

2019 National

Critical Access

Introduction:

Welcome to the 2019 National and State HAI Progress Report using the 2015 baseline. This report is created by CDC staff with the National Healthcare Safety Network (NHSN).

This workbook includes national and state-specific SIR data for Critical Access Hospitals.

Scope of report:

HAI Types
Central line-associated bloodstream infections (CLABSI) by locations
Catheter-associated urinary tract infections (CAUTI) by locations
Ventilator-associated events (VAE) by locations
Surgical site infections (SSI)- All procedures for adults and pediatrics (using Complex Admission Readmission (A/R) model)
Surgical site infections (SSI)- adults (using Complex Admission Readmission (A/R) model), COLO and HYST
Hospital-onset methicillin-resistant <i>Staphylococcus aureus</i> (MRSA) bacteremia by facility-wide reporting
Hospital-onset <i>Clostridioides difficile</i> (CDI) by facility-wide reporting

National and State HAI Progress Report

Local Access Hospitals

eline and risk adjustment calculations. Standardized infection ratios (SIRs) are used to describe different HAI ty
ons. This year's report will compare 2019 SIRs to those from the prior year.
IHSN).

spitals (CAHs).

CAH	
National	State
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2019 Annual National and State HAI Progress Report

Critical Access Hospitals: Full series of tables for all national and state-specific data

Tables included in this report:

- Table 1** Characteristics of NHSN Critical Access Hospitals reporting to NHSN by state
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 - 1b. Catheter-associated urinary tract infections (CAUTI)
 - 1c. Ventilator-associated events (VAE), including Infection-related ventilator-associated condition and possible ventilator-associated pneumonia
 - 1d. Surgical site infections (SSI)
 - 1e. Hospital-onset methicillin-resistant *Staphylococcus aureus* (MRSA) bacteremia
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- Table 2** National standardized infection ratios (SIRs)
- 2a. CLABSI, CAUTI, VAE, hospital-onset MRSA bacteremia, and hospital-onset CDI from Critical Access Hospitals
 - 2b. Hospital-onset MRSA bacteremia and hospital-onset CDI from Critical Access Hospitals
 - 2c. Adult SSIs from all NHSN procedure categories from Critical Access Hospitals
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- Table 3** State-specific SIRs for CLABSI from Critical Access Hospitals
- 3a. All locations combined
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- Table 4** State-specific SIRs for CAUTI from Critical Access Hospitals
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 - 4b. Critical care locations only
 - 4c. Ward (non-critical care) locations only
- Table 5** State-specific SIRs for VAE from Critical Access Hospitals
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 - 5b. VAE, critical care locations only
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Appendix B	Factors used in NHSN risk adjustment of the MRSA Bacteremia and C.difficile negative binomial regression models from Critical Access Hospitals
Appendix C	List of NHSN procedures included in this report with predictive risk factors from the NHSN Complex Admission/Re-admission SSI Logistic Regression Models
Appendix D	List of NHSN procedures included in this report with predictive risk factors from the NHSN Complex Admission/Re-admission SSI Logistic Regression Models
Appendix E	List of NHSN procedures and corresponding SCIP procedures included in this report with factors used in the NHSN risk adjustment of the device-associated HAIs
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monia (IVAC-Plus)

19 from Critical Access Hospitals

Critical Access Hospitals

Hospitals

Regression, Adults \geq 18 years of age

Regression, Pediatrics < 18 years of age

Complex Admission/Readmission Model, Adults \geq 18 years of age

Table 1. Characteristics of NHSN Critical Access Hospitals reporting to NHSN by State¹, 2019:
1a. Central line-associated bloodstream infections (CLABSI)²

State	2019			Locations (n) ²		
	State NHSN Mandate ³	Any Validation ⁴	No. of Critical Access Hospitals Reporting ⁵	Total	ICU	Wards ²
	Alabama	Yes	Yes ^a	4	.	.
Alaska			2	.	.	.
Arizona			4	.	.	.
Arkansas			13	18	2	16
California	Yes	Yes	29	48	16	32
Colorado			17	20	4	16
Connecticut	No	No	0	.	.	.
D.C.			0	.	.	.
Delaware			0	.	.	.
Florida	No	Yes	8	10	1	9
Georgia			18	21	3	18
Guam			0	.	.	.
Hawaii			2	.	.	.
Idaho			12	15	3	12
Illinois			35	44	10	34
Indiana	Yes	Yes	35	52	16	36
Iowa	No	No	48	51	2	49
Kansas	No	No	49	56	5	51
Kentucky	No	No	18	22	4	18
Louisiana			4	.	.	.
Maine	Yes	No	15	22	2	20
Maryland	No	No	0	.	.	.
Massachusetts	No	Yes	3	.	.	.
Michigan			27	36	6	30
Minnesota	No	No	39	43	4	39
Mississippi	No	No	7	10	3	7
Missouri			21	27	6	21
Montana	No	No	9	17	4	13
Nebraska			17	23	6	17
Nevada	M	No	2	.	.	.
New Hampshire	Yes	No	12	12	.	12
New Jersey	No	No	0	.	.	.
New Mexico	M	No	9	15	5	10
New York			5	7	2	5
North Carolina	No	No	12	17	2	15
North Dakota	No	No	11	14	2	12
Ohio	No	Yes	22	36	10	26
Oklahoma			10	21	11	10
Oregon	Yes	Yes	23	30	5	25
Pennsylvania	Yes	Yes	14	22	.	22
Puerto Rico			0	.	.	.
Rhode Island	No	No	0	.	.	.
South Carolina	Yes	Yes	4	.	.	.
South Dakota	No	Yes	15	16	1	15
Tennessee	No	No	6	13	7	6
Texas	Yes		29	32	3	29
Utah			5	5	.	5
Vermont	M	Yes	8	10	4	6
Virgin Islands			0	.	.	.
Virginia	No	Yes	5	7	.	7
Washington	Yes	Yes	34	50	9	41
West Virginia	No	No	16	24	7	17
Wisconsin	No	Yes	52	70	12	58
Wyoming	No	No	11	13	2	11
All US			741	985	179	770

Table 1b-CAUTI

1b. Catheter-associated urinary tract infections (CAUTI)²

		2019				
State				Total	ICU	
	Alabama	Yes		5	7	1	6
Alaska			3	.	.	.
Arizona			4	.	.	.
Arkansas			14	19	2	17
California	No	No	31	55	16	39
Colorado	No	No	24	30	4	26
Connecticut	No	No	1	.	.	.
D.C.			1	.	.	.
Delaware			1	.	.	.
Florida	No	Yes	8	10	1	9
Georgia			18	21	3	18
Guam			1	.	.	.
Hawaii			2	.	.	.
Idaho			14	18	3	15
Illinois			39	52	14	38
Indiana	Yes	Yes	35	60	16	44
Iowa	No	No	62	69	3	66
Kansas	No	No	60	70	5	65
Kentucky	No	No	18	22	4	18
Louisiana			4	.	.	.
Maine	No	No	16	27	2	25
Maryland	No	No	1	.	.	.
Massachusetts	No	Yes	3	.	.	.
Michigan			30	43	6	37
Minnesota	Yes	Yes	73	93	10	83
Mississippi	No	No	13	13	1	12

Table 1b-CAUTI

Missouri			24	33	6	27
Montana	No	No	10	24	3	21
Nebraska			26	32	3	29
Nevada	No	No	2	.	.	.
New Hampshire	M	No	13	22	6	16
New Jersey	No	No	1	.	.	.
New Mexico	No	No	9	18	5	13
New York			6	9	2	7
North Carolina	No	No	12	22	4	18
North Dakota	No	No	12	19	3	16
Ohio	No	No	23	40	10	30
Oklahoma			13	15	1	14
Oregon	Yes	Yes	25	45	12	33
Pennsylvania	Yes	Yes	15	30	6	24
Puerto Rico			1	.	.	.
Rhode Island	No	No	1	.	.	.
South Carolina	No	No	4	.	.	.
South Dakota	No	Yes	36	39	2	37
Tennessee	No	No	7	8	1	7
Texas	Yes		38	49	8	41
Utah			8	9	.	9
Vermont	No	No	4	.	.	.
Virgin Islands			1	.	.	.
Virginia	No	Yes	5	9	3	6
Washington	No	No	37	63	9	54
West Virginia	Yes	No	20	30	8	22
Wisconsin	No	Yes	56	86	12	74
Wyoming	No	No	13	15	2	13
All US			903	1,226	197	1,029

Table 1c-VAE

1c. Ventilator-associated events (VAE)						
2019						
State				Total	ICU	
Alabama			0	.	.	.
Alaska	No	No	1	.	.	.
Arizona			2	.	.	.
Arkansas			6	6	1	5
California	No	No	12	12	10	2
Colorado	No	No	2	.	.	.
Connecticut			0	.	.	.
D.C.			0	.	.	.
Delaware			0	.	.	.
Florida	No	No	3	.	.	.
Georgia			2	.	.	.
Guam			0	.	.	.
Hawaii			0	.	.	.
Idaho			4	.	.	.
Illinois			8	9	5	4
Indiana	No	No	18	21	16	5
Iowa	No	No	1	.	.	.
Kansas	No	No	3	.	.	.
Kentucky	No	No	4	.	.	.
Louisiana			1	.	.	.
Maine	No	No	5	5	2	3
Maryland	No	No	0	.	.	.
Massachusetts	No	No	1	.	.	.
Michigan			9	10	6	4
Minnesota	No	No	2	.	.	.
Mississippi			0	.	.	.

Table 1c-VAE

Missouri			3	.	.	.
Montana	No	No	3	.	.	.
Nebraska			0	.	.	.
Nevada	No	No	1	.	.	.
New Hampshire	No	No	7	7	6	1
New Jersey	No	No	0	.	.	.
New Mexico	No	No	3	.	.	.
New York			2	.	.	.
North Carolina			4	.	.	.
North Dakota	No	No	2	.	.	.
Ohio	No	No	11	16	9	7
Oklahoma			1	.	.	.
Oregon	No	No	10	14	8	6
Pennsylvania	Yes	Yes	9	9	5	4
Puerto Rico			0	.	.	.
Rhode Island	No	No	0	.	.	.
South Carolina	Yes	Yes	3	.	.	.
South Dakota	No	Yes	0	.	.	.
Tennessee	No	No	2	.	.	.
Texas	No	No	7	9	4	5
Utah			0	.	.	.
Vermont	No	No	0	.	.	.
Virgin Islands			0	.	.	.
Virginia	No	No	2	.	.	.
Washington	No	No	9	9	7	2
West Virginia	No	No	6	9	5	4
Wisconsin	No	No	16	21	10	11
Wyoming	No	No	3	.	.	.
All US			188	157	94	63

**Table 1. Characteristics of NHSN Critical Access Hospitals reporting to NHSN by State¹, 2019:
1d. Surgical site infections⁶**

State	2019			
	Any Validation ⁴		No. of Critical Access Hospitals Reporting colon surgeries in adults ⁵	No. of Procedures ⁶ colon surgeries in adults
Alabama	Yes	Yes	0	.
Alaska			2	.
Arizona			2	.
Arkansas			2	.
California	Yes	Yes	16	195
Colorado	Yes	Yes	11	63
Connecticut	No	No	0	.
D.C.			0	.
Delaware			0	.
Florida	No	Yes	3	.
Georgia			2	.
Guam			0	.
Hawaii			1	.
Idaho			4	.
Illinois			13	134
Indiana	Yes	No	24	216
Iowa	Yes	No	8	41
Kansas	No	Yes	8	47
Kentucky	No	No	5	35
Louisiana			2	.
Maine	No	Yes	8	102
Maryland	No	No	0	.
Massachusetts	No	Yes	1	.
Michigan			14	111
Minnesota	No	No	12	130
Mississippi	No	No	0	.
Missouri			9	54
Montana	No	No	5	51
Nebraska			2	.
Nevada	No	No	1	.
New Hampshire			9	78
New Jersey	Yes	No	0	.
New Mexico			3	.
New York			3	.
North Carolina	No	No	9	72
North Dakota	No	No	2	.
Ohio	No	Yes	14	92
Oklahoma			0	.
Oregon	Yes	Yes	17	197
Pennsylvania	Yes	Yes	7	47
Puerto Rico			0	.

Rhode Island	No	No	0	
South Carolina	Yes	Yes	1	
South Dakota	No	Yes	0	
Tennessee	No	No	1	
Texas	Yes	Yes	11	56
Utah			2	
Vermont	Yes	Yes	1	
Virgin Islands			0	
Virginia	No	Yes	3	
Washington	Yes	Yes ^a	15	118
West Virginia	No	No	7	95
Wisconsin	No	Yes	34	282
Wyoming	No	No	5	30
All US			229	2,533

	2019			
State			No. of Critical Access Hospitals Reporting hysterectomy surgeries in adults ⁵	No. of Procedures ⁶ abdominal hysterectomy surgeries in adults
Alabama	Yes	Yes	0	.
Alaska			1	.
Arizona			1	.
Arkansas			1	.
California	Yes	Yes	16	129
Colorado	Yes	Yes	11	56
Connecticut	No	No	0	.
D.C.			0	.
Delaware			0	.
Florida	No	Yes	0	.
Georgia			3	.
Guam			0	.
Hawaii			1	.
Idaho			3	.
Illinois			6	54
Indiana	Yes	No	20	200
Iowa	Yes	No	6	101
Kansas	No	Yes	7	73
Kentucky	No	No	2	.
Louisiana			2	.
Maine	No	Yes	9	98
Maryland	No	No	0	.
Massachusetts	No	Yes	2	.
Michigan			8	133
Minnesota	No	No	10	186
Mississippi	No	No	0	.
Missouri			9	47
Montana			5	76
Nebraska			3	.
Nevada	No	No	2	.
New Hampshire			9	51
New Jersey	Yes	No	0	.
New Mexico			5	13
New York			2	.
North Carolina	No	No	6	88
North Dakota	No	No	3	.
Ohio	No	Yes	15	178
Oklahoma			1	.
Oregon	Yes	Yes	12	158
Pennsylvania	Yes	Yes	6	96
Puerto Rico			0	.

Rhode Island	No	No	0	.
South Carolina	Yes	Yes	0	.
South Dakota	No	Yes	0	.
Tennessee	No	No	1	.
Texas	Yes	Yes	9	92
Utah			3	.
Vermont	Yes	Yes	6	83
Virgin Islands			0	.
Virginia	No	Yes	2	.
Washington	Yes	Yes	10	200
West Virginia	No	No	3	.
Wisconsin	No	Yes	25	423
Wyoming	No	No	3	.
All US			249	2,847

Table 1. Characteristics of NHSN Critical Access Hospitals reporting to NHSN by State¹, 2019:

1e. Hospital-onset methicillin-resistant *Staphylococcus aureus* bacteremia⁷

State	2019		
Alabama	No		4
Alaska			2
Arizona			5
Arkansas			9
California	Yes	Yes	33
Colorado	No	No	24
Connecticut	No	Yes	0
D.C.			0
Delaware			0
Florida	No	Yes	9
Georgia			16
Guam			0
Hawaii			2
Idaho			11
Illinois			49
Indiana	No	No	35
Iowa	No	No	31
Kansas	No	Yes	49
Kentucky	No	No	18
Louisiana			3
Maine	Yes	Yes	16
Maryland	No	No	0
Massachusetts	No	Yes	3
Michigan			29
Minnesota	No	No	26
Mississippi	No	No	7
Missouri			23
Montana	No	No	8
Nebraska			21
Nevada	Yes	No	2
New Hampshire	No	No	11
New Jersey	No	No	0
New Mexico	Yes	No	9
New York			5
North Carolina	No	No	11
North Dakota	No	No	12
Ohio	No	Yes	25
Oklahoma			13
Oregon	Yes	Yes	25
Pennsylvania	Yes	Yes	11
Puerto Rico			0
Rhode Island	No	No	0
South Carolina	Yes	Yes	3
South Dakota	No	Yes	2
Tennessee	No	No	7
Texas	No	No	27
Utah			7
Vermont	No	Yes	8
Virgin Islands			0
Virginia	No	Yes	5

Washington	No	No	24
West Virginia	No	No	15
Wisconsin	No	No	56
Wyoming	No	No	6
All US			717

1f. Hospital-onset *Clostridioides difficile*⁷

	2019		
State	Any Validation ⁴		
Alabama	No		4
Alaska			3
Arizona			4
Arkansas			10
California	Yes	Yes	33
Colorado	No	No	26
Connecticut	No	Yes	0
D.C			0
Delaware			0
Florida	No	Yes	9
Georgia			16
Guam			0
Hawaii			1
Idaho			11
Illinois			49
Indiana	No	No	34
Iowa	No	No	49
Kansas	No	Yes	50
Kentucky	No	No	18
Louisiana			3
Maine	Yes	Yes	16
Maryland	No	No	0
Massachusetts	No	Yes	3
Michigan			29
Minnesota	No	No	52
Mississippi	No	No	10
Missouri			24
Montana	No	No	8
Nebraska			22
Nevada	No	No	2
New Hampshire	No	No	12
New Jersey			0
New Mexico	Yes	No	9
New York			5
North Carolina	No	No	11
North Dakota	No	No	12
Ohio	No	Yes	25
Oklahoma	No	No	13
Oregon	Yes	Yes	25
Pennsylvania	Yes	Yes	11
Puerto Rico			0
Rhode Island	No	No	0

South Carolina	Yes	Yes	4
South Dakota	No	Yes	37
Tennessee	No	No	7
Texas	No	No	28
Utah			7
Vermont	Yes	Yes	8
Virgin Islands			0
Virginia	No	Yes	5
Washington	Yes	Yes	36
West Virginia	No	No	15
Wisconsin	No	No	56
Wyoming	No	No	13
All US			825

Footnotes for Tables 1a-1f:

1. United States, Washington, D.C., Guam, Puerto Rico and Virgin Islands

2. Data included in this table are from 2019 from acute care facility ICUs (critical care units), NICUs (CLABSI only, see footnote 7), and ward plus (for this report wards also include step-down, mixed acuity and specialty care areas [hematology/oncology, bone marrow transplant]). Long-term acute care facilities and locations, inpatient rehabilitation facilities and locations, dialysis facilities and locations, and long term care facilities (skilled nursing facilities) are not included in Table 1.

3. Yes indicates that a legislative or regulatory requirement ("state mandate") for Critical Access Hospitals to report data for the given HAI type to the state health department or hospital association via NHSN was in effect at the beginning of the year. If no state mandate existed at the beginning of each year, but was implemented at some time during the year, the value of this column is "M" for midyear implementation. No indicates that a state mandate did not exist during the years included in this report. On Table 1c, the presence of a state mandate reflects a mandate for colon surgery or abdominal hysterectomy data.

4. Yes indicates that the state health department reported the completion of all of the following validation activities for NHSN data during that year: state health department had access to NHSN data, state health department performed an assessment of missing or implausible values on at least six months of the year's data prior to the freeze date of July 1, 2020 for 2019 data, and state health department contacted identified facilities. YesA indicates that the state also conducted an audit of facility medical or laboratory records prior to July 1, 2020 for 2019 data to confirm proper case ascertainment (although intensity of auditing activities varies by state). On Table 1d, validation information applies to either colon surgery or abdominal hysterectomy data. Information on validation efforts was requested from all states, regardless of the presence of a legislative mandate for the particular HAI type. Some states without mandatory reporting of a given HAI to the state health department have performed validation on NHSN data that is voluntarily shared with them by facilities in their jurisdiction.

5. The number of facilities reporting at least one month of "in-plan" data to NHSN may be lower than the number of facilities in the state identified in footnote 3, as some hospitals in a state may not be included in the state mandate (e.g., facilities that do not have units or perform procedure covered by the mandate, or the mandate covers only facilities above a certain bed size).

6. SSIs included are those classified as deep incisional or organ/space infections following inpatient procedures within colon and abdominal hysterectomy surgeries, detected during the same admission as the surgical procedure or upon readmission to the same facility.

7. Hospital-onset is defined as event detected on the 4th day (or later) after admission to an inpatient location within the facility.

HAI and Patient Population	No. of Critical Access Hospitals Reporting ¹
CLABSI, all⁵	741
ICUs⁶	190
Wards⁷	727
CAUTI, all⁸	903
	209
	878
VAE, all⁸	121
	103
	22

1. The number of reporting facilities included in the SIR calculation. Due to SIR exclusion criteria
2. Risk factors used in the calculation of the number of predicted device-associated infections
3. Percent of facilities with at least one predicted infection (event) that had an SIR significantly
4. Facility-specific percentiles are only calculated if at least 20 facilities had ≥ 1.0 predicted HAI
5. Data from all ICUs, wards (and other non-critical care locations).
6. Data from all ICUs; excludes wards (and other non-critical care locations) and NICUs. VAE i
7. Data from all wards (for this table wards also include step-down and specialty care areas [in
8. Data from all ICUs and wards (and other non-critical care locations). This excludes NICUs. IVAC-plus includes those events identified as infection-related ventilator-associated conditio

Central line-associated bloodstream infections (CLABSIs), cathe

Total Patient Days	Total Device Days	No. of Infections (Events)			95% CI for SIR	
		Observed	Predicted ²	SIR	Lower	Upper
1,772,091	175,431	25	47.854	0.522	0.346	0.760
120,184	14,413	3	3.933	0.763	0.194	2.076
1,651,907	161,018	22	43.933	0.501	0.322	0.746
2,257,477	295,231	174	306.006	0.569	0.489	0.658
136,166	33,414	15	32.831	0.457	0.265	0.737
2,121,311	261,817	159	273.172	0.582	0.497	0.678
63,063	3,942	9	5.625	1.600	0.780	2.936
41,657	3,078	7	4.392	1.594	0.697	3.153
21,406	864	2	1.233	1.622	0.272	5.359

ia, this may be different from the numbers shown in Table 1. These tables contain data from Critical Access Ho are listed in Appendix A.

greater than or less than the nominal value of the national SIR for the given HAI type. This is only calculated if in 2019. If a facility's predicted number of HAIs was <1.0, a facility-specific SIR was neither calculated nor inclu

ncludes only adult locations, per surveillance definition.

cluding hematology/oncology, bone marrow transplant]). VAE includes only adult locations, per surveillance def

VAE includes only adult locations, per surveillance definition. This includes IVAC-plus events.

n (IVAC) and possible ventilator-associated pneumonia (pVAP).

Table 2a. National standardized infection ratios (SIRs) and facility-specific summary SIRs using HAI data for catheter-associated urinary tract infections (CAUTIs) and ventilator-associated events (VAE)

No. Facilities with ≥1 Predicted Infection (Event)	Facility-specific SIRs					5%	10%	15%
	No. Facilities with SIR Significantly > National SIR		No. Facilities with SIR Significantly < National SIR					
	N	% ³	N					
0	.	.	.	.	.	.	.
0	.	.	.	.	.	.	.
0	.	.	.	.	.	.	.
63	1	2%	0	0%	0.000	0.000	0.000	
1	.	.	.	.	.	.	.
59	1	2%	0	0%	0.000	0.000	0.000	
0	.	.	.	.	.	.	.
0	.	.	.	.	.	.	.
0	.	.	.	.	.	.	.

spitals; as such, they exclude data from LTACHs, IRFs, and ACHs.

at least 10 facilities had ≥ 1.0 predicted HAI in 2019.
ded in the distribution of facility-specific SIRs.

inition.

70%	75%	80%	85%	90%	95%
.
.
.
0.000	0.000	0.150	0.455	0.570	1.006
.
0.000	0.000	0.000	0.387	0.693	1.084
.
.
.

HAI and Patient Population	Reporting	
	No. of Critical Access Hospitals Reporting ¹	Total Admissions
MRSA bacteremia, facility-wide⁴	717	589,766
Hospital-onset <i>C. difficile</i>, facility-wide⁴	819	605,582

1. The number of reporting facilities included in the SIR calculation. Due to SIR exclusion criteria,
2. Percent of facilities with at least one predicted infection (event) that had an SIR significantly greater than 1.0
3. Facility-specific percentiles are only calculated if at least 20 facilities had ≥ 1.0 predicted HAI in the facility
4. Hospital-onset is defined as event detected on the 4th day (or later) after admission to an inpatient unit
5. Risk factors used in the calculation of the number of predicted MRSA bacteremia and CDI are defined in the SIR model

Hospitals		Standardized Infection Ratio Data			95% CI	
Total Patient Days	Community-onset events	Hospital-onset events	Predicted Hospital-onset events⁵	SIR	Lower	
2,129,107	171	26	44.291	0.587	0.392	
2,269,757	1,615	558	702.779	0.794	0.73	

this may be different from the numbers shown in Table 1. These tables contain data from Critical Access hospitals greater than or less than the nominal value of the national SIR for the given HAI type. This is only calculated for 2019. If a facility's predicted number of HAIs was <1.0, a facility-specific SIR was neither calculated nor listed in Appendix B.

Table 2b. National standardized infection ratios (SIRs) and facility-specific summary statistics for hospital-onset methicillin-resistant *Staphylococcus aureus* (MRSA) SIRs

Upper Bound for SIR	Facility SIRs Compared to National SIR					
	No. Facilities with ≥ 1 Predicted Event	No. Facilities with SIR Significantly > National SIR		No. Facilities with SIR Significantly < National SIR		
		N	% ²	N	%	
0.848	0	.	.	.	.
0.862	270	12	4%	2	1%	

ss Hospitals; as such, they exclude data from LTACHs, IRFs, and ACHs.
 ited if at least 10 facilities had ≥ 1.0 predicted HAI in 2019.
 r included in the distribution of facility-specific SIRs.

on of Facility-specific SIRs³

50% 55% 60% 65% 70% 75% 80% 85% 90%

0.642 0.751 0.792 0.912 1.048 1.235 1.449 1.666 2.054

95%

2.616

Surgical Procedure	No. of Critical Access Hospitals Reporting ²	No. of Procedures
US, all NHSN procedures	430	32,481
US, SCIP procedures only⁵	411	26,508
AAA Abdominal aortic aneurysm repair ⁵	0	.
AMP Limb amputation	15	53
APPY Appendix surgery	38	545
AVSD Shunt for dialysis	0	.
BILI Bile duct, liver or pancreatic surgery	8	25
BRST Breast surgery	16	75
CABG- Coronary artery bypass graft ^{5,6}	0	.
CARD Cardiac surgery ⁵	0	.
CEA Carotid endarterectomy	1	.
CHOL Gallbladder surgery	49	651
COLO Colon surgery ⁵	296	2,467
CRAN Craniotomy	1	.
CSEC Cesarean section	55	2,194
FUSN Spinal fusion	5	467
FX Open reduction of fracture	26	684
GAST Gastric surgery	15	178
HER Herniorrhaphy	36	288
HPRO Hip arthroplasty ⁵	255	7,772
HTP Heart transplant	0	.
HYST Abdominal hysterectomy ⁵	242	2,444
KPRO Knee arthroplasty ⁵	281	13,635
KTP Kidney transplant	0	.
LAM Laminectomy	5	83
LTP Liver transplant	0	.
NECK surgery	0	.
NEPH Kidney surgery	3	.
OVRY Ovarian surgery	18	103
PACE Pacemaker surgery	5	15
PRST Prostate surgery	3	.
PVBY Peripheral vascular bypass surgery ⁵	2	.
REC Rectal surgery ⁵	10	41
SB Small bowel surgery	27	147
SPLE Spleen surgery	5	6
THOR Thoracic surgery	6	34
THYR Thyroid and/or parathyroid surgery	3	.
VHYS Vaginal hysterectomy ⁵	23	143
VSHN Ventricular shunt	0	.
XLAP Abdominal surgery	32	375

1. SSIs included are those classified as deep incisional or organ/space infections following inpatient
2. The number of reporting facilities included in the SIR calculation. Due to SIR exclusion criteria, thi
3. Risk factors used in the calculation of the number of predicted SSIs are listed in Appendix C.

4. Percent of facilities with at least one predicted infection that had an SIR significantly greater than 1.0
5. These procedures were presented in previous versions of the HAI Progress Report and follow selected SCIP procedures and the corresponding SCIP procedures are listed in Appendix E.
6. Coronary artery bypass graft includes procedures with either chest only or chest and donor site incision
7. Facility-specific percentiles are only calculated if at least 20 facilities had ≥ 1.0 predicted SSI in 2010

Table 2c. National standardized infection ratios (SIRs) and facility-specific summary SI

No. of Infections		SIR	95% CI for SIR		No. Facilities with ≥1 Predicted Infection	Facility- No. Facilities Significantly > N
Observed	Predicted³		Lower	Upper		
147	152.158	0.966	0.819	1.132	32	2
132	132.381	0.997	0.838	1.179	24	1
.	.	.	.	.	0	.
0	0.028	.	.	.	0	.
1	1.649	0.607	0.030	2.991	0	.
.	.	.	.	.	0	.
0	0.213	.	.	.	0	.
0	0.504	.	.	.	0	.
.	.	.	.	.	0	.
.	.	.	.	.	0	.
.	.	.	.	.	0	.
1	1.842	0.543	0.027	2.677	0	.
44	45.722	0.962	0.708	1.280	0	.
.	.	.	.	.	0	.
2	3.299	0.606	0.102	2.003	0	.
0	0.851	.	.	.	0	.
2	3.643	0.549	0.092	1.814	0	.
2	1.158	1.727	0.290	5.705	0	.
1	1.521	0.658	0.033	3.243	0	.
30	37.960	0.790	0.543	1.114	1	.
.	.	.	.	.	0	.
19	13.206	1.439	0.892	2.205	0	.
37	34.033	1.087	0.777	1.483	1	.
.	.	.	.	.	0	.
0	0.258	.	.	.	0	.
.	.	.	.	.	0	.
.	.	.	.	.	0	.
.	.	.	.	.	0	.
0	0.078	.	.	.	0	.
0	0.0249	.	.	.	0	.
.	.	.	.	.	0	.
.	.	.	.	.	0	.
0	0.656	.	.	.	0	.
2	2.663	0.751	0.126	2.482	0	.
0	0.031	.	.	.	0	.
0	0.088	.	.	.	0	.
.	.	.	.	.	0	.
2	0.725	.	.	.	0	.
.	.	.	.	.	0	.
4	1.797	2.226	0.707	5.368	0	.

procedures that occurred in 2019 with a primary or other than primary skin closure technique, detected during the study period may be different from the numbers shown in Table 1. Refer to the Technical Appendix for information about

or less than the nominal value of the national SIR for the given procedure type. This is only calculated if at least one inpatient surgical procedure approximating procedures covered by the Surgical Care Improvement Project is included in the analysis.

2019. If a facility's predicted number of SSIs was < 1.0 , a facility-specific SIR was neither calculated nor included in the analysis.

at least 10 facilities had ≥ 1.0 predicted SSI in 2019.
Specific NHSN procedures

and in the distribution of facility-specific SIRs.

Surgical Procedure	No. of Critical Access Hospitals Reporting ²	No. of Procedures
US, all NHSN procedures	64	272
	26	30
AMP Limb amputation	.	.
APPY Appendix surgery	30	153
AVSD Shunt for dialysis	.	.
BILI Bile duct, liver or pancreatic surgery	.	.
BRST Breast surgery	.	.
	.	.
CEA Carotid endarterectomy	.	.
CHOL Gallbladder surgery	10	14
	10	10
CRAN Craniotomy (ALL AGE)	.	.
CSEC Cesarean section	11	15
FUSN Spinal fusion (AGE >=2)	1	.
FX Open reduction of fracture	9	44
GAST Gastric surgery	.	.
HER Herniorrhaphy	.	.
	6	7
HTP Heart transplant	.	.
	5	5
	6	8
KTP Kidney transplant	.	.
LAM Laminectomy	.	.
LTP Liver transplant	.	.
NECK surgery	.	.
NEPH Kidney surgery	.	.
OVRY Ovarian surgery	.	.
PACE Pacemaker surgery	.	.
PRST Prostate surgery	.	.
	.	.
RFUSN Refusion of spine	.	.
SB Small bowel surgery	3	.
SPLE Spleen surgery	.	.
THOR Thoracic surgery	.	.
THYR Thyroid and/or parathyroid surgery	.	.
	.	.
VSHN Ventricular shunt	.	.
XLAP Abdominal surgery	3	.

1. SSIs included are those classified as deep incisional or organ/space infections following inpatient
2. The number of reporting facilities included in the SIR calculation. Due to SIR exclusion criteria, thi

- statistics are only calculated for surgeries in which at least 5 facilities reported pediatric SSI data in
3. Risk factors used in the calculation of the number of predicted SSIs are listed in Appendix D.
 4. Percent of facilities with at least one predicted infection that had an SIR significantly greater than 1.0
 5. These procedures were presented in previous versions of the HAI Progress Report and follow selected SCIP procedures and the corresponding SCIP procedures are listed in Appendix E.
 6. Coronary artery bypass graft includes procedures with either chest only or chest and donor site incisions
 7. Facility-specific percentiles are only calculated if at least 20 facilities had ≥ 1.0 predicted SSI in 2010

n 2019.

or less than the nominal value of the national SIR for the given procedure type. This is only calculated if at least one inpatient surgical procedure approximating procedures covered by the Surgical Care Improvement Project

is included.

19. If a facility's predicted number of SSIs was < 1.0 , a facility-specific SIR was neither calculated nor included.

at least 10 facilities had ≥ 1.0 predicted SSI in 2019.
Specific NHSN procedures

and in the distribution of facility-specific SIRs.

Table 3. State-specific standardized infection ratios (SIRs) and facility-specific SIR summary measures, NHSN Critical Access Hospitals reporting during 2019

3a. Central line-associated bloodstream infections (CLABSI), all locations¹

State	State NHSN Mandate ²	Any Validation ³	No. of Critical Access Hospitals Reporting ⁴	No. of Infections		95% CI for SIR			Facility-specific SIRs			Facility-specific SIRs at Key Percentiles ⁵				
				Observed	Predicted	SIR	Lower	Upper	No. of facilities with at least 1 predicted CLABSI	% of facilities with SIR sig higher than national SIR ⁶	% of facilities with SIR sig lower than national SIR ⁶	10%	25%	Median (50%)	75%	90%
Alabama	Yes		4	.	.	.	.	.	0	.	.	.	.	.
Alaska			2	.	.	.	.	.	0	.	.	.	.	.
Arizona			4	.	.	.	.	.	0	.	.	.	.	.
Arkansas			13	0	0.693	.	.	.	0	.	.	.	.	.
California	Yes	Yes	29	4	2.253	1.775	0.564	4.283	0	.	.	.	.	.
Colorado	Yes	Yes	17	1	0.615	.	.	.	0	.	.	.	.	.
Connecticut	No	No	.	.	.	.	.	.	.	.	.	.	.	.
D.C.			.	.	.	.	.	.	.	.	.	.	.	.
Delaware			.	.	.	.	.	.	.	.	.	.	.	.
Florida	No	Yes	8	0	0.272	.	.	.	0	.	.	.	.	.
Georgia			18	0	1.809	0.000	.	1.656	0	.	.	.	.	.
Guam			.	.	.	.	.	.	.	.	.	.	.	.
Hawaii			2	.	.	.	.	.	0	.	.	.	.	.
Idaho			12	0	0.549	.	.	.	0	.	.	.	.	.
Illinois			35	0	2.523	0.000	.	1.187	0	.	.	.	.	.
Indiana	Yes	Yes	35	0	2.264	0.000	.	1.323	0	.	.	.	.	.
Iowa	No	No	48	0	2.208	0.000	.	1.357	0	.	.	.	.	.
Kansas	No	No	49	1	2.744	0.364	0.018	1.797	0	.	.	.	.	.
Kentucky	No	No	18	2	1.814	1.103	0.185	3.643	0	.	.	.	.	.
Louisiana			4	.	.	.	.	.	0	.	.	.	.	.
Maine	Yes	No	15	1	1.498	0.668	0.033	3.292	0	.	.	.	.	.
Maryland	No	No	.	.	.	.	.	.	.	.	.	.	.	.
Massachusetts	No	Yes	3	.	.	.	.	.	0	.	.	.	.	.
Michigan			27	0	0.997	.	.	.	0	.	.	.	.	.
Minnesota	No	No	39	3	2.287	1.312	0.334	3.570	0	.	.	.	.	.
Mississippi	No	No	7	0	0.583	.	.	.	0	.	.	.	.	.
Missouri			21	0	1.447	0.000	.	2.070	0	.	.	.	.	.
Montana	No	No	9	0	0.533	.	.	.	0	.	.	.	.	.
Nebraska			17	0	0.767	.	.	.	0	.	.	.	.	.
Nevada	M	No	2	.	.	.	.	.	0	.	.	.	.	.
New Hampshire	Yes	No	12	0	0.925	.	.	.	0	.	.	.	.	.
New Jersey	No	No	.	.	.	.	.	.	.	.	.	.	.	.
New Mexico	M	No	9	1	0.487	.	.	.	0	.	.	.	.	.
New York			5	0	0	.	.	.	0	.	.	.	.	.
North Carolina	No	No	12	1	0.812	.	.	.	0	.	.	.	.	.
North Dakota	No	No	11	0	0.452	.	.	.	0	.	.	.	.	.
Ohio	No	Yes	22	0	1.439	0.000	.	2.082	0	.	.	.	.	.
Oklahoma			10	0	0.516	.	.	.	0	.	.	.	.	.
Oregon	No	No	23	0	1.851	0.000	.	1.618	0	.	.	.	.	.
Pennsylvania	Yes	Yes	14	2	1.334	1.499	0.251	4.953	0	.	.	.	.	.
Puerto Rico			.	.	.	.	.	.	.	.	.	.	.	.
Rhode Island	No	Yes	.	.	.	.	.	.	.	.	.	.	.	.
South Carolina	Yes	Yes	4	.	.	.	.	.	0	.	.	.	.	.
South Dakota	No	Yes	15	1	0.447	.	.	.	0	.	.	.	.	.
Tennessee	No	No	6	0	0.279	.	.	.	0	.	.	.	.	.
Texas	Yes		29	0	1.891	0.000	.	1.584	0	.	.	.	.	.
Utah			5	0	0.169	.	.	.	0	.	.	.	.	.
Vermont	M	Yes	8	0	0.667	.	.	.	0	.	.	.	.	.
Virgin Islands			.	.	.	.	.	.	.	.	.	.	.	.
Virginia	No	Yes	5	0	0.544	.	.	.	0	.	.	.	.	.
Washington	Yes	Yes	34	1	2.766	0.362	0.018	1.783	0	.	.	.	.	.
West Virginia	No	No	16	0	0.980	.	.	.	0	.	.	.	.	.
Wisconsin	No	Yes	52	5	3.982	1.256	0.460	2.783	0		
Wyoming	No	No	11	0	0.339	.	.	.	0		

All US	741	25	47.854	0.522	0.346	0.760	0
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1. Data from all ICUs, wards (and other non-critical care locations), and NICUs. CLABSIs identified as Mucosal Barrier Injury (MBI) are excluded from the SIRs. These tables contain data from Critical Access Hospitals; as such, they exclude data from LTACHs, IRFs, and ACHs.
2. Yes indicates the presence of a state mandate to report CLABSI data from any location to NHSN at the beginning of 2019. M indicates midyear implementation of a mandate. No indicates that a state mandate did not exist during 2019.
3. Yes indicates that the state health department reported the completion of all of the following validation activities: state health department had access to 2019 NHSN data, state health department performed 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 identified facilities. 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 (although intensity of auditing activities varies by state). Information on validation efforts was requested from all states, regardless of the presence of a legislative mandate for the particular HAI type. Some states without mandatory reporting of a given HAI to the state health department have performed validation on NHSN data that is voluntarily shared with them by facilities in their jurisdiction.
4. The number of reporting facilities included in the SIR calculation. SIRs and accompanying statistics are only calculated for states in which at least 5 facilities reported CLABSI data in 2019.
5. Percent of facilities with at least one predicted CLABSI that had an SIR significantly greater or less than the nominal value of the 2019 national overall CLABSI SIR of 0.522. This is only calculated if at least 10 facilities had ≥ 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. If a facility's predicted number of CLABSI was < 1.0 , a facility-specific SIR was neither calculated nor included in the distribution of facility-specific SIRs.

Table 3. State-specific standardized infection ratios (SIRs) and facility-specific SIR summary measures, NHSN Critical Access Hospitals reporting during 2019

3c. Central line-associated bloodstream infections (CLABSI), ward (non-critical care) locations¹

State		No. of Infections	95% CI for SIR			Facility-specific SIRs						
			Observed	Predicted	SIR	Lower	Upper	10%	25%	75%	90%	
Alabama	Yes	4	.	.	.	.	.	.	.	.	.	.
Alaska		2	.	.	.	.	.	.	.	.	.	.
Arizona		4	.	.	.	.	.	.	.	.	.	.
Arkansas		13	0	0.672	.	.	.	0	.	.	.	.
California	Yes	28	3	1.703	1.762	0.448	4.796	0	.	.	.	.
Colorado	No	16	1	0.577	.	.	.	0	.	.	.	.
Connecticut	Yes	.	.	.	.	.	.	.	.	.	.	.
D.C.		.	.	.	.	.	.	.	.	.	.	.
Delaware		.	.	.	.	.	.	.	.	.	.	.
Florida	No	8	0	0.268	.	.	.	0	.	.	.	.
Georgia		17	0	1.566	0.000	.	1.912	0	.	.	.	.
Guam		.	.	.	.	.	.	.	.	.	.	.
Hawaii		2	.	.	.	.	.	.	.	.	.	.
Idaho		11	0	0.474	.	.	.	0	.	.	.	.
Illinois		33	0	2.398	0.000	.	1.249	0	.	.	.	.
Indiana	No	35	0	1.983	0.000	.	1.511	0	.	.	.	.
Iowa	No	48	0	2.202	0.000	.	1.360	0	.	.	.	.
Kansas	No	48	1	2.601	0.384	0.019	1.896	0	.	.	.	.
Kentucky	No	18	2	1.768	1.132	0.190	3.738	0	.	.	.	.
Louisiana		4	.	.	.	.	.	.	.	.	.	.
Maine	Yes	15	1	1.471	0.680	0.034	3.352	0	.	.	.	.
Maryland	No	.	.	.	.	.	.	.	.	.	.	.
Massachusetts	No	2	.	.	.	.	.	.	.	.	.	.
Michigan		27	0	0.886	.	.	.	0	.	.	.	.
Minnesota	No	39	3	2.226	1.348	0.343	3.668	0	.	.	.	.
Mississippi	No	7	0	0.583	.	.	.	0	.	.	.	.
Missouri		21	0	1.348	0.000	.	2.223	0	.	.	.	.
Montana	No	9	0	0.509	.	.	.	0	.	.	.	.
Nebraska		16	0	0.679	.	.	.	0	.	.	.	.
Nevada	Yes	2	.	.	.	.	.	.	.	.	.	.
New Hampshire	No	12	0	0.843	.	.	.	0	.	.	.	.
New Jersey	No	.	.	.	.	.	.	.	.	.	.	.
New Mexico	Yes	9	0	0.358	.	.	.	0	.	.	.	.
New York		5	0	0	.	.	.	0	.	.	.	.
North Carolina	No	12	0	0.681	.	.	.	0	.	.	.	.
North Dakota	No	11	0	0.428	.	.	.	0	.	.	.	.
Ohio	No	22	0	1.292	0.000	.	2.318	0	.	.	.	.
Oklahoma		10	0	0.518	.	.	.	0	.	.	.	.
Oregon	Yes	23	0	1.542	0.000	.	1.943	0	.	.	.	.
Pennsylvania	Yes	14	2	1.201	1.665	0.279	5.500	0	.	.	.	.
Puerto Rico		.	.	.	.	.	.	.	.	.	.	.
Rhode Island	No	.	.	.	.	.	.	.	.	.	.	.
South Carolina	Yes	4	.	.	.	.	.	.	.	.	.	.
South Dakota	No	15	1	0.450	.	.	.	0	.	.	.	.
Tennessee	No	6	0	0.279	.	.	.	0	.	.	.	.
Texas	Yes	26	0	1.861	0.000	.	1.610	0	.	.	.	.
Utah		5	0	0.169	.	.	.	0	.	.	.	.
Vermont	Yes	6	0	0.553	.	.	.	0	.	.	.	.

Virgin Islands			.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Virginia	No	5	0	0.506	.	.	.	0	.	.	.	.	.	.	.	.	.	.	.	.
Washington	Yes	34	1	2.442	0.410	0.020	2.020	0	.	.	.	.	.	.	.	.	.	.	.	.
West Virginia	No	16	0	0.847	.	.	.	0	.	.	.	.	.	.	.	.	.	.	.	.
Wisconsin	No	52	5	3.857	1.296	0.475	2.873	0	.	.	.	.	.	.	.	.	.	.	.	.
Wyoming	No	11	0	0.322	.	.	.	0	.	.	.	.	.	.	.	.	.	.	.	.
All US		727	22	43.933	0.501	0.322	0.746	0	.	.	.	.	.	.	.	.	.	.	.	.

1. Data from all wards (for this table wards also include step-down, mixed acuity and specialty care areas [including hematology/oncology, bone marrow transplant]). CLABSIs identified as Mucosal Barrier Injury (MBI) are excluded from the SIRs. These tables contain data from Critical Access Hospitals; as such, they exclude data from LTACHs, IRFs, and ACHs.
2. Yes indicates the presence of a state mandate to report CLABSI data from ward locations to NHSN at the beginning of 2019. M indicates midyear implementation of a mandate. No indicates that a state mandate did not exist during 2019.
3. The number of reporting facilities included in the SIR calculation. SIRs and accompanying statistics are only calculated for states in which at least 5 facilities reported CLABSI data from at least one ward in 2019.
4. Percent of facilities with at least one predicted ward CLABSI that had an SIR significantly greater or less than the nominal value of the 2019 national ward CLABSI SIR of 0.501. This is only calculated if at least 10 facilities had at least one predicted ward CLABSI in 2019.
5. Facility-specific key percentiles were only calculated if at least 20 facilities had ≥ 1.0 predicted ward CLABSI in 2019. If a facility's predicted number of ward CLABSI was < 1.0 , a facility-specific SIR was neither calculated nor included in the distribution of facility-specific SIRs.

Virgin Islands			1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Virginia	No	Yes	5	1	1.724	0.580	0.029	2.861	0	.	.	.	.	.	.	.	.	.	.	.
Washington	No	No	37	21	16.160	1.300	0.826	1.953	2	.	.	.	.	.	.	.	.	.	.	.
West Virginia	Yes	No	20	1	6.455	0.155	0.008	0.764	1	.	.	.	.	.	.	.	.	.	.	.
Wisconsin	No	Yes	56	10	30.166	0.331	0.168	0.591	9	.	.	.	.	.	.	.	.	.	.	.
Wyoming	No	No	13	0	4.805	0.000	.	0.623	2	.	.	.	.	.	.	.	.	.	.	.
All US			903	174	306.006	0.569	0.489	0.658	62	2%	0%	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.570	

1. Data from all ICUs and wards (and other non-critical care locations). This excludes NICUs. These tables contain data from Critical Access Hospitals; as such, they exclude data from LTACHs, IRFs, and ACHs.
2. Yes indicates the presence of a state mandate to report CAUTI data from any location to NHSN at the beginning of 2019. M indicates midyear implementation of a mandate. No indicates that a state mandate did not exist during 2019.
3. Yes indicates that the state health department reported the completion of all of the following validation activities: state health department had access to 2019 NHSN data, state health department performed 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 identified facilities. 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 (although intensity of auditing activities varies by state). Information on validation efforts was requested from all states, regardless of the presence of a legislative mandate for the particular HAI type. Some states without mandatory reporting of a given HAI to the state health department have performed validation on NHSN data that is voluntarily shared with them by facilities in their jurisdiction.
4. The number of reporting facilities included in the SIR calculation. SIRs and accompanying statistics are only calculated for states in which at least 5 facilities reported CAUTI data in 2019.
5. Percent of facilities with at least one predicted CAUTI that had an SIR significantly greater or less than the nominal value of the 2019 national overall CAUTI SIR of 0.569. This is only calculated if at least 10 facilities had at least one 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 a facility's predicted number of CAUTI was < 1.0 , a facility-specific SIR was neither calculated nor included in the distribution of facility-specific SIRs.

Virgin Islands		.	.	.	.	.	.	.	.	.	.	.	.	.	.
Virginia	No	5	1	1.433	0.698	0.035	3.442	.	.	.	.	.	.	.	.
Washington	No	37	20	14.566	1.373	0.862	2.083	2	.	.	.	.	.	.	.
West Virginia	No	20	1	5.704	0.175	0.009	0.865	.	.	.	.	.	.	.	.
Wisconsin	No	56	10	28.231	0.354	0.180	0.631	9	.	.	.	.	.	.	.
Wyoming	No	13	0	4.297	0.000	.	0.697	.	.	.	.	.	.	.	.
All US		878	159	273.172	0.582	0.497	0.678	59	2%	0%	0.000	0.000	0.000	0.000	0.693

1. Data from all wards (for this table wards also include stepdown, mixed acuity and specialty care areas [including hematology/oncology, bone marrow transplant]). This excludes NICU. These tables contain data from Critical Access Hospitals; as such, they exclude data from LTACHs, IRFs, and CAHs.
2. Yes indicates the presence of a state mandate to report CAUTI data from ward locations to NHSN at the beginning of 2019. M indicates midyear implementation of a mandate. No indicates that a state mandate did not exist during 2019.
3. The number of reporting facilities included in the SIR calculation. SIRs and accompanying statistics are only calculated for states in which at least 5 facilities reported CAUTI data from at least one ward in 2019.
4. Percent of facilities with at least one predicted ward CAUTI that had an SIR significantly greater or less than the nominal value of the 2019 national ward CAUTI SIR of 0.582. This is only calculated if at least 10 facilities had at least one predicted ward CAUTI in 2019.
5. Facility-specific key percentiles were only calculated if at least 20 facilities had ≥ 1.0 predicted ward CAUTI in 2019. If a facility's predicted number of ward CAUTI was < 1.0 , a facility-specific SIR was neither calculated nor included in the distribution of facility-specific SIRs.

**Table 5. State-specific standardized infection ratios (SIRs) and facility-specific SIR summary measures,
NHSN Critical Access Hospitals reporting during 2019
5a. Ventilator-associated events (VAE), all locations¹**

State			No. of Events		95% CI for SIR		Facility-specific SIRs			
	Observed	Predicted	SIR	Lower	Upper	No. of facilities with at least 1 predicted VAE	10%	25%	75%	90%
Alabama	No	No	0	.	.	.	.	.	.	.
Alaska			1	.	.	.	.	.	.	.
Arizona			2	.	.	.	.	.	.	.
Arkansas			2	.	.	.	.	.	.	.
California	No	No	10	2	0.849	.	.	.	.	.
Colorado	No	No	2	.	.	.	.	.	.	.
Connecticut	No	No	0	.	.	.	.	.	.	.
D.C.			0	.	.	.	.	.	.	.
Delaware			0	.	.	.	.	.	.	.
Florida	No	No	2	.	.	.	.	.	.	.
Georgia			1	.	.	.	.	.	.	.
Guam			0	.	.	.	.	.	.	.
Hawaii			0	.	.	.	.	.	.	.
Idaho			3	.	.	.	.	.	.	.
Illinois			3	.	.	.	.	.	.	.
Indiana	No	No	10	0	0.258	.	.	.	.	.
Iowa	No	No	0	.	.	.	.	.	.	.
Kansas	No	No	2	.	.	.	.	.	.	.
Kentucky	No	No	2	.	.	.	.	.	.	.
Louisiana			1	.	.	.	.	.	.	.
Maine	No	No	2	.	.	.	.	.	.	.
Maryland	No	No	0	.	.	.	.	.	.	.
Massachusetts	No	No	1	.	.	.	.	.	.	.
Michigan			5	1.00	0.281	.	.	.	.	.
Minnesota	No	No	1	.	.	.	.	.	.	.
Mississippi			0	.	.	.	.	.	.	.
Missouri			2	.	.	.	.	.	.	.
Montana	No	No	2	.	.	.	.	.	.	.
Nebraska			0	.	.	.	.	.	.	.
Nevada	No	No	1	.	.	.	.	.	.	.
New Hampshire	No	No	5	0	0.205	.	.	.	.	.
New Jersey	No	No	0	.	.	.	.	.	.	.
New Mexico	No	No	2	.	.	.	.	.	.	.
New York			2	.	.	.	.	.	.	.
North Carolina			4	.	.	.	.	.	.	.
North Dakota	No	No	1	.	.	.	.	.	.	.
Ohio	No	No	8	0	0.457	.	.	.	.	.
Oklahoma			0	.	.	.	.	.	.	.
Oregon	No	No	9	0	0.211	.	.	.	.	.
Pennsylvania	Yes	Yes	7	0	0.775	.	.	.	.	.
Puerto Rico			0	.	.	.	.	.	.	.
Rhode Island	No	No	0	.	.	.	.	.	.	.
South Carolina	Yes	Yes	1	.	.	.	.	.	.	.
South Dakota	No	Yes	0	.	.	.	.	.	.	.
Tennessee	No	No	0	.	.	.	.	.	.	.
Texas	No	No	4	.	.	.	.	.	.	.
Utah			0	.	.	.	.	.	.	.

Vermont	No	No	0	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Virgin Islands			0	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Virginia	No	No	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Washington	No	No	8	1	0.815	.	.	.	.	0	.	.	.	.	.	.	.	.	.	.
West Virginia	No	No	4	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Wisconsin	No	No	9	0	0.116	.	.	.	.	0	.	.	.	.	.	.	.	.	.	.
Wyoming	No	No	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
All US			121	9	5.625	1.600	0.780	2.936	0	.	.	.	.	.	.	.	.	.	.	.

- Data from all ICUs and wards (and other non-critical care locations). This excludes NICUs. Pediatric locations (ICUs or wards) are excluded, since pediatric and neonatal locations are excluded from VAE surveillance. These tables contain data from Critical Access Hospitals; as such, they exclude data from LTACHs, IRFs, and ACHs.
- Yes indicates the presence of a state mandate to report VAE data from any location to NHSN at the beginning of 2019. M indicates midyear implementation of a mandate. No indicates that a state mandate did not exist during 2019.
- Yes indicates that the state health department reported the completion of all of the following validation activities: state health department had access to 2019 NHSN data, state health department performed 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 identified facilities. 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 (although intensity of auditing activities varies by state). Information on validation efforts was requested from all states, regardless of the presence of a legislative mandate for the particular HAI type. Some states without mandatory reporting of a given HAI to the state health department have performed validation on NHSN data that is voluntarily shared with them by facilities in their jurisdiction.
- The number of reporting facilities included in the SIR calculation. SIRs and accompanying statistics are only calculated for states in which at least 5 facilities reported VAE data in 2019.
- Percent of facilities with at least one predicted VAE that had an SIR significantly greater or less than the nominal value of the 2019 national overall VAE SIR of 1.600. This is only calculated if at least 10 facilities had at least one predicted VAE in 2019.
- Facility-specific key percentiles were only calculated if at least 20 facilities had ≥ 1.0 predicted VAE in 2019. If a facility's predicted number of VAE was < 1.0 , a facility-specific SIR was neither calculated nor included in the distribution of facility-specific SIRs.

Virgin Islands		0	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Virginia	No	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Washington	No	7	1	0.812	.	.	.	.	0	.	.	.	.	.	.	.	.	.	.	.
West Virginia	No	3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Wisconsin	No	8	0	0.108	.	.	.	.	0	.	.	.	.	.	.	.	.	.	.	.
Wyoming	No	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
All US		103	7	4.392	1.594	0.697	3.153		0											

1. Data from all ICUs; excludes wards (and other non-critical care locations) and NICUs. Pediatric location (ICUs) are excluded from SIR since pediatric and neonatal locations are excluded from VAE surveillance. These tables contain data from Critical Access Hospitals; as such, they exclude data from LTACHs, IRFs, and ACHs.
2. Yes indicates the presence of a state mandate to report VAE data from critical care units to NHSN at the beginning of 2019. M indicates midyear implementation of a mandate. No indicates that a state mandate did not exist during 2019.
3. The number of reporting facilities included in the SIR calculation. SIRs and accompanying statistics are only calculated for states in which at least 5 facilities reported VAE data from at least one critical care location in 2019.
4. Percent of facilities with at least one predicted ICU VAE that had an SIR significantly greater or less than the nominal value of the 2019 national ICU VAE SIR of 1.594. This is only calculated if at least 10 facilities had at least one predicted ICU VAE in 2019.
5. Facility-specific key percentiles were only calculated if at least 20 facilities had ≥ 1.0 predicted ICU VAE in 2019. If a facility's predicted number of ICU VAE was < 1.0 , a facility-specific SIR was neither calculated nor included in the distribution of facility-specific SIRs.

Virginia	No	0	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Washington	No	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
West Virginia	No	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Wisconsin	No	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Wyoming	No	1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
All US		22	2	1.233	1.622	0.272	5.359	0	.	.	.	.	.	.	.	.	.	.	.	.

1. Data from all wards (for this table wards also include stepdown, mixed acuity and specialty care areas [including hematology/oncology, bone marrow transplant]). This excludes NICU. Pediatric location (wards) are excluded from SIR since pediatric and neonatal locations are excluded from VAE surveillance. These tables contain data from Critical Access Hospitals; as such, they exclude data from LTACHs, IRFs, and ACHs.
2. Yes indicates the presence of a state mandate to report VAE data from ward locations to NHSN at the beginning of 2019. M indicates midyear implementation of a mandate. No indicates that a state mandate did not exist during 2019.
3. The number of reporting facilities included in the SIR calculation. SIRs and accompanying statistics are only calculated for states in which at least 5 facilities reported VAE data from at least one ward in 2019.
4. Percent of facilities with at least one predicted ward VAE that had an SIR significantly greater or less than the nominal value of the 2019 national ward VAE SIR of 1.622. This is only calculated if at least 10 facilities had at least one predicted ward VAE in 2019.
5. Facility-specific key percentiles were only calculated if at least 20 facilities had ≥ 1.0 predicted ward VAE in 2019. If a facility's predicted number of ward VAE was < 1.0 , a facility-specific SIR was neither calculated nor included in the distribution of facility-specific SIRs.

Table 6. State-specific standardized infection ratios (SIRs) and facility-specific SIR summary measures, NHSN Critical Access Hospitals reporting during 2019

6a. Surgical site infections (SSI) following colon surgery¹ in adults, ≥ 18years

State					No. of Infections		95% CI for SIR			Facility-specific SIRs			
	No. of Critical Access Hospitals Reporting ⁴	No. of Procedures	Observed	Predicted	SIR	Lower	Upper	No. of facilities with at least 1 predicted SSI	10%	25%	75%	90%	
Alabama	Yes	Yes	0	.	.	.	.	.	.	.	.	.	.
Alaska			2	.	.	.	.	.	.	.	.	.	.
Arizona			2	.	.	.	.	.	.	.	.	.	.
Arkansas			2	.	.	.	.	.	.	.	.	.	.
California	Yes	Yes	16	191	6	3.731	1.608	0.652	3.345	0	.	.	.
Colorado	Yes	Yes	10	58	4	1.046	3.823	1.215	9.221	0	.	.	.
Connecticut	No	No	0	.	.	.	.	.	.	.	.	.	.
D.C.			0	.	.	.	.	.	.	.	.	.	.
Delaware			0	.	.	.	.	.	.	.	.	.	.
Florida	No	Yes	3	.	.	.	.	.	.	.	.	.	.
Georgia			2	.	.	.	.	.	.	.	.	.	.
Guam			0	.	.	.	.	.	.	.	.	.	.
Hawaii			1	.	.	.	.	.	.	.	.	.	.
Idaho			4	.	.	.	.	.	.	.	.	.	.
Illinois			13	133	1	2.424	0.413	0.021	2.035	0	.	.	.
Indiana	Yes	Yes	24	211	1	3.912	0.256	0.013	1.261	0	.	.	.
Iowa	No	No	8	40	0	0.655	.	.	.	0	.	.	.
Kansas	No	Yes	8	44	2	0.801	.	.	.	0	.	.	.
Kentucky	No	No	5	35	1	0.7283	.	.	.	0	.	.	.
Louisiana			2	.	.	.	.	.	.	.	.	.	.
Maine	No	Yes	8	99	0	2.249	0.000	.	1.332	0	.	.	.
Maryland	No	No	0	.	.	.	.	.	.	.	.	.	.
Massachusetts	No	Yes	1	.	.	.	.	.	.	.	.	.	.
Michigan			14	106	2	2.048	0.977	0.164	3.227	0	.	.	.
Minnesota	No	No	12	127	8	2.310	3.464	1.609	6.577	0	.	.	.
Mississippi	No	No	0	.	.	.	.	.	.	.	.	.	.
Missouri			9	53	0	0.760	.	.	.	0	.	.	.
Montana	No	No	5	51	0	0.815	.	.	.	0	.	.	.
Nebraska			2	.	.	.	.	.	.	.	.	.	.
Nevada	No	No	1	.	.	.	.	.	.	.	.	.	.
New Hampshire	Yes	No	9	74	2	1.329	1.505	0.252	4.971	0	.	.	.
New Jersey	No	No	0	.	.	.	.	.	.	.	.	.	.
New Mexico	No	No	3	.	.	.	.	.	.	.	.	.	.
New York			3	.	.	.	.	.	.	.	.	.	.
North Carolina	No	No	9	69	2	1.290	1.551	0.260	5.123	0	.	.	.
North Dakota	No	No	2	.	.	.	.	.	.	.	.	.	.
Ohio	No	Yes	13	89	0	1.696	0.000	.	1.767	0	.	.	.
Oklahoma			0	.	.	.	.	.	.	.	.	.	.
Oregon	Yes	Yes	16	193	2	3.739	0.535	0.090	1.767	0	.	.	.
Pennsylvania	Yes	Yes	7	47	1	0.827	.	.	.	0	.	.	.
Puerto Rico			0	.	.	.	.	.	.	.	.	.	.
Rhode Island			0	.	.	.	.	.	.	.	.	.	.
South Carolina	Yes	Yes	1	.	.	.	.	.	.	.	.	.	.
South Dakota	No	Yes	0	.	.	.	.	.	.	.	.	.	.
Tennessee	No	No	1	.	.	.	.	.	.	.	.	.	.
Texas	Yes	Yes	11	49	0	0.958	.	.	.	0	.	.	.
Utah			2	.	.	.	.	.	.	.	.	.	.
Vermont	No	No	1	.	.	.	.	.	.	.	.	.	.
Virgin Islands			0	.	.	.	.	.	.	.	.	.	.
Virginia	No	Yes	3	.	.	.	.	.	.	.	.	.	.
Washington	Yes	Yes	15	114	1	1.937	0.516	0.026	2.546	0	.	.	.
West Virginia	No	No	7	95	0	1.804	0.000	.	1.661	0	.	.	.
Wisconsin	No	Yes	34	274	4	4.690	0.853	0.271	2.057	0	.	.	.
Wyoming	No	No	5	30	1	0.50	.	.	.	0	.	.	.
All US			296	2,467	44	45.722	0.962	0.708	1.280	0	.	.	.

1. Critical Access Hospitals are not required to report SSIs following inpatient colon procedures in adults 18 years and older to NHSN for participation in the Centers for Medicare and Medicaid Services' (CMS) Hospital Inpatient Quality Reporting Program. SSIs included in this table are those classified as deep incisional or organ/space infections following NHSN-defined inpatient colon procedures that occurred in 2019 with a primary or other than primary skin closure technique, detected during the same admission as the surgical procedure or upon readmission to the same facility. The colon surgery SSI data published in this report use different risk adjustment methodology and a different subset of data than that which are used for public reporting by CMS.
2. Yes indicates the presence of a state mandate to report SSIs following colon surgery to NHSN at the beginning of 2019. M indicates midyear implementation of a mandate. No indicates that a state mandate did not exist during 2019.
3. Yes indicates that the state health department reported the completion of all of the following validation activities: state health department had access to 2019 NHSN data, state health department performed 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 identified facilities. 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 (although intensity of auditing activities varies by state). Information on validation efforts was requested from all states, regardless of the presence of a legislative mandate for the particular HAI type. Some states without mandatory reporting of a given HAI to the state health department have performed validation on NHSN data that is voluntarily shared with them by facilities in their jurisdiction.
4. The number of reporting facilities included in the SIR calculation. Due to SIR exclusion criteria, this may be different from the numbers shown in Table 1. Refer to the Technical Appendix for information about exclusion criteria. SIRs and accompanying statistics are only calculated for states in which at least 5 facilities reported SSI data following colon surgery in 2019.
5. Percent of facilities with at least one predicted colon surgery SSI that had an SIR significantly greater or less than the nominal value of the 2019 national colon surgery SIR of 0.962. This is only calculated if at least 10 facilities had at least one predicted colon surgery SSI in 2019.
6. Facility-specific key percentiles were only calculated if at least 20 facilities had ≥ 1.0 predicted colon surgery SSI in 2019. If a facility's predicted number of colon surgery SSI was < 1.0 , a facility-specific SIR was neither calculated nor included in the distribution of facility-specific SIRs.

All US	242	2,444	19	13,206	1,439	0.892	2,205	0
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- Critical Access Hospitals are not required to report SSIs following inpatient abdominal hysterectomy procedures in adults 18 years and older to NHSN for participation in the Centers for Medicare and Medicaid Services' (CMS) Hospital Inpatient Quality Reporting Program. SSIs included are those classified as deep incisional or organ/space infections following NHSN-defined inpatient abdominal hysterectomy procedures that occurred in 2019 with a primary or other than primary skin closure technique, detected during the same admission as the surgical procedure or upon readmission to the same facility. The abdominal hysterectomy SSI data published in this report use different risk adjustment methodology and a different subset of data than that which are used for public reporting by CMS.
- Yes indicates the presence of a state mandate to report SSIs following abdominal hysterectomy surgery to NHSN at the beginning of 2019. M indicates midyear implementation of a mandate. No indicates that a state mandate did not exist during 2019.
- Yes indicates that the state health department reported the completion of all of the following validation activities: state health department had access to 2019 NHSN data, state health department performed 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 identified facilities. 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 (although intensity of auditing activities varies by state). Information on validation efforts was requested from all states, regardless of the presence of a legislative mandate for the particular HAI type. Some states without mandatory reporting of a given HAI to the state health department have performed validation on NHSN data that is voluntarily shared with them by facilities in their jurisdiction.
- The number of reporting facilities included in the SIR calculation. Due to SIR exclusion criteria, this may be different from the numbers shown in Table 1. Refer to the Technical Appendix for information about exclusion criteria. SIRs and accompanying statistics are only calculated for states in which at least 5 facilities reported SSI data following abdominal hysterectomy surgery in 2019.
- Percent of facilities with at least one predicted abdominal hysterectomy SSI that had an SIR significantly greater or less than the nominal value of the 2019 national abdominal hysterectomy SIR of 1.439. This is only calculated if at least 10 facilities had at least one predicted abdominal hysterectomy SSI in 2019.
- Facility-specific key percentiles were only calculated if at least 20 facilities had ≥ 1.0 predicted abdominal hysterectomy SSI in 2019. If a facility's predicted number of abdominal hysterectomy SSI was < 1.0 , a facility-specific SIR was neither calculated nor included in the distribution of facility-specific SIRs.

Virginia	No	Yes	5	1	0.486	.	.	.	0	.	.	.	.	.	.	.	.	.
Washington	No	No	24	1	1.946	0.514	0.026	2.534	0	.	.	.	.	.	.	.	.	.
West Virginia	No	No	15	0	1.070	0.000	.	2.800	0	.	.	.	.	.	.	.	.	.
Wisconsin	No	No	56	0	3.414	0.000	.	0.877	0	.	.	.	.	.	.	.	.	.
Wyoming	No	No	6	0	0.282	.	.	.	0	.	.	.	.	.	.	.	.	.
All US			717	26	44.291	0.587	0.392	0.848	0	.	.	.	.	.	.	.	.	.

- Critical Access Hospitals are not required to report facility-wide MRSA bacteremia data to NHSN for participation in the Centers for Medicare and Medicaid Services' (CMS) Hospital Inpatient Quality Reporting Program. Hospital-onset is defined as event detected on the 4th day (or later) after admission to an inpatient location within the facility.
- 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 implementation of a mandate. No indicates that a state mandate did not exist during 2019.
- Yes indicates that the state health department reported the completion of all of the following validation activities: state health department had access to 2019 NHSN data, state health department performed 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 identified facilities. 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 (although intensity of auditing activities varies by state). Information on validation efforts was requested from all states, regardless of the presence of a legislative mandate for the particular HAI type. Some states without mandatory reporting of a given HAI to the state health department have performed validation on NHSN data that is voluntarily shared with them by facilities in their jurisdiction.
- The number of reporting facilities included in the SIR calculation. Due to SIR exclusion criteria, this may be different from the numbers shown in Table 1. Refer to the Technical Appendix for information about exclusion criteria. SIRs and accompanying statistics are only calculated for states in which at least 5 facilities reported MRSA bacteremia data in 2019.
- Percent of facilities with at least one predicted hospital-onset MRSA bacteremia that had an SIR significantly greater or less than the nominal value of the 2019 national hospital-onset MRSA bacteremia SIR of 0.587. This is only calculated if at least 10 facilities had at least one predicted hospital-onset MRSA bacteremia in 2019.
- Facility-specific key percentiles were only calculated if at least 20 facilities had ≥ 1.0 predicted hospital-onset MRSA bacteremia in 2019. If a facility's predicted number of hospital-onset MRSA bacteremia was < 1.0 , a facility-specific SIR was neither calculated nor included in the distribution of facility-specific SIRs.

Table 8. State-specific standardized infection ratios (SIRs) and facility-specific SIR summary measures, NHSN Critical Access Hospitals reporting during 2019

Hospital-onset *Clostridioides difficile* infection (CDI), facility-wide¹

State			No. of Events		95% CI for SIR		Facility-specific SIRs								
	Observed	Predicted	SIR	Lower	Upper	No. of facilities with at least 1 predicted HO CDI	10%	25%	75%	90%					
Alabama	No		4	.	.	.	.	.	.	.	.	.	.	.	.
Alaska			3	.	.	.	.	.	.	.	.	.	.	.	.
Arizona			4	.	.	.	.	.	.	.	.	.	.	.	.
Arkansas			10	12	7.501	1.600	0.867	2.720	2	.	.	.	.	.	.
California	Yes	Yes	33	26	29.040	0.895	0.597	1.293	12	8%	0%	.	.	.	.
Colorado	No	No	25	21	16.704	1.257	0.799	1.889	4	.	.	.	.	.	.
Connecticut	No	Yes	0	.	.	.	.	.	.	.	.	.	.	.	.
D.C			0	.	.	.	.	.	.	.	.	.	.	.	.
Delaware			0	.	.	.	.	.	.	.	.	.	.	.	.
Florida	No	Yes	9	3	7.583	0.396	0.101	1.077	4	.	.	.	.	.	.
Georgia			16	10	15.897	0.629	0.320	1.121	8	.	.	.	.	.	.
Guam			0	.	.	.	.	.	.	.	.	.	.	.	.
Hawaii			1	.	.	.	.	.	.	.	.	.	.	.	.
Idaho			11	8	8.267	0.968	0.449	1.838	3	.	.	.	.	.	.
Illinois			49	44	33.483	1.314	0.967	1.748	7	.	.	.	.	.	.
Indiana	No	No	34	17	33.819	0.503	0.303	0.788	14	0%	0%	.	.	.	.
Iowa	No	No	49	12	25.818	0.465	0.252	0.790	4	.	.	.	.	.	.
Kansas	No	Yes	50	21	28.450	0.738	0.469	1.109	8	.	.	.	.	.	.
Kentucky	No	No	18	13	15.020	0.866	0.481	1.443	4	.	.	.	.	.	.
Louisiana			3	.	.	.	.	.	.	.	.	.	.	.	.
Maine	Yes	Yes	16	16	27.942	0.573	0.339	0.910	14	0%	0%	.	.	.	.
Maryland	No	No	0	.	.	.	.	.	.	.	.	.	.	.	.
Massachusetts	No	Yes	3	.	.	.	.	.	.	.	.	.	.	.	.
Michigan			29	13	20.249	0.642	0.357	1.070	8	.	.	.	.	.	.
Minnesota	No	No	50	24	35.227	0.681	0.447	0.998	14	0%	0%	.	.	.	.
Mississippi	No	No	10	8	11.079	0.722	0.335	1.371	6	.	.	.	.	.	.
Missouri			23	19	33.262	0.571	0.354	0.876	10	10%	10%	.	.	.	.
Montana	No	No	8	7	14.079	0.497	0.217	0.984	5	.	.	.	.	.	.
Nebraska			22	8	9.292	0.861	0.400	1.635	3	.	.	.	.	.	.
Nevada	No	No	2	.	.	.	.	.	.	.	.	.	.	.	.
New Hampshire	No	No	12	16	17.453	0.917	0.543	1.457	11	9%	0%	.	.	.	.
New Jersey	No	No	0	.	.	.	.	.	.	.	.	.	.	.	.
New Mexico	Yes	No	9	3	8.698	0.345	0.088	0.939	3	.	.	.	.	.	.
New York			5	14	7.279	1.923	1.095	3.151	3	.	.	.	.	.	.
North Carolina	No	No	11	13	16.728	0.777	0.432	1.296	7	.	.	.	.	.	.
North Dakota	No	Yes	12	3	6.767	0.443	0.113	1.207	2	.	.	.	.	.	.
Ohio	No	Yes	25	28	29.314	0.955	0.647	1.362	13	8%	0%	.	.	.	.
Oklahoma			13	5	5.627	0.889	0.326	1.970	1	.	.	.	.	.	.
Oregon	Yes	Yes	25	31	28.150	1.101	0.761	1.544	13	8%	0%	.	.	.	.
Pennsylvania	Yes	Yes	11	11	12.354	0.890	0.468	1.548	5	.	.	.	.	.	.
Puerto Rico			0	.	.	.	.	.	.	.	.	.	.	.	.
Rhode Island	No	No	0	.	.	.	.	.	.	.	.	.	.	.	.
South Carolina	Yes	Yes	3	.	.	.	.	.	.	.	.	.	.	.	.
South Dakota	No	Yes	37	12	13.964	0.859	0.466	1.461	3	.	.	.	.	.	.
Tennessee	No	No	7	2	2.494	0.802	0.134	2.649	1	.	.	.	.	.	.
Texas	No	No	28	9	19.698	0.457	0.223	0.838	8	.	.	.	.	.	.
Utah			7	0	2.397	0.000	.	1.250	0	.	.	.	.	.	.
Vermont	Yes	Yes	8	10	15.610	0.641	0.325	1.142	7	.	.	.	.	.	.
Virgin Islands			0	.	.	.	.	.	.	.	.	.	.	.	.
Virginia	No	Yes	5	10	9.159	1.092	0.555	1.946	5	.	.	.	.	.	.
Washington	Yes	Yes	35	28	36.554	0.766	0.519	1.092	16	6%	0%	.	.	.	.

West Virginia	No	No	15	11	16.908	0.651	0.342	1.131	8	.	.	.	.	.	.	.
Wisconsin	No	No	56	52	53.073	0.980	0.739	1.275	24	0%	0%	0.000	0.000	0.822	1.370	1.928
Wyoming	No	No	13	4	6.257	0.639	0.203	1.542	1	.	.	.	.	.	.	.
All US			819	558	702.779	0.794	0.730	0.862	270	4%	1%	0.000	0.000	0.642	1.235	2.054

- Critical Access Hospitals are not required to report facility-wide CDI data to NHSN for participation in the Centers for Medicare and Medicaid Services' (CMS) Hospital Inpatient Quality Reporting Program. Hospital-onset is defined as event detected on the 4th day (or later) after admission to an inpatient location within the facility.
- Yes indicates the presence of a state mandate to report facility-wide CDI data to NHSN at the beginning of 2019. M indicates midyear implementation of a mandate. No indicates that a state mandate did not exist during 2019.
- Yes indicates that the state health department reported the completion of all of the following validation activities: state health department had access to 2019 NHSN data, state health department performed 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 identified facilities. 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 (although intensity of auditing activities varies by state). Information on validation efforts was requested from all states, regardless of the presence of a legislative mandate for the particular HAI type. Some states without mandatory reporting of a given HAI to the state health department have performed validation on NHSN data that is voluntarily shared with them by facilities in their jurisdiction.
- The number of reporting facilities included in the SIR calculation. Due to SIR exclusion criteria, this may be different from the numbers shown in Table 1. Refer to the Technical Appendix for information about exclusion criteria. SIRs and accompanying statistics are only calculated for states in which at least 5 facilities reported CDI data in 2019.
- Percent of facilities with at least one predicted hospital-onset CDI that had an SIR significantly greater or less than the nominal value of the 2019 national hospital-onset CDI SIR of 0.794. This is only calculated if at least 10 facilities had at least one predicted hospital-onset CDI in 2019.
- Facility-specific key percentiles were only calculated if at least 20 facilities had ≥ 1.0 predicted hospital-onset CDI in 2019. If a facility's predicted number of hospital-onset CDI was < 1.0 , a facility-specific SIR was neither calculated nor included in the distribution of facility-specific SIRs.

Table 9. Changes in national standardized infection ratios (SIRs) using HAI data reported from all NHSN Critical line-associated bloodstream infections (CLABSIs), catheter-associated urinary tract infections (CAUTIs), ventilator-associated pneumonia (VAPs), *Clostridioides difficile* infections (CDI), and surgical site infections (SSIs) following Surgical Care

	2018 SIR	2019 SIR	Percent Change	Direction of Change, Based on Statistical Significance	p-value
CLABSI, all locations¹	0.932	0.522	-44%	Decrease	0.0207
CLABSI, ICU ²	1.018	0.763	25%	No change	0.7253
CLABSI, Ward ³	0.924	0.501	-46%	Decrease	0.0208
CAUTI, all locations⁵	0.785	0.569	-28%	Decrease	0.0011
CAUTI, ICU ²	0.615	0.457	26%	No change	0.3846
CAUTI, Ward ³	0.806	0.582	-28%	Decrease	0.0016
ICUs ⁵	0.613	1.600	161%	No change	0.1461
Wards ⁶	0.461	1.594	246%	No change	0.1131
Hospital-onset MRSA bacteremia, facility-wide⁶	0.551	0.587	7%	No change	0.8281
Hospital-onset <i>C. difficile</i> infections, facility-wide⁶	0.790	0.794	1%	No change	0.9279
SSI, combined SCIP procedures⁷	0.897	0.997	11%	No change	0.4097
SSI, Abdominal aortic aneurysm repair	.	.	.	.	.
SSI, Coronary artery bypass graft ⁸	.	.	.	.	.
SSI, Cardiac surgery	.	.	.	.	.
SSI, Colon surgery	0.903	0.962	7%	No change	0.7739
SSI, Hip arthroplasty	0.952	0.790	17%	No change	0.4637
SSI, Abdominal hysterectomy	0.848	1.439	70%	No change	0.1912
SSI, Knee arthroplasty	0.858	1.087	27%	No change	0.3416
SSI, Peripheral vascular bypass surgery	.	.	.	.	.
SSI, Rectal surgery	.	.	.	.	.
SSI, Vaginal hysterectomy	.	.	.	.	.

* Statistically significant, p < 0.0500

1. Data from all ICUs, wards (and other non-critical care locations), and NICUs. This excludes LTAC locations (or facilities) and IRF locations (or facilities).
2. Data from all ICUs; excludes wards (and other non-critical care locations), NICUs, LTAC locations (or facilities), and IRF locations (or facilities).
3. Data from all wards (for this table wards also include step-down and specialty care areas [including hematology/oncology, bone marrow transplant]).
4. Data from all NICU locations, including Level II/III and Level III nurseries. Both umbilical line and central line-associated bloodstream infections are included.
5. Data from all ICUs and wards (and other non-critical care locations). This excludes NICUs, LTAC locations (or facilities) and IRF locations (or facilities).
6. Hospital-onset is defined as event detected on the 4th day (or later) after admission to an inpatient location within the facility.
7. These procedures were presented in previous versions of the HAI Progress Report and follow select inpatient surgical procedures with a primary diagnosis using NHSN surgical procedure categorizations. Includes SSIs that were classified as deep incisional or organ/space, and were detected upon admission.
8. Coronary artery bypass graft includes procedures with either chest only or chest and donor site incisions.

tical Access Hospitals reporting during 2019 by HAI and patient population:
associated events (VAEs), methicillin-resistant *Staphylococcus aureus* (MRSA) bacteremia,
Improvement Project (SCIP) procedures, 2018 compared to 2019

ilities) and ACHs.

t]. This excludes LTAC locations [or facilities] and IRF locations [or facilities]).

e considered CLABSIs.

ilities).

and other primary skin closure technique approximating the procedures covered by SCIP,

mission or readmission. Specific NHSN procedures and the corresponding SCIP procedures are listed in Appendix C.

Table 10. Changes in state-specific standardized infection ratios (SIRs) between 2018 and 2019 from NHSN Critical Access Hospitals

10a. Central line-associated bloodstream infections (CLABSIs), all locations¹

State ²	All Critical Access Hospitals Reporting to NHSN				
	2018 SIR	2019 SIR	Percent Change	Direction of Change, Based on Statistical Significance	p-value
Alabama	.	.	.	.	.
Alaska	.	.	.	.	.
Arizona	.	.	.	.	.
Arkansas	.	.	.	.	.
California	0.000	1.775	.	No change	0.0547
Colorado	.	.	.	.	.
Connecticut	.	.	.	.	.
D.C.	.	.	.	.	.
Delaware	.	.	.	.	.
Florida	.	.	.	.	.
Georgia	0.000	0.000	.	.	.
Guam	.	.	.	.	.
Hawaii	.	.	.	.	.
Idaho	.	.	.	.	.
Illinois	0.400	0.000	100%	No change	0.4974
Indiana	1.051	0.000	100%	No change	0.2086
Iowa	1.125	0.000	100%	No change	0.1990
Kansas	0.375	0.364	3%	No change	0.9860
Kentucky	1.210	1.103	9%	No change	0.9304
Louisiana	.	.	.	.	.
Maine	4.075	0.668	84%	No change	0.0777
Maryland	.	.	.	.	.
Massachusetts	.	.	.	.	.
Michigan	.	.	.	.	.
Minnesota	2.203	1.312	40%	No change	0.5196
Mississippi	.	.	.	.	.
Missouri	1.586	0.000	100%	No change	0.1818
Montana	.	.	.	.	.
Nebraska	.	.	.	.	.
Nevada	.	.	.	.	.
New Hampshire	.	.	.	.	.
New Jersey	.	.	.	.	.
New Mexico	.	.	.	.	.
New York	.	.	.	.	.
North Carolina	.	.	.	.	.
North Dakota	.	.	.	.	.
Ohio	1.542	0.000	100%	No change	0.2247
Oklahoma	.	.	.	.	.
Oregon	0.586	0.000	100%	No change	0.4796
Pennsylvania	1.779	1.499	16%	No change	0.8722
Puerto Rico	.	.	.	.	.
Rhode Island	.	.	.	.	.
South Carolina	.	.	.	.	.
South Dakota	.	.	.	.	.
Tennessee	.	.	.	.	.
Texas	0.000	0.000	.	.	.
Utah	.	.	.	.	.
Vermont	.	.	.	.	.
Virgin Islands	.	.	.	.	.
Virginia	.	.	.	.	.
Washington	2.120	0.362	83%	No change	0.0748
West Virginia	.	.	.	.	.
Wisconsin	0.527	1.256	138%	No change	0.3171
Wyoming	.	.	.	.	.
All US	0.932	0.522	-44%	Decrease	0.0207

* Statistically significant, p < 0.0500

1. Data from all ICUs, wards (and other non-critical care locations). This excludes LTAC locations (or facilities) and IRF locations (or facilities).
2. States without SIR either in 2018 and/or 2019 and therefore subsequent data not calculated

Table 10. Changes in state-specific standardized infection ratios (SIRs) between 2018 and 2019 from NHSN Critical Access Hospitals					
10b. Catheter-associated urinary tract infections (CAUTI), all locations¹					
	All Critical Access Hospitals Reporting to NHSN				
	2018 SIR	2019 SIR	Percent Change	Direction of Change, Based on Statistical Significance	p-value
Alabama	0.000	0.000	.	.	.
Alaska	.	.	.	.	.
Arizona	.	.	.	.	.
Arkansas	0.607	0.539	11%	No change	0.9117
California	1.027	0.744	28%	No change	0.4902
Colorado	1.348	0.995	26%	No change	0.5509
Connecticut	.	.	.	.	.
D.C.	.	.	.	.	.
Delaware	.	.	.	.	.
Florida	0.245	0.216	12%	No change	0.9373
Georgia	0.657	0.691	5%	No change	0.9614
Guam	.	.	.	.	.
Hawaii	.	.	.	.	.
Idaho	1.770	1.685	5%	No change	0.9131
Illinois	0.456	0.516	13%	No change	0.8203
Indiana	0.280	0.459	64%	No change	0.4615
Iowa	0.682	0.569	17%	No change	0.6767
Kansas	1.209	0.416	-66%	Decrease	0.0110
Kentucky	0.530	0.632	19%	No change	0.8370
Louisiana	.	.	.	.	.
Maine	0.112	0.309	176%	No change	0.4191
Maryland	.	.	.	.	.
Massachusetts	.	.	.	.	.
Michigan	0.156	0.827	430%	No change	0.0980
Minnesota	0.854	0.364	57%	No change	0.0686
Mississippi	1.267	0.905	29%	No change	0.6804
Missouri	1.328	0.585	56%	No change	0.1579
Montana	1.100	0.000	-100%	Decrease	0.0179
Nebraska	0.930	0.933	0%	No change	0.9959
Nevada	.	.	.	.	.
New Hampshire	0.980	0.335	66%	No change	0.1007
New Jersey	.	.	.	.	.
New Mexico	0.716	0.417	42%	No change	0.5668
New York	2.131	3.135	47%	No change	0.6346
North Carolina	0.482	0.207	57%	No change	0.3306
North Dakota	0.000	0.000	.	.	.
Ohio	0.375	0.213	43%	No change	0.5477
Oklahoma	0.259	1.106	327%	No change	0.2228
Oregon	0.815	0.770	6%	No change	0.9070
Pennsylvania	0.671	0.420	37%	No change	0.5453
Puerto Rico	.	.	.	.	.
Rhode Island	.	.	.	.	.
South Carolina	.	.	.	.	.
South Dakota	1.297	0.238	-82%	Decrease	0.0176
Tennessee	0.000	0.000	.	.	.
Texas	1.489	1.343	10%	No change	0.8283
Utah	1.185	0.000	100%	.	.
Vermont	.	.	.	.	.
Virgin Islands	.	.	.	.	.
Virginia	1.880	0.580	69%	No change	0.2938
Washington	1.060	1.300	23%	No change	0.5370
West Virginia	0.786	0.155	80%	No change	0.1208
Wisconsin	0.643	0.331	49%	No change	0.0844
Wyoming	2.495	0.000	-100%	Decrease	0.0022
All US	0.785	0.569	-28%	Decrease	0.0011

* Statistically significant, p < 0.0500

1. Data from all ICUs, wards (and other non-critical care locations). This excludes LTAC locations (or facilities) and IRF locations (or facilities).
2. States without SIR either in 2018 and/or 2019 and therefore subsequent data not calculated

Table 10. Changes in state-specific standardized infection ratios (SIRs) between 2018 and 2019 from NHSN Critical Access Hospitals
10c. Ventilator-associated events (VAE), all locations¹

	All Critical Access Hospitals Reporting to NHSN				
	2018 SIR	2019 SIR	Percent Change	Direction of Change, Based on Statistical Significance	p-value
Alabama
Alaska
Arizona
Arkansas
California
Colorado
Connecticut
D.C.
Delaware
Florida
Georgia
Guam
Hawaii
Idaho
Illinois
Indiana
Iowa
Kansas
Kentucky
Louisiana
Maine
Maryland
Massachusetts
Michigan
Minnesota
Mississippi
Missouri
Montana
Nebraska
Nevada
New Hampshire
New Jersey
New Mexico
New York
North Carolina
North Dakota
Ohio
Oklahoma
Oregon
Pennsylvania
Puerto Rico
Rhode Island
South Carolina
South Dakota
Tennessee
Texas
Utah
Vermont
Virgin Islands
Virginia
Washington
West Virginia
Wisconsin
Wyoming
All US	0.613	1.600	161%	No change	0.1461

* Statistically significant, p < 0.0500

1. Data from all ICUs, wards (and other non-critical care locations). This excludes LTAC locations (or facilities) and IRF locations (or facilities).
2. All states without SIR both in 2018 and 2019 and therefore subsequent data not calculated

Table 10. Changes in state-specific standardized infection ratios (SIRs) between 2018 and 2019 from NHSN Critical Access Hospitals

10d. Surgical site infections (SSI) following colon surgery¹

All Critical Access Hospitals Reporting to NHSN					
	2018 SIR	2019 SIR	Percent Change	Direction of Change, Based on Statistical Significance	p-value
Alabama	.	.	.	.	.
Alaska	.	.	.	.	.
Arizona	.	.	.	.	.
Arkansas	.	.	.	.	.
California	1.291	1.608	25%	No change	0.7283
Colorado	.	.	.	.	.
Connecticut	.	.	.	.	.
D.C.	.	.	.	.	.
Delaware	.	.	.	.	.
Florida	.	.	.	.	.
Georgia	.	.	.	.	.
Guam	.	.	.	.	.
Hawaii	.	.	.	.	.
Idaho	.	.	.	.	.
Illinois	0.000	0.413	.	.	.
Indiana	1.561	0.256	84%	No change	0.0776
Iowa	.	.	.	.	.
Kansas	.	.	.	.	.
Kentucky	.	.	.	.	.
Louisiana	.	.	.	.	.
Maine	0.000	0.000	.	.	.
Maryland	.	.	.	.	.
Massachusetts	.	.	.	.	.
Michigan	2.049	0.977	52%	No change	0.4010
Minnesota	2.248	3.464	54%	No change	0.5521
Mississippi	.	.	.	.	.
Missouri	.	.	.	.	.
Montana	.	.	.	.	.
Nebraska	.	.	.	.	.
Nevada	.	.	.	.	.
New Hampshire	1.754	1.505	14%	No change	0.8853
New Jersey	.	.	.	.	.
New Mexico	.	.	.	.	.
New York	.	.	.	.	.
North Carolina	0.612	1.551	153%	No change	0.4977
North Dakota	.	.	.	.	.
Ohio	0.000	0.000	.	.	.
Oklahoma	.	.	.	.	.
Oregon	0.765	0.535	30%	No change	0.7370
Pennsylvania	.	.	.	.	.
Puerto Rico	.	.	.	.	.
Rhode Island	.	.	.	.	.
South Carolina	.	.	.	.	.
South Dakota	.	.	.	.	.
Tennessee	.	.	.	.	.
Texas	.	.	.	.	.
Utah	.	.	.	.	.
Vermont	.	.	.	.	.
Virgin Islands	.	.	.	.	.
Virginia	.	.	.	.	.
Washington	1.159	0.516	55%	No change	0.5345
West Virginia	0.564	0.000	100%	No change	0.4955
Wisconsin	0.381	0.853	124%	No change	0.3775
Wyoming	.	.	.	.	.
All US	0.903	0.962	7%	No change	0.7739

* Statistically significant, p < 0.0500

1. SSIs included are those classified as deep incisional or organ/space infections following NHSN-defined inpatient colon procedures with both primary and detected during the same admission as the surgical procedure or upon readmission to the same facility.
2. States without SIR either in 2018 and/or 2019 and therefore subsequent data not calculated

d other than primary skin closure technique,

Table 10. Changes in state-specific standardized infection ratios (SIRs) between 2018 and 2019 from NHSN Critical Access Hospitals

10e. Surgical site infections (SSI) following abdominal hysterectomy surgery¹

	All Critical Access Hospitals Reporting to NHSN				
	2018 SIR	2019 SIR	Percent Change	Direction of Change, Based on Statistical Significance	p-value
Alabama
Alaska
Arizona
Arkansas
California
Colorado
Connecticut
D.C.
Delaware
Florida
Georgia
Guam
Hawaii
Idaho
Illinois
Indiana
Iowa
Kansas
Kentucky
Louisiana
Maine
Maryland
Massachusetts
Michigan
Minnesota
Mississippi
Missouri
Montana
Nebraska
Nevada
New Hampshire
New Jersey
New Mexico
New York
North Carolina
North Dakota
Ohio
Oklahoma
Oregon
Pennsylvania
Puerto Rico
Rhode Island
South Carolina
South Dakota
Tennessee
Texas
Utah
Vermont
Virgin Islands
Virginia
Washington
West Virginia
Wisconsin	0.919	2.184	138%	No change	0.4829
Wyoming
All US	0.848	1.439	70%	No change	0.1912

* Statistically significant, p < 0.0500

1. SSIs included are those classified as deep incisional or organ/space infections following NHSN-defined inpatient abdominal hysterectomy procedures with detected during the same admission as the surgical procedure or upon readmission to the same facility.
 2. States without SIR both in 2018 and 2019 and therefore subsequent data not calculate. For any state with a referent SIR of 0.000, the percent change will

with a primary or other than primary skin closure technique,
as reflected as greater than 100 percent.

Table 10. Changes in state-specific standardized infection ratios (SIRs) between 2018 and 2019 from NHSN Critical Access Hospitals

10f. Hospital-onset methicillin-resistant *Staphylococcus aureus* (MRSA) bacteremia, facility-wide¹

	All Critical Access Hospitals Reporting to NHSN				
	2018 SIR	2019 SIR	Percent Change	Direction of Change, Based on Statistical Significance	p-value
Alabama	.	.	.	.	.
Alaska	.	.	.	.	.
Arizona	.	.	.	.	.
Arkansas	.	.	.	.	.
California	0.000	1.393	.	No change	0.1435
Colorado	0.000	0.000	.	.	.
Connecticut	.	.	.	.	.
D.C.	.	.	.	.	.
Delaware	.	.	.	.	.
Florida	.	.	.	.	.
Georgia	0.948	0.000	100%	No change	0.4327
Guam	.	.	.	.	.
Hawaii	.	.	.	.	.
Idaho	.	.	.	.	.
Illinois	0.765	0.821	7%	No change	0.9471
Indiana	0.000	0.907	.	No change	0.2750
Iowa	2.865	0.000	100%	No change	0.1100
Kansas	1.481	0.471	68%	No change	0.3513
Kentucky	.	.	.	.	.
Louisiana	.	.	.	.	.
Maine	0.655	0.000	100%	No change	0.4863
Maryland	.	.	.	.	.
Massachusetts	.	.	.	.	.
Michigan	0.707	0.000	100%	No change	0.4911
Minnesota	.	.	.	.	.
Mississippi	.	.	.	.	.
Missouri	0.596	1.030	73%	No change	0.7090
Montana	.	.	.	.	.
Nebraska	.	.	.	.	.
Nevada	.	.	.	.	.
New Hampshire	1.711	0.000	100%	No change	0.2627
New Jersey	.	.	.	.	.
New Mexico	.	.	.	.	.
New York	.	.	.	.	.
North Carolina	0.000	0.973	.	.	.
North Dakota	.	.	.	.	.
Ohio	0.639	1.630	155%	No change	0.4603
Oklahoma	.	.	.	.	.
Oregon	1.136	1.648	45%	No change	0.7134
Pennsylvania	.	.	.	.	.
Puerto Rico	.	.	.	.	.
Rhode Island	.	.	.	.	.
South Carolina	.	.	.	.	.
South Dakota	.	.	.	.	.
Tennessee	.	.	.	.	.
Texas	0.883	1.355	53%	No change	0.7796
Utah	.	.	.	.	.
Vermont	.	.	.	.	.
Virgin Islands	.	.	.	.	.
Virginia	.	.	.	.	.
Washington	1.001	0.514	49%	No change	0.6399
West Virginia	0.000	0.000	.	.	.
Wisconsin	0.000	0.000	.	.	.
Wyoming	.	.	.	.	.
All US	0.551	0.587	7%	No change	0.8281

* Statistically significant, p < 0.0500

1. Hospital-onset is defined as event detected on the 4th day (or later) after admission to an inpatient location within the facility.
2. States without SIR either in 2018 and/or 2019 and therefore subsequent data not calculated

Table 10. Changes in state-specific standardized infection ratios (SIRs) between 2018 and 2019 from NHSN Critical Access Hospitals

10g. Hospital-onset *Clostridioides difficile* infection (CDI), facility-wide¹

	All Critical Access Hospitals Reporting to NHSN				
	2018 SIR	2019 SIR	Percent Change	Direction of Change, Based on Statistical Significance	p-value
Alabama	.	.	.	.	.
Alaska	.	.	.	.	.
Arizona	.	.	.	.	.
Arkansas	0.614	1.600	161%	No change	0.0674
California	0.953	0.895	6%	No change	0.8208
Colorado	1.096	1.257	15%	No change	0.6746
Connecticut	.	.	.	.	.
D.C.	.	.	.	.	.
Delaware	.	.	.	.	.
Florida	0.377	0.396	5%	No change	0.9540
Georgia	0.504	0.629	25%	No change	0.6662
Guam	.	.	.	.	.
Hawaii	.	.	.	.	.
Idaho	1.065	0.968	9%	No change	0.8492
Illinois	0.962	1.314	37%	No change	0.1669
Indiana	0.973	0.503	-48%	Decrease	0.0278
Iowa	0.636	0.465	27%	No change	0.4190
Kansas	0.965	0.738	24%	No change	0.3649
Kentucky	1.132	0.866	23%	No change	0.4783
Louisiana	.	.	.	.	.
Maine	0.752	0.573	24%	No change	0.4263
Maryland	.	.	.	.	.
Massachusetts	.	.	.	.	.
Michigan	0.374	0.642	72%	No change	0.2337
Minnesota	0.866	0.681	21%	No change	0.3913
Mississippi	1.774	0.722	59%	No change	0.0559
Missouri	0.771	0.571	26%	No change	0.3658
Montana	1.299	0.497	-62%	Decrease	0.0431
Nebraska	0.741	0.861	16%	No change	0.8115
Nevada	.	.	.	.	.
New Hampshire	0.790	0.917	16%	No change	0.6817
New Jersey	.	.	.	.	.
New Mexico	0.363	0.345	5%	No change	0.9524
New York	0.961	1.923	100%	No change	0.1539
North Carolina	0.805	0.777	3%	No change	0.9294
North Dakota	0.547	0.443	19%	No change	0.8021
Ohio	0.906	0.955	5%	No change	0.8497
Oklahoma	1.091	0.889	19%	No change	0.7377
Oregon	0.511	1.101	115%	Increase	0.0145
Pennsylvania	0.392	0.890	127%	No change	0.1068
Puerto Rico	.	.	.	.	.
Rhode Island	.	.	.	.	.
South Carolina	.	.	.	.	.
South Dakota	0.575	0.859	49%	No change	0.3884
Tennessee	0.000	0.802	.	No change	0.2534
Texas	0.859	0.457	47%	No change	0.1418
Utah	0.000	0.000	.	.	.
Vermont	1.123	0.641	43%	No change	0.1605
Virgin Islands	.	.	.	.	.
Virginia	.	1.092	.	.	.
Washington	0.711	0.766	8%	No change	0.7884
West Virginia	0.770	0.651	15%	No change	0.6836
Wisconsin	0.693	0.980	41%	No change	0.1051
Wyoming	0.310	0.639	106%	No change	0.4328
All US	0.790	0.794	1%	No change	0.9279

* Statistically significant, p < 0.0500

1. Hospital-onset is defined as event detected on the 4th day (or later) after admission to an inpatient location within the facility.
 2. States without SIR either in 2018 and/or 2019 and therefore subsequent data not calculated

**Appendix A. Factors used in NHSN risk adjustment of the device-associated HAIs
Negative Binomial Regression Models¹ in Critical Access Hospitals**

HAI Type	Validated Parameters for Risk Model
CLABSI (non-NICU)	Intercept Medical School Affiliation* Location Type Facility Type* Facility Bed size*
CLABSI (NICU)	Intercept Birthweight
CAUTI	Intercept Medical School Affiliation* Location Facility Type* Facility Bed size*
VAE	Intercept Medical School Affiliation* School Type* Location Type Facility Type* Facility Bed size* Medical

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

* Facility bed size, facility type and medical school affiliation are taken from the Annual Hospital Survey.

Appendix B. Factors used in NHSN risk adjustment of the MRSA Bacteremia and C. difficile Negative Binomial Regression Models¹ in Critical Access Hospitals

HAI Type	Validated Parameters for Risk Model
MRSA bacteremia	Intercept
<i>C. difficile</i>	Intercept Inpatient CO admission prevalence rate* CDI test type ⁺ Medical school affiliation [‡] Number of ICU beds [‡] Facility type size [‡] from an ED or 24-hour observation unit Bed Reporting

1. MRSA bacteremia and CDI risk adjustment methodology in the SIR Guide: <https://www.cdc.gov/nhsr>

* Inpatient community-onset prevalence is calculated as the # of inpatient community-onset MRSA blood culture admissions x 100.

** Average length of stay is taken from the Annual Hospital Survey. It is calculated as: total # of annual patient admissions / total # of inpatient days.

‡ Medical school affiliation, number of ICU beds, and facility bed size are taken from the Annual Hospital Survey.

+ CDI test type is reported on the FacWideIN MDRO denominator form on the 3rd month of each quarter.

[/pdfs/ps-analysis-resources/nhsn-sir-guide.pdf](#)

events, divided by total

patient days / total # of annual admissions.

Survey.

**Appendix C. List of NHSN procedures included in this report
Admission/Re-admission SSI Logistic Regression Model¹, A**

NHSN Procedure Code	NHSN Procedure
AAA	Abdominal aortic aneurysm
AMP	Limb amputation
APPY	Appendectomy
AVSD	Arteriovenous shunt for dialysis
BILI	Bile duct, liver or pancreatic surgery
BRST	Breast surgery
CABG	Coronary artery bypass graft
CARD	Cardiac surgery
CEA	Carotid endarterectomy
CHOL	Cholecystectomy
COLO	Colon surgery
CRAN	Craniotomy
CSEC	Cesarean delivery
FUSN	Spinal fusion
FX	Open reduction of long bone fracture
GAST	Gastric surgery
HER	Herniorrhaphy
HPRO	Hip arthroplasty
HTP	Heart transplant
HYST	Abdominal hysterectomy
KPRO	Knee arthroplasty
KTP	Kidney transplant
LTP	Liver transplant
NECK	Neck surgery
NEPH	Kidney surgery
OVRV	Ovarian surgery
PACE	Pacemaker surgery
PRST	Prostate surgery
PVBY	Peripheral vascular bypass surgery
REC	Rectal surgery
RFUSN	Refusion of spine

SB	Small-bowel surgery
SPLE	Spleen surgery
THOR	Thoracic surgery
THYR	Thyroid and/or parathyroid surgery
VHYS	Vaginal hysterectomy
VSHN	Ventricular shunt
XLAP	Exploratory Laparotomy

1. SSI risk adjustment methodology: SIR Guide: [https://www.c](https://www.cdc.gov/nhsn/pdfs/sirguide)

* These risk factors originate from the Annual Facility Survey.

‡ None of the variables investigated were statistically significantl

As a result, the overall incidence will be used in the SIR calcu

Exclusion Criteria: SIR Guide: <https://www.cdc.gov/nhsn/pdfs>

**rt with predictive risk factors from the NHSN Complex
Adults ≥ 18 years of age**

Validated Parameters for Risk Model
<i>Intercept-only model*</i>
anesthesia, wound class, hospital bed size*, age
gender, wound class, hospital bed size*, procedure duration
gender, emergency, trauma, hospital bed size*, scope, age, procedure duration
ASA score, closure, age, procedure duration, BMI
emergency, medical school affiliation*, age, procedure duration, BMI
gender, diabetes, ASA score, trauma, wound class, medical school affiliation*, hospital bed size*, age, procedure duration, BMI, age-gender interaction
wound class
gender, diabetes, ASA score, wound class, hospital bed size*, age, procedure duration, age-gender interaction
gender, diabetes, trauma, anesthesia, ASA score, wound class, hospital bed size*, scope, closure, age, procedure duration, BMI
diabetes, trauma, ASA score, age, procedure duration, wound class
emergency, ASA score, wound class, medical school affiliation*, hospital bed size*, age, procedure duration, duration of labor
gender, diabetes, trauma, ASA score, medical school affiliation*, hospital bed size*, procedure duration, BMI, spinal level, approach
gender, diabetes, ASA score, wound class, closure, age, procedure duration, BMI
wound class, scope, age, procedure duration, BMI
gender, ASA score, wound class, medical school affiliation*, hospital bed size*, scope, age, procedure duration, BMI
diabetes, trauma, anesthesia, ASA score, wound class, medical school affiliation*, hospital bed size*, age, procedure duration, BMI, procedure type
closure
diabetes, ASA score, hospital bed size*, scope, age, procedure duration, BMI
gender, trauma, anesthesia, ASA score, wound class, medical school affiliation*, hospital bed size*, age, procedure duration, BMI, procedure type
procedure duration, diabetes, ASA score, hospital bed size*, BMI
age
procedure duration
wound class
age
BMI, diabetes, procedure duration, number of beds
ASA score, procedure duration, number of beds, oncology
age, procedure duration, number of beds

gender, age, procedure duration, oncology
ASA score
procedure duration, medical school affiliation*
medical school affiliation*
age
ASA score, closure, diabetes, procedure duration, emergency, gender, scope, wound class, trauma

[dc.gov/nhsn/pdfs/ps-analysis-resources/nhsn-sir-guide.pdf](https://www.dhs.gov/ps-analysis-resources/nhsn-sir-guide.pdf)

ly associated with SSI risk in these procedure categories.
 lation (i.e., intercept-only model).

[s/ps-analysis-resources/nhsn-sir-guide.pdf](https://www.dhs.gov/ps-analysis-resources/nhsn-sir-guide.pdf)

**Appendix D. List of NHSN procedures included in this re
Complex Admission/Re-admission SSI Logistic Regressi**

NHSN Procedure Code	NHSN Procedure
AAA	Abdominal aortic aneurysm
AMP	Limb amputation
APPY	Appendectomy
AVSD	Arteriovenous shunt for dialysis
BILI	Bile duct, liver or pancreatic surgery
BRST	Breast surgery
CARD	Cardiac surgery
CABG	Coronary artery bypass graft
CEA	Carotid endarterectomy
CHOL [†]	Cholecystectomy
COLO	Colon surgery
CRAN, age ≥ 2	Craniotomy
CRAN, age < 2 [†]	
CSEC	Cesarean delivery
FUSN, age ≥ 2	Spinal fusion
FUSN, age < 2	
FX	Open reduction of long bone fracture
GAST	Gastric surgery
HER [†]	Herniorrhaphy
HPRO [†]	Hip arthroplasty
HTP	Heart transplant
HYST [†]	Abdominal hysterectomy
KPRO [†]	Knee arthroplasty
KTP [†]	Kidney transplant
LAM [†]	Laminectomy
LTP [‡]	Liver transplant
NECK	Neck surgery
NEPH	Kidney surgery
OVRY	Ovarian surgery
PACE	Pacemaker surgery
PRST	Prostate surgery
PVBY	Peripheral vascular bypass surgery
REC [†]	Rectal surgery
RFUSN [†]	Refusion of spine
SB	Small-bowel surgery
SPLE	Spleen surgery
THOR	Thoracic surgery
THYR	Thyroid and/or parathyroid surgery
VHYS	Vaginal hysterectomy
VSHN	Ventricular shunt
XLAP	Exploratory Laparotomy

* These risk factors originate from the Annual Facility Survey

^ Sufficient national data were not available for analysis. As a

As a result, the overall incidence will be used in the SIR cal

Appendix E. List of NHSN procedures and corresponding SCIP procedures included in this report with factors used in the NHSN risk adjustment of the Complex Admission/Readmission Model¹ for adults

SCIP Procedure	NHSN Procedure	Validated Parameters for Risk Model
Vascular	Abdominal aortic aneurysm repair	
	Peripheral vascular bypass surgery	BMI, diabetes, procedure duration, number of beds
Coronary artery bypass graft	Coronary artery bypass graft with both chest and donor site incisions	emergency, medical school affiliation*, age, procedure duration, BMI
	Coronary artery bypass graft with chest incision only	
Other cardiac	Cardiac surgery	gender, diabetes, ASA score, trauma, wound class, medical school affiliation*, hospital bed size*, age, procedure duration, BMI, age-gender interaction
Colon surgery	Colon surgery	gender, diabetes, trauma, anesthesia, ASA score, wound class, hospital bed size*, scope, closure, age, procedure duration, BMI
	Rectal surgery	ASA score, procedure duration, number of beds, oncology
Hip arthroplasty	Hip arthroplasty	diabetes, trauma, anesthesia, ASA score, wound class, medical school affiliation*, hospital bed size*, age, procedure duration, BMI, procedure type
Abdominal hysterectomy	Abdominal hysterectomy	diabetes, ASA score, hospital bed size*, scope, age, procedure duration, BMI
Knee arthroplasty	Knee arthroplasty	gender, trauma, anesthesia, ASA score, wound class, medical school affiliation*, hospital bed size*, age, procedure duration, BMI, procedure type
Vaginal hysterectomy	Vaginal hysterectomy	medical school affiliation*

* These risk factors originate from the Annual Facility Survey.

As a result, the overall incidence will be used in the SIR calculation (i.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 the Executive Summary and previous reports, can be found at the above

website.