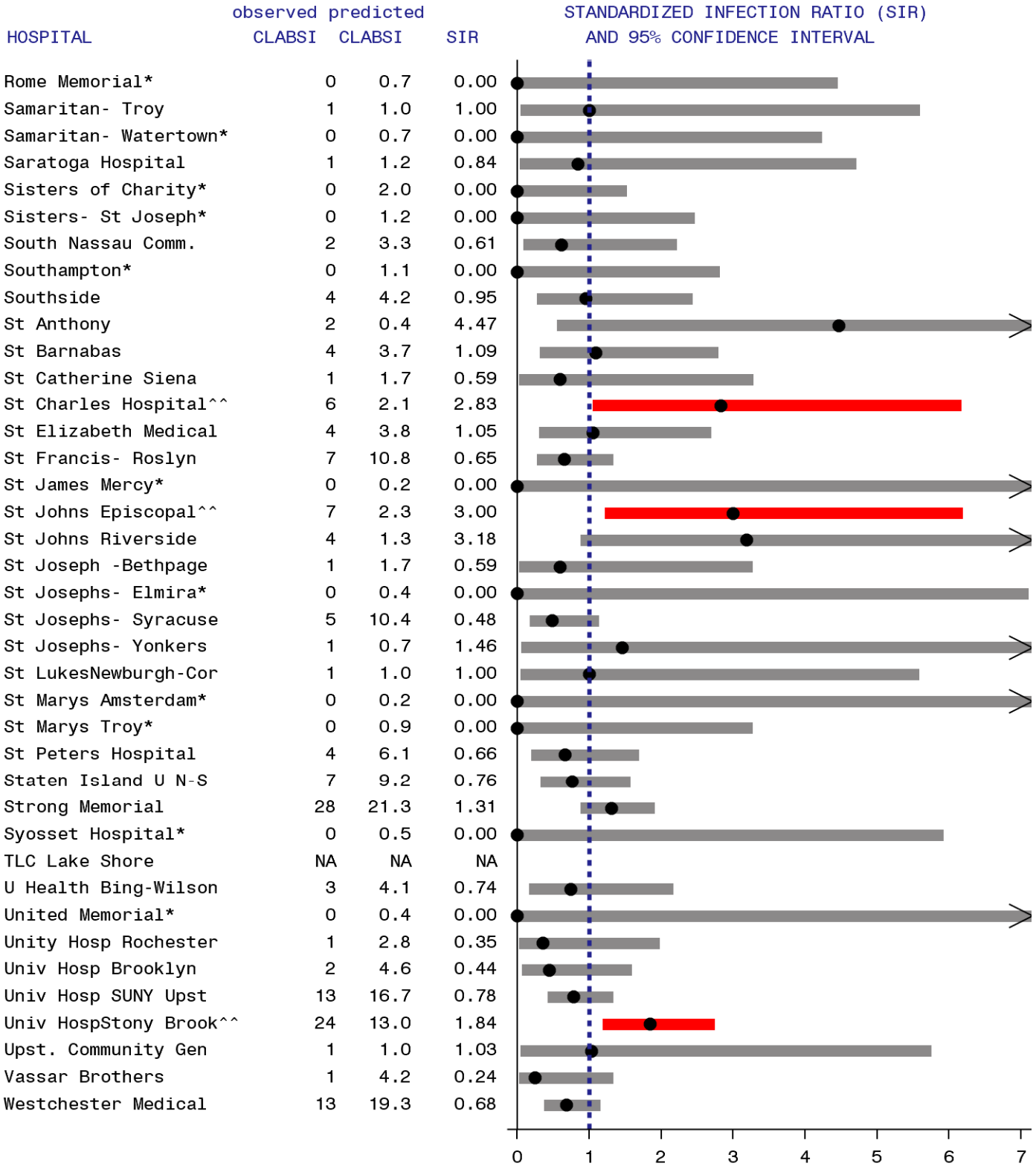
State average. ●SIR. > Upper confidence limit exceeds graph area. ^^Significantly higher than state average.
**Significantly lower than state average. Average. *Zero infections, not significant. NA: Hospitals with <50 central line days.
Data reported as of July 10, 2014. Expected based on NYS 2013 average, adjusting for ICU type and birthweight.

Figure 13. Central line-associated bloodstream infection (CLABSI) summary for adult, pediatric, and neonatal ICUs: standardized infection ratio (SIR), New York 2013 (page 3 of 5)



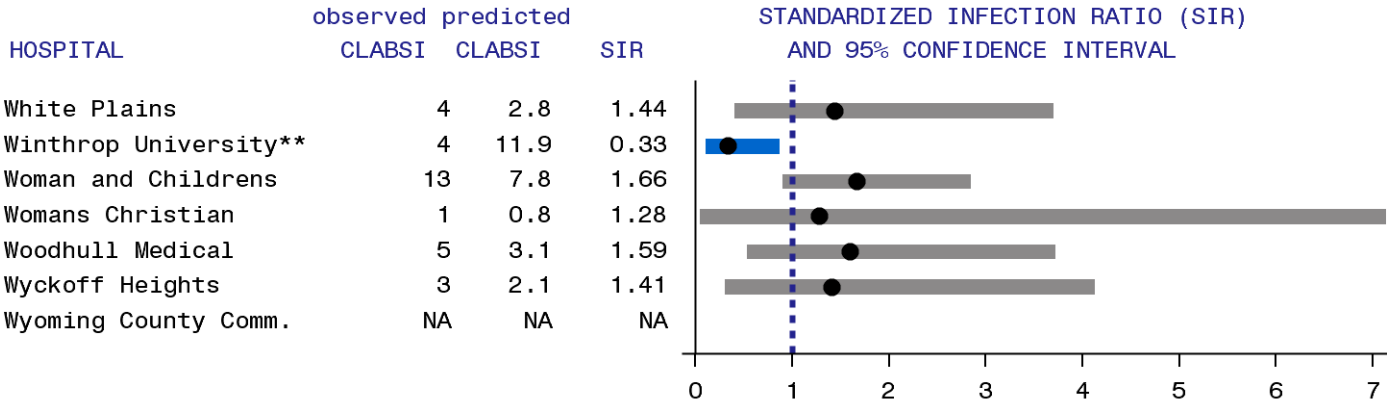
State average. ●SIR. > Upper confidence limit exceeds graph area. ^^Significantly higher than state average. **Significantly lower than state average. Average. *Zero infections, not significant. NA: Hospitals with <50 central line days.
Data reported as of July 10, 2014. Expected based on NYS 2013 average, adjusting for ICU type and birthweight.

Figure 13. Central line-associated bloodstream infection (CLABSI) summary for adult, pediatric, and neonatal ICUs: standardized infection ratio (SIR), New York 2013 (page 4 of 5)



State average. ●SIR. > Upper confidence limit exceeds graph area. ^^Significantly higher than state average. **Significantly lower than state average. Average. *Zero infections, not significant. NA: Hospitals with <50 central line days. Data reported as of July 10, 2014. Expected based on NYS 2013 average, adjusting for ICU type and birthweight.

Figure 13. Central line-associated bloodstream infection (CLABSI) summary for adult, pediatric, and neonatal ICUs: standardized infection ratio (SIR), New York 2013 (page 5 of 5)



State average. ●SIR. > Upper confidence limit exceeds graph area. —^^Significantly higher than state average.
—**Significantly lower than state average. —Average. —*Zero infections, not significant. NA: Hospitals with <50 central line days.
Data reported as of July 10, 2014. Expected based on NYS 2013 average, adjusting for ICU type and birthweight.

Catheter-Associated Urinary Tract Infections (CAUTIs)

A urinary tract infection (UTI) is an infection of the bladder or kidneys. Hospitalized patients may have a thin tube called a urinary catheter inserted into the bladder through the urethra to drain urine when they cannot urinate on their own. The catheter provides a pathway for bacteria to enter the bladder, increasing the risk of a UTI.

Catheter-associated urinary tract infections (CAUTIs) can be treated with antibiotics or removal/change of the catheter. The risk of a CAUTI can be decreased by using a catheter only when necessary, proper insertion technique and catheter care, hand washing by healthcare providers handling the catheter, and using a closed system of a catheter and attached urine collection bag.

In order to determine if a patient has a healthcare-associated CAUTI, the CDC developed surveillance definitions based on catheter usage, symptoms, and laboratory results. These definitions are used by all facilities entering data into NHSN (http://www.cdc.gov/nhsn/PDFs/pscManual/7pscCAUTIcurrent.pdf). Hospitals track the number of CAUTIs, the number of urinary catheter days, and the number of patient days per month.

The CMS IQR Program required CAUTI reporting in adult and pediatric ICUs starting in January 2012. All NY hospitals with ICUs are participating in this program. In 2015, CMS will be expanding the IQR program to include medical, surgical, and medical-surgical wards; about half of hospitals have already begun entering the ward data. While CAUTI reporting is not required by NYSDOH, data submitted as of May 2013 were included as a result of the CDC-NYS DUA. This DUA prohibits NYSDOH from publishing hospital-specific rates. NYSDOH does not audit this data.

CAUTI data reported between May and December 2013 were annualized by multiplying the observed data by 12 months/8 months. With the entire year of data, 2,593 infections would be expected. Catheters were used 56% of the time in ICU patients, and 13% of the time in the medical and surgical wards. CAUTI rates were higher in ICU patients, occurring at a rate of 2.9 infections per 1,000 catheter days (Table 20).

Table 20. Catheter-associated urinary tract infections, New York State 2013

Location	# Hospitals	# catheter-associated urinary tract infections	# urinary catheter days	CAUTI rate (infections per 1,000 catheter days)	Number of patient days	Device Utilization
Intensive Care Units	169	1,952	678,227	2.9	1,205,453	56.3%
Wards*	98	576	339,849	1.7	2,742,069	12.4%

Data reported from May-December 2013 were annualized

*Medical, surgical, and medical/surgical wards; not all hospitals reported data in wards.

Clostridium difficile Infections and Multidrug Resistant Organisms

Clostridium difficile Infections (CDI)

Clostridium difficile (C. difficile) is a type of bacteria that is a common cause of diarrhea in healthcare settings. In a small percentage of people, *C. difficile* lives along with other types of bacteria normally found in the intestinal tract and does not cause any symptoms or problems. However, when the *C. difficile* bacteria crowd out the other naturally occurring bacteria, they excrete a toxin into the intestines that may result in symptoms ranging from abdominal cramping and mild diarrhea to severe diarrhea and intestinal damage, which in some instances can result in death. The elderly and those who have recently taken antibiotics are at the greatest risk for developing CDI. When people take antibiotics, good germs that protect against infection may be destroyed along with the bad germs. The types of germs in the intestines might be altered for several months. During this time, patients can get sick from *C. difficile* acquired from contaminated surfaces or health care providers' hands.

Hospitals count CDI cases in all inpatient areas of the hospital except newborn nurseries, because babies may naturally carry the bacteria without symptoms. The diagnosis of CDI is made by performing a laboratory test on a stool sample. Patients are not tested for *C. difficile* unless they have symptoms of infection. Each month, hospitals enter the number of CDI cases, the number of admissions, and the number of patient days into NHSN.

Categories of CDI

Laboratory identified CDI cases are separated into reporting categories depending upon whether the onset of illness occurred in the community or in a hospital. Cases termed "community-onset not my hospital" (CO-NMH) are cases in which the positive stool sample was obtained during the first three days of the patient's hospital admission and more than four weeks after any previous discharge from that same hospital. These cases are presumed to be unrelated to the patient's stay in that hospital. Cases termed "community-onset possibly related to my hospital" (CO-PMH) are cases in which a patient who was discharged from the same hospital within the previous four weeks is readmitted to that hospital and has a positive *C. difficile* test during the first three days of the re-admission. In CO-PMH cases, it is not certain whether the CDI occurred as a result of the recent hospitalization or whether it is related to other exposures outside of the hospital. Hospital-onset (HO) cases are cases in which the positive stool sample was obtained on day four or later during the hospital stay.

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

In 2013, NYS hospitals reported 20,273 cases of CDI. Approximately half of the cases were community-onset and half were hospital-onset. Ninety-three percent of cases were incident, while 7% were recurrent (Table 21).

Table 21. Classification of *C. difficile* infections, New York State 2013

	# Community onset - Not my hospital	# Community onset - Possibly my hospital	# Hospital Onset	Total
Incident	6,894	2,672	9,341	18,907 (93%)
Recurrent	239	528	599	1,366 (7%)
Total	7,133 (35%)	3,200 (16%)	9,940 (49%)	20,273

New York State data reported as of July 24, 2014.

Sometimes CO-NMH and CO-PMH cases are combined and called "admission prevalent" cases because these patients were probably already colonized with the bacteria when they were admitted. The admission prevalence rate is the number of admission prevalent cases per 100 admissions. In 2013, there were 10,333 of these cases out of 2,191,203 admissions, for a rate of 0.47%. This rate describes the burden of CDI cases entering the hospital.

The longer a person stays in the hospital, the higher the total risk of acquiring an infection in the hospital, so incidence rates are reported using a denominator of patient days rather than admissions. The NHSN HO rate is the number incident HO cases (9,341) divided by the number of patient days (12,215,445), or 7.65 per 10,000 patient days in 2013. This rate is the main focus of HAI programs because these cases are most influenced by hospital infection prevention practices.

A portion of CO-PMH cases may also be influenced by infection prevention practices. The NYS 2013 CO-PMH rate was 2.18 per 10,000 patient days.

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 a large impact on observed CDI rates, with an increased number of cases detected with a change to a more sensitive test.

Table 22 summarizes the primary test methods used by NYS hospitals in 2013. NYSDOH categorized the methods into two general groups according to whether they will likely result in higher or lower reported CDI rates. Within these groups, and even within test method, there are variations in precision depending on the test manufacturer and lab technique.

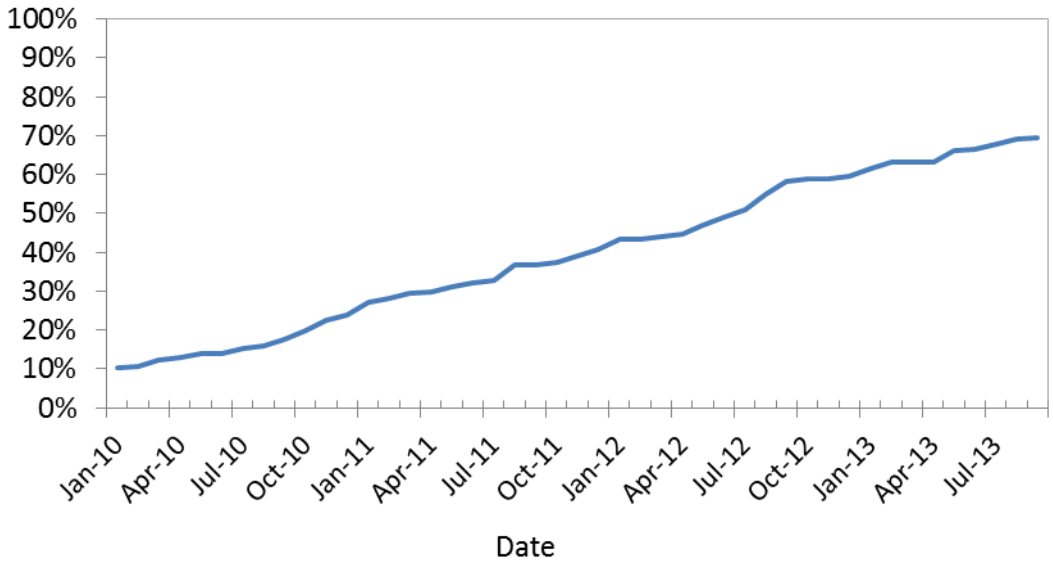
Table 22. *C. difficile* laboratory methods used by NYS hospitals in 2013

NYSDOH classification	Laboratory method used for majority of 2013	# hospitals (%)
Less sensitive (lower CDI rates)	EIA for Toxin A and B	41 (24.1%)
	GDH antigen and toxin EIA (report if GDH+ and EIA+)	16 (9.4%)
More sensitive (higher CDI rates)	GDH antigen and NAAT (report if GDH+ and NAAT+)	2 (1.2%)
	GDH antigen and toxin EIA, plus confirm discrepancies with NAAT/culture	35 (20.6%)
	NAAT	76 (44.7%)

EIA: enzyme immunoassay; GDH: glutamate dehydrogenase; NAAT: nucleic acid amplification test (e.g. polymerase chain reaction (PCR) and loop-mediated isothermal amplification (LAMP))
As reported by hospitals in October 2013 NYSDOH survey.

Between January 2010 and October 2013, the percentage of hospitals using more sensitive tests steadily increased from 10% to 70% (Figure 14).

Figure 14. Percentage of hospitals using sensitive laboratory test method for *C. difficile*



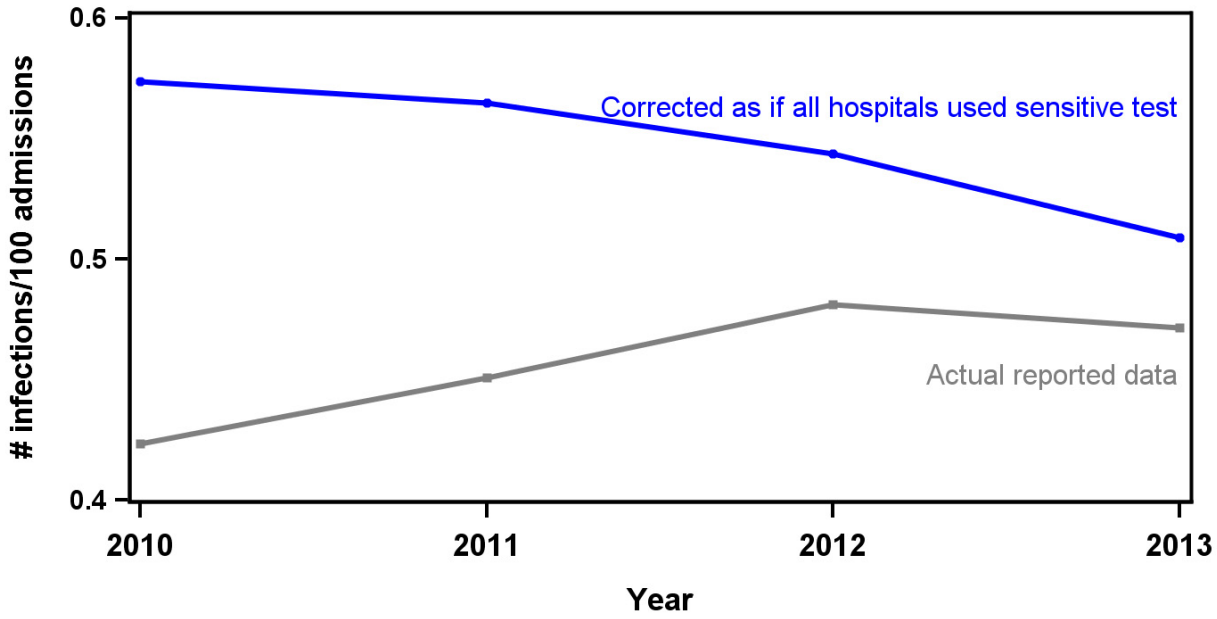
Trends in CDI Rates

Valid interpretation of trends requires that methods remain constant over time. To correct time trends for the continued adoption of more sensitive lab tests by hospitals, the CDI rates at hospitals that performed less sensitive tests were multiplied by 1.5. This estimate was obtained from three sources. In a network of 42 community hospitals in the Southeastern U.S., CDI rates increased 56% after switching from nonmolecular to molecular tests.[6] In three states with Emerging Infections Programs, CDI rates increased 43%, 52%, and 67% after switching from toxin EIA to NAAT.[7] In the combined 2010-2013 NYSDOH dataset, hospitals performing more sensitive tests had HO rates 53% higher than hospitals performing less sensitive tests.

An additional change that occurred in 2013 was clarification in CDC's guidance on the hospital units required to report CDI. As a result of new wording in the CDC protocol, 13% of hospitals added surveillance in rehabilitation units, and 16% added surveillance in psychiatric units. As a result, the total number of reported patient days increased by 2% between 2012 and 2013. These units contain lower-risk patients and will tend to decrease CDI rates slightly. The population at risk may change again slightly in 2015 based on anticipated new guidance. This factor was not incorporated into the assessment of trends because the 2% change in denominator data is within the 5% error allowed by the protocol to accommodate the multiple ways hospitals operationalize denominator data collection.

Figure 15 summarizes trends in the admission prevalence rate, both before and after the correction for test method. After the correction for test method, the admission prevalence rate declined 11% between 2010 and 2013.

Figure 15. Trend in *C. difficile* admission prevalence rate, New York State 2010-2013

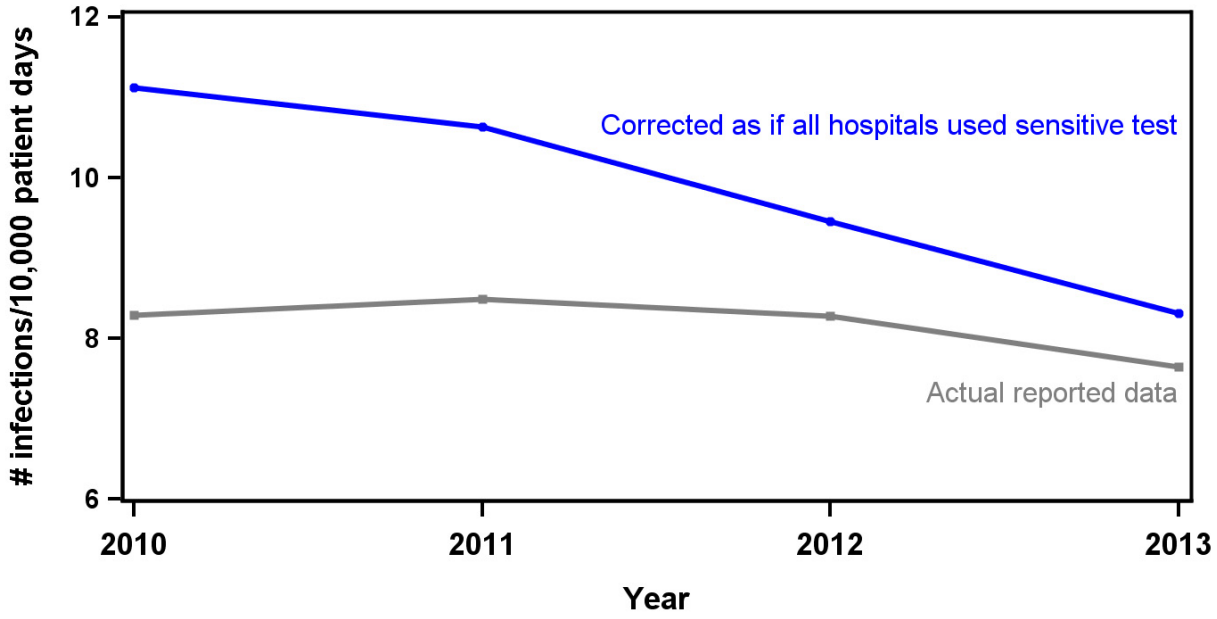


Year	# Hospitals	# Admissions	# Admission Prevalent Infections	Admission Prevalence Rate[1]	# Admission Prevalent Infections, Corrected[2]	Admission Prevalence Rate[1], Corrected
2010	176	2,319,736	9,820	0.423	13,305	0.574
2011	176	2,306,989	10,400	0.451	13,034	0.565
2012	174	2,248,409	10,815	0.481	12,222	0.544
2013	170	2,191,203	10,333	0.472	11,149	0.509

New York State data reported as of July 24, 2014.
[1] Rate is number of community onset infections per 100 admissions.
[2] More sensitive tests (i.e. nucleic acid amplification test (NAAT) or multistep screening with confirmation with NAAT or culture) detect approximately 50% more CDI than less sensitive tests.
Corrected # = observed # multiplied by (proportion of year less sensitive test was used times 1.5).

Correcting for changes in test method, HO rates declined 25% between 2010 and 2013 (Figure 16). This corresponds to approximately 8,000 fewer HO infections than would have occurred if the incidence of HO did not decrease between 2010 and 2013, with an associated cost savings of $52 million to $74 million, assuming that costs were accrued for HO cases that were not reported because of use of a less sensitive test method.

Figure 16. Trend in incidence of hospital onset *C. difficile*, New York State 2010-2013



Year	# Hosp	# Patient Days	# Hospital Onset Infections	Hospital Onset Rate[1]	# Hospital Onset Infections Corrected[2]	Hospital Onset Rate[1] Corrected	Hospital Onset Rate[3] for Hospital Comparisons
2010	176	12,290,750	10,186	8.29	13,671	11.12	12.54
2011	176	12,243,421	10,388	8.48	13,022	10.64	12.83
2012	174	11,962,739	9,902	8.28	11,309	9.45	12.51
2013	170	12,215,445	9,341	7.65	10,157	8.31	11.30

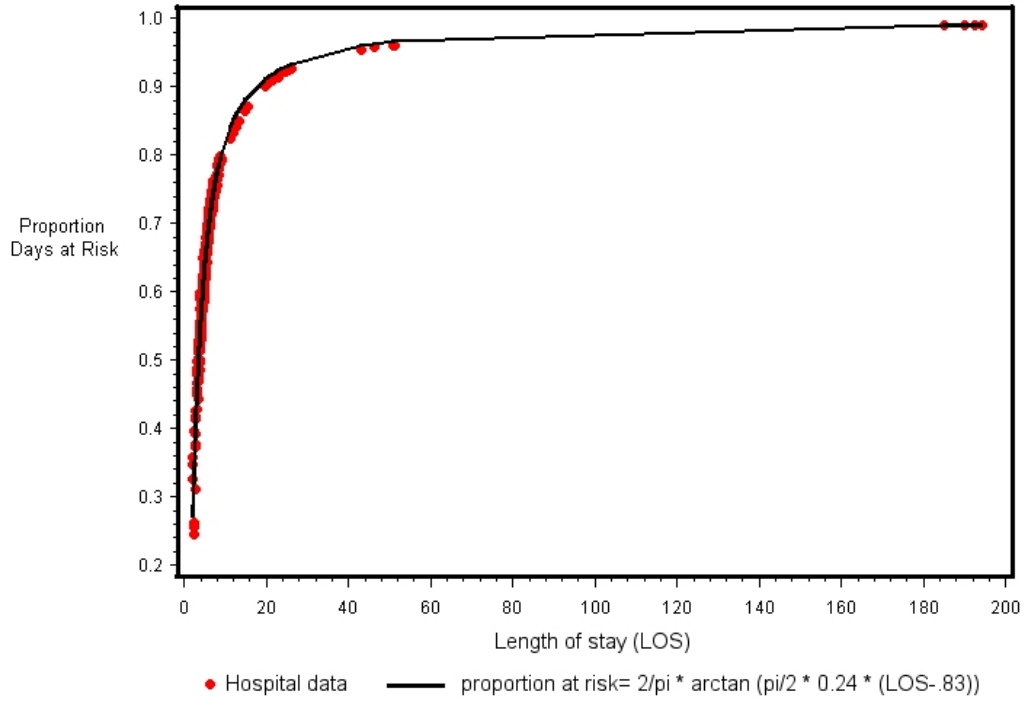
New York State data reported as of July 24, 2014.
[1] Rate is number of hospital onset infections per 10,000 patient days.
[2] More sensitive tests (i.e. nucleic acid amplification test (NAAT) or multistep screening with confirmation with NAAT or culture) detect approximately 50% more CDI than less sensitive tests.
Corrected # = observed # multiplied by (proportion of year less sensitive test was used times 1.5).
[3] Rate calculated using estimated days at risk (i.e. deleting first three days of all admissions)

CDI Risk Adjustment

In previous reports, hospital CDI rates were not risk-adjusted because facility-wide individual risk factor data are not reported to NHSN. Instead, each hospital's rate in the current year was compared to the rate in the previous year. There were a few limitations to that method: 1) It was not possible to compare rates when test methods or denominator reporting methods changed; 2) The method did not highlight hospitals with progress over many years; and 3) Hospitals with unusually high or low rates could not be identified. For this report, a new method was developed to assess hospital performance in a given year, similar to the method of displaying other indicators in this report. Hospital CDI rates were adjusted based on the length of stay obtained from NHSN, laboratory test method obtained from a survey of hospitals, and a hospital CDI risk index calculated from the previous year's billing database (SPARCS).

By NHSN definition, patients cannot have a hospital-onset infection on the first three days of admission. Therefore, infection rates should be based only on the days at risk for CDI.[8,9] Figure 17 shows the relationship between length of stay and the proportion of days at risk (i.e. number of patient days after deleting the first three days from each admission, divided by total patient days) in billing data (including long term acute care hospitals, which started reporting to NYS in 2014). An equation was developed to fit the data using a curve fitting program.

Figure 17. Proportion of days at risk for hospital onset infection versus length of stay



NHSN CDI events were matched onto SPARCS 2010-2012 discharges, and Poisson regression was used to predict which patients would develop NHSN defined HO CDI each year based on diagnosis codes assigned at discharge. All diagnosis codes have an indicator of whether or not

the onset of the diagnosis was present prior to admission. Only diagnoses that were "present on admission" were included. A risk index was calculated for each hospital in each year as the total predicted number of cases divided by the days at risk; the risk index is the predicted HO rate. The 2012 model is summarized in Table 23. The model shows that patients who were admitted for mental health issues were the least likely group to develop CDI. Hospitals with a large proportion of mental health patients will have a lower risk index because these patients have a very low risk for CDI. Similarly, patients admitted for substance abuse issues, rehabilitation, and childbirth were very unlikely to develop CDI, so hospitals with a large proportion of these types of patients will tend to have lower risk indices. Hospitals with a large proportion of elderly patients, cancer patients, and patients with infections will tend to have higher risk indices.

SPARCS data are not equivalent to NHSN data in timeliness because NHSN events are entered within 60 days after the end of the month that the event occurred, while SPARCS data are entered after patient discharge and are not considered complete until August for the previous discharge year.

NYS developed a risk index for each hospital each year. The risk index was found to be highly consistent between years (r-squared=0.94). The 2012 index was used to risk adjust 2013 data, the 2011 index was used for the 2012 data, and the 2010 index was used for 2011 and 2010 data. (A 2009 risk index was not available because NHSN data collection did not begin until July 2009).

Table 23. Risk factors used in calculation of hospital *Clostridium difficile* risk index, 2012

Risk factor		Relative Risk	Freq. (%)	ICD-9 diagnosis codes present on admission
Age:	0 to <60	ref (1.0)	48.6	
	60 to <70	1.22	15.7	
	70 to <80	1.32	15.4	Not applicable
	80 +	1.51	20.3	
Hospitalized in last 60 days		1.40	24.8	Not applicable
Not recently hospitalized		ref (1.0)	75.2	
Primary reason for admission[1]:	Mental health	0.06	7.8	291-319
	Substance abuse	0.20	2.2	303-305, 965, 967, 968, 969
	Low risk pregnancy	0.25	10.0	630-679 and not 646, 647.81-648.04, 648.9
	Rehabilitation	0.25	1.7	V57
	Fracture/sprain/disc	0.79	3.4	fracture 800-829; dislocation 830-839; sprain 840-848, slipped disc 722.0-722.2; scoliosis 737.30, 737.32
	Heart disease	0.75	5.4	410, 414, 415, 426, 427
	Cerebrovascular disease	0.75	2.3	430-438
	Asthma	0.43	1.4	493
	Sickle cell	0.27	0.5	282.4-282.6
	Other	ref (1.0)	65.3	
Cancer	Leukemia/lymphoma	1.56	2.2	200-208
	Other cancer	1.12	8.4	140-199, 209
	None of above	ref (1.0)	89.4	
Infection				
	Septicemia	1.66	6.7	038, 003.1, 020.2, 022.3, 036.2, 054.5, 449, 790.7, 785.5, 995.9
	Other	1.36	15.6	bacterial infection 031-037, 039-041 (primary dx only); mycoses 110-118 (primary dx only); pneumonia 481-486; urinary tract infections 590, 595, 597; skin infections 680-686,707,728.86,785.4,440.24; appendix rupture/abscess 540.0, 540.1; central nervous system infections 320-324, 326; heart 420-422, 519.2; respiratory 510, 513; digestive 566, 567, 569.5; arthropathy 711; osteomyelitis 730; device 996.6
	None of above	ref (1.0)	77.7	
Any diagnosis codes POA[2]				
Diseases of white blood cells		1.35	3.1	288
Lower gastrointestinal tract		1.40	9.0	555, 556, 557, 560, 562
Transplant		1.26	0.4	V42, V58.44, 996.8
Kidney disease, acute/chronic		1.26	18.0	584-586, 996.73, 285.21
Liver, gallbladder, pancreas		1.21	8.7	570-578
HIV infection and disease		1.14	1.0	042
Respiratory failure		1.19	5.2	518.5,518.8,519.0, 997.31,V46.1, V55.0

[1] Only primary diagnosis code. [2]Any present on admission diagnosis code. Reference group for each of these factors is patients without any of the diagnosis codes. Model c-statistic= 0.62.

The next step of the adjustment process was based on the number of HO cases, admissions, and patient days reported to NHSN by each hospital each year. The proportion of days at risk was estimated by substituting average length of stay (NHSN patient days divided by admissions) into 'LOS' in the equation in Figure 17. Days at risk were then calculated by multiplying this proportion by the number of patient days reported to NHSN. A Poisson regression model was developed to predict the number of HO cases in each hospital in each year based on laboratory testing method (a continuous variable representing the percent of days in the year using a sensitive test), hospital CDI risk index for the previous year, and days at risk for CDI.

- In 2013, hospitals that used more sensitive laboratory tests had HO rates 1.5 times higher than hospitals that used less sensitive tests; and
- Each five unit increase in risk index increased the predicted HO rate 1.7 times.

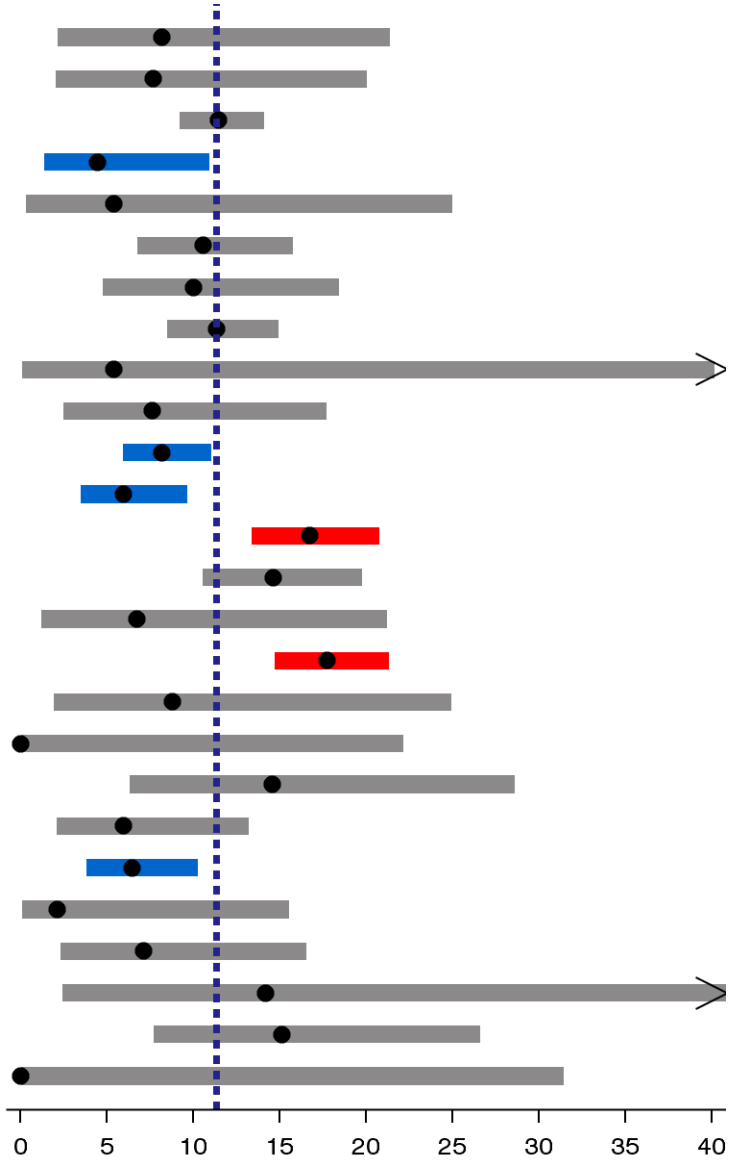
Each hospital's risk adjusted rate was calculated as the number of observed infections divided by the number of predicted infections, multiplied by the state average (last column of Figure 16).

There are some limitations to this risk adjustment method. First, diagnosis codes are recorded in SPARCS for billing rather than surveillance purposes, and there may be variations in how these codes, as well as the associated present on admission indicators, are recorded across hospitals. Second, the model only predicts CDI from the SPARCS data marginally well. The model does not account for some factors that may be related to a person's risk for developing CDI, such as recent antibiotic use.

Hospitals were flagged as having adjusted rates significantly higher or lower than the state average if the 99% confidence interval excluded the state average HO rate. The more conservative 99% confidence interval was selected for this indicator due to the previously mentioned model limitations. In 2013, 18 hospitals (11%) were flagged with adjusted rates significantly higher than the state average, and 23 hospitals (14%) were flagged significantly lower than average (Figure 18).

Figure 18. Hospital onset *C. difficile* rates, New York State 2013 (Page 1 of 7)

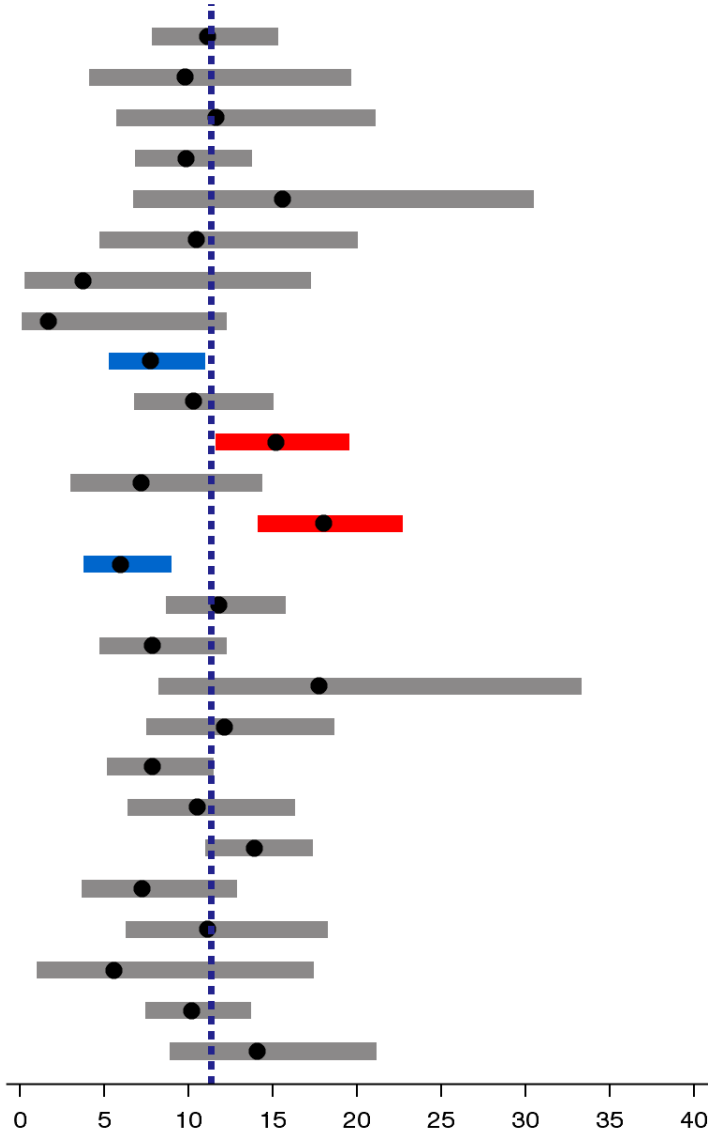
HOSPITAL	TEST	# CO-NMH	# CO-PMH	# HO	# PATDAYS	PATDAYS AT RISK	RISK INDEX	RAW HO RATE	ADJ HO RATE
AO Fox Memorial	N	5	3	6	12,586	7,858	14.5	4.8	8.2
Adirondack Medical	S	7	0	6	12,138	7,511	11.4	4.9	7.7
Albany Medical	S	111	34	151	178,616	120,915	11.8	8.5	11.4
Albany Memorial**	N	1	1	7	22,129	16,091	14.9	3.2	4.4
Alice Hyde	N	4	3	2	8,596	4,113	14.1	2.3	5.4
Arnot Ogden	S	37	16	39	48,609	27,302	13.9	8.0	10.5
Auburn Memorial	S	23	6	16	21,956	13,648	12.5	7.3	10.0
Bellevue Hospital	N	30	11	86	188,461	169,349	5.2	4.6	11.3
Bertrand Chaffee	N	2	1	1	2,996	1,762	15.6	3.3	5.4
Bon Secours	S	3	1	8	24,468	16,592	6.5	3.3	7.6
Bronx-Lebanon**	N	37	15	71	146,913	98,918	13.9	4.8	8.1
Brookdale Hospital**	N	12	7	27	97,715	68,775	11.1	2.8	5.9
Brookhaven Memorial^	S	106	34	141	93,035	65,790	13.4	15.2	16.7
BrooklynHos-Downtown	N	25	12	70	89,692	59,078	13.1	7.8	14.6
Brooks Memorial	S	16	4	4	9,891	5,382	15.9	4.0	6.7
Buffalo General^	S	65	23	196	155,934	115,140	10.6	12.6	17.7
Canton-Potsdam	S	18	4	5	15,009	8,295	7.3	3.3	8.8
Carthage Area*	N	1	1	0	5,289	2,817	12.2	0.0	0.0
Catskill Regional	N	8	3	13	21,097	14,342	10.5	6.2	14.5
Cayuga Medical Cntr	S	16	0	9	28,759	17,342	9.7	3.1	5.9
Champlain Valley**	S	23	8	29	56,272	39,699	12.2	5.2	6.4
Chenango Memorial	S	12	5	1	6,227	3,254	14.7	1.6	2.1
Claxton-Hepburn	S	10	2	8	22,499	16,168	7.4	3.6	7.1
Clifton Springs	S	8	0	4	7,479	4,070	7.4	5.3	14.2
Columbia Memorial	N	17	8	19	30,050	19,964	10.6	6.3	15.1
Community Memorial*	N	1	0	0	4,412	1,838	12.9	0.0	0.0



Data reported as of July 24, 2014. State Average. ●Risk-adjusted Infection rate. > Upper confidence limit exceeds graph area. ^^Significantly higher than state average. **Significantly lower than state average. Average *Zero Infections, not significant. CO-NMH: community onset-not my hospital, CO-PMH: community onset-possibly my hospital, HO: hospital onset, raw rate is per 10,000 patient days, adjusted rate is per 10,000 days at risk (more than 3 days in hospital), Test method: N= less sensitive test, S= more sensitive test (nucleic acid amplification test (NAAT) or combination of sensitive test plus confirmation with NAAT). Adjusted using test and hospital CDI risk index from 2012 billing data.

Figure 18. Hospital onset *C. difficile* rates, New York State 2013 (Page 2 of 7)

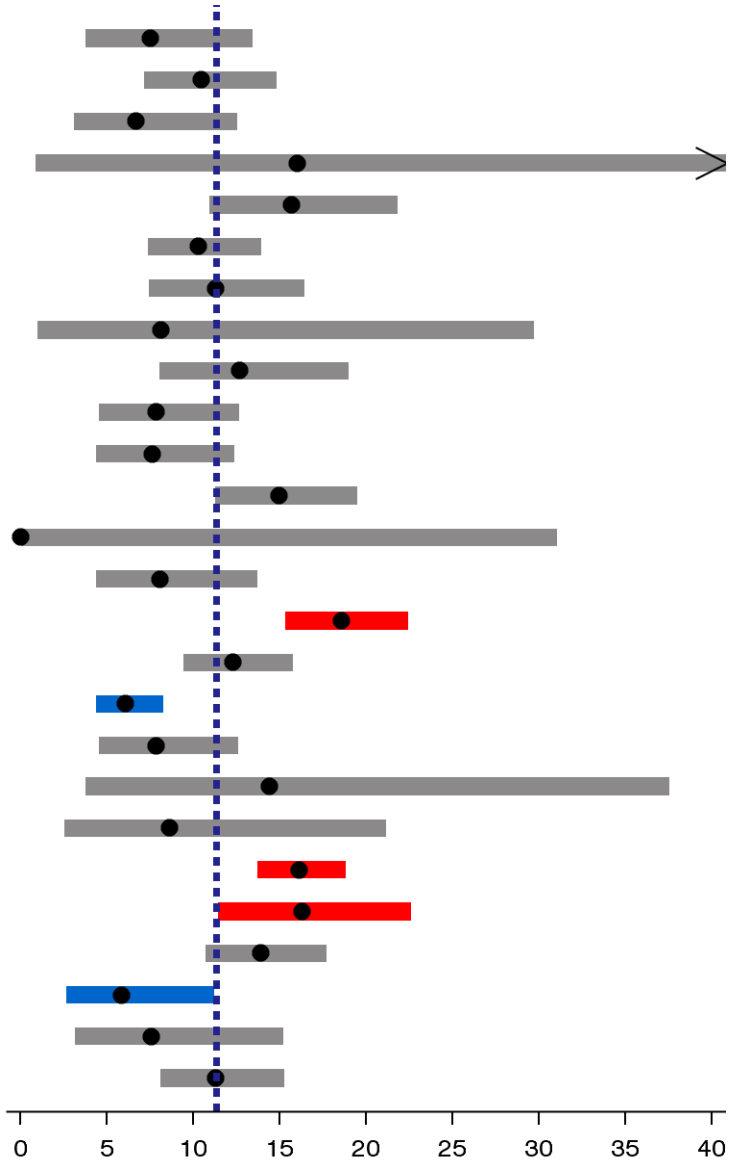
HOSPITAL	TEST	# CO-NMH	# CO-PMH	# HO	# PATDAYS	PATDAYS AT RISK	RISK INDEX	RAW HO RATE	ADJ HO RATE
Coney Island	S	46	7	62	75,834	56,769	10.8	8.2	11.1
Corning Hospital	S	22	9	12	14,899	7,782	15.4	8.1	9.7
Cortland Reg Med	N	16	13	17	22,595	15,788	14.4	7.5	11.6
Crouse Hospital	S	67	24	56	81,630	48,261	12.6	6.9	9.8
DeGraff Memorial	S	26	2	13	11,270	7,088	12.6	11.5	15.5
East. Niag. Lockport	N	6	8	14	35,604	24,920	9.1	3.9	10.4
East. Niag. Newfane	N	1	2	2	8,499	5,620	14.7	2.4	3.7
Eastern Long Island	S	2	1	1	18,136	12,946	3.6	0.6	1.6
Ellis Hospital**	S	61	14	51	90,656	57,867	12.3	5.6	7.7
Elmhurst	S	21	5	44	140,496	100,633	6.8	3.1	10.3
Erie Medical Center^	S	44	14	101	131,315	102,139	6.8	7.7	15.2
FF Thompson	S	25	9	12	19,204	11,527	14.7	6.2	7.1
Faxton St. Lukes^	S	82	37	120	75,492	46,833	14.4	15.9	18.0
Flushing Hospital**	N	23	11	37	86,575	59,264	13.1	4.3	5.9
Forest Hills Hosp	S	79	29	76	72,724	44,083	14.7	10.5	11.8
Franklin	S	39	8	31	51,063	34,756	12.3	6.1	7.8
Geneva General	N	23	6	15	17,004	9,915	13.6	8.8	17.7
Glen Cove Hospital	S	33	7	34	53,879	39,342	7.7	6.3	12.1
Glens Falls	S	58	19	43	71,337	44,079	13.1	6.0	7.8
Good Samar. Suffern	N	21	11	32	57,836	32,609	14.5	5.5	10.5
Good Samar. W Islip	S	76	31	130	105,187	66,184	14.3	12.4	13.9
Harlem Hospital	N	10	3	18	68,860	46,794	6.9	2.6	7.2
HealthAlli Broadway	N	17	12	25	38,234	23,446	14.7	6.5	11.1
HealthAlli MarysAve	N	3	0	4	27,451	21,115	4.7	1.5	5.5
Highland Hospital	S	80	27	74	78,138	49,457	14.7	9.5	10.2
Hosp for Spec Surg	S	8	1	37	53,429	28,656	10.2	6.9	14.0



Data reported as of July 24, 2014. ┆State Average. ●Risk-adjusted Infection rate. > Upper confidence limit exceeds graph area. —^^Significantly higher than state average. —**Significantly lower than state average. —Average —*Zero Infections, not significant. CO-NMH: community onset-not my hospital, CO-PMH: community onset-possibly my hospital, HO: hospital onset, raw rate is per 10,000 patient days, adjusted rate is per 10,000 days at risk (more than 3 days in hospital), Test method: N= less sensitive test, S= more sensitive test (nucleic acid amplification test (NAAT) or combination of sensitive test plus confirmation with NAAT). Adjusted using test and hospital CDI risk index from 2012 billing data.

Figure 18. Hospital onset *C. difficile* rates, New York State 2013 (Page 3 of 7)

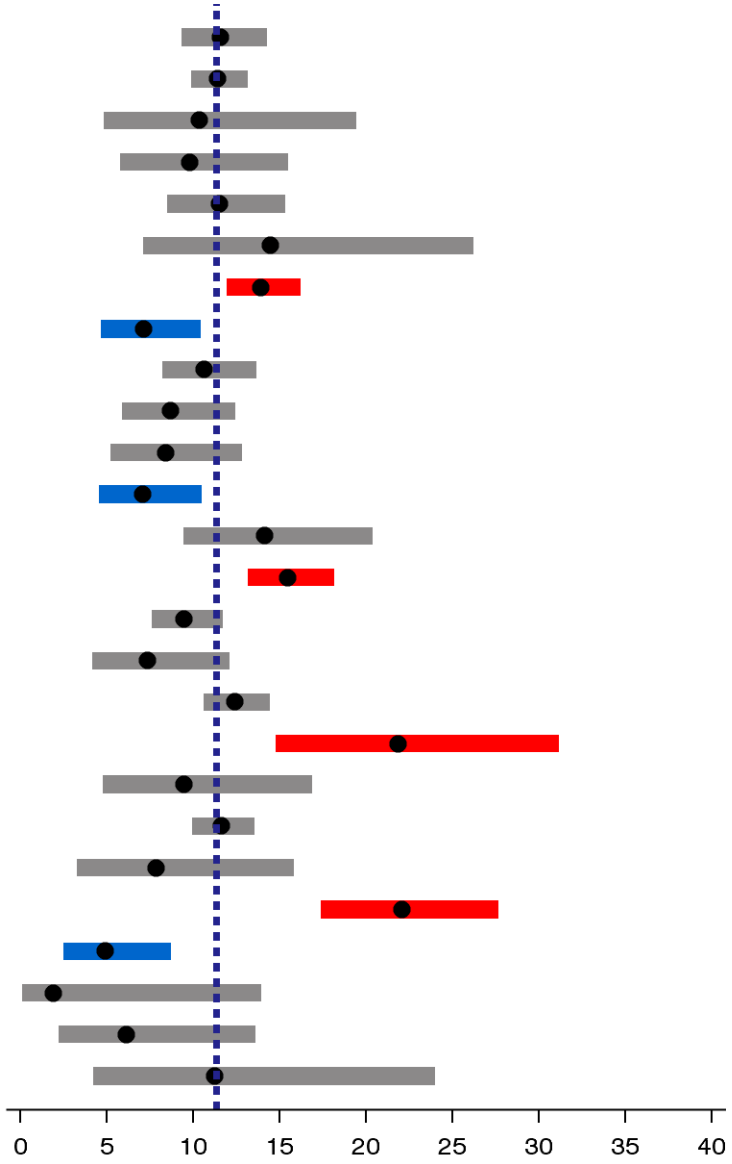
HOSPITAL	TEST	# CO-NMH	# CO-PMH	# HO	# PATDAYS	PATDAYS AT RISK	RISK INDEX	RAW HO RATE	ADJ HO RATE
Hudson Valley	N	21	6	18	32,732	20,453	16.7	5.5	7.5
Huntington	S	53	20	52	71,977	44,917	12.0	7.2	10.4
Interfaith Medical	N	1	3	15	78,519	60,910	5.4	1.9	6.7
Ira Davenport	S	3	0	2	2,068	883	14.4	9.7	16.0
JT Mather	N	32	15	58	68,964	47,673	12.7	8.4	15.6
Jacobi Medical	S	29	15	69	129,954	94,222	7.7	5.3	10.2
Jamaica Hospital	N	17	10	44	113,577	74,275	8.9	3.9	11.2
Jones Memorial	N	2	1	3	6,816	3,588	15.4	4.4	8.1
Kenmore Mercy	S	34	14	38	36,643	22,796	13.7	10.4	12.6
Kings County	N	10	2	27	121,491	84,773	6.4	2.2	7.8
Kingsbrook Jewish	N	13	14	26	69,112	52,025	11.0	3.8	7.6
Lenox Hill	N	44	23	92	134,227	81,843	12.3	6.9	14.9
Lewis County*	N	1	0	0	4,486	1,824	13.1	0.0	0.0
Lincoln Medical	N	8	7	22	89,577	50,195	9.2	2.5	8.1
Long Island Jewish^	S	224	60	185	203,413	120,682	9.1	9.1	18.6
Lutheran Medical	S	55	28	103	121,876	82,391	11.2	8.5	12.2
Maimonides**	N	51	22	69	198,712	131,838	13.7	3.5	6.1
Mary Imogene Bassett	S	30	24	27	47,682	31,598	11.8	5.7	7.8
Massena Memorial	N	4	5	6	10,040	4,776	13.8	6.0	14.4
Medina Memorial	S	12	3	7	12,606	8,856	10.1	5.6	8.6
Memor SloanKettering^	S	131	67	267	138,337	97,913	16.1	19.3	16.1
Mercy Medical^	S	41	11	60	59,977	38,751	10.5	10.0	16.3
Mercy- Buffalo	S	66	24	109	96,833	62,210	13.2	11.3	13.9
Metropolitan**	N	13	5	14	80,985	55,816	4.6	1.7	5.8
MidHudson Reg of WMC	N	18	3	12	56,323	43,472	5.3	2.1	7.5
Millard Fill. Suburb	S	103	22	69	65,725	39,931	15.1	10.5	11.2



Data reported as of July 24, 2014. State Average. ●Risk-adjusted Infection rate. > Upper confidence limit exceeds graph area. ^^Significantly higher than state average. **Significantly lower than state average. Average *Zero Infections, not significant. CO-NMH: community onset-not my hospital, CO-PMH: community onset-possibly my hospital, HO: hospital onset, raw rate is per 10,000 patient days, adjusted rate is per 10,000 days at risk (more than 3 days in hospital), Test method: N= less sensitive test, S= more sensitive test (nucleic acid amplification test (NAAT) or combination of sensitive test plus confirmation with NAAT). Adjusted using test and hospital CDI risk index from 2012 billing data.

Figure 18. Hospital onset *C. difficile* rates, New York State 2013 (Page 4 of 7)

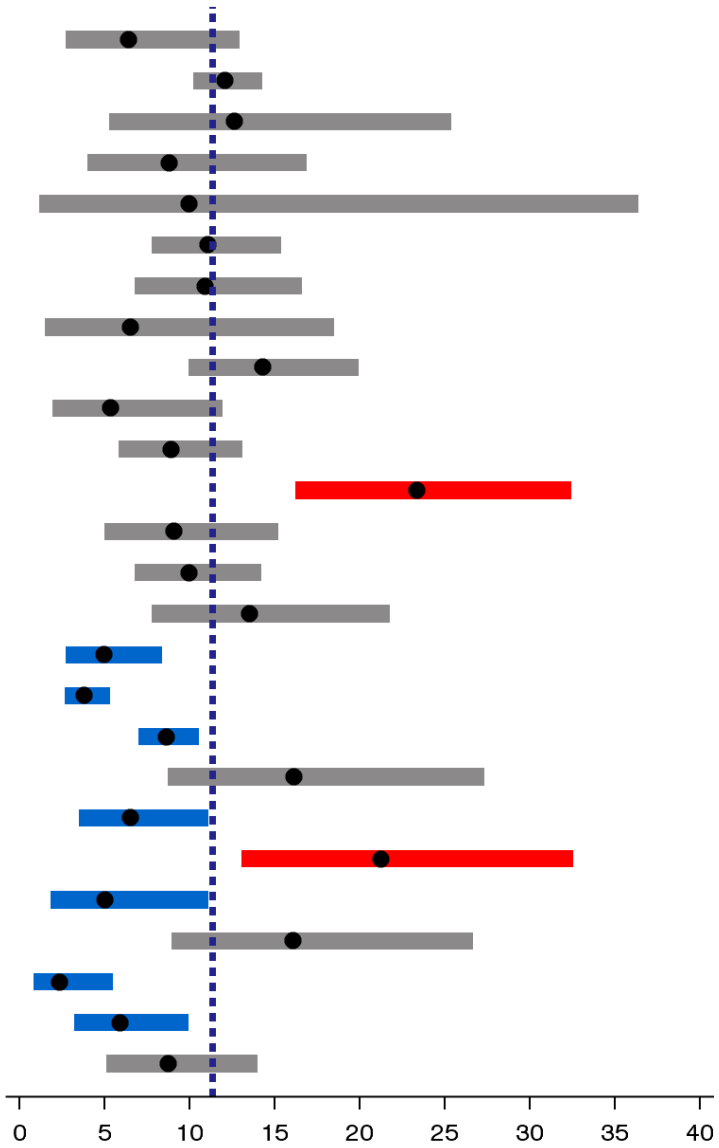
HOSPITAL	TEST	# CO-NMH	# CO-PMH	# HO	# PATDAYS	PATDAYS AT RISK	RISK INDEX	RAW HO RATE	ADJ HO RATE
Montefiore-Einstein	S	71	31	150	136,252	92,514	14.3	11.0	11.6
Montefiore-Moses	S	156	72	322	273,880	201,531	14.3	11.8	11.4
Montifiore-Mt Vernon	S	2	2	15	23,417	17,587	9.1	6.4	10.3
Montifiore-NewRochl	S	36	7	29	34,202	20,666	14.5	8.5	9.8
Montifiore-Wakefield	S	85	19	79	84,540	58,680	12.5	9.3	11.5
Mount St. Marys	N	19	6	17	26,381	17,503	11.2	6.4	14.4
Mt Sinai^	S	150	44	285	303,042	194,142	11.5	9.4	13.9
Mt Sinai BI-Bklyn**	S	31	12	43	66,359	46,133	16.4	6.5	7.1
Mt Sinai Beth Israel	S	73	34	105	216,857	142,196	10.2	4.8	10.6
Mt Sinai Queens	S	28	11	49	55,240	37,890	14.9	8.9	8.7
Mt Sinai Roosevelt	S	26	13	35	116,715	74,923	8.1	3.0	8.4
Mt Sinai St Lukes**	S	43	14	40	109,511	78,593	10.6	3.7	7.0
NY Community Bklyn	N	39	13	47	45,585	31,721	15.6	10.3	14.1
NY Hosp Queens^	S	204	58	258	159,316	106,651	15.3	16.2	15.5
NY Methodist	S	102	41	143	194,817	129,532	12.5	7.3	9.4
NYP-Allen	S	46	22	25	54,985	35,276	10.6	4.5	7.3
NYP-Columbia/Morgan S	S	170	53	285	267,066	192,394	12.7	10.7	12.4
NYP-Lawrence^	S	54	8	50	36,186	16,905	13.9	13.8	21.8
NYP-Lower Manhattan	N	15	3	18	39,253	23,822	12.9	4.6	9.4
NYP-Weill Cornell	S	100	47	275	252,761	180,192	13.6	10.9	11.6
NYU Joint Disease	S	1	3	12	31,649	22,038	7.4	3.8	7.8
NYU Medical Center^	S	88	33	127	108,745	56,721	11.1	11.7	22.1
Nassau University**	N	9	1	18	130,418	94,864	5.9	1.4	4.9
Nathan Littauer	N	8	0	1	11,103	5,724	14.5	0.9	1.9
Newark Wayne	S	20	2	9	21,863	14,107	11.4	4.1	6.1
Niagara Falls	S	8	4	10	23,151	14,598	6.2	4.3	11.2



Data reported as of July 24, 2014. ¦State Average. ●Risk-adjusted Infection rate. > Upper confidence limit exceeds graph area. –^^Significantly higher than state average. –**Significantly lower than state average. –Average –*Zero Infections, not significant. CO-NMH: community onset-not my hospital, CO-PMH: community onset-possibly my hospital, HO: hospital onset, raw rate is per 10,000 patient days, adjusted rate is per 10,000 days at risk (more than 3 days in hospital), Test method: N= less sensitive test, S= more sensitive test (nucleic acid amplification test (NAAT) or combination of sensitive test plus confirmation with NAAT). Adjusted using test and hospital CDI risk index from 2012 billing data.

Figure 18. Hospital onset *C. difficile* rates, New York State 2013 (Page 5 of 7)

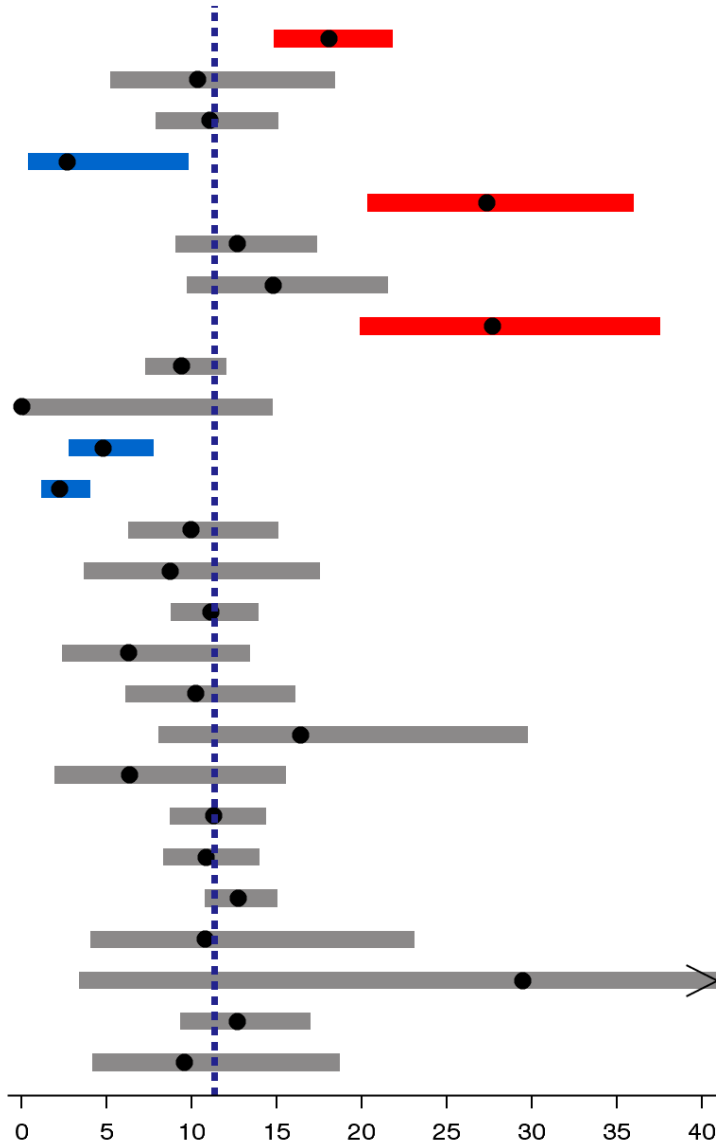
HOSPITAL	TEST	# CO-NMH	# CO-PMH	# HO	# PATDAYS	PATDAYS AT RISK	RISK INDEX	RAW HO RATE	ADJ HO RATE
North Central Bronx	S	15	3	12	43,047	31,366	5.9	2.8	6.4
North Shore	S	33	222	239	241,890	150,992	13.6	9.9	12.1
Northern Dutchess	S	25	4	12	15,632	9,373	11.1	7.7	12.6
Northern Westchester	N	31	9	14	36,637	21,441	12.2	3.8	8.8
Noyes Memorial	N	4	2	3	6,431	3,448	13.8	4.7	9.9
Nyack Hospital	S	50	21	59	57,278	33,989	15.4	10.3	11.1
Olean General	S	51	14	35	32,707	18,723	16.2	10.7	10.9
Oneida Healthcare	S	23	4	5	10,638	5,827	13.7	4.7	6.5
OrangeReg Goshen-Mid	N	51	28	57	89,947	56,536	11.7	6.3	14.3
Oswego Hospital	S	42	10	9	19,191	12,051	14.2	4.7	5.3
Our Lady of Lourdes	S	66	29	42	47,201	29,101	15.7	8.9	8.9
Peconic Bay Medical^	S	27	7	58	29,347	17,469	14.4	19.8	23.3
Phelps Memorial	S	40	11	23	51,863	37,068	7.3	4.4	9.0
Plainview Hospital	S	76	17	50	50,904	32,258	15.3	9.8	9.9
Putnam Hospital	S	40	8	27	32,125	17,863	12.1	8.4	13.5
Queens Hospital**	S	9	7	22	85,968	63,279	7.5	2.6	4.9
Richmond Univ**	S	32	13	56	161,602	127,753	12.5	3.5	3.8
Rochester General**	S	122	43	163	200,926	154,008	13.0	8.1	8.6
Rome Memorial	S	36	6	22	21,087	13,211	11.3	10.4	16.1
Roswell Park**	N	14	10	21	37,765	29,125	16.2	5.6	6.5
SUNY Downstate LICH^	S	11	6	34	35,133	23,135	10.2	9.7	21.2
Samaritan- Troy**	N	6	2	9	50,777	33,669	9.0	1.8	5.0
Samaritan- Watertown	S	47	12	24	28,055	15,750	10.4	8.6	16.1
Saratoga Hospital**	N	18	5	8	45,768	30,322	13.7	1.7	2.3
Sisters of Charity**	S	41	18	22	51,172	29,353	13.4	4.3	5.8
Sisters- St Joseph	S	28	12	28	27,063	18,819	16.2	10.3	8.7



Data reported as of July 24, 2014. ┆State Average. ●Risk-adjusted Infection rate. > Upper confidence limit exceeds graph area. –^^Significantly higher than state average. –**Significantly lower than state average. –Average –*Zero Infections, not significant. CO-NMH: community onset-not my hospital, CO-PMH: community onset-possibly my hospital, HO: hospital onset, raw rate is per 10,000 patient days, adjusted rate is per 10,000 days at risk (more than 3 days in hospital), Test method: N= less sensitive test, S= more sensitive test (nucleic acid amplification test (NAAT) or combination of sensitive test plus confirmation with NAAT). Adjusted using test and hospital CDI risk index from 2012 billing data.

Figure 18. Hospital onset *C. difficile* rates, New York State 2013 (Page 6 of 7)

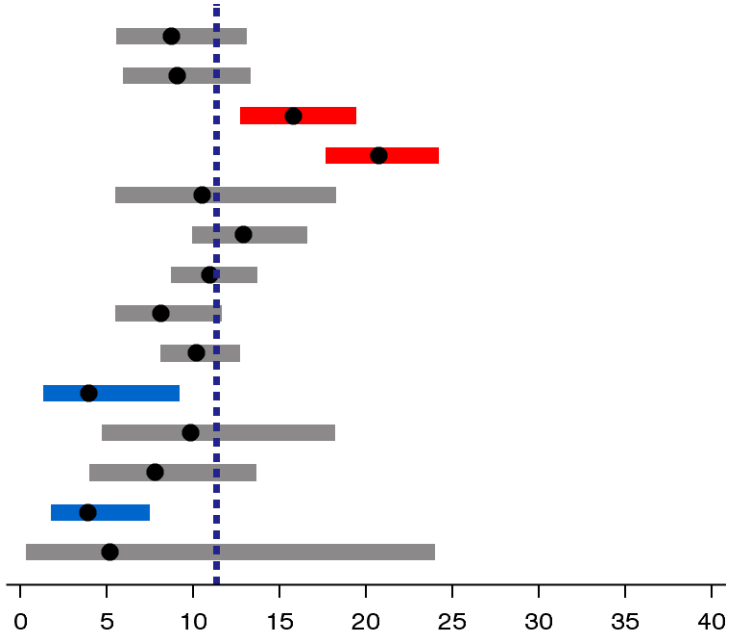
HOSPITAL	TEST	# CO-NMH	# CO-PMH	# HO	# PATDAYS	PATDAYS AT RISK	RISK INDEX	RAW HO RATE	ADJ HO RATE
South Nassau Comm.^	S	162	46	183	110,850	78,780	13.4	16.5	18.0
Southampton	S	35	10	18	19,892	10,779	15.7	9.0	10.3
Southside	S	66	18	65	92,933	64,286	10.1	7.0	11.0
St Anthony**	S	6	2	3	9,761	5,934	17.2	3.1	2.7
St Barnabas^	N	23	7	85	86,638	55,296	9.5	9.8	27.3
St Catherine Siena	S	76	31	65	69,304	47,143	11.8	9.4	12.7
St Charles Hospital	S	34	9	44	58,205	43,149	7.4	7.6	14.7
St Elizabeth Medical^	S	59	20	69	53,476	34,666	11.9	12.9	27.7
St Francis- Roslyn	S	66	10	107	97,792	68,245	16.0	10.9	9.4
St James Mercy*	N	1	1	0	13,050	8,373	5.5	0.0	0.0
St Johns Episcopal**	S	14	4	26	68,226	49,850	11.9	3.8	4.8
St Johns Riverside**	N	26	14	18	103,591	70,200	16.5	1.7	2.2
St Joseph -Bethpage	S	41	20	36	32,700	21,461	16.1	11.0	9.9
St Josephs- Elmira	S	11	5	12	22,648	19,648	7.5	5.3	8.7
St Josephs- Syracuse	S	140	48	126	130,168	87,105	13.6	9.7	11.1
St Josephs- Yonkers	N	7	4	10	41,889	31,689	8.5	2.4	6.2
St LukesNewburgh-Cor	N	34	24	30	43,171	26,264	16.2	6.9	10.2
St Marys Amsterdam	N	47	6	17	26,208	16,442	10.6	6.5	16.4
St Marys Troy	N	7	5	7	27,530	19,302	9.7	2.5	6.3
St Peters Hospital	S	83	22	109	112,556	66,597	14.6	9.7	11.3
Staten Island U N-S	N	79	28	101	211,230	137,409	11.3	4.8	10.8
Strong Memorial	S	178	39	241	243,180	185,498	11.2	9.9	12.7
Syosset Hospital	S	7	1	10	18,275	11,133	9.2	5.5	10.8
TLC Lake Shore	S	7	4	3	4,127	2,347	6.7	7.3	29.5
U Health Bing-Wilson	S	45	30	76	90,569	68,179	9.7	8.4	12.7
United Memorial	S	14	3	13	14,601	8,389	15.7	8.9	9.5



Data reported as of July 24, 2014. State Average. ●Risk-adjusted Infection rate. > Upper confidence limit exceeds graph area. ^^Significantly higher than state average. **Significantly lower than state average. Average *Zero Infections, not significant. CO-NMH: community onset-not my hospital, CO-PMH: community onset-possibly my hospital, HO: hospital onset, raw rate is per 10,000 patient days, adjusted rate is per 10,000 days at risk (more than 3 days in hospital), Test method: N= less sensitive test, S= more sensitive test (nucleic acid amplification test (NAAT) or combination of sensitive test plus confirmation with NAAT). Adjusted using test and hospital CDI risk index from 2012 billing data.

Figure 18. Hospital onset *C. difficile* rates, New York State 2013 (Page 7 of 7)

HOSPITAL	TEST	# CO-NMH	# CO-PMH	# HO	# PATDAYS	PATDAYS AT RISK	RISK INDEX	RAW HO RATE	ADJ HO RATE
Unity Hosp Rochester	S	51	23	38	63,915	39,026	12.1	5.9	8.7
Univ Hosp Brooklyn	S	25	10	43	89,704	62,509	10.7	4.8	9.0
Univ Hosp SUNY Upst^	S	97	31	151	134,121	96,026	10.9	11.3	15.8
Univ HospStony Brook^	S	173	54	267	166,349	114,310	12.1	16.1	20.7
Upst. Community Gen	S	28	7	20	36,381	24,148	8.6	5.5	10.5
Vassar Brothers	S	139	50	102	88,319	52,437	15.0	11.5	12.9
Westchester Medical	S	85	21	132	179,926	141,590	9.4	7.3	10.9
White Plains	S	75	16	49	67,224	40,834	14.8	7.3	8.1
Winthrop University	S	83	34	131	151,834	95,939	13.8	8.6	10.2
Woman and Childrens**	S	22	3	8	33,636	25,482	8.7	2.4	3.9
Womans Christian	S	32	7	16	29,093	19,204	13.0	5.5	9.8
Woodhull Medical	N	14	2	19	92,233	67,963	5.2	2.1	7.7
Wyckoff Heights**	N	12	8	14	65,577	39,404	14.3	2.1	3.9
Wyoming County Comm.	N	4	3	2	10,288	6,556	10.0	1.9	5.2



Data reported as of July 24, 2014. State Average. ●Risk-adjusted Infection rate. > Upper confidence limit exceeds graph area. –^^Significantly higher than state average. –**Significantly lower than state average. –Average –*Zero Infections, not significant. CO-NMH: community onset-not my hospital, CO-PMH: community onset-possibly my hospital, HO: hospital onset, raw rate is per 10,000 patient days, adjusted rate is per 10,000 days at risk (more than 3 days in hospital), Test method: N= less sensitive test, S= more sensitive test (nucleic acid amplification test (NAAT) or combination of sensitive test plus confirmation with NAAT). Adjusted using test and hospital CDI risk index from 2012 billing data.

C. difficile Prevention Survey

In April 2014, 182 of 183 NY hospitals completed a survey measuring CDI prevention practices. The following are the results.

- 92% of hospitals place patients with unexplained diarrhea on contact precautions prior to laboratory confirmation of CDI. Contact precautions, such as wearing gown and gloves, decrease the risk that germs are spread.
- 63% of hospitals always place CDI patients in private rooms because all patient rooms in the facility are private (7%) or they are always able to make or find private rooms (56%). An additional 34% place the patients in private rooms if they are available. If private rooms are not available, hospitals group CDI patients together.
- 77% of hospitals use unique CDI contact precautions signs. Signs can help alert visitors, healthcare workers, and cleaning staff to hospital policy.
- 94% of hospitals have an education, orientation, or training program for staff on reducing transmission of CDI. All staff must know how to correctly and consistently apply CDI prevention measures.
- 92% of hospitals provided infection control training to environmental services staff within the last year. It is vital that cleaning staff know and use an appropriate method to clean rooms contaminated with C. difficile.
- 22% of hospitals use bleach-based surface disinfectant, and 68% of hospitals use quaternary ammonium-based surface disinfectant for daily room cleaning in non-isolation areas. Bleach kills C. difficile spores; quaternary ammonium does not.
- 91% of hospitals use bleach-based surface disinfectant or hydrogen peroxide-based surface disinfectant to clean isolation rooms, either daily or on discharge. The remainder use quaternary ammonium or phenolic-based surface disinfection, which are not effective in killing C. difficile spores.
- 18% of hospitals use ultraviolet light, aerosolized hydrogen peroxide, or hydrogen peroxide vapor room treatment during outbreaks. These new cleaning methods may be able to kill C. difficile spores in difficult to clean places.
- Hospitals monitor the effectiveness of environmental disinfection using several methods.
    - 87% directly observe room cleaning using a checklist
    - 38% use adenosine triphosphate
    - 27% use fluorescing product

  Monitoring cleaning can identify processes that need improvement and result in improved cleaning practices.

Multidrug Resistant Organisms (MDROs)

Multidrug resistant organisms (MDROs) are bacteria that cannot be treated with commonly used antibiotics. Examples of MDROs that may affect hospitalized patients include:

- carbapenem-resistant Enterobacteriaceae (CRE)
- methicillin-resistant *Staphylococcus aureus* (MRSA)
- vancomycin-resistant Enterococci (VRE)
- multidrug resistant *Acinetobacter* spp. (MDR-Acinetobacter).

MDROs are important to monitor because they can spread among patients in hospital settings, and there are fewer treatment options, which results in increased morbidity and mortality. These MDROs can be tracked using the NHSN inpatient Laboratory-Identified event (LabID) protocol.

LabID cases are separated into reporting categories depending upon whether the onset of illness is presumed to have occurred in the community or in a hospital. Cases termed "community-onset (CO)" are cases in which the positive specimen was obtained during the first three days of the patient's hospital admission. Hospital-onset (HO) cases are cases in which the positive specimen was obtained on day four or later during the hospital stay (Figure 19).

Figure 19. Definition of community and hospital onset

Community onset			Hospital onset			
Day 1 (Admission)	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7+

Carbapenem-resistant Enterobacteriaceae Infections (CRE)

The Enterobacteriaceae are a large family of bacteria. Some of these organisms are normally found in the human gastrointestinal tract; others live mainly in soil and water. When these organisms are living in the gastrointestinal tract they do not cause harm and can help with necessary digestive functions. They are able to cause infections if they are spread to other locations in the body (e.g. through surgery or trauma) or are introduced into other body sites by contact with an infected person or contaminated surface.

CRE cannot be effectively treated with antibiotics called carbapenems, which are a type of antibiotic of last resort. Healthy people do not typically get infections with CRE. These organisms are most commonly identified in hospitalized patients. Risk factors for developing CRE infections include diagnosis with multiple medical conditions, treatment with a long course of antibiotics, use of indwelling medical devices, and repeated inpatient medical care. CRE are increasingly causing HAIs in many parts of the world. As of 2013, cases have been identified in forty US states and twenty-five countries on five continents.[10]

The specific types of CRE that are tracked by NYSDOH are *E. coli* and *Klebsiella* spp. CRE is monitored because it is a relatively new pathogen, it has been increasing ever since it was first identified, and it can be responsible for high mortality rates. In addition, CRE can pass their antibiotic resistance mechanisms to other types of bacteria, making new species resistant to carbapenem treatment as well. It is important for medical and public health professionals to know how common CRE is in the state so efforts can be taken to prevent its continued spread.

Carbapenems are considered last resort antibiotics by medical professionals. These antibiotics are only used when other antibiotics cannot be used. As antimicrobial resistance becomes a larger problem, last resort antibiotics like carbapenems have to be used more often. When carbapenems cannot be used to treat an infection, the alternative therapies can be dangerous for the patient. In some cases no alternative treatment is available. Bloodstream infections with CRE have been reported to have attributable mortality rates of 27% to 50%.[11,12]

CRE has emerged as a serious public health threat in New York State. While some hospitals have never reported a case, downstate hospitals, especially in New York City, carry a very high burden of CRE. Although the problem of CRE in New York is very serious, it is important to note that these infections can be prevented, and their spread in health care facilities can be stopped. Successful campaigns to stop the spread of CRE have been undertaken both in the US and internationally.

Israel offers an excellent example of a CRE prevention success story. In 2006, Israel faced an ongoing CRE outbreak in its hospitals. Control measures at individual hospitals did little to reduce the rates of CRE. In order to stop the spread of the pathogen, a government sponsored task force was created to oversee the containment of CRE. This task force evaluated infection

control and laboratory policies for individual hospitals and performed site visits to observe prevention practices and staff behaviors. Feedback on these evaluations and visits was offered to the administration of each hospital, and necessary changes or improvements were initiated. A direct connection was observed between compliance with isolation guidelines and reducing the spread of CRE.[13] The main lesson from the experiences in Israel is the need for a coordinated effort to reduce CRE. Studies from the US have also shown how application of the CDC recommendations in the 2012 CRE Toolkit - Guidance for Control of Carbapenem-resistant Enterobacteriaceae (CRE) are successful in reducing the burden of CRE and other MDROs in hospitals.[14]

The first step to stopping CRE in NYS is to understand the true scope of the problem. In order to obtain baseline rates, NYS required that all hospitals report LabID CRE-*E. coli* and CRE-*Klebsiella* spp. beginning in July 2013. July 2013 through December 2013 was considered a pilot reporting period. This time period provided NYSDOH the opportunity to ensure the accuracy and completeness of reporting, assess variation in CRE rates, and explore the relationship between differences in laboratory testing methods and CRE rates. Preliminary regional rates and infection surveillance and prevention recommendations were shared with all hospitals via regional conference calls in January and February 2014. CRE became a fully-reportable required indicator in January 2014, and NYSDOH plans to provide individual hospital rates in the next annual report. The goals of the reporting requirement and surveillance efforts are to stop the spread of CRE in affected areas and to prevent the spread of CRE to areas that have not yet seen any cases.

Table 24 summarizes the statewide prevalence and incidence rates for CRE, annualized to represent all of 2013. The majority of reported CRE cases in NYS are CRE-*Klebsiella* spp. (92%). This finding is consistent with previously reported data; emergence of carbapenemase-producing strains is especially likely among *Klebsiella* spp.[15] The most common CRE infection sites were the urinary tract (49%), respiratory system (20%), bloodstream (13%), and skin/soft tissue (12%). Bloodstream infections have the highest mortality rate. The overall incidence of HO BSIs was 0.22 per 10,000 patient days.

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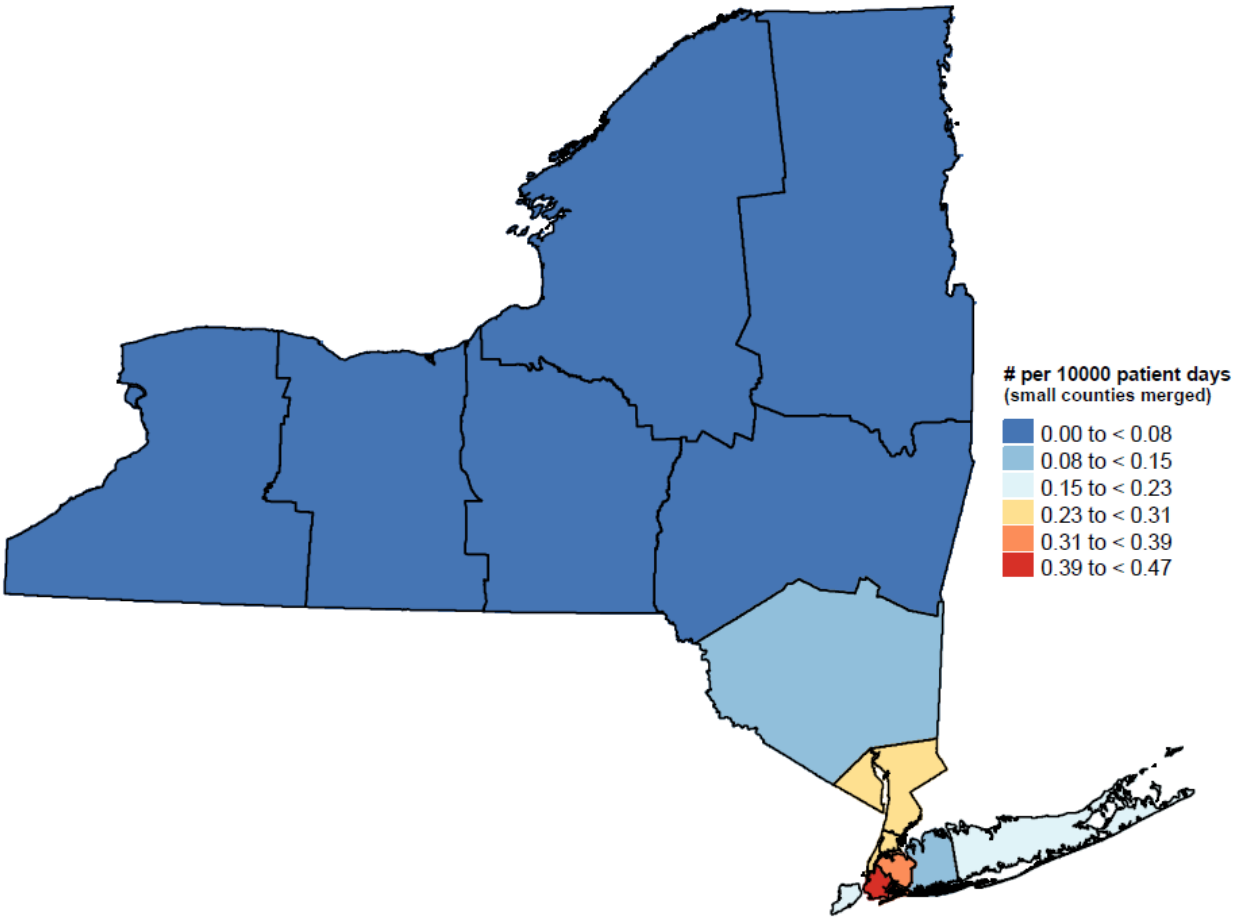
Table 24. Carbapenem-resistant Enterobacteriaceae (CRE) infections, New York State 2013

	CRE-*Klebsiella* spp	CRE-*E. coli*	CRE combined
Total number of cases	2,988	268	3,256
Total rate (per 100 admissions)	0.124	0.011	0.150
Number of admission prevalent cases	1,480	140	1,620
Admission prevalence rate (per 100 admissions)	0.062	0.006	0.068
Number of adm. prevalent bloodstream infection cases	164	18	182
Adm. prevalent bloodstream infection rate	0.007	0.001	0.008
Number of hospital-onset (HO) cases	1,508	128	1,636
HO rate (per 10,000 patient days)	1.17	0.10	1.27
Number of HO bloodstream infection cases	264	14	278
HO bloodstream infection rate (per 10,000 patient days)	0.20	0.01	0.22

New York State data reported as of July 10, 2014. All data have been annualized to represent a full year. Incidence rates are based on 12,914,730 patient days, and prevalence rates are based on 2,394,218 admissions. The number of cases only includes one test per patient per hospital per month. In addition, only one blood test can be entered per 14 days, even across calendar months.

Figure 20 shows the geographic distribution of incident hospital-onset CRE-*Klebsiella* spp. bloodstream infections in the state. The analysis focuses on bloodstream infections because blood specimens are more consistently screened by laboratories across the state. In addition, bloodstream infections are more serious; CRE detected from nonsterile body sites such as wounds may not reflect clinical disease.[16] The highest concentration of cases can be found in Brooklyn. The CRE BSI prevalence rate is 20 times higher in New York City than in the Capital District.

Figure 20. Carbapenem-resistant K*lebsiella* spp. bloodstream infection incidence, New York State 2013



Laboratory Survey

Along with collecting the surveillance data presented above, DOH also surveyed hospitals to determine how each facility identifies CRE cases. The purpose of the survey was to verify that surveillance data is as accurate as possible. When conducting surveillance it is important for all reporting facilities to follow the same guidelines to be sure that the data are comparable across various locations. The laboratory survey identified a few areas for potential improvement in the surveillance of CRE.

Questions were asked on the laboratory survey to identify whether or not it is likely that cases of CRE could be missed by routine laboratory practice. Many hospital laboratories (52%) screen all potential enteric organisms to identify *E. coli* or *Klebsiella* spp. Most laboratories (64%) also screen all identified enteric organisms for resistance to carbapenems. It is possible for cases of CRE to be missed by those facilities that do not screen all cultures either for identification as an

enteric or for resistance to carbapenems. However, those facilities that do not screen all enteric organisms reported that they do screen all pure isolates and sterile sites for resistance to carbapenems. This methodology means that those carbapenem-resistant infections with the highest likelihood of morbidity and mortality (e.g. bloodstream infections) are likely to be identified in all facilities across the state. A change in testing protocol for routine clinical specimens is not recommended based on these survey results.

How each laboratory identifies cases of CRE is also important for accurate and reliable surveillance. There are a variety of approved methods for testing enteric organisms for resistance to carbapenems or production of a resistance enzyme (production of an enzyme is not required to be a case of CRE).

There are four carbapenem antibotics: ertapenem, meropenem, doripenem, and imipenem. For technical reasons only three of these (meropenem, doripenem, and imipenem) are included in the CDC and NYSDOH CRE case definitions. Laboratories were asked to report which carbapenem antibiotics they routinely use for antibiotic sensitivity testing on enteric organisms regardless of whether or not the results are reported to clinicians. The combinations of antibiotics used by hospital laboratories in NYS for susceptibility testing are given in Table 25.

Table 25. Combinations of carbapenems used by hospital laboratories in NYS for susceptibility testing

Antibiotics Used	Percentage of Hospital Laboratories
Ertapenem, meropenem, and imipenem	40%
Ertapenem and imipenem	23%
Ertapenem and meropenem	12%
Ertapenem, meropenem, doripenem, and imipenem	10%
Meropenem and imipenem	7%
Ertapenem, doripenem, and imipenem	3%
Imipenem	3%
Meropenem	3%

Data from October 2013 survey.

Breakpoints for determining whether an organism is susceptible, intermediate, or resistant to an antibiotic are published by the Clinical Laboratory Standards Institute (CLSI). These breakpoint standards are used by all microbiology laboratories to ensure similarity of results regardless of testing location. However, the CLSI breakpoints are often updated more frequently than they can be adopted at the facility level. Therefore, there are some facilities in the state using older breakpoints, some with current breakpoints, and some with a combination of breakpoint sets. The lack of uniformity in the use of breakpoints creates a challenge to accurate surveillance because the use of older breakpoints will not identify as many isolates as CRE.

Laboratory identification of CRE can be achieved through several methods, all of which have benefits and drawbacks. There is no standardization for which method should be used in individual health care facility laboratories. As such, surveillance for CRE is complicated by variation in testing methodology.

A common method is automated identification and susceptibility testing. Automated identification is performed on one of several commercially available instruments. The majority (98%) of facilities in the state use automated instruments for primary detection of CRE. The four automated instruments that are used in NYS are Vitek II (58%), Microscan (36%), Phoenix (3%), and Trek (1%). Two percent of hospitals use both Vitek and Microscan.

Manual susceptibility testing methods (e.g. disk diffusion, E-tests) can also be used to identify CRE cases. These methods are used as the sole method of detecting CRE by a small number of facilities (2%), and they are used by many facilities for purposes of confirmation (53%) after use of automated methods.

Table 26 summarizes the percent of hospitals using different methods. Seventy-one percent of New York hospitals are classified as having sensitive testing methods, meaning they use current CLSI breakpoints (M22 or M23) for their primary testing method. There is some geographic variation to the use of sensitive tests: eighty-eight percent of hospitals in the five county NYC area use a sensitive method, compared to 64% of hospitals in the rest of the state. Within the NYC area, 2013 CRE bloodstream infection prevalence rates were three times higher in hospitals that use the more sensitive testing method compared to hospitals that used the less sensitive method. While this is a large difference, the geographic variation in testing methods is not enough to explain the differences in CRE rates in the state.

Table 26. Application of Clinical Laboratory Standards Institute breakpoints in NYS

	CLSI Breakpoints Used	Percentage of Facilities
More sensitive test (i.e. will identify more CRE cases)	Automated and manual testing – both current breakpoints	60%
	Automated testing only - current breakpoints	7%
	Manual testing only – current breakpoints	2%
	Automated testing - current breakpoints; manual testing - older breakpoints	2%
Less sensitive test (i.e. will identify fewer CRE cases)	Automated testing - older breakpoints; manual testing - current breakpoints	12%
	Automated and manual testing – both older breakpoints	11%
	Automated testing only - older breakpoints	6%

Data from October 2013 survey.

Identification of enzymes that bacteria produce that destroy carbapenems, called carbapenemases, can also be used to meet the LabID definition for CRE. Forty-six percent of New York hospitals identify CRE cases by detecting the presence of a carbapenemase. Of the hospitals that test for a carbapenemase, 83% use the culture-based Modified Hodge Test (MHT), 14% use a molecular method called polymerase chain reaction (PCR), and 3% send isolates for confirmation by a reference laboratory. An enzyme must be identified in order to call an organism a carbapenemase producer; however, an organism may show resistance to the carbapenems, and therefore be considered CRE, without producing an enzyme. The methods described above are used by laboratories to differentiate between enzyme-producing CRE and non-enzyme producing CRE.

Challenges

Beginning in 2004, several New York City hospitals reported outbreaks of CRE-*Klebsiella* to NYSDOH. Laboratory analysis showed high similarity of the specimens. In 2005, NYSDOH released an advisory to hospitals and local health departments about the outbreak and CRE-*Klebsiella* in general, including recommendations about identification, treatment, reporting, and infection control measures. While hospitals have been concerned about CRE for ten years and knowledgeable about infection control practices for longer than that, CRE has continued to spread. Challenges include imperfect compliance with handwashing, delays in implementing contact precautions and appropriately cohorting patients, delays in discontinuing devices when they are no longer needed, and lack of established protocols to screen epidemiologically linked contacts and perform active surveillance testing in high-risk areas.

Methicillin-resistant *Staphylococcus aureus* (MRSA) Infections

Staphylococcus aureus (*SA*) is a common bacteria 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 called MRSA. MRSA infections can cause a broad range of symptoms depending on the part of the body that is infected. The most serious type of infections occur in the blood.

In 2013, CMS began paying higher reimbursement to hospitals that reported MRSA bloodstream infections to NHSN. While MRSA reporting is not required by NYSDOH, we are able to use the MRSA data for surveillance or prevention as a result of a DUA between CDC and NYSDOH. The DUA prohibits the use of the data for public reporting of facility-specific data or for regulatory action. The data are not audited. The DUA began in May 2013.

Between May and December 2013, 2,278 MRSA bloodstream infections were reported among 1,608,431 admissions, for an overall infection rate of 1.42 per 1,000 admissions. A quarter of the infections were hospital-onset. The eight months of data were converted to complete year estimates by multiplying the observed data by a factor to account for the missing months (Table 27).

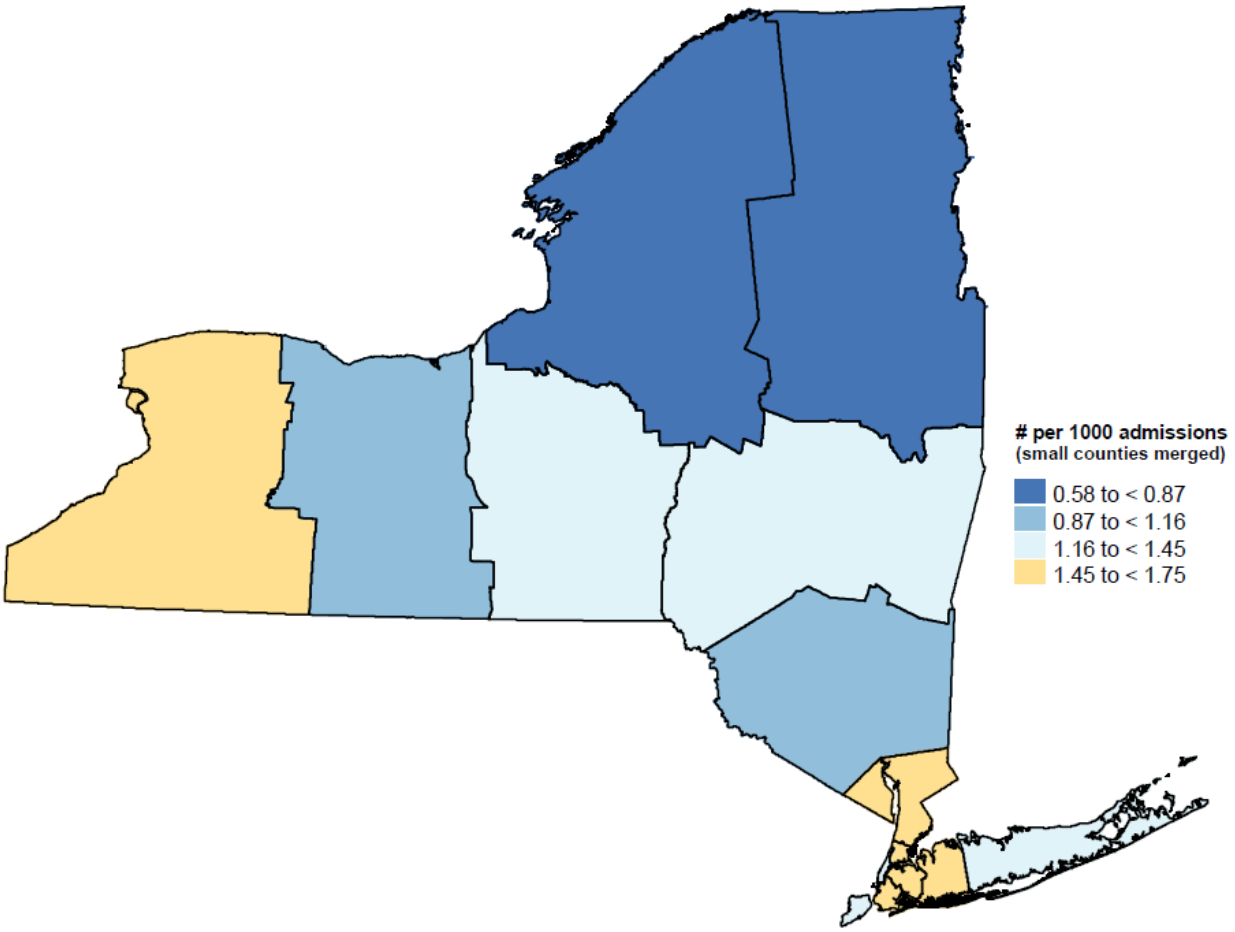
Table 27. MRSA bloodstream infections, New York State 2013

# Hosp	# Infections Total	# Hospital Onset Infections	# Admissions	# Patient Days	Overall Infection Rate (per 1,000 admissions)	Hospital Onset Incidence Rate (per 10,000 patient days)
177	3,422	858	2,415,918	13,028,155	1.42	0.66

New York State data reported as of June 17, 2014. May through December data annualized to the number of cases expected in the full year.

The overall MRSA bloodstream infection rate is mapped by region in Figure 21. Adjacent counties were merged to ensure more than one hospital per area and protect the confidentiality of the data. Overall MRSA rates were lowest in the North Country and highest in the West and in the NYC area excluding Manhattan. The average HO incidence rate of 0.66 is close to the 2010-2011 national baseline (which was predominantly reported by California, Tennessee, Illinois, and New Jersey) of 0.64[17].

Figure 21. MRSA bloodstream infection prevalence, NYS 2013



Other MDROs

Vancomycin-resistant Enterococci (VRE)

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

A group of 22 hospitals in NYS (14 in NYC, 8 Upstate) voluntarily performed VRE surveillance using NHSN in 2013. A total of 359 cases were reported among 159,231 admissions. The majority (62%) were urinary tract infections, while 20% were skin/soft tissue infections, and 9% were bloodstream infections. Cases were hospital-onset 56% of the time. The HO BSI incidence rate was 0.22 per 10,000 patient days. Extrapolating this small sample (only 13% of hospitals), we would have expected a total of approximately 510 VRE BSIs if all hospitals had reported for the entire year. However, the hospitals that voluntarily report may not be representative of all NYS hospitals.

Multi-drug resistant Acinetobacter (MDR- Acinetobacter)

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

A group of 38 hospitals in NYS (21 in NYC, 17 Upstate) voluntarily performed MDR-Acinetobacter surveillance using NHSN in 2013. A total of 173 cases were reported among 222,974 admissions. The majority (62%) were respiratory tract infections, while 18% were skin/soft tissue infections, 10% were urinary tract infections, and 8% were bloodstream infections. Cases were hospital-onset 58% of the time. The HO BSI incidence rate was 0.07 per 10,000 patient days. Extrapolating this small sample (only 22% of hospitals), we would have expected a total of approximately 140 MDR-AB BSIs if all hospitals had reported for the entire year. Again, it is not possible to know if these hospitals are representative of all NYS hospitals.

Mortality related to CDI and MDROs

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

The attributable mortality rate is the death rate among a group of people with the infection minus the death rate among a similar (matched) group of people without the infection. The attributable death rates for five types of infections are summarized in Table 28. More details on the derivation of these rates are provided in Appendix 3.

To estimate how many deaths were attributable to these infections in NYS, the derived attributable mortality rate was multiplied by the total number of reported infections. Only bloodstream infections were counted for CRE, VRE, and MDR-Acinetobacter. Based on this analysis, CDI resulted in the largest number of deaths. MRSA resulted in the second largest number of deaths. The total number of estimated CDI, MRSA, VRE, and MDR-Acinetobacter deaths greatly exceeds the number of deaths due to other well-known infections such as AIDS (749), influenza (57), and tuberculosis (28) reported in NYS in 2012.[18]

Table 28. New York State hospital mortality estimates, 2013

Infection	% Attributable Deaths	# Cases Total[3]	# Hospital Onset Cases	# Deaths Total	# Deaths from Hospital Onset Cases
Clostridium difficile	6%	18,189[1]	9,737[1]	1,091	584
MRSA BSI	20%	3,422	858	684	172
CRE BSI	38%	460	278	175	106
VRE BSI[2]	28%	516	253	144	71
MDR-Acinetobacter BSI[2]	22%	140	80	30	18
TOTAL		22,727	11,206	2,124	951

BSI=bloodstream infection.

[1] only counting one infection per person

[2] based on small sample of voluntary reporters

[3] total cases = community and hospital onset.

Antimicrobial Stewardship

Hospital antimicrobial stewardship programs (ASPs) help ensure that each patient receives "the right antibiotic, at the right dose, at the right time, and for the right duration".[19] ASPs have been shown to improve patient health. For example, antibiotics are the biggest risk factor for CDI. Improved prescribing of antibiotics reduces CDI.[20, 21, 22] ASPs also decrease the risk of developing antimicrobial resistant infections.[23, 24] Antimicrobial resistance is the ability of microbes to grow in the presence of drugs that would normally kill them. People infected with antimicrobial resistant organisms require more complicated treatment and may have longer hospital stays. By decreasing antimicrobial use and improving patient outcomes, comprehensive ASPs have reduced healthcare costs in both large academic hospitals and small community hospitals.[25, 26]

CDC recommends that all hospitals have antimicrobial stewardship programs.[1] In April 2014, 182 of 183 NY hospitals completed a survey measuring core elements of hospital antimicrobial stewardship programs, following CDC's 2014 checklist.[27] Where the questions were similar to the questions asked on the 2013 survey, results are shown for both years (Table 29). Implementation of the antimicrobial stewardship programs improved over the last year, although more improvement is needed. Larger hospitals tend to have more developed ASPs.

Table 29. Antimicrobial stewardship programs in NYS hospitals, 2013 and 2014 surveys

Element of antimicrobial stewardship program	2013 % hospitals	2014 % hospitals
Hospital has a formal, written statement of support from leadership that supports efforts to improve antibiotic use.*	33%	53%
Hospital financially supports antibiotic stewardship activities.*	N/A	59%
A physician leader is responsible for program outcomes of stewardship activities.*	57%	66%
A pharmacist leader is responsible for working to improve antibiotic use.	57%	86%
Staff that work with stewardship leaders to improve antibiotic use:		
Clinicians*	N/A	76%
Infection prevention and epidemiology*	16%	82%
Quality improvement	N/A	54%
Microbiology (laboratory)*	43%	73%
Information technology*	24%	49%
Nursing	N/A	51%
Hospital has a policy that requires prescribers to document in the medical record or during order entry a dose, duration, and indication for all antibiotic prescriptions.	26%	53%
Hospital has facility-specific treatment recommendations, based on national guidelines and local susceptibility, to assist with antibiotic selection for common clinical conditions.	40%	80%
There is a formal procedure for all clinicians to review the appropriateness of all antibiotics 48 hours after the initial orders (e.g. antibiotic time out).	N/A	26%
Specified antibiotic agents need to be approved by a physician or pharmacist prior to dispensing (i.e. pre-authorization).*	62%	73%
A physician or pharmacist reviews courses of therapy for specified antibiotic agents (i.e. prospective audit with feedback).	44%	77%
Automatic changes from intravenous to oral antibiotic therapy in appropriate situations.	56%	58%
Dose adjustments in cases of organ dysfunction.	N/A	91%
Dose optimization to optimize the treatment of organisms with reduced susceptibility.	37%	77%
Automatic alerts in situations where therapy might be unnecessarily duplicative.	14%	56%
Time sensitive automatic stop orders for specified antibiotic prescriptions.	50%	71%
Specific interventions are in place to ensure optimal use of antibiotics to treat the following common infections:	N/A	
Community-acquired pneumonia		82%
Urinary tract infection		46%
Skin and soft tissue infections*		45%
Surgical prophylaxis		89%

Empiric treatment of methicillin-resistant *Staph. aureus* (MRSA) Non-*C. difficile* infection (CDI) antibiotics in new cases of CDI* Culture-proven invasive (e.g. bloodstream) infections		53% 41% 48%
Stewardship program monitors adherence to a documentation policy (dose, duration, and indication).*	N/A	46%
Stewardship program monitors adherence to facility-specific treatment recommendations.*	N/A	51%
Stewardship program monitors compliance with one of more of the specific interventions in place.*	N/A	52%
Hospital produces an antibiogram.	64%	93%
Hospital monitors antibiotic use at the unit and/or facility wide level by one of the following metrics: Counts of antibiotic(s) administered to patients per day (Days of Therapy; DOT) Number of grams of antibiotics used (Defined Daily Dose, DDD) Direct expenditure for antibiotics (purchasing costs)*	N/A	 40% 33% 69%
Stewardship program shares facility-specific reports on antibiotic use with prescribers.	N/A	48%
Current antibiogram has been distributed to prescribers.*	N/A	80%
Prescribers receive direct, personalized communication about how they can improve their antibiotic prescribing.	N/A	72%
Stewardship program provides education to clinicians and other relevant staff on improving antibiotic prescribing.*	36%	71%

* Hospitals with larger bed size significantly more likely to have implemented this element (Cochran-Armitage test for trend p-value < 0.05, 2014 data)

NYSDOH recommends that hospitals review their concordance with the above checklist and implement additional program elements based on resources and local infection and resistance patterns. Smaller hospitals may consider establishing an ASP through a cooperative relationship with neighboring hospitals. Resources for hospitals are available at:

- http://www.cdc.gov/getsmart/healthcare/
- http://www.jointcommission.org/topics/hai_antimicrobial_stewardship.aspx.

For patients, the following recommendations can help ensure appropriate antibiotic use:

- Take antibiotics exactly as your doctor prescribes.
- Only take antibiotics prescribed for you – do not share or use leftover antibiotics.
- Do not ask your doctor for antibiotics when your doctor thinks you do not need them.
- Ask your doctor what the side effects of the antibiotic are.
- Ask your doctor if the choice of antibiotic and dose was optimized to your infection and local resistance patterns.
- Ask your doctor to reassess the prescription when culture results become available.

Comparison of NYS HAI Rates with National HAI Rates

Approximate comparisons of state and national HAI rates are available in annual progress reports published by CDC.[28] The latest report compares 2012 state and national rates to historical benchmarks. The following summary table is extracted from the CDC report for easy reference.

Table 30. Comparison of New York and national hospital-acquired infections for 2012

Type of Hospital-Acquired Infection	New York Standardized Infection Ratio*	National Standardized Infection Ratio*
Central-line associated bloodstream infections (CLABSIs)	0.64	0.56
Catheter-associated urinary tract infections (CAUTI)	1.36	1.03
Colon surgical site infections (SSIs)	0.83	0.80
Abdominal hysterectomy SSIs	1.33	0.89

Source of data: CDC's National and State HAI Progress Report, March 2014[28]

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

While CDC did not directly compare state and national data for the same year, the parallel comparison of state and national rates to the historical baseline suggests that NY HAI rates are higher than national HAI rates. There are several limitations to CDC's methods, including changes in the indirectly compared populations over time[29] and lack of consideration for the impact of auditing on reported rates.[30]

The intensity of the auditing performed by NYSDOH exceeds the intensity of auditing performed by other states and CMS in terms of the number of hospitals audited, the number of records audited in each hospital, and the methods used to efficiently target the records most likely to have errors. According to the CDC Progress Report, only 12% of states audited SSI data, and 31% of states audited CLABSI data. NYS has shown that auditing of SSIs and CLABSIs increases reported rates.[31] The data validation process is likely to increase HAI rates because missed infections are identified and entered into the NHSN, and training efforts increase the skills of the hospital IPs, leading to better identification of HAIs. Additionally, the presence of a validation process in a state might encourage increased care and thoroughness in reporting, which might result in higher pre-audit HAI rates. States with data validation programs might appear to have higher rates because of their validation efforts, because they truly have a higher rate, or both.

HAI Prevention Projects

NYSDOH Funded Prevention Projects

NYSDOH funds HAI Prevention Projects with non-profit health care organizations to develop, implement, and evaluate strategies to reduce or eliminate targeted HAIs. The HAI Reporting Program is responsible for the evaluation, selection, and oversight of the projects. A Request for Applications (RFA) for 2013-2018 was issued on October 17th, 2012. The following three projects were funded for five years.

University of Rochester Medical Center, Year 1: April 2013-March 2014, $190,000
The goal of this project is to prevent CDI in long term care facilities (LTCFs) through an antimicrobial stewardship program focusing on transition of care. The University of Rochester recruited seven large nursing homes affiliated with four Monroe County hospitals for the collaborative. The LTCFs are in the process of establishing multidisciplinary teams, enrolling in NHSN for CDI reporting, and responding to an antimicrobial stewardship survey that will be used to guide interventions. Evidence-based guidelines for antimicrobial treatment of urinary and respiratory tract infections will be developed. Interventions will include education on the developed guidelines and feedback on compliance, a communication transfer form for antibiotics at time of hospital discharge and feedback on compliance with form use, and feedback to providers regarding specific CDI cases incurred in their own patients following antibiotic treatment.

Westchester County Healthcare Corporation, Year 1: April 2013-March 2014, $194,622:
The purpose of this project is to define the clinical features and molecular epidemiology of hospital-onset CDI in six diverse healthcare facilities, and use data to guide a stringent enhanced environmental disinfection initiative. Project staff will continuously study the epidemiology of CDI during this initiative and will work to quantify the reduction in hospital-onset CDI that can be achieved through optimizing environmental disinfection. The primary outcome measured will be incidence rates of hospital-onset CDI; secondary outcomes will include the cost and benefit of the intervention. Specimens and medical charts will be analyzed in order to describe the clinical features and molecular epidemiology of hospital-onset CDI pre-intervention, during the intervention, and post-intervention, and staff will work to determine how well the molecular typing results correlate with current clinical definitions of hospital-onset CDI and the definitions of relapsing infection vs. re-infection. During the first year of this project, inter-hospital collaborations were strengthened through meetings and conference calls, trainings were conducted, and specimens were collected and stored for future analysis.

Weill Medical College, Year 1: April 2013-March 2014, $233,578: This project aims to design and implement sustainable interventions related to multidisciplinary healthcare worker education, environmental cleaning, and antimicrobial stewardship. The project interventions will be developed to include best practices and will also focus on implementation strategies and overcoming barriers to implementation. The project is being conducted in five diverse acute care hospitals in New York City. The desired outcomes are increased healthcare worker knowledge related to MDROs and CDI, enhanced environmental cleaning and disinfection, improved antimicrobial prescribing practices, and reduced incidence of CDI and MDRO. This project has received IRB approval, many planning meetings have been held, and preliminary work has been conducted to develop educational content for antimicrobial prescribers and environmental service workers.

CDC Funded HAI Prevention Projects

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

In 2013, the NYSDOH Bureau of Healthcare Associated Infections continued its efforts to reduce CDI rates in LTCFs by facilitating improved implementation of well-established and routinely recommended infection control practices in nursing homes. A prevention project based on lessons learned from the previous year's work was implemented, and all New York State LTCFs were invited to voluntarily participate. Through use of monthly webinar presentations, NYSDOH staff continued to educate participants on the latest evidence-based infection prevention and control practices. Throughout the project year, emphasis was placed on ensuring adherence to environmental cleaning as a prevention strategy in nursing homes. Project activities also included collection of information about infection control practices at each participating facility through issuance of a survey at the start and end of the project year. Participants were provided with information about the Long Term Care Facility Component of NHSN and voluntary reporting of CDI events using the NHSN protocol for CDI reporting was promoted. Data collection of CDI events ended as of May 31, 2014 and analysis of project data is ongoing.

The New York State Perinatal Quality Collaborative

The NYS Perinatal Quality Collaborative (NYSPQC) aims to improve maternal and newborn outcomes and improve capability within NYS for ongoing quality improvement and transformation of healthcare by applying evidence-based healthcare system change interventions in Obstetrical and Neonatal Intensive Care Units (NICUs). One of the NYSPQC's goals is to expand on the prior collaborative work of the NYSDOH HAI Program and NYS's Regional Perinatal Centers (RPCs), which demonstrated the effectiveness of central line care bundle and checklist use in preventing CLABSIs in NICUs. The NYSPQC CLABSI-reduction intervention, begun in September 2013, is focusing similar efforts on the Level III and II/III NICU hospitals, whose CLABSI rates are higher than those of the RPCs. The process uses the Institute for

Healthcare Improvement's learning model to promote team work, increase communication, enhance knowledge of the value of CL care bundle insertion and maintenance checklists, and track progress toward reducing CLABSIs using data submitted to the NHSN. Starting with baseline data for October 2013, the 36 facilities (11 RPCs and 25 Level III and II/III) participating in the project have been reporting birth weight-specific checklist usage data via the NHSN denominator summary screen. Checklist usage has increased from 81% among RPCs and 78% among lower level facilities to 93% percent among all hospitals of all levels, with rates slightly higher among infants born weighing under 1000 grams. There is not yet sufficient data to determine the effect of checklist usage on CLABSI rates.

Hospital Success Stories

NYSDOH would like to recognize the achievements of three hospitals for their outstanding work in preventing HAIs in 2013.

SSI Prevention Success

St Francis Hospital-the Heart Center in Roslyn, New York, had a significantly low sternal wound SSI rate in CABG surgery patients when compared to other hospitals in New York State in 2013. At St Francis all members of the interdisciplinary health care team including experienced surgeons; operating room (OR), anesthesia, and post-anesthesia care unit staff; intensivists; midlevel practitioners (MLP); nursing staff; performance improvement staff; pharmacy staff; microbiology laboratory staff; and infection prevention and control staff are committed to consistently identifying and implementing processes that will improve patient outcomes.

Preventing SSIs begins with pre-admission testing (PAT), where patients receive a packet of six chlorhexidine wash cloths for their pre-op bath the night before surgery along with written instructions and mupirocin intranasal ointment for decolonization of MRSA/*Staphylococcus aureus*. The nurse practitioners educate the patients on appropriate use of the wash cloths and mupirocin as well as the rationale for use. All CABG patients have a HgbA1c (a test that might indicate diabetes) performed in PAT, and if it is elevated an automatic endocrine consult is requested.

When the patient is admitted the MLP will check to be sure the patient has had 5 days of mupirocin, and if not will order to continue its use.

In the holding room, hair is removed using clippers no more than an hour prior to surgery. This is followed by a second bath with chlorhexidine wash cloths. Chlorhexidine and alcohol are used as skin preps in the OR. Antibiotic prophylactic guidelines were developed by infectious disease and pharmacy staff and are monitored by both pharmacy and performance improvement personnel. Guidelines recommend timely and weight based administration of antibiotics.

Glucose control is managed in the cardiothoracic (CT) ICU by intensivists, MLPs and nursing. Glucose is monitored hourly with a target range of 120 to 160, adjusting insulin dosage with a continuous insulin infusion.

Wound care is performed on the sternal incision beginning 48 hours post-operatively with one chlorhexidine wash cloth and is continued for five days.

If an SSI is identified the cardiac surgeon is notified. Risk factors are assessed based on a case control study of five years of data conducted by performance improvement personnel. The three most common risk factors at St Francis for sternal wound infections are obesity, smoking, and diabetes. Infection prevention and control staff also assess lack of compliance with preventive

measures such as uncontrolled glucose, appropriate antibiotic use, pre-op bathing and hair removal, OR skin prep, and use of mupirocin twice a day for five days, with feedback to members of the team on areas of noncompliance.

If wound cultures grow *S. aureus* (which includes MRSA) the microbiology laboratory checks for mupirocin resistance. In addition, mupirocin resistance is monitored every six months in a sample of *S. aureus* isolates.

If uncontrolled glucose levels are noted, a referral is made to the CTICU Performance Improvement Team.

It is the consistent use of preventive measures and follow-up when infections do occur that have led to a significantly low SSI rate. St Francis Hospital plans to continue this process and is consistently exploring new and innovative ways to prevent SSIs.

CLABSI Prevention Success

Erie County Medical Center (ECMC) in Buffalo, NY has been successful in CLABSI reduction in their 12-bed medical intensive care unit (MICU).

ECMC is a 602-bed tertiary care facility, and serves as the regional trauma center for the eight counties of Western NY. Currently, critical care is provided in a 12 bed MICU, a six bed Burn Treatment Center and a 24-bed Trauma Intensive Care Unit. In addition to Medical Surgical Services, ECMC is the Regional Center for Renal Transplant and Behavioral Health Services.

The Patient Safety Department includes five certified infection Preventionists (IPs) who report directly to the Chief Safety Officer, who has an infection prevention background and is certified in infection control (CIC). This offers the infection prevention program tremendous administrative support.

The ECMC MICU reported zero CLABSI's for 2013, and continues to be CLABSI free for the first half of 2014. The unit follows the standard central line insertion bundle as recommended by the Institute for Healthcare Improvement. A line cart is used to keep all line insertion supplies in one location for efficiency. An electronic procedure form was developed by the MICU providers to consistently confirm compliance with all elements of the insertion bundle. This remains part of the MICU patient electronic medical record. In addition, when accessing any line, the hubs are scrubbed with alcohol and covered with a sterile cap after every use. ECMC also has a dedicated IV team for peripherally inserted central catheter (PICC) line insertion, which provides consistent proficiency.

The MICU staff is comprised of a dedicated group of intensivists and hospitalists. The continuity of providers has resulted in a team dynamic which facilitates communication and prioritizes prevention of infections.

Multidisciplinary rounds are conducted daily and are comprised of the medical attending physician, intensivist, nurse practitioner/physician assistant, unit manager, charge nurse, clinical pharmacist, and nutritionist. Line necessity is reviewed daily, resulting in earlier line discontinuation and immediate replacement of emergent femoral lines.

The IPs provide CLABSI data to the critical care units for immediate case review. Results are discussed with the staff by the nurse managers and presented monthly by the IPs to the Critical Care Quality Improvement Committee.

Consistent adherence to established evidence-based practice guidelines and participation in New York State Partnership for Patients initiatives have also been important to their success.

CDI Prevention Success

Two hospitals in the Mount Sinai Health System**: Mount Sinai Beth Israel Brooklyn, and Mount Sinai St. Luke's Hospital** were successful in reducing CDI rates.

Between 2010 and 2013, hospital onset CDI rates significantly decreased by an average of 50% across the two hospitals. The hospitals were able to significantly reduce hospital onset CDI rates by: linking infection prevention goals with organizational strategies and resources related to patient safety and process improvement; engaging and facilitating teamwork; creating and linking a culture of safety to outcomes; and setting achievable goals and measuring and assessing effectiveness of interventions with feedback in a timely manner. This was accomplished with the support of senior administration leadership, identification of physician, nursing, environmental services, and transport champions, and support from front line staff.

A tiered approach was used to implement their CDI prevention bundle. Interventions first focused on: hand hygiene with soap and water, adherence to contact precautions and availability of gowns and gloves, elimination of routine use of rectal thermometers, and patient placement in a private room or cohorting with similar patients. Patient placement started in the Emergency Departments and required strong coordination and communication between the Admitting Departments and clinical staff. The second set of interventions involved partnering with environmental services, transporters, and patient care services staff to ensure adequate cleaning of equipment, patient rooms, and bathrooms with a bleach-based disinfectant. Particular attention was given to shared equipment and high touch areas.

Compliance with their infection prevention bundle and environmental protocols was validated through the use of direct observation, checklists, fluorescent markers, and handheld luminometers. Results were reported back in a timely manner to Senior Leadership, including

the Board of Trustees, and to front line staff at each of the hospitals. Control charts were utilized to determine trends and variations over time.

The two most recent interventions involved daily chlorhexidine gluconate bathing of patients, which has been shown to reduce hospital onset CDI, and alignment of their antimicrobial stewardship programs to evaluate antimicrobial use in relation to CDI. Protocols for the treatment of community acquired pneumonia were modified. Esomeprazole use was also monitored.

The Mount Sinai Health System team attributes their success to adherence to evidence-based practices, careful tracking and trending of performance, and, most importantly, to exceptional teamwork and infection prevention leadership.

Recommendations and Next Steps

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

NYSDOH will continue to work with the HAI Technical Advisory Workgroup (TAW) to seek guidance on the selection of reporting indicators, methods of risk adjustment, and presentation of hospital-identified data. In late 2013 the TAW recommended that hospitals report CLABSIs in medical, surgical, medical/surgical wards, and step-down units beginning in January 2015. NYSDOH posted this recommendation for public comment in September 2014. Expanding CLABSI surveillance is important to decrease morbidity and mortality associated with these preventable infections. Evidence-based central line insertion and maintenance practices to reduce the risk of CLABSIs are applicable to central line use across hospital locations. Standardized surveillance allows hospitals to track their progress over time and compared to other facilities.

NYSDOH will continue to conduct medical record audits to verify appropriate use of surveillance definitions and accurate reporting by hospitals. The latest year of auditing results showed that NYS hospitals under reported HAIs by approximately 6%. Valid data are important both for the analysis of variation in HAI rates within the state, as well for the analysis of NYS rates in comparison with other states' rates. Differences in audit coverage and thoroughness across the country currently results in inequitable comparisons of hospital and state average rates. NYSDOH will continue to discuss audit methodology with CDC and CMS and advocate that information on auditing be incorporated into performance evaluations.

As CDI impacts the greatest number of people in NYS, reducing CDI rates continues to be a priority. NYSDOH recently applied for and received a grant from CDC to continue efforts to reduce CDI rates. New activities may include targeting communities with high CDI rates and instituting measures to improve those rates, such as improving communication and coordination between facilities and improving prevention practices within facilities.

Multidrug resistant organisms (MDROs) are a growing concern in NYS. There were approximately 3,422 BSIs and 684 deaths attributable to MRSA, as well as 460 BSIs and 175 deaths attributable to CRE in 2013. Antimicrobial resistance occurs due to both natural factors (e.g. natural selection, genetic mutations) and societal factors (e.g. inappropriate antibiotic use, close contact of very ill patients in hospitals). CDC recommends that all hospitals have

antimicrobial stewardship programs. Only 53% of NYS hospitals reported having a formal, written statement of support from leadership that supports efforts to improve antibiotic use. More improvement is needed to slow the spread of antimicrobial resistance.

CRE is a particular problem in the New York City (NYC) area, where the CRE BSI prevalence rate is 20 times higher than in the Capital District. Hospitals continue to experience challenges in preventing CRE transmission, including imperfect compliance with handwashing, delays in implementing contact precautions and appropriately cohorting patients, delays in discontinuing devices when they are no longer needed, and lack of established protocols to screen epidemiologically linked contacts and perform active surveillance testing in high-risk areas. NYSDOH recently applied for and received funding from CDC to focus additional attention on CRE in the NYC area. Grant related efforts will include working with hospitals and nursing homes to improve recognition of clusters, visiting facilities with high rates to assess compliance with recommended prevention and control practices, and facilitating communication between hospitals and admitting facilities.

NYSDOH will continue to monitor the impact of changes in NHSN definitions on HAI rates. In the next year, decisions must be made concerning whether and how to report open colon procedures.

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

NYSDOH will continue to disseminate data on hospital-specific HAI rates in multiple formats, including annual reports and downloadable spreadsheets. Decisions regarding healthcare quality should not be based on these data alone. Consumers should consult with doctors, healthcare facilities, health insurance carriers, and reputable healthcare websites before deciding where to receive care.

Appendix 1: List of Abbreviations

ASA – American Society of Anesthesiologists' classification of physical status
ASP – Antimicrobial stewardship program
BMI – Body mass index
BSI – Bloodstream infection
CABG – Coronary artery bypass graft surgery
CAUTI – Catheter-associated urinary tract infection
CDC – Centers for Disease Control and Prevention
CDI – *Clostridium difficile* infection
C. difficile – *Clostridium difficile*
Ceph – Cephalosporin
CHF – Congestive heart failure
CHG –Chlorhexidine gluconate
CI – Confidence interval
CIC – Certified in infection control
CL – Central line
CLABSI – Central line-associated bloodstream infection
CLSI - Clinical Laboratory Standards Institute
CMS – Centers for Medicare and Medicaid Services
CNS – Coagulase negative staphylococcus
CO – Community onset
CO-NMH − Community onset-not my hospital
CO-PMH − Community onset-possibly my hospital
CRE – Carbapenem-resistant Enterobacteriaceae
CSRS – Cardiac Surgery Reporting System
DOH –Department of Health
DU– Device utilization
DUA– Data use agreement
EIA – Enzyme immunoassay
EMR – Electronic medical record
GDH – Glutamate dehydrogenase
HAI – Hospital-acquired infection
HO – Hospital onset
ICD-9 – International Classification of Diseases, Ninth Revision
ICU – Intensive care unit
IP – Infection preventionist
IQR – Inpatient quality reporting
LabID – Laboratory identified
LAMP – Loop-mediated isothermal amplification
LOS – Length of stay
LTCF – Long term care facility
MD – Medical doctor
MDRO – Multidrug resistant organism
MHT – Modified Hodge Test
MLP – Mid level practitioner
MRSA – Methicillin-resistant *Staphylococcus aureus*
MSSA – Methicillin sensitive *Staphylococcus aureus*

NAAT – Nucleic acid amplification test
NICU – Neonatal intensive care unit
NHSN – National Healthcare Safety Network
NYS – New York State
NYSDOH – New York State Department of Health
NYSPQC – New York State Perinatal Quality Collaborative
OR – Operating room
OS – Organ/space Infection
PAD – Peripheral artery disease
PCR – Polymerase chain reaction
PDS – Post-discharge surveillance
PHL – Public health law
PICC – Peripherally inserted central catheter
RHIO – Regional health information system
RFA – Request for applications
RPC – Regional Perinatal Center
SIR − Standardized infection ratio
SPARCS - Statewide Planning and Research Cooperative System
spp – species (pleural)
SSI – Surgical site infection
TAW – Technical Advisory Workgroup
UTI – Urinary tract infection
VRE – Vancomycin-resistant Enterococci

Appendix 2: Glossary of Terms

ASA score: This is a scale used by the anesthesiologist to classify the patient's physical condition prior to surgery. It uses the American Society of Anesthesiologist (ASA) Classification of Physical Status. It is one of the factors that help determine a patient's risk of possibly developing a SSI. Here is the ASA scale:

1 - Normally healthy patient
2 - Patient with mild systemic disease
3 - Patient with severe systemic disease
4 - Patient with an incapacitating systemic disease that is a constant threat to life
5 -A patient who is not expected to survive with or without the operation.

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

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

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

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

Carbapenem: There are four carbapemen antibotics: ertapenem, meropenem, doripenem, and imipenem. For technical reasons only three of these (meropenem, doripenem, and imipenem) are used to identify carbapenem-resistant infections. Carbapenems are considered an antibiotic of last resort by medical professionals.

Carbapenem-resistant Enterobacteriaceae infection (CRE): Bacteria in the Enterobacteriaceae family that are resistant to carbapenems are called CRE. NHSN currently only includes *Klebsiella* and *E. coli* spp.

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

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

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

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

Central line device utilization ratio: This ratio is obtained by dividing the number of central line-days by the number of patient-days. It is also referred to as the device utilization (DU) ratio.

***Clostridium difficile*:** A bacterium that naturally resides in the bowels of some people without symptoms of infection**.** Overgrowth of *C. difficile* in the bowel, sometimes resulting from a patient's taking antibiotics, or touching their mouth after coming in contact with contaminated environmental surfaces or patient care items, allows this bacterium to produce a toxin in the bowel causing infection symptoms, which range from mild to severe diarrhea and in some instances death.

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

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

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

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

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

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

Deep incisional SSI: A surgical site infection that involves the deep soft tissues (e.g., fascial and muscle layers) of the incision and meets the NHSN criteria as described in the NHSN Patient Safety Manual.

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

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

infections involving the donor incision site are reported separately from CABG surgical chest incision site infections.

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

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

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

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

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

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

Infection control / prevention processes: These are routine measures to prevent infections that can be used in all healthcare settings. These steps or principles can be expanded to meet the needs of specialized types of hospitals. 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.

Inpatient: A patient whose date of admission to the healthcare facility and the date of discharge are different calendar days.

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 typically 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 specialty ICUs 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 bacteria 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 called MRSA.

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 and newborns under the supervision of a neonatologist.
- **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.
- **Community onset 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:

- For surgical site infections, 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.
- For NICU CLABSIs, the adjusted rate is a comparison of the actual rate and the predicted rate based on statewide rates within birth weight categories for neonates.

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

- A SIR of 1.0 means the observed number of infections is equal to the number of predicted infections.
- A SIR above 1.0 means that the infection rate is higher than that found in the standard population. The difference above 1.0 is the percentage by which the infection rate exceeds that of the standard population.
- A SIR below 1.0 means that the infection rate is lower than that of the standard population. The difference below 1.0 is the percentage by which the infection rate is lower than that experienced by the standard population.

Superficial incisional SSI: A surgical site infection that involves only skin and soft tissue layers of the incision and meets NHSN criteria as described in the NHSN Patient Safety Protocol.

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

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

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

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

- **Clean:** An uninfected operation body site is encountered and the respiratory, digestive, genital, or uninfected urinary tracts are not entered.
- **Clean-contaminated:** Operation body sites in which the respiratory, digestive, genital or urinary tracts are entered under controlled conditions and without unusual contamination.
- **Contaminated:** Operation body sites that have recently undergone trauma, operations with major breaks in sterile technique (e.g., open cardiac massage) or gross spillage from the gastrointestinal tract.
- **Dirty or infected:** Includes old traumatic wounds with retained dead tissue and those that involve existing infection or perforated intestines.

Appendix 3: Methods

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

Data Validation

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

1) 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.

2) 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.

3) 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:
    a. Enhance the reliability and consistency of applying the surveillance definitions;
    b. Evaluate the adequacy of surveillance methods to detect infections; and
    c. 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. Between 2007 and 2013, 97%, 89%, 89%, 74%, 68%, 31%, and 50% of hospitals were audited by HAI Reporting staff, respectively. A hospital was more likely to be audited in a given year if it had significantly high or low rates in the previous year, was not audited the previous year, performed poorly during the previous audit, hired new hospital staff, and was located in a region covered by an HAI staff member or offered electronic medical record (EMR) access.

    NYSDOH continues to take advantage of technological developments in healthcare information. NYSDOH developed a process to conduct these audits via off-site access to EMRs. Of the hospitals that were audited in 2013, 18% were audited off-site. EMR development and access vary across the state, and may be available as part of a Regional Health Information Organization (RHIO) (i.e. HealtheLink in Western NY) or within an individual hospital. Regional health information systems are more valuable than independent hospital systems because they allow for complete follow-up of patients post-

discharge through various facilities in the region. When complete EMRs are not available, the missing documents (i.e. coding summaries, intra-operative reports and vital signs) can also be effectively obtained by fax or secure file transfer, allowing the use of partial EMRs.

Off-site audits can be accomplished as effectively as on-site audits and are an efficient use of time and resources. Communication of audit results, review of compliance issues, and education are successfully provided through phone conference. IPs that participated in this audit process approved and endorsed this method of auditing. Availability of EMRs continues to grow, and NYSDOH will continue to leverage this resource to increase audit efficiency in the future.

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

The 2013 audit results will be summarized in the next annual report. In 2012, NYSDOH staff reviewed almost 2,000 records and agreed with the hospital-reported infection status 94% of the time. Disagreements were discussed with the IPs and corrected in NHSN. Table 31 summarizes the number of inconsistencies in reporting infections out of the total number of records reviewed in 2012. The agreement rate for SSIs declined from 2011 to 2012. This may be due in part to a change in the chart selection criteria; in 2012 a larger proportion of suspicious (as opposed to random) charts were selected for review, i.e., the test got harder. However, we would also expect improvement in the ability of hospitals to accurately identify HAIs since the program began in 2007. Recommendations for improving SSI surveillance accuracy were reviewed with all hospitals in January 2013 during regional conference calls.

Table 31. Brief summary of 2012 HAI audit

Type of Infection	# Agreements	# Records Reviewed	% Agreement	% Under reported	% Over reported
Colon SSI	309	352	87.8%	10.2%	2.0%
CABG SSI	104	112	92.9%	7.1%	0.0%
Hip SSI	342	352	97.2%	2.0%	0.8%
Hysterectomy SSI	310	321	96.6%	3.1%	0.3%
CLABSI	399	422	94.5%	4.3%	1.2%
C. difficile	530	560	94.6%	5.2%	0.2%
TOTAL	**1,994**	**2,119**	**94.1%**	**5.1%**	**0.8%**

* Note, results from 14 hospitals reviewed by an auditor-in-training were excluded from this analysis.

In addition to on-site and off-site audits, a few hospitals that had significantly low preliminary HAI rates but were not audited during the year were selected to participate in a partial-self-audit. In the 2012 process, HAI staff securely emailed each hospital a list of records that had indications of infection in SPARCS but no infection in NHSN. The hospital IPs reviewed the medical records associated with these charts, and self-reported whether these records met the NHSN surveillance criteria. In 2013, the process was modified such that CDI and CRE laboratory results were reviewed by HAI staff, to facilitate more active involvement from HAI staff. In 2012 and 2013, 6% and 9% of hospitals participated in the partial-self-audit. The 2012 self-audit results are summarized in Table 32.

Table 32. Brief Summary of 2012 partial self-audit

Type of Infection	# Records Reviewed	# Under reported	% Under reported
SSI	202	14	6.9%
CLABSI	18	0	0%
C. difficile	73	23	31.5%
TOTAL	**293**	**37**	**12.3%**

Of the infections that were under reported, 43% were not previously reviewed by the IPs. The IPs were given recommendations both to improve their surveillance processes to review all appropriate records, and to double check their data in NHSN at the end of the year to verify that they entered all the infections that they identified.

4) Cross-checks for completeness and accuracy in reporting - NYS HAI staff match the NHSN data to other NYSDOH data sets to aid in evaluating the completeness and accuracy of the data reported to the NHSN.
    a. NHSN CABG data are linked to the Cardiac Surgery Reporting System[32] (CSRS) database. The cardiac services program collects and analyzes risk factor information for patients undergoing cardiac surgery and uses the information to monitor and report hospital and physician-specific mortality rates.

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

Thresholds for Reporting Hospital-Specific Infection Rates

This report contains data from 170 hospitals reporting complete data for 2013. Five of these hospitals, which recently closed, are not shown in hospital-specific tables. Hospitals that perform very few procedures or have ICUs with very few patients with central lines have infection rates that fluctuate greatly over time. This is because even a few cases of infection will yield a numerically high rate in the rate calculation when the denominator is small. To assure a fair and representative set of data, the NYSDOH adopted minimum thresholds.

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

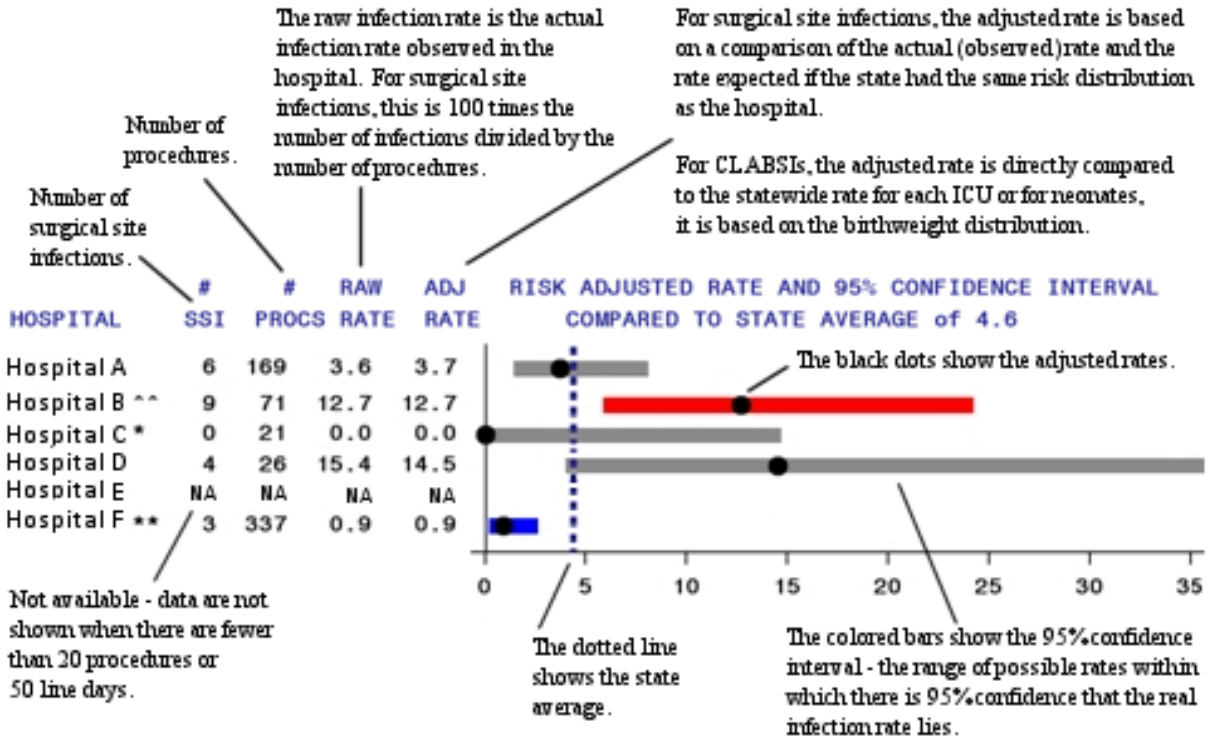
Risk Adjustment

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

Risk-adjusted infection rates for SSIs in each hospital were calculated using a two-step method. First, all the data for the state were pooled to develop a logistic regression model predicting the risk of infection based on patient-specific risk factors. Second, that model was used to calculate the expected number of infections for each hospital. The observed infection rate was then divided by the hospital's expected infection rate. If the resulting ratio is larger than one, the provider has a higher infection rate than expected on the basis of its patient mix. If it is smaller than one, the provider has a lower infection rate than expected from its patient mix. For each hospital, the ratio is then multiplied by the overall statewide infection rate to obtain the hospital's risk-adjusted rate. This method of risk adjustment is called "indirect adjustment." Hospitals with risk-adjusted rates significantly higher or lower than the state average were identified using exact two-sided 95% Poisson confidence intervals. The Poisson distribution is used for rates based on rare events. All data analyses were performed using SAS version 9.3 (SAS Institute, Cary NC).

Figure 22 provides an example of how to interpret the hospital-specific SSI and CLABSI infection rate tables.

Figure 22. How to read hospital-specific SSI and CLABSI infection rate



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

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

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

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

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

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

Adult and pediatric ICU CLABSI data were compared within the ICU types listed in Table 15.

Trends and cost savings

Cost estimates were based on a CDC report that provided a range of estimates for the direct hospital cost of treating HAIs[4]. Ranges were provided because HAIs vary in severity. For example, a deep chest infection following CABG surgery is more complicated and expensive than a superficial site infection following CABG surgery. Additionally, studies upon which the CDC report is based differ somewhat in their cost estimates. Until more precise estimates are available, these ranges have been used to estimate comparative costs of HAIs and cost savings since the inception of the HAI program.

Attributable Mortality of CDI/MDROs

Attributable mortality rates were calculated using the data in Table 33. 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 33: Attributable mortality estimates from literature review

MDRO	Reference	# MDROs	% Deaths MDROs	% Deaths controls	Attributable Mortality %
CDI	Dodek 2013[33]	227	29	27	2.0
	Gravel 2009[34]	1430	N/A	N/A	5.7
	Kenneally 2007[35]	278	36.7	30.6	6.1
	Loo 2005[36]	1703	N/A	N/A	6.9
	Pepin 2005[37]	161	23	7	16.0
	Tabak 2013[38]	255	11.8	7.3	4.5
	Weighted average				**6**
CRE	Borer 2009[11]	32	71.9	21.9	50.0
	Mouloudi 2014[12]	37	NA	NA	27.0
	Weighted average				**38**
MRSA	Harbarth 1998[39]	39	36	28	8.0
	DeKraker 2011[40]	242	30.6	8.4	22.2
	Weighted average				**20**
VRE	Carmeli 2002[41]	21	NA	NA	25.0
	Edmond 1996[42]	27	66.7	29.6	37.0
	Song 2003[43]	159	50.3	27.7	22.6
	Stosor 1998[44]	21	NA	NA	61.9
	Weighted average				**28**
MDR Acinetobacter	Blot 2003[45]	45	42.2	34.4	7.8
	Grupper 2007[46]	52	55.8	19.2	36.5
	Wisplinghoff 1999[47]	29	31.0	13.8	17.2
	Weighted average				**22**

Comparison of NYS and CMS HAI Reporting

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

The HAI rates reported by NYS and CMS may differ. The following table (Table 34) summarizes the reasons for these differences.

Table 34. Comparison of New York State and Hospital Compare data

	NYSDOH HAI Report	CMS Hospital Compare
Question answered	How did each hospital perform in 2013 compared to the NYS 2013 average?	How did each hospital perform in the most recent time period compared to the historical National baseline?
Surveillance system	NHSN	NHSN
2013 measures	CLABSI (ICU), SSI (colon, hip, CABG, hysterectomy), CDI, CRE (pilot)	CLABSI (ICU), SSI (colon, hysterectomy), CAUTI (ICU), CDI, MRSA
Time period	Calendar year	Rolling year (updated quarterly)
Hospital	Reported by unique NHSN number	Reported by unique CMS number (may contain more than one NHSN number)
Intensive care units (ICUs)	8 types of ICUs (cardiothoracic, coronary, medical, medical-surgical, surgical, neurosurgical, pediatric, neonatal)	The 8 ICUs tracked by NYS plus other adult and pediatric ICUs (e.g. burn, trauma)
SSI Exclusions	SSIs detected using post discharge surveillance and not readmitted to any hospital	Children, patients with outlying risk adjustment variables, superficial infections
Displayed outcomes	Raw rates, risk-adjusted rates, and standardized infection ratios	Standardized infection ratios
Risk adjustment variables	Do not include hospital-level factors	Include hospital-level factors

Appendix 4: List of Hospitals by County

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

County	PFI	CMS ID	Hospital Name	Previous Name
Albany	0001	330013	Albany Medical	
	0004	330003	Albany Memorial	
	0005	330057	St Peters Hospital	
Allegany	0039	330096	Jones Memorial	
Bronx	1178	330009	Bronx-Lebanon	
	1175	332006	Calvary Hospital*	
	1165	330127	Jacobi Medical	
	1172	330080	Lincoln Medical	
	3058	330059	Montefiore-Einstein	
	1169	330059	Montefiore-Moses	
	1168	330059	Montifiore-Wakefield	Montifiore North
	1186	330385	North Central Bronx	
	1176	330399	St Barnabas	
Broome	0043	330011	Our Lady of Lourdes	
	0042/0058	330394	U Health Bing-Wilson	
Cattaraugus	0066	330103	Olean General	
Cayuga	0085	330235	Auburn Memorial	
Chautauqua	0098	330229	Brooks Memorial	
	0114	330132	TLC Lake Shore	
	0111	330166	Westfield Memorial*	
	0103	330239	Womans Christian	
Chemung	0116	330090	Arnot Ogden	
	0118	330108	St Josephs- Elmira	
Chenango	0128	330033	Chenango Memorial	
Clinton	0135	330250	Champlain Valley	
Columbia	0146	330094	Columbia Memorial	
Cortland	0158	330175	Cortland Reg Med	
Dutchess	0180	330067	MidHudson Reg of WMC	St Francis- Pough.
	0192	330049	Northern Dutchess	
	0181	330023	Vassar Brothers	
Erie	0280	330111	Bertrand Chaffee	
	0207	330005	Buffalo General	
	0210	330219	Erie Medical Center	
	0267	330102	Kenmore Mercy	
	0213	330279	Mercy- Buffalo	
	3067	330005	Millard Fill. Suburb	
	0216	330354	Roswell Park	
	0218	330078	Sisters of Charity	
	0292	330078	Sisters- St Joseph	St Joseph Cheektow.
	0208	333562	Woman and Childrens	

County	PFI	CMS ID	Hospital Name	Previous Name
Franklin	0324	330079	Adirondack Medical	
	0325	330084	Alice Hyde	
Fulton	0330	330276	Nathan Littauer	
Genesee	0339	330073	United Memorial	
Jefferson	0379	330263	Carthage Area	
	0367	330157	Samaritan- Watertown	
Kings	1286	330233	Brookdale Hospital	
	1288	330056	BrooklynHos-Downtown	
	1294	330196	Coney Island	
	1309	330397	Interfaith Medical	
	1301	330202	Kings County	
	1315	330201	Kingsbrook Jewish	
	1304	330306	Lutheran Medical	
	1305	330194	Maimonides	
	1324	330169	Mt Sinai BI-Bklyn	Beth Israel- Kings
	1293	330019	NY Community Bklyn	
	1306	330236	NY Methodist	
	1302	330152	SUNY Downstate LICH	
	1320	330350	Univ Hosp Brooklyn	
	1692	330396	Woodhull Medical	
	1318	330221	Wyckoff Heights	
Lewis	0383	331317	Lewis County	
Livingston	0393	330238	Noyes Memorial	
Madison	0401	330249	Community Memorial	
	0397	330115	Oneida Healthcare	
Monroe	0409	330164	Highland Hospital	
	0461	330037	Lakeside Memorial	
	0414	330403	Monroe Community*	
	0411	330125	Rochester General	
	0413	330285	Strong Memorial	
	0471	330226	Unity Hosp Rochester	
Montgomery	0484	330047	St Marys Amsterdam	
Nassau	0518	330372	Franklin	
	0490	330181	Glen Cove Hospital	
	0513	330259	Mercy Medical	
	0528	330027	Nassau University	
	0541	330106	North Shore	
	0552	330331	Plainview Hospital	
	0527	330198	South Nassau Comm.	
	0563	330182	St Francis- Roslyn	
	0551	330332	St Joseph -Bethpage	
	0550	330106	Syosset Hospital	
	0511	330167	Winthrop University	

County	PFI	CMS ID	Hospital Name	Previous Name
New York	1438	330204	Bellevue Hospital	
	1445	330240	Harlem Hospital	
	1486	332008	Henry J. Carter*	
	1447	330270	Hosp for Spec Surg	
	1450	330119	Lenox Hill	
	1453	330154	Memor SloanKettering	
	1454	330199	Metropolitan	
	1456	330024	Mt Sinai	
	1439	330169	Mt Sinai Beth Israel	Beth Israel- Petrie
	1466	330046	Mt Sinai Roosevelt	
	1469	330046	Mt Sinai St Lukes	
	1460	330100	NY Eye and Ear*	
	3975	330101	NYP-Allen	
	1464	330101	NYP-Columbia/Morgan S	(previously reported separately)
	1437	330101	NYP-Lower Manhattan	NY Downtown
	1458	330101	NYP-Weill Cornell	
	1446	330214	NYU Joint Disease	
	1463	330214	NYU Medical Center	
Niagara	0581	330005	DeGraff Memorial	
	0565	330163	East. Niag. Lockport	Lockport Memorial
	0585	330163	East. Niag. Newfane	Intercomm. Newfane
	0583	330188	Mount St. Marys	
	0574	330065	Niagara Falls	
Oneida	0599	330044	Faxton St. Lukes	
	0589	330215	Rome Memorial	
	0598	330245	St Elizabeth Medical	
Onondaga	0636	330203	Crouse Hospital	
	0630	330140	St Josephs- Syracuse	
	0635	330241	Univ Hosp SUNY Upst	
	0628	330241	Upst. Community Gen	
Ontario	0676	330265	Clifton Springs	
	0678	330074	FF Thompson	
	0671	330058	Geneva General	
Orange	0708	330135	Bon Secours	
	0699/0686	330126	OrangeReg Goshen-Mid	
	0704	330205	St Anthony	
	0694/0698	330264	St LukesNewburgh-Cor	
Orleans	0718	330053	Medina Memorial	
Oswego	0727	330218	Oswego Hospital	
Otsego	0739	330085	AO Fox Memorial	
	0746	330136	Mary Imogene Bassett	
Putnam	0752	330273	Putnam Hospital	

County	PFI	CMS ID	Hospital Name	Previous Name
Queens	1626	330128	Elmhurst	
	1628	330193	Flushing Hospital	
	1638	330353	Forest Hills Hosp	
	1629	330014	Jamaica Hospital	
	1630	330195	Long Island Jewish	
	1639	330024	Mt Sinai Queens	
	1637	330055	NY Hosp Queens	
	1633	330231	Queens Hospital	
	1635	330395	St Johns Episcopal	
Rensselaer	9250	330409	Burdett Care Center*	
	0756	330180	Samaritan- Troy	
	0755	330232	St Marys Troy	
Richmond	1738	330028	Richmond Univ	
	1740/1737	330160	Staten Island U N-S	
Rockland	0779	330158	Good Samar. Suffern	
	0775	330405	Helen Hayes Hospital*	
	0776	330104	Nyack Hospital	
	0793	332014	Summit Park Hospital*	
Saratoga	0818	330222	Saratoga Hospital	
Schenectady	0829	330153	Ellis Hospital	
	0831	330406	Sunnyview Hosp-Rehab*	
Schoharie	0851	330268	Cobleskill Regional*	
St.Lawrence	0815	330197	Canton-Potsdam	
	0798	330211	Claxton-Hepburn	
	0804	330223	Massena Memorial	
Steuben	0866	330277	Corning Hospital	
	0873	330144	Ira Davenport	
	0870	330151	St James Mercy	
Suffolk	0885	330141	Brookhaven Memorial	
	0891	330088	Eastern Long Island	
	0925	330286	Good Samar. W Islip	
	0913	330045	Huntington	
	0895	330185	JT Mather	
	0938	330107	Peconic Bay Medical	
	0889	330340	Southampton	
	0924	330043	Southside	
	0943	330401	St Catherine Siena	
	0896	330246	St Charles Hospital	
	0245	330393	Univ HospStony Brook	
Sullivan	0971	330386	Catskill Regional	
Tompkins	0977	330307	Cayuga Medical Cntr	
Ulster	0990	330004	HealthAlli Broadway	Kingston Hospital
	0989	330224	HealthAlli MarysAve	Benedictine Hospital
Warren	1005	330191	Glens Falls	
Wayne	1028	330030	Newark Wayne	

County	PFI	CMS ID	Hospital Name	Previous Name
Westchester	1138	333301	Blythedale Childrens*	
	1039	330267	Hudson Valley	
	1061	330086	Montifiore-Mt Vernon	Mount Vernon
	1072	330184	Montifiore-NewRochl	Sound Shore Medical
	1122	330061	NYP-Lawrence	
	1117	330162	Northern Westchester	
	1129	330261	Phelps Memorial	
	1097	330208	St Johns Riverside	
	1098	330006	St Josephs- Yonkers	
	1046	330404	WM Burke Rehab*	
	1139	330234	Westchester Medical	
	1045	330304	White Plains	
Wyoming	1153	330008	Wyoming County Comm.	

* Only included in survey responses; started reporting HAI data in January 2014.
PFI: New York State Permanent Facility Identification Number
CMS: Centers for Medicaid and Medicare Services Identification Number

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Guthrie Birkhead, MD, MPH, Director, Office of Public Health
Bradley Hutton, MPH, Director, Center for Community Health
Debra Blog, MD, MPH, Director, Division of Epidemiology

NYS HAI Reporting Program Personnel
Director, Bureau of Healthcare-Associated Infections – Emily Lutterloh, MD, MPH
HAI Reporting Program Director/Data Manager/Capital Area Representative – Valerie Haley, PhD
Western Region Program Representative – Peggy Hazamy, RN, BSN, CIC
Metropolitan Area (LI, Queens, Manhattan) Program Representative – Marie Tsivitis, MPH, CIC
Metropolitan Area (SI, Brooklyn, Bronx to mid-Hudson Valley) Program Rep – Rosalie Giardina, MT(ASCP), CIC
Central Region Program Representative – Robin Knab, CLT, MT(ASCP), CIC
Data Analyst – Boldtsetseg Tserenpuntsag, DrPH
State HAI Plan Coordinator (Feb 2014-current) – Kara Burke, MPH
State HAI Plan Coordinator (through Dec 2013) – Cindi Dubner, BS
Student Data Analyst – Christen Mayer, DrPHc, CLS(ASCP), CIC
Student Data Analyst – Yifeng Wu, PhD

Technical Advisory Workgroup
Physicians
John Crane, MD, Erie County Medical Center
Sarah Elmendorf, MD, Albany Medical Center
Paul Graman, MD, Strong Memorial Hospital
Brian Koll, MD, Beth Israel Medical Center
Marisa Montecalvo, MD, Westchester Medical Center
Lisa Saiman, MD, MPH, Columbia University Medical Center
Kent Sepkowitz, MD, Memorial Sloan-Kettering Cancer Center
Michael Tapper, MD, Lenox Hill Hospital
Brian Valerian, MD, FACS, FASCRS, Albany Medical Center
Infection Preventionists
Audrey Adams, RN, MPH, CIC, Montefiore Medical Center
Donna Armellino, RN, DNP, CIC, North Shore University Hospital
Melissa Bown, NP-C, Saratoga Hospital
LeAnna Grace, RN, BSN, CIC, Rome Memorial Hospital
Linda Greene, RN, MPS, CIC, Highland Hospital
Janet Haas, RN, DNSc, CIC, Westchester Medical Center
Charlene Ludlow, RN, CIC, Erie County Medical Center
Jill Patak, RN, CIC, Our Lady of Lourdes Hospital
Consumer
Arthur Levin, MPH, Center for Medical Consumers
Researcher
Eileen Graffunder, BA, Albany Medical Center
Healthcare Organization Representatives
Donna Farnsworth, RN, MHA, CIC, New York State APIC Coordinating Council
Hillary Jalon, MS, United Hospital Fund
Lauren Johnston, RN, MPA, CNAA-BC, FACHE, NYC Health & Hospitals Corporation
Karline Roberts, MS, IPRO, Medicare Quality Improvement Contactor for NY
Zeynep Sumer, MS, Greater New York Hospital Association
Mary Therriault, RN, MS, Healthcare Association of New York State

References

[1] Fridkin SK, Baggs J, Fagan R, et al. Vital signs: Improving antibiotic use among hospitalized patients. *MMWR. Morbidity and mortality weekly report.* 2014;63(09);194-200.

[2] Magill SS, Edwards JR, Bamberg W, Beldavs ZG, Dumyati G, et al. Multistate Point-Prevalence Survey of Health Care – Associated Infections. NEJM. 2014; 370:1198-208.

[3] New York State Department of Health. Statewide Planning and Research Cooperative System. http://www.health.ny.gov/statistics/sparcs/. (accessed August 14, 2014).

[4] 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. http://www.cdc.gov/HAI/pdfs/hai/Scott_CostPaper.pdf. (accessed August 14, 2014).

[5] 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.

[6] Moehring RW, Lofgren ET, Anderson DJ. Impact of change to molecular testing for *Clostridium difficile* infection on healthcare facility-associated incidence rates. Infect Control Hosp Epidemiol. 2013. 34:1055-1061.

[7] Gould CV, Edwards JR, Cohen J, Bamberg WM, Clark LA, et al. Effect of nucleic acid amplification testing on population-based incidence rates of Clostridium difficile infection. Clin Infect Dis. 2013;57:1304-7.

[8] Huang SS, Avery TR, Song Y, et al. Quantifying interhospital patient sharing as a mechanism for infectious disease spread. Infect Control Hosp Epidemiol. 2010;31:1160–1169.

[9] Haley VB, DiRienzo AG, Lutterloh EC, Stricof RL. Quantifying bias in National Healthcare Safety Network Laboratory-identified *Clostridium difficile* infection rates. Infect Control Hosp Epidemiol. 2014;35(1):1-7.

[10] Swaminathan M, Sharma S, Blash SP, Patel G, Banach DB, Phillips M, LaBombardi V, Anderson KF, Kitchel B, Srinivasan A, Calfee DP. Prevalence and risk factors for acquisition of carbapenem-resistant Enterobacteriaceae in the setting of endemicity. Infect Control Hosp Epidemiol. 2013; 34:809-817.

[11] 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.

[12] 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.

[13] Schwaber MJ, Klarfeld-Lidgji S, Navon-Venezia S, Schwartz D, Leavitt A, Carmeli Y. Containment of a country-wide outbreak of carbapenem-resistant *Klebsiella pneumoniae* in Israeli hospitals via a nationally implemented intervention. Clin Infect Dis. 2011; 52:848–855.

[14] Enfield KB, Huq NN, Gosseling MF, Low DJ, Hazen KC, Toney DM, Slitt G, Zapata HJ, Cox HL, Lewis JD, Kundzins JR, Mathers AJ, Sifri CD. Control of simultaneous outbreaks of carbapenemase-producing Enterobacteriaceae and extensively drug resistant *Acinetobacter baumannii* infection in an intensive care unit using interventions promoted in the centers for disease control and prevention. Infect Control Hosp Epidemiol. 2014; 35:810-814.

[15] CDC. Vital signs: Carbapenem-resistant enterobacteriaceae. MMWR 2013; 62:165-170

[16] 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 Disease Hosp Epidemiol. 2008. 29: 901-913.

[17] Dudeck MA, Weiner LM, Malpiedi PJ, Edwards JR, Peterson KD, Sievert D. Risk adjustment for healthcare facility-onset C. difficile and MRSA Bacteremia laboratory-identified event reporting in NHSN. 2012, CDC report.

[18] New York State Department of Health. Vital statistics of New York State 2012. Table 33a: Deaths and death rates by selected causes and race New York State 2012. https://www.health.ny.gov/statistics/vital_statistics/2012/table33a.htm

[19] CDC. Get Smart for Healthcare. http://www.cdc.gov/getsmart/healthcare/inpatient-stewardship.html. (accessed July 5, 2013).

[20] Dancer SJ, Kirkpatrick P, Corcoran DS, et al. Approaching zero: temporal effects of a restrictive antibiotic policy on hospital-acquired *Clostridium difficile*, extended-spectrum *B*-lactamase-producing coliforms and methicillin-resistant *Staphylococcus aureus*. International Journal of Antimicrobial Agents. 2013; 41:137-142.

[21] Nathwani D, Sneddon J, Malcolm W, et al. Scottish Antimicrobial Prescribing Group (SAPG): development and impact of the Scottish National Antimicrobial Stewardship Programme. International Journal of Antimicrobial Agents. 2011; 38:16-26.

[22] Valiquette L, Cossette B, Garant MP, Diab H, Pepin J. Impact of a reduction in the use of high-risk antibiotics on the course of an epidemic of *Clostridium difficile*-Associated disease caused by the hypervirulent NAP1/027 strain. Clin Infect Dis. 2007;45 Suppl 2:S112-21.

[23] Singh N, Rogers P, Atwood CW, Wagener MW, Yu VL. Short-course empiric antibiotic therapy for patients with pulmonary infiltrates in the intensive care unit. American Journal of Respiratory and Critical Care Medicine. 2000; 162:505-511.

[24] Carling P, Fung T, Killion A, Terrin N, Barza M. Favorable impact of a multidisciplinary antibiotic management program conducted during 7 years. Infect Control Hosp Epidemiol. 2003; 24:699-706.

[25] Dellit TH, Owens RC, McGowan JE Jr, et al. Infectious Diseases Society of America and the Society for Healthcare Epidemiology of America guidelines for developing an institutional program to enhance antimicrobial stewardship. Clin Infect Dis. 2007; 44:159-77.

[26] Goff DA. Antimicrobial stewardship: bridging the gap between quality care and cost. Curr Opin Infect Dis. 2011; 24 Suppl 1:S11-20.

[27] CDC. Core elements of hospital antibiotic stewardship programs. Atlanta, GA: US Department of Health and Human Services, CDC; 2014. Available at http://www.cdc.gov/getsmart/healthcare/pdfs/core-elements.pdf (accessed July 8, 2014).

[28] CDC. National and State Healthcare-Associated Infections Progress Report. March 2014. Available at http://www.cdc.gov/HAI/pdfs/progress-report/hai-progress-report.pdf. (accessed July 2, 2014)

[29] Birnbaum D, Zarate R, Marfin A. SIR, you've led me astray! Infect Control Hosp Epidemiol. 2011; 32:276-282.

[30] Haley VB, Van Antwerpen C, Tserenpuntsag B, et al. Use of administrative data in efficient auditing of hospital-acquired surgical site infections, NYS 2009-2010. Infect Control Hosp Epidemiol. 2012; 33:565-571.

[31] Hazamy PA, Van Antwerpen C, Tserenpuntsag B, Haley VB, Tsivitis M, et al. Trends in validity of central line-associated bloodstream infection surveillance data, New York State, 2007-2010. Am J Infect Control. 2013;41:1200-4.

[32] New York State Department of Health. Adult Cardiac Surgery Reporting System. http://www.health.ny.gov/statistics/diseases/cardiovascular/. (accessed August 14, 2014).

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

[34] 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 *Clostridium 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.

[35] 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 *Clostridium difficile*-associated disease in the ICU setting. Chest. 2007; 132:418-424.

[36] 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 *Clostridium difficile*-associated diarrhea with high morbidity and mortality. New England Journal of Medicine. 2005; 353:2442-2449.

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

[38] Tabak YP, Zilberberg MD, Johannes RS, Sun X, McDonald LC. Attributable burden of hospital-onset *Clostridium difficile* infection: a propensity score matching study. Infect Control Hosp Epidemiol. 2013; 34:588-596.

[39] 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.

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

[41] Carmeli Y, Eliopoulos G, Mozaffari E, Samore M. Health and economic outcomes of vancomycin-resistant enterococci. Archives of Internal Medicine. 2002; 162:2223-2228.

[42] Edmond MB, Ober JF, Dawson JD, Weinbaum DL, Wenzel RP. Voncomycin resistant enterococcal bacteremia: Natural history and attributable mortality. Clinical Infectious Diseases. 1996; 23:1234-1239.

[43] Song X, Srinivasan A, Plaut D, Perl TM. Effect of nosocomial vancomycin-resistant enterococcal bacteremia on mortality, length of stay, and costs. Infect Control Hosp Epidemiol. 2003; 24:251-256.

[44] Stosor V, Peterson LR, Postelnick M, Noskin GA. *Enterococcus faecium* bacteremia: does vancomycin resistance make a difference? Archives of Internal Medicine. 1998; 158:522-527.

[45] Blot S, Vandewoude K, Colardyn F. Nosocomial bacteremia involving *Acinetobacter baumannii* in critically ill patients: a matched cohort study. Intensive Care Medicine. 2003; 29:471-475.

[46] Grupper M, Sprecher H, Mashiach T, Finkelsteing R. Attributable mortality of nosocomial *Acinetobacter* bacteremia. Infect Control Hosp Epidemiol. 2007; 28:293-298.

[47] Wisplinghoff H, Perbix W, Seifert H. Risk factors for nosocomial bloodstream infections due to *Acinetobacter baumannii*: a case-control study of adult burn patients. Clin Infect Dis. 1999; 28:59-66.