2018 Nat
S

Introduction: Welcome to the 2018 National and State HAI Progress Report using the 2015 base
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

tional and State HAI Progress Report
tandardized Utilization Ratios

Long Term Acute Care Hospitals

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

ACH	
National	State
☑	☑
☑	☑
☑	☑

utilization

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. T
standardized to compare with a reference baseline population as well as over time. Accordingly, CDC has dev

Development of SUR models

SUR models were developed for the following measures: central line days, urinary catheter days and ventilato
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 regressio
"Extra-binomial Variation in Logistic Linear Models," Applied Statistics, 31, 144–148.). Unit of analysis in all the

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 predic
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 1.0.

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

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

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

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

ted device days;

evel).
er of predicted device days.

ıcare setting/location needs to be
atheter days) at various healthcare settings.

AH),

2018 Annual National and State HAI Progress Report
Long-Term Acute Care Hospitals: Full series of tables for all national and state data

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

ry SURs:

ong-term acute care hospitals (LTACHs)

ısn-sur-guide-508.pdf

Device and Patient Population	No. of Facilities	No. of Device days	
	Reporting[1]	Observed	Predicted
Central line days, all[4]	449	2,211,159	2,936,309.8513
ICUs[5]	77	129,757	175,408.1125
Wards[6]	443	2,081,402	2,760,901.7389
Urinary catheter days, all[4]	449	1,690,362	1,991,318.5125
	77	109,027	140,232.4032
Wards[6]	443	1,581,335	1,851,086.1093
Ventilator days, all[4]	447	1,039,451	920,015.0414
	77	97,643	96,687.5427
	433	941,808	823,327.4988

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

Table 1. National standardized utilization ratios (SURs) and facility-spe
Table

95% CI for SUR			Facility-specific SURs				
SUR	Lower	Upper	No. Facilities with ≥1 Predicted Device Days	No. Facilities with SUR Significantly > National SUR		No. Facilities with SUR Significantly < National SUR	
				N	%	N	%
0.7530	0.7521	0.7540	449	222	49%	192	43%
0.7397	0.7357	0.7438	77	50	65%	21	27%
0.7539	0.7529	0.7549	443	219	49%	186	42%
0.8489	0.8476	0.8501	449	229	51%	176	39%
0.7775	0.7729	0.7821	77	48	62%	22	29%
0.8543	0.8529	0.8556	443	214	48%	186	42%
1.1298	1.1277	1.1320	447	151	34%	247	55%
1.0099	1.0035	1.0162	77	50	65%	21	27%
1.1439	1.1416	1.1462	433	142	33%	241	56%

than 5 reporting facilities. This may be different from those reported in the SIR tables due to exclusion and inclusion
ı the nominal value of the national SUR. This is only calculated if at least 10 facilities had ≥ 1.0 predicted device da
ın 2018. If a facility's predicted number of device days was <1.0, a facility-specific SUR was neither calculated nor ir
ong-term acute care hospitals; as such, data from ACHs, IRFs and CAHs are excluded.
ble are reported from long-term acute care hospitals; as such, data from ACHs, IRFs and CAHs are excluded.
ıg hematology/oncology, bone marrow transplant]). Data contained in this table are reported from long-term acute c

cific summary SURs using device days data reported to NHSN during 2018 for long term acute care hospita
1a. Central line days (CLDs), urinary catheter days (UCDs), and ventilator days (VDs).

					Percentile Distribution of Faci				
									Median
5%	10%	15%	20%	25%	30%	35%	40%	45%	50%
0.4131	0.4618	0.5293	0.5631	0.5901	0.6288	0.6681	0.7068	0.7418	0.7699
0.2065	0.4282	0.5962	0.6561	0.6942	0.7286	0.8255	0.8627	0.8820	0.9118
0.4182	0.4721	0.5315	0.5692	0.5907	0.6357	0.6751	0.7125	0.7478	0.7736
0.3451	0.5138	0.6185	0.6560	0.7002	0.7422	0.7841	0.8240	0.8592	0.8916
0.1857	0.4639	0.5540	0.5865	0.6603	0.8029	0.8199	0.8624	0.9133	0.9803
0.3633	0.5202	0.6175	0.6560	0.6942	0.7432	0.7861	0.8194	0.8471	0.8779
0.2626	0.4552	0.5519	0.6589	0.7359	0.8117	0.8531	0.9063	0.9845	1.0122
0.2133	0.4668	0.5762	0.7380	0.8907	0.9795	1.0723	1.1518	1.2216	1.3640
0.0000	0.2948	0.4723	0.6215	0.7151	0.7981	0.8504	0.9094	0.9782	1.0122

n criteria. Refer to the technical appendix for details.
ays in 2018.
ncluded in the distribution of facility-specific SURs.

care hospitals.

als (LTACHs), by device type and patient population:

ility-specific SURs[3]

55%	60%	65%	70%	75%	80%	85%	90%	95%
0.7995	0.8410	0.8797	0.9088	0.9579	1.0018	1.0739	1.1866	1.3256
0.9257	0.9885	1.0195	1.0529	1.0940	1.1316	1.2153	1.2656	1.3027
0.8035	0.8407	0.8761	0.9142	0.9656	1.0064	1.0914	1.2070	1.3539
0.9212	0.9603	0.9948	1.0235	1.0677	1.1287	1.1997	1.3130	1.4101
1.0098	1.0492	1.0944	1.1182	1.1577	1.1804	1.2973	1.4242	1.5586
0.9138	0.9524	0.9932	1.0219	1.0664	1.1207	1.1946	1.3034	1.4107
1.0650	1.1114	1.1639	1.2362	1.3160	1.3993	1.5107	1.6658	1.8955
1.4387	1.4921	1.5077	1.5648	1.6573	1.8008	1.8862	2.0871	2.2017
1.0728	1.1156	1.1639	1.2365	1.3164	1.4012	1.5403	1.6658	1.8789

Table 2. State-specific standardized utilization ratios (SURs) and facility-specific summary SURs

Table 2. C

State	Facilities	No. of Device days			95% CI f
		Observed	Predicted	SUR	Lower
Alaska	1	.	.	.	.
Alabama	8	28,095	38,974.8646	0.7208	0.7125
Arkansas	8	23,162	32,419.0464	0.7145	0.7053
Arizona	6	23,648	33,981.7159	0.6959	0.6871
California	23	192,955	243,989.8258	0.7908	0.7873
Colorado	7	24,280	38,516.8319	0.6304	0.6225
Connecticut	3	.	.	.	.
D.C.	2	.	.	.	.
Delaware	1	.	.	.	.
Florida	28	152,745	229,071.0406	0.6668	0.6635
Georgia	14	61,615	89,887.9011	0.6855	0.6801
Guam	.	.	.	.	.
Hawaii	1	.	.	.	.
Iowa	2	.	.	.	.
Idaho	2	.	.	.	.
Illinois	10	71,184	92,957.4739	0.7658	0.7602
Indiana	12	51,396	70,421.4457	0.7298	0.7235
Kansas	3	.	.	.	.
Kentucky	9	43,301	54,097.8561	0.8004	0.7929
Louisiana	34	134,344	159,404.1889	0.8428	0.8383
Massachusetts	12	74,926	145,999.9085	0.5132	0.5095
Maryland	2	.	.	.	.
Maine	.	.	.	.	.
Michigan	20	62,206	103,982.3050	0.5982	0.5935
Minnesota	2	.	.	.	.
Missouri	11	41,665	51,819.7921	0.8040	0.7964
Mississippi	8	36,565	52,392.9342	0.6979	0.6908
Montana	1	.	.	.	.
North Carolina	9	49,946	56,689.6840	0.8810	0.8733
North Dakota	2	.	.	.	.
Nebraska	4	.	.	.	.
New Hampshire	.	.	.	.	.
New Jersey	12	49,636	67,906.0167	0.7310	0.7245
New Mexico	3	.	.	.	.
Nevada	10	61,009	65,676.1829	0.9289	0.9216
New York	1	.	.	.	.
Ohio	31	124,840	155,353.9437	0.8036	0.7991
Oklahoma	12	54,745	61,706.4617	0.8872	0.8798
Oregon	1	.	.	.	.
Pennsylvania	22	67,843	113,707.0242	0.5966	0.5922
Puerto Rico	.	.	.	.	.
Rhode Island	1	.	.	.	.
South Carolina	6	32,064	36,534.5206	0.8776	0.8680

South Dakota	1	.	.	.	.
Tennessee	9	39,286	61,111.8942	0.6429	0.6365
Texas	72	440,510	499,977.3632	0.8811	0.8785
Utah	4	.	.	.	.
Virginia	6	26,686	36,088.2527	0.7395	0.7306
Virgin Islands	.	.	.	.	.
Vermont	.	.	.	.	.
Washington	3	.	.	.	.
Wisconsin	6	28,796	34,337.6685	0.8386	0.8289
West Virginia	4	.	.	.	.
Wyoming	.	.	.	.	.
All US	**449**	**2,211,159**	**2,936,309.8513**	**0.7530**	**0.7521**

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

s using device days data reported to NHSN during 2018 for long term acute care hospitals (LTACH
entral line days (CLDs), all locations[4]

for SUR	Facility-specific SURs					
Upper	No. Facilities with ≥1 Predicted Device Days	No. Facilities with SUR Significantly > National SUR N	%[2]	No. Facilities with SUR Significantly < National SUR N		10%
.	.	.	.	.	.	.
0.7293	8	.	.	.	.	.
0.7237	8	.	.	.	.	.
0.7048	6	.	.	.	.	.
0.7943	23	11	48%	10	43%	0.5940
0.6384	7	.	.	.	.	.
.	.	.	.	.	.	.
.	.	.	.	.	.	.
.	.	.	.	.	.	.
0.6702	28	7	25%	19	68%	0.4525
0.6909	14	5	36%	7	50%	.
.	.	.	.	.	.	.
.	.	.	.	.	.	.
.	.	.	.	.	.	.
.	.	.	.	.	.	.
0.7714	10	7	70%	3	30%	.
0.7362	12	7	58%	2	17%	.
.	.	.	.	.	.	.
0.8080	9	.	.	.	.	.
0.8473	34	24	71%	8	24%	0.4727
0.5169	12	3	25%	9	75%	.
.	.	.	.	.	.	.
.	.	.	.	.	.	.
0.6030	20	4	20%	14	70%	0.4126
.	.	.	.	.	.	.
0.8118	11	4	36%	4	36%	.
0.7051	8	.	.	.	.	.
.	.	.	.	.	.	.
0.8888	9	.	.	.	.	.
.	.	.	.	.	.	.
.	.	.	.	.	.	.
.	.	.	.	.	.	.
0.7374	12	7	58%	4	33%	.
.	.	.	.	.	.	.
0.9363	10	8	80%	2	20%	.
.	.	.	.	.	.	.
0.8080	31	17	55%	11	35%	0.5866
0.8946	12	7	58%	4	33%	.
.	.	.	.	.	.	.
0.6011	22	6	27%	15	68%	0.4307
.	.	.	.	.	.	.
.	.	.	.	.	.	.
0.8873	6	.	.	.	.	.

.	.	.	.	.	.	.
0.6492	9	.	.	.	.	.
0.8837	72	48	67%	21	29%	0.5576
.	.	.	.	.	.	.
0.7484	6	.	.	.	.	.
.	.	.	.	.	.	.
.	.	.	.	.	.	.
.	.	.	.	.	.	.
0.8483	6	.	.	.	.	.
.	.	.	.	.	.	.
.	.	.	.	.	.	.
0.7540	**449**	**222**	**49%**	**192**	**43%**	**0.4618**

ss than 5 reporting facilities. This may be different from those reported in the SIR tables due to exclusion
han the nominal value of the national SUR. This is only calculated if at least 10 facilities had ≥ 1.0 predic
ys in 2018. If a facility's predicted number of device days was <1.0, a facility-specific SUR was neither ca
l from long-term acute care hospitals.

s), by device type and patient population:

Median			
25%	**50%**	**75%**	**90%**
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
0.6323	0.7478	0.9210	1.0561
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
0.5714	0.6616	0.7937	0.9399
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
0.7593	0.8880	1.0288	1.4464
.	.	.	.
.	.	.	.
.	.	.	.
0.4463	0.5643	0.7589	1.0604
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
0.6848	0.8136	0.8889	1.1755
.	.	.	.
.	.	.	.
0.5269	0.5737	0.7903	0.8761
.	.	.	.
.	.	.	.
.	.	.	.

.	.	.	.
.	.	.	.
0.6993	0.9110	1.0513	1.2865
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
0.5901	**0.7699**	**0.9579**	**1.1866**

and inclusion criteria. Refer to the technical appendix for details
ted device days in 2018.
lculated nor included in the distribution of facility-specific SURs.

Table 3. State-specific standardized utilization ratios (SURs) and facility-specific summary SURs u

Table 3. Urinary C

State	No. of Facilities	No. of Device days			95% CI
		Observed	Predicted	SUR	Lower
Alaska	1	.	.	.	.
Alabama	8	26,304	26,078.4299	1.0086	0.9965
Arkansas	8	23,826	21,792.7017	1.0933	1.0795
Arizona	6	21,844	22,980.1896	0.9506	0.9380
California	23	167,886	173,295.4926	0.9688	0.9642
Colorado	7	25,922	25,477.5964	1.0174	1.0051
Connecticut	3	.	.	.	.
D.C.	2	.	.	.	.
Delaware	1	.	.	.	.
Florida	28	135,051	159,400.7970	0.8472	0.8427
Georgia	14	59,021	65,019.4382	0.9077	0.9004
Guam	.	.	.	.	.
Hawaii	1	.	.	.	.
Iowa	2	.	.	.	.
Idaho	2	.	.	.	.
Illinois	10	59,121	65,423.7281	0.9037	0.8964
Indiana	12	41,089	50,350.1439	0.8161	0.8082
Kansas	3	.	.	.	.
Kentucky	9	30,719	35,433.7629	0.8669	0.8573
Louisiana	34	99,357	99,134.5313	1.0022	0.9960
Massachusetts	12	39,388	94,207.2918	0.4181	0.4140
Maryland	2	.	.	.	.
Maine	.	.	.	.	.
Michigan	20	54,347	70,486.1112	0.7710	0.7646
Minnesota	2	.	.	.	.
Missouri	11	30,445	35,910.7305	0.8478	0.8383
Mississippi	8	32,876	36,352.0181	0.9044	0.8947
Montana	1	.	.	.	.
North Carolina	9	32,663	38,239.6192	0.8542	0.8449
North Dakota	2	.	.	.	.
Nebraska	4	.	.	.	.
New Hampshire	.	.	.	.	.
New Jersey	12	42,633	47,355.9673	0.9003	0.8917
New Mexico	3	.	.	.	.
Nevada	10	40,961	44,590.8038	0.9186	0.9097
New York	1	.	.	.	.
Ohio	31	96,209	108,837.6316	0.8840	0.8784
Oklahoma	12	46,798	42,632.8885	1.0977	1.0878
Oregon	1	.	.	.	.
Pennsylvania	22	50,457	80,399.5921	0.6276	0.6221
Puerto Rico	.	.	.	.	.
Rhode Island	1	.	.	.	.
South Carolina	6	17,357	26,528.2061	0.6543	0.6446

South Dakota	1	.	.	.	.
Tennessee	9	28,858	39,676.1040	0.7273	0.7190
Texas	72	297,909	318,348.4590	0.9358	0.9325
Utah	4	.	.	.	.
Virginia	6	22,799	25,562.8528	0.8919	0.8804
Virgin Islands	.	.	.	.	.
Vermont	.	.	.	.	.
Washington	3	.	.	.	.
Wisconsin	6	17,516	23,017.5055	0.7610	0.7498
West Virginia	4	.	.	.	.
Wyoming	.	.	.	.	.
All US	**449**	**1,690,362**	**1,991,318.5125**	**0.8489**	**0.8476**

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

using device days data reported to NHSN during 2018 long term acute care hospitals (LTACHs), by catheter days (UCDs), 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%
.	.	.	.	.	.	.
1.0209	8	.	.	.	.	.
1.1073	8	.	.	.	.	.
0.9632	6	.	.	.	.	.
0.9734	23	15	65%	6	26%	0.7725
1.0299	7	.	.	.	.	.
.	.	.	.	.	.	.
.	.	.	.	.	.	.
.	.	.	.	.	.	.
0.8518	28	10	36%	12	43%	0.5254
0.9151	14	8	57%	4	29%	.
.	.	.	.	.	.	.
.	.	.	.	.	.	.
.	.	.	.	.	.	.
.	.	.	.	.	.	.
0.9110	10	5	50%	2	20%	.
0.8240	12	7	58%	3	25%	.
.	.	.	.	.	.	.
0.8767	9	.	.	.	.	.
1.0085	34	21	62%	9	26%	0.5034
0.4223	12	1	8%	10	83%	.
.	.	.	.	.	.	.
.	.	.	.	.	.	.
0.7775	20	7	35%	12	60%	0.5707
.	.	.	.	.	.	.
0.8574	11	6	55%	3	27%	.
0.9142	8	.	.	.	.	.
.	.	.	.	.	.	.
0.8634	9	.	.	.	.	.
.	.	.	.	.	.	.
.	.	.	.	.	.	.
.	.	.	.	.	.	.
0.9088	12	8	67%	4	33%	.
.	.	.	.	.	.	.
0.9275	10	5	50%	3	30%	.
.	.	.	.	.	.	.
0.8896	31	18	58%	9	29%	0.6514
1.1076	12	9	75%	2	17%	.
.	.	.	.	.	.	.
0.6331	22	6	27%	15	68%	0.2687
.	.	.	.	.	.	.
.	.	.	.	.	.	.
0.6641	6	.	.	.	.	.

.	.	.	.	.	.	.
0.7358	9	.	.	.	.	.
0.9391	72	49	68%	17	24%	0.6534
.	.	.	.	.	.	.
0.9035	6	.	.	.	.	.
.	.	.	.	.	.	.
.	.	.	.	.	.	.
.	.	.	.	.	.	.
0.7723	6	.	.	.	.	.
.	.	.	.	.	.	.
.	.	.	.	.	.	.
0.8501	**449**	**229**	**51%**	**176**	**39%**	**0.5138**

ss than 5 reporting facilities. This may be different from those reported in the SIR tables due to exclusion a
ıan the nominal value of the national SUR. This is only calculated if at least 10 facilities had ≥ 1.0 predicte
/s in 2018. If a facility's predicted number of device days was <1.0, a facility-specific SUR was neither calc
from long-term acute care hospitals.

device type and patient population:

Median			
25%	**50%**	**75%**	**90%**
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
0.8240	0.9616	1.1318	1.2217
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
0.7309	0.8434	1.0170	1.2580
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
0.7685	1.0130	1.3497	1.4297
.	.	.	.
.	.	.	.
.	.	.	.
0.6335	0.7800	0.9489	1.0268
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
0.7331	0.9081	1.0206	1.2648
.	.	.	.
.	.	.	.
0.4719	0.7087	0.9031	1.1366
.	.	.	.
.	.	.	.
.	.	.	.

.	.	.	.
.	.	.	.
0.8428	0.9973	1.1563	1.3414
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
0.7002	**0.8916**	**1.0677**	**1.3130**

and inclusion criteria. Refer to the technical appendix for detai
ed device days in 2018.
culated nor included in the distribution of facility-specific SURs

Table 4. State-specific standardized utilization ratios (SURs) and facility-specific summary S
Ta

State	No. of Facilities	No. of Device days		
		Observed	Predicted	SUR
Alaska	1	.	.	.
Alabama	8	10,060	14,728.8899	0.6830
Arkansas	7	9,546	7,121.2850	1.3405
Arizona	6	14,637	9,740.0406	1.5028
California	22	141,592	102,930.6217	1.3756
Colorado	7	10,021	12,917.8856	0.7757
Connecticut	3	.	.	.
D.C.	2	.	.	.
Delaware	1	.	.	.
Florida	28	98,214	72,258.7720	1.3592
Georgia	14	36,763	36,865.0894	0.9972
Guam	.	.	.	.
Hawaii	1	.	.	.
Iowa	2	.	.	.
Idaho	2	.	.	.
Illinois	10	54,535	42,238.2293	1.2911
Indiana	12	22,058	27,055.9304	0.8153
Kansas	3	.	.	.
Kentucky	9	19,854	16,194.0298	1.2260
Louisiana	34	16,982	29,013.7114	0.5853
Massachusetts	12	46,337	39,414.0356	1.1756
Maryland	2	.	.	.
Maine	.	.	.	.
Michigan	20	36,098	32,391.0991	1.1144
Minnesota	2	.	.	.
Missouri	11	16,669	15,352.3848	1.0858
Mississippi	8	10,209	12,836.6393	0.7953
Montana	1	.	.	.
North Carolina	9	22,560	18,275.8031	1.2344
North Dakota	2	.	.	.
Nebraska	4	.	.	.
New Hampshire	.	.	.	.
New Jersey	12	44,067	28,792.1043	1.5305
New Mexico	3	.	.	.
Nevada	10	21,657	20,254.2522	1.0693
New York	1	.	.	.
Ohio	31	51,987	55,673.0228	0.9338
Oklahoma	12	15,246	16,408.6416	0.9291
Oregon	1	.	.	.
Pennsylvania	22	42,008	43,177.6200	0.9729
Puerto Rico	.	.	.	.
Rhode Island	1	.	.	.

South Carolina	6	11,713	13,629.5830	0.8594
South Dakota	1	.	.	.
Tennessee	9	27,959	22,382.4811	1.2491
Texas	72	95,899	111,174.7644	0.8626
Utah	4	.	.	.
Virginia	6	18,841	12,518.8940	1.5050
Virgin Islands	.	.	.	.
Vermont	.	.	.	.
Washington	3	.	.	.
Wisconsin	6	9,994	10,575.9511	0.9450
West Virginia	4	.	.	.
Wyoming	.	.	.	.
All US	**447**	**1,039,451**	**920,015.0414**	**1.1298**

1. The number of reporting facilities included in the SUR calculation; SURs are not calculated when there ar
2. Percent of facilities with at least one predicted device day that had an SUR significantly greater than or le
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 repo

SURs using device days data reported to NHSN during 2018 for long term acute care hospitals (LTA
able 4. Ventilator days (VDs), all locations[4]

95% CI for SUR		Facility-specific SURs				
Lower	Upper	No. Facilities with ≥1 Predicted Device Days	No. Facilities with SUR Significantly > National SUR N		No. Facilities with SUR Significantly < National SUR N	
.	.	.	.	.	.	.
0.6698	0.6964	8	.	.	.	.
1.3138	1.3676	7	.	.	.	.
1.4785	1.5272	6	.	.	.	.
1.3685	1.3828	22	17	77%	3	14%
0.7607	0.7911	7	.	.	.	.
.	.	.	.	.	.	.
.	.	.	.	.	.	.
.	.	.	.	.	.	.
1.3507	1.3677	28	18	64%	8	29%
0.9871	1.0074	14	7	50%	7	50%
.	.	.	.	.	.	.
.	.	.	.	.	.	.
.	.	.	.	.	.	.
.	.	.	.	.	.	.
1.2804	1.3020	10	5	50%	4	40%
0.8046	0.8261	12	5	42%	6	50%
.	.	.	.	.	.	.
1.2090	1.2431	9	.	.	.	.
0.5766	0.5941	34	4	12%	29	85%
1.1650	1.1864	12	8	67%	4	33%
.	.	.	.	.	.	.
.	.	.	.	.	.	.
1.1030	1.1260	20	5	25%	8	40%
.	.	.	.	.	.	.
1.0693	1.1024	11	2	18%	5	45%
0.7800	0.8108	8	.	.	.	.
.	.	.	.	.	.	.
1.2184	1.2506	9	.	.	.	.
.	.	.	.	.	.	.
.	.	.	.	.	.	.
.	.	.	.	.	.	.
1.5163	1.5449	12	11	92%	1	8%
.	.	.	.	.	.	.
1.0551	1.0836	10	4	40%	5	50%
.	.	.	.	.	.	.
0.9258	0.9419	31	4	13%	19	61%
0.9145	0.9440	12	2	17%	8	67%
.	.	.	.	.	.	.
0.9636	0.9823	22	7	32%	12	55%
.	.	.	.	.	.	.
.	.	.	.	.	.	.

0.8439	0.8750	6	.	.	.	.
.	.	.	.	.	.	.
1.2346	1.2639	9	.	.	.	.
0.8572	0.8681	72	13	18%	54	75%
.	.	.	.	.	.	.
1.4836	1.5266	6	.	.	.	.
.	.	.	.	.	.	.
.	.	.	.	.	.	.
.	.	.	.	.	.	.
0.9266	0.9636	6	.	.	.	.
.	.	.	.	.	.	.
.	.	.	.	.	.	.
1.1277	**1.1320**	**447**	**151**	**34%**	**247**	**55%**

re less than 5 reporting facilities. This may be different from those reported in the SIR tables due to exclusi
ss than the nominal value of the national SUR. This is only calculated if at least 10 facilities had ≥ 1.0 prec
e days in 2018. If a facility's predicted number of device days was <1.0, a facility-specific SUR was neither c
orted from long-term acute care hospitals.

CHs), by device type and patient population:

Median				
10%	**25%**	**50%**	**75%**	**90%**
.	.	.	.	.
.	.	.	.	.
.	.	.	.	.
.	.	.	.	.
1.0261	1.2102	1.4136	1.6347	1.7944
.	.	.	.	.
.	.	.	.	.
.	.	.	.	.
.	.	.	.	.
0.7903	1.0483	1.3634	1.6697	1.8615
.	.	.	.	.
.	.	.	.	.
.	.	.	.	.
.	.	.	.	.
.	.	.	.	.
.	.	.	.	.
.	.	.	.	.
.	.	.	.	.
.	.	.	.	.
0.0000	0.2412	0.4962	0.8291	1.4336
.	.	.	.	.
.	.	.	.	.
.	.	.	.	.
0.9372	0.9979	1.0941	1.2048	1.4642
.	.	.	.	.
.	.	.	.	.
.	.	.	.	.
.	.	.	.	.
.	.	.	.	.
.	.	.	.	.
.	.	.	.	.
.	.	.	.	.
.	.	.	.	.
.	.	.	.	.
.	.	.	.	.
.	.	.	.	.
0.6716	0.7365	1.0022	1.1511	1.1836
.	.	.	.	.
.	.	.	.	.
0.6589	0.8866	1.0659	1.2297	1.4248
.	.	.	.	.
.	.	.	.	.

.	.	.	.	.
.	.	.	.	.
.	.	.	.	.
0.3566	0.6458	0.8525	1.0563	1.3344
.	.	.	.	.
.	.	.	.	.
.	.	.	.	.
.	.	.	.	.
.	.	.	.	.
.	.	.	.	.
.	.	.	.	.
.	.	.	.	.
0.4552	**0.7359**	**1.0122**	**1.3160**	**1.6658**

on and inclusion criteria. Refer to the technical appendix for details.
dicted device days in 2018.
calculated 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 long term acute care 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 locations[1]	0.7968	0.7530	-5.4860	DECREASE	0.0000
ICU[2]	0.7376	0.7397	0.2925	NO CHANGE	0.4474
Ward[3]	0.8006	0.7539	-5.8301	DECREASE	0.0000
UCDs, all locations[1]	0.9009	0.8489	-5.7743	DECREASE	0.0000
	0.8044	0.7775	-3.3426	DECREASE	0.0000
	0.9083	0.8543	-5.9431	DECREASE	0.0000
VDs, all[1]	1.1222	1.1298	0.6770	INCREASE	0.0000
ICUs[2]	0.9965	1.0099	1.3431	INCREASE	0.0029
Wards[3]	1.1363	1.1439	0.6697	INCREASE	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 transp

plant].

Table 6. Changes in state-specific standardized infection ratios (SURs) between 2017 and 2018 from NHSN Long Term Acute Care Hospitals

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

	All Long Term Acute Care Hospitals Reporting to NHSN				
State	2017 SUR	2018 SUR	Percent Change	Direction of Change, Based on Statistical Significance	p-value
Alaska	.	.	.		.
Alabama	0.7950	0.7208	-9%	DECREASE	0.0000
Arkansas	0.8167	0.7145	-13%	DECREASE	0.0000
Arizona	0.7311	0.6959	-5%	DECREASE	0.0000
California	0.8280	0.7908	-4%	DECREASE	0.0000
Colorado	0.6821	0.6304	-8%	DECREASE	0.0000
Connecticut	.	.	.	.	.
D.C.	.	.	.	.	.
Delaware	.	.	.	.	.
Florida	0.7500	0.6668	-11%	DECREASE	0.0000
Georgia	0.7427	0.6855	-8%	DECREASE	0.0000
Guam	.	.	.	.	.
Hawaii	.	.	.	.	.
Iowa	.	.	.	.	.
Idaho	.	.	.	.	.
Illinois	0.7838	0.7658	-2%	DECREASE	0.0000
Indiana	0.8603	0.7298	-15%	DECREASE	0.0000
Kansas	.	.	.	.	.
Kentucky	0.9070	0.8004	-12%	DECREASE	0.0000
Louisiana	0.8466	0.8428	0%	NO CHANGE	0.2259
Massachusetts	0.5292	0.5132	-3%	DECREASE	0.0000
Maryland	.	.	.	.	.
Maine	.	.	.	.	.
Michigan	0.6581	0.5982	-9%	DECREASE	0.0000
Minnesota	.	.	.	.	.
Missouri	0.8757	0.8040	-8%	DECREASE	0.0000
Mississippi	0.8604	0.6979	-19%	DECREASE	0.0000
Montana	.	.	.	.	.
North Carolina	1.0337	0.8810	-15%	DECREASE	0.0000
North Dakota	.	.	.	.	.
Nebraska	.	.	.	.	.
New Hampshire	.	.	.	.	.
New Jersey	0.7885	0.7310	-7%	DECREASE	0.0000
New Mexico	.	.	.	.	.
Nevada	1.0491	0.9289	-11%	DECREASE	0.0000
New York	.	.	.	.	.
Ohio	0.9007	0.8036	-11%	DECREASE	0.0000
Oklahoma	1.0048	0.8872	-12%	DECREASE	0.0000
Oregon	.	.	.	.	.
Pennsylvania	0.6557	0.5966	-9%	DECREASE	0.0000
Puerto Rico	.	.	.	.	.
Rhode Island	.	.	.	.	.
South Carolina	0.8477	0.8776	4%	INCREASE	0.0000
South Dakota	.	.	.	.	.
Tennessee	0.7457	0.6429	-14%	DECREASE	0.0000
Texas	0.8910	0.8811	-1%	DECREASE	0.0000
Utah	.	.	.		.
Virginia	0.7726	0.7395	-4%	DECREASE	0.0000
Virgin Islands	.	.	.	.	.
Vermont	.	.	.	.	.
Washington	.	.	.	.	.
Wisconsin	0.9619	0.8386	-13%	DECREASE	0.0000
West Virginia	.	.	.	.	.
Wyoming	.	.	.	.	.
All US	**0.7968**	**0.7530**	**-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 2017 and/or 2018 and therefore subsequent data not calculated

Table 6. Changes in state-specific standardized infection ratios (SURs) between 2017 and 2018 from NHSN Long Term Acute Care Hospitals

6b. Urinary catheter days (UCDs), all locations[1]

	All Long Term Acute Care Hospitals Reporting to NHSN				
State	2017 SUR	2018 SUR	Percent Change	Direction of Change, Based on Statistical Significance	p-value
Alaska	.	.	.		.
Alabama	1.1296	1.0086	-11%	DECREASE	0.0000
Arkansas	1.0947	1.0933	0%	NO CHANGE	0.8904
Arizona	0.8282	0.9506	15%	INCREASE	0.0000
California	1.0000	0.9688	-3%	DECREASE	0.0000
Colorado	1.1548	1.0174	-12%	DECREASE	0.0000
Connecticut	.	.	.	.	.
D.C.	.	.	.	.	.
Delaware	.	.	.	.	.
Florida	0.9462	0.8472	-10%	DECREASE	0.0000
Georgia	1.0566	0.9077	-14%	DECREASE	0.0000
Guam	.	.	.	.	.
Hawaii	.	.	.	.	.
Iowa	.	.	.	.	.
Idaho	.	.	.	.	.
Illinois	0.9611	0.9037	-6%	DECREASE	0.0000
Indiana	0.8802	0.8161	-7%	DECREASE	0.0000
Kansas	.	.	.	.	.
Kentucky	0.9920	0.8669	-13%	DECREASE	0.0000
Louisiana	1.0506	1.0022	-5%	DECREASE	0.0000
Massachusetts	0.4461	0.4181	-6%	DECREASE	0.0000
Maryland	.	.	.	.	.
Maine	.	.	.	.	.
Michigan	0.7711	0.7710	0%	NO CHANGE	0.9839
Minnesota	.	.	.	.	.
Missouri	0.9123	0.8478	-7%	DECREASE	0.0000
Mississippi	1.0654	0.9044	-15%	DECREASE	0.0000
Montana	.	.	.	.	.
North Carolina	0.9764	0.8542	-13%	DECREASE	0.0000
North Dakota	.	.	.	.	.
Nebraska	.	.	.	.	.
New Hampshire	.	.	.	.	.
New Jersey	0.9208	0.9003	-2%	DECREASE	0.0007
New Mexico	.	.	.	.	.
Nevada	1.0354	0.9186	-11%	DECREASE	0.0000
New York	.	.	.	.	.
Ohio	0.9520	0.8840	-7%	DECREASE	0.0000
Oklahoma	1.2268	1.0977	-11%	DECREASE	0.0000
Oregon	.	.	.	.	.
Pennsylvania	0.7254	0.6276	-13%	DECREASE	0.0000
Puerto Rico	.	.	.	.	.
Rhode Island	.	.	.	.	.
South Carolina	0.7125	0.6543	-8%	DECREASE	0.0000
South Dakota	.	.	.	.	.
Tennessee	0.8564	0.7273	-15%	DECREASE	0.0000
Texas	0.9722	0.9358	-4%	DECREASE	0.0000
Utah	.	.	.	.	.
Virginia	0.9191	0.8919	-3%	DECREASE	0.0011
Virgin Islands	.	.	.	.	.
Vermont	.	.	.	.	.
Washington	.	.	.	.	.
Wisconsin	0.7984	0.7610	-5%	DECREASE	0.0000
West Virginia	.	.	.	.	.
Wyoming	.	.	.	.	.
All US	**0.9009**	**0.8489**	**-6%**	**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 infection ratios (SURs) between 2017 and 2018 from NHSN Long Term Acute Care Hospitals

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

	All Long Term Acute Care Hospitals Reporting to NHSN				
State	2017 SUR	2018 SUR	Percent Change	Direction of Change, Based on Statistical Significance	p-value
Alaska	.	.	.		.
Alabama	0.7737	0.6830	-12%	DECREASE	0.0000
Arkansas	1.1823	1.3405	13%	INCREASE	0.0000
Arizona	1.2596	1.5028	19%	INCREASE	0.0000
California	1.3934	1.3756	-1%	DECREASE	0.0007
Colorado	0.7445	0.7757	4%	INCREASE	0.0032
Connecticut	.	.	.	.	.
D.C.	.	.	.	.	.
Delaware	.	.	.	.	.
Florida	1.3035	1.3592	4%	INCREASE	0.0000
Georgia	1.0078	0.9972	1%	NO CHANGE	0.1428
Guam	.	.	.	.	.
Hawaii	.	.	.	.	.
Iowa	.	.	.	.	.
Idaho	.	.	.	.	.
Illinois	1.3776	1.2911	-6%	DECREASE	0.0000
Indiana	1.0092	0.8153	-19%	DECREASE	0.0000
Kansas	.	.	.	.	.
Kentucky	1.3956	1.2260	-12%	DECREASE	0.0000
Louisiana	0.5355	0.5853	9%	INCREASE	0.0000
Massachusetts	1.1492	1.1756	2%	INCREASE	0.0004
Maryland	.	.	.	.	.
Maine	.	.	.	.	.
Michigan	1.1592	1.1144	-4%	DECREASE	0.0000
Minnesota	.	.	.	.	.
Missouri	0.7618	1.0858	43%	INCREASE	0.0000
Mississippi	0.8712	0.7953	-9%	DECREASE	0.0000
Montana	.	.	.	.	.
North Carolina	1.3385	1.2344	-8%	DECREASE	0.0000
North Dakota	.	.	.	.	.
Nebraska	.	.	.	.	.
New Hampshire	.	.	.	.	.
New Jersey	1.3534	1.5305	13%	INCREASE	0.0000
New Mexico	.	.	.	.	.
Nevada	1.2528	1.0693	-15%	DECREASE	0.0000
New York	.	.	.	.	.
Ohio	0.9825	0.9338	-5%	DECREASE	0.0000
Oklahoma	0.9058	0.9291	3%	INCREASE	0.0249
Oregon	.	.	.	.	.
Pennsylvania	1.0948	0.9729	-11%	DECREASE	0.0000
Puerto Rico	.	.	.	.	.
Rhode Island	.	.	.	.	.
South Carolina	0.7454	0.8594	15%	INCREASE	0.0000
South Dakota	.	.	.	.	.
Tennessee	1.2556	1.2491	1%	NO CHANGE	0.5349
Texas	0.7885	0.8626	9%	INCREASE	0.0000
Utah	.	.	.	.	.
Virginia	1.6055	1.5050	-6%	DECREASE	0.0000
Virgin Islands	.	.	.	.	.
Vermont	.	.	.	.	.
Washington	.	.	.	.	.
Wisconsin	1.0327	0.9450	-8%	DECREASE	0.0000
West Virginia	.	.	.	.	.
Wyoming	.	.	.	.	.
All US	**1.1222**	**1.1298**	**1%**	**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

Appendix A. Factors used in NHSN risk adjusted standard utilization ratios (SUR) calculation of the device utilization in Long Term Acute Care Hospitals (LTACHs).

Device Type	Validated Parameters for Risk Model
CLD	Intercept Location type Facility bed size* Facility type* LTACH setting** Proportion of admissions with hemodialysis (in percentile) Length of stay in days (in percentile)
UCD	Intercept Location type Facility bed size* Ventilator days HEMO LTACH setting** Proportion of admissions with ventilator dependence (in percentile) Proportion of admissions with hemodialysis (in percentile) Length of stay in days (in percentile)
VD	Intercept Location type proportion of admissions with ventilator dependence (in percentile)

* Facility bed size and facility type are taken from the Annual LTACH Survey.
** LTACH setting categorized as free standing LTACH or LTACH units in Hospitals

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 found

at the above website.