

2018 Nat S

Introduction:

Welcome to the 2018 National and State HAI Data Report using the 2015 baseline by comparing the number of observed device days to the number of predicted devi This report is created by CDC staff with the National Healthcare Safety Network (N

Scope of report:

Device Days Types
Central line days (CLDs) by locations
Urinary catheter days (UCDs) by locations
Ventilator days (VDs) by locations

National and State HAI Progress Report

Standardized Utilization Ratios

Critical Access Hospitals

and risk adjustment calculations. Standardized utilization ratios (SURs) are used to describe device utilization days.
(HSN).

CAH	
National	State
p	p
p	p
p	p

]

zations

Development of the NHSN Standardized Utilization Ratio (SUR): Methodology

Rationale

Traditionally, NHSN has been providing a crude measure of device utilization rate to the healthcare facilities standardized to compare with a reference baseline population as well as over time. Accordingly, CDC has

Development of SUR models

SUR models were developed for the following measures: central line days, urinary catheter days and ventilator days in intensive care units (ICU), inpatient rehabilitation facilities (IRF), long-term acute care hospitals (LTACH) (and NICU for central line days). Using the NHSN data (2018) in sync with rebaseline work, CDC has developed multivariable logistic regression models (see “Extra-binomial Variation in Logistic Linear Models,” Applied Statistics, 31, 144–148.). Unit of analysis in :

STEPS to compute SUR at the location level

1: First, calculate the logit scale value of p_{hat} , using parameter estimates of corresponding SUR model.

Logit p_{hat} = intercept + x_1 + x_2 + x_3 +

(Risk factors are provided in appendices for individual matrix of measure and healthcare setting)

2: Then, compute the probability of device use

$p_{hat} = [e^{\text{logit}(p_{hat})}] / [1 + e^{\text{logit}(p_{hat})}]$

3: Calculate predicted device days as follows:

Predicted Device Days = p_{hat} * In-patient days

4: Finally, derive SUR value at the location by dividing number of observed device days with number of predicted device days

$SUR = \text{Observed Device Days} / \text{Predicted Device Days}$

Note that SUR will not be calculated if Predicted Device Days is < 1 due to minimum precision criteria of 1

STEPS to compute SUR at higher level above location

Do the same computation as in step 1, 2, 3 at location level.

Sum the observed device days and predicted device days up to the level of aggregation desired (e.g., facility, region, country).

Then, derive SUR value at the desired aggregate level by dividing number of observed device days with number of predicted device days

SUR Guide: <https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/nhsn-sur-guide-508.pdf>

ies. To monitor the progress of healthcare acquired infections (HAI) prevention efforts, device utilization in any h
s developed statistical models to make SUR values available for different measures (e.g., central line days, urin

tilator days. They were available for the healthcare setting of acute care hospitals (ACH), critical access hospita
days).

ession models that correct over dispersion by the Williams' method (Reference: Williams, D. A. (1982),
all the SUR models are at the location level.

redicted device days;

l.0.

ility-level).

number of predicted device days.

healthcare setting/location needs to be
ary catheter days) at various healthcare settings.

Is (CAH),

2018 Annual National and State HAI Progress Report

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

Table 1	National standardized utilization ratios (SURs) and facility-specific summary SURs Central line days (CLDs) Urinary catheter days (UCDs) Ventilator days (VDs)
Table 2	State-specific SURs for CLDs from Critical access hospitals 2a. All locations combined 2b. Critical care locations only 2c. Ward (non-critical care) locations only
Table 3	State-specific SURs for UCDs from Critical access hospitals 3a. All locations combined 3b. Critical care locations only 3c. Ward (non-critical care) locations only
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Table 5	Changes in national SURs, 2018 compared to 2017 Central Line Days (CLDs) Urinary Catheter Days (UCDs) Ventilator days (VDs)
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Appendix A	Factors used in NHSN risk-adjusted SUR calculation of the device utilization in Critical acce
Additional Resources	Technical Appendix HAI Progress Report Home Page SUR Guide: https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/nhsn-sur-guid

ss hospitals (CAHs)

le-508.pdf

Table 1. National standardiz

Population	No. of Facilities Reporting ¹	No. of Device days			95% CI	
		Observed	Predicted	SUR	Lower	Upper
Central line days, all⁴	781	165,143	145,305.1252	1.1365	1.1310	1.1420
ICUs⁵	208	14,398	16,673.7455	0.8635	0.8495	0.8775
Wards⁶	762	150,745	128,631.3797	1.1719	1.1660	1.1778
Urinary catheter days, all⁴	896	299,581	345,718.4286	0.8665	0.8635	0.8695
	210	34,648	45,030.2981	0.7694	0.7614	0.7774
Wards⁶	878	264,933	300,688.1305	0.8811	0.8777	0.8845
Ventilator days, all⁴	190	3,432	3,582.9531	0.9579	0.9262	0.9896
	131	3,042	3,317.0514	0.9171	0.8849	0.9493
	84	390	265.9018	1.4667	1.3265	1.6069

1. The number of reporting facilities included in the SUR calculation; SURs are not calculated when there are
2. Percent of facilities with at least one predicted device day that had an SUR significantly greater than or less
3. Facility-specific percentiles are only calculated if at least 20 facilities had ≥ 1.0 predicted number of device d
4. Data from all ICUs, wards (and other non-critical care locations). Data contained in this table are reported fr
5. Data from all ICUs; excludes wards (and other non-critical care locations). Data contained in this table are r
6. Data from all wards (for this table wards also include step-down, mixed acuity, and specialty care areas [inc

ed utilization ratios (SURs) and facility-specific summary SURs using device days data reported to
Table 1a. Central li

for SUR	Facility-specific SURs						5%
	No. Facilities with ≥ 1 Predicted Device Days	No. Facilities with SUR Significantly > National SUR		No. Facilities with SUR Significantly < National SUR			
Upper		N	% ²	N			
1.1420	779	226	29%	418	54%	0.0000	
0.8777	207	66	32%	77	37%	0.0000	
1.1778	760	217	29%	411	54%	0.0000	
0.8696	896	304	34%	407	45%	0.2345	
0.7776	209	85	41%	61	29%	0.2578	
0.8845	878	296	34%	409	47%	0.2547	
0.9903	175	27	15%	84	48%	0.0000	
0.9501	129	26	20%	62	48%	0.0000	
1.6178	68	6	9%	43	63%	0.0000	

less than 5 reporting facilities. This may be different from those reported in the SIR tables due to exclusion of facilities with a predicted SUR greater than the nominal value of the national SUR. This is only calculated if at least 10 facilities had ≥ 1.0 predicted SURs in 2018. If a facility's predicted number of device days was < 1.0 , a facility-specific SUR was neither calculated nor reported from acute care hospitals; as such, data from ACHs, IRFs and LTACHs are excluded. Data from critical access hospitals; as such, data from ACHs, IRFs and LTACHs are excluded. Data from critical access hospitals (including hematology/oncology, bone marrow transplant). Data contained in this table are reported from critical access hospitals.

› NHSN during 2018 for Critical access hospitals (CAHs), by device type and patient population
 ne days (CLDs), urinary catheter days (UCDs), and ventilator days (VDs).

Percentile Distribution of Facility-specific									
Median									
10%	15%	20%	25%	30%	35%	40%	45%	50%	55%
0.0537	0.1945	0.3194	0.4262	0.5257	0.6103	0.7099	0.7914	0.8930	0.9772
0.1504	0.2505	0.3448	0.3862	0.4499	0.5376	0.6335	0.7303	0.7794	0.8441
0.0480	0.1910	0.3112	0.4359	0.5446	0.6383	0.7339	0.8024	0.9135	0.9895
0.3391	0.4103	0.4871	0.5454	0.5992	0.6413	0.6967	0.7383	0.7955	0.8589
0.3992	0.4798	0.5409	0.5935	0.6379	0.6652	0.7371	0.7870	0.8384	0.9131
0.3440	0.4130	0.4852	0.5488	0.5992	0.6414	0.7002	0.7399	0.7962	0.8672
0.0000	0.0000	0.0000	0.0000	0.0000	0.0436	0.1124	0.1791	0.3276	0.4356
0.0000	0.0000	0.0307	0.0681	0.1159	0.1876	0.3227	0.4356	0.5312	0.5904
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

› and inclusion criteria. Refer to the technical appendix for details.

› cted device days in 2018.

› alculated nor included in the distribution of facility-specific SURs.

› cal access hospitals; as such, data from ACHs, IRFs and LTACHs are excluded.

c SURs³

60%	65%	70%	75%	80%	85%	90%	95%
1.0855	1.1836	1.2798	1.4395	1.6537	1.9070	2.2943	3.0129
0.9967	1.0797	1.2248	1.3447	1.4911	1.6839	2.0621	2.5336
1.0973	1.1925	1.3024	1.4564	1.7127	1.9364	2.2946	3.0182
0.9120	0.9639	1.0313	1.1148	1.2177	1.3276	1.4682	1.7748
0.9764	1.0409	1.1734	1.2333	1.4095	1.5179	1.7062	2.1473
0.9205	0.9806	1.0532	1.1247	1.2261	1.3403	1.4806	1.9230
0.5406	0.6713	0.8158	1.0136	1.1957	1.5902	2.3048	4.9851
0.6828	0.8158	0.9918	1.1364	1.4642	1.9447	2.5437	3.9231
0.0000	0.0000	0.0000	0.0000	0.1791	0.4299	1.4489	9.9336

Table 2. State-specific standardized utilization ratios (SURs) and facility-specific summary
Table 2a. Central line days (CL

State	No. of Facilities	No. of Device days			95% CI
	Reporting ¹	Observed	Predicted	SUR	Lower
Alaska	3	.	.	.	.
Alabama	4	.	.	.	.
Arkansas	14	3,768	2,230.0130	1.6897	1.6364
Arizona	4	.	.	.	.
California	33	8,801	6,508.0995	1.3523	1.3242
Colorado	17	1,987	2,592.1137	0.7666	0.7334
Connecticut	.	.	.	.	.
D.C.	.	.	.	.	.
Delaware	.	.	.	.	.
Florida	7	1,185	1,981.3375	0.5981	0.5647
Georgia	15	3,914	3,908.4396	1.0014	0.9704
Guam	.	.	.	.	.
Hawaii	2	.	.	.	.
Iowa	51	6,517	6,072.9199	1.0731	1.0473
Idaho	7	1,497	1,116.0032	1.3414	1.2748
Illinois	39	9,156	7,366.9026	1.2429	1.2176
Indiana	35	6,965	6,951.6893	1.0019	0.9786
Kansas	56	9,792	7,448.4945	1.3146	1.2888
Kentucky	18	6,061	3,869.8519	1.5662	1.5271
Louisiana	5	1,986	1,291.1302	1.5382	1.4717
Massachusetts	3	.	.	.	.
Maryland	.	.	.	.	.
Maine	15	4,494	4,439.4007	1.0123	0.9830
Michigan	28	2,980	4,579.5201	0.6507	0.6277
Minnesota	38	6,652	5,209.8138	1.2768	1.2464
Missouri	23	6,925	4,473.7680	1.5479	1.5118
Mississippi	9	2,368	1,995.0180	1.1870	1.1398
Montana	9	1,748	2,368.5185	0.7380	0.7040
North Carolina	12	2,781	3,407.7908	0.8161	0.7862
North Dakota	11	1,529	1,410.9171	1.0837	1.0304
Nebraska	20	2,816	2,110.0892	1.3345	1.2859
New Hampshire	13	3,877	3,910.8896	0.9913	0.9605
New Jersey	.	.	.	.	.
New Mexico	9	1,775	1,815.0447	0.9779	0.9332
Nevada	2	.	.	.	.
New York	6	801	1,421.3264	0.5636	0.5255
Ohio	21	4,755	4,524.0953	1.0510	1.0215
Oklahoma	14	1,869	1,763.7234	1.0597	1.0125
Oregon	20	6,257	4,968.4676	1.2593	1.2285
Pennsylvania	15	4,123	4,336.2408	0.9508	0.9222
Puerto Rico	.	.	.	.	.

Rhode Island	.	.	.	.	.
South Carolina	3	.	.	.	.
South Dakota	19	1,048	1,517.4870	0.6906	0.6498
Tennessee	7	1,524	818.7706	1.8613	1.7696
Texas	30	5,741	4,597.3930	1.2488	1.2167
Utah	7	936	592.7736	1.5790	1.4802
Virginia	5	.	.	.	.
Virgin Islands	.	.	.	.	.
Vermont	8	2,300	3,458.9647	0.6649	0.6382
Washington	38	10,373	8,259.6152	1.2559	1.2319
Wisconsin	57	13,935	10,396.8490	1.3403	1.3182
West Virginia	17	3,597	3,790.4499	0.9490	0.9183
Wyoming	12	988	1,531.5640	0.6451	0.6058
All US	781	165,143	145,305.1252	1.1365	1.1310

1. The number of reporting facilities included in the SUR calculation; SURs are not calculated when the
2. Percent of facilities with at least one predicted device day that had an SUR significantly greater than
3. Facility-specific percentiles are only calculated if at least 20 facilities had ≥ 1.0 predicted number of de
4. Data from all ICUs and wards (and other non-critical care locations). Data contained in this table are

**SURs using device days data reported to NHSN during 2018 for critical access hospitals (CAHs), b
.Ds), all locations⁴**

for SUR	Facility-specific SURs					Percenti 10%
	Upper	No. Facilities with ≥1 Predicted Device Days	No. Facilities with SUR		No. Facilities with SUR	
			Significantly > National SUR N	% ²		
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.
1.7443	14	10	71%	2	14%	.
.
1.3808	33	11	33%	18	55%	0.0000
0.8008	17	3	18%	10	59%	.
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0.6329	7
1.0332	15	3	20%	11	73%	.
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1.0994	51	18	35%	26	51%	0.0000
1.4106	7
1.2685	39	14	36%	18	46%	0.0079
1.0257	35	6	17%	20	57%	0.3904
1.3409	56	15	27%	24	43%	0.0000
1.6060	18	7	39%	8	44%	.
1.6070	5
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.
1.0422	15	4	27%	9	60%	.
0.6744	28	1	4%	22	79%	0.0000
1.3078	37	12	32%	20	54%	0.1025
1.5847	23	12	52%	8	35%	0.1478
1.2355	9	.	.	.	.	.
0.7732	9	.	.	.	.	.
0.8468	12	2	17%	8	67%	.
1.1391	10	4	40%	3	30%	.
1.3845	20	8	40%	11	55%	0.1128
1.0229	13	3	23%	6	46%	.
.
1.0242	9	.	.	.	.	.
.
0.6036	6	.	.	.	.	.
1.0812	21	4	19%	14	67%	0.3274
1.1085	14	6	43%	7	50%	.
1.2909	20	7	35%	10	50%	0.4533
0.9802	15	4	27%	11	73%	.
.

.
0.7334	19	0	0%	12	63%	.
1.9565	7	.	.	.	.	.
1.2814	30	11	37%	17	57%	0.0000
1.6826	7	.	.	.	.	.
.
0.6926	8	.	.	.	.	.
1.2802	38	15	39%	18	47%	0.0703
1.3627	57	17	30%	25	44%	0.1145
0.9803	17	2	12%	9	53%	.
0.6863	12	1	8%	9	75%	.
1.1420	779	226	29%	418	54%	0.0537

re are less than 5 reporting facilities. This may be different from those reported in the SIR tables due to ex or less than the nominal value of the national SUR. This is only calculated if at least 10 facilities had ≥ 1.0 evice days in 2018. If a facility's predicted number of device days was <1.0, a facility-specific SUR was ne reported from critical access hospitals.

y device type and patient population:

ile Distribution of Facility-specific SURs³				
Median				
25%	50%	75%	90%	
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0.2591	0.7767	1.6587	1.9386	.
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0.2642	0.8454	1.5175	2.1743	.
.
0.4913	0.9772	1.6767	2.6578	.
0.6032	0.9117	1.2165	1.8140	.
0.4613	0.9712	1.5316	2.4524	.
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0.3636	0.6431	0.8632	1.2681	.
0.2834	0.8302	1.9343	3.5914	.
0.6217	1.3099	1.8970	2.7706	.
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0.4900	0.8501	2.1221	2.2802	.
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0.5008	0.6047	1.0879	1.8922	.
.
0.8099	1.0361	1.6322	2.3809	.
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.	.	.	.
0.1563	0.5893	1.6846	2.5086
.	.	.	.
.	.	.	.
.	.	.	.
0.5860	1.0379	1.8208	2.5534
0.5453	1.1146	1.4611	2.5143
.	.	.	.
.	.	.	.
0.4262	0.8930	1.4395	2.2943

clusion and inclusion criteria. Refer to the technical appendix for details.
) predicted device days in 2018.
ither calculated nor included in the distribution of facility-specific SURs.

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Table 2. State-specific standardized utilization ratios (SURs) and facility-specific summary (Table 2b. Central line days (CLDs),

State	No. of Facilities	No. of Device days			95% CI	
		Observed	Predicted	SUR	Lower	Upper
Alaska	1	.	.	.	.	.
Alabama	1	.	.	.	.	.
Arkansas	2	.	.	.	.	.
Arizona	2	.	.	.	.	.
California	15	2,032	1,341.2896	1.5150	1.4501	
Colorado	4	.	.	.	.	.
Connecticut	.	.	.	.	.	.
D.C	.	.	.	.	.	.
Delaware	.	.	.	.	.	.
Florida	1	.	.	.	.	.
Georgia	2	.	.	.	.	.
Guam	.	.	.	.	.	.
Hawaii	1	.	.	.	.	.
Iowa	3	.	.	.	.	.
Idaho	2	.	.	.	.	.
Illinois	15	673	1,515.5406	0.4441	0.4115	
Indiana	16	723	884.2014	0.8177	0.7597	
Kansas	6	754	716.8318	1.0519	0.9787	
Kentucky	4	.	.	.	.	.
Louisiana	1	.	.	.	.	.
Massachusetts	2	.	.	.	.	.
Maryland	.	.	.	.	.	.
Maine	2	.	.	.	.	.
Michigan	8	388	469.2181	0.8269	0.7476	
Minnesota	5	172	190.1132	0.9047	0.7769	
Missouri	7	441	356.1999	1.2381	1.1265	
Mississippi	1	.	.	.	.	.
Montana	3	.	.	.	.	.
North Carolina	5	590	862.2742	0.6842	0.6307	
North Dakota	3	.	.	.	.	.
Nebraska	3	.	.	.	.	.
New Hampshire	6	375	377.4272	0.9936	0.8968	
New Jersey	.	.	.	.	.	.
New Mexico	5	313	347.8022	0.8999	0.8043	
Nevada	2	.	.	.	.	.
New York	2	.	.	.	.	.
Ohio	10	513	698.4036	0.7345	0.6730	
Oklahoma	2	.	.	.	.	.
Oregon	11	1,373	997.2196	1.3768	1.3054	
Pennsylvania	6	455	472.0173	0.9639	0.8784	
Puerto Rico	.	.	.	.	.	.
Rhode Island	.	.	.	.	.	.

South Carolina	1	.	.	.	.
South Dakota	.	.	.	.	.
Tennessee	1	.	.	.	.
Texas	8	86	445.3081	0.1931	0.1554
Utah	.	.	.	.	.
Virginia	3	.	.	.	.
Virgin Islands	.	.	.	.	.
Vermont	4	.	.	.	.
Washington	9	1,104	865.4234	1.2757	1.2021
Wisconsin	13	389	512.7225	0.7587	0.6861
West Virginia	8	685	445.8913	1.5362	1.4244
Wyoming	2	.	.	.	.
All US	208	14,398	16,673.7455	0.8635	0.8495

1. The number of reporting facilities included in the SUR calculation; SURs are not calculated when the
2. Percent of facilities with at least one predicted device day that had an SUR significantly greater than
3. Facility-specific percentiles are only calculated if at least 20 facilities had ≥ 1.0 predicted number of d
4. Data from all ICUs; excludes wards (and other non-critical care locations). Data contained in this tabl

SURs using device days data reported to NHSN during 2018 for critical access hospitals (CAHs), b critical care locations⁴

for SUR	Facility-specific SURs					10%
	No. Facilities with ≥1 Predicted Device Days	No. Facilities with SUR Significantly > National SUR N	No. Facilities with SUR Significantly < National SUR N	No. Facilities with SUR	No. Facilities with SUR	
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1.5819	15	11	73%	3	20%	.
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0.4786	15	1	7%	7	47%	.
0.8789	16	5	31%	6	38%	.
1.1290	6
.
.
.
0.9123	8
1.0478	5
1.3577	6
.
0.7411	5
.
1.0981	6
.
1.0039	5
.
0.8002	10	2	20%	6	60%	.
.
1.4511	11	4	36%	2	18%	.
1.0556	6
.
.

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.
0.2373	8
.
.
1.3526	9
0.8370	13	4	31%	4	31%	.
1.6546	8
.
0.8777	207	66	32%	77	37%	0.1504

There are less than 5 reporting facilities. This may be different from those reported in the SIR tables due to being or less than the nominal value of the national SUR. This is only calculated if at least 10 facilities had ≥ 1.0 device days in 2018. If a facility's predicted number of device days was <1.0, a facility-specific SUR was not reported from critical access hospitals.

Table 2. State-specific standardized utilization ratios (SURs) and facility-specific summary (Table 2c. Central line days (CLD))

State	No. of Facilities	No. of Device days			95% CI
		Observed	Predicted	SUR	Lower
Alaska	3	.	.	.	.
Alabama	4	.	.	.	.
Arkansas	14	3,720	2,182.8929	1.7042	1.6501
Arizona	4	.	.	.	.
California	32	6,769	5,166.8099	1.3101	1.2792
Colorado	16	1,799	2,395.0025	0.7511	0.7170
Connecticut	.	.	.	.	.
D.C.	.	.	.	.	.
Delaware	.	.	.	.	.
Florida	7	1,178	1,906.6918	0.6178	0.5833
Georgia	14	3,681	3,558.7712	1.0343	1.0014
Guam	.	.	.	.	.
Hawaii	2	.	.	.	.
Iowa	51	6,505	6,045.1610	1.0761	1.0502
Idaho	6	1,287	930.2055	1.3836	1.3095
Illinois	35	8,483	5,851.3620	1.4497	1.4191
Indiana	35	6,242	6,067.4879	1.0288	1.0035
Kansas	54	9,038	6,731.6627	1.3426	1.3151
Kentucky	18	5,850	3,576.8676	1.6355	1.5940
Louisiana	5	1,930	1,249.7252	1.5443	1.4766
Massachusetts	2	.	.	.	.
Maryland	.	.	.	.	.
Maine	15	4,377	4,344.3441	1.0075	0.9780
Michigan	28	2,592	4,110.3020	0.6306	0.6067
Minnesota	38	6,480	5,019.7006	1.2909	1.2598
Missouri	23	6,484	4,117.5682	1.5747	1.5367
Mississippi	8	2,358	1,923.2882	1.2260	1.1773
Montana	9	1,665	2,204.1814	0.7554	0.7197
North Carolina	11	2,191	2,545.5165	0.8607	0.8253
North Dakota	11	1,468	1,264.7749	1.1607	1.1024
Nebraska	19	2,307	1,616.6113	1.4271	1.3698
New Hampshire	13	3,502	3,533.4624	0.9911	0.9587
New Jersey	.	.	.	.	.
New Mexico	9	1,462	1,467.2424	0.9964	0.9463
Nevada	2	.	.	.	.
New York	6	749	1,313.2068	0.5704	0.5306
Ohio	21	4,242	3,825.6916	1.1088	1.0758
Oklahoma	14	1,854	1,727.1004	1.0735	1.0255
Oregon	20	4,884	3,971.2480	1.2298	1.1957
Pennsylvania	15	3,668	3,864.2235	0.9492	0.9189
Puerto Rico	.	.	.	.	.
Rhode Island	.	.	.	.	.
South Carolina	3	.	.	.	.

South Dakota	19	1,048	1,517.4870	0.6906	0.6498
Tennessee	7	1,508	806.4074	1.8700	1.7775
Texas	27	5,655	4,152.0849	1.3620	1.3268
Utah	7	936	592.7736	1.5790	1.4802
Virginia	5	1,749	1,463.3128	1.1952	1.1402
Virgin Islands	.	.	.	.	.
Vermont	7	1,909	2,144.3843	0.8902	0.8510
Washington	38	9,269	7,394.1918	1.2536	1.2282
Wisconsin	57	13,546	9,884.1265	1.3705	1.3476
West Virginia	17	2,912	3,344.5586	0.8707	0.8395
Wyoming	11	918	1,392.0699	0.6594	0.6178
All US	762	150,745	128,631.3797	1.1719	1.1660

1. The number of reporting facilities included in the SUR calculation; SURs are not calculated when the
2. Percent of facilities with at least one predicted device day that had an SUR significantly greater than
3. Facility-specific percentiles are only calculated if at least 20 facilities had ≥ 1.0 predicted number of d
4. Data from all wards (for this table wards also include step-down, mixed acuity, and specialty care are

0.7334	19	0	0%	12	63%	.
1.9662	7	.	.	.	.	.
1.3978	27	11	41%	16	59%	0.0000
1.6826	7	.	.	.	.	.
1.2522	5	.	.	.	.	.
.
0.9309	7	.	.	.	.	.
1.2792	38	14	37%	18	47%	0.0703
1.3937	57	17	30%	26	46%	0.1145
0.9027	17	3	18%	10	59%	.
0.7032	11	1	9%	8	73%	.
1.1778	760	217	29%	411	54%	0.0480

re are less than 5 reporting facilities. This may be different from those reported in the SIR tables due to e or less than the nominal value of the national SUR. This is only calculated if at least 10 facilities had ≥ 1. evice days in 2018. If a facility's predicted number of device days was <1.0, a facility-specific SUR was ne as [including hematology/oncology, bone marrow transplant]). Data contained in this table are reported fr

by device type and patient population:

Median			
25%	50%	75%	90%
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
0.2577	0.7320	1.6535	1.9596
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
0.2642	0.8454	1.5175	2.1743
.	.	.	.
0.5612	0.9958	1.7354	2.6578
0.6032	0.8944	1.2176	1.8541
0.4343	0.9712	1.7537	2.4524
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
0.3315	0.6431	0.8975	1.3022
0.2834	0.8302	1.9343	3.5914
0.6217	1.3099	1.8970	2.7706
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
0.5001	0.7283	1.0879	1.8922
.	.	.	.
0.8234	1.0728	1.6458	2.3519
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.

.	.	.	.
0.1563	0.5543	1.8140	2.6381
.	.	.	.
.	.	.	.
0.5860	1.0362	1.8015	2.5534
0.5453	1.0987	1.6341	2.5143
.	.	.	.
.	.	.	.
0.4359	0.9135	1.4564	2.2946

exclusion and inclusion criteria. Refer to the technical appendix for detail.
 0 predicted device days in 2018.
 either calculated nor included in the distribution of facility-specific SURs.
 from critical access hospitals.

Table 3. State-specific standardized utilization ratios (SURs) and facility-specific su
Table 3a. Urinary catheter days (l

State	No. of Facilities	No. of Device days			95% CI
		Observed	Predicted	SUR	Lower
Alaska	4	.	.	.	.
Alabama	5	1,268	1,890.0422	0.6709	0.6347
Arkansas	15	5,049	4,805.2822	1.0507	1.0220
Arizona	4	.	.	.	.
California	31	16,043	14,982.8412	1.0708	1.0543
Colorado	21	4,411	6,169.8831	0.7149	0.6941
Connecticut	.	.	.	.	.
D.C.	.	.	.	.	.
Delaware	.	.	.	.	.
Florida	7	3,039	4,145.7346	0.7330	0.7073
Georgia	15	4,111	8,284.0292	0.4963	0.4813
Guam	.	.	.	.	.
Hawaii	2	.	.	.	.
Iowa	65	15,533	17,462.5172	0.8895	0.8756
Idaho	8	3,179	2,620.9813	1.2129	1.1713
Illinois	40	13,211	16,371.0971	0.8070	0.7933
Indiana	35	13,499	15,249.3319	0.8852	0.8704
Kansas	61	14,565	16,829.5842	0.8654	0.8515
Kentucky	18	8,103	8,337.3804	0.9719	0.9509
Louisiana	5	2,120	2,783.3310	0.7617	0.7298
Massachusetts	3	.	.	.	.
Maryland	.	.	.	.	.
Maine	15	6,634	9,573.3419	0.6930	0.6765
Michigan	30	7,183	10,030.5508	0.7161	0.6997
Minnesota	76	19,276	22,520.7501	0.8559	0.8439
Missouri	24	8,370	10,111.5522	0.8278	0.8102
Mississippi	12	4,839	5,553.5411	0.8713	0.8470
Montana	11	4,598	5,461.0897	0.8420	0.8179
North Carolina	12	6,364	8,295.6164	0.7672	0.7485
North Dakota	12	4,573	3,642.8745	1.2553	1.2193
Nebraska	28	4,128	7,161.5902	0.5764	0.5590
New Hampshire	13	8,164	8,028.9403	1.0168	0.9949
New Jersey	.	.	.	.	.
New Mexico	9	4,472	4,203.4964	1.0639	1.0330
Nevada	2	.	.	.	.
New York	7	2,156	3,293.3691	0.6546	0.6275
Ohio	22	10,468	10,365.7892	1.0099	0.9906
Oklahoma	17	4,139	3,967.7606	1.0432	1.0118
Oregon	25	12,985	12,563.4454	1.0336	1.0159
Pennsylvania	15	8,104	9,108.1103	0.8898	0.8706
Puerto Rico	.	.	.	.	.
Rhode Island	.	.	.	.	.
South Carolina	3	.	.	.	.

South Dakota	38	5,949	8,273.1865	0.7191	0.7010
Tennessee	7	1,375	1,635.5962	0.8407	0.7971
Texas	34	9,089	10,367.3296	0.8767	0.8588
Utah	7	1,290	1,338.0004	0.9641	0.9126
Virginia	5	2,781	3,725.1444	0.7465	0.7192
Virgin Islands	.	.	.	.	.
Vermont	4	.	.	.	.
Washington	38	18,105	18,419.3995	0.9829	0.9687
Wisconsin	58	20,079	22,858.4586	0.8784	0.8663
West Virginia	20	8,279	8,750.9847	0.9461	0.9259
Wyoming	13	3,067	3,296.0728	0.9305	0.8980
All US	896	299,581	345,718.4286	0.8665	0.8635

1. The number of reporting facilities included in the SUR calculation; SURs are not calculated when there
2. Percent of facilities with at least one predicted device day that had an SUR significantly greater than or
3. Facility-specific percentiles are only calculated if at least 20 facilities had ≥ 1.0 predicted number of dev
4. Data from all ICUs and wards (and other non-critical care locations). Data contained in this table are re

Summary SURs using device days data reported to NHSN during 2018 for critical access hospitals (CAHs), all locations⁴

for SUR	Facility-specific SURs					
	Upper	No. Facilities with ≥ 1 Predicted Device Days	No. Facilities with SUR		10%	
			Significantly > National SUR	Significantly < National SUR		
		N	N			
		
0.7086	5	.	.	.	.
1.0800	15	12	80%	2	13%	
	
1.0875	31	15	48%	11	35%	
0.7363	21	5	24%	9	43%	
	
	
0.7595	7	.	.	.	.
0.5116	15	2	13%	11	73%	
	
	
0.9036	65	20	31%	24	37%	
1.2556	8	.	.	.	.
0.8208	40	20	50%	16	40%	
0.9002	35	11	31%	20	57%	
0.8796	61	25	41%	23	38%	
0.9932	18	8	44%	8	44%	
0.7946	5	.	.	.	.
	
	
0.7098	15	1	7%	12	80%	
0.7328	30	4	13%	19	63%	
0.8681	76	20	26%	41	54%	
0.8457	24	4	17%	14	58%	
0.8961	12	6	50%	4	33%	
0.8666	11	5	45%	3	27%	
0.7862	12	4	33%	6	50%	
1.2921	12	5	42%	5	42%	
0.5942	28	4	14%	14	50%	
1.0391	13	8	62%	2	15%	
	
1.0954	9	.	.	.	.
	
0.6827	7	.	.	.	.
1.0293	22	10	45%	9	41%	
1.0753	17	9	53%	3	18%	
1.0514	25	13	52%	10	40%	
0.9093	15	6	40%	7	47%	
	
	
	

0.7375	38	5	13%	21	55%	0.3157
0.8860	7	.	.	.	.	.
0.8949	34	13	38%	15	44%	0.3610
1.0178	7	.	.	.	.	.
0.7747	5	.	.	.	.	.
.
.
0.9973	38	17	45%	14	37%	0.2840
0.8906	58	13	22%	30	52%	0.3307
0.9666	20	5	25%	9	45%	0.2950
0.9638	13	6	46%	5	38%	.
0.8696	896	304	34%	407	45%	0.3391

are less than 5 reporting facilities. This may be different from those reported in the SIR tables due to exclusion of facilities with less than the nominal value of the national SUR. This is only calculated if at least 10 facilities had ≥ 1.0 predicted device days in 2018. If a facility's predicted number of device days was <1.0, a facility-specific SUR was neither reported from critical access hospitals.

SAHs), by device type and patient population:

Median			
25%	50%	75%	90%
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
0.5827	0.9274	1.2121	1.4151
0.5924	0.7502	0.8571	1.1569
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
0.6182	0.8305	1.0907	1.3266
.	.	.	.
0.5770	0.9371	1.3156	1.7439
0.4864	0.7271	1.0648	1.8369
0.6421	0.8838	1.1639	1.5470
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
0.4065	0.6075	0.8098	1.2484
0.4727	0.6942	0.9832	1.3332
0.5878	0.7077	0.9785	1.2263
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
0.3383	0.5764	0.9037	1.1247
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
0.6172	0.8574	1.1160	1.5524
.	.	.	.
0.5972	1.1370	1.3380	1.4663
.	.	.	.
.	.	.	.
.	.	.	.

0.4170	0.6429	0.9385	1.2876
.	.	.	.
0.5425	0.8280	1.1591	1.4095
.	.	.	.
.	.	.	.
.	.	.	.
0.4036	0.9075	1.2724	1.6308
0.6384	0.7599	0.9158	1.3492
0.4761	0.8151	1.0028	1.8163
.	.	.	.
0.5454	0.7955	1.1148	1.4682

clusion and inclusion criteria. Refer to the technical appendix for details.
predicted device days in 2018.
ner calculated nor included in the distribution of facility-specific SURs.

Table 3. State-specific standardized utilization ratios (SURs) and facility-specific summary statistics
Table 3b. Urinary catheter days (UCDs)

State	No. of Facilities	No. of Device days			95% CI	
		Observed	Predicted	SUR	Lower	Upper
Alaska	1	.	.	.	.	.
Alabama	1	.	.	.	.	.
Arkansas	2	.	.	.	.	.
Arizona	2	.	.	.	.	.
California	15	4,430	3,737.3724	1.1853	1.1508	1.2200
Colorado	4	.	.	.	.	.
Connecticut	.	.	.	.	.	.
D.C.	.	.	.	.	.	.
Delaware	.	.	.	.	.	.
Florida	1	.	.	.	.	.
Georgia	2	.	.	.	.	.
Guam	.	.	.	.	.	.
Hawaii	1	.	.	.	.	.
Iowa	3	.	.	.	.	.
Idaho	2	.	.	.	.	.
Illinois	15	1,642	4,280.2236	0.3836	0.3654	0.4018
Indiana	16	2,303	2,497.1814	0.9222	0.8852	0.9592
Kansas	4	.	.	.	.	.
Kentucky	4	.	.	.	.	.
Louisiana	1	.	.	.	.	.
Massachusetts	2	.	.	.	.	.
Maryland	.	.	.	.	.	.
Maine	2	.	.	.	.	.
Michigan	8	952	1,325.1762	0.7184	0.6739	0.7629
Minnesota	10	948	1,482.6294	0.6394	0.5997	0.6791
Missouri	7	796	990.1764	0.8039	0.7495	0.8583
Mississippi	1	.	.	.	.	.
Montana	3	.	.	.	.	.
North Carolina	5	1,859	2,435.2542	0.7634	0.7293	0.7975
North Dakota	3	.	.	.	.	.
Nebraska	4	.	.	.	.	.
New Hampshire	6	1,045	1,065.9384	0.9804	0.9222	1.0386
New Jersey	.	.	.	.	.	.
New Mexico	5	1,099	982.2708	1.1188	1.0541	1.1835
Nevada	2	.	.	.	.	.
New York	2	.	.	.	.	.
Ohio	10	1,528	1,972.4472	0.7747	0.7365	0.8129
Oklahoma	2	.	.	.	.	.
Oregon	11	2,828	2,816.3700	1.0041	0.9676	1.0406
Pennsylvania	6	1,086	1,333.0818	0.8147	0.7673	0.8621
Puerto Rico	.	.	.	.	.	.
Rhode Island	.	.	.	.	.	.

South Carolina	1	.	.	.	.
South Carolina	.	.	.	.	.
Tennessee	1	.	.	.	.
Texas	8	646	1,257.6492	0.5137	0.4752
Utah	.	.	.	.	.
Virginia	3	.	.	.	.
Virgin Islands	.	.	.	.	.
Vermont	2	.	.	.	.
Washington	9	2,421	2,444.1480	0.9905	0.9517
Wisconsin	13	996	1,446.0660	0.6888	0.6470
West Virginia	8	1,247	1,259.2962	0.9902	0.9364
Wyoming	2	.	.	.	.
All US	210	34,648	45,030.2981	0.7694	0.7614

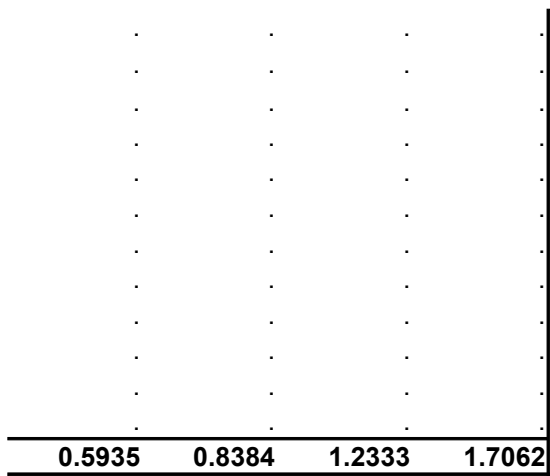
1. The number of reporting facilities included in the SUR calculation; SURs are not calculated when the
2. Percent of facilities with at least one predicted device day that had an SUR significantly greater than
3. Facility-specific percentiles are only calculated if at least 20 facilities had ≥ 1.0 predicted number of de
4. Data from all ICUs; excludes wards (and other non-critical care locations). Data contained in this tabl

**SURs using device days data reported to NHSN during 2018 for critical access hospitals (CAHs), b
s), critical care locations⁴**

for SUR	Facility-specific SURs					
	Upper	No. Facilities with ≥1 Predicted Device Days	No. Facilities with SUR Significantly > National N	No. Facilities with SUR Significantly < National N		10%
	
	
	
1.2206	15	10	67%	3	20%	.
	
	
	
	
	
	
0.4025	15	6	40%	5	33%	.
0.9605	16	6	38%	3	19%	.
	
	
	
	
0.7651	8	.	.	.	.	.
0.6811	10	2	20%	4	40%	.
0.8612	6	.	.	.	.	.
	
0.7987	5	.	.	.	.	.
	
	
1.0412	6	.	.	.	.	.
	
1.1865	5	.	.	.	.	.
	
0.8143	10	3	30%	3	30%	.
	
1.0417	11	6	55%	5	45%	.
0.8642	6	.	.	.	.	.
	
	

.
.
0.5544	8	.	.	.	.	.
.
.
1.0306	9	.	.	.	.	.
0.7326	13	4	31%	4	31%	.
1.0463	8	.	.	.	.	.
.
0.7776	209	85	41%	61	29%	0.3992

re are less than 5 reporting facilities. This may be different from those reported in the SIR tables due to e: or less than the nominal value of the national SUR. This is only calculated if at least 10 facilities had ≥ 1 . evices days in 2018. If a facility's predicted number of device days was <1.0 , a facility-specific SUR was ne e are reported from critical access hospitals.



exclusion and inclusion criteria. Refer to the technical appendix for detail:
 0 predicted device days in 2018.
 either calculated nor included in the distribution of facility-specific SURs.

Table 3. State-specific standardized utilization ratios (SURs) and facility-specific summary
Table 3c. Urinary catheter day

State	No. of Facilities	No. of Device days			95% CI
		Observed	Predicted	SUR	Lower
Alaska	4	.	.	.	.
Alabama	5	1,159	1,654.1918	0.7006	0.6612
Arkansas	15	4,920	4,672.2046	1.0530	1.0239
Arizona	4	.	.	.	.
California	30	11,613	11,245.4688	1.0327	1.0140
Colorado	20	3,841	5,613.1971	0.6843	0.6629
Connecticut	.	.	.	.	.
D.C.	.	.	.	.	.
Delaware	.	.	.	.	.
Florida	7	3,028	3,934.9186	0.7695	0.7425
Georgia	14	3,811	7,296.4880	0.5223	0.5059
Guam	.	.	.	.	.
Hawaii	2	.	.	.	.
Iowa	65	15,483	17,384.1200	0.8906	0.8767
Idaho	7	2,795	2,096.2471	1.3333	1.2846
Illinois	36	11,569	12,090.8734	0.9568	0.9395
Indiana	35	11,196	12,752.1505	0.8780	0.8618
Kansas	61	14,107	16,015.6368	0.8808	0.8664
Kentucky	18	6,879	7,509.9276	0.9160	0.8945
Louisiana	5	1,962	2,666.3939	0.7358	0.7038
Massachusetts	2	.	.	.	.
Maryland	.	.	.	.	.
Maine	15	6,324	9,304.8809	0.6796	0.6631
Michigan	30	6,231	8,705.3746	0.7158	0.6982
Minnesota	75	18,328	21,038.1207	0.8712	0.8586
Missouri	24	7,574	9,121.3757	0.8304	0.8118
Mississippi	11	4,718	5,350.9601	0.8817	0.8568
Montana	11	4,255	4,996.9651	0.8515	0.8262
North Carolina	11	4,505	5,860.3621	0.7687	0.7465
North Dakota	12	4,327	3,230.1363	1.3396	1.3001
Nebraska	27	3,373	5,749.7818	0.5866	0.5671
New Hampshire	13	7,119	6,963.0018	1.0224	0.9989
New Jersey	.	.	.	.	.
New Mexico	9	3,373	3,221.2255	1.0471	1.0122
Nevada	2	.	.	.	.
New York	7	1,796	2,988.0153	0.6011	0.5737
Ohio	22	8,940	8,393.3420	1.0651	1.0432
Oklahoma	17	3,987	3,864.3290	1.0317	1.0001
Oregon	25	10,157	9,747.0754	1.0421	1.0220
Pennsylvania	15	7,018	7,775.0285	0.9026	0.8817
Puerto Rico	.	.	.	.	.
Rhode Island	.	.	.	.	.

South Carolina	3	.	.	.	.
South Dakota	38	5,949	8,273.1865	0.7191	0.7010
Tennessee	7	1,299	1,600.6798	0.8115	0.7683
Texas	31	8,443	9,109.6804	0.9268	0.9072
Utah	7	1,290	1,338.0004	0.9641	0.9126
Virginia	5	2,221	3,019.8989	0.7355	0.7053
Virgin Islands	.	.	.	.	.
Vermont	3	.	.	.	.
Washington	38	15,684	15,975.2515	0.9818	0.9665
Wisconsin	58	19,083	21,412.3926	0.8912	0.8786
West Virginia	20	7,032	7,491.6885	0.9386	0.9169
Wyoming	12	2,855	2,902.1104	0.9838	0.9482
All US	878	264,933	300,688.1305	0.8811	0.8777

1. The number of reporting facilities included in the SUR calculation; SURs are not calculated when the
2. Percent of facilities with at least one predicted device day that had an SUR significantly greater than
3. Facility-specific percentiles are only calculated if at least 20 facilities had ≥ 1.0 predicted number of d
4. Data from all wards (for this table wards also include step-down, mixed acuity, and specialty care are

0.7375	38	5	13%	22	58%	0.3157
0.8566	7	.	.	.	.	.
0.9467	31	11	35%	14	45%	0.3742
1.0178	7	.	.	.	.	.
0.7665	5	.	.	.	.	.
.
0.9972	38	16	42%	16	42%	0.2840
0.9039	58	13	22%	29	50%	0.3307
0.9608	20	5	25%	11	55%	0.2950
1.0204	12	7	58%	4	33%	.
0.8845	878	296	34%	409	47%	0.3440

re are less than 5 reporting facilities. This may be different from those reported in the SIR tables due to e) or less than the nominal value of the national SUR. This is only calculated if at least 10 facilities had ≥ 1.0 device days in 2018. If a facility's predicted number of device days was <1.0, a facility-specific SUR was ne as [including hematology/oncology, bone marrow transplant]). Data contained in this table are reported fr

y device type and patient population:

Median			
25%	50%	75%	90%
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
0.6274	0.9666	1.2106	1.4460
0.5826	0.7374	0.8635	1.1154
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
0.6182	0.8305	1.0907	1.3266
.	.	.	.
0.5865	1.0889	1.3555	1.6531
0.4864	0.7363	1.0179	1.7987
0.6421	0.8907	1.1639	1.5470
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
0.4065	0.6042	0.8299	1.2484
0.4773	0.7002	0.9909	1.3263
0.5676	0.7145	0.9785	1.2263
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
0.3378	0.6227	0.9188	1.1247
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
0.5943	0.9443	1.1160	1.7934
.	.	.	.
0.5972	1.1378	1.3380	1.4663
.	.	.	.
.	.	.	.
.	.	.	.

0.4170	0.6429	0.9385	1.2876
0.5425	0.7356	1.1263	1.2576
0.4036	0.9075	1.3572	1.8565
0.6413	0.7689	0.9158	1.4012
0.4545	0.7901	0.9509	1.9447
0.5488	0.7962	1.1247	1.4806

exclusion and inclusion criteria. Refer to the technical appendix for details.
 0 predicted device days in 2018.
 either calculated nor included in the distribution of facility-specific SURs.
 om critical access hospitals.

Table 4. State-specific standardized utilization ratios (SURs) and facility-specific summary (Table 4a. Ventilator days (VD

State	No. of Facilities	No. of Device days			95% CI
		Observed	Predicted	SUR	Lower
Alaska	1	.	.	.	.
Alabama	.	.	.	.	.
Arkansas	5	4	22.4519	0.1782	0.0566
Arizona	2	.	.	.	.
California	13	929	388.0132	2.3942	2.2439
Colorado	3	.	.	.	.
Connecticut	.	.	.	.	.
D.C.	.	.	.	.	.
Delaware	.	.	.	.	.
Florida	3	.	.	.	.
Georgia	1	.	.	.	.
Guam	.	.	.	.	.
Hawaii	.	.	.	.	.
Iowa	2	.	.	.	.
Idaho	2	.	.	.	.
Illinois	7	12	56.9458	0.2107	0.1142
Indiana	18	186	360.7038	0.5157	0.4454
Kansas	4	.	.	.	.
Kentucky	4	.	.	.	.
Louisiana	1	.	.	.	.
Massachusetts	1	.	.	.	.
Maryland	.	.	.	.	.
Maine	5	27	52.0533	0.5187	0.3488
Michigan	13	80	185.1051	0.4322	0.3450
Minnesota	2	.	.	.	.
Missouri	4	.	.	.	.
Mississippi	.	.	.	.	.
Montana	3	.	.	.	.
North Carolina	5	83	236.4455	0.3510	0.2814
North Dakota	2	.	.	.	.
Nebraska	.	.	.	.	.
New Hampshire	6	136	144.6298	0.9403	0.7920
New Jersey	.	.	.	.	.
New Mexico	3	.	.	.	.
Nevada	2	.	.	.	.
New York	2	.	.	.	.
Ohio	10	283	191.6407	1.4767	1.3120
Oklahoma	2	.	.	.	.
Oregon	8	165	179.4007	0.9197	0.7872
Pennsylvania	9	333	209.3961	1.5903	1.4263
Puerto Rico	.	.	.	.	.
Rhode Island	.	.	.	.	.
South Carolina	2	.	.	.	.

South Dakota	.	.	.	.	.
Tennessee	2	.	.	.	.
Texas	8	56	34.5375	1.6214	1.2365
Utah	.	.	.	.	.
Virginia	2	.	.	.	.
Virgin Islands	.	.	.	.	.
Vermont	.	.	.	.	.
Washington	9	395	335.4972	1.1774	1.0655
Wisconsin	15	74	159.6832	0.4634	0.3665
West Virginia	6	116	142.5945	0.8135	0.6752
Wyoming	3	.	.	.	.
All US	190	3,432	3,582.9531	0.9579	0.9262

1. The number of reporting facilities included in the SUR calculation; SURs are not calculated when the
2. Percent of facilities with at least one predicted device day that had an SUR significantly greater than
3. Facility-specific percentiles are only calculated if at least 20 facilities had ≥ 1.0 predicted number of d
4. Data from all ICUs and wards (and other non-critical care locations). Data contained in this table are

**SURs using device days data reported to NHSN during 2018 for critical access hospitals (CAHs), b
is), all locations⁴**

for SUR	Facility-specific SURs					10%
	Upper	No. Facilities with ≥1 Predicted Device Days	No. Facilities with SUR Significantly > National SUR N	No. Facilities with SUR Significantly < National SUR	No. Facilities with SUR	
.
0.4297	5	.	.	.	.	.
2.5520	10	7	70%	1	10%	.
.
.
.
0.3582	7	.	.	.	.	.
0.5939	18	2	11%	12	67%	.
.
.
0.7443	4	.	.	.	.	.
0.5351	11	1	9%	6	55%	.
.
0.4329	5	.	.	.	.	.
.
1.1087	5	.	.	.	.	.
.
1.6565	9	.	.	.	.	.
1.0684	8	.	.	.	.	.
1.7682	9	.	.	.	.	.
.
.

.
2.0902	6	.	.	.	.	.
.
.
1.2978	8	.	.	.	.	.
0.5785	15	1	7%	7	47%	.
0.9721	6	.	.	.	.	.
.
0.9903	175	27	15%	84	48%	0.0000

re are less than 5 reporting facilities. This may be different from those reported in the SIR tables due to e. or less than the nominal value of the national SUR. This is only calculated if at least 10 facilities had ≥ 1. evice days in 2018. If a facility's predicted number of device days was <1.0, a facility-specific SUR was ne reported from critical access hospitals.

Table 4. State-specific standardized utilization ratios (SURs) and facility-specific summary (Table 4b. Ventilator days (VDs), c

State	No. of Facilities	No. of Device days			95% CI
		Observed	Predicted	SUR	Lower
Alaska	.	.	.	.	.
Alabama	.	.	.	.	.
Arkansas	1	.	.	.	.
Arizona	2	.	.	.	.
California	10	900	384.7074	2.3394	2.1904
Colorado	2	.	.	.	.
Connecticut	.	.	.	.	.
D.C.	.	.	.	.	.
Delaware	.	.	.	.	.
Florida	1	.	.	.	.
Georgia	1	.	.	.	.
Guam	.	.	.	.	.
Hawaii	.	.	.	.	.
Iowa	1	.	.	.	.
Idaho	1	.	.	.	.
Illinois	5	12	41.4597	0.2894	0.1568
Indiana	16	186	348.0686	0.5344	0.4616
Kansas	2	.	.	.	.
Kentucky	4	.	.	.	.
Louisiana	1	.	.	.	.
Massachusetts	1	.	.	.	.
Maryland	.	.	.	.	.
Maine	2	.	.	.	.
Michigan	7	78	168.7313	0.4623	0.3679
Minnesota	1	.	.	.	.
Missouri	4	.	.	.	.
Mississippi	.	.	.	.	.
Montana	1	.	.	.	.
North Carolina	3	.	.	.	.
North Dakota	2	.	.	.	.
Nebraska	.	.	.	.	.
New Hampshire	5	136	138.5663	0.9815	0.8266
New Jersey	.	.	.	.	.
New Mexico	2	.	.	.	.
Nevada	2	.	.	.	.
New York	2	.	.	.	.
Ohio	7	146	169.1446	0.8632	0.7315
Oklahoma	1	.	.	.	.
Oregon	6	165	167.3080	0.9862	0.8441
Pennsylvania	5	186	183.5613	1.0133	0.8753
Puerto Rico	.	.	.	.	.
Rhode Island	.	.	.	.	.

South Carolina	1	.	.	.	.
South Dakota	.	.	.	.	.
Tennessee	1	.	.	.	.
Texas	5	47	25.7574	1.8247	1.3561
Utah	.	.	.	.	.
Virginia	2	.	.	.	.
Virgin Islands	.	.	.	.	.
Vermont	.	.	.	.	.
Washington	8	395	328.9228	1.2009	1.0868
Wisconsin	9	74	136.0870	0.5438	0.4300
West Virginia	5	113	121.9916	0.9263	0.7670
Wyoming	2	.	.	.	.
All US	131	3,042	3,317.0514	0.9171	0.8849

1. The number of reporting facilities included in the SUR calculation; SURs are not calculated when the
2. Percent of facilities with at least one predicted device day that had an SUR significantly greater than
3. Facility-specific percentiles are only calculated if at least 20 facilities had ≥ 1.0 predicted number of d
4. Data from all ICUs; excludes wards (and other non-critical care locations). Data contained in this tabl

**SURs using device days data reported to NHSN during 2018 for critical access hospitals (CAHs), b
ritical care locations⁴**

for SUR	Facility-specific SURs						
	Upper	No. Facilities with ≥1 Predicted Device Days	No. Facilities with SUR Significantly > National N	No. Facilities with SUR Significantly < National N	No. Facilities with SUR	No. Facilities with SUR	10%
2.4961	10	7	70%	1	10%		
0.4921	5						
0.6155	16	2	13%	11	69%		
0.5738	6						
1.1572	5						
1.0120	7						
1.1456	6						
1.1671	5						

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2.4057	5
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1.3238	8
0.6788	9
1.1094	5
.
0.9501	129	26	20%	62	48%	0.0000

re are less than 5 reporting facilities. This may be different from those reported in the SIR tables due to e or less than the nominal value of the national SUR. This is only calculated if at least 10 facilities had ≥ 1. evice days in 2018. If a facility's predicted number of device days was <1.0, a facility-specific SUR was ne e are reported from critical access hospitals.

Table 4. State-specific standardized utilization ratios (SURs) and facility-specific summary (Table 4c. Ventilator days (

State	No. of Facilities	No. of Device days			95% CI
		Observed	Predicted	SUR	Lower
Alaska	1	.	.	.	.
Alabama	.	.	.	.	.
Arkansas	4	.	.	.	.
Arizona	.	.	.	.	.
California	4	.	.	.	.
Colorado	2	.	.	.	.
Connecticut	.	.	.	.	.
D.C.	.	.	.	.	.
Delaware	.	.	.	.	.
Florida	2	.	.	.	.
Georgia	.	.	.	.	.
Guam	.	.	.	.	.
Hawaii	.	.	.	.	.
Iowa	1	.	.	.	.
Idaho	1	.	.	.	.
Illinois	3	.	.	.	.
Indiana	3	.	.	.	.
Kansas	2	.	.	.	.
Kentucky	2	.	.	.	.
Louisiana	.	.	.	.	.
Massachusetts	.	.	.	.	.
Maryland	.	.	.	.	.
Maine	3	.	.	.	.
Michigan	6	2	16.3738	0.1221	0.0205
Minnesota	1	.	.	.	.
Missouri	1	.	.	.	.
Mississippi	.	.	.	.	.
Montana	2	.	.	.	.
North Carolina	2	.	.	.	.
North Dakota	.	.	.	.	.
Nebraska	.	.	.	.	.
New Hampshire	3	.	.	.	.
New Jersey	.	.	.	.	.
New Mexico	2	.	.	.	.
Nevada	.	.	.	.	.
New York	.	.	.	.	.
Ohio	7	137	22.4962	6.0899	5.1323
Oklahoma	1	.	.	.	.
Oregon	4	.	.	.	.
Pennsylvania	4	.	.	.	.
Puerto Rico	.	.	.	.	.
Rhode Island	.	.	.	.	.
South Carolina	1	.	.	.	.

South Dakota	.	.	.	.	.
Tennessee	1	.	.	.	.
Texas	4	.	.	.	.
Utah	.	.	.	.	.
Virginia	.	.	.	.	.
Virgin Islands	.	.	.	.	.
Vermont	.	.	.	.	.
Washington	3	.	.	.	.
Wisconsin	9	0	23.5963	0.0000	.
West Virginia	4	.	.	.	.
Wyoming	1	.	.	.	.
All US	84	390	265.9018	1.4667	1.3265

1. The number of reporting facilities included in the SUR calculation; SURs are not calculated when the
2. Percent of facilities with at least one predicted device day that had an SUR significantly greater than
3. Facility-specific percentiles are only calculated if at least 20 facilities had ≥ 1.0 predicted number of d
4. Data from all wards (for this table wards also include step-down, mixed acuity, and specialty care are

SURs using device days data reported to NHSN during 2018 for critical access hospitals (CAHs), b (VDs), wards⁴

for SUR	Facility-specific SURs			10%
	No. Facilities with ≥ 1 Predicted Device Days	No. Facilities with SUR Significantly > National SUR N	No. Facilities with SUR Significantly < National SUR N	
Upper
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0.4036	5	.	.	.
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7.1761	6	.	.	.
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0.1270	8
1.6178	68	6	9%	43	63%	0.0000

re are less than 5 reporting facilities. This may be different from those reported in the SIR tables due to e or less than the nominal value of the national SUR. This is only calculated if at least 10 facilities had ≥ 1. evice days in 2018. If a facility's predicted number of device days was <1.0, a facility-specific SUR was ne as [including hematology/oncology, bone marrow transplant]). Data contained in this table are reported fr

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0.0000	0.0000	0.0000	1.4489

exclusion and inclusion criteria. Refer to the technical appendix for detail
 0 predicted device days in 2018.
 either calculated nor included in the distribution of facility-specific SURs.
 om critical access hospitals.

Table 5. Changes in national standardized utilization ratios (SURs) using HAI data reported from all NHSN critical access hospitals reporting during 2018 by HAI and patient population: Central line days (CLDs), urinary catheter days (UCDs), and ventilator days (VDs), 2018 compared to 2017

	2017 SUR	2018 SUR	Percent Change	Direction of Change, Based on Statistical Significance	p-value
CLDs, all locations¹	1.1069	1.1365	3%	INCREASE	0.0000
ICU ²	0.8598	0.8635	0%	NO CHANGE	0.7128
Ward ³	1.1399	1.1719	3%	INCREASE	0.0000
UCDs, all locations¹	0.8774	0.8665	-1%	DECREASE	0.0000
	0.8257	0.7694	-7%	DECREASE	0.0000
	0.8854	0.8811	0%	NO CHANGE	0.0771
VDs, all¹	1.0396	0.9579	-8%	DECREASE	0.0004
ICUs ²	0.9118	0.9171	1%	NO CHANGE	0.8165
Wards ³	2.6834	1.4667	-45%	DECREASE	0.0000

* Statistically significant, $p < 0.0500$

1. Data from all ICUs, wards (and other non-critical care locations).

2. Data from all ICUs; excludes wards (and other non-critical care locations).

3. Data from all wards (for this table wards also include step-down and specialty care areas [including hematology/oncology, bone ma

|

|

arrow transplant].

Table 6. Changes in state-specific standardized utilization ratios (SURs) between 2017 and 2018 from NHSN Critical Access Hospitals
6a. Central line days (CLDs), all locations¹

State ²	All Critical Access Hospitals Reporting to NHSN				
	2017 SUR	2018 SUR	Percent Change	Direction of Change, Based on Statistical Significance	p-value
Alaska	.	.	.	.	.
Alabama	.	.	.	.	.
Arkansas	1.1452	1.6897	48%	INCREASE	0.0000
Arizona	.	1.3920	.	.	.
California	1.2064	1.3523	12%	INCREASE	0.0000
Colorado	0.6584	0.7666	16%	INCREASE	0.0000
Connecticut	.	.	.	.	.
D.C.	.	.	.	.	.
Delaware	.	.	.	.	.
Florida	0.6114	0.5981	2%	NO CHANGE	0.5582
Georgia	1.3423	1.0014	-25%	DECREASE	0.0000
Guam	.	.	.	.	.
Hawaii	.	.	.	.	.
Iowa	1.0330	1.0731	4%	INCREASE	0.0236
Idaho	1.2679	1.3414	6%	NO CHANGE	0.1403
Illinois	1.2970	1.2429	-4%	DECREASE	0.0041
Indiana	1.0014	1.0019	0%	NO CHANGE	0.9784
Kansas	1.4764	1.3146	-11%	DECREASE	0.0000
Kentucky	1.3046	1.5662	20%	INCREASE	0.0000
Louisiana	1.8205	1.5382	-16%	DECREASE	0.0000
Massachusetts	.	.	.	.	.
Maryland	.	.	.	.	.
Maine	1.1278	1.0123	-10%	DECREASE	0.0000
Michigan	0.6442	0.6507	1%	NO CHANGE	0.7053
Minnesota	1.1698	1.2768	9%	INCREASE	0.0000
Missouri	1.5085	1.5479	3%	NO CHANGE	0.1610
Mississippi	0.7428	1.1870	60%	INCREASE	0.0000
Montana	0.9237	0.7380	-20%	DECREASE	0.0000
North Carolina	0.8271	0.8161	1%	NO CHANGE	0.6342
North Dakota	1.0013	1.0837	8%	INCREASE	0.0254
Nebraska	1.2584	1.3345	6%	INCREASE	0.0363
New Hampshire	0.7955	0.9913	25%	INCREASE	0.0000
New Jersey	.	.	.	.	.
New Mexico	1.0193	0.9779	4%	NO CHANGE	0.2118
Nevada	.	.	.	.	.
New York	0.4941	0.5636	14%	INCREASE	0.0166
Ohio	1.0000	1.0510	5%	INCREASE	0.0173
Oklahoma	1.1705	1.0597	-9%	DECREASE	0.0022
Oregon	1.0754	1.2593	17%	INCREASE	0.0000
Pennsylvania	1.1437	0.9508	-17%	DECREASE	0.0000
Puerto Rico	.	.	.	.	.
Rhode Island	.	.	.	.	.
South Carolina	0.8635	.	.	.	.
South Dakota	0.8875	0.6906	-22%	DECREASE	0.0000
Tennessee	1.5138	1.8613	23%	INCREASE	0.0000
Texas	1.2708	1.2488	2%	NO CHANGE	0.3606
Utah	1.0005	1.5790	58%	INCREASE	0.0000
Virginia	1.1958	.	.	.	.
Virgin Islands	.	.	.	.	.
Vermont	0.7643	0.6649	-13%	DECREASE	0.0000
Washington	1.4071	1.2559	-11%	DECREASE	0.0000
Wisconsin	1.2375	1.3403	8%	INCREASE	0.0000
West Virginia	0.8162	0.9490	16%	INCREASE	0.0000
Wyoming	0.4553	0.6451	42%	INCREASE	0.0000
All US	1.1069	1.1365	3%	INCREASE	0.0000

* Statistically significant, p < 0.0500

1. Data from all ICUs, wards (and other non-critical care locations).

2. States without SUR either in 2017 and/or 2018 and therefore subsequent data not calculated

Table 6. Changes in state-specific standardized utilization ratios (SURs) between 2017 and 2018 from NHSN Critical Access Hospitals

6b. Urinary catheter days (UCDs), all locations¹

	All Critical Access Hospitals Reporting to NHSN				
	2017 SUR	2018 SUR	Percent Change	Direction of Change, Based on Statistical Significance	p-value
Alaska	0.5810	.	.	.	.
Alabama	.	0.6709	.	.	.
Arkansas	1.1516	1.0507	-9%	DECREASE	0.0000
Arizona	.	.	.	.	.
California	1.2195	1.0708	-12%	DECREASE	0.0000
Colorado	0.7355	.	.	.	.
Connecticut	.	.	.	.	.
D.C.	.	.	.	.	.
Delaware	.	.	.	.	.
Florida	0.7770	0.7330	-6%	DECREASE	0.0121
Georgia	0.5223	0.4963	-5%	DECREASE	0.0191
Guam	.	.	.	.	.
Hawaii	.	.	.	.	.
Iowa	0.8426	0.8895	6%	INCREASE	0.0000
Idaho	1.2720	1.2129	5%	NO CHANGE	0.0562
Illinois	0.9021	0.8070	-11%	DECREASE	0.0000
Indiana	0.9924	0.8852	-11%	DECREASE	0.0000
Kansas	0.8460	0.8654	2%	NO CHANGE	0.0531
Kentucky	1.0542	0.9719	-8%	DECREASE	0.0000
Louisiana	0.7576	0.7617	1%	NO CHANGE	0.8604
Massachusetts	.	.	.	.	.
Maryland	.	.	.	.	.
Maine	0.7980	0.6930	-13%	DECREASE	0.0000
Michigan	0.7610	0.7161	-6%	DECREASE	0.0003
Minnesota	0.7723	0.8559	11%	INCREASE	0.0000
Missouri	0.7664	0.8278	8%	INCREASE	0.0000
Mississippi	0.6913	0.8713	26%	INCREASE	0.0000
Montana	0.8561	0.8420	2%	NO CHANGE	0.4413
North Carolina	0.8710	0.7672	-12%	DECREASE	0.0000
North Dakota	1.0926	1.2553	15%	INCREASE	0.0000
Nebraska	0.6754	0.5764	-15%	DECREASE	0.0000
New Hampshire	0.9232	1.0168	10%	INCREASE	0.0000
New Jersey	.	.	.	.	.
New Mexico	1.1479	1.0639	-7%	DECREASE	0.0003
Nevada	.	.	.	.	.
New York	0.7675	0.6546	-15%	DECREASE	0.0000
Ohio	0.9416	1.0099	7%	INCREASE	0.0000
Oklahoma	1.1280	1.0432	-8%	DECREASE	0.0004
Oregon	1.0429	1.0336	1%	NO CHANGE	0.4683
Pennsylvania	0.9872	0.8898	-10%	DECREASE	0.0000
Puerto Rico	.	.	.	.	.
Rhode Island	.	.	.	.	.
South Carolina	0.6533	.	.	.	.
South Dakota	0.6530	0.7191	10%	INCREASE	0.0000
Tennessee	0.8993	0.8407	7%	NO CHANGE	0.0802
Texas	1.0159	0.8767	-14%	DECREASE	0.0000
Utah	0.7126	0.9641	35%	INCREASE	0.0000
Virginia	0.8373	0.7465	-11%	DECREASE	0.0000
Virgin Islands	.	.	.	.	.
Vermont	.	.	.	.	.
Washington	1.0031	0.9829	2%	NO CHANGE	0.0530
Wisconsin	0.8857	0.8784	1%	NO CHANGE	0.4050
West Virginia	0.7180	0.9461	32%	INCREASE	0.0000
Wyoming	0.8599	0.9305	8%	INCREASE	0.0028
All US	0.8774	0.8665	-1%	DECREASE	0.0000

* Statistically significant, p < 0.0500

1. Data from all ICUs, wards (and other non-critical care locations).

2. States without SUR either in 2017 and/or 2018 and therefore subsequent data not calculated

Table 6. Changes in state-specific standardized utilization ratios (SURs) between 2017 and 2018 from NHSN Critical Access Hospitals
6c. Ventilator days (VDs), all locations¹

All Critical Access Hospitals Reporting to NHSN					
	2017 SUR	2018 SUR	Percent Change	Direction of Change, Based on Statistical Significance	p-value
Alaska	.	.	.	.	.
Alabama	.	.	.	.	.
Arkansas	.	0.1782	.	.	.
Arizona	.	.	.	.	.
California	2.3325	2.3942	3%	NO CHANGE	0.5761
Colorado	.	.	.	.	.
Connecticut	.	.	.	.	.
D.C.	.	.	.	.	.
Delaware	.	.	.	.	.
Florida	.	.	.	.	.
Georgia	.	.	.	.	.
Guam	.	.	.	.	.
Hawaii	.	.	.	.	.
Iowa	.	.	.	.	.
Idaho	.	.	.	.	.
Illinois	0.1582	0.2107	33%	NO CHANGE	0.5410
Indiana	0.2840	0.5157	82%	INCREASE	0.0000
Kansas	.	.	.	.	.
Kentucky	.	.	.	.	.
Louisiana	.	.	.	.	.
Massachusetts	.	.	.	.	.
Maryland	.	.	.	.	.
Maine	0.4096	0.5187	27%	NO CHANGE	0.3978
Michigan	0.3458	0.4322	25%	NO CHANGE	0.2083
Minnesota	.	.	.	.	.
Missouri	.	.	.	.	.
Mississippi	.	.	.	.	.
Montana	.	.	.	.	.
North Carolina	0.5020	0.3510	-30%	DECREASE	0.0145
North Dakota	.	.	.	.	.
Nebraska	.	.	.	.	.
New Hampshire	0.6870	0.9403	37%	INCREASE	0.0122
New Jersey	.	.	.	.	.
New Mexico	.	.	.	.	.
Nevada	.	.	.	.	.
New York	.	.	.	.	.
Ohio	0.8598	1.4767	72%	INCREASE	0.0000
Oklahoma	.	.	.	.	.
Oregon	0.9031	0.9197	2%	NO CHANGE	0.8671
Pennsylvania	3.2897	1.5903	-52%	DECREASE	0.0000
Puerto Rico	.	.	.	.	.
Rhode Island	.	.	.	.	.
South Carolina	.	.	.	.	.
South Dakota	.	.	.	.	.
Tennessee	.	.	.	.	.
Texas	1.0142	1.6214	60%	INCREASE	0.0185
Utah	.	.	.	.	.
Virginia	.	.	.	.	.
Virgin Islands	.	.	.	.	.
Vermont	.	.	.	.	.
Washington	1.1946	1.1774	1%	NO CHANGE	0.8387
Wisconsin	0.3969	0.4634	17%	NO CHANGE	0.3502
West Virginia	0.6646	0.8135	22%	NO CHANGE	0.1513
Wyoming	.	.	.	.	.
All US	1.0396	0.9579	-8%	DECREASE	0.0004

* Statistically significant, p < 0.0500

1. Data from all ICUs, wards (and other non-critical care locations).

2. States without SUR either in 2017 and/or 2018 and therefore subsequent data not calculated

Appendix A. Factors used in NHSN risk adjusted standard utilization ratios (SUR) calculation of the device utilization in Critical Access Hospitals (CAHs).

SUR Type	Validated Parameters for Risk Model
CLDs	Intercept Location type
UCDs	Intercept Location type
VDs	Intercept Location type

Additional Resources

Technical Appendix: <http://www.cdc.gov/hai/pdfs/progress-report/tech-appendix.pdf>

Explains the methodology used to procedure the HAI Progress Report.

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

The complete HAI Progress Report, including state-specific fact sheets and the Executive Summary, can be fo

The new SUR Guide: <https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/nhsn-sur-guide-508.pdf>

und at the above website.