

Risk Model Tables

Table1a: CLABSI Acute Care Hospitals (ACH): ICU

Parameter (Variable Name)	Parameter Level	Description	Parameter Estimate	P-Value
Intercept			-8.8456	<.0001
Location Groups (LOCCDC_grp)	CC_Group1	Inpatient locations in any of the following: Medical Cardiac Critical Care Pediatric Medical-Surgical Critical Care Trauma Critical Care Pediatric Trauma Critical Care	1.0072	<.0001
	CC_Group2	Inpatient locations in any of the following: Surgical Cardiothoracic Critical Care	0.4236	<.0001
	CC_Group3	Inpatient locations in any of the following: Burn Critical Care Pediatric Burn Critical Care Pediatric Surgical Cardiothoracic Critical Care Medical Critical Care Pediatric Medical Critical Care Onsite Overflow Ward Prenatal Critical Care Respiratory Critical Care Pediatric Respiratory Critical Care	1.1416	<.0001
	CC_Group4	Inpatient locations in any of the following: Medical-Surgical Critical Care Neurologic Critical Care Neurosurgical Critical Care Surgical Critical Care Pediatric Surgical Critical Care	0.9184	<.0001
	MIXED	Inpatient locations in any of the following: Mixed Age Mixed Acuity Unit Adult Mixed Acuity Unit Pediatric Mixed Acuity Unit	0.6581	<.0001
	STEP	Inpatient locations in any of the following: Adult Step-Down Unit Special Care Nursery (Level II) Pediatric Step-Down Unit	0.6617	<.0001
	WARD_Group1	Inpatient locations in any of the following: Gerontology Ward Medical Ward Onsite Overflow Ward Pediatric Surgical Ward	0.5714	<.0001
	WARD_Group3	Inpatient locations in any of the following:	0.7840	<.0001

		Ear, Nose, Throat Ward Gastrointestinal Ward Genitourinary Ward Pediatric Genitourinary Ward Jail Unit Pediatric Medical-Surgical Ward Pediatric Medical Ward Pulmonary Ward Orthopedic Trauma Ward		
	WARD_Group4	Inpatient locations in any of the following: Antenatal Care Ward Burn Ward Pediatric Burn Ward Gynecology Ward Medical-Surgical Ward Neurology Ward Neurosurgical Ward Plastic Surgery Ward Surgical Ward Telemetry Ward Vascular Surgery Ward	0.4028	<.0001
	WARD_Group2	Inpatient locations in any of the following: Behavioral Health/Psych Ward Pediatric Behavioral Health Ward Labor and Delivery Ward Labor, Delivery, Recovery, Postpartum Suite Pediatric Neurosurgical Ward Well Newborn-- Nursery (Level I) Pediatric Neurology Ward Orthopedic Ward Pediatric Orthopedic Ward Postpartum Ward Rehabilitation Ward Pediatric Rehabilitation Ward Stroke (Acute) Ward	REF	.
Medical Type Groups (medType2_grp)	G/M	Hospital Medical Affiliation Type in any Major Medical Graduate Teaching	0.0989	<.0001
	U/N	Hospital Medical Affiliation Type in any Undergraduate Teaching Non-Teaching	REF	.
Facility Type Groups (facType_grp)	OTHER	Facility Type in Any Children's General Military VA Women/Children	0.7286	0.0010

	ORTHO/SURG/WOM	Facility Type in Any Orthopedic Surgery Women	REF	.
Average Length of Stay in Days (avgLOS_grp)	4.8<=avgLOS<5.7	Average LOS 4.8-<5.7	0.0946	<.0001
	avgLOS>=5.7	Average LOS ≥5.7	0.2042	<.0001
	1<=avgLOS<4.8	Average LOS 1-<4.8	REF	.
Number of Hospital Beds Groupings (numBeds_grp)	138<=numBeds<425	Number of Beds 138 - <425	0.0784	0.0151
	numBeds>=425	Number of Beds ≥425	0.1628	<.0001
	1<=numBeds<138	Number of Beds <138	REF	.
Proportion of ICU Beds Group (propICU_grp)	propICU>=0.189	Proportion of ICU Beds ≥ 0.189	0.0747	0.0001
	0<=propICU<0.189	Proportion of ICU Beds < 0.189	REF	.

Table1b: CLABSI Acute Care Hospitals (ACH): NICU

Parameter	Parameter Estimate	Standard Error	P-value
<i>Intercept</i>	-7.7658	0.0887	<.0001
Birthweight A: ≤750 grams	1.3132	0.0836	<.0001
Birthweight B: 751-1000 grams	0.8392	0.0958	<.0001
Birthweight C: 1001-1500 grams	0.2747	0.1038	0.0081
Birthweight D and E: 1501-2500 grams and >2500 grams	REFERENT	-	-
Number of ICU beds ¹ : <56	0.3514	0.0936	0.0002
Number of ICU beds ¹ : ≥56	REFERENT	-	-
Average length of stay ² : ≥4.9 days	0.1957	0.0760	0.0100
Average length of stay ² : 1-4.8 days	REFERENT	-	-

¹ Number of ICU beds is reported on the [Annual Hospital Survey](#).

² Average length of stay is calculated as # annual patient days / # annual admissions, as reported on the [Annual Hospital Survey](#).

Table1c: CLABSI Acute Care Hospitals (ACH): SCA

<u>Parameter</u>	<u>Parameter Estimate</u>	<u>Standard Error</u>	<u>P-value</u>
Intercept	-8.2924	0.1929	<.0001
<u>CDC Location Code: Critical Care Wards</u> Oncology Medical Critical Care- IN:ACUTE:CC:ONC_M Oncology Medical-Surgical Critical Care- IN:ACUTE:CC:ONC_MS Oncology Pediatric Critical Care- IN:ACUTE:CC:ONC_PED Oncology Surgical Critical Care- IN:ACUTE:CC:ONC_S	0.5247	0.2233	0.0188
<u>CDC Location Code: Mixed/SCA/Step Wards</u> Dialysis Specialty Care Area- IN:ACUTE:SCA:DIAL Oncology Mixed Acuity Unit (all ages)- IN:ACUTE:MIXED:ONC Oncology Step Down Unit- IN:ACUTE:STEP:ONC Pediatric Solid Organ Transplant Specialty Care Area- IN:ACUTE:SCA:SOTP_PED Solid Organ Transplant Specialty Care Area- IN:ACUTE:SCA:SOTP	0.3969	0.1739	0.0225
<u>CDC Location Code: Hematology-Oncology Wards</u> General Hematology-Oncology Ward- IN:ACUTE:WARD:ONC_HONC Pediatric General Hematology-Oncology Ward- IN:ACUTE:WARD:ONC_HONC_PED	0.5186	0.1521	0.0006
<u>CDC Location Code: Hematopoietic Wards</u> Oncology Hematopoietic Stem Cell Transplant Ward- IN:ACUTE:WARD: ONC_HSCT Oncology Pediatric Hematopoietic Stem Cell Transplant Ward- IN:ACUTE:WARD: ONC_HSCT_PED	0.8711	0.1575	<.0001
<u>CDC Location Code: Leukemia Wards</u> Oncology Leukemia Ward- IN:ACUTE:WARD: ONC_LEUK Oncology Leukemia/Lymphoma Ward- IN:ACUTE:WARD: ONC_LL	0.7364	0.1762	<.0001

Oncology Lymphoma – IN:ACUTE:WARD:ONC_LYMPH			
CDC Location Code: Solid Tumor Ward	REFERENT	-	-
Oncology Solid Tumor Ward- IN:ACUTE:WARD:ONC_ST			
Number of ICU beds ¹ : <35 beds	0.2868	0.0734	<.0001
Number of ICU beds ¹ : ≥146 beds	0.1411	0.0565	0.0124
Number of ICU beds ¹ : 35-145 beds	REFERENT	-	-
Central line type: Temporary	0.3001	0.0499	<.0001
Central line type: Permanent	REFERENT	-	-
Average length of stay ² : ≥4.4 days	0.2831	0.0976	0.0037
Average length of stay ² : 1-4.3 days	REFERENT	-	-
Medical school affiliation ¹ : Major	0.2859	0.0713	<.0001
Medical school affiliation ¹ : Graduate/undergraduate/non-teaching	REFERENT	-	-

Table2: CLABSI Critical Access Hospitals (CAH)

Parameter (Variable Name)	Parameter Level	Description	Parameter Estimate	P-Value
Intercept			-9.0295	<.0001
Location and LOS Groupings (Location_LOS)	CC	Location in any Critical Care	1.5980	<0.001
	non-CC & LOS>=8.9 DAYS	Location in any NON Critical Care (i.e., Ward, Step-Down, Other) <u>AND</u> Average Length of Stay >=8.9 days	1.0270	0.0155
	non-CC & 1<=LOS<8.9 DAYS	Location in any NON Critical Care (i.e., Ward, Step-Down, Other) <u>AND</u> Average Length of Stay 1<= to <8.9 days	Ref	Ref

Table3: CLABSI Long-Term Acute Care (LTAC)

Parameter (Variable Name)	Parameter Level	Description	Parameter Estimate	P-Value
Intercept			-8.8145	<0.001
Proportion of Admissions with HemoDialysis (pHemo_decilegp)	0<=pHEMO<0.078	Proportion of Hemo Dialysis Admissions <0.078	Ref	Ref
	pHEMO >=0.078	Proportion of Ortho Admissions >=0.078	0.5353	<0.001
Proportion of admissions on a ventilator (pVent_quartilegp)	0<=pVent<0.145	Proportion of Ventilator admissions <0.145	Ref	Ref
	pVent>=0.145	Proportion of Ventilator admissions >=0.145	0.5795	<0.001
Length of Stay Groupings (los_decilegp)	27.6<=LOS<31.7	Average LOS 27.6 - < 31.7	0.4178	0.009
	LOS >=31.7	Average LOS >= 31.7	0.7592	<0.001
	1<=LOS<27.6	Average LOS 1 - < 27.6	Ref	Ref
LocationGroups (locationtype)	CC_LTAC	Any Location in Critical Care	0.7032	<0.001
	WARD_LTAC	Any Location in Ward	Ref	Ref
LTAC SETTING	1	Higher Risk Setting: Compliment of Below	0.4166	0.018
	0	Lowest Risk Setting: Located near an acute care hospital and provides acute care services OR Free -standing LTAC which shares with units other and SNF	Ref	Ref

4.1b Implementation Costs and Burden*

Form Number & Name	No. of Facilities Completing Form	Time for Each Facility to Complete Data Collection (minutes)	Total Cost for Each Facility to Complete Data Collection
57.108 Primary Bloodstream Infection (BSI)	6000	42	\$2,461
57.116 Denominators for Neonatal Intensive Care Unit (NICU)	1100	240	\$14,064
57.117 Denominators for Specialty Care Area (SCA)/Oncology (ONC)	500	300	\$17,580
57.118 Denominators for Intensive Care Unit (ICU)/Other locations (not NICU or SCA)	5500	300	\$17,580
		882 minutes	\$51,685

5.1.3 Characteristics of Measured Entities*

Reliability Testing:

Any acute care hospital or long-term acute care facility that reported 2023 data to NHSN CLABSI events and had at least one predicted event was, included in the analysis for the respective facility type. Bed size, medical type, and census region of included facilities are broken down below by facility type. Critical access hospitals were not included due to small sample size.

	ACH			LTAC		
Medical Type	Frequency	Percent	Cumulative	Frequency	Percent	Cumulative
Major	1310	55.86	1310	1	0.31	1
Non-Major	1035	44.14	2345	320	99.7	320
Bed Size Group						
< 319	1656	70.62	1656	320	99.69	320
>= 319	689	29.38	2345	1	0.31	321
Census Region						
Midwest	495	21.11	495	77	23.99	77
Non Mainland	24	1.02	519	0	0	77
Northeast	401	17.1	920	37	11.53	114
South	927	39.53	1847	158	49.22	272
West	498	21.24	2345	49	15.26	321

Validity Testing:

Any acute care hospital or long-term acute care facility that reported 2023 data to NHSN for both CAUTI and CLABSI events and had at least one predicted event for each, was included in the analysis for the respective facility type. Bed size, medical type, and census region of included facilities are broken down below by facility type. Critical access hospitals were not included due to small sample size resulting in no facilities having both a CLABSI and CAUTI SIR for analysis.

	ACH			LTAC		
Medical Type	Frequency	Percent	Cumulative	Frequency	Percent	Cumulative
(missing)	272	12.04	272	313	100	313
Major	1283	56.77	1555	0	0	313
Non-Major	705	31.19	2260	0	0	313
Bed Size Group						
(missing)	1	0.04	1	4	1.28	4
< 319	1572	69.59	1573	307	98.08	311
>= 319	687	30.41	2260	2	0.64	313
Census Region						
Midwest	478	21.15	478	73	23.32	73
Non Mainland	23	1.02	501	0	0	73
Northeast	388	17.17	889	37	11.82	110
South	889	39.34	1778	154	49.2	264
West	482	21.33	2260	49	15.65	313

5.4.3 Variable Distribution Across Measured Entities*

Below shows the CLABSI Events, number of central line days, and CLABSI rate (per 1000 days) for the variables included in the acute care hospital risk model:

Factor *See tables below for descriptions	Number of Events	Number of Central Line Days	Rate (# CLABSI per 1,000 CL days)
LOCCDC_grp			
CC_Group1	1411	1133841	1.244
CC_Group2	734	1066311	0.688
CC_Group3	2627	1972696	1.332
CC_Group4	4838	4982049	0.971
MIXED	647	835609	0.774
STEP	1561	1950149	0.800
WARD_Group1	2262	3078366	0.735
WARD_Group2	175	418884	0.418
WARD_Group3	715	708565	1.009
WARD_Group4	4242	7126523	0.595
medType2_grp			
U/N	3161	4703558	0.672
G/M	16051	18569435	0.864
facType_grp			
ORTHO/SURG/WOM	25	89908	0.278
OTHER	19187	23183085	0.828
avgLOS_grp			
1<=avgLOS<4.8	5593	8172126	0.684
4.8<=avgLOS< 5.7	5301	6495660	0.816
avgLOS>=5.7	8318	8605207	0.967
numBeds_grp			
numBeds<138	1553	2411875	0.644
138<=numbeds<425	8574	11167100	0.768

numBeds>=425	9085	9694018	0.937
propICU_grp			
propICU<0.189	11118	14667615	0.758
propICU>=0.189	8094	8605378	0.941

Below shows the CLABSI Events, number of central line days, and CLABSI rate (per 1000 days) for the variables included in the acute care hospital risk model (NICU Specific):

Factor	Number of Events	Number of Central Line Days	Rate (# CLABSI per 1,000 CL days)
BIRTHWTCODE1			
A	555	306130	1.8130
B	244	210735	1.1579
C	171	252300	0.6778
D/E	302	565996	0.5336
ICUBEDS_GP			
<56	169	149450	1.1308
>=56	1103	1185711	0.9302
LOS_GP			
1<=LOS<4.9 days	331	382296	0.8658
>=4.9 days	941	952865	0.98

Below shows the CLABSI Events, number of central line days, and CLABSI rate (per 1000 days) for the variables included in the acute care hospital risk model (SCA Specific):

Factor	Number of Events	Number of Central Line Days	Rate (# CLABSI per 1,000 CL days)
LOCCDC_grp			
CC	55	51648	1.065
MIXED/SCA/STEP	174	221791	0.785
WARD_HONC/HONCPED	1533	1791951	0.855
WARD_HSCT/ HSCTPED	793	617117	1.285
WARD_LL	240	208902	1.149
WARD_ST	65	119003	0.546
numICUbeds_grp			
numICUbeds<35	511	457901	1.116
35<=numICUbeds<146	1195	1464289	0.816
numICUbeds>=146	1154	1088222	1.06
lineType			
PERM	1423	1687332	0.843
TEMP	1437	1323080	1.086
avgLOS_grp			
1<=avgLOS<4.4	168	246666	0.681
avgLOS>=4.4	2692	2763746	0.974
medType2_grp			
M	2450	2468251	0.993
OTHER	410	542161	0.756

Below shows the CLABSI Events, number of central line days, and CLABSI rate (per 1000 days) for the variables included in the critical access hospital risk model:

LOCATION_LOS *See tables below for descriptions	Number of Events	Number of Central Line Days	Rate (# CLABSI per 1,000 CL days)
CC critical care locations combined	12	19905	0.6029
non-CC & 1<=LOS<8.9 DAYS	19	158419	0.1199
non-CC & LOS>=8.9 DAYS	10	32102	0.3115

Below shows the CLABSI Events, number of central line days, and CLABSI rate (per 1000 days) for the variables included in the long-term acute care model:

Factor *See tables below for descriptions	Number of Events	Number of Central Line (CL) Days	Rate (CLABSI events per 1,000 CL Days)
pHEMO_DECILEGP			
<0.078	104	255,904	0.4064
>=0.078	1,271	1,215,250	1.0459
pVENT_QUARTILEGP			
<0.145	173	373,369	0.4633
>=0.145	1,202	1,097,785	1.0949
los_DECILEGP			
1-<27.6	253	506,610	0.4994
27.6 - <31.7	243	272,999	0.8901
>=31.7	879	691,545	1.2711

locationType			
CC_LTAC	151	80,715	1.8708
WARD_LTAC	1,224	1,390,439	0.8803
LTACSETTING1			
0	117	205,118	0.5704
1	1,258	1,266,036	0.9937

6.2.4 [If maintenance review OR Current Status = In Use (6.1.1)] Progress on Improvement*

Table. Central Line-Associated Bloodstream Infection (CLABSI) 2015 Baseline Data 2015-2021, by facility type

Facility Type	Year	Number of Reporting Facilities ¹	Number of Indwelling Urinary Catheter Days	Number of CLABSI Events	Number of Predicted Infections	SIR ²	95% CI Lower Bound	95% CI Upper Bound	Number of facilities with ≥ 1 Predicted Infection	No. Facilities with SIR Significantly > National SIR n (%) ³	No. Facilities with SIR Significantly < National SIR n (%) ³	Percentile Distribution of Facility-specific SIRs ⁴				
												10%	25%	Median 50%	75%	90%
ACH	2015	3510	27,480,047	26242	26447.19	0.992	0.980	1.004	2336	264 (11%)	250 (11%)	0.000	0.485	0.873	1.310	1.958
	2016	3503	27,279,398	23814	26653.88	0.893	0.882	0.905	2352	242 (10%)	264 (11%)	0.000	0.419	0.782	1.217	1.793
	2017	3557	26,584,715	21306	26172.25	0.814	0.803	0.825	2345	206 (9%)	224 (10%)	0.000	0.353	0.701	1.102	1.638
	2018	3578	26,206,445	19336	26104.15	0.741	0.73	0.751	2340	198 (8%)	196 (8%)	0.000	0.317	0.648	1.012	1.509
	2019	3605	26,324,845	18148	26353.77	0.689	0.679	0.699	2333	201 (9%)	170 (7%)	0.000	0.301	0.603	0.950	1.462
	2020	3681	25,156,944	21609	25221.14	0.857	0.845	0.868	2402	279 (12%)	249 (10%)	0.000	0.430	0.777	1.277	1.929
	2021	3718	29,379,385	27169	29476.94	0.922	0.911	0.933	2545	356 (14%)	283 (11%)	0.165	0.509	0.878	1.401	2.136
CAH	2015	510	112,464	32	30.72	1.042	0.725	1.453	0	-	-	-	-	-	-	-
	2016	599	136,448	42	37.25	1.128	0.823	1.51	0	-	-	-	-	-	-	-
	2017	696	161,092	31	43.98	0.705	0.487	0.988	0	-	-	-	-	-	-	-
	2018	736	170,229	40	46.52	0.86	0.623	1.159	0	-	-	-	-	-	-	-
	2019	762	181,923	26	49.68	0.523	0.349	0.756	0	-	-	-	-	-	-	-
	2020	762	174,128	41	47.53	0.863	0.627	1.159	0	-	-	-	-	-	-	-
	2021	855	214,664	63	58.69	1.073	0.832	1.364	0	-	-	-	-	-	-	-
LTAC	2015	489	3,380,736	3795	3797.94	0.999	0.968	1.031	462	57 (12%)	78 (17%)	0.168	0.448	0.887	1.387	2.002
	2016	486	3,019,690	3227	3359.24	0.961	0.928	0.994	466	54 (12%)	67 (14%)	0.127	0.366	0.732	1.326	1.931
	2017	469	2,527,985	2384	2832.47	0.842	0.808	0.876	452	52 (12%)	59 (13%)	0.000	0.297	0.713	1.271	2.018
	2018	448	2,210,517	2216	2559	0.866	0.830	0.903	421	61 (14%)	60 (14%)	0.000	0.336	0.734	1.371	2.102
	2019	428	1,966,377	1769	2278.66	0.776	0.741	0.813	397	46 (12%)	51 (13%)	0.000	0.298	0.706	1.207	2.024
	2020	406	1,829,384	1589	2238.03	0.710	0.676	0.746	382	47 (12%)	53 (14%)	0.000	0.144	0.515	1.071	1.878
	2021	390	1,668,931	1532	2055.46	0.745	0.709	0.783	375	47 (13%)	56 (15%)	0.000	0.000	0.447	1.077	1.834
IRF	2015	91	89,995	30	42.8	0.701	0.482	0.988	8	-	-	-	-	-	-	-
	2016	100	87,930	27	42.03	0.642	0.432	0.922	7	-	-	-	-	-	-	-
	2017	102	99,356	36	48.31	0.745	0.53	1.021	11	-	-	-	-	-	-	-
	2018	118	106,005	35	52.4	0.668	0.472	0.919	13	-	-	-	-	-	-	-
	2019	129	121,499	33	60	0.550	0.385	0.763	12	-	-	-	-	-	-	-
	2020	135	137,257	33	69.78	0.473	0.331	0.656	19	-	-	-	-	-	-	-
	2021	147	147,235	41	73.15	0.561	0.408	0.753	18	-	-	-	-	-	-	-

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1. Number of facilities included in SIR calculation.
 2. Bolded SIR value indicates statistical significance at the alpha = 0.05 level (e.g., the SIR is statistically significantly different than 1.0)
 3. Percent of facilities with at least one predicted infection that had an SIR significantly greater than or less than the nominal value of the national SIR for CLABSI by facility type and year. This is only calculated if at least 10 facilities had ≥ 1.0 predicted CLABSI for the given year.
 4. Facility-specific percentiles are only calculated if at least 20 facilities had ≥ 1.0 predicted CLABSIs for the given year. If a facility's predicted number of CLABSIs was < 1.0 , a facility-specific SIR was neither calculated nor included in the distribution of facility-specific SIRs.
- ACH: Acute Care Hospital; CAH: Critical Access Hospital; LTAC: Long-term Acute Care Hospital; IRF: Inpatient Rehabilitation Facility