

2019 National and State HAI Progress Report

Inpatient Rehabilitation Facilities

Introduction: Welcome to the 2019 National and State HAI Progress Report using the 2015 baseline data. Data from 2015 and 2016 are used to describe different HAI types by comparing the number of observed infections to the expected number of infections. This report is created by CDC staff with the National Healthcare Safety Network (NHSN).

This workbook includes national and state-specific SIR data for inpatient rehabilitation facilities.

Scope of report:

HAI Type	IRF
	National
Central line-associated bloodstream infections (CLABSI) by locations	6
Catheter-associated urinary tract infections (CAUTI) by locations	6
Hospital-onset <i>Clostridioides difficile</i> (CDI) by facility-wide reporting	6
Hospital-onset methicillin-resistant <i>Staphylococcus aureus</i> (MRSA) bacteremia by facility-wide reporting	6

Mid State HAI Progress Report

Intensive Care Unit Rehabilitation Facilities

Standardized infection ratios (SIRs) are calculated based on risk adjustment calculations. Standardized infection ratios (SIRs) are compared to the number of predicted infections. This year's report will compare 2019 SIRs to those from the prior year.

Infection Rates (IRFs).

IRF
State
b
b
b
b

2019 Annual National and State HAI Progress Report

Inpatient Rehabilitation Facilities: Full series of tables for all national and state-specific data

Table 1 National standardized infection ratios (SIRs) for the following HAIs from Inpatient Rehabilitation Facilities (IRFs):
1a. Central line-associated bloodstream infections (CLABSI)
1a. Catheter-associated urinary tract infections (CAUTI)
1b. Hospital-onset *Clostridioides difficile* (CDI)
1b. Hospital-onset methicillin-resistant *Staphylococcus aureus* (MRSA) bacteremia

Table 2 State-specific SIRs for CLABSI from IRFs, all locations combined

Table 3 State-specific SIRs for CAUTI from IRFs, all locations combined

Table 4 State-specific SIRs for hospital-onset CDI from IRFs

Table 5 State-specific SIRs for hospital-onset MRSA bacteremia from IRFs

Table 6 Changes in national SIRs for CLABSI, CAUTI, hospital-onset CDI, and hospital-onset MRSA bacteremia from IRFs

Table 7 Changes in state-specific SIRs between 2018 and 2019 from IRFs
7a. CLABSI, all locations combined
7b. CAUTI, all locations combined
7c. Hospital-onset CDI
7d. Hospital-onset MRSA bacteremia

Appendix A Factors used in NHSN risk adjustment of the device-associated HAIs (CLABSI, CAUTI) negative binomial

Appendix B Factors used in NHSN risk adjustment of the CDI and MRSA Bacteremia negative binomial

Additional Resources [SIR Guide](#)
[Technical Appendix](#)
[HAI Progress Report Home Page](#)

NOTE: Tables contain data from Inpatient Rehabilitation Facilities (IRFs); as such, they exclude data from other types of facilities.

tion Facilities (IRFs):

\ bacteremia between 2018 and 2019 from IRFs

ative binomial regression models from IRFs

regression models from IRFs

a from Long-term Acute Care Hospitals (LTACHs), Critical Access Hospitals (CAHs), and Acute Care Hospitals (AC

);Hs).

<u>HAI Type</u>	<u>Reporting Facilities</u>	
	No. of Inpatient Rehabilitation Facilities Reporting¹	Total Patient Days
CLABSI, all⁴	723	4,620,904
CAUTI, all⁴	1,139	8,966,001

1. The number of reporting facilities included in the SIR calculation. Includes Inpatient Rehabilitation
2. Percent of facilities with at least one predicted infection that had an SIR significantly greater than
3. Facility-specific percentiles are only calculated if at least 20 facilities had ≥ 1.0 predicted HAI in
4. Data from all IRF locations (or facilities). Risk factors used in the calculation of the number of j

**Table 1a. National standardized infection (IRF) units within the acute care setting.
Central line-associated bloodstream infection (CLABSI) and catheter-associated urinary tract infection (CAUTI) are listed in Appendix A.**

Total Device Days	<u>Standardized Infection Ratio Data</u>					No. Facilities with ≥ 1 Predicted Infection
	Observed Events	Predicted Events	SIR	Lower 95% Confidence Interval	Upper 95% Confidence Interval	
366,607	131	182.174	0.719	0.604	0.850	21
574,328	1,171	1,021.140	1.147	1.083	1.214	358

ion (IRF) units within the acute care setting.
 an or less than the nominal value of the national SIR for the given HAI type. This is only calculated if at least 10 fac
 2019. If a facility's predicted number of HAIs was <1.0, a facility-specific SIR was neither calculated nor included ir
 predicted CLABSI and CAUTI are listed in Appendix A.

**infection ratios (SIRs) and facility-specific summary SIRs using HAI data reported to NHSN during 2019:
bloodstream infections (CLABSIs) and catheter-associated urinary tract infections (CAUTIs)**

Facility SIRs Compared to National SIR							
No. Facilities with SIR Significantly > National SIR		No. Facilities with SIR Significantly < National SIR					
N	%²	N	%	5%	10%	15%	20%
0	0%	0	0%	0.000	0.000	0.000	0.000
23	6%	11	3%	0.000	0.000	0.000	0.000

ilities had ≥ 1.0 predicted HAI in 2019.
n the distribution of facility-specific SIRs.

Percentile Distribution of Facility-specific SIRs³

	Median									
	25%	30%	35%	40%	45%	50%	55%	60%	65%	70%
	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.354	0.617	0.684
	0.000	0.395	0.569	0.675	0.780	0.861	0.963	1.069	1.311	1.534

75%	80%	85%	90%	95%
0.740	1.220	1.834	1.956	2.369
1.770	1.919	2.217	2.693	3.422

<u>HAI and Patient Population</u>	<u>Reporting Facilities</u>	
	Total Admissions	
Laboratory-identified <i>C. difficile</i>	1,131	504,259
Laboratory-identified MRSA bacteremia	1,026	594,951

1. The number of reporting facilities included in the SIR calculation. Includes Inpatient Rehabilitation (IR)
2. Hospital-onset events are defined as those that were identified in an inpatient location on the 4th day
3. Calculated from a negative binomial regression model. Risk factors used in the calculation of the number of events
4. Percent of facilities with at least one predicted event that had an SIR significantly greater than or less than 1.0
5. Percentile distribution of facility-specific SIRs. This is only calculated if at least 20 facilities had ≥ 1.0

**Table 1b. National standardized infect
Laboratory-identified *Clostridioi***

Total Patient Days	Standardized Infection Ratio Data					No. Facilities with ≥1 Predicted Event
	Observed Hospital-onset Events ²	Predicted Hospital-onset Events ³	SIR	Lower 95% Confidence Interval	Upper 95% Confidence Interval	
6,624,367	1,641	2,806.495	0.585	0.557	0.614	529
7,536,253	117	143.304	0.816	0.678	0.975	1

IRF) units within the acute care setting. LabID reporting is performed at facility wide for freestanding IRFs. For IRF-u y (or later) after admission to the facility.

umber of predicted events are listed in Appendix B.

is than the nominal value of the national SIR for the given HAI type. This is only calculated if at least 10 facilities ha) predicted HAI in 2019. If a facility's predicted number of events was <1.0, a facility-specific SIR was neither calcul

infection ratios (SIRs) and facility-specific summary SIRs using HAI data reported to NHSN during 2019:
Clostridium difficile (*C. difficile*) and methicillin-resistant *Staphylococcus aureus* (MRSA) bacteremia

Facility SIRs Compared to National SIR							
No. Facilities with SIR Significantly > National SIR		No. Facilities with SIR Significantly < National SIR					
N	%⁴	N	%	5%	10%	15%	20%
27	5%	21	4%	0.000	0.000	0.000	0.000
.

units located within acute care hospitals, LabID reporting is performed at unit level.

id ≥ 1.0 predicted HAI in 2019.
 ated nor included in the distribution of facility-specific SIRs.

75%	80%	85%	90%	95%
0.895	0.971	1.071	1.302	1.595
.

**Table 2. State-specific standardized infection rates for
NHSN Inpatient Rehabilitation
Central line-associated bloodstream infections**

State	State NHSN Mandate ²	Any Validation ³	No. of IRFs Reporting ⁴	No. of Infections			95% CI
				Observed	Predicted	SIR	Lower
Alabama	No	No	7	5	3.297	1.516	0.556
Alaska			2	.	.	.	.
Arizona			13	3	2.815	1.066	0.271
Arkansas			12	1	2.206	0.453	0.023
California	Yes	Yes	75	11	16.339	0.673	0.354
Colorado	Yes	Yes	19	1	4.347	0.230	0.012
Connecticut	No	No	4	.	.	.	.
D.C.			2	.	.	.	.
Delaware			3	.	.	.	.
Florida	No	Yes	29	10	10.195	0.981	0.498
Georgia			19	6	5.433	1.104	0.448
Guam			.	.	.	.	.
Hawaii			.	.	.	.	.
Idaho			3	.	.	.	.
Illinois			32	8	10.551	0.758	0.352
Indiana	No	No	25	4	5.854	0.683	0.217
Iowa	No	No	13	1	2.033	0.492	0.025
Kansas	No	No	9	1	2.093	0.478	0.024
Kentucky	No	No	7	1	2.011	0.497	0.025
Louisiana			21	5	3.358	1.489	0.546
Maine	No	No	4	.	.	.	.
Maryland	No	No	2	.	.	.	.
Massachusetts	No	No	4	.	.	.	.
Michigan			20	1	5.742	0.174	0.009
Minnesota	No	No	6	0	1.123	0.000	.
Mississippi	No	No	7	1	1.239	0.807	0.040
Missouri			17	2	3.615	0.553	0.093
Montana	No	No	5	0	0.105	.	.
Nebraska			6	1	0.932	.	.
Nevada	M	No	12	2	3.951	0.506	0.085
New Hampshire	No	No	3	.	.	.	.
New Jersey	No	No	5	3	1.869	1.605	0.408
New Mexico	No	No	4	.	.	.	.
New York			41	9	8.956	1.005	0.490
North Carolina	Yes	No	13	5	8.034	0.622	0.228
North Dakota	No	No	2	.	.	.	.
Ohio	No	No	25	4	6.676	0.599	0.190
Oklahoma			14	2	3.015	0.663	0.111
Oregon	Yes	No	6	0	0.742	.	.
Pennsylvania	Yes	Yes	74	16	23.323	0.686	0.406
Puerto Rico			2	.	.	.	.
Rhode Island	No	No	4	.	.	.	.

South Carolina	Yes	Yes	21	3	5.648	0.531	0.135
South Dakota	No	Yes	3	.	.	.	.
Tennessee	No	No	16	2	3.558	0.562	0.094
Texas	No	No	61	15	12.964	1.157	0.672
Utah			4	.	.	.	.
Vermont	No	No	2	.	.	.	.
Virgin Islands			.	.	.	.	.
Virginia	No	No	13	1	4.514	0.222	0.011
Washington	Yes	Yes	13	0	2.039	0.000	.
West Virginia	No	No	2	.	.	.	.
Wisconsin	No	Yes	17	0	3.442	0.000	.
Wyoming	No	No	.	.	.	.	.
All US			723	131	182.174	0.719	0.604

1. Includes data reported from all locations (i.e., adult and pediatric rehabilitation wards) within free-standing IRFs.
2. Yes indicates the presence of a state mandate to report facility-wide CLABSI data to NHSN at the beginning of 2019. No indicates that a state mandate did not exist during 2019. Blank fields indicate data not available
3. Yes indicates that the state health department reported the completion of all of the following validation activities: assessment of missing or implausible values on at least six months of 2019 NHSN data prior to July 1, 2020, an audit of facility medical or laboratory records prior to July 1, 2020, and a review of facility reporting of a given HAI to the state health department have performed validation on NHSN data that is voluntary (YesA indicates that the state also conducted an audit of facility medical or laboratory records prior to July 1, 2020 varies by state).
4. The number of IRFs that reported 2019 CLABSI data and are included in the SIR calculation. SIRs and accompanying data were reported from at least one location in 2019.
5. Percent of facilities with ≥ 1.0 predicted CLABSI that had an SIR significantly greater or less than the nominal value of ≥ 1.0 predicted CLABSI in 2019.
6. Facility-specific key percentiles were only calculated if at least 20 facilities had ≥ 1.0 predicted CLABSI in 2019. Facilities that did not meet this criterion were not included in the distribution of facility-specific SIRs.

1.446	0	.	.	.	.	.	.
.
1.857	0	.	.	.	.	.	.
1.866	0	.	.	.	.	.	.
.
.
1.093	1	.	.	.	.	.	.
1.469	0	.	.	.	.	.	.
.
0.870	0	.	.	.	.	.	.
.
0.850	21	0%	0%	0.000	0.000	0.000	0.740

Also includes data from CMS-certified IRF units within a hospital.
 2019. M indicates midyear implementation of a mandate.

state health department had access to 2019 NHSN data, state health department performed an
 and state health department contacted identified facilities.

to confirm proper case ascertainment (although intensity of auditing activities
 legislative mandate for the particular HAI type. Some states without mandatory
 rely shared with them by facilities in their jurisdiction.

many statistics are only calculated for states in which at least 5 IRFs reported CLABSI data

value of the 2019 national IRF CLABSI SIR of 0.719. This is only calculated if at least 10 facilities had

If a facility's predicted number of CLABSI was <1.0, a facility-specific SIR was neither calculated

tiles⁶

90%

1.956

**Table 3. State-specific standardized infection
NHSN Inpatient Rehabilitative
Catheter-associated urinary tract**

State				No. of Events		95% CI	
				Observed	Predicted	SIR	Lower
Alabama	No	No	18	31	24.427	1.269	0.878
Alaska			2	.	.	.	.
Arizona			26	40	27.620	1.448	1.049
Arkansas			24	16	18.466	0.866	0.513
California	No	No	76	44	62.235	0.707	0.520
Colorado	Yes	Yes	19	16	12.524	1.278	0.756
Connecticut	Yes	No	7	6	4.119	1.457	0.590
D.C.			2	.	.	.	.
Delaware			4	.	.	.	.
Florida	No	Yes	55	63	66.307	0.950	0.736
Georgia			28	25	25.340	0.987	0.653
Guam			.	.	.	.	.
Hawaii			1	.	.	.	.
Idaho			7	6	4.653	1.289	0.523
Illinois			41	66	42.176	1.565	1.220
Indiana	No	No	37	26	28.181	0.923	0.616
Iowa	No	No	17	20	9.765	2.048	1.286
Kansas	No	No	20	14	11.420	1.226	0.698
Kentucky	Yes	No	16	13	17.995	0.722	0.402
Louisiana			51	31	27.474	1.128	0.780
Maine	No	No	5	8	4.493	1.781	0.827
Maryland	No	No	3	.	.	.	.
Massachusetts	No	No	10	23	21.139	1.088	0.706
Michigan			38	41	30.643	1.338	0.973
Minnesota	No	No	12	12	10.774	1.114	0.603
Mississippi	No	No	10	4	6.666	0.600	0.191
Missouri			30	33	27.996	1.179	0.825
Montana	No	No	5	1	1.929	0.518	0.026
Nebraska			10	15	9.688	1.548	0.900
Nevada	No	No	14	16	13.446	1.190	0.704
New Hampshire	No	No	8	8	4.764	1.679	0.780
New Jersey	No	No	19	45	34.407	1.308	0.965
New Mexico	No	No	7	8	7.227	1.107	0.514
New York			48	52	36.485	1.425	1.075
North Carolina	Yes	No	25	40	19.566	2.044	1.480
North Dakota	No	No	3	.	.	.	.
Ohio	No	No	46	31	49.862	0.622	0.430
Oklahoma			22	12	14.192	0.846	0.458
Oregon	No	No	8	7	3.805	1.840	0.805
Pennsylvania	Yes	Yes	74	74	70.430	1.051	0.831
Puerto Rico			5	1	2.992	0.334	0.017
Rhode Island	No	No	5	4	2.565	1.559	0.496

South Carolina	No	No	22	20	13.258	1.509	0.947
South Dakota	No	Yes	3	.	.	.	.
Tennessee	Yes	Yes	30	22	22.505	0.978	0.628
Texas	No	No	143	170	141.041	1.205	1.034
Utah			10	7	6.957	1.006	0.440
Vermont	No	No	2	.	.	.	.
Virgin Islands			.	.	.	.	.
Virginia	M	No	28	27	21.946	1.230	0.827
Washington	No	No	14	15	21.085	0.711	0.413
West Virginia	Yes	No	8	19	9.630	1.973	1.223
Wisconsin	No	Yes	19	7	10.946	0.640	0.280
Wyoming	No	No	2	.	.	.	.
All US			1,139	1,171	1,021.140	1.147	1.083

1. Includes data reported from all locations (i.e., adult and pediatric rehabilitation wards) within free-standing IRFs.
2. Yes indicates the presence of a state mandate to report facility-wide CAUTI data to NHSN at the beginning of 2019. No indicates that a state mandate did not exist during 2019. Blank fields indicate data not available
3. Yes indicates that the state health department reported the completion of all of the following validation activities: assessment of missing or implausible values on at least six months of 2019 NHSN data prior to July 1, 2020, an audit of facility medical or laboratory records prior to July 1, 2020, and a review of facility reporting of a given HAI to the state health department have performed validation on NHSN data that is voluntary (YesA indicates that the state also conducted an audit of facility medical or laboratory records prior to July 1, 2020, varies by state).
4. The number of IRFs that reported 2019 CAUTI data and are included in the SIR calculation. SIRs and accompanying CAUTI rates are calculated from at least one location in 2019.
5. Percent of facilities with ≥ 1.0 predicted CAUTI that had an SIR significantly greater or less than the nominal value of ≥ 1.0 predicted CAUTI in 2019.
6. Facility-specific key percentiles were only calculated if at least 20 facilities had ≥ 1.0 predicted CAUTI in 2019. If not, they were not included in the distribution of facility-specific SIRs.

ratios (SIRs) and facility-specific SIR summary measures,
on Facilities (IRFs) reporting during 2019

ct infections (CAUTIs) in IRFs, all locations¹

for SIR	Facility-specific SIRs			10%	25%	
	Upper	No. of facilities with at least 1 predicted CAUTI				
1.779	11	0%	20%	.	.	.
.
1.953	13	15%	8%	.	.	.
1.377	5	.	.	.	.	.
0.941	22	0%	0%	0.000	0.000	0.654
2.030	6	.	.	.	.	.
3.030	1	.	.	.	.	.
.
1.208	32	3%	0%	0.000	0.000	0.656
1.435	11	0%	0%	.	.	.
.
.
2.682	2
1.978	15	7%	0%	.	.	.
1.333	10	0%	10%	.	.	.
3.107	4
2.008	3
1.204	6
1.582	7
3.381	2
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1.607	4
1.798	9
1.894	5
1.447	4
1.636	6
2.557	0
2.496	2
1.891	5
3.189	1
1.735	12	0%	0%	.	.	.
2.102	3
1.854	12	8%	8%	.	.	.
2.757	7	.	.	.	.	.
.
0.872	17	0%	18%	.	.	.
1.437	4	.	.	.	.	.
3.639	0	.	.	.	.	.
1.312	22	5%	0%	0.000	0.000	0.818
1.648	1	.	.	.	.	.
3.762	0	.	.	.	.	.

2.288	3	.	.	.	.	.	.
1.456	7	.	.	.	.	.	.
1.397	53	8%	2%	0.000	0.000	0.784	.
1.990	2	.	.	.	.	.	.
1.765	9	.	.	.	.	.	.
1.147	6	.	.	.	.	.	.
3.024	6	.	.	.	.	.	.
1.265	2	.	.	.	.	.	.
1.214	358	6%	3%	0.000	0.000	0.861	.

Also includes data from CMS-certified IRF units within a hospital.

019. M indicates midyear implementation of a mandate.

state health department had access to 2019 NHSN data, state health department performed an audit and state health department contacted identified facilities.

10 to confirm proper case ascertainment (although intensity of auditing activities

legislative mandate for the particular HAI type. Some states without mandatory

publicly shared with them by facilities in their jurisdiction.

Reporting statistics are only calculated for states in which at least 5 IRFs reported CAUTI data

Rate of the 2019 national IRF CAUTI SIR of 1.147. This is only calculated if at least 10 facilities had

Reported a facility's predicted number of CAUTI was <1.0, a facility-specific SIR was neither calculated

75%	90%
.	.
.	.
.	.
0.935	0.992
.	.
.	.
1.316	1.909
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1.366	1.959
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1.248

3.048

1.770

2.693

**Table 4. State-specific standardized infection rates
NHSN Inpatient Rehabilitation
Laboratory-identified healthcare facility-ons**

State				No. of Events		95% CI	
				Observed	Predicted	SIR	Lower
Alabama	No	No	18	36	67.930	0.530	0.377
Alaska			2	.	.	.	.
Arizona			26	48	75.090	0.639	0.477
Arkansas			23	23	57.424	0.401	0.260
California	Yes	Yes	76	61	135.267	0.451	0.348
Colorado	Yes	Yes	19	17	26.895	0.632	0.381
Connecticut	Yes	Yes	7	3	9.941	0.302	0.077
D.C.			2	.	.	.	.
Delaware			4	.	.	.	.
Florida	No	Yes	52	117	220.828	0.530	0.440
Georgia			28	25	56.745	0.441	0.291
Guam			0	.	.	.	.
Hawaii			1	.	.	.	.
Idaho			7	2	7.535	0.265	0.044
Illinois			41	39	107.192	0.364	0.262
Indiana	No	No	36	39	68.198	0.572	0.412
Iowa	No	No	17	10	9.930	1.007	0.512
Kansas	No	Yes	20	17	41.473	0.410	0.247
Kentucky	Yes	Yes	16	52	66.245	0.785	0.592
Louisiana			49	21	59.756	0.351	0.223
Maine	No	Yes	5	6	11.011	0.545	0.221
Maryland	No	No	3	.	.	.	.
Massachusetts	No	No	10	56	80.172	0.698	0.533
Michigan			38	26	59.663	0.436	0.291
Minnesota			12	6	10.249	0.585	0.237
Mississippi	Yes	No	10	4	16.577	0.241	0.077
Missouri			30	34	68.617	0.496	0.349
Montana	No	No	4	.	.	.	.
Nebraska			10	9	16.943	0.531	0.259
Nevada	No	No	14	55	49.867	1.103	0.839
New Hampshire	No	No	8	19	24.512	0.775	0.481
New Jersey	No	No	19	99	127.044	0.779	0.637
New Mexico	No	No	7	14	23.761	0.589	0.335
New York			49	32	74.675	0.429	0.298
North Carolina	Yes	No	25	31	68.301	0.454	0.314
North Dakota	No	No	3	.	.	.	.
Ohio	No	No	46	59	112.226	0.526	0.404
Oklahoma			23	18	38.299	0.470	0.287
Oregon	Yes	Yes	8	0	5.536	0.000	.
Pennsylvania	Yes	Yes	73	137	199.920	0.685	0.578
Puerto Rico			6	2	11.618	0.172	0.029
Rhode Island	No	No	5	4	3.934	1.017	0.323

South Carolina	Yes	Yes	22	40	59.397	0.673	0.488
South Dakota	No	Yes	3	.	.	.	.
Tennessee	Yes	Yes	30	31	77.594	0.400	0.276
Texas	No	No	141	302	415.275	0.727	0.649
Utah			10	13	11.717	1.109	0.617
Vermont	No	No	2	.	.	.	.
Virgin Islands			0	.	.	.	.
Virginia	M	No	27	49	72.160	0.679	0.508
Washington	Yes	Yes	14	11	22.350	0.492	0.259
West Virginia	Yes	No	8	32	51.970	0.616	0.428
Wisconsin	No	No	20	11	19.214	0.572	0.301
Wyoming	No	No	2	.	.	.	.
All US			1,131	1,641	2,806.495	0.585	0.557

1. Includes data reported from all locations (i.e., adult and pediatric rehabilitation wards) within free-standing IRFs. Healthcare facility-onset is defined as event detected on the 4th day (or later) after admission to a free-standing IRF. Alternatively, this measure includes events detected on the 4th day (or later) after transfer to an IRF unit within a free-standing IRF.
2. Yes indicates the presence of a state mandate to report facility-wide CDI data to NHSN at the beginning of 2019. No indicates that a state mandate did not exist during 2019. Blank fields indicate data not available.
3. Yes indicates that the state health department reported the completion of all of the following validation activities: assessment of missing or implausible values on at least six months of 2019 NHSN data prior to July 1, 2020, an audit of facility medical or laboratory records prior to July 1, 2020 (varies by state). Information on validation efforts was requested from all states, regardless of the presence of a reporting of a given HAI to the state health department have performed validation on NHSN data that is voluntary.
4. The number of IRFs that reported 2019 CDI data and are included in the SIR calculation. SIRs and accompany data in 2019.
5. Percent of facilities with ≥ 1.0 predicted CDI that had an SIR significantly greater or less than the nominal value ≥ 1.0 predicted CDI in 2019.
6. Facility-specific key percentiles were only calculated if at least 20 facilities had ≥ 1.0 predicted CDI in 2019. If a facility was neither calculated nor included in the distribution of facility-specific SIRs.

ratios (SIRs) and facility-specific SIR summary measures,
 1 Facilities (IRFs) reporting during 2019
 et *Clostridioides difficile* infection (CDI), facility-wide¹

Upper for SIR	Facility-specific SIRs				10%	25%	75%
	No. of facilities with at least 1 predicted CDI						
0.726	12	17%	17%	.	.	.	.
.
0.840	14	0%	7%	.	.	.	.
0.591	9	.	.	.	.	.	.
0.575	30	0%	0%	0.000	0.000	0.299	0.691
0.991	9	.	.	.	.	.	.
0.821	2	.	.	.	.	.	.
.
.
0.633	43	2%	0%	0.000	0.107	0.474	0.770
0.641	14	7%	7%	.	.	.	.
.
.
0.877	3	.	.	.	.	.	.
0.492	18	0%	6%	.	.	.	.
0.774	14	0%	0%	.	.	.	.
1.795	1	.	.	.	.	.	.
0.643	8	.	.	.	.	.	.
1.021	6	.	.	.	.	.	.
0.528	20	0%	0%	0.000	0.000	0.000	0.423
1.133	2	.	.	.	.	.	.
.
0.900	6	.	.	.	.	.	.
0.629	14	0%	7%	.	.	.	.
1.218	4	.	.	.	.	.	.
0.582	4	.	.	.	.	.	.
0.685	9	.	.	.	.	.	.
.
0.975	3	.	.	.	.	.	.
1.425	9	.	.	.	.	.	.
1.188	6	.	.	.	.	.	.
0.945	14	14%	7%	.	.	.	.
0.965	3	.	.	.	.	.	.
0.598	23	4%	4%	0.000	0.000	0.054	0.754
0.636	14	0%	0%	.	.	.	.
.
0.673	19	5%	11%	.	.	.	.
0.728	7	.	.	.	.	.	.
0.541	1	.	.	.	.	.	.
0.807	33	12%	6%	0.000	0.165	0.681	0.964
0.569	3	.	.	.	.	.	.
2.453	1	.	.	.	.	.	.

0.908	12	0%	0%	.	.	.	.
.
0.560	14	0%	7%	.	.	.	.
0.813	81	10%	1%	0.000	0.267	0.651	1.010
1.850	4	.	.	.	.	.	.
.
.
0.890	15	13%	0%	.	.	.	.
0.855	4	.	.	.	.	.	.
0.859	6	.	.	.	.	.	.
0.995	5	.	.	.	.	.	.
.
0.614	529	5%	4%	0.000	0.000	0.536	0.895

Also includes data from CMS-certified IRF units within a hospital.
inpatient rehabilitation facility.
hospital.

) . M indicates midyear implementation of a mandate.

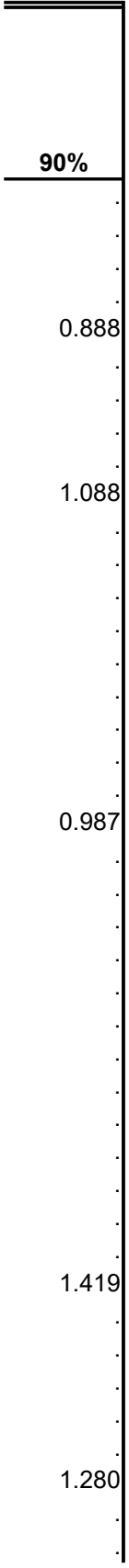
: state health department had access to 2019 NHSN data, state health department performed an
id state health department contacted identified facilities.

!0 to confirm proper case ascertainment (although intensity of auditing activities
legislative mandate for the particular HAI type. Some states without mandatory
ily shared with them by facilities in their jurisdiction.

ing statistics are only calculated for states in which at least 5 IRFs reported CDI

of the 2019 national IRF CDI SIR of 0.585. This is only calculated if at least 10 facilities had

facility's predicted number of CDI was <1.0, a facility-specific SIR



1.424

1.302

**Table 5. State-specific standardized infection ratios (SIRs) and facility-specific
NHSN Inpatient Rehabilitation Facilities (IRFs) reporting during
Laboratory-identified healthcare facility-onset methicillin-resistant *Staphylococcus aureus***

State				No. of Events		95% CI for SIR			No. of facilities with at least 1 predicted MRSA
				Observed	Predicted	SIR	Lower	Upper	
Alabama	No	No	13	3	2.254	1.331	0.339	3.622	0
Alaska			2	.	.	.	.	.	.
Arizona			21	0	2.833	0.000		1.057	0
Arkansas			19	2	2.377	0.841	0.141	2.780	0
California	Yes	Yes	76	4	10.885	0.367	0.117	0.886	0
Colorado	No	NO	16	1	1.748	0.572	0.029	2.821	0
Connecticut	M	No	7	0	0.655	.	.	.	0
D.C.			2	.	.	.	.	.	.
Delaware			2	.	.	.	.	.	.
Florida	No	Yes	46	13	9.242	1.407	0.782	2.345	0
Georgia			26	3	3.31	0.906	0.231	2.467	0
Guam			0	.	.	.	.	.	.
Hawaii			0	.	.	.	.	.	.
Idaho			4	.	.	.	.	.	.
Illinois			40	6	5.685	1.055	0.428	2.195	0
Indiana	No	No	34	1	3.604	0.277	0.014	1.368	0
Iowa	No	No	16	0	1.104	0.000	.	2.714	0
Kansas	No	Yes	19	3	1.598	1.877	0.478	5.109	0
Kentucky	Yes	No	14	2	2.715	0.737	0.124	2.434	0
Louisiana			45	6	3.7	1.622	0.657	3.373	0
Maine	No	No	5	0	0.78	.	.	.	.
Maryland	No	No	3	.	.	.	.	.	.
Massachusetts	No	No	6	1	1.197	0.835	0.042	4.120	0
Michigan			38	7	4.864	1.439	0.629	2.847	0
Minnesota			12	1	1.153	0.867	0.043	4.277	0
Mississippi	Yes	No	10	1	1.417	0.706	0.035	3.481	0
Missouri			26	2	2.881	0.694	0.116	2.294	0
Montana	No	No	3	.	.	.	.	.	.
Nebraska			8	0	0.631	.	.	.	0

Nevada	Yes	No	14	1	2.602	0.384	0.019	1.895	0
New Hampshire	No	No	8	0	1.082	0.000	.	2.769	0
New Jersey	No	No	18	4	5.081	0.787	0.250	1.899	0
New Mexico	No	No	6	0	0.953	.	.	.	0
New York			49	6	7.46	0.804	0.326	1.673	0
North Carolina	Yes	No	25	9	4.32	2.083	1.016	3.823	0
North Dakota	No	No	3	.	.	.	.	.	.
Ohio	No	No	42	3	6.146	0.488	0.124	1.328	1
Oklahoma			20	2	1.842	1.086	0.182	3.587	0
Oregon	Yes	Yes	6	0	0.539	.	.	.	0
Pennsylvania	Yes	Yes	74	8	12.138	0.659	0.306	1.252	0
Puerto Rico			5	0	0.67	.	.	.	.
Rhode Island	No	No	5	2	0.395	.	.	.	.
South Carolina	Yes	Yes	22	2	3.743	0.534	0.090	1.765	0
South Dakota	No	Yes	3	.	.	.	.	.	.
Tennessee	Yes	Yes	30	3	4.739	0.633	0.161	1.723	0
Texas	No	No	111	10	13.764	0.727	0.369	1.295	0
Utah			8	0	0.809	.	.	.	0
Vermont	No	No	2	.	.	.	.	.	.
Virgin Islands			0	.	.	.	.	.	.
Virginia	No	No	26	4	4.018	0.996	0.316	2.401	0
Washington	No	No	11	0	1.068	0.000	.	2.805	0
West Virginia	Yes	No	8	2	2.407	0.831	0.139	2.745	0
Wisconsin	No	No	16	2	1.311	1.526	0.256	5.040	0
Wyoming	No	No	1	.	.	.	.	.	.
All US			1,026	117	143.304	0.816	0.678	0.975	1

1. Includes data reported from all locations (i.e., adult and pediatric rehabilitation wards) within free-standing IRFs. Also includes data from CMS-certified Healthcare facility-onset is defined as event detected on the 4th day (or later) after admission to a free-standing inpatient rehabilitation facility. Alternatively, this measure includes events detected on the 4th day (or later) after transfer to an IRF unit within a hospital.
2. Yes indicates the presence of a state mandate to report facility-wide MRSA bacteremia data to NHSN at the beginning of 2019. M indicates midyear. No indicates that a state mandate did not exist during 2019. Blank fields indicate data not available.
3. Yes indicates that the state health department reported the completion of all of the following validation activities: state health department had access to NHSN data for a random sample of facilities for a period of at least six months of 2019 NHSN data prior to July 1, 2020, and state health department conducted an assessment of missing or implausible values on at least six months of 2019 NHSN data prior to July 1, 2020, and state health department contacted facilities to confirm proper case ascertainment (state health department contact status varies by state). YesA indicates that the state also conducted an audit of facility medical or laboratory records prior to July 1, 2020 to confirm proper case ascertainment (state health department contact status varies by state). Information on validation efforts was requested from all states, regardless of the presence of a legislative mandate for the particular state. No indicates that the state health department has not performed validation on NHSN data that is voluntarily shared with them by facilities in that state.

4. The number of IRFs that reported 2019 MRSA bacteremia data and are included in the SIR calculation. SIRs and accompanying statistics are only bacteremia data from at least one location in 2019.
5. Percent of facilities with ≥ 1.0 predicted MRSA bacteremia that had an SIR significantly greater or less than the nominal value of the 2019 national IF ≥ 1.0 predicted MRSA bacteremia in 2019.
6. Facility-specific key percentiles were only calculated if at least 20 facilities had ≥ 1.0 predicted MRSA bacteremia in 2019. If a facility's predicted number was neither calculated nor included in the distribution of facility-specific SIRs.

calculated for states in which at least 5 IRFs reported MRSA

RF MRSA SIR of 0.816. This is only calculated if at least 10 facilities had

number of MRSA bacteremia was <1.0 , a facility-specific SIR

**Table 6. Changes in national standardized infection
Central line-associated bloodstream infections (CLABSIs)**

€

HAI Type ¹	2018 SIR	2019 SIR
CLABSI, all locations	0.829	0.719
CAUTI, all locations	1.170	1.147
Laboratory-identified MRSA bacteremia	0.929	0.816
Laboratory-identified <i>C. difficile</i> infections	0.635	0.585

* Statistically significant, $p < 0.0500$

1. Includes data reported from all locations (i.e., adult and pediatric rehabilitation wards) within free-standing IRFs. For IRF-units located within acute care hospitals, LabID reporting is performed at facility wide for freestanding IRFs. For IRF-units located within acute care hospitals, LabID reporting is performed at facility wide for freestanding IRFs.

ratios (SIRs) using HAI data reported from all NHSN Inpatient Rehabilitation Facilities reporting during 2018, catheter-associated urinary tract infections (CAUTIs), methicillin-resistant *Staphylococcus aureus* (MRSA), and *Clostridioides difficile* infection (CDI), 2018 compared to 2019

Percent Change	Direction of Change, Based on Statistical Significance	p-value
13%	No change	0.2377
2%	No change	0.6168
12%	No change	0.2870
-8%	Decrease	0.0087

standing IRFs. Also includes data from CMS-certified IRF units within a hospital. For non-standalone hospitals, LabID reporting is performed at unit level.

2019 by HAI:
MRSA) bacteremia,

Table 7. Changes in state-specific standardized infection ratios (SIRs) between 2018 and 2019 from NHSN Inpatient Rehabilitation Facilities

7a. Central line-associated bloodstream infections (CLABSI), all locations¹

State ²	All Inpatient Rehabilitation Facilities Reporting to NHSN				
	2018 SIR	2019 SIR	Percent Change	Direction of Change, Based on Statistical Significance	p-value
Alabama	0.662	1.516	129%	No change	0.3423
Alaska	.	.	.	.	.
Arizona	0.382	1.066	179%	No change	0.4122
Arkansas	0.346	0.453	31%	No change	0.8663
California	0.539	0.673	25%	No change	0.6298
Colorado	0.000	0.230	.	.	.
Connecticut	.	.	.	.	.
D.C.	.	.	.	.	.
Delaware	.	.	.	.	.
Florida	0.725	0.981	35%	No change	0.5343
Georgia	0.771	1.104	43%	No change	0.5965
Guam	.	.	.	.	.
Hawaii	.	.	.	.	.
Idaho	.	.	.	.	.
Illinois	0.957	0.758	21%	No change	0.6394
Indiana	0.438	0.683	56%	No change	0.5817
Iowa	2.070	0.492	76%	No change	0.1995
Kansas	0.500	0.478	4%	No change	0.9778
Kentucky	1.709	0.497	71%	No change	0.3561
Louisiana	0.866	1.489	72%	No change	0.4810
Maine	.	.	.	.	.
Maryland	.	.	.	.	.
Massachusetts	.	.	.	.	.
Michigan	0.549	0.174	68%	No change	0.3508
Minnesota	3.251	0.000	100%	No change	0.0748
Mississippi	0.698	0.807	16%	No change	0.9274
Missouri	0.000	0.553	.	No change	0.2645
Montana	.	.	.	.	.
Nebraska	.	.	.	.	.
Nevada	0.532	0.506	5%	No change	0.9629
New Hampshire	.	.	.	.	.
New Jersey	2.435	1.605	34%	No change	0.5932
New Mexico	.	.	.	.	.
New York	0.965	1.005	4%	No change	0.9387
North Carolina	0.917	0.622	32%	No change	0.5356
North Dakota	.	.	.	.	.
Ohio	0.767	0.599	22%	No change	0.7270
Oklahoma	1.245	0.663	47%	No change	0.5218
Oregon	.	.	.	.	.
Pennsylvania	1.050	0.686	35%	No change	0.1892
Puerto Rico	.	.	.	.	.
Rhode Island	.	.	.	.	.

South Carolina	1.025	0.531	48%	No change	0.3884
South Dakota	.	.	.	.	.
Tennessee	1.891	0.562	70%	No change	0.1225
Texas	1.217	1.157	5%	No change	0.8905
Utah	.	.	.	.	.
Vermont	.	.	.	.	.
Virgin Islands	.	.	.	.	.
Virginia	0.446	0.222	50%	No change	0.6213
Washington	0.370	0.000	100%	No change	0.5703
West Virginia	.	.	.	.	.
Wisconsin	0.287	0.000	100%	No change	0.5030
Wyoming	.	.	.	.	.
All US	0.829	0.719	13%	No change	0.2377

* Statistically significant, $p < 0.0500$

1. Includes data reported from all locations (i.e., adult and pediatric rehabilitation wards) within free-standing I
2. Percent change and supporting statistics are not calculated for states if the 2018 or 2019 SIRs is not calcula

RFs. Also includes data from CMS-certified IRF units within a hospital.
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Table 7. Changes in state-specific standardized infection ratios (SIRs) between 2018 and 2019 from NHSN Inpatient Rehabilitation Facilities

7b. Catheter-associated urinary tract infections (CAUTI), all locations¹

	All Inpatient Rehabilitation Facilities Reporting to NHSN				
	2018 SIR	2019 SIR	Percent Change	Direction of Change, Based on Statistical Significance	p-value
Alabama	0.662	1.269	92%	Increase	0.0394
Alaska	.	.	.	.	.
Arizona	1.008	1.448	44%	No change	0.1555
Arkansas	0.918	0.866	6%	No change	0.8708
California	0.769	0.707	8%	No change	0.6840
Colorado	1.639	1.278	22%	No change	0.4583
Connecticut	1.844	1.457	21%	No change	0.6755
D.C.	.	.	.	.	.
Delaware	.	.	.	.	.
Florida	0.923	0.950	3%	No change	0.8661
Georgia	0.860	0.987	15%	No change	0.6513
Guam	.	.	.	.	.
Hawaii	.	.	.	.	.
Idaho	0.772	1.289	67%	No change	0.4444
Illinois	1.444	1.565	8%	No change	0.6476
Indiana	0.868	0.923	6%	No change	0.8259
Iowa	1.740	2.048	18%	No change	0.6400
Kansas	1.635	1.226	25%	No change	0.4146
Kentucky	0.924	0.722	22%	No change	0.5283
Louisiana	1.141	1.128	1%	No change	0.9648
Maine	0.720	1.781	147%	No change	0.1824
Maryland	.	.	.	.	.
Massachusetts	1.795	1.088	39%	No change	0.0597
Michigan	1.256	1.338	7%	No change	0.7763
Minnesota	1.574	1.114	29%	No change	0.3592
Mississippi	1.506	0.600	60%	No change	0.1099
Missouri	1.063	1.179	11%	No change	0.6878
Montana	1.152	0.518	55%	No change	0.5668
Nebraska	1.172	1.548	32%	No change	0.4685
Nevada	0.696	1.190	71%	No change	0.1861
New Hampshire	1.614	1.679	4%	No change	0.9374
New Jersey	1.460	1.308	10%	No change	0.5922
New Mexico	0.760	1.107	46%	No change	0.5262
New York	1.172	1.425	22%	No change	0.3326
North Carolina	1.591	2.044	28%	No change	0.3010
North Dakota	.	.	.	.	.
Ohio	1.065	0.622	-42%	Decrease	0.0177
Oklahoma	0.607	0.846	39%	No change	0.4607
Oregon	1.444	1.840	27%	No change	0.6739
Pennsylvania	1.041	1.051	1%	No change	0.9514
Puerto Rico	0.931	0.334	64%	No change	0.4132
Rhode Island	0.692	1.559	125%	No change	0.3736

South Carolina	1.687	1.509	11%	No change	0.7274
South Dakota	.	.	.	.	.
Tennessee	1.483	0.978	34%	No change	0.1230
Texas	1.399	1.205	14%	No change	0.1548
Utah	1.702	1.006	41%	No change	0.2755
Vermont	.	.	.	.	.
Virgin Islands	.	.	.	.	.
Virginia	1.522	1.230	19%	No change	0.4152
Washington	0.938	0.711	24%	No change	0.4196
West Virginia	0.841	1.973	135%	Increase	0.0475
Wisconsin	1.208	0.640	47%	No change	0.1544
Wyoming	.	.	.	.	.
All US	1.170	1.147	2%	No change	0.6168

* Statistically significant, $p < 0.0500$

1. Includes data reported from all locations (i.e., adult and pediatric rehabilitation wards) within free-standing IR
2. Percent change and supporting statistics are not calculated for states if the 2018 or 2019 SIRs is not calculated

IRFs. Also includes data from CMS-certified IRF units within a hospital.
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Table 7. Changes in state-specific standardized infection ratios (SIRs) between 2018 and 2019 from NHSN Inpatient Rehabilitation Facilities

7c. Laboratory-identified *Clostridioides difficile* infection (CDI),¹

	All Inpatient Rehabilitation Facilities Reporting to NHSN				
	2018 SIR	2019 SIR	Percent Change	Direction of Change, Based on Statistical Significance	p-value
Alabama	0.748	0.530	29%	No change	0.0908
Alaska	.	.	.	.	.
Arizona	0.613	0.639	4%	No change	0.8251
Arkansas	0.680	0.401	-41%	Decrease	0.0327
California	0.589	0.451	23%	No change	0.0766
Colorado	0.449	0.632	41%	No change	0.3035
Connecticut	0.431	0.302	30%	No change	0.6372
D.C.	.	.	.	.	.
Delaware	.	.	.	.	.
Florida	0.715	0.530	-26%	Decrease	0.0079
Georgia	0.593	0.441	26%	No change	0.2168
Guam	.	.	.	.	.
Hawaii	.	.	.	.	.
Idaho	0.871	0.265	70%	No change	0.1035
Illinois	0.585	0.364	-38%	Decrease	0.0079
Indiana	0.848	0.572	-33%	Decrease	0.0387
Iowa	0.729	1.007	38%	No change	0.4192
Kansas	0.502	0.410	18%	No change	0.5152
Kentucky	0.727	0.785	8%	No change	0.6837
Louisiana	0.427	0.351	18%	No change	0.4748
Maine	0.411	0.545	33%	No change	0.6178
Maryland	.	.	.	.	.
Massachusetts	1.001	0.698	-30%	Decrease	0.0375
Michigan	0.595	0.436	27%	No change	0.1591
Minnesota	0.558	0.585	5%	No change	0.8897
Mississippi	0.636	0.241	62%	No change	0.0655
Missouri	0.701	0.496	29%	No change	0.0910
Montana	.	.	.	.	.
Nebraska	0.458	0.531	16%	No change	0.7129
Nevada	0.996	1.103	11%	No change	0.5799
New Hampshire	0.775	0.775	0%	No change	0.9948
New Jersey	0.929	0.779	16%	No change	0.1989
New Mexico	0.764	0.589	23%	No change	0.4544
New York	0.590	0.429	27%	No change	0.1046
North Carolina	0.318	0.454	43%	No change	0.1562
North Dakota	.	.	.	.	.
Ohio	0.645	0.526	18%	No change	0.2093
Oklahoma	0.515	0.470	9%	No change	0.7685
Oregon	0.300	0.000	100%	No change	0.2381
Pennsylvania	0.669	0.685	2%	No change	0.8216
Puerto Rico	0.193	0.172	11%	No change	0.9150
Rhode Island	0.673	1.017	51%	No change	0.5276

South Carolina	0.556	0.673	21%	No change	0.4084
South Dakota	.	.	.	.	.
Tennessee	0.638	0.400	-37%	Decrease	0.0279
Texas	0.634	0.727	15%	No change	0.0861
Utah	0.668	1.109	66%	No change	0.1641
Vermont	.	.	.	.	.
Virgin Islands	.	.	.	.	.
Virginia	0.537	0.679	26%	No change	0.2363
Washington	0.322	0.492	53%	No change	0.3183
West Virginia	0.650	0.616	5%	No change	0.8431
Wisconsin	0.595	0.572	4%	No change	0.9329
Wyoming	.	.	.	.	.
All US	0.635	0.585	-8%	Decrease	0.0087

* Statistically significant, $p < 0.0500$

1. Includes data reported from all locations (i.e., adult and pediatric rehabilitation wards) within free-standing IR
2. Percent change and supporting statistics are not calculated for states if the 2018 or 2019 SIRs is not calculated

Fs. Also includes data from CMS-certified IRF units within a hospital.

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Table 7. Changes in state-specific standardized infection ratios (SIRs) between 2018 and 2019 from NHSN Inpatient Rehabilitation Facilities

7d. Laboratory-identified methicillin-resistant *Staphylococcus aureus* (MRSA) bacteremia¹

	All Inpatient Rehabilitation Facilities Reporting to NHSN				
	2018 SIR	2019 SIR	Percent Change	Direction of Change, Based on Statistical Significance	p-value
Alabama	1.340	1.331	1%	No change	1.0000
Alaska	.	.	.	.	.
Arizona	0.234	0.000	100%	No change	0.6018
Arkansas	0.309	0.841	172%	No change	0.4618
California	0.851	0.367	57%	No change	0.1640
Colorado	0.000	0.572	.	No change	0.4701
Connecticut	.	.	.	.	.
D.C.	.	.	.	.	.
Delaware	.	.	.	.	.
Florida	1.394	1.407	1%	No change	0.9721
Georgia	1.357	0.906	33%	No change	0.6056
Guam	.	.	.	.	.
Hawaii	.	.	.	.	.
Idaho	.	.	.	.	.
Illinois	0.943	1.055	12%	No change	0.8378
Indiana	0.966	0.277	71%	No change	0.2776
Iowa	.	.	.	.	.
Kansas	0.439	1.877	328%	No change	0.2225
Kentucky	2.262	0.737	67%	No change	0.1571
Louisiana	1.156	1.622	40%	No change	0.5898
Maine	.	.	.	.	.
Maryland	.	.	.	.	.
Massachusetts	0.799	0.835	5%	No change	0.9170
Michigan	1.285	1.439	12%	No change	0.8347
Minnesota	0.000	0.867	.	No change	0.4790
Mississippi	0.723	0.706	2%	No change	0.9879
Missouri	0.239	0.694	190%	No change	0.4312
Montana	.	.	.	.	.
Nebraska	0.000	.	.	.	.
Nevada	0.000	0.384	.	No change	0.5015
New Hampshire	1.488	0.000	100%	No change	0.3069
New Jersey	0.347	0.787	127%	No change	0.3699
New Mexico	0.000	.	.	.	.
New York	0.913	0.804	12%	No change	0.828
North Carolina	1.163	2.083	79%	No change	0.3059
North Dakota	.	.	.	.	.
Ohio	0.584	0.488	16%	No change	0.8319
Oklahoma	2.535	1.086	57%	No change	0.3142
Oregon	.	.	.	.	.
Pennsylvania	1.030	0.659	36%	No change	0.3280
Puerto Rico	.	.	.	.	.
Rhode Island	.	.	.	.	.

South Carolina	0.878	0.534	39%	No change	0.6177
South Dakota	.	.	.	.	.
Tennessee	1.659	0.633	62%	No change	0.1537
Texas	0.938	0.727	22%	No change	0.5221
Utah	.	.	.	.	.
Vermont	.	.	.	.	.
Virgin Islands	.	.	.	.	.
Virginia	1.431	0.996	30%	No change	0.5931
Washington	0.000	0.000	.	.	.
West Virginia	1.287	0.831	35%	No change	0.6820
Wisconsin	1.185	1.526	29%	No change	0.8124
Wyoming	.	.	.	.	.
All US	0.929	0.816	12%	No change	0.2870

* Statistically significant, $p < 0.0500$

1. Includes data reported from all locations (i.e., adult and pediatric rehabilitation wards) within free-standing
2. Percent change and supporting statistics are not calculated for states if the 2018 or 2019 SIRs is not calcul

IRFs. Also includes data from CMS-certified IRF units within a hospital.
lated

Appendix A. Factors used in NHSN risk adjustment of the device-associated HAIs (CLABSI, CAUTI) negative binomial regression models¹ from Inpatient Rehabilitation Facilities

HAI Type	Validated Parameters for Risk Model
CLABSI	Intercept*
CAUTI	Intercept Setting [‡] Proportion of Admissions- Traumatic and Non-Traumatic Spinal Cord Dysfunction combined** Proportion of Admissions- Stroke**

1. SIR Guide: <https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/nhsn-sir-guide.pdf>

* None of the variables investigated were statistically significantly associated with CLABSI in IRFs. Free-standing IRFs and CMS-certified IRF units within a hospital will have the predicted number of events calculated using the 2019 national IRF CLABSI pooled mean (i.e., intercept-only model).

** Proportion of annual admissions with primary diagnoses are taken from the Annual IRF Survey and

[‡]IRF Setting is taken from the Annual IRF Survey and NHSN enrollment/location mapping data.

**Appendix B. Factors used in
regression models¹ from**

HAI Type

CDI

MRSA bacteremia

* None of the variables included in these models were measured at the unit level. Therefore, none of the variables included in these models will vary between units within a hospital.

**Model in NHSN risk adjustment of the CDI and MRSA Bacteremia negative binomial
Inpatient Rehabilitation Facilities**

Validated Parameters for Risk Model	
Intercept	CDI Test
Type (free-standing or unit)	Type of IRF (free-
Community Onset CDI events	
Percentage of Admissions- Orthopedic Conditions	
Percentage of Admissions- Stroke	
Percentage of Admissions- Traumatic and Non-Traumatic Spinal Cord Dysfunction	
Intercept*	

Parameters investigated were statistically significantly associated with hospital-onset MRSA bacteremia in IRFs. Free-standing IRFs have the predicted number of events calculated using the 2019 national IRF MRSA bacteremia incidence rate (i

IRFs and CMS-certified IRF
(i.e., intercept-only model).

Additional Resources

SIR Guide: <https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/nhsn-sir-guide.pdf>

Technical Appendix (2019 Report): <http://www.cdc.gov/hai/progress-report/index.html>

Explains the methodology used to produce the HAI Report.

HAI Progress Report Home Page: <http://www.cdc.gov/hai/progress-report/index.html>

The complete HAI Report, including Executive Summary and previous reports, can be found at the above web

site.