2018 National ar

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Introduction:

Welcome to the 2018 National and State HAI Progress Report using the 2015 baseline at are used to describe different HAI types by comparing the number of observed 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 fac

Scope of report:

HAI Type	l IR
	National
Central line-associated bloodstream infections (CLABSI) by locations	Ø
Catheter-associated urinary tract infections (CAUTI) by locations	☑
Hospital-onset Clostridioides difficile (CDI) by facility-wide reporting	☑
Hospital-onset methicillin-resistant Staphylococcus aureus (MRSA)	
bacteremia by facility-wide reporting	☑

nd State HAI Progress Report

t Rehabilitation Facilities

nd risk adjustment calculations. Standardized infection ratios (SIRs) to the number of predicted infections. This year's report will compare 2018 SIRs to those from the prior year.

ilities (IRFs).



2018 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 Rehabilita 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 State-specific SIRs for hospital-onset CDI from IRFs Table 4 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 MRS/ Table 7 Changes in state-specific SIRs between 2017 and 2018 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) neg 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 dat

tion Facilities (IRFs):
A bacteremia between 2017 and 2018 from IRFs
ative binomial regression models from IRFs
regression models from IRFs
ta from Long-term Acute Care Hospitals (LTACHs), Critical Access Hospitals (CAHs), and Acute Care Hospitals (A



HAI Type		Reporting Facilities
	No. of Inpatient Rehabilitation Facilities Reporting ¹	Total Patient Days
CLABSI, all ⁴	714	4,365,161
CAUTI, all⁴	1,156	8,847,711

- 1. The number of reporting facilities included in the SIR calculation. Includes Inpatient Rehabilitat
- 2. Percent of facilities with at least one predicted infection that had an SIR significantly greater the
- 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 \parallel

Table 1a. National standardized infe Central line-associated bl

<u>=</u>			Standardized Infection Ratio Data						
	Total Device Days	Observed Events			Lower 95% Confidence Interval	Upper 95% Confidence Interval	No. Facilities with ≥1 Predicted Infection		
	357,291	147	177.361	0.829	0.703	0.971	21		
	585,502	1,224	1,045.740	1.170	1.106	1.237	336		

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 fact 2018. If a facility's predicted number of HAIs was <1.0, a facility-specific SIR was neither calculated nor included i predicted CLABSI and CAUTI are listed in Appendix A.

ection ratios (SIRs) and facility-specific summary SIRs using HAI data reported to NHSN during 2018: loodstream infections (CLABSIs) and catheter-associated urinary tract infections (CAUTIs)

Facility SIRs Compa							
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
O	070	O	0 70	0.000	0.000	0.000	0.000
14 4%		11	3%	0.000	0.000	0.000	0.000

cilities had ≥ 1.0 predicted HAI in 2018. n the distribution of facility-specific SIRs.

Percentile Distribution of Facility-specific SIRs³

М	ed	iaı	า

25%	30%	35%	40%	45%	50%	55%	60%	65%	70%
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.409	0.697
0.000	0.516	0.602	0.722	0.843	0.928	0.989	1.174	1.394	1.557

75%	80%	85%	90%	95%
0.778	0.796	0.806	0.930	1.653
1.715	1.832	2.020	2.452	3.018

HAI and Patient Population	Repo	rting Facilities
	Tota	I Admissions
Laboratory-identified <i>C. difficile</i>	1,141	733,417
Laboratory-identified MRSA bacteremia	1,150	719,313

- 1. The number of reporting facilities included in the SIR calculation. Includes Inpatient Rehabilitation (I
- 2. Hospital-onset events are defined as those that were identified in an inpatient location on the 4th da
- 3. Calculated from a negative binomial regression model. Risk factors used in the calculation of the nu
- 4. Percent of facilities with at least one predicted event that had an SIR significantly greater than or les
- 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*

<u>></u>			Standardized Infection Ratio Data						
	Total Patient Days	Observed Hospital- onset Events ²	Predicted Hospital- onset Events ³	SIR	Lower 95% Confidence Interval	Upper 95% Confidence Interval	No. Facilities with ≥1 Predicted Event		
	9,240,459	2,623	4,131.433	0.635	0.611	0.660	963		
	9,054,327	160	172.146	0.929	0.794	1.082	1		

RF) units within the acute care setting. LabID reporting is performed at facility wide for freestanding IRFs. For IRF-up (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 has predicted HAI in 2018. If a facility's predicted number of events was <1.0, a facility-specific SIR was neither calcu

ion ratios (SIRs) and facility-specific summary SIRs using HAI data reported to NHSN during 2018: des difficile (C. difficile) and methicillin-resistant Staphylococcus aureus (MRSA) bacteremia

Facility SIRs Compa							
No. Facilities with Significantly > Nation	No. Facilities with Significantly < Nation N		5%	10%	15%	20%	
N % ⁴ 57 6%		35	4%	0.000	0.000	0.000	0.000

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

ad ≥ 1.0 predicted HAI in 2018. lated nor included in the distribution of facility-specific SIRs.

Percentile Distribution of Facility-specific SIRs⁵

Median

incalan									
25%	30%	35%	40%	45%	50%	55%	60%	65%	70%
0.000	0.211	0.299	0.370	0.437	0.506	0.589	0.648	0.713	0.808

75%	80%	85%	90%	95%
0.916	1.044	1.216	1.480	1.900
		•	•	

Table 2. State-specific standardized infection rati NHSN Inpatient Rehabilitation I

Central line-associated bloodstream

				No. of In	<u>fections</u>		<u>95% CI</u>
State	State NHSN Mandate ²	Any Validation³	No. of IRFs Reporting⁴	Observed	Predicted	SIR	Lower
Alaska	М	No	2				
Alabama	No	No	6	2	3.020	0.662	0.111
Arkansas	No	No	13	1	2.887	0.346	0.017
Arizona	No	No	14	1	2.618	0.382	0.019
California	Yes	Yes	76	9	16.691	0.539	0.263
Colorado	Yes	Yesª	21	0	3.690	0.000	
Connecticut	No	No	4				
D.C.	Yes	No	2				
Delaware			2 3				
Florida	No	Yes	26		11.029	0.725	0.337
Georgia	No	No	20	4	5.191	0.771	0.245
Guam							
Hawaii	No	No					
lowa	No	No	13	4	1.932	2.070	0.658
Idaho	No	No	2		_		
Illinois	No	No			9.403	0.957	0.467
Indiana	No	No	23			0.438	0.111
Kansas	No		9			0.500	0.025
Kentucky	No		7			1.709	0.287
Louisiana	No	No	22			0.866	0.220
Massachusetts	No						
Maryland	No						
Maine	No				_		
Michigan	No	No			5.466	0.549	0.140
Minnesota	No					3.251	1.033
Missouri			15			0.000	
Mississippi	No	No			1.433	0.698	0.035
Montana	No					0.000	0.000
North Carolina	No				6.542	0.917	0.372
North Dakota	No				0.012	0.017	0.072
Nebraska		110	6		1.019	0.981	0.049
New Hampshire	No	No				0.001	0.040
New Jersey		140	2 6	5		2.435	0.892
New Mexico	No	No				2.400	0.002
Nevada	M	No				0.532	0.089
New York	No					0.965	0.448
Ohio	No					0.767	0.281
Oklahoma	No					1.245	0.201
Oregon	No					1.240	0.317
Pennsylvania	Yes					1.050	0.688
Puerto Rico	l res	res				1.000	0.000
	NI-	NI_	1		•	•	
Rhode Island	No	No	4		•	•	

South Carolina	Yes	Yes	22	5	4.879	1.025	0.375
South Dakota	No	No	3		-		
Tennessee	No	No	15	7	3.702	1.891	0.827
Texas	No	No	57	15	12.323	1.217	0.707
Utah			4		-		
Virginia	No	No	11	2	4.484	0.446	0.075
Virgin Islands							
Vermont	No	No	2				
Washington	Yes	Yes	12	1	2.706	0.370	0.018
Wisconsin	No	Yes	18	1	3.483	0.287	0.014
West Virginia	No	No	2				
Wyoming	No	No					
All US			714	140	177.361	0.829	0.703

- 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 \(\text{No indicates that a state mandate did not exist during 2018.} \)
- 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 2018 NHSN data prior to June 1, 2019, a YesA indicates that the state also conducted an audit of facility medical or laboratory records prior to June 1, 20 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 voluntar
- 4. The number of IRFs that reported 2018 CLABSI data and are included in the SIR calculation. SIRs and accomp from at least one location in 2018.
- 5. Percent of facilities with ≥1.0 predicted CLABSI that had an SIR significantly greater or less than the nominal val ≥ 1.0 predicted CLABSI in 2018.
- 6. Facility-specific key percentiles were only calculated if at least 20 facilities had ≥1.0 predicted CLABSI in 2018. nor included in the distribution of facility-specific SIRs.

ios (SIRs) and facility-specific SIR summary measures, Facilities (IRFs) reporting during 2018

infections (CLABSIs) in IRFs, all locations¹

for SIR	Fac	cility-specific SI	Rs	Facili	ity-specifi	c SIRs at K	ey Percen
Upper	No. of facs with at least 1 predicted CLABSI	% of facs with SIR sig higher than national SIR⁵	% of facs with SIR sig lower than national SIR⁵	10%	25%	Median (50%)	75%
	;						
2.188		•					•
1.708				·			
1.884				·			
0.990			•				•
0.812	0	•	•				-
		•	•				-
		•	•				-
		•	•				-
1.377			•				•
1.859	0						
4.994	0						
	•						
1.757							
1.191							
2.464							
5.647	0						
2.357	0						
1.494							
7.841							
0.878							
3.442	0						
1.907	1						
4.838	0						
5.398	0						
	0						
1.758							
1.833	0						
1.701	1						
3.387	1						
	0						
1.538	4						

0.971	20	0%	0%	0.000	0.000	0.000	0.778
1.416	1						
1.823							
			-			-	
1.474	0						
1.963	1						
3.741	0						
2.271	0						

Also includes data from CMS-certified IRF units within a hospital. 2018. M indicates midyear implementation of a mandate.

state health department had access to 2018 NHSN data, state health department performed an nd state health department contacted identified facilities.

19 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.

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

lue of the 2018 national IRF CLABSI SIR of 0.829. 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%

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Table 3. State-specific standardized infection rati NHSN Inpatient Rehabilitation I

Catheter-associated urinary tract i

	1			No ef	d urinary tract i		
				<u>NO. OT</u>	<u>Events</u>		<u>95% CI</u>
State				Observed	Predicted	SIR	Lower
Alaska	Yes	No	2				
Alabama	No	No	18	14	21.160	0.662	0.377
Arkansas	Yes	No	24	17	18.521	0.918	0.553
Arizona	No	No	26	25	24.790	1.008	0.667
California	No					0.769	0.579
Colorado	М					1.639	1.042
Connecticut	Yes	Yes				1.844	0.856
D.C.	Yes	No	2				
Delaware			2 3				
Florida	No	Yes			74.775	0.923	0.723
Georgia	Yes	Yes				0.860	0.540
Guam					_	_	
Hawaii	Yes	No	1				
lowa	No			15	8.621	1.740	1.011
Idaho	No					0.772	0.245
Illinois	No					1.444	1.121
Indiana	No					0.868	0.579
Kansas	No					1.635	1.027
Kentucky	Yes	No				0.924	0.526
Louisiana	No		49			1.141	0.794
Massachusetts	No					1.795	1.276
Maryland	No				20.001	11100	1.210
Maine	No				4.166	0.720	0.183
Michigan	No					1.256	0.914
Minnesota	No					1.574	0.962
Missouri		110	31			1.063	0.725
Mississippi	Yes	No			7.304	1.506	0.792
Montana	No					1.152	0.193
North Carolina	Yes					1.591	1.093
North Dakota	No	No			10.000	1.001	1.000
Nebraska		140	10		11.091	1.172	0.652
New Hampshire	No	No				1.614	0.749
New Jersey		140	19		34.927	1.460	1.099
New Mexico	No	No				0.760	0.279
Nevada	No						0.273
New York	No					1.172	0.871
Ohio	No					1.172	0.779
Oklahoma	No					0.607	0.799
	Yes					1.444	0.290
Oregon Pennsylvania	Yes					1.041	
Pennsylvania Puerto Rico	res	res				0.931	0.834 0.237
	N ₁	NI.	6				
Rhode Island	No	No	5	2	2.890	0.692	0.116

All US			1,156	1,224	1,045.740	1.170	1.106
Wyoming	No	No	2		•	•	
West Virginia	Yes	No	8	7	8.324	0.841	0.368
Wisconsin	No	Yes	22	17	14.072	1.208	0.727
Washington	No	No	15	21	22.395	0.938	0.596
Vermont	No	No	2				
Virgin Islands							
Virginia	No	No	27	33	21.680	1.522	1.065
Utah			11	12	7.050	1.702	0.922
Texas	No	No	142	196	140.078	1.399	1.213
Tennessee	Yes	Yes	32	36	24.280	1.483	1.054
South Dakota	No	No	3				
South Carolina	No	No	22	19	11.260	1.687	1.046

- 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 20 No indicates that a state mandate did not exist during 2018.
- 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 2018 NHSN data prior to June 1, 2019, a YesA indicates that the state also conducted an audit of facility medical or laboratory records prior to June 1, 20 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 voluntar
- 4. The number of IRFs that reported 2018 CAUTI data and are included in the SIR calculation. SIRs and accompa from at least one location in 2018.
- 5. Percent of facilities with ≥1.0 predicted CAUTI that had an SIR significantly greater or less than the nominal valu ≥ 1.0 predicted CAUTI in 2018.
- 6. Facility-specific key percentiles were only calculated if at least 20 facilities had ≥1.0 predicted CAUTI in 2018. If nor included in the distribution of facility-specific SIRs.

ios (SIRs) and facility-specific SIR summary measures, Facilities (IRFs) reporting during 2018

infections (CAUTIs) in IRFs, all locations¹

or SIR	<u>Facility</u> -	specific SIRs					
Upper	No. of facs with at least 1 predicted CAUTI			10%	25%		75%
	•						
1.084							
1.440							
1.467	14	0%	0%	•			
1.003		0%	5%	0.000	0.000	0.575	1.074
2.463		•	-				
3.501	1	•		•		•	
				•			
							4 500
1.161	31	6%	6%	0.000	0.129	0.939	1.593
1.304	7	•	-	•	•	•	
•		•	•	•	•	•	
2.805	2	•	•	•	•	•	
1.863		•			•	•	
1.832		0%	0%		•	•	
1.253		9%	9%	•	•	•	
2.480		9 70	9 70	•	•	•	
1.513		•		•	•	•	
1.513		•		•	•	•	
2.458		•		•	•	•	
2.400	J	•			•	•	
1.960	2	•	1	•	•	•	
1.688		•]		•	•	
2.440							
1.507							
2.618						_	
3.806							
2.242	7						
1.954							
3.064	2						
1.905	12	17%	0%				
1.685	3						
1.241	5						
1.545		7%	0%				
1.392	17	12%	12%				
1.114							
3.004							
1.284		0%	0%	0.125	0.690	0.900	1.312
2.533							
2.286	0	•					

1.237	330	4%	3%	0.000	0.000	0.928	1.715
						•	
1.663	4						
1.895	2						
1.409	4						
2.113	8						
2.894	3				•	·	
1.606	44	7%	0%	0.000	0.000	0.858	1.598
2.031	8					•	•
					•	•	
2.586	2						

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

318. M indicates midyear implementation of a mandate.

state health department had access to 2018 NHSN data, state health department performed an nd state health department contacted identified facilities.

19 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.

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

ie of the 2018 national IRF CAUTI SIR of 1.170. This is only calculated if at least 10 facilities had

¹ a facility's predicted number of CAUTI was <1.0, a facility-specific SIR was neither calculated

90%

1.535

2.002

2.696 .

Table 4. State-specific standardized infection rati NHSN Inpatient Rehabilitation I

Laboratory-identified healthcare facility-(

	I				Events	va noan	ncare facility-c 95% CI
				110. 01	<u>L vonto</u>		<u>5070 51</u>
State				Observed	Predicted	SIR	Lower
Alaska	Yes	No	2				
Alabama	No	No	17	69	92.189	0.748	0.587
Arkansas	No	No	23	50	73.540	0.680	0.510
Arizona	No	No	25	59	96.300	0.613	0.471
California	Yes	Yes	76	147	249.584	0.589	0.499
Colorado	No	No	20	20	44.575	0.449	0.282
Connecticut	Yes	Yes	7	7	16.249	0.431	0.188
D.C.	Yes	No	2				
Delaware			3				
Florida	No	Yes	52	225	314.722	0.715	0.626
Georgia	Yes	Yes	28	56	94.488	0.593	0.452
Guam			0				
Hawaii	Yes	No	1				
Iowa	No	No	16	17	23.333	0.729	0.439
Idaho	No	No	6	11	12.636	0.871	0.458
Illinois	Yes	Yes	41	121	206.822	0.585	0.488
Indiana	No	No	37	86	101.457	0.848	0.682
Kansas	No	Yes	20	29	57.792	0.502	0.342
Kentucky	Yes	No	16	61	83.904	0.727	0.561
Louisiana	No	Yes	48	40	93.628	0.427	0.309
Massachusetts	No	No	10	81	80.904	1.001	0.800
Maryland	No	No	3				
Maine	No	Yes	5	7	17.011	0.411	0.180
Michigan	No	Yes	38	87	146.184	0.595	0.480
Minnesota	No	No	13	19	34.047	0.558	0.346
Missouri			30	74	105.564	0.701	0.554
Mississippi	Yes	No		18	28.292	0.636	0.389
Montana	No	No	4				
North Carolina	Yes	Yes	26	33	103.933	0.318	0.222
North Dakota	No	No					
Nebraska			10	16	34.936	0.458	0.271
New Hampshire	No	No			29.688	0.775	0.503
New Jersey			19			0.929	0.771
New Mexico	No	No				0.764	0.491
Nevada	No	No				0.996	0.774
New York	Yes	Yes				0.590	0.489
Ohio	No	No				0.645	0.530
Oklahoma	No	Yes				0.515	0.349
Oregon	Yes	Yes				0.300	0.110
Pennsylvania	Yes	Yes				0.669	0.580
Puerto Rico			5			0.193	0.032
Rhode Island	No	No				0.673	0.273

South Carolina	Yes	Yes	21	36	64.697	0.556	0.396
South Dakota	No	No	3				
Tennessee	Yes	Yes	32	69	108.216	0.638	0.500
Texas	No	No	143	333	524.924	0.634	0.569
Utah			11	20	29.921	0.668	0.420
Virginia	No	No	27	54	100.554	0.537	0.407
Virgin Islands			0				
Vermont	No	No	2				
Washington	Yes	Yes	15	12	37.211	0.322	0.175
Wisconsin	No	Yes	21	24	40.326	0.595	0.390
West Virginia	Yes	No	8	19	29.228	0.650	0.403
Wyoming	No	No	2				
All US			1,141	2,623	4,131.433	0.635	0.611

- 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 Alternatively, this measure includes events detected on the 4th day (or later) after transfer to an IRF unit within a
- 2. Yes indicates the presence of a state mandate to report facility-wide CDI data to NHSN at the beginning of 2018 No indicates that a state mandate did not exist during 2018.
- 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 2018 NHSN data prior to June 1, 2019, a YesA indicates that the state also conducted an audit of facility medical or laboratory records prior to June 1, 20 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 voluntar
- 4. The number of IRFs that reported 2018 CDI data and are included in the SIR calculation. SIRs and accompany data in 2018.
- 5. Percent of facilities with ≥1.0 predicted CDI that had an SIR significantly greater or less than the nominal value c ≥ 1.0 predicted CDI in 2018.
- 6. Facility-specific key percentiles were only calculated if at least 20 facilities had ≥1.0 predicted CDI in 2018. If a 1 was neither calculated nor included in the distribution of facility-specific SIRs.

ios (SIRs) and facility-specific SIR summary measures, Facilities (IRFs) reporting during 2018

onset Clostridioides difficile (CDI), facility-wide1

or SIR	<u>Facilit</u>	y-specific SIRs					
Upper	No. of facs with at least 1 predicted CDI			10%	25%		75%
0.942	16	19%	6%				
0.889		11%	11%				
0.785		4%	4%	0.000	0.000	0.274	1.098
0.690		4%	4%	0.000	0.000	0.380	0.823
0.681		0%	0%				
0.852	6	•	-			•	•
	·	•		•	•	•	
							0.074
0.813		6%	4%	0.186	0.399	0.658	0.971
0.764	26	8%	4%	0.000	0.258	0.433	0.763
	·	•		•	•		
	9	•	-			•	
1.143		•	-	•	•	•	•
0.697		5%	3%	0.000	0.342	0.637	0.857
1.042		13%	0%	0.000	0.000	0.560	1.224
0.711		0%	7%	0.000	0.000	0.500	1.224
0.928		8%	0%	•	•	•	
0.576		3%	3%	0.000	0.000	0.000	0.628
1.238		30%	0%	0.000	0.000	0.000	0.020
1.200	1	0070	0,70	•	•	•	•
0.814	4						•
0.730		3%	9%	0.000	0.000	0.462	0.927
0.855		0%	0%				
0.875		4%	0%	0.000	0.000	0.483	0.904
0.986		0%	0%				
0.441	20	0%	20%	0.000	0.000	0.080	0.558
0.728	9						
1.144	8						
1.110	17	18%	0%				
1.138	4						
1.264	12	17%	0%				
0.705	42	2%	2%	0.000	0.198	0.505	0.819
0.778	39	13%	5%	0.000	0.000	0.615	1.037
0.735		0%	0%				
0.665							
0.766	•	8%	2%	0.000	0.329	0.582	1.022
0.637							
1.399	5						

0.762	18	0%	0%				
0.802	27	11%	4%	0.000	0.000	0.360	0.805
0.705	129	5%	3%	0.000	0.000	0.481	0.932
1.014	8						
0.695	22	5%	5%	0.000	0.085	0.421	0.744
				•		•	•
0.548	13	0%	8%				
0.872	14	0%	0%				
0.996	5						
0.660	963	6%	4%	0.000	0.000	0.506	0.916

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

of the 2018 national IRF CDI SIR of 0.635. This is only calculated if at least 10 facilities had

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

^{3.} M indicates midyear implementation of a mandate.

state health department had access to 2018 NHSN data, state health department performed an nd state health department contacted identified facilities.

¹⁹ 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

90%

1.191 1.477

1.388 1.337

1.447 1.929

1.058

1.225

1.305

0.706

1.078 1.559

2.165 1.471 . 1.203

Table 5. State-specific standardized infection ratios (SIRs) and facility-specific specific s

Laboratory-identified healthcare facility-onset methicillin-resistant Staphylococcus aureu

				No. of Events 95% CI for SIR			<u>Fa</u>		
State				Observed	Predicted	SIR	Lower	Upper	No. of facs with at least 1 predicted MRSA
Alaska	Yes	No	2						
Alabama	No	No	17	5	3.732	1.340	0.491	2.970	0
Arkansas	No	No	23	1	3.238	0.309	0.015	1.523	0
Arizona	No	No	25	1	4.281	0.234	0.012	1.152	0
California	Yes	Yes	76	9	10.58	0.851	0.415	1.561	0
Colorado	М	No	21	0	1.970	0.000		1.521	0
Connecticut	Yes	Yes	7	0	0.713				0
D.C.	Yes	No	2						
Delaware			3						
Florida	No	Yes	52	18	12.917	1.394	0.852	2.160	0
Georgia	Yes	Yes	28	5	3.684	1.357	0.497	3.008	0
Guam			0						
Hawaii	Yes	No	1						
Iowa	No	No	16	0	0.972				0
Idaho	No	No	6	0	0.551				0
Illinois	Yes	Yes	43	7	7.423	0.943	0.412	1.865	1
Indiana	No	No	37	4	4.142	0.966	0.307	2.329	0
Kansas	No	Yes	20		2.278	0.439	0.022	2.165	0
Kentucky	Yes	No	16	7	3.095	2.262	0.989	4.474	0
Louisiana	No	Yes	49	5	4.324	1.156	0.424	2.563	0
Massachusetts	No	No	10	3	3.756	0.799	0.203	2.174	0
Maryland	No	No	3						
Maine	No	No	5		0.767				
Michigan	No	Yes	38		5.449	1.285	0.562	2.541	0
Minnesota	No	No	13		1.254	0.000		2.389	0
Missouri			30		4.183	0.239	0.012	1.179	0
Mississippi	Yes	No	11	1	1.383	0.723	0.036	3.566	0
Montana	No	No	4						
North Carolina	Yes	Yes	26	5	4.299	1.163	0.426	2.578	0

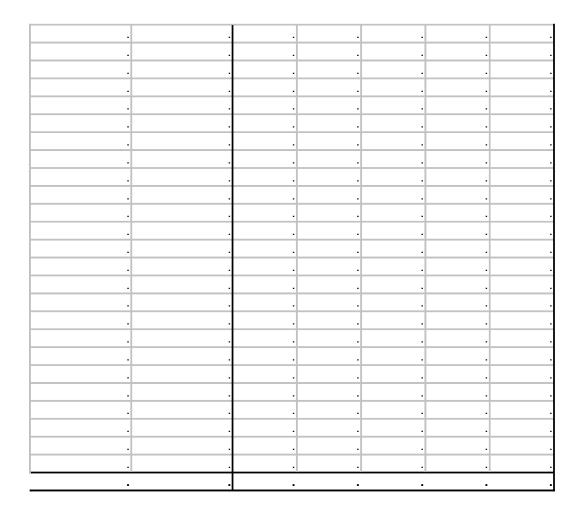
All US			1,150	160	172.146	0.929	0.794	1.082	1
Wyoming	No	No							
West Virginia	Yes			2	1.554	1.287	0.216	4.252	0
Wisconsin	No	Yes	22	2	1.688		0.199	3.915	0
Washington	No	No			1.526			1.963	
Vermont	No	No							
Virgin Islands			0						
Virginia	No	No	27	6	4.192	1.431	0.580	2.977	0
Utah			11	1	1.222	0.818	0.041	4.036	0
Texas	No	No	143	20	21.333	0.938	0.589	1.422	0
Tennessee	Yes	Yes	32	8	4.821	1.659	0.771	3.151	0
South Dakota	No	No							
South Carolina	Yes	Yes	22	3	3.417	0.878	0.223	2.389	0
Rhode Island	No	No	5	0	0.384				
Puerto Rico			6	0	0.636				0
Pennsylvania	Yes	Yes	76	13	12.622	1.030	0.573	1.717	0
Oregon	Yes	Yes	8	0	0.651				0
Oklahoma	No	Yes	22	6	2.367	2.535	1.027	5.272	0
Ohio	No	No	47	4	6.846	0.584	0.186	1.409	0
New York	No	No	54	7	7.667	0.913	0.399	1.806	0
Nevada	Yes	No	13	0	2.586	0.000		1.158	0
New Mexico	No	No	8	0	1.180	0.000		2.539	0
New Jersey			19	2	5.758	0.347	0.058	1.148	0
New Hampshire	No	No	8	2	1.344	1.488	0.249	4.916	0
Nebraska			10	0	1.178	0.000		2.543	0
North Dakota	No	No	3						

- 1. Includes data reported from all locations (i.e., adult and pediatric rehabilitation wards) within free-standing IRFs. Also includes data from CMS-ce 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 2018. M indicates mid No indicates that a state mandate did not exist during 2018.
- 3. Yes indicates that the state health department reported the completion of all of the following validation activities: state health department had acc assessment of missing or implausible values on at least six months of 2018 NHSN data prior to June 1, 2019, and state health department conta YesA indicates that the state also conducted an audit of facility medical or laboratory records prior to June 1, 2019 to confirm proper case ascert varies by state). Information on validation efforts was requested from all states, regardless of the presence of a legislative mandate for the partic reporting of a given HAI to the state health department have performed validation on NHSN data that is voluntarily shared with them by facilities i

- 4. The number of IRFs that reported 2018 MRSA bacteremia data and are included in the SIR calculation. SIRs and accompanying statistics are of bacteremia data from at least one location in 2018.
- 5. Percent of facilities with ≥1.0 predicted MRSA bacteremia that had an SIR significantly greater or less than the nominal value of the 2018 national ≥ 1.0 predicted MRSA bacteremia in 2018.
- 6. Facility-specific key percentiles were only calculated if at least 20 facilities had ≥1.0 predicted MRSA bacteremia in 2018. If a facility's predicted was neither calculated nor included in the distribution of facility-specific SIRs.

SIR summary measures, ıg 2018

s (MRSA) bacteremia, facil cility-specific SIRs	ity-wide'			
	10%	25%	75%	90%
-				



ertified IRF units within a hospital.

year implementation of a mandate.

cess to 2018 NHSN data, state health department performed an acted identified facilities.
ainment (although intensity of auditing activities cular HAI type. Some states without mandatory in their jurisdiction.

nly calculated for states in which at least 5 IRFs reported MRSA

al IRF MRSA SIR of 0.929. 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 Type¹	2017 SIR	2018 SIR
CLABSI, all locations	0.932	0.829
CAUTI, all locations	1.149	1.170
Laboratory-identified MRSA bacteremia	0.915	0.929
Laboratory-identified <i>C. difficile</i> infections	0.792	0.635

^{*} Statistically significant, p < 0.0500

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

ratios (SIRs) using HAI data reported from all NHSN Inpatient Rehabilitation Facilities reporting during s), catheter-associated urinary tract infections (CAUTIs), methicillin-resistant *Staphylococcus aureus* (N and *Clostridioides difficile* infections, 2017 compared to 2018

Percent Change	Direction of Change, Based on Statistical Significance	p-value
11%	No change	0.3096
2%	No change	0.6381
2%	No change	0.8913
-20%	Decrease	0.0000

tanding IRFs. Also includes data from CMS-certified IRF units within a hospital. care hospitals, LabID reporting is performed at unit level.

2018 by HAI: //RSA) bacteremia,

Table 7. Changes in state-specific standardized infection ratios (SIRs) between 2017 and 2018 from NHSN Inpatient Rehabilitation Facilities

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

-value 0.3376 0.3072 0.6096 0.3533 0.5150
0.3376 0.3072 0.6096 0.3533
0.3072 0.6096 0.3533
0.6096 0.3533
0.3533
0.5150
0.1325
0.9330
0.0886
0.2858
0.4823
0.6869
0.0712
0.9725
0.9085
0.2036
0.9132
0.6434
0.9281
0.0512
0.9589
0.1701
0.3731
0.1385
0.9305
j

All US	0.932	0.829	11%	No change	0.3096
Wyoming					
West Virginia					
Wisconsin	0.276	0.287	4%	No change	0.9803
Washington	0.875	0.370	58%	No change	0.5331
Vermont					
Virgin Islands					
Virginia	1.518	0.446	71%	No change	0.1184
Utah					
Texas	0.623	1.217	95%	No change	0.1425
Tennessee	2.660	1.891	29%	No change	0.5094
South Dakota					
South Carolina	1.411	1.025	27%	No change	0.6010

^{*} 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 2017 or 2018 SIRs is not calculated.

^{3.} For states with <100% or >100% value in the percent change field, the percent change is not calculated due

 $\ensuremath{\mathsf{RFs}}.$ Also includes data from CMS-certified IRF units within a hospital. ated

to sparse data reported within the facility type

Table 7. Changes in state-specific standardized infection ratios (SIRs) between 2017 and 2018 from NHSN Inpatient Rehabilitation Facilities

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

	A	All Inpatient Rehabilitation Facilities Reporting to NHSN					
	2017 SIR	2018 SIR		Direction of Change, Based on Statistical Significance	p-value		
Alaska							
Alabama	1.013	0.662	35%	No change	0.2252		
Arkansas	0.627	0.918	46%	No change	0.3167		
Arizona	1.073	1.008	6%	No change	0.8247		
California	1.013	0.769	24%	No change	0.1360		
Colorado	1.288	1.639	27%	No change	0.4507		
Connecticut	2.760	1.844	33%	No change	0.3943		
D.C.							
Delaware							
Florida	1.012	0.923	9%	No change	0.5789		
Georgia	0.617	0.860	39%	No change	0.3271		
Guam		-					
Hawaii							
lowa	0.948	1.740	84%	No change	0.1853		
Idaho	1.119	0.772	31%	No change	0.5852		
Illinois	1.384	1.444	4%	No change	0.8060		
Indiana	1.261	0.868	31%	No change	0.1467		
Kansas	1.524	1.635	7%	No change	0.8285		
Kentucky	1.358	0.924	32%	No change	0.2628		
Louisiana	1.144	1.141	0%	No change	0.9935		
Massachusetts	1.288	1.795	39%	No change	0.1891		
Maryland							
Maine	1.800	0.720	60%	No change	0.1887		
Michigan	1.663	1.256	24%	No change	0.1801		
Minnesota	1.604	1.574	2%	No change	0.9553		
Missouri	1.253	1.063	15%	No change	0.5155		
Mississippi	1.041	1.506	45%	No change	0.4568		
Montana		1.152					
North Carolina	1.758	1.591	10%	No change	0.6857		
North Dakota	2.106						
Nebraska	1.464	1.172	20%	No change	0.5632		
New Hampshire	1.050	1.614	54%	No change	0.4389		
New Jersey	1.100	1.460	33%	No change	0.1695		
New Mexico	1.223	0.760	38%	No change	0.4081		
Nevada	0.797	0.696	13%	No change	0.7541		
New York	0.861	1.172	36%	No change	0.1591		
Ohio	1.015	1.065	5%	No change	0.8133		
Oklahoma	0.793	0.607	23%	No change	0.5474		
Oregon	1.728	1.444	16%	No change	0.7562		
Pennsylvania	1.374	1.041	24%	No change	0.0586		
Puerto Rico	1.905	0.931	51%	No change	0.3269		
Rhode Island	0.784	0.692	12%	No change	0.9067		

All US	1.149	1.170	2%	No change	0.6381
Wyoming					
West Virginia	0.684	0.841	23%	No change	0.7392
Wisconsin	0.832	1.208	45%	No change	0.3276
Washington	1.308	0.938	28%	No change	0.2345
Vermont					
Virgin Islands					
Virginia	1.213	1.522	25%	No change	0.3522
Utah	1.157	1.702	47%	No change	0.4071
Texas	1.033	1.399	35%	Increase	0.0052
Tennessee	1.164	1.483	27%	No change	0.3302
South Dakota					
South Carolina	1.391	1.687	21%	No change	0.5600

^{*} Statistically significant, p < 0.0500

^{1.} Includes data reported from all locations (i.e., adult and pediatric rehabilitation wards) within free-standing IF

^{2.} Percent change and supporting statistics are not calculated for states if the 2017 or 2018 SIRs is not calculat

^{3.} For states with <100% or >100% value in the percent change field, the percent change is not calculated due

Res. Also includes data from CMS-certified IRF units within a hospital. ted to sparse data reported within the facility type

Table 7. Changes in state-specific standardized infection ratios (SIRs) between 2017 and 2018 from NHSN Inpatient Rehabilitation Facilities

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

i l	All Inpatient Rehabilitation Facilities Reporting to NHSN						
	2017 SIR	2018 SIR		Direction of Change, Based on Statistical Significance	p-value		
Alaska							
Alabama	0.743	0.748	1%	No change	0.9645		
Arkansas	0.499	0.680	36%	No change	0.1545		
Arizona	0.862	0.613	-29%	Decrease	0.0449		
California	0.834	0.589	-29%	Decrease	0.0014		
Colorado	0.696	0.449	35%	No change	0.1233		
Connecticut	0.328	0.431	31%	No change	0.6560		
D.C.							
Delaware							
Florida	0.829	0.715	14%	No change	0.1136		
Georgia	0.707	0.593	16%	No change	0.3406		
Guam				· ·			
Hawaii							
lowa	1.252	0.729	42%	No change	0.0729		
Idaho	0.887	0.871	2%	No change	0.9659		
Illinois	0.733	0.585	20%	No change	0.0651		
Indiana	0.658	0.848		No change	0.1192		
Kansas	0.604	0.502		No change	0.4638		
Kentucky	0.707	0.727	3%	No change	0.8780		
, Louisiana	0.666	0.427	-36%	Decrease	0.0323		
Massachusetts	1.018	1.001	2%	No change	0.9183		
Maryland				3			
Maine	0.566	0.411	27%	No change	0.5225		
Michigan	0.763	0.595	22%	No change	0.0840		
Minnesota	0.829	0.558		No change	0.1846		
Missouri	1.036	0.701	-32%	Decrease	0.0111		
Mississippi	0.888	0.636		No change	0.2834		
Montana		0.000					
North Carolina	0.721	0.318	-56%	Decrease	0.0000		
North Dakota	0.859			200.0400			
Nebraska	0.904	0.458	-49%	Decrease	0.0284		
New Hampshire	0.710	0.775	9%	No change	0.7649		
New Jersey	1.031	0.929	10%	No change	0.4155		
New Mexico	1.127	0.764		No change	0.1557		
Nevada	1.615	0.996		Decrease	0.0025		
New York	0.614	0.590		No change	0.7577		
Ohio	0.639	0.645	1%	No change	0.9486		
Oklahoma	0.816	0.515		No change	0.0671		
Oregon	0.307	0.300		No change	0.9707		
Pennsylvania	0.870	0.669		Decrease	0.0049		
Puerto Rico	0.070	3.555	2070	200,0000	0.0040		
Rhode Island	1.059	0.673	36%	No change	0.3823		

All US	0.792	0.635	-20%	Decrease	0.0000
Wyoming				- 1	
West Virginia	0.759	0.650	14%	No change	0.6205
Wisconsin	1.149	0.595	-48%	Decrease	0.0065
Washington	0.488	0.322	34%	No change	0.2608
Vermont					
Virgin Islands					
Virginia	0.859	0.537	-37%	Decrease	0.0063
Utah	1.445	0.668	-54%	Decrease	0.0050
Texas	0.781	0.634	-19%	Decrease	0.0054
Tennessee	0.720	0.638	11%	No change	0.4638
South Dakota					
South Carolina	0.652	0.556	15%	No change	0.4753

^{*} 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 2017 or 2018 SIRs is not calculate

^{3.} For states with <100% or >100% value in the percent change field, the percent change is not calculated due to

Fs. Also includes data from CMS-certified IRF units within a hospital. ed to sparse data reported within the facility type

Table 7. Changes in state-specific standardized infection ratios (SIRs) between 2017 and 2018 from NHSN Inpatient Rehabilitation Facilities

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

	All Inpatient Rehabilitation Facilities Reporting to NHSN					
	2017 SIR	2018 SIR		Direction of Change, Based on Statistical Significance	p-value	
Alaska						
Alabama	1.550	1.340	14%	No change	0.8203	
Arkansas	0.898	0.309	66%	No change	0.3907	
Arizona	0.885	0.234	74%	No change	0.2408	
California	0.310	0.851	175%	No change	0.1251	
Colorado	0.485	0.000	100%	No change	0.5112	
Connecticut						
D.C.						
Delaware						
Florida	1.083	1.394	29%	No change	0.4863	
Georgia	1.685	1.357	19%	No change	0.7329	
Guam						
Hawaii						
Iowa						
Idaho						
Illinois	0.809	0.943	17%	No change	0.7922	
Indiana	0.956	0.966	1%	No change	0.9890	
Kansas	0.848	0.439	48%	No change	0.6445	
Kentucky	0.973	2.262	132%	No change	0.2286	
Louisiana	0.258	1.156	348%	No change	0.1590	
Massachusetts	0.804	0.799	1%	No change	0.9938	
Maryland				_		
Maine						
Michigan	1.166	1.285	10%	No change	0.8692	
Minnesota	0.000	0.000		· ·		
Missouri	0.700	0.239	66%	No change	0.3871	
Mississippi	1.508	0.723	52%	No change	0.6017	
Montana				_		
North Carolina	0.963	1.163	21%	No change	0.7920	
North Dakota				ŭ		
Nebraska	0.888	0.000	100%	No change	0.4888	
New Hampshire	1.367	1.488	9%	No change	0.9365	
New Jersey	0.185	0.347	88%	No change	0.6604	
New Mexico	0.000	0.000		ŭ		
Nevada	1.168	0.000	100%	No change	0.1237	
New York	0.899	0.913	2%	No change	0.9768	
Ohio	0.898	0.584	35%	No change	0.5246	
Oklahoma	0.000	2.535		Increase	0.0182	
Oregon						
Pennsylvania	0.471	1.030	119%	No change	0.1106	
Puerto Rico				3-		
Rhode Island	l ·_					

All US	0.915	0.929	2%	No change	0.8913
Wyoming					
West Virginia	0.000	1.287		No change	0.2581
Wisconsin	0.000	1.185		No change	0.2439
Washington	0.607	0.000	100%	No change	0.5193
Vermont					
Virgin Islands					
Virginia	2.468	1.431	42%	No change	0.3002
Utah	0.000	0.818		No change	0.5360
Texas	1.188	0.938	21%	No change	0.4302
Tennessee	3.013	1.659	45%	No change	0.1807
South Dakota					
South Carolina	1.197	0.878	27%	No change	0.7055

^{*} 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 2017 or 2018 SIRs is not calculated.

^{3.} For states with <100% or >100% value in the percent change field, the percent change is not calculated du

IRFs. Also includes data from CMS-certified IRF units within a hospital. lated ie to sparse data reported within the facility type

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 2018 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 regression models¹ from

HAI Type

CDI

MRSA bacteremia

^{*} None of the variables inve units within a hospital will

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

Intercept CDI Test Type Type of IRF (freestanding or unit) Community Onset CDI events Percentage of Admissions- Orthopedic Conditions Percentage of Admissions- Stroke Percentage of Admissions- Traumatic and Non-Traumatic Spinal Cord Dysfunction Intercept*

estigated were statistically significantly associated with hospital-onset MRSA bacteremia in IRFs. Free-standing have the predicted number of events calculated using the 2018 national IRF MRSA bacteremia incidence rate (i

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

Additional Resources

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

Technical Appendix (2018 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 well

