2019 Nat
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Introduction: Welcome to the 2019 National and State HAI Data Report using the 2015 baseline
by comparing the number of observed device days to the number of predicted dev
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

tional and State HAI Progress Report
tandardized Utilization Ratios

Inpatient Rehabilitation Facilities

e and risk adjustment calculations. Standardized utilization ratios (SURs) are used to describe device-ass
ice days.
NHSN).

IRF	
National	State
☑	☑
☑	☑
☑	☑

sociated HAIs

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 facili
standardized to compare with a reference baseline population as well as over time. Accordingly, CDC ha

Development of SUR models

SUR models were developed for the following measures: central line days, urinary catheter days and ver
inpatient rehabilitation facilities (IRF), long-term acute care hospitals (LTACH) (and NICU for central line
Using the NHSN data (2019) in sync with rebaseline work, CDC has developed multivariable logistic regr
"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 + x1 + X2 + X3 + ……
(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^logit(p_hat)] / [1+ e^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 p
SUR = Observed Device Days / Predicted Device Days

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

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

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

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

ntilator days. They were available for the healthcare setting of acute care hospitals (ACH), critical access hospita
days).
ression models that correct over dispersion by the Williams' method (Reference: Williams, D. A. (1982),
all the SUR models are at the location level.

.

predicted device days;

1.0.

cility-level).
number of predicted device days.

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

ɑls (CAH),

2019 Annual National and State HAI Progress Report
Inpatient Rehabilitation Facilities: 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 Inpatient rehabilitation facilities:** All locations combined
Table 3	**State-specific SURs for UCDs from Inpatient rehabilitation facilities:** All locations combined
Table 4	**State-specific SURs for VDs from Inpatient rehabilitation facilities** All locations combined
Table 5	**Changes in national SURs, 2019 compared to 2018:** Central Line Days (CLDs) Urinary Catheter Days (UCDs) Ventilator days (VDs)
Table 6	**Changes in state SURs, 2019 compared to 2018:** 6a. Central Line Days (CLDs) 6b. Urinary Catheter Days (UCDs) 6c. Ventilator Days (VDs)
Appendix A	Factors used in NHSN risk-adjusted SUR calculation of the device utilization in inpatient reh

Additional Resources	Technical Appendix HAI Progress Report Home Page SUR Guide: https://www.cdc.gov/nhsn/pdfs/ps-analysis-resources/nhsn-sur-guid

ıabilitation facilities (IRFs)

e-508.pdf

Device and Patient Population	No. of Facilities	No. of Device days	
	Reporting[1]	Observed	Predicted
Central line days, all[4]	732	366,586	439,872.6757
ICUs[5]	133	121,312	162,808.4543
Wards[6]	599	245,274	277,064.2215
Urinary catheter days, all[4]	1,145	573,942	725,121.4790
	356	335,833	403,793.6988
Wards[6]	789	238,109	321,327.7802
Ventilator days, all[4]	30	1,262	1,621.3554
	8	1,015	649.3746
	22	247	971.9808

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

Table 1. National standardized utilization ratios (SURs) and facility-specific summary
Table 1a. Central line days (CLDs), urinary

95% CI for SUR				Facility-specific SURs		
SUR	Lower	Upper	No. Facilities with ≥1 Predicted Device Days	No. Facilities with SUR Significantly > National SUR N	%[2]	No. Facilitie Significantly < N
0.8334	0.8307	0.8361	731	259	35%	359
0.7451	0.7409	0.7493	133	48	36%	67
0.8853	0.8818	0.8888	598	204	34%	301
0.7915	0.7895	0.7936	1,145	418	37%	522
0.8317	0.8289	0.8345	356	130	37%	169
0.7410	0.7381	0.7440	789	312	40%	345
0.7784	0.7363	0.8222	30	3	10%	25
1.5630	1.4691	1.6614	8	.	.	.
0.2541	0.2239	0.2873	22	3	14%	14

ss than 5 reporting facilities. This may be different from those reported in the SIR tables due to exclusio
han the nominal value of the national SUR. This is only calculated if at least 10 facilities had ≥ 1.0 pred
ys in 2019. If a facility's predicted number of device days was <1.0, a facility-specific SUR was neither c
m inpatient rehabilitation facilities; as such, data from ACHs, CAHs and LTACHs are excluded.
ported from inpatient rehabilitation facilities; as such, data from ACHs, CAHs and LTACHs are excluded
uding hematology/oncology, bone marrow transplant]). Data contained in this table are reported from inp

SURs using device days data reported to NHSN during 2019 for inpatient rehabilitation facilities (IRF catheter days (UCDs), and ventilator days (VDs).

es with SUR								Percenti
National SUR	5%	10%	15%	20%	25%	30%	35%	40%
49%	0.1658	0.2929	0.3752	0.4497	0.5185	0.5713	0.6167	0.6652
50%	0.2404	0.3382	0.4021	0.4580	0.5168	0.5488	0.5838	0.6254
50%	0.1559	0.2879	0.3675	0.4459	0.5194	0.5790	0.6272	0.6791
46%	0.2352	0.3125	0.3786	0.4465	0.4953	0.5434	0.5944	0.6469
47%	0.3284	0.3972	0.4824	0.5420	0.5873	0.6422	0.6910	0.7262
44%	0.2210	0.2939	0.3479	0.4060	0.4663	0.5038	0.5572	0.6014
83%	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
.	.	.	.	.	.	.	.	.
64%	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

on and inclusion criteria. Refer to the technical appendix for details.
licted device days in 2019.
calculated nor included in the distribution of facility-specific SURs.

d.
patient rehabilitation facilities.

s), by device type and patient population:

le Distribution of Facility-specific SURs[3]

Median									
45%	**50%**	**55%**	**60%**	**65%**	**70%**	**75%**	**80%**	**85%**	**90%**
0.7111	0.7629	0.8190	0.8747	0.9315	1.0182	1.1219	1.2167	1.3187	1.4812
0.6356	0.6942	0.7241	0.7429	0.7992	0.8932	0.9424	1.0406	1.1683	1.2761
0.7260	0.7881	0.8410	0.9007	0.9670	1.0484	1.1600	1.2539	1.3515	1.5494
0.7033	0.7500	0.7890	0.8406	0.8952	0.9410	0.9985	1.0714	1.1670	1.3071
0.7636	0.7866	0.8291	0.8631	0.8984	0.9354	0.9990	1.0659	1.1383	1.2482
0.6657	0.7165	0.7722	0.8317	0.8912	0.9429	0.9982	1.0733	1.1696	1.3405
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0685	0.5668	1.1858
.	.	.	.	.	.	.	.	.	.
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.1370	0.5668

95%
1.7969
1.5692
1.8543
1.4924
1.4563
1.5058
3.6208
.
0.6928

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

State	No. of Facilities	No. of Device days			95% CI
		Observed	Predicted	SUR	Lower
Alabama	7	5,704	4,714.7596	1.2098	1.1787
Alaska	2	.	.	.	.
Arizona	13	5,874	6,316.8768	0.9299	0.9063
Arkansas	12	4,264	6,386.5120	0.6677	0.6478
California	76	37,555	49,297.6276	0.7618	0.7541
Colorado	19	9,088	10,074.3164	0.9021	0.8837
Connecticut	4	.	.	.	.
Delaware	3	.	.	.	.
District of Col	2	.	.	.	.
Florida	29	20,341	26,939.8870	0.7551	0.7447
Georgia	19	11,384	10,029.2866	1.1351	1.1143
Guam	0	.	.	.	.
Hawaii	0	.	.	.	.
Idaho	3	.	.	.	.
Illinois	32	20,004	23,158.3569	0.8638	0.8519
Indiana	25	11,529	11,119.8476	1.0368	1.0180
Iowa	14	3,554	4,213.0504	0.8436	0.8162
Kansas	10	4,191	3,276.2250	1.2792	1.2409
Kentucky	7	3,479	3,997.4536	0.8703	0.8417
Louisiana	22	6,874	7,789.6580	0.8825	0.8618
Maine	4	.	.	.	.
Maryland	2	.	.	.	.
Massachusetts	4	.	.	.	.
Michigan	21	11,039	11,831.1864	0.9330	0.9158
Minnesota	6	2,646	2,858.1234	0.9258	0.8910
Mississippi	8	2,559	2,757.0529	0.9282	0.8927
Missouri	17	6,392	7,565.0166	0.8449	0.8244
Montana	5	211	998.6924	0.2113	0.1842
Nebraska	6	2,109	2,270.6793	0.9288	0.8898
Nevada	12	8,134	10,647.9566	0.7639	0.7474
New Hampshire	3	.	.	.	.
New Jersey	5	4,438	6,042.4634	0.7345	0.7131
New Mexico	5	1,120	2,606.0182	0.4298	0.4052
New York	41	19,202	23,023.8514	0.8340	0.8223
North Carolina	13	14,336	17,104.1644	0.8382	0.8245
North Dakota	2	.	.	.	.
Ohio	25	12,940	14,604.8553	0.8860	0.8708
Oklahoma	15	5,454	6,061.3392	0.8998	0.8761
Oregon	6	1,478	2,233.6279	0.6617	0.6286
Pennsylvania	74	46,874	56,351.3450	0.8318	0.8243
Puerto Rico	2	.	.	.	.
Rhode Island	4	.	.	.	.
South Carolina	21	10,359	18,110.4165	0.5720	0.5611

South Dakota	3	.	.	.	.
Tennessee	16	6,639	9,277.1435	0.7156	0.6986
Texas	63	27,299	34,292.9941	0.7961	0.7866
Utah	4	.	.	.	.
Vermont	2	.	.	.	.
Virgin Islands	0	.	.	.	.
Virginia	12	8,449	8,288.3746	1.0194	0.9978
Washington	13	5,505	6,478.2751	0.8498	0.8275
West Virginia	2	.	.	.	.
Wisconsin	17	6,342	6,179.7697	1.0263	1.0012
Wyoming	0	.	.	.	.
	732	**366,586**	**439,872.6757**	**0.8334**	**0.8307**

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

Rs using device days data reported to NHSN during 2019 for inpatient rehabilitation facilities (IRFs) Ds), all locations[4]

for SUR		Facility-specific SURs				
Upper	No. Facilities with ≥1 Predicted Device Days	No. Facilities with SUR Significantly > National SUR N		No. Facilities with SUR Significantly < National SUR N		10%
1.2415	7	.	.	.	.	.
.	.	.	.	.	.	.
0.9539	13	5	38%	6	46%	.
0.6879	12	2	17%	10	83%	.
0.7696	76	16	21%	44	58%	0.3601
0.9208	19	7	37%	8	42%	.
.	.	.	.	.	.	.
.	.	.	.	.	.	.
.	.	.	.	.	.	.
0.7655	29	9	31%	13	45%	0.3691
1.1560	19	13	68%	6	32%	.
.	.	.	.	.	.	.
.	.	.	.	.	.	.
.	.	.	.	.	.	.
0.8758	32	13	41%	11	34%	0.3565
1.0558	25	15	60%	7	28%	0.4021
0.8716	13	4	31%	8	62%	.
1.3184	10	6	60%	3	30%	.
0.8996	7	.	.	.	.	.
0.9035	22	11	50%	7	32%	0.2907
.	.	.	.	.	.	.
.	.	.	.	.	.	.
.	.	.	.	.	.	.
0.9506	21	6	29%	11	52%	0.2545
0.9616	6	.	.	.	.	.
0.9647	8	.	.	.	.	.
0.8658	17	5	29%	8	47%	.
0.2413	5	.	.	.	.	.
0.9691	6	.	.	.	.	.
0.7807	12	3	25%	8	67%	.
.	.	.	.	.	.	.
0.7563	5	.	.	.	.	.
0.4555	5	.	.	.	.	.
0.8459	41	12	29%	23	56%	0.1530
0.8520	13	5	38%	5	38%	.
.	.	.	.	.	.	.
0.9014	25	10	40%	11	44%	0.5358
0.9239	15	5	33%	7	47%	.
0.6961	6	.	.	.	.	.
0.8394	74	26	35%	38	51%	0.1759
.	.	.	.	.	.	.
.	.	.	.	.	.	.
0.5831	21	6	29%	12	57%	0.3752

.	.	.	.	.	.	.
0.7330	16	6	38%	8	50%	.
0.8055	63	19	30%	37	59%	0.2681
.	.	.	.	.	.	.
.	.	.	.	.	.	.
.	.	.	.	.	.	.
1.0413	12	6	50%	6	50%	.
0.8724	13	3	23%	7	54%	.
.	.	.	.	.	.	.
1.0518	17	10	59%	4	24%	.
.	.	.	.	.	.	.
0.8361	**731**	**259**	**35%**	**359**	**49%**	**0.2929**

ıere are less than 5 reporting facilities. This may be different from those reported in the SIR tables due to
ı or less than the nominal value of the national SUR. This is only calculated if at least 10 facilities had ≥ 1
device days in 2019. If a facility's predicted number of device days was <1.0, a facility-specific SUR was n
ɐ reported from inpatient rehabilitation facilities.

), by device type and patient population:

Median			
25%	**50%**	**75%**	**90%**
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
0.4881	0.6803	0.8863	1.3209
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
0.6536	0.8199	1.0883	1.3767
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
0.6398	0.8031	1.0923	1.4618
0.5803	1.0736	1.3510	1.5354
.	.	.	.
.	.	.	.
.	.	.	.
0.5549	0.9245	1.3053	1.6243
.	.	.	.
.	.	.	.
.	.	.	.
0.4818	0.7259	1.3367	1.6362
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
0.3245	0.5753	1.2687	1.7753
.	.	.	.
.	.	.	.
0.6435	0.7918	1.1832	1.4546
.	.	.	.
.	.	.	.
0.4862	0.7190	1.1220	1.4471
.	.	.	.
.	.	.	.
0.5077	0.6483	0.9223	1.1517

.	.	.	.
.	.	.	.
0.4913	0.6923	1.0770	1.4489
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
0.5185	**0.7629**	**1.1219**	**1.4812**

exclusion and inclusion criteria. Refer to the technical appendix for details.
.0 predicted device days in 2019.
neither calculated nor included in the distribution of facility-specific SURs.

Table 3. State-specific standardized utilization ratios (SURs) and facility-specific summary SUF
Table 3. Urinary catheter days (U

State	No. of Facilities	No. of Device days			95% CI
		Observed	Predicted	SUR	Lower
Alabama	18	16,677	17,326.8977	0.9625	0.9479
Alaska	2	.	.	.	.
Arizona	26	17,699	18,200.0361	0.9725	0.9582
Arkansas	24	13,332	14,367.8809	0.9279	0.9123
California	76	29,165	43,799.7905	0.6659	0.6583
Colorado	19	7,171	9,331.9248	0.7684	0.7508
Connecticut	7	1,761	3,371.2954	0.5224	0.4984
D.C.	2	.	.	.	.
Delaware	4	.	.	.	.
Florida	54	44,046	54,771.0361	0.8042	0.7967
Georgia	28	13,160	16,220.4144	0.8113	0.7976
Guam	0	.	.	.	.
Hawaii	1	.	.	.	.
Idaho	7	1,980	2,417.4735	0.8190	0.7836
Illinois	41	21,897	28,756.6711	0.7615	0.7514
Indiana	37	15,120	17,844.9665	0.8473	0.8339
Iowa	17	4,292	4,701.3295	0.9129	0.8859
Kansas	20	7,061	9,363.8717	0.7541	0.7366
Kentucky	16	11,550	13,140.7611	0.8789	0.8630
Louisiana	51	14,906	17,194.6016	0.8669	0.8531
Maine	5	2,443	3,182.8007	0.7676	0.7376
Maryland	3	.	.	.	.
Massachusetts	10	13,208	15,617.3869	0.8457	0.8314
Michigan	38	13,816	21,007.4021	0.6577	0.6468
Minnesota	12	4,192	4,705.7600	0.8908	0.8642
Mississippi	11	3,317	5,874.9712	0.5646	0.5456
Missouri	30	15,836	18,666.0261	0.8484	0.8353
Montana	5	749	1,066.6079	0.7022	0.6533
Nebraska	10	4,471	5,140.6581	0.8697	0.8445
Nevada	14	10,193	11,117.2221	0.9169	0.8992
New Hampshire	8	3,533	5,521.4562	0.6399	0.6190
New Jersey	19	18,914	22,729.0387	0.8322	0.8204
New Mexico	8	4,708	4,991.0283	0.9433	0.9166
New York	49	15,873	30,845.6586	0.5146	0.5066
North Carolina	26	9,797	18,538.1606	0.5285	0.5181
North Dakota	3	.	.	.	.
Ohio	46	24,690	28,842.6402	0.8560	0.8454
Oklahoma	23	7,599	10,044.3181	0.7565	0.7397
Oregon	8	1,402	2,772.1544	0.5057	0.4798
Pennsylvania	74	37,816	48,405.0460	0.7812	0.7734
Puerto Rico	6	1,438	3,542.8450	0.4059	0.3853
Rhode Island	5	1,130	1,621.2875	0.6970	0.6572
South Carolina	22	8,477	15,298.8503	0.5541	0.5424

South Dakota	3	.	.	.	.
Tennessee	30	13,710	19,215.8087	0.7135	0.7016
Texas	144	91,617	94,516.4420	0.9693	0.9631
Utah	10	3,304	4,565.8465	0.7236	0.6993
Vermont	2	.	.	.	.
Virgin Islands	0	.	.	.	.
Virginia	27	11,904	18,158.6839	0.6556	0.6439
Washington	14	8,440	6,742.6686	1.2517	1.2252
West Virginia	8	7,006	7,932.9445	0.8832	0.8626
Wisconsin	20	4,991	6,763.0338	0.7380	0.7177
Wyoming	2	.	.	.	.
All US	**1,145**	**573,942**	**725,121.4790**	**0.7915**	**0.7895**

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 les
3. Facility-specific percentiles are only calculated if at least 20 facilities had ≥1.0 predicted number of device
4. Data from all ICUs and wards (and other non-critical care locations). Data contained in this table are repor

Rs using device days data reported to NHSN during 2019 inpatient rehabilitation facilities (IRFs), by JCDs), all locations[4]

for SUR	Facility-specific SURs					
Upper	No. Facilities with ≥1 Predicted Device Days	No. Facilities with SUR Significantly > National SUR N		No. Facilities with SUR Significantly < National SUR N		10%
0.9772	18	10	56%	4	22%	.
.	.	.	.	.	.	.
0.9869	26	17	65%	5	19%	0.4986
0.9438	24	16	67%	6	25%	0.5581
0.6736	76	19	25%	46	61%	0.3035
0.7864	19	7	37%	9	47%	.
0.5472	7	.	.	.	.	.
.	.	.	.	.	.	.
.	.	.	.	.	.	.
0.8117	54	21	39%	21	39%	0.4332
0.8253	28	14	50%	12	43%	0.3785
.	.	.	.	.	.	.
.	.	.	.	.	.	.
0.8557	7	.	.	.	.	.
0.7716	41	15	37%	21	51%	0.3070
0.8609	37	17	46%	15	41%	0.3163
0.9406	17	9	53%	7	41%	.
0.7718	20	5	25%	7	35%	0.3996
0.8951	16	8	50%	7	44%	.
0.8809	51	24	47%	20	39%	0.3409
0.7984	5	.	.	.	.	.
.	.	.	.	.	.	.
0.8602	10	5	50%	3	30%	.
0.6687	38	9	24%	22	58%	0.2909
0.9181	12	5	42%	5	42%	.
0.5841	11	3	27%	8	73%	.
0.8617	30	10	33%	14	47%	0.2658
0.7539	5	.	.	.	.	.
0.8955	10	4	40%	4	40%	.
0.9348	14	6	43%	5	36%	.
0.6612	8	.	.	.	.	.
0.8441	19	6	32%	9	47%	.
0.9705	8	.	.	.	.	.
0.5227	49	8	16%	33	67%	0.1966
0.5390	26	4	15%	19	73%	0.1696
.	.	.	.	.	.	.
0.8668	46	18	39%	19	41%	0.3797
0.7737	23	7	30%	13	57%	0.2767
0.5328	8	.	.	.	.	.
0.7891	74	24	32%	29	39%	0.3724
0.4273	6	.	.	.	.	.
0.7385	5	.	.	.	.	.
0.5660	22	3	14%	17	77%	0.3672

.	.	.	.	.	.	.
0.7255	30	10	33%	13	43%	0.4613
0.9756	144	66	46%	38	26%	0.4847
0.7486	10	3	30%	6	60%	.
.	.	.	.	.	.	.
.	.	.	.	.	.	.
0.6674	27	5	19%	18	67%	0.2423
1.2786	14	6	43%	6	43%	.
0.9040	8	.	.	.	.	.
0.7587	20	7	35%	11	55%	0.3482
.	.	.	.	.	.	.
0.7936	**1,145**	**418**	**37%**	**522**	**46%**	**0.3125**

e less than 5 reporting facilities. This may be different from those reported in the SIR tables due to exclusic
ss than the nominal value of the national SUR. This is only calculated if at least 10 facilities had ≥ 1.0 pred
days in 2019. If a facility's predicted number of device days was <1.0, a facility-specific SUR was neither c
ted from inpatient rehabilitation facilities.

device type and patient population:

Median			
25%	**50%**	**75%**	**90%**
.	.	.	.
.	.	.	.
0.7730	0.9637	1.2814	1.4318
0.7129	1.0608	1.2845	1.3872
0.4515	0.6276	0.8791	1.1435
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
0.6120	0.7814	0.9985	1.1714
0.5752	0.8131	1.0565	1.0972
.	.	.	.
.	.	.	.
.	.	.	.
0.4344	0.6522	1.0829	1.2031
0.5565	0.8721	1.2834	1.5281
.	.	.	.
0.5016	0.7664	0.8721	1.1749
.	.	.	.
0.4863	0.8812	1.2203	1.4096
.	.	.	.
.	.	.	.
.	.	.	.
0.4028	0.6504	0.9000	1.0598
.	.	.	.
.	.	.	.
0.4258	0.7735	0.9998	1.2984
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
0.2696	0.4850	0.7685	1.0277
0.3003	0.5028	0.6960	0.8945
.	.	.	.
0.5751	0.7765	0.9530	1.4846
0.4529	0.6558	1.1361	1.5058
.	.	.	.
0.5149	0.7933	0.9668	1.1324
.	.	.	.
.	.	.	.
0.3850	0.5025	0.7143	0.9393

.	.	.	.
0.5090	0.7055	0.8865	1.1687
0.7101	0.8511	1.1148	1.3889
.	.	.	.
.	.	.	.
.	.	.	.
0.4630	0.6259	0.8016	0.9580
.	.	.	.
.	.	.	.
0.4746	0.6059	0.9337	1.0542
.	.	.	.
0.4953	**0.7500**	**0.9985**	**1.3071**

ɔn and inclusion criteria. Refer to the technical appendix for details.
licted device days in 2019.
calculated nor included in the distribution of facility-specific SURs.

Table 3. State-specific standardized utilization ratios (SURs) and facility-specific summary SUR
Table 3. Ventilator days (VDs

State	No. of Facilities	No. of Device days			95% CI
		Observed	Predicted	SUR	Lower
Alabama	0	.	.	.	.
Alaska	0	.	.	.	.
Arizona	0	.	.	.	.
Arkansas	0	.	.	.	.
California	4	.	.	.	.
Colorado	0	.	.	.	.
Connecticut	0	.	.	.	.
D.C.	0	.	.	.	.
Delaware	0	.	.	.	.
Florida	0	.	.	.	.
Georgia	1	.	.	.	.
Guam	0	.	.	.	.
Hawaii	0	.	.	.	.
Idaho	0	.	.	.	.
Illinois	1	.	.	.	.
Indiana	1	.	.	.	.
Iowa	0	.	.	.	.
Kansas	0	.	.	.	.
Kentucky	0	.	.	.	.
Louisiana	3	.	.	.	.
Maine	0	.	.	.	.
Maryland	0	.	.	.	.
Massachusetts	0	.	.	.	.
Michigan	0	.	.	.	.
Minnesota	0	.	.	.	.
Mississippi	0	.	.	.	.
Missouri	0	.	.	.	.
Montana	0	.	.	.	.
Nebraska	0	.	.	.	.
Nevada	2	.	.	.	.
New Hampshire	0	.	.	.	.
New Jersey	0	.	.	.	.
New Mexico	0	.	.	.	.
New York	5	12	280.9831	0.0427	0.0231
North Carolina	0	.	.	.	.
North Dakota	0	.	.	.	.
Ohio	3	.	.	.	.
Oklahoma	1	.	.	.	.
Oregon	0	.	.	.	.
Pennsylvania	6	1,015	409.2375	2.4802	2.3311
Puerto Rico	1	.	.	.	.

Rhode Island	0	.	.	.	.
South Carolina	1	.	.	.	.
South Dakota	0	.	.	.	.
Tennessee	1	.	.	.	.
Texas	0	.	.	.	.
Utah	0	.	.	.	.
Vermont	0	.	.	.	.
Virgin Islands	0	.	.	.	.
Virginia	0	.	.	.	.
Washington	0	.	.	.	.
West Virginia	0	.	.	.	.
Wisconsin	0	.	.	.	.
Wyoming	0	.	.	.	.
All US	**30**	**1,262**	**1,621.3554**	**0.7784**	**0.7363**

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 and wards (and other non-critical care locations). Data contained in this table are repor

ts using device days data reported to NHSN during 2019 inpatient rehabilitation facilities (IRFs), by s), all locations[4]

for SUR	Facility-specific SURs					
Upper	No. Facilities with ≥1 Predicted Device Days	No. Facilities with SUR Significantly > National SUR N		No. Facilities with SUR Significantly < National SUR N		10%
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0.0726	5	.	.	.	.	.
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2.6363	6	.	.	.	.	.
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0.8222	**30**	**3**	**10%**	**25**	**83%**	**0.0000**

less than 5 reporting facilities. This may be different from those reported in the SIR tables due to exclusio
s than the nominal value of the national SUR. This is only calculated if at least 10 facilities had ≥ 1.0 predi
days in 2019. If a facility's predicted number of device days was <1.0, a facility-specific SUR was neither ca
ted from inpatient rehabilitation facilities.

device type and patient population:

	Median		
25%	50%	75%	90%
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0.0000	**0.0000**	**0.0000**	**1.1858**

ɳ and inclusion criteria. Refer to the technical appendix for details.
cted device days in 2019.
alculated nor included in the distribution of facility-specific SURs.

Table 5. Changes in national standardized utilization ratios (SURs) using HAI data reported from all NHSN inpatient rehabilitation facilities reporting during 2019 by HAI and patient population: Central line days (CLDs), urinary catheter days (UCDs), and ventilator days (VDs), 2019 compared to 2018

	2018 SUR	2019 SUR	Percent Change	Direction of Change, Based on Statistical Significance	p-value
Central line days, all locations[1]	0.8746	0.8334	-5%	DECREASE	0.0000
ICU[2]	0.7749	0.7451	-4%	DECREASE	0.0000
Ward[3]	0.9247	0.8853	-4%	DECREASE	0.0000
UCDs, all locations[1]	0.8190	0.7915	-3%	DECREASE	0.0000
	0.8427	0.8317	-1%	DECREASE	0.0000
	0.7908	0.7410	-6%	DECREASE	0.0000
Ventilator days, all locations[1]	1.9189	0.7784	-59%	DECREASE	0.0000
ICUs[2]	2.8507	1.5630	-45%	DECREASE	0.0000
Wards[3]	1.1632	0.2541	-78%	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 marrow transplar

ıt].

Table 6. Changes in state-specific standardized infection ratios (SURs) between 2018 and 2019 from NHSN Inpatient Rehabilitation Facilities

6a. Central line days (CLDs), all locations[1]

	All Inpatient Rehabilitation Facilities Reporting to NHSN				
State[2]	2018 SUR	2019 SUR	Percent Change	Direction of Change, Based on Statistical Significance	p-value
Alabama	1.2703	1.2098	-5%	DECREASE	0.0108
Alaska	.	.	.		.
Arizona	0.9963	0.9299	-7%	DECREASE	0.0002
Arkansas	0.9365	0.6677	-29%	DECREASE	0.0000
California	0.7813	0.7618	-2%	DECREASE	0.0006
Colorado	0.8543	0.9021	6%	INCREASE	0.0003
Connecticut	.	.	.	.	.
D.C.	.	.	.	.	.
Delaware	.	.	.	.	.
Florida	1.0120	0.7551	-25%	DECREASE	0.0000
Georgia	1.1000	1.1351	3%	INCREASE	0.0204
Guam	.	.	.	.	.
Hawaii	.	.	.	.	.
Idaho	.	.	.	.	.
Illinois	0.9040	0.8638	-4%	DECREASE	0.0000
Indiana	1.3343	1.0368	-22%	DECREASE	0.0000
Iowa	0.9714	0.8436	-13%	DECREASE	0.0000
Kansas	1.2962	1.2792	1%	NO CHANGE	0.5589
Kentucky	1.0594	0.8703	-18%	DECREASE	0.0000
Louisiana	0.8993	0.8825	2%	NO CHANGE	0.2629
Maine	.	.	.	.	.
Maryland	.	.	.	.	.
Massachusetts	.	.	.	.	.
Michigan	0.8338	0.9330	12%	INCREASE	0.0000
Minnesota	0.8988	0.9258	3%	NO CHANGE	0.2806
Mississippi	0.9310	0.9282	0%	NO CHANGE	0.9125
Missouri	0.8784	0.8449	-4%	DECREASE	0.0300
Montana	0.3678	0.2113	-43%	DECREASE	0.0000
Nebraska	0.9720	0.9288	4%	NO CHANGE	0.1289
Nevada	1.0718	0.7639	-29%	DECREASE	0.0000
New Hampshire	.	.	.	.	.
New Jersey	0.6652	0.7345	10%	INCREASE	0.0000
New Mexico	0.5418	0.4298	-21%	DECREASE	0.0000
New York	0.8112	0.8340	3%	INCREASE	0.0063
North Carolina	0.7870	0.8382	7%	INCREASE	0.0000
North Dakota	.	.	.	.	.
Ohio	0.9216	0.8860	-4%	DECREASE	0.0019
Oklahoma	1.1444	0.8998	-21%	DECREASE	0.0000
Oregon	0.6054	0.6617	9%	INCREASE	0.0208
Pennsylvania	0.7587	0.8318	10%	INCREASE	0.0000
Puerto Rico	.	.	.	.	.
Rhode Island	.	.	.	.	.
South Carolina	0.5988	0.5720	-4%	DECREASE	0.0014
South Dakota	.	.	.	.	.
Tennessee	0.8178	0.7156	-12%	DECREASE	0.0000
Texas	0.9152	0.7961	-13%	DECREASE	0.0000
Utah	.	.	.	.	.
Vermont	.	.	.	.	.
Virgin Islands	.	.	.	.	.
Virginia	1.1304	1.0194	-10%	DECREASE	0.0000
Washington	0.9512	0.8498	-11%	DECREASE	0.0000
West Virginia	.	.	.	.	.
Wisconsin	1.2651	1.0263	-19%	DECREASE	0.0000
Wyoming	.	.	.	.	.
All US	**0.8746**	**0.8334**	**-5%**	**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 2018 and/or 2019 and therefore subsequent data not calculated

Table 6. Changes in state-specific standardized utilization ratios (SURs) between 2018 and 2019 from NHSN Inpatient Rehabilitation Facilities

6b. Urinary Catheter Days (UCDs), all locations[1]

	All Inpatient Rehabilitation Facilities Reporting to NHSN				
	2018 SUR	2019 SUR	Percent Change	Direction of Change, Based on Statistical Significance	p-value
Alabama	0.9143	0.9625	5%	INCREASE	0.0000
Alaska	.	.	.	.	.
Arizona	0.8717	0.9725	12%	INCREASE	0.0000
Arkansas	0.9431	0.9279	2%	NO CHANGE	0.1873
California	0.6997	0.6659	-5%	DECREASE	0.0000
Colorado	0.8184	0.7684	-6%	DECREASE	0.0002
Connecticut	0.5972	0.5224	-13%	DECREASE	0.0001
D.C.	.	.	.	.	.
Delaware	.	.	.	.	.
Florida	0.8803	0.8042	-9%	DECREASE	0.0000
Georgia	0.8242	0.8113	2%	NO CHANGE	0.2071
Guam	.	.	.	.	
Hawaii	.	.	.	.	.
Idaho	0.9321	0.8190	-12%	DECREASE	0.0000
Illinois	0.7866	0.7615	-3%	DECREASE	0.0006
Indiana	0.9032	0.8473	-6%	DECREASE	0.0000
Iowa	1.0269	0.9129	-11%	DECREASE	0.0000
Kansas	0.7444	0.7541	1%	NO CHANGE	0.4427
Kentucky	0.7954	0.8789	11%	INCREASE	0.0000
Louisiana	0.8647	0.8669	0%	NO CHANGE	0.8222
Maine	0.7092	0.7676	8%	INCREASE	0.0070
Maryland	.	.	.	.	.
Massachusetts	0.8821	0.8457	-4%	DECREASE	0.0006
Michigan	0.6912	0.6577	-5%	DECREASE	0.0000
Minnesota	0.8928	0.8908	0%	NO CHANGE	0.9173
Mississippi	0.6538	0.5646	-14%	DECREASE	0.0000
Missouri	0.7778	0.8484	9%	INCREASE	0.0000
Montana	0.7313	0.7022	4%	NO CHANGE	0.4318
Nebraska	1.1316	0.8697	-23%	DECREASE	0.0000
Nevada	1.0697	0.9169	-14%	DECREASE	0.0000
New Hampshire	0.6606	0.6399	3%	NO CHANGE	0.1771
New Jersey	0.8345	0.8322	0%	NO CHANGE	0.7846
New Mexico	0.9879	0.9433	-5%	DECREASE	0.0240
New York	0.5473	0.5146	-6%	DECREASE	0.0000
North Carolina	0.4883	0.5285	8%	INCREASE	0.0000
North Dakota	.	.	.	.	.
Ohio	0.8541	0.8560	0%	NO CHANGE	0.8054
Oklahoma	0.8119	0.7565	-7%	DECREASE	0.0000
Oregon	0.6295	0.5057	-20%	DECREASE	0.0000
Pennsylvania	0.8513	0.7812	-8%	DECREASE	0.0000
Puerto Rico	0.4106	0.4059	1%	NO CHANGE	0.7564
Rhode Island	0.8467	0.6970	-18%	DECREASE	0.0000
South Carolina	0.5218	0.5541	6%	INCREASE	0.0002
South Dakota	.	.	.	.	.
Tennessee	0.7585	0.7135	-6%	DECREASE	0.0000
Texas	0.9889	0.9693	-2%	DECREASE	0.0000
Utah	0.7468	0.7236	3%	NO CHANGE	0.1984
Vermont	.	.	.	.	.
Virgin Islands	.	.	.	.	
Virginia	0.6943	0.6556	-6%	DECREASE	0.0000
Washington	1.2966	1.2517	-3%	DECREASE	0.0206
West Virginia	0.8940	0.8832	1%	NO CHANGE	0.4919
Wisconsin	0.8850	0.7380	-17%	DECREASE	0.0000
Wyoming	.	.	.	.	.
All US	**0.8190**	**0.7915**	**-3%**	**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 2018 and/or 2019 and therefore subsequent data not calculated

Table 6. Changes in state-specific standardized utilization ratios (SURs) between 2018 and 2019 from NHSN Inpatient Rehabilitation Facilities

6c. Ventilator days (VDs), all locations[1]

	All Inpatient Rehabilitation Facilities Reporting to NHSN				
	2018 SUR	2019 SUR	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	1.7425	0.0427	-98%	DECREASE	0.0000
North Carolina	.	.	.	.	.
North Dakota	.	.	.	.	.
Ohio	.	.	.	.	.
Oklahoma	.	.	.	.	.
Oregon	.	.	.	.	.
Pennsylvania	5.0391	2.4802	-51%	DECREASE	0.0000
Puerto Rico	.	.	.	.	.
Rhode Island	.	.	.	.	.
South Carolina	.	.	.	.	.
South Dakota	.	.	.	.	.
Tennessee	.	.	.	.	.
Texas	.	.	.	.	.
Utah	.	.	.	.	.
Vermont	.	.	.	.	.
Virgin Islands	.	.	.	.	.
Virginia	.	.	.	.	.
Washington	.	.	.	.	.
West Virginia	.	.	.	.	.
Wisconsin	.	.	.	.	.
Wyoming	.	.	.	.	.
All US	**1.9189**	**0.7784**	**-59%**	**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 2018 and/or 2019 and therefore subsequent data not calculated

Appendix A. Factors used in NHSN risk adjusted standard utilization ratios (SUR) calculation of the device utilization in inpatient rehabilitation facilities (IRFs).

Device Type	Validated Parameters for Risk Model
CLDs (non-NICU)	Intercept Facility bed size* Primary diagnosis of stroke admission (in percentile) Primary diagnosis of ortho admission (in percentile)
UCDs	Intercept Proportion of stroke admission (in percentile)
VAE	Intercept only

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

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

ound at the above website.