

2017 National and State HAI Progress Report

Introduction: Welcome to the 2017 National and State HAI Progress Report using the 2015 baseline. This report is created by CDC staff with the National Healthcare Safety Network (NHSN).

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

Long Term Acute Care Hospitals

baseline and risk adjustment calculations. Standardized utilization ratios (SURs) are used to describe device use days. (ICD-9-CM, ICD-10-CM, and ICD-10-PCS).

ACH	
National	State
p	p
p	p
p	p

]

: 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. It is 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 ventilator days in inpatient rehabilitation facilities (IRF), long-term acute care hospitals (LTACH) (and NICU for central line days). Using the NHSN data (2017) 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 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 + 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 1.0.

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-level).

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>

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

They were available for the healthcare setting of acute care hospitals (ACH), critical access hospitals (CAH), and long-term care hospitals (LTC).

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

Number of device days;

(level).

Number of predicted device days.

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

AH),

2017 Annual National and State HAI Progress Report

Long-Term Acute Care Hospitals: Full series of tables for all national and state data

Table 1 **National standardized utilization ratios (SURs) and facility-specific summary**
Central line days (CLDs)
Urinary catheter days (UCDs)
Ventilator days (VDs)

Table 2 **State-specific SURs for CLDs from Long term acute care hospitals:**
All locations combined

Table 3 **State-specific SURs for UCDs from Long term acute care hospitals:**
All locations combined

Table 4 **State-specific SURs for VDs from Long term acute care hospitals:**
All locations combined

Table 5 **Changes in national SURs, 2017 compared to 2016:**
Central Line Days (CLDs)
Urinary Catheter Days (UCDs)
Ventilator days (VDs)

Table 6 **Changes in state SURs, 2017 compared to 2016:**
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 I

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

ry SURs:

ong-term acute care hospitals (LTACHs)

1sn-sur-guide-508.pdf

Device and Patient Population	No. of Facilities	No. of Device days	
	Reporting ¹	Observed	Predicted
Central line days, all⁴	471	2,526,315	3,170,774.4715
ICUs⁵	81	141,415	191,726.7712
Wards⁶	464	2,384,900	2,979,047.7003
Urinary catheter days, all⁴	471	1,910,985	2,121,229.9804
	81	120,984	150,410.2730
Wards⁶	464	1,790,001	1,970,819.7073
Ventilator days, all⁴	469	1,144,852	1,020,164.9480
	81	102,331	102,690.6085
	455	1,042,521	917,474.3395

1. The number of reporting facilities included in the SUR calculation; SURs are not calculated when there are less than 10 reporting facilities.
2. Percent of facilities with at least one predicted device day that had an SUR significantly greater than or less than the predicted number of device days.
3. Facility-specific percentiles are only calculated if at least 20 facilities had ≥ 1.0 predicted number of device days in the reporting period.
4. Data from all ICUs, wards (and other non-critical care locations). Data contained in this table are reported from the most recent reporting period.
5. Data from all ICUs; excludes wards (and other non-critical care locations), and NICUs. Data contained in this table are reported from the most recent reporting period.
6. Data from all wards (for this table wards also include step-down, mixed acuity, and specialty care areas [including intensive care]). Data contained in this table are reported from the most recent reporting period.

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

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	%	
0.7968	0.7958	0.7977	471	249	53	184	39	
0.7376	0.7338	0.7415	81	54	67	18	22	
0.8006	0.7996	0.8016	464	245	53	178	38	
0.9009	0.8996	0.9022	471	236	50	197	42	
0.8044	0.7998	0.8089	81	53	65	22	27	
0.9083	0.9069	0.9096	464	223	48	202	44	
1.1222	1.1201	1.1242	469	163	35	270	58	
0.9965	0.9904	1.0026	81	53	65	23	28	
1.1363	1.1341	1.1385	455	152	33	269	59	

than 5 reporting facilities. This may be different from those reported in the SIR tables due to exclusion and inclusion of the nominal value of the national SUR. This is only calculated if at least 10 facilities had ≥ 1.0 predicted device days in 2017. If a facility's predicted number of device days was <1.0, a facility-specific SUR was neither calculated nor reported from long-term acute care hospitals; as such, data from ACHs, IRFs and CAHs are excluded. Data contained in this table are reported from long-term acute care hospitals; as such, data from ACHs, IRFs and CAHs are excluded. Data contained in this table are reported from long-term acute care hospitals (excluding hematology/oncology, bone marrow transplant).

Facility-specific summary SURs using device days data reported to NHSN during 2017 for long term acute care hospitals. Table 1a. Central line days (CLDs), urinary catheter days (UCDs), and ventilator days (VDs).

Percentile Distribution of Facility-Specific Summary SURs									
									Median
5%	10%	15%	20%	25%	30%	35%	40%	45%	50%
0.4152	0.4993	0.5572	0.6078	0.6589	0.7031	0.7483	0.7860	0.8084	0.8339
0.2980	0.4875	0.6036	0.6464	0.7269	0.7724	0.8456	0.8694	0.9184	0.9404
0.4152	0.4899	0.5572	0.6168	0.6657	0.7058	0.7527	0.7917	0.8144	0.8352
0.4275	0.5626	0.6269	0.6958	0.7362	0.7850	0.8271	0.8564	0.9005	0.9321
0.2364	0.3993	0.5849	0.6871	0.7290	0.7553	0.8634	0.9309	0.9698	1.0271
0.4288	0.5626	0.6269	0.6929	0.7334	0.7813	0.8232	0.8434	0.8925	0.9283
0.2457	0.4721	0.5585	0.6537	0.7258	0.7780	0.8566	0.9207	0.9576	1.0103
0.2580	0.4128	0.5504	0.6688	0.8464	1.0004	1.1044	1.2056	1.2549	1.3392
0.0000	0.2798	0.4972	0.6179	0.7095	0.7700	0.8598	0.9279	0.9722	1.0197

selection criteria. Refer to the technical appendix for details.
 CLD days in 2017.
 are not included in the distribution of facility-specific SURs.

Long-term acute care hospitals; as such, data from ACHs, IRFs and CAHs are excluded.

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

ility-specific SURs³

55%	60%	65%	70%	75%	80%	85%	90%	95%
0.8609	0.9146	0.9526	0.9802	1.0275	1.0714	1.1301	1.2171	1.3795
0.9757	1.0037	1.0262	1.0553	1.1028	1.1394	1.1961	1.2222	1.2815
0.8606	0.9153	0.9528	0.9887	1.0292	1.0811	1.1463	1.2302	1.3836
0.9653	1.0081	1.0623	1.1117	1.1573	1.2130	1.2495	1.3384	1.5141
1.0476	1.0666	1.1234	1.1920	1.2289	1.2621	1.3505	1.4793	1.6057
0.9616	1.0074	1.0601	1.1023	1.1588	1.2130	1.2519	1.3463	1.5141
1.0502	1.0909	1.1667	1.2413	1.3052	1.3820	1.5065	1.6260	1.9135
1.3815	1.4119	1.4408	1.5774	1.6626	1.7426	1.8432	2.2819	2.4370
1.0536	1.0889	1.1635	1.2401	1.3090	1.3880	1.5074	1.6260	1.9182

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

State	Facilities	No. of Device days			95% CI
		Observed	Predicted	SUR	Lower
Alaska	1	.	.	.	.
Alabama	9	32,246	40,561.8189	0.7950	0.7863
Arkansas	7	28,072	34,372.6047	0.8167	0.8072
Arizona	7	24,467	33,466.0006	0.7311	0.7220
California	24	207,150	250,195.4342	0.8280	0.8244
Colorado	8	28,803	42,225.4370	0.6821	0.6743
Connecticut	3	.	.	.	.
D.C.	2	.	.	.	.
Delaware	1	.	.	.	.
Florida	28	174,452	232,587.4035	0.7500	0.7465
Georgia	16	71,313	96,019.5461	0.7427	0.7373
Guam	0	.	.	.	.
Hawaii	1	.	.	.	.
Iowa	3	.	.	.	.
Idaho	3	.	.	.	.
Illinois	9	81,466	103,933.2624	0.7838	0.7785
Indiana	13	68,410	79,515.1879	0.8603	0.8539
Kansas	4	.	.	.	.
Kentucky	9	52,407	57,783.2203	0.9070	0.8992
Louisiana	34	154,270	182,221.8533	0.8466	0.8424
Massachusetts	14	84,621	159,894.5758	0.5292	0.5257
Maryland	2	.	.	.	.
Maine	0	.	.	.	.
Michigan	21	72,158	109,653.9106	0.6581	0.6533
Minnesota	2	.	.	.	.
Missouri	11	51,391	58,686.2640	0.8757	0.8681
Mississippi	9	47,913	55,685.1612	0.8604	0.8527
Montana	1	.	.	.	.
North Carolina	10	59,143	57,216.4299	1.0337	1.0254
North Dakota	2	.	.	.	.
Nebraska	4	.	.	.	.
New Hampshire	0	.	.	.	.
New Jersey	12	60,568	76,816.1700	0.7885	0.7822
New Mexico	3	.	.	.	.
Nevada	10	69,140	65,902.0313	1.0491	1.0413
New York	1	.	.	.	.
Ohio	31	153,509	170,434.8106	0.9007	0.8962
Oklahoma	13	66,933	66,611.5403	1.0048	0.9972
Oregon	1	.	.	.	.
Pennsylvania	22	80,878	123,337.8472	0.6557	0.6512
Puerto Rico	0	.	.	.	.

Rhode Island	1	.	.	.	.
South Carolina	6	31,968	37,713.3336	0.8477	0.8384
South Dakota	1	.	.	.	.
Tennessee	9	44,308	59,419.8366	0.7457	0.7387
Texas	80	490,344	550,355.7031	0.8910	0.8885
Utah	4	.	.	.	.
Virginia	6	28,615	37,036.2132	0.7726	0.7637
Virgin Islands	0	.	.	.	.
Vermont	0	.	.	.	.
Washington	3	.	.	.	.
Wisconsin	6	31,597	32,848.0014	0.9619	0.9513
West Virginia	4	.	.	.	.
Wyoming	0	.	.	.	.
All US	471	2,526,315	3,170,774.4715	0.7968	0.7958

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 th
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). This excludes NICUs. Data contained in

0.8570	6	.	.	.	.	.	.
0.7527	9	.	.	.	.	.	.
0.8934	80	53	66	23	29	0.5946	0.7075
0.7816	6	.	.	.	.	.	.
.
0.9725	6	.	.	.	.	.	.
.
0.7977	471	249	53	184	39	0.4993	0.6589

less than 5 reporting facilities. This may be different from those reported in the SIR tables due to exclusion and inclusion of the nominal value of the national SUR. This is only calculated if at least 10 facilities had ≥ 1.0 predicted device days in 2017. If a facility's predicted number of device days was < 1.0 , a facility-specific SUR was neither calculated nor reported in this table. Data from long-term acute care hospitals; as such, data from ACHs, IRFs and CAHs are excluded.

ice type and patient population:

Median		
50%	75%	90%
.	.	.
.	.	.
.	.	.
0.8526	0.9391	1.1408
.	.	.
.	.	.
.	.	.
0.7653	0.8795	1.0714
.	.	.
.	.	.
.	.	.
.	.	.
0.9975	1.1791	1.5809
.	.	.
.	.	.
0.6398	0.8874	1.0162
.	.	.
.	.	.
.	.	.
.	.	.
.	.	.
0.8305	1.0616	1.1969
.	.	.
0.6601	0.7939	0.9102
.	.	.

.	.	.
.	.	.
.	.	.
0.9244	1.0576	1.2790
.	.	.
.	.	.
.	.	.
.	.	.
.	.	.
.	.	.
0.8339	1.0275	1.2171

clusion criteria. Refer to the technical appendix for details.
 e days in 2017.
 or included in the distribution of facility-specific SURs.
 led.

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

State	No. of Facilities	No. of Device days		95% CI	
		Observed	Predicted	SUR	Lower
Alaska	1	.	.	.	.
Alabama	9	30,870	27,329.1105	1.1296	1.1170
Arkansas	7	25,749	23,522.4273	1.0947	1.0813
Arizona	7	20,834	25,156.9673	0.8282	0.8170
California	24	174,008	174,003.0443	1.0000	0.9953
Colorado	8	31,603	27,365.5611	1.1548	1.1422
Connecticut	3	.	.	.	.
D.C.	2	.	.	.	.
Delaware	1	.	.	.	.
Florida	28	156,083	164,959.1665	0.9462	0.9415
Georgia	16	73,631	69,685.2157	1.0566	1.0490
Guam	0	.	.	.	.
Hawaii	1	.	.	.	.
Iowa	3	.	.	.	.
Idaho	3	.	.	.	.
Illinois	9	68,145	70,905.4876	0.9611	0.9539
Indiana	13	49,751	56,522.8651	0.8802	0.8725
Kansas	4	.	.	.	.
Kentucky	9	38,246	38,555.4241	0.9920	0.9821
Louisiana	34	110,884	105,540.5998	1.0506	1.0445
Massachusetts	14	43,330	97,140.2148	0.4461	0.4419
Maryland	2	.	.	.	.
Maine	0	.	.	.	.
Michigan	21	57,497	74,562.5059	0.7711	0.7648
Minnesota	2	.	.	.	.
Missouri	11	38,971	42,718.4122	0.9123	0.9032
Mississippi	9	40,122	37,659.7346	1.0654	1.0550
Montana	1	.	.	.	.
North Carolina	10	38,931	39,871.5198	0.9764	0.9667
North Dakota	2	.	.	.	.
Nebraska	4	.	.	.	.
New Hampshire	0	.	.	.	.
New Jersey	12	47,651	51,749.0766	0.9208	0.9126
New Mexico	3	.	.	.	.
Nevada	10	46,349	44,765.7389	1.0354	1.0260
New York	1	.	.	.	.
Ohio	31	112,861	118,556.9203	0.9520	0.9464
Oklahoma	13	54,641	44,540.4772	1.2268	1.2165
Oregon	1	.	.	.	.
Pennsylvania	22	60,835	83,864.0927	0.7254	0.7197
Puerto Rico	0	.	.	.	.

Rhode Island	1	.	.	.	.
South Carolina	6	19,221	26,978.2833	0.7125	0.7025
South Dakota	1	.	.	.	.
Tennessee	9	33,994	39,694.8199	0.8564	0.8473
Texas	80	330,308	339,743.6022	0.9722	0.9689
Utah	4	.	.	.	.
Virginia	6	23,909	26,012.6909	0.9191	0.9075
Virgin Islands	0	.	.	.	.
Vermont	0	.	.	.	.
Washington	3	.	.	.	.
Wisconsin	6	19,335	24,217.1135	0.7984	0.7872
West Virginia	4	.	.	.	.
Wyoming	0	.	.	.	.
All US	471	1,910,985	2,121,229.9804	0.9009	0.8996

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

using device days data reported to NHSN during 2017 long term acute care hospitals (LTACHs), by meter days (CDs), all locations⁴

for SUR	Facility-specific SURs					10%
	Upper	No. Facilities with ≥ 1 Predicted Device Days	No. Facilities with SUR Significantly > National SUR	No. Facilities with SUR Significantly < National SUR		
		N	N	N		
.
1.1422	9	.	.	.	.	.
1.1081	7	.	.	.	.	.
0.8395	7	.	.	.	.	.
1.0047	24	16	67	6	25	0.7046
1.1676	8	.	.	.	.	.
.
.
0.9509	28	14	50	11	39	0.5737
1.0643	16	9	56	3	19	.
.
.
0.9683	9	.	.	.	.	.
0.8880	13	5	38	6	46	.
.
1.0019	9	.	.	.	.	.
1.0568	34	21	62	10	29	0.5778
0.4503	14	2	14	11	79	.
.
0.7774	21	4	19	17	81	0.5626
.
0.9214	11	5	45	4	36	.
1.0758	9	.	.	.	.	.
.
0.9862	10	6	60	4	40	.
.
.
0.9291	12	8	67	4	33	.
.
1.0448	10	7	70	3	30	.
.
0.9575	31	16	52	12	39	0.6929
1.2371	13	9	69	3	23	.
.
0.7312	22	8	36	14	64	0.3635
.

0.7226	6	.	.	.	.	.
0.8655	9	.	.	.	.	.
0.9755	80	49	61	22	28	0.6254
0.9308	6	.	.	.	.	.
.
0.8097	6	.	.	.	.	.
.
0.9022	471	236	50	197	42	0.5626

ss than 5 reporting facilities. This may be different from those reported in the SIR tables due to exclusion ε
 ran the nominal value of the national SUR. This is only calculated if at least 10 facilities had ≥ 1.0 predicte
 /s in 2017. If a facility's predicted number of device days was <1.0, a facility-specific SUR was neither calc
 this table are reported from long-term acute care hospitals; as such, data from ACHs, IRFs and CAHs are

device type and patient population:

Median			
25%	50%	75%	90%
.	.	.	.
.	.	.	.
.	.	.	.
0.8846	0.9667	1.1605	1.2904
.	.	.	.
.	.	.	.
.	.	.	.
0.8293	0.9417	1.1930	1.4813
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
0.8378	1.0460	1.3319	1.6578
.	.	.	.
0.6189	0.8079	0.8424	0.9773
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
.	.	.	.
0.7691	0.9309	1.1409	1.2612
.	.	.	.
0.4447	0.7901	0.9925	1.2341
.	.	.	.

**Table 4. State-specific standardized utilization ratios (SURs) and facility-specific summary S
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State	No. of Facilities	No. of Device days		
		Observed	Predicted	SUR
Alaska	1	.	.	.
Alabama	9	12,759	16,490.5926	0.7737
Arkansas	7	11,405	9,646.7123	1.1823
Arizona	7	15,199	12,066.4712	1.2596
California	23	137,105	98,393.7421	1.3934
Colorado	8	10,528	14,140.8849	0.7445
Connecticut	3	.	.	.
D.C.	2	.	.	.
Delaware	1	.	.	.
Florida	28	109,051	83,658.0001	1.3035
Georgia	16	40,515	40,200.9289	1.0078
Guam	0	.	.	.
Hawaii	1	.	.	.
Iowa	3	.	.	.
Idaho	3	.	.	.
Illinois	9	53,364	38,736.7389	1.3776
Indiana	13	29,076	28,812.1732	1.0092
Kansas	4	.	.	.
Kentucky	9	26,746	19,164.0302	1.3956
Louisiana	34	18,002	33,619.2274	0.5355
Massachusetts	14	50,296	43,767.5257	1.1492
Maryland	2	.	.	.
Maine	0	.	.	.
Michigan	21	42,983	37,079.0548	1.1592
Minnesota	2	.	.	.
Missouri	11	17,822	23,393.1939	0.7618
Mississippi	9	13,680	15,701.6026	0.8712
Montana	1	.	.	.
North Carolina	10	26,883	20,084.2956	1.3385
North Dakota	2	.	.	.
Nebraska	4	.	.	.
New Hampshire	0	.	.	.
New Jersey	12	44,566	32,928.5893	1.3534
New Mexico	3	.	.	.
Nevada	10	24,340	19,429.2467	1.2528
New York	1	.	.	.
Ohio	31	64,094	65,236.3987	0.9825
Oklahoma	13	15,949	17,606.8812	0.9058
Oregon	1	.	.	.
Pennsylvania	22	45,947	41,969.1937	1.0948

Puerto Rico	0	.	.	.
Rhode Island	1	.	.	.
South Carolina	6	11,283	15,136.6837	0.7454
South Dakota	1	.	.	.
Tennessee	9	30,601	24,372.0769	1.2556
Texas	79	97,563	123,740.0224	0.7885
Utah	4	.	.	.
Virginia	6	23,050	14,356.7704	1.6055
Virgin Islands	0	.	.	.
Vermont	0	.	.	.
Washington	3	.	.	.
Wisconsin	6	12,899	12,491.0240	1.0327
West Virginia	4	.	.	.
Wyoming	0	.	.	.
All US	469	1,144,852	1,020,164.9480	1.1222

1. The number of reporting facilities included in the SUR calculation; SURs are not calculated when there are no reported cases.
2. Percent of facilities with at least one predicted device day that had an SUR significantly greater than or less than the expected value.
3. Facility-specific percentiles are only calculated if at least 20 facilities had ≥ 1.0 predicted number of device days.
4. Data from all ICUs and wards (and other non-critical care locations). This excludes NICUs. Data contain only cases that occurred during the study period.

URs using device days data reported to NHSN during 2017 for long term acute care hospitals (LT/ble 4. Ventilator days (VDs), all locations⁴

95% CI for SUR		Facility-specific SURs				
Lower	Upper	No. Facilities with ≥1 Predicted Device Days	No. Facilities with SUR		No. Facilities with SUR	
			Significantly > National SUR		Significantly < National SUR	
			N		N	
.
0.7604	0.7872	9	.	.	.	.
1.1607	1.2041	7	.	.	.	.
1.2397	1.2797	7	.	.	.	.
1.3861	1.4008	23	18	78	5	22
0.7304	0.7588	8	.	.	.	.
.
.
1.2958	1.3113	28	17	61	9	32
0.9980	1.0176	16	6	38	10	63
.
.
.
1.3660	1.3893	9	.	.	.	.
0.9976	1.0208	13	3	23	9	69
.
1.3790	1.4124	9	.	.	.	.
0.5277	0.5433	34	2	6	31	91
1.1392	1.1592	14	8	57	4	29
.
.
1.1483	1.1702	21	10	48	8	38
.
0.7507	0.7731	11	0	0	9	82
0.8567	0.8859	9	.	.	.	.
.
1.3226	1.3545	10	7	70	2	20
.
.
1.3409	1.3660	12	10	83	2	17
.
1.2371	1.2685	10	7	70	2	20
.
0.9749	0.9901	31	8	26	20	65
0.8919	0.9200	13	3	23	10	77
.
1.0848	1.1048	22	10	45	11	50

.
0.7317	0.7593	6	.	.	.	.
1.2416	1.2697	9	.	.	.	.
0.7835	0.7934	79	14	18	57	72
1.5849	1.6263	6	.	.	.	.
.
1.0150	1.0506	6	.	.	.	.
.
1.1201	1.1242	469	163	35	270	58

re less than 5 reporting facilities. This may be different from those reported in the SIR tables due to exclusions less than the nominal value of the national SUR. This is only calculated if at least 10 facilities had ≥ 1.0 predicted days in 2017. If a facility's predicted number of device days was < 1.0 , a facility-specific SUR was neither reported in this table nor reported from long-term acute care hospitals; as such, data from ACHs, IRFs and CAHs

ACHs), by device type and patient population:

Median				
10%	25%	50%	75%	90%
.
.
.
1.0229	1.1667	1.4428	1.6806	1.7585
.
.
.
0.7697	1.0172	1.3216	1.5007	1.6917
.
.
.
.
.
0.0000	0.2438	0.4420	0.7580	1.0053
.
.
0.8949	0.9691	1.0916	1.3132	1.4514
.
.
.
.
.
.
.
0.7667	0.8731	1.0122	1.1774	1.2974
.
.
0.8435	0.9989	1.0963	1.5399	1.6637

Table 5. Changes in national standardized utilization ratios (SURs) using HAI data reported from all NHSN long term acute care hospitals reporting during 2017 by HAI and patient population: Central line days (CLDs), urinary catheter days (UCDs), and ventilator days (VDs), 2017 compared to 2016

	2016 SUR	2017 SUR	Percent Change	Direction of Change, Based on Statistical Significance	p-value
CLDs, all locations¹	0.9004	0.7968	-12%	DECREASE	0.0000
ICU ²	0.8392	0.7376	-12%	DECREASE	0.0000
Ward ³	0.9040	0.8006	-11%	DECREASE	0.0000
UCDs, all locations¹	0.9688	0.9009	-7%	DECREASE	0.0000
	0.8512	0.8044	-5%	DECREASE	0.0000
	0.9769	0.9083	-7%	DECREASE	0.0000
VDs, all¹	1.1198	1.1222	0%	NO CHANGE	0.0923
ICUs ²	1.0290	0.9965	-3%	DECREASE	0.0000
Wards ³	1.1291	1.1363	1%	INCREASE	0.0000

* Statistically significant, p < 0.0500

1. Data from all ICUs, wards (and other non-critical care locations). This excludes ACH, CAH, and IRF locations (or facilities).
2. Data from all ICUs; excludes wards (and other non-critical care locations), NICUs, and ACH, CAH, and IRF locations (or facilities).
3. Data from all wards (for this table wards also include step-down and specialty care areas [including hematology/oncology, bone marrow trans;

plant]. This excludes ACH, CAH, and IRF locations (or facilities)

Table 6. Changes in state-specific standardized infection ratios (SURs) between 2016 and 2017 from NHSN Long Term Acute Care Hospitals
6a. Central line days (CLD), all locations¹

State	All Long Term Acute Care Hospitals Reporting to NHSN				
	2016 SUR	2017 SUR	Percent Change	Direction of Change, Based on Statistical Significance	p-value
Alaska	.	.	.	.	.
Alabama	0.9628	0.7950	-17%	DECREASE	0.0000
Arkansas	0.9669	0.8167	-16%	DECREASE	0.0000
Arizona	1.0029	0.7311	-27%	DECREASE	0.0000
California	0.8254	0.8280	0%	NO CHANGE	0.3258
Colorado	0.7170	0.6821	-5%	DECREASE	0.0000
Connecticut	.	.	.	.	.
D.C.	.	.	.	.	.
Delaware	.	.	.	.	.
Florida	0.9169	0.7500	-18%	DECREASE	0.0000
Georgia	0.8864	0.7427	-16%	DECREASE	0.0000
Guam	.	.	.	.	.
Hawaii	.	.	.	.	.
Iowa	.	.	.	.	.
Idaho	.	.	.	.	.
Illinois	0.8860	0.7838	-12%	DECREASE	0.0000
Indiana	0.9768	0.8603	-12%	DECREASE	0.0000
Kansas	.	.	.	.	.
Kentucky	1.0428	0.9070	-13%	DECREASE	0.0000
Louisiana	0.9566	0.8466	-11%	DECREASE	0.0000
Massachusetts	0.5800	0.5292	-9%	DECREASE	0.0000
Maryland	.	.	.	.	.
Maine	.	.	.	.	.
Michigan	0.8229	0.6581	-20%	DECREASE	0.0000
Minnesota	.	.	.	.	.
Missouri	1.0159	0.8757	-14%	DECREASE	0.0000
Mississippi	0.9039	0.8604	-5%	DECREASE	0.0000
Montana	.	.	.	.	.
North Carolina	1.1998	1.0337	-14%	DECREASE	0.0000
North Dakota	.	.	.	.	.
Nebraska	.	.	.	.	.
New Hampshire	.	.	.	.	.
New Jersey	0.9547	0.7885	-17%	DECREASE	0.0000
New Mexico	.	.	.	.	.
Nevada	1.1667	1.0491	-10%	DECREASE	0.0000
New York	.	.	.	.	.
Ohio	0.9406	0.9007	-4%	DECREASE	0.0000
Oklahoma	1.0583	1.0048	-5%	DECREASE	0.0000
Oregon	.	.	.	.	.
Pennsylvania	0.8022	0.6557	-18%	DECREASE	0.0000
Puerto Rico	.	.	.	.	.
Rhode Island	.	.	.	.	.
South Carolina	1.0380	0.8477	-18%	DECREASE	0.0000
South Dakota	.	.	.	.	.
Tennessee	0.7897	0.7457	-6%	DECREASE	0.0000
Texas	0.9944	0.8910	-10%	DECREASE	0.0000
Utah	.	.	.	.	.
Virginia	1.0219	0.7726	-24%	DECREASE	0.0000
Virgin Islands	.	.	.	.	.
Vermont	.	.	.	.	.
Washington	.	.	.	.	.
Wisconsin	1.0028	0.9619	-4%	DECREASE	0.0000
West Virginia	.	.	.	.	.
Wyoming	.	.	.	.	.
All US	0.9004	0.7968	-12%	DECREASE	0.0000

* Statistically significant, p < 0.0500

1. Data from all ICUs, wards (and other non-critical care locations), and NICUs.
2. States without SUR either in 2016 and/or 2017 and therefore subsequent data not calculated

Table 6. Changes in state-specific standardized infection ratios (SURs) between 2016 and 2017 from NHSN Long Term Acute Care Hospitals
6b. Urinary catheter days (UCD), all locations¹

State	All Long Term Acute Care Hospitals Reporting to NHSN				
	2016 SUR	2017 SUR	Percent Change	Direction of Change, Based on Statistical Significance	p-value
Alaska	.	.	.	.	.
Alabama	1.2431	1.1296	-9%	DECREASE	0.0000
Arkansas	1.1483	1.0947	-5%	DECREASE	0.0000
Arizona	0.9956	0.8282	-17%	DECREASE	0.0000
California	1.0860	1.0000	-8%	DECREASE	0.0000
Colorado	1.2626	1.1548	-9%	DECREASE	0.0000
Connecticut	.	.	.	.	.
D.C.	.	.	.	.	.
Delaware	.	.	.	.	.
Florida	1.1141	0.9462	-15%	DECREASE	0.0000
Georgia	1.1614	1.0566	-9%	DECREASE	0.0000
Guam	.	.	.	.	.
Hawaii	.	.	.	.	.
Iowa	.	.	.	.	.
Idaho	.	.	.	.	.
Illinois	1.0641	0.9611	-10%	DECREASE	0.0000
Indiana	0.9072	0.8802	-3%	DECREASE	0.0000
Kansas	.	.	.	.	.
Kentucky	1.0648	0.9920	-7%	DECREASE	0.0000
Louisiana	1.1366	1.0506	-8%	DECREASE	0.0000
Massachusetts	0.5333	0.4461	-16%	DECREASE	0.0000
Maryland	.	.	.	.	.
Maine	.	.	.	.	.
Michigan	0.8002	0.7711	-4%	DECREASE	0.0000
Minnesota	.	.	.	.	.
Missouri	0.9839	0.9123	-7%	DECREASE	0.0000
Mississippi	1.1188	1.0654	-5%	DECREASE	0.0000
Montana	.	.	.	.	.
North Carolina	1.1026	0.9764	-11%	DECREASE	0.0000
North Dakota	.	.	.	.	.
Nebraska	.	.	.	.	.
New Hampshire	.	.	.	.	.
New Jersey	0.9940	0.9208	7%	DECREASE	0.0000
New Mexico	.	.	.	.	.
Nevada	1.1155	1.0354	-7%	DECREASE	0.0000
New York	.	.	.	.	.
Ohio	1.0252	0.9520	-7%	DECREASE	0.0000
Oklahoma	1.1860	1.2268	3%	INCREASE	0.0000
Oregon	.	.	.	.	.
Pennsylvania	0.7828	0.7254	-7%	DECREASE	0.0000
Puerto Rico	.	.	.	.	.
Rhode Island	.	.	.	.	.
South Carolina	0.7477	0.7125	-5%	DECREASE	0.0000
South Dakota	.	.	.	.	.
Tennessee	0.8407	0.8564	2%	INCREASE	0.0134
Texas	0.9902	0.9722	-2%	DECREASE	0.0000
Utah	.	.	.	.	.
Virginia	1.0048	0.9191	-9%	DECREASE	0.0000
Virgin Islands	.	.	.	.	.
Vermont	.	.	.	.	.
Washington	.	.	.	.	.
Wisconsin	0.7947	0.7984	0%	NO CHANGE	0.6443
West Virginia	.	.	.	.	.
Wyoming	.	.	.	.	.
All US	0.9688	0.9009	7%	DECREASE	0.0000

* Statistically significant, p < 0.0500

1. Data from all ICUs, wards (and other non-critical care locations), and NICUs.
2. States without SUR either in 2016 and/or 2017 and therefore subsequent data not calculated

**Table 6. Changes in state-specific standardized infection ratios (SURs) between 2016 and 2017 from NHSN Long Term Acute Care Hospitals
6c. Ventilator days (VD), all locations¹**

State	All Long Term Acute Care Hospitals Reporting to NHSN				
	2016 SUR	2017 SUR	Percent Change	Direction of Change, Based on Statistical Significance	p-value
Alaska	.	.	.	.	.
Alabama	0.8024	0.7737	-4%	DECREASE	0.0038
Arkansas	1.0070	1.1823	17%	INCREASE	0.0000
Arizona	1.3259	1.2596	-5%	DECREASE	0.0000
California	1.3019	1.3934	7%	INCREASE	0.0000
Colorado	0.9016	0.7445	-17%	DECREASE	0.0000
Connecticut	.	.	.	.	.
D.C.	.	.	.	.	.
Delaware	.	.	.	.	.
Florida	1.3239	1.3035	-2%	DECREASE	0.0003
Georgia	1.1119	1.0078	-9%	DECREASE	0.0000
Guam	.	.	.	.	.
Hawaii	.	.	.	.	.
Iowa	.	.	.	.	.
Idaho	.	.	.	.	.
Illinois	1.3307	1.3776	4%	INCREASE	0.0000
Indiana	1.0324	1.0092	-2%	DECREASE	0.0051
Kansas	.	.	.	.	.
Kentucky	1.3999	1.3956	0%	NO CHANGE	0.7149
Louisiana	0.5467	0.5355	-2%	DECREASE	0.0471
Massachusetts	1.0990	1.1492	5%	INCREASE	0.0000
Maryland	.	.	.	.	.
Maine	.	.	.	.	.
Michigan	1.1053	1.1592	5%	INCREASE	0.0000
Minnesota	.	.	.	.	.
Missouri	0.8283	0.7618	-8%	DECREASE	0.0000
Mississippi	0.8995	0.8712	-3%	DECREASE	0.0073
Montana	.	.	.	.	.
North Carolina	1.1370	1.3385	18%	INCREASE	0.0000
North Dakota	.	.	.	.	.
Nebraska	.	.	.	.	.
New Hampshire	.	.	.	.	.
New Jersey	1.4178	1.3534	-5%	DECREASE	0.0000
New Mexico	.	.	.	.	.
Nevada	1.2202	1.2528	3%	INCREASE	0.0042
New York	.	.	.	.	.
Ohio	1.0155	0.9825	-3%	DECREASE	0.0000
Oklahoma	1.0790	0.9058	-16%	DECREASE	0.0000
Oregon	.	.	.	.	.
Pennsylvania	1.1055	1.0948	-1%	NO CHANGE	0.1338
Puerto Rico	.	.	.	.	.
Rhode Island	.	.	.	.	.
South Carolina	1.0205	0.7454	-27%	DECREASE	0.0000
South Dakota	.	.	.	.	.
Tennessee	1.2522	1.2556	0%	NO CHANGE	0.7383
Texas	0.8546	0.7885	-8%	DECREASE	0.0000
Utah	.	.	.	.	.
Virginia	1.4861	1.6055	8%	INCREASE	0.0000
Virgin Islands	.	.	.	.	.
Vermont	.	.	.	.	.
Washington	.	.	.	.	.
Wisconsin	0.9344	1.0327	11%	INCREASE	0.0000
West Virginia	.	.	.	.	.
Wyoming	.	.	.	.	.
All US	1.1198	1.1222	0%	NO CHANGE	0.0923

* Statistically significant, p < 0.0500

1. Data from all ICUs, wards (and other non-critical care locations), and NICUs.
2. States without SUR either in 2016 and/or 2017 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.