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National Healthcare Safety Network (NHSN) report, data summary for 2012, Device-associated module

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This report is a summary of Device-associated (DA) Module data collected by hospitals participating in the National Healthcare Safety Network (NHSN) for events occurring from January through December 2012 and reported to the Centers for Disease Control and Prevention (CDC) by July 1, 2013. This report updates previously published DA Module data from NHSN and provides contemporary comparative rates.¹ Figure 1 provides a brief summary of key findings from this report. This report complements other NHSN reports, including national and state-specific reports of standardized infection ratios (SIRs) for select health care-associated infections (HAIs).^{2,3}

NHSN data collection, reporting, and analysis are organized into four components: Patient Safety, Healthcare Personnel Safety, Biovigilance, and Long-term Care, and use standardized methods and definitions in accordance with specific module protocols.^{4,5,6,7} Institutions may use modules singly or simultaneously, but once selected, they must be used for a minimum of one calendar month for the data to be included in CDC analyses. All infections are categorized using standard CDC definitions that include laboratory and clinical criteria.^{5–7} The DA Module within the Patient Safety Component may be used by facilities other than general acute care hospitals, including inpatient rehabilitation facilities (IRFs) and long term acute care hospitals (LTACHs). NHSN facilities contributing HAI surveillance data to this report did so voluntarily, in response to state mandatory reporting requirements or in compliance with the Centers for Medicare and Medicaid Services' (CMS's) Quality Reporting Programs.^{8,9} CDC aggregated these data into a single national database for 2012, consistent with the stated purposes of NHSN, which are to:

- Collect data from a sample of health care facilities in the United States to permit valid estimation of the magnitude of adverse events among patients and health care personnel.
- Collect data from a sample of health care facilities in the United States to permit valid estimation of the adherence to practices known to be associated with prevention of these adverse events.
- Analyze and report collected data to permit recognition of trends.
- Provide facilities with risk-adjusted metrics that can be used for inter-facility comparisons and local quality improvement activities.
- Assist facilities in developing surveillance and analysis methods that permit timely recognition of patient and health care worker safety problems and prompt intervention with appropriate measures.
- Conduct collaborative research studies with NHSN member facilities (eg, describe the epidemiology of emerging health care-associated infection [HAI] and pathogens, assess the importance of potential risk factors, further characterize HAI pathogens and their mechanisms of resistance, and evaluate alternative surveillance and prevention strategies).
- Comply with legal requirements – including but not limited to state or federal laws, regulations, or other requirements – for mandatory reporting of health care facility-specific adverse event, prevention practice adherence, and other public health data.
- Enable health care facilities to report HAI and prevention practice adherence data via NHSN to the U.S. Centers for Medicare and Medicaid Services (CMS) in fulfillment of CMS's quality measurement reporting requirements for those data.
- Provide state departments of health with information that identifies the health care facilities in their state that participate in NHSN.
- Provide to state agencies, at their request, facility-specific, NHSN patient safety component and health care personnel safety

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- Greater diversity in the types of facilities reporting to NHSN with growth in the number of Long Term Acute Care Hospitals (LTACHs) and Inpatient Rehabilitation Facilities (IRFs) (Table 1).
- Nearly 18% of all facilities contributing to this report are acute care hospitals with 50 beds or less (Table 2).
- This report includes pooled means specific to Critical Access Hospitals (CAHs), allowing for targeted prevention efforts in this setting.
- All Device-associated (DA) rates continue to be higher in major teaching locations (where stratified) than in non-major teaching counterparts.
- Rates in Burn critical care (CC) locations continue to be higher than all other CC location types for all DA event types (Tables 3, 5, and 6).
- When compared to the previous report, CAUTI rates have increased in every critical care location type, with the exception of Surgical CC – All others (Table 5).
- In reviewing the percentile distributions for each event type, collectively, CAUTI rates have the widest distributions, and nearly all of the 90th percentiles are > 3.0/1,000 urinary catheter days (Table 5).
- CLABSI pooled mean rates and central line device utilization (DU) ratios in LTACH critical care units are higher than almost all other critical care location types (Table 3) in all facility types.
- CAUTI pooled mean rates and urinary catheter DU ratios in LTACH Ward units are higher than almost all other ward location types (Table 5).
- The CAUTI pooled mean rate is significantly higher in CAH non-critical care units than in CAH critical care units ($p < 0.0001$) (Table 5).
- VAP rates are higher in Level 2/3 NICUs than Level 3 NICUs, in each birth weight category (Tables 9–10).

Fig 1. Highlights from this report.

component adverse event and prevention practice adherence data for surveillance, prevention, or mandatory public reporting.

Patient- and facility-specific data reported to CDC are kept confidential in accordance with sections 304, 306, and 308(d) of the Public Health Service Act (42 USC 242b, 242k, and 242m(d)).

METHODS

Data collection methods

For reporting to the DA Module, health care facility personnel responsible for infection prevention and patient safety may choose, with consideration of state mandates, federal reporting programs, and prevention initiatives, to collect data on central line-associated bloodstream infections (CLABSI), ventilator-associated pneumonias (VAP), or urinary catheter-associated urinary tract infections (CAUTI) that occur in patients staying in a patient care location such as a critical or intensive care unit (ICU), specialty care area, or inpatient ward. In NHSN, locations are further stratified according to patient population: adults, children, or neonates (in tables, pediatric and neonatal locations are so noted). In neonatal intensive care unit (NICU) locations (level III or level II/III), infection preventionists (IPs) collect data on CLABSI or VAP that occur in patients in each of five birth-weight categories (≤ 750 g, 751–1,000 g, 1,001–1,500 g, 1,501–2,500 g, and $> 2,500$ g); data on CAUTI are not collected as part of the NHSN protocols in any NICU location. Corresponding location-specific denominator data consisting of patient-days and specific device-days are also collected by IPs or other trained personnel.

In non-NICU locations, the device-days consist of the total number of central line-days, urinary catheter-days, or ventilator-

days. For specialty care areas and oncology units, such as hematology/oncology and hematopoietic stem cell transplant locations, central line-days are split into those with only a permanent central line vs those with temporary central lines (with or without a permanent central line). In NICU locations, the device-days consist of the total number of central line-days (inclusive of umbilical catheters), or ventilator-days for each birth-weight category.

Data analysis methods

Compared to the previous report, five new locations — gastrointestinal ward, pediatric orthopedic ward, inpatient hospice ward, solid tumor ward, and pediatric inpatient rehabilitation facility — had sufficient data to be included in this report.¹

Locations were further stratified by facility type, unit bed size and/or major teaching status to determine if pooled mean rates, medians, and empirical distributions significantly differed between two groups for all DA infections; if differences were present, the strata were retained for reporting. Comparisons of pooled mean rates were performed using Poisson regression. These comparisons could be influenced by potential outlier rates from locations with disproportionately large denominators. Therefore, greater weight was given to the results of nonparametric tests comparing the medians for location shift and empirical distributions for assessing differences across the range of reported rates. These nonparametric comparisons by definition require no validity assumptions and provide test results that are not subject to the potential weighting influence of high or low rates with large denominators. Comparisons of the pooled mean, median and percentile distribution were made if there were at least 50 locations contributing to one or more strata and at least

Table 1
NHSN facilities contributing data used in this report

Hospital type	N (%)
Children's	70 (1.6)
Critical access	324 (7.3)
General, including acute, trauma, and teaching	3,200 (72.0)
Long-term acute care	465 (10.5)
Military	34 (0.8)
Oncology	12 (0.3)
Orthopedic	14 (0.3)
Psychiatric	10 (0.2)
Rehabilitation	237 (5.3)
Surgical	51 (1.1)
Veterans' Affairs	12 (0.3)
Women's	6 (0.1)
Women's and Children's	9 (0.2)
Total	4,444

20 locations contributing to the percentile distribution in both strata.

Existing strata were retained for adult combined medical/surgical ICUs, medical ICUs, and surgical ICUs. The data for adult combined medical/surgical ICUs were split by medical school affiliation and unit bedsize, resulting in three groups: "major teaching," "all others" with unit bedsize ≤ 15 beds, and "all others" with unit bedsize >15 . The data for adult medical ICUs and adult surgical ICUs were split into two groups by teaching status. Hospitals self-identified their teaching hospital status through the annual NHSN facility survey. A major teaching hospital was defined as a hospital that has a program for medical students and post-graduate medical training. Locations within critical access hospitals (CAHs) were compared to their counterparts in all other acute care hospitals. The statistical evidence indicated that there was a significant difference in these strata and therefore, data from CAHs have been reported separate from all other location types. Adult hematology/oncology locations were also evaluated to assess importance of status as an oncology hospital, but differences were not significant and no new strata for this population were retained.

Device utilization (DU) was calculated as a ratio of device-days to patient-days for each location type. As such, the DU of a location is one measure of the use of invasive devices and constitutes an extrinsic risk factor for health care-associated infection.¹⁰ DU may also serve as a marker for severity of illness of patients (ie more severely ill patients are more likely to require an invasive device) which is another reflection of the intrinsic susceptibility to infection.

Data from at least 5 different reporting units of a given location type were used to determine pooled mean DA infection rates and DU ratios. Percentile distributions were determined if there were data from at least 20 different locations, excluding rates or DU ratios for locations that did not report at least 50 device-days or patient-days. Because of these requirements, the number of locations contributing data may vary among the tables.

RESULTS

In 2012, 4,444 enrolled facilities reported at least one month of DA denominator data for some patient cohorts under surveillance. These 4,444 facilities were located in 53 states, territories, and the District of Columbia and were predominantly general acute care

hospitals (Table 1); 27% of all facilities that reported data were smaller organizations of 50 beds or less, comprised mostly of acute care hospitals that were not identified as critical access. Among LTACHs and IRFs, 59% and 86%, respectively, were categorized as physically free-standing from a hospital setting (Table 2). Where data volume was sufficient for this report, we tabulated DA infection rates and DU ratios for January through December 2012 (Tables 3–10). Data on the specific criteria used to report DA infections are provided in Tables 11–18.

Tables 3–6 update and augment previously published DA rates and DU ratios by type of non-NICU locations.¹ Based on results of statistical comparisons, data from CAHs are reported separately from all other acute care hospitals. These data are further stratified into combined critical care units and combined non-critical care units.

Tables 7–10 update and augment the previously published DA rates and DU ratios by birth-weight category for NICU locations.¹ Beginning in January 2012, CLABSI data in NICU locations were no longer collected according to central line type (ie, central line and umbilical catheter); therefore, CLABSI rates and DU ratios for NICUs are not stratified by line type in this report.

Tables 11–18 provide data on select attributes of the DA infections for each location. For example, Tables 11, 12, 15 and 16 show the frequency and percent distribution of the specific sites of CLABSI and the criteria used for identifying these infections. Note that for these tables, criteria 2 and 3, which involve common commensals only, have been combined.

DISCUSSION

This report summarizes the HAI data reported to the DA module of NHSN during 2012. Compared to the health care facility types for which HAI data were summarized in the last published report, in this report there is a slight increase in smaller hospitals, IRFs, and LTACHs.¹ Based on the number of facilities reporting, overall contribution from all facility types to the device-associated module increased by 15% from the last report.¹ This increase in reporting is largely attributable to health care facilities' participation in CMS's Quality Reporting Programs which require participants to use NHSN as the tool to report CLABSI data from all acute care hospital adult, pediatric, and neonatal ICUs (effective as of January 2011) and all LTACH locations, as well as CAUTI data from all acute care hospital adult and pediatric ICUs, and all LTACH and IRF locations (effective as of January 2012).^{8,9} While this growth impacted the volume of reporting in these designated settings, there is also an indication of increased participation in ward locations for CLABSI and CAUTI surveillance.

Extensive analyses of the impact of facility type and medical school affiliation on all DA infection rates were performed for select locations. Medical school affiliation continues to be a significant factor for all three DA infection rates and/or percentile distributions in medical ICUs and surgical ICUs. All DA infection rate pooled means in this report continue to be higher in those locations stratified as major teaching compared to their non-major teaching counterparts. This suggests room for targeted prevention efforts in these settings that care for higher complexity patients. Additionally, medical school affiliation and bed size both continue to be significant factors in DA infection rates for medical/surgical ICUs. Note that while the CLABSI rates between unit bedsize strata in medical/surgical "all other" ICUs are equal (Table 3), the

Table 2
Enrolled NHSN facilities contributing data used in this report by facility type and bedsize

Facility type	Bed size category				Total N (%)
	50 N (%)	51-200 N (%)	201-500 N (%)	>500 N (%)	
Acute care hospitals	802 (18.0)	1,596 (35.9)	1,086 (24.4)	258 (5.8)	3,742 (84.2)
Major teaching	16 (0.4)	99 (2.2)	215 (4.8)	145 (3.3)	475 (10.7)
Graduate teaching	33 (0.7)	202 (4.5)	238 (5.4)	55 (1.2)	528 (11.9)
Undergraduate teaching	16 (0.4)	63 (1.4)	38 (0.8)	3 (0.1)	120 (2.7)
Nonteaching	737 (16.6)	1,232 (27.7)	595 (13.4)	55 (1.2)	2,619 (58.9)
Long term acute care hospitals	274 (6.2)	181 (4.1)	10 (0.2)	0 (0.0)	465 (10.5)
Free-standing	104 (2.3)	161 (3.6)	9 (0.2)	0 (0.0)	274 (6.2)
Within a hospital	170 (3.8)	20 (0.5)	1 (0.0)	0 (0.0)	191 (4.3)
Inpatient rehabilitation facilities	102 (2.3)	131 (2.9)	3 (0.1)	1 (0.0)	237 (5.3)
Free-standing	82 (1.8)	118 (2.6)	3 (0.1)	1 (0.0)	204 (4.6)
Within a health care facility*	20 (0.5)	13 (0.3)	0 (0.0)	0 (0.0)	33 (0.7)
Total	1,178 (26.5)	1,908 (42.9)	1,099 (24.7)	259 (5.8)	4,444

Major: Facility has a program for medical students and post-graduate medical training.

Graduate: Facility has a program for post-graduate medical training (ie, residency and/or fellowships).

Undergraduate: Facility has a program for medical students only.

Free-standing/within a hospital or health care facility: Describes physical placement of LTACH or IRF and does not define financial or administrative relationship with other health care facility types.

*Does not include inpatient rehabilitation facilities reporting to NHSN as locations within enrolled acute care hospitals.

Table 3
Pooled means and key percentiles of the distribution of laboratory-confirmed central line associated BSI rates and central line utilization ratios, by type of location, DA module, 2012

Type of location	Central line-associated BSI rate*				Percentile				
	No. of locations [†]	No. of CLABSI	Central line-days	Pooled mean	10%	25%	50% (median)	75%	90%
Acute Care Hospitals									
Critical Care									
Burn	73 (72)	265	78,825	3.4	0.0	0.7	2.2	5.2	9.3
Medical									
Major teaching	231 (230)	792	625,053	1.3	0.0	0.5	1.1	1.9	2.8
Medical									
All other	459 (433)	684	627,374	1.1	0.0	0.0	0.5	1.5	2.9
Medical cardiac	409 (403)	630	597,529	1.1	0.0	0.0	0.8	1.6	2.5
Medical/surgical									
Major teaching	328 (324)	940	765,267	1.2	0.0	0.0	1.0	1.8	3.0
Medical/surgical									
All other 15 beds	1,690 (1,562)	1,226	1,312,634	0.9	0.0	0.0	0.0	1.2	2.6
Medical/surgical									
All other > 15 beds	803 (801)	1,894	2,110,694	0.9	0.0	0.0	0.7	1.4	2.2
Neurologic	55 (54)	83	80,900	1.0	0.0	0.0	0.5	1.6	2.5
Neurosurgical	174	361	314,752	1.1	0.0	0.0	0.9	1.9	2.8
Pediatric cardiothoracic	41	189	134,529	1.4	0.0	0.8	1.3	2.1	2.5
Pediatric medical	33 (24)	29	24,297	1.2	0.0	0.0	0.6	2.7	3.8
Pediatric medical/surgical	317 (293)	573	401,074	1.4	0.0	0.0	0.8	2.1	2.9
Pediatric surgical	6	3	3,457	0.9					
Prenatal	6 (3)	1	376	2.7					
Respiratory	10	18	15,254	1.2					
Surgical									
Major teaching	178	529	445,486	1.2	0.0	0.3	0.9	1.8	2.8
Surgical									
All other	210 (203)	357	387,095	0.9	0.0	0.0	0.7	1.5	2.5
Surgical cardiothoracic	459 (457)	803	950,847	0.8	0.0	0.0	0.5	1.2	2.0
Trauma	153	547	341,619	1.6	0.0	0.5	1.3	2.4	3.9
Step-Down Units									
Adult step-down (post-critical care)	585 (570)	527	667,879	0.8	0.0	0.0	0.0	1.2	2.3
Step-down NICU (level II)	42 (20)	4	5,096	0.8	0.0	0.0	0.0	0.0	0.0
Pediatric step-down (post-critical care)	14	26	13,962	1.9					
Inpatient Wards									
Acute stroke	20	15	14,038	1.1	0.0	0.0	0.0	1.4	3.4
Antenatal	18 (6)	1	1,554	0.6					
Behavioral health/psychiatry	104 (31)	5	9,032	0.6	0.0	0.0	0.0	0.0	0.0
Burn	17	21	8,877	2.4					
Gastrointestinal	6	19	10,619	1.8					
Genitourinary	14 (12)	19	17,005	1.1					
Geronotology	10 (9)	3	5,940	0.5					
Gynecology	51 (28)	6	10,916	0.5	0.0	0.0	0.0	0.0	1.1
Jail	14 (12)	12	7,350	1.6					
Labor and delivery	57 (2)	0	802	0.0					
Labor, delivery, recovery, postpartum suite	111 (16)	4	3,182	1.3					
Medical	917 (877)	962	1,080,386	0.9	0.0	0.0	0.0	1.3	2.5

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Table 3
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Central line-associated BSI rate ^a					Percentile				
Type of location	No. of locations ¹	No. of CLABSI	Central line-days	Pooled mean	10%	25%	50% (median)	75%	90%
Medical/surgical	2,048 (1,932)	1,592	1,938,992	0.8	0.0	0.0	0.0	1.1	2.2
Neurologic	64 (63)	54	64,719	0.8	0.0	0.0	0.0	1.4	2.6
Neurosurgical	63 (61)	44	54,802	0.8	0.0	0.0	0.0	0.8	2.2
Orthopedic	274 (247)	78	172,241	0.5	0.0	0.0	0.0	0.0	1.7
Orthopedic trauma	21 (20)	26	22,588	1.2	0.0	0.0	0.4	1.6	2.1
Pediatric medical	52 (47)	48	49,399	1.0	0.0	0.0	0.0	1.1	2.3
Pediatric medical/surgical	286 (216)	226	212,654	1.1	0.0	0.0	0.0	1.1	2.3
Pediatric orthopedic	10 (3)	1	2,034	0.5					
Pediatric rehabilitation - non-IRF ²	8	8	4,418	1.8					
Pediatric surgical	14	15	15,668	1.0					
Postpartum	155 (23)	2	3,647	0.5	0.0	0.0	0.0	0.0	0.0
Pulmonary	41	69	66,228	1.0	0.0	0.0	0.7	1.3	2.7
Rehabilitation - non-IRF ²	32 (26)	4	15,786	0.3	0.0	0.0	0.0	0.0	0.0
Surgical	507 (482)	452	555,766	0.8	0.0	0.0	0.3	1.4	2.8
Telemetry	298 (293)	241	277,559	0.9	0.0	0.0	0.0	1.3	2.7
Vascular Surgery	25	21	37,652	0.6	0.0	0.0	0.0	1.3	1.9
Well-Baby Nursery	16 (3)	0	486	0.0					
Chronic Care Units ³									
Chronic care	24	18	24,932	0.7	0.0	0.0	0.0	0.9	1.8
Inpatient hospice	5	0	3,089	0.0					
Ventilator dependent unit	7	15	13,193	1.1					
Critical Access Hospitals									
Critical care units ¹	153 (74)	10	17,942	0.6	0.0	0.0	0.0	0.0	0.0
Non-critical care units ⁴	181 (126)	21	37,932	0.6	0.0	0.0	0.0	0.0	0.0
Long-Term Acute Care Hospitals ⁵									
Adult critical care	63	147	90,703	1.6	0.0	0.0	1.1	2.6	4.4
Adult ward	574 (564)	1,967	1,879,822	1.0	0.0	0.0	0.8	1.6	2.4
Inpatient Rehabilitation Facilities ^{6*}									
Adult rehabilitation units - Freestanding	69 (64)	17	44,818	0.4	0.0	0.0	0.0	0.0	1.0
Adult rehabilitation units - Within health care facility	323 (288)	86	133,910	0.6	0.0	0.0	0.0	0.0	2.4
Central line utilization ratio ^{††}					Percentile				
Type of location	No. of locations ¹	Central line-days	Patient-days	Pooled mean	10%	25%	50% (median)	75%	90%
Acute Care Hospitals									
Critical Care									
Burn	73	78,825	165,242	0.48	0.21	0.32	0.46	0.61	0.75
Medical									
Major teaching	231	625,053	1,065,875	0.59	0.39	0.50	0.59	0.68	0.76
Medical									
All other	459 (454)	627,374	1,403,932	0.45	0.12	0.23	0.41	0.57	0.69
Medical cardiac	409	597,529	1,421,371	0.42	0.18	0.30	0.41	0.56	0.69
Medical/surgical									
Major teaching	328 (327)	765,267	1,380,023	0.55	0.27	0.41	0.53	0.65	0.71
Medical/surgical									
All other < 15 beds	1,690 (1,669)	1,312,634	3,774,615	0.35	0.10	0.19	0.33	0.49	0.62
Medical Surgical									
All other > 15 beds	803	2,110,694	4,378,657	0.48	0.29	0.40	0.51	0.60	0.69
Neurologic	55 (54)	80,900	160,483	0.50	0.22	0.35	0.49	0.59	0.74
Neurosurgical	174	314,752	721,754	0.44	0.25	0.35	0.43	0.53	0.63
Pediatric cardiothoracic	41	134,529	187,490	0.72	0.52	0.59	0.76	0.87	0.91
Pediatric medical	33 (29)	24,297	56,936	0.43	0.10	0.21	0.29	0.39	0.48
Pediatric medical/surgical	317 (313)	401,074	880,238	0.46	0.15	0.23	0.36	0.51	0.60
Pediatric surgical	6	3,457	9,252	0.37					
Prenatal	6	376	6,974	0.05					
Respiratory	10	15,254	32,728	0.47					
Surgical									
Major teaching	178	445,486	753,588	0.59	0.37	0.47	0.58	0.70	0.77
Surgical									
All other	210 (208)	387,095	717,985	0.54	0.33	0.44	0.55	0.66	0.75
Surgical cardiothoracic	459 (458)	950,847	1,428,269	0.67	0.37	0.50	0.68	0.81	0.90
Trauma	153	341,619	631,876	0.54	0.35	0.45	0.54	0.63	0.70
Step-Down Units									
Adult step-down (post-critical care)	585 (583)	667,879	3,188,720	0.21	0.08	0.12	0.19	0.29	0.40
Step-down NICU (level II)	42 (40)	5,096	79,525	0.06	0.01	0.03	0.06	0.09	0.15
Pediatric step-down (post-critical care)	14	13,962	51,428	0.27					
Inpatient Wards									
Acute stroke	20	14,038	111,017	0.13	0.06	0.09	0.11	0.14	0.16
Antenatal	18	1,554	27,399	0.06					
Behavioral health/psychiatry	104	9,032	257,975	0.04	0.00	0.01	0.01	0.03	0.05
Burn	17	8,877	41,957	0.21					
Gastrointestinal	6	10,619	38,469	0.28					
Genitourinary	14	17,005	72,775	0.23					

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Table 3
continued

Type of location	No. of locations [†]	Central line-days	Patient-days	Pooled mean	Percentile				
					10%	25%	50% (median)	75%	90%
Geronotology	10	5,940	51,878	0.11					
Gynecology	51 (50)	10,916	124,952	0.09	0.01	0.02	0.04	0.08	0.14
Jail	14	7,350	46,237	0.16					
Labor and delivery	57 (56)	802	53,708	0.01	0.00	0.01	0.01	0.03	0.06
Labor, delivery, recovery, postpartum suite	111 (110)	3,182	147,766	0.02	0.00	0.01	0.01	0.03	0.06
Medical	917 (911)	1,080,386	6,325,631	0.17	0.06	0.09	0.15	0.21	0.30
Medical/surgical	2,048 (2,038)	1,938,992	13,323,221	0.15	0.05	0.08	0.12	0.17	0.26
Neurologic	64	64,719	460,682	0.14	0.06	0.09	0.14	0.18	0.21
Neurosurgical	63	54,802	400,128	0.14	0.06	0.08	0.14	0.18	0.22
Orthopedic	274	172,241	1,629,594	0.11	0.02	0.05	0.08	0.13	0.17
Orthopedic Trauma	21	22,588	149,270	0.15	0.03	0.10	0.15	0.17	0.21
Pediatric medical	52	49,399	234,474	0.21	0.04	0.08	0.16	0.26	0.39
Pediatric medical/surgical	286 (284)	212,654	1,142,975	0.19	0.02	0.05	0.10	0.22	0.34
Pediatric orthopedic	10	2,034	12,684	0.16					
Pediatric rehabilitation - non-IRF [‡]	8	4,418	24,829	0.18					
Pediatric surgical	14	15,668	70,738	0.22					
Postpartum	155	3,647	318,836	0.01	0.00	0.00	0.01	0.02	0.04
Pulmonary	41	66,228	290,991	0.23	0.10	0.14	0.22	0.31	0.38
Rehabilitation - non-IRF [‡]	32	15,786	122,348	0.13	0.03	0.06	0.11	0.18	0.31
Surgical	507 (506)	555,766	3,336,490	0.17	0.05	0.09	0.14	0.21	0.27
Telemetry	298	277,559	2,111,059	0.13	0.05	0.09	0.13	0.17	0.23
Vascular surgery	25	37,652	178,330	0.21	0.09	0.11	0.19	0.27	0.40
Well-Baby Nursery	16 (14)	486	11,649	0.04					
Chronic Care Units [§]									
Chronic care unit	24 (23)	24,932	104,024	0.24	0.04	0.09	0.17	0.33	0.61
Inpatient hospice	5	3,089	10,670	0.29					
Ventilator dependent unit	7	13,193	41,749	0.32					
Critical Access Hospitals									
Critical care units	153 (136)	17,942	113,098	0.16	0.06	0.10	0.17	0.23	0.34
Non-critical care units [¶]	181 (177)	37,932	415,592	0.09	0.03	0.04	0.07	0.10	0.16
Long-Term Acute Care Hospitals [#]									
Adult critical care	63	90,703	147,465	0.62	0.53	0.66	0.78	0.88	0.93
Adult ward	574 (573)	1,879,822	3,069,199	0.61	0.30	0.52	0.66	0.76	0.86
Inpatient Rehabilitation Facilities ^{**}									
Adult rehabilitation units - Freestanding	69	44,818	578,554	0.08	0.02	0.04	0.06	0.10	0.15
Adult rehabilitation units - Within health care facility	323 (322)	133,910	1,394,340	0.10	0.04	0.06	0.08	0.12	0.16

BSI, bloodstream infection; CLABSI, central line-associated BSI; NICU, neonatal intensive care unit.

* $\frac{\text{Number of CLABSI}}{\text{Number of central line} - \text{days}} \times 1,000$.

[†]The number in parentheses is the number of locations meeting minimum requirements for percentile distributions (ie, ≥ 50 device days for rate distributions, ≥ 50 patient days for device utilization ratios) if less than total number of locations. If this number is < 20 , percentile distributions are not calculated.

^{††} $\frac{\text{Number of central line} - \text{days}}{\text{Number of patient} - \text{days}}$

[‡]Includes only in-hospital rehabilitation wards that are not defined as inpatient rehabilitation facilities (IRF) per the CMS Inpatient Rehabilitation Facility Quality Reporting Program.

[§]Includes chronic care locations within the general acute care hospital setting.

^{||}Combines all critical care unit types within critical access hospitals.

[¶]Combines all units not identified as critical care (eg, inpatient wards, step-down units) within critical access hospitals.

[#]Includes free-standing long-term acute care hospitals and long-term acute care locations within the general acute care hospital setting.

^{**}Includes free-standing inpatient rehabilitation facilities and inpatient rehabilitation facilities within the acute care hospital setting, as defined by the CMS Inpatient Rehabilitation Facility Quality Reporting Program.

percentile distributions were shown to be significantly different as a result of nonparametric statistical tests. Therefore, this stratification by unit bedside in “all other” medical/surgical ICUs was retained. Adult hematology/oncology locations were not further stratified by hospital type (ie, oncology hospital vs all other acute care hospitals) as the results of the statistical tests indicated that the differences in the strata were not statistically significant. In 2013, oncology and general acute care hospitals were provided with fourteen oncology-specific CDC locations with which to identify for device-associated infection surveillance. As the volume of these data become sufficient, future

analyses will continue to assess any potential differences in this specialized population.

In 2012, facilities participating in NHSN were able to designate themselves as CAHs. This information allowed for the comparison of DA rates and DU ratios in these hospitals to all other hospitals. The results of the statistical tests indicated that DA rates and DU ratios in CAHs are significantly different from all other hospitals and therefore, CAHs are now able to compare themselves to pooled means generated from like-hospitals. This allows for more targeted prevention efforts in this unique setting.

Table 4
Pooled means and key percentiles of the distribution of laboratory-confirmed permanent and temporary central line-associated BSI rates and central line utilization ratios, by type of speciality care area/oncology location, DA module, 2012

Permanent Central line-associated BSI rate*					Percentile				
Type of location	No. of locations [†]	No. of PCLABSI	Permanent central line-days	Pooled mean	10%	25%	50% (median)	75%	90%
Specialty Care Area/Oncology									
General hematology/oncology	178 (174)	402	300,231	1.3	0.0	0.0	0.8	1.7	3.0
Hematopoietic stem cell transplant	54 (53)	256	118,924	2.2	0.0	0.4	1.3	2.9	5.0
Pediatric general hematology/oncology	46	257	151,942	1.7	0.0	0.6	1.1	2.4	3.5
Pediatric hematopoietic stem cell transplant	16	93	33,176	2.8					
Solid organ transplant	20 (17)	20	11,675	1.7					
Solid tumor	6	15	18,032	0.8					
Temporary Central line-associated BSI rate [‡]					Percentile				
Type of location	No. of locations [†]	No. of TCLABSI	Temporary central line-days	Pooled mean	10%	25%	50% (median)	75%	90%
Specialty Care Area/Oncology									
General hematology/oncology	185 (180)	491	257,889	1.9	0.0	0.0	1.2	2.5	4.5
Hematopoietic stem cell transplant	56	294	109,591	2.7	0.0	0.5	2.4	3.7	4.8
Pediatric general hematology/oncology	44	94	40,141	2.3	0.0	0.0	2.0	2.8	4.5
Pediatric hematopoietic stem cell transplant	15 (13)	22	9,549	2.3					
Solid organ transplant	23 (22)	64	44,202	1.4	0.0	0.4	1.2	1.9	3.4
Solid tumor	6	17	6,730	2.5					
Permanent Central line utilization ratio [§]					Percentile				
Type of location	No. of locations [†]	Permanent central		Pooled mean	10%	25%	50% (median)	75%	90%
		line-days	Patient-days						
Specialty Care Area/Oncology									
General hematology/oncology	178 (177)	300,231	999,114	0.30	0.10	0.18	0.25	0.39	0.52
Hematopoietic stem cell transplant	54	118,924	243,340	0.49	0.14	0.29	0.44	0.63	0.83
Pediatric general hematology/oncology	46	151,942	243,377	0.62	0.36	0.47	0.60	0.72	0.85
Pediatric hematopoietic stem cell transplant	16	33,176	46,688	0.71					
Solid organ transplant	20	11,675	106,289	0.11	0.02	0.04	0.07	0.10	0.26
Solid tumor	6	18,032	77,293	0.23					
Temporary Central line utilization ratio					Percentile				
Type of location	No. of locations [†]	Temporary central		Pooled mean	10%	25%	50% (median)	75%	90%
		line-days	Patient-days						
Specialty Care Area/Oncology									
General hematology/oncology	185 (184)	257,889	1,044,242	0.25	0.09	0.14	0.20	0.33	0.44
Hematopoietic stem cell transplant	56	109,591	252,048	0.43	0.11	0.24	0.44	0.62	0.79
Pediatric general hematology/oncology	44	40,141	224,294	0.18	0.05	0.09	0.13	0.22	0.36
Pediatric hematopoietic stem cell transplant	15	9,549	45,420	0.21					
Solid organ transplant	23 (22)	44,202	127,153	0.35	0.15	0.19	0.34	0.49	0.73
Solid tumor	6	6,730	78,482	0.09					

BSI, bloodstream infection; PCLABSI, permanent central line-associated BSI; TCLABSI, temporary central line-associated BSI.

* $\frac{\text{Number of PCLABSI}}{\text{Number of permanent central line} - \text{days}} \times 1,000$.

[†]The number in parentheses is the number of locations meeting minimum requirements for percentile distributions (ie, ≥ 50 device days for rate distributions, ≥ 50 patient days for device utilization ratios) if less than total number of locations. If this number is < 20 , percentile distributions are not calculated.

[‡] $\frac{\text{Number of TCLABSI}}{\text{Number of temporary central line} - \text{days}} \times 1,000$.

[§] $\frac{\text{Number of permanent central line} - \text{days}}{\text{Number of patient} - \text{days}}$.

^{||} $\frac{\text{Number of temporary central line} - \text{days}}{\text{Number of patient} - \text{days}}$.

In producing this report, there were several areas identified for which prevention activities and further investigation may be needed, both at the national and local levels. For example, the CLABSI pooled mean rate for LTACH critical care units is higher than most other critical care unit types (Table 3). Similarly, the CAUTI pooled mean rate for LTACH wards is higher than CAUTI pooled mean rates in the majority of other ward-level locations (Table 5). Further, when compared to the previous report, CAUTI rates have increased in every critical care unit type, with the exception of "Surgical critical care – all others" (Table 5).¹ Additional key findings from this report can be found in Figure 1.

Tables 11-18 were included to aid the reader in interpreting the DA infection rates data. One important use of data in these tables is to better understand the distribution of DA infections by type of reporting criterion nationally. For example, nearly 85% of the CLABSIs from adult and pediatric ICUs and inpatient wards were identified using criterion (1) which attributes the CLABSI to a recognized pathogen; however, for NICUs, only 70% used this criterion, resulting in a greater percentage of CLABSIs in this population that were identified with common commensals. Similarly, the specific type of ventilator-associated pneumonia (VAP) most frequently reported, regardless of location, was the clinical criterion

Table 5

Pooled means and key percentiles of the distribution of urinary catheter-associated UTI rates and urinary catheter utilization ratios, by type of location, DA module, 2012

Urinary catheter-associated UTI rate ^a					Percentile					
	Type of location	No. of locations [†]	No. of CAUTI	Urinary catheter-days	Pooled mean	10%	25%	50% (median)	75%	90%
Acute Care Hospitals										
Critical care units										
Burn	73	384	82,039	4.7	0.0	1.7	4.3	8.1	11.5	
Medical										
Major teaching	230	2,181	741,268	2.9	0.4	1.3	2.3	3.9	5.5	
Medical										
All other	460 (454)	1,438	852,627	1.7	0.0	0.0	1.0	2.3	3.7	
Medical cardiac	405	1,517	703,734	2.2	0.0	0.6	1.8	3.4	4.9	
Medical/Surgical										
Major teaching	328 (325)	2,280	935,001	2.4	0.0	0.9	2.0	3.5	5.2	
Medical/Surgical										
All other, 15 beds	1,688 (1,651)	2,521	2,032,215	1.2	0.0	0.0	0.6	1.8	3.2	
Medical/Surgical										
All other, >15 beds	797	4,387	2,766,887	1.6	0.0	0.6	1.3	2.2	3.3	
Neurologic	55 (54)	441	118,556	3.7	0.3	1.7	2.8	5.0	7.9	
Neurosurgical	173	2,464	489,391	5.0	1.1	2.7	4.3	6.2	8.3	
Pediatric cardiothoracic	32 (31)	61	28,823	2.1	0.0	0.8	2.1	3.4	5.0	
Pediatric medical	30 (21)	35	10,389	3.4	0.0	0.0	1.0	3.1	6.7	
Pediatric medical/surgical	297 (268)	452	166,710	2.7	0.0	0.0	1.6	3.8	6.0	
Pediatric surgical	5 (4)	1	1,346	0.7						
Respiratory	9	30	19,324	1.6						
Surgical										
Major teaching	176	1,800	558,102	3.2	0.6	1.5	2.7	4.5	6.6	
Surgical										
All other	209 (205)	918	491,868	1.9	0.0	0.6	1.3	2.5	3.9	
Surgical cardiothoracic	456 (455)	1,657	939,044	1.8	0.0	0.4	1.4	2.5	3.8	
Trauma	153 (152)	1,991	490,351	4.1	0.9	1.6	3.3	5.6	8.2	
Specialty Care Areas/Oncology										
General hematology/oncology	148 (143)	257	119,248	2.2	0.0	0.0	1.6	3.6	5.7	
Hematopoietic stem cell transplant	42 (38)	41	21,134	1.9	0.0	0.0	0.8	3.4	7.3	
Pediatric general hematology/oncology	24 (18)	9	3,252	2.8						
Pediatric hematopoietic stem cell transplant	5 (2)	1	277	3.6						
Solid organ transplant	16	37	22,667	1.6						
Solid tumor	6	58	25,785	2.2						
Step-down Units										
Adult step-down (post-critical care)	470 (466)	1,139	615,962	1.8	0.0	0.0	1.2	2.7	4.6	
Pediatric step-down (post-critical care)	12 (7)	1	970	1.0						
Inpatient Wards										
Acute stroke	15	26	17,456	1.5						
Antenatal	15 (12)	2	2,234	0.9						
Behavioral health/psychiatry	118 (50)	32	11,605	2.8	0.0	0.0	0.0	3.2	9.1	
Burn	16 (15)	32	6,061	5.3						
Genitourinary	12 (11)	11	11,409	1.0						
Gerontology	11	8	7,489	1.1						
Gynecology	59 (51)	26	29,614	0.9	0.0	0.0	0.0	1.1	3.1	
Jail	11 (7)	6	3,372	1.8						
Labor and delivery	95 (69)	15	28,435	0.5	0.0	0.0	0.0	0.0	1.6	
Labor, delivery, recovery, postpartum suite	167 (144)	30	63,794	0.5	0.0	0.0	0.0	0.0	1.2	
Medical	813 (788)	1,334	882,392	1.5	0.0	0.0	1.0	2.4	4.5	
Medical/Surgical	1,825 (1,765)	2,752	2,038,073	1.4	0.0	0.0	0.8	2.1	3.6	
Neurologic	56 (55)	159	78,211	2.0	0.0	0.6	1.6	3.0	5.3	
Neurosurgical	48	175	61,879	2.8	0.0	0.9	2.3	3.8	5.3	
Orthopedic	249 (239)	425	356,156	1.2	0.0	0.0	0.8	2.1	3.2	
Orthopedic trauma	17	68	31,586	2.2						
Pediatric medical	33 (16)	6	4,188	1.4						
Pediatric medical/surgical	209 (111)	55	31,738	1.7	0.0	0.0	0.0	1.4	6.6	
Pediatric orthopedic	5 (4)	1	2,086	0.5						
Pediatric rehabilitation - non-IRF [‡]	5 (1)	1	245	4.1						
Pediatric surgical	12 (8)	4	5,846	0.7						
Postpartum	215 (195)	61	115,138	0.5	0.0	0.0	0.0	0.0	2.4	
Pulmonary	29 (28)	88	44,393	2.0	0.0	0.7	1.4	2.2	4.7	
Rehabilitation - non-IRF [‡]	37 (31)	29	11,285	2.6	0.0	0.0	0.0	4.9	6.2	
Surgical	458 (450)	1,099	647,041	1.7	0.0	0.0	1.2	2.6	4.8	
Telemetry	207 (203)	400	286,809	1.4	0.0	0.0	1.1	2.1	3.6	
Vascular surgery	20	25	23,153	1.1	0.0	0.0	0.6	1.2	2.7	
Well-baby nursery	6 (0)	0	24	0.0						
Chronic Care Units[§]										
Chronic care	30 (29)	31	14,553	2.1	0.0	0.0	0.0	3.6	4.3	
Chronic care rehabilitation unit	12 (10)	6	2,278	2.6						
Inpatient hospice	5	2	5,509	0.4						
Ventilator dependent unit	5	40	8,311	4.8						
Critical Access Hospitals										

(continued on next page)

Table 5
continued

Urinary catheter-associated UTI rate*					Percentile				
Type of location	No. of locations [†]	No. of CAUTI	Urinary catheter-days	Pooled mean	10%	25%	50% (median)	75%	90%
Critical care units [‡]	140 (119)	25	35,833	0.7	0.0	0.0	0.0	0.0	3.8
Non-critical care units [¶]	276 (239)	173	98,900	1.7	0.0	0.0	0.0	3.0	6.2
Long-Term Acute Care Hospitals [#]									
Adult critical care	61	148	57,468	2.6	0.0	0.0	1.5	4.3	6.4
Adult ward	588 (580)	2,537	1,282,295	2.0	0.0	0.0	1.6	3.0	4.9
Inpatient Rehabilitation Facilities**									
Adult rehabilitation units - Freestanding	286 (260)	348	119,422	2.9	0.0	0.0	1.1	4.8	9.3
Adult rehabilitation units - Within hospital	888 (662)	569	180,177	3.2	0.0	0.0	0.0	4.5	9.9
Pediatric rehabilitation units - Within hospital	10 (5)	2	1,087	1.8					
Urinary catheter utilization ratio ^{††}					Percentile				
Type of location	No. of locations [†]	Urinary catheter-days	Patient days	Pooled mean	10%	25%	50% (median)	75%	90%
Acute Care Hospitals									
Critical care units									
Burn	73	82,039	163,298	0.50	0.24	0.35	0.48	0.64	0.84
Medical									
Major teaching	230	741,268	1,061,826	0.70	0.53	0.64	0.73	0.79	0.85
Medical									
All other	460 (456)	852,627	1,401,026	0.61	0.32	0.50	0.64	0.74	0.82
Medical cardiac	405	703,734	1,393,767	0.50	0.29	0.42	0.54	0.66	0.76
Medical/Surgical									
Major teaching	328 (327)	935,001	1,371,681	0.68	0.46	0.58	0.69	0.77	0.83
Medical/Surgical									
All other, 15 beds	1,688 (1,670)	2,032,215	3,800,961	0.53	0.31	0.45	0.60	0.72	0.79
Medical/Surgical									
All other, >15 beds	797	2,766,887	4,338,434	0.64	0.46	0.59	0.70	0.77	0.82
Neurologic	55	118,556	157,449	0.75	0.48	0.64	0.76	0.85	0.88
Neurosurgical	173	489,391	713,836	0.69	0.46	0.61	0.72	0.80	0.86
Pediatric cardiothoracic	32	28,823	129,344	0.22	0.07	0.16	0.20	0.30	0.36
Pediatric medical	30 (27)	10,389	49,809	0.21	0.05	0.09	0.13	0.21	0.34
Pediatric medical/surgical	297 (292)	166,710	775,828	0.21	0.08	0.13	0.19	0.26	0.32
Pediatric surgical	5	1,346	3,792	0.35					
Respiratory	9	19,324	32,296	0.60					
Surgical									
Major teaching	176	558,102	745,658	0.75	0.55	0.67	0.77	0.84	0.89
Surgical									
All other	209 (205)	491,868	708,482	0.69	0.52	0.64	0.75	0.82	0.88
Surgical cardiothoracic	456 (455)	939,044	1,417,609	0.66	0.41	0.55	0.70	0.80	0.89
Trauma	153	490,351	631,132	0.78	0.60	0.71	0.80	0.86	0.93
Specialty Care Areas/Oncology									
General hematology/oncology	148 (147)	119,248	812,884	0.15	0.07	0.10	0.14	0.20	0.28
Hematopoietic stem cell transplant	42	21,134	192,836	0.11	0.03	0.05	0.08	0.16	0.23
Pediatric general hematology/oncology	24	3,252	113,041	0.03	0.01	0.01	0.02	0.03	0.08
Pediatric hematopoietic stem cell transplant	5	277	8,384	0.03					
Solid organ transplant	16	22,667	94,290	0.24					
Solid tumor	6	25,785	78,482	0.33					
Step-down Units									
Adult step-down (post-critical care)	470 (469)	615,962	2,480,340	0.25	0.11	0.17	0.25	0.37	0.50
Pediatric step-down (post-critical care)	12	970	37,889	0.03					
Inpatient Wards									
Acute stroke	15	17,456	77,769	0.22					
Antenatal	15	2,234	33,101	0.07					
Behavioral health/psychiatry	118	11,605	318,371	0.04	0.00	0.01	0.02	0.04	0.06
Burn	16	6,061	35,863	0.17					
Genitourinary	12	11,409	65,152	0.18					
Gerontology	11	7,489	60,604	0.12					
Gynecology	59 (58)	29,614	170,866	0.17	0.05	0.11	0.15	0.23	0.38
Jail	11	3,372	37,316	0.09					
Labor and delivery	95 (94)	28,435	168,958	0.17	0.01	0.06	0.11	0.21	0.35
Labor, delivery, recovery, postpartum suite	167 (166)	63,794	411,335	0.16	0.05	0.09	0.13	0.18	0.29
Medical	813 (809)	882,392	5,552,794	0.16	0.07	0.11	0.15	0.20	0.26
Medical/Surgical	1,825 (1,814)	2,038,073	11,501,523	0.18	0.09	0.12	0.17	0.22	0.29
Neurologic	56	78,211	376,137	0.21	0.08	0.14	0.19	0.24	0.34
Neurosurgical	48	61,879	315,157	0.20	0.10	0.15	0.19	0.24	0.35
Orthopedic	249 (248)	356,156	1,389,082	0.26	0.11	0.17	0.25	0.33	0.43
Orthopedic trauma	17	31,586	132,749	0.24					
Pediatric medical	33 (32)	4,188	102,201	0.04	0.00	0.01	0.02	0.04	0.10
Pediatric medical/surgical	209 (205)	31,738	654,343	0.05	0.01	0.01	0.03	0.07	0.12
Pediatric orthopedic	5	2,086	11,202	0.19					
Pediatric rehabilitation - non-IRF ^{‡‡}	5	245	6,965	0.04					
Pediatric surgical	12	5,846	48,474	0.12					

(continued on next page)

Table 5
continued

Type of location	No. of locations [†]	Urinary catheter-days	Patient days	Pooled mean	Percentile				
					10%	25%	50% (median)	75%	90%
Urinary catheter utilization ratio ^{††}									
Postpartum	215	115,138	880,621	0.13	0.03	0.08	0.12	0.17	0.24
Pulmonary	29	44,393	206,424	0.22	0.09	0.14	0.18	0.30	0.51
Rehabilitation - non-IRF [‡]	37 (36)	11,285	113,203	0.10	0.04	0.06	0.09	0.13	0.24
Surgical	458	647,041	2,887,968	0.22	0.11	0.16	0.22	0.29	0.39
Telemetry	207	286,809	1,484,465	0.19	0.11	0.14	0.19	0.25	0.30
Vascular surgery	20	23,153	139,105	0.17	0.06	0.11	0.15	0.20	0.27
Well-baby nursery	6 (4)	24	1,024	0.02					
Chronic Care Units [§]									
Chronic care	30 (27)	14,553	95,809	0.15	0.04	0.07	0.13	0.17	0.28
Chronic care rehabilitation unit	12	2,278	26,153	0.09					
Inpatient hospice	5	5,509	10,670	0.52					
Ventilator dependent unit	5	8,311	28,901	0.29					
Critical Access Hospitals									
Critical care units	140 (129)	35,833	118,365	0.30	0.19	0.31	0.43	0.54	0.66
Non-critical care units [¶]	276 (239)	98,900	609,462	0.16	0.08	0.12	0.16	0.22	0.30
Long-Term Acute Care Hospitals [#]									
Adult critical care	61	57,468	128,089	0.45	0.35	0.46	0.65	0.80	0.87
Adult ward	588 (587)	1,282,295	2,757,396	0.47	0.20	0.35	0.46	0.57	0.66
Inpatient Rehabilitation Facilities ^{**}									
Adult rehabilitation units - Freestanding	286	119,422	1,382,477	0.09	0.03	0.05	0.08	0.10	0.15
Adult rehabilitation units - Within hospital	888 (887)	180,177	2,171,747	0.08	0.02	0.05	0.07	0.11	0.17
Pediatric rehabilitation units - Within hospital	10	1,087	13,564	0.08					

UTI, urinary tract infection; CAUTI, catheter-associated UTI.

^{*} Number of CAUTI
^{*} Number of urinary catheter – days × 1,000.

[†]The number in parentheses is the number of locations meeting minimum requirements for percentile distributions (ie, ≥50 device days for rate distributions, ≥50 patient days for device utilization ratios) if less than total number of locations. If this number is <20, percentile distributions are not calculated.

[‡]Includes only in-hospital rehabilitation wards that are not defined as inpatient rehabilitation facilities (IRF) per the CMS Inpatient Rehabilitation Facility Quality Reporting Program.

[§]Includes chronic care locations within the general acute care hospital setting.

^{||}Combines all critical care unit types within critical access hospitals.

[¶]Combines all units not identified as critical care (eg, inpatient wards, step-down units) within critical access hospitals.

[#]Includes free-standing long-term acute care hospitals and long-term acute care locations within the general acute care hospital setting.

^{**}Includes free-standing inpatient rehabilitation facilities and inpatient rehabilitation facilities within the acute care hospital setting, as defined by the CMS Inpatient Rehabilitation Facility Quality Reporting Program.

^{††}Number of urinary catheter – days
Number of patient – days × 1,000.

Table 6

Pooled means and key percentiles of the distribution of ventilator-associated PNEU rates and ventilator utilization ratios, by type of location, DA module, 2012

Type of location	No. of locations [†]	No. of VAP	Ventilator-days	Pooled mean	Percentile				
					10%	25%	50% (median)	75%	90%
Ventilator-associated PNEU rate [*]									
Acute Care Hospitals									
Critical Care Units									
Burn	36 (34)	86	19,503	4.4	0.0	0.0	1.1	6.7	10.9
Medical									
Major teaching	112 (111)	205	212,392	1.0	0.0	0.0	0.5	1.6	2.9
Medical									
All other	223 (197)	191	206,731	0.9	0.0	0.0	0.0	1.3	3.4
Medical cardiac	178 (170)	135	139,864	1.0	0.0	0.0	0.0	1.5	3.6
Medical/surgical									
Major teaching	152 (145)	372	234,972	1.6	0.0	0.0	0.9	2.2	3.9
Medical/surgical									
All other 15 beds	841 (660)	419	383,926	1.1	0.0	0.0	0.0	1.2	3.6
Medical/surgical									
All other >15 beds	405 (400)	666	711,280	0.9	0.0	0.0	0.4	1.3	2.8
Neurologic	23	62	20,859	3.0	0.0	0.0	0.2	2.5	7.0
Neurosurgical	76 (74)	210	98,026	2.1	0.0	0.0	1.5	2.9	3.8
Pediatric cardiothoracic	20	9	36,187	0.2	0.0	0.0	0.0	0.2	0.6
Pediatric medical	16 (9)	2	6,634	0.3					
Pediatric medical/surgical	142 (132)	113	147,441	0.8	0.0	0.0	0.0	0.9	2.4
Pediatric surgical	5 (4)	1	2,328	0.4					
Respiratory	7	4	6,037	0.7					
Surgical									
Major teaching	81 (80)	280	127,251	2.2	0.0	0.6	1.5	3.1	5.6

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Table 6
continued

Ventilator-associated PNEU rate*					Percentile				
Type of location	No. of locations [†]	No. of VAP	Ventilator-days	Pooled mean	10%	25%	50% (median)	75%	90%
Surgical									
All other	93 (88)	192	96,388	2.0	0.0	0.0	0.9	2.8	5.9
Surgical cardiothoracic	207 (203)	319	190,785	1.7	0.0	0.0	0.6	2.5	5.1
Trauma	75 (74)	508	141,314	3.6	0.0	0.8	2.6	6.0	9.4
Specialty Care Areas/Oncology									
Hematopoietic stem cell transplant	5	0	1,951	0.0					
Step-Down Units									
Adult step-down (post-critical care)	102 (82)	31	42,462	0.7	0.0	0.0	0.0	0.0	1.8
Pediatric step-down (post-critical care)	5 (4)	1	5,813	0.2					
Step-down NICU (level II)	7 (1)	0	119	0.0					
Inpatient Wards									
Medical	39 (22)	3	6,472	0.5	0.0	0.0	0.0	0.0	1.4
Medical/surgical	64 (35)	22	25,731	0.9	0.0	0.0	0.0	0.0	1.3
Pediatric medical	6 (5)	0	2,026	0.0					
Pediatric medical/surgical	11 (8)	0	3,146	0.0					
Pulmonary	9 (8)	7	7,241	1.0					
Surgical	8 (1)	0	107	0.0					
Telemetry	10 (5)	1	1,770	0.6					
Critical Access Hospitals									
Critical care units [‡]	67 (14)	3	2,964	1.0					
Non-critical care units [§]	9 (1)	4	2,660	1.5					
Long-Term Acute Care Hospitals									
Adult critical care	18 (17)	8	12,544	0.6					
Adult ward	195 (190)	103	316,632	0.3	0.0	0.0	0.0	0.3	1.4
Ventilator utilization ratio [¶]					Percentile				
Type of location	No. of locations [†]	Ventilator-days	Patient-days	Pooled mean	10%	25%	50% (median)	75%	90%
Acute Care Hospitals									
Critical Care Units									
Burn	36	19,503	71,198	0.27	0.08	0.15	0.23	0.34	0.43
Medical									
Major teaching	112	212,392	477,003	0.45	0.28	0.37	0.45	0.54	0.63
Medical									
All other	223 (220)	206,731	606,883	0.34	0.08	0.16	0.28	0.42	0.55
Medical cardiac	178 (177)	139,864	547,699	0.26	0.09	0.16	0.25	0.33	0.40
Medical/surgical									
Major teaching	152 (150)	234,972	618,025	0.38	0.16	0.25	0.37	0.46	0.54
Medical/surgical									
All other 15 beds	841 (815)	383,926	1,616,191	0.24	0.05	0.10	0.19	0.32	0.43
Medical/surgical									
All other >15 beds	405	711,280	2,114,095	0.34	0.19	0.25	0.33	0.41	0.49
Neurologic	23	20,859	64,005	0.33	0.10	0.20	0.33	0.39	0.42
Neurosurgical	76	98,026	323,269	0.30	0.16	0.24	0.30	0.39	0.45
Pediatric cardiothoracic	20	36,187	86,054	0.42	0.25	0.34	0.41	0.50	0.54
Pediatric medical	16	6,634	21,470	0.31					
Pediatric medical/surgical	142 (141)	147,441	400,413	0.37	0.12	0.19	0.30	0.42	0.48
Pediatric surgical	5 (4)	2,328	8,039	0.29					
Respiratory	7	6,037	22,926	0.26					
Surgical									
Major teaching	81	127,251	320,792	0.40	0.23	0.29	0.40	0.48	0.53
Surgical									
All other	93 (92)	96,388	281,455	0.34	0.15	0.22	0.32	0.41	0.47
Surgical cardiothoracic	207 (206)	190,785	606,801	0.31	0.15	0.20	0.29	0.39	0.49
Trauma	75	141,314	301,607	0.47	0.34	0.41	0.47	0.53	0.63
Specialty Care Areas/Oncology									
Hematopoietic stem cell transplant	5	1,951	22,808	0.09					
Step-Down Units									
Adult step-down (post-critical care)	102 (101)	42,462	437,346	0.10	0.01	0.03	0.06	0.13	0.24
Pediatric step-down (post-critical care)	5	5,813	19,832	0.29					
Step-down NICU (level II)	7 (6)	119	4,073	0.03					
Inpatient Wards									
Medical	39	6,472	209,363	0.03	0.00	0.00	0.02	0.04	0.07
Medical/surgical	64	25,731	378,747	0.07	0.00	0.01	0.02	0.05	0.13
Pediatric medical	6	2,026	25,314	0.08					
Pediatric medical/surgical	11	3,146	62,702	0.05					
Pulmonary	9	7,241	51,428	0.14					
Surgical	8	107	15,644	0.01					
Telemetry	10	1,770	42,097	0.04					

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Table 6
continued

Ventilator utilization ratio [¶]	Type of location	No. of locations [†]	Ventilator-days	Patient-days	Pooled mean	Percentile				
						10%	25%	50% (median)	75%	90%
Critical Access Hospitals										
	Critical care units [‡]	67 (54)	2,964	30,983	0.10	0.01	0.04	0.07	0.12	0.16
	Non-critical care units [§]	9 (9)	2,660	12,632	0.21					
Long-Term Acute Care Hospitals										
	Adult critical care	18 (17)	12,544	41,665	0.30					
	Adult ward	195	316,632	1,474,536	0.21	0.07	0.12	0.19	0.29	0.39

VAP, ventilator-associated pneumonia.

* $\frac{\text{Number of VAP}}{\text{Number of ventilator - days}} \times 1,000$.[†]The number in parentheses is the number of locations meeting minimum requirements for percentile distributions (ie, ≥ 50 device days for rate distributions, ≥ 50 patient days for device utilization ratios) if less than total number of locations. If this number is < 20 , percentile distributions are not calculated.[‡]Combines all critical care unit types within critical access hospitals.[§]Combines all units not identified as critical care (eg, inpatient wards, step-down units) within critical access hospitals.^{||}Includes free-standing long-term acute care hospitals and long-term acute care locations within the general acute care hospital setting.[¶] $\frac{\text{Number of ventilator - days}}{\text{Number of patient - days}}$ **Table 7**

Pooled means and key percentiles of the distribution of central line-associated BSI rates and central line utilization ratios for level III NICUs, DA module, 2012

Central line-associated BSI rate [*]					Percentile				
Birth-weight category	No. of locations [†]	No. of CLABSI	Central line-days	Pooled mean	10%	25%	50% (median)	75%	90%
750 grams	380 (334)	420	185,851	2.3	0	0	1.5	3.7	7.5
751-1,000 grams	401 (339)	256	160,230	1.6	0	0	0	2.6	4.6
1,001-1,500 grams	418 (370)	195	172,732	1.1	0	0	0	1.6	3.9
1,501-2,500 grams	415 (338)	104	161,361	0.6	0	0	0	0	2.3
>2,500 grams	422 (322)	136	176,853	0.8	0	0	0	0.3	2.0
Central line utilization ratio [‡]					Percentile				
Birth-weight category	No. of locations [†]	Central line-days	Patient-days	Pooled Mean	10%	25%	50% (median)	75%	90%
750 grams	380 (346)	185,851	455,113	0.41	0.27	0.33	0.42	0.55	0.67
751-1,000 grams	401 (369)	160,230	457,406	0.35	0.21	0.27	0.34	0.46	0.60
1,001-1,500 grams	418 (407)	172,732	653,953	0.26	0.13	0.18	0.24	0.35	0.49
1,501-2,500 grams	415 (410)	161,361	908,957	0.18	0.05	0.08	0.13	0.22	0.37
>2,500 grams	422 (412)	176,853	738,196	0.24	0.06	0.09	0.15	0.26	0.42

BSI, bloodstream infection; CLABSI, central line-associated BSI; NICU, neonatal intensive care unit.

* $\frac{\text{Number of CLABSI}}{\text{Number of central line - days}} \times 1,000$.[†]The number in parentheses is the number of locations meeting minimum requirements for percentile distributions (ie, ≥ 50 device days for rate distributions, ≥ 50 patient days for device utilization ratios) if less than total number of locations. If this number is < 20 , percentile distributions are not calculated.[‡] $\frac{\text{Number of central line - days}}{\text{Number of patient - days}}$ **Table 8**

Pooled means and key percentiles of the distribution of central line-associated BSI rates and central line utilization ratios for level II/III NICUs, DA module, 2012

Central line-associated BSI rate [*]					Percentile				
Birth-weight category	No. of locations [†]	No. of CLABSI	Central line-days	Pooled mean	10%	25%	50% (median)	75%	90%
750 grams	377 (283)	300	118,042	2.5	0	0	0	4.9	10.1
751-1,000 grams	443 (312)	197	101,014	2.0	0	0	0	3.3	7.8
1,001-1,500 grams	524 (373)	115	123,617	0.9	0	0	0	0	3.4
1,501-2,500 grams	555 (351)	67	109,035	0.6	0	0	0	0	1.9
>2,500 grams	555 (313)	68	112,147	0.6	0	0	0	0	1.4
Central line utilization ratio [‡]					Percentile				
Birth-weight category	No. of locations [†]	Central line-days	Patient-days	Pooled mean	10%	25%	50% (median)	75%	90%
750 grams	377 (311)	118,042	310,004	0.38	0.23	0.33	0.45	0.57	0.75
751-1,000 grams	443 (356)	101,014	304,330	0.33	0.19	0.27	0.36	0.47	0.61
1,001-1,500 grams	524 (466)	123,617	484,544	0.26	0.11	0.17	0.25	0.35	0.49
1,501-2,500 grams	555 (532)	109,035	756,073	0.14	0.04	0.06	0.10	0.17	0.28
>2,500 grams	555 (528)	112,147	614,939	0.18	0.05	0.07	0.11	0.19	0.29

BSI, bloodstream infection; CLABSI, central line-associated BSI; NICU, neonatal intensive care unit.

* $\frac{\text{Number of CLABSI}}{\text{Number of central line - days}} \times 1,000$.[†]The number in parentheses is the number of locations meeting minimum requirements for percentile distributions (ie, ≥ 50 device days for rate distributions, ≥ 50 patient days for device utilization ratios) if less than total number of locations. If this number is < 20 , percentile distributions are not calculated.[‡] $\frac{\text{Number of central line - days}}{\text{Number of patient - days}}$

Table 9
Pooled means and key percentiles of the distribution of ventilator-associated PNEU rates and ventilator utilization ratios for level III NICUs, DA module, 2012

Ventilator-associated PNEU rate*					Percentile				
Birth-weight category	No. of locations [†]	No. of VAP	Ventilator-days	Pooled mean	10%	25%	50% (median)	75%	90%
750 grams	157 (133)	97	73,987	1.3	0	0	0	2.0	4.4
751-1,000 grams	163 (123)	47	39,689	1.2	0	0	0	0	4.0
1,001-1,500 grams	167 (95)	14	22,701	0.6	0	0	0	0	2.1
1,501-2,500 grams	165 (83)	4	20,945	0.2	0	0	0	0	0
>2,500 grams	167 (87)	10	30,305	0.3	0	0	0	0	0
Ventilator utilization ratio [‡]					Percentile				
Birth-weight category	No. of locations [†]	Ventilator-days	Patient-days	Pooled mean	10%	25%	50% (median)	75%	90%
750 grams	157 (143)	73,987	195,281	0.38	0.21	0.28	0.38	0.50	0.65
751-1,000 grams	163 (149)	39,689	171,975	0.23	0.08	0.14	0.20	0.35	0.48
1,001-1,500 grams	167 (157)	22,701	225,630	0.10	0.02	0.04	0.07	0.14	0.26
1,501-2,500 grams	165 (163)	20,945	308,507	0.07	0.01	0.02	0.04	0.08	0.18
>2,500 grams	167 (162)	30,305	272,791	0.11	0.02	0.03	0.06	0.11	0.19

VAP, ventilator-associated pneumonia; NICU, neonatal intensive care unit.

* $\frac{\text{Number of VAP}}{\text{Number of ventilator - days}} \times 1,000$.

[†]The number in parentheses is the number of locations meeting minimum requirements for percentile distributions (ie, ≥ 50 device days for rate distributions, ≥ 50 patient days for device utilization ratios) if less than total number of locations. If this number is < 20 , percentile distributions are not calculated.

[‡] $\frac{\text{Number of ventilator - days}}{\text{Number of patient - days}}$.

Table 10
Pooled means and key percentiles of the distribution of ventilator-associated PNEU rates and ventilator utilization ratios for level II/III NICUs, DA module, 2012

Ventilator-associated PNEU rate*					Percentile				
Birth-weight category	No. of locations [†]	No. of VAP	Ventilator-days	Pooled mean	10%	25%	50% (median)	75%	90%
750 grams	147 (110)	76	44,399	1.7	0	0	0	2.4	5.8
751-1,000 grams	157 (100)	33	23,481	1.4	0	0	0	0	5.6
1,001-1,500 grams	184 (75)	8	14,065	0.6	0	0	0	0	0
1,501-2,500 grams	194 (54)	5	12,029	0.4	0	0	0	0	0
>2,500 grams	201 (58)	5	16,163	0.3	0	0	0	0	0
Ventilator utilization ratio [‡]					Percentile				
Birth-weight category	No. of locations [†]	Ventilator-days	Patient-days	Pooled mean	10%	25%	50% (median)	75%	90%
750 grams	147 (121)	44,399	117,397	0.38	0.25	0.30	0.43	0.53	0.71
751-1,000 grams	157 (137)	23,481	106,652	0.22	0.09	0.16	0.22	0.33	0.45
1,001-1,500 grams	184 (166)	14,065	151,764	0.09	0.03	0.05	0.08	0.14	0.24
1,501-2,500 grams	194 (188)	12,029	246,360	0.05	0.01	0.02	0.03	0.05	0.09
>2,500 grams	201 (189)	16,163	194,888	0.08	0.02	0.02	0.05	0.08	0.13

VAP, ventilator-associated pneumonia; NICU, neonatal intensive care unit.

* $\frac{\text{Number of VAP}}{\text{Number of ventilator - days}} \times 1,000$.

[†]The number in parentheses is the number of locations meeting minimum requirements for percentile distributions (ie, ≥ 50 device days for rate distributions, ≥ 50 patient days for device utilization ratios) if less than total number of locations. If this number is < 20 , percentile distributions are not calculated.

[‡] $\frac{\text{Number of ventilator - days}}{\text{Number of patient - days}}$.

Table 11
Distribution of criteria for central line-associated laboratory-confirmed BSI by location, 2012

Type of location	LCBI		Total
	Criterion 1 n (%)	Criterion 2/3 n (%)	
Acute Care Hospitals			
Critical Care			
Burn	251 (94.7)	14 (5.3)	265
Medical			
Major teaching	692 (87.4)	100 (12.6)	792
Medical			
All other	560 (81.9)	124 (18.1)	684
Medical cardiac	487 (77.3)	143 (22.7)	630
Medical/surgical			
Major teaching	803 (85.4)	137 (14.6)	940
Medical/surgical			
All other 15 beds	996 (81.2)	230 (18.8)	1,226
Medical/surgical			
All other > 15 beds	1,542 (81.4)	352 (18.6)	1,894
Neurologic	63 (75.9)	20 (24.1)	83
Neurosurgical	275 (76.2)	86 (23.8)	361

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Table 11
continued

Type of location	LCBI		Total
	Criterion 1 n (%)	Criterion 2/3 n (%)	
Pediatric cardiothoracic	154 (81.5)	35 (18.5)	189
Pediatric medical	24 (82.8)	5 (17.2)	29
Pediatric medical/surgical	466 (81.3)	107 (18.7)	573
Pediatric surgical	3 (100.0)		3
Prenatal	1 (100.0)		1
Respiratory	16 (88.9)	2 (11.1)	18
Surgical			
Major teaching	443 (83.7)	86 (16.3)	529
Surgical			
All other	276 (77.3)	81 (22.7)	357
Surgical cardiothoracic	657 (81.8)	146 (18.2)	803
Trauma	458 (83.7)	89 (16.3)	547
Step-Down Units			
Adult step-down (post-critical care)	459 (87.1)	68 (12.9)	527
Step-down NICU (level II)	2 (50.0)	2 (50.0)	4
Pediatric step-down (post-critical care)	21 (80.8)	5 (19.2)	26
Inpatient Wards			
Acute stroke	14 (93.3)	1 (6.7)	15
Antenatal		1 (100.0)	1
Behavioral health/psychiatry	4 (80.0)	1 (80.0)	5
Burn	19 (90.5)	2 (9.5)	21
Gastrointestinal	18 (94.7)	1 (5.3)	19
Genitourinary	13 (68.4)	6 (31.6)	19
Geronotology	2 (66.7)	1 (33.3)	3
Gynecology	5 (83.3)	1 (16.7)	6
Jail	11 (91.7)	1 (8.3)	12
Labor and delivery	0	0	0
Labor, delivery, recovery, postpartum suite	4 (100.0)	0 (0.0)	4
Medical	854 (88.8)	108 (11.2)	962
Medical/surgical	1,349 (84.7)	243 (15.3)	1,592
Neurologic	43 (79.6)	11 (20.4)	54
Neurosurgical	37 (84.1)	7 (15.9)	44
Orthopedic	65 (83.3)	13 (16.7)	78
Orthopedic trauma	21 (80.8)	5 (19.2)	26
Pediatric medical	43 (89.6)	5 (10.4)	48
Pediatric medical/surgical	195 (86.3)	31 (13.7)	226
Pediatric orthopedic	1 (100.0)		1
Pediatric rehabilitation - non-IRF*	8 (100.0)		8
Pediatric surgical	13 (86.7)	2 (13.3)	15
Postpartum	2 (100.0)		2
Pulmonary	60 (87.0)	9 (13.0)	69
Rehabilitation - non-IRF*	3 (75.0)	1 (25.0)	4
Surgical	388 (85.8)	64 (14.2)	452
Telemetry	212 (88.0)	29 (12.0)	241
Vascular Surgery	20 (95.2)	1 (4.8)	21
Well-Baby Nursery	0	0	0
Chronic Care Units†			
Chronic care	14 (77.8)	4 (22.2)	18
Inpatient hospice	0	0	0
Ventilator dependent unit	15 (100.0)		15
Critical Access Hospitals			
Critical care units‡	7 (70.0)	3 (30.0)	10
Non-critical care units§	16 (76.2)	5 (23.8)	21
Long-Term Acute Care Hospitals			
Adult critical care	132 (89.8)	15 (10.2)	147
Adult ward	1,734 (88.2)	233 (11.8)	1,967
Inpatient Rehabilitation Facilities¶			
Adult rehabilitation units - Freestanding	17 (100.0)		17
Adult rehabilitation units - Within health care facility	77 (89.5)	9 (10.5)	86
TOTAL	14,065 (84.2)	2,645 (15.8)	16,710

BSI, bloodstream infection; LCBI, laboratory-confirmed BSI.⁵

*Includes only in-hospital rehabilitation wards that are not defined as inpatient rehabilitation facilities (IRF) per the CMS Inpatient Rehabilitation Facility Quality Reporting Program.

†Includes chronic care locations within the general acute care hospital setting.

‡Combines all critical care unit types within critical access hospitals.

§Combines all units not identified as critical care (eg, inpatient wards, step-down units) within critical access hospitals.

||Includes free-standing long-term acute care hospitals and long-term acute care locations within the general acute care hospital setting.

¶Includes free-standing inpatient rehabilitation facilities and inpatient rehabilitation facilities within the acute care hospital setting, as defined by the CMS Inpatient Rehabilitation Facility Quality Reporting Program.

Table 12
Distribution of criteria for permanent and temporary central line-associated laboratory-confirmed BSI by location, 2012

Type of Location	LCBI		Total
	Criterion 1 n (%)	Criterion 2/3 n (%)	
Permanent Central Line			
General hematology/oncology	308 (76.6)	94 (23.4)	402
Hematopoietic stem cell transplant	200 (78.1)	56 (21.9)	256
Pediatric general hematology/oncology	187 (72.8)	70 (27.2)	257
Pediatric hematopoietic stem cell transplant	67 (72.0)	26 (28.0)	93
Solid organ transplant	16 (80.0)	4 (20.0)	20
Solid tumor	11 (73.3)	4 (26.7)	15
Total	789 (75.6)	254 (24.4)	1,043
Temporary Central Line			
General hematology/oncology	399 (81.3)	92 (18.7)	491
Hematopoietic stem cell transplant	229 (77.9)	65 (22.1)	294
Pediatric general hematology/oncology	73 (77.7)	21 (22.3)	94
Pediatric hematopoietic stem cell transplant	17 (77.3)	5 (22.7)	22
Solid organ transplant	57 (89.1)	7 (10.9)	64
Solid tumor	10 (58.8)	7 (41.2)	17
Total	785 (79.9)	197 (20.1)	982

BSI, bloodstream infection; LCBI, laboratory-confirmed BSI.⁵

Table 13
Distribution of specific sites of urinary catheter-associated UTI by location, 2012

Type of location	SUTI n (%)	ABUTI n (%)	Total
Acute Care Hospitals			
Critical care units			
Burn	382 (99.5)	2 (0.5)	384
Medical			
Major teaching	2,150 (98.6)	31 (1.4)	2,181
All other	1,408 (97.9)	30 (2.1)	1,438
Medical cardiac	1,497 (98.7)	20 (1.3)	1,517
Medical/Surgical			
Major teaching	2,244 (98.4)	36 (1.6)	2,280
All other, 15 beds	2,472 (98.1)	49 (1.9)	2,521
Medical/Surgical			
All other, >15 beds	4,323 (98.5)	64 (1.5)	4,387
Neurologic	437 (99.1)	4 (0.9)	441
Neurosurgical	2,459 (99.8)	5 (0.2)	2,464
Pediatric cardiothoracic	60 (98.4)	1 (1.6)	61
Pediatric medical	35 (100.0)		35
Pediatric medical/surgical	450 (99.6)	2 (0.4)	452
Pediatric surgical	1 (100.0)		1
Respiratory	29 (96.7)	1 (3.3)	30
Surgical			
Major teaching	1,782 (99.1)	17 (0.9)	1,799
All other	910 (99.1)	8 (0.9)	918
Surgical cardiothoracic	1,628 (98.2)	29 (1.8)	1,657
Trauma	1,973 (99.1)	18 (0.9)	1,991
Specialty Care Areas/Oncology			
General hematology/oncology	253 (98.4)	4 (1.6)	257
Hematopoietic stem cell transplant	39 (95.1)	2 (4.9)	41
Pediatric general hematology/oncology	9 (100.0)		9
Pediatric hematopoietic stem cell transplant	1 (100.0)		1
Solid organ transplant	35 (94.6)	2 (5.4)	37
Solid tumor	58 (100.0)		58
Step-down Units			
Adult step-down (post-critical care)	1,120 (98.3)	19 (1.7)	1,139
Pediatric step-down (post-critical care)	1 (100.0)		1
Inpatient Wards			
Acute stroke	25 (96.2)	1 (3.8)	26
Antenatal	2 (100.0)		2
Behavioral health/psychiatry	31 (96.9)	1 (3.1)	32
Burn	30 (93.8)	2 (6.3)	32
Genitourinary	11 (100.0)		11
Gerontology	8 (100.0)		8
Gynecology	25 (96.2)	1 (3.8)	26
Jail	5 (83.3)	1 (16.7)	6
Labor and delivery	15 (100.0)		15
Labor, delivery, recovery, postpartum suite	30 (100.0)		30

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Table 13
continued

Type of location	SUTI n (%)	ABUTI n (%)	Total
Medical	1,320 (99.0)	14 (1.0)	1,334
Medical/Surgical	2,711 (98.5)	40 (1.5)	2,751
Neurologic	159 (100.0)		159
Neurosurgical	175 (100.0)		175
Orthopedic	422 (99.3)	3 (0.7)	425
Orthopedic trauma	68 (100.0)		68
Pediatric medical	6 (100.0)		6
Pediatric medical/surgical	55 (100.0)		55
Pediatric orthopedic	1 (100.0)		1
Pediatric rehabilitation - non-IRF*	1 (100.0)		1
Pediatric surgical	4 (100.0)		4
Postpartum	61 (100.0)		61
Pulmonary	87 (98.9)	1 (1.1)	88
Rehabilitation - non-IRF*	28 (96.6)	1 (3.4)	29
Surgical	1,082 (98.5)	17 (1.5)	1,099
Telemetry	390 (97.5)	10 (2.5)	400
Vascular surgery	25 (100.0)		25
Well-baby nursery			0
Chronic Care Units [†]			
Chronic care	30 (96.8)	1 (3.2)	31
Chronic care rehabilitation unit	6 (100.0)		6
Inpatient hospice	2 (100.0)		2
Ventilator dependent unit	39 (97.5)	1 (2.5)	40
Critical Access Hospitals			
Critical care units [‡]	25 (100.0)		25
Non-critical care units [§]	167 (96.5)	6 (3.5)	173
Long-Term Acute Care Hospitals			
Adult critical care	145 (98.0)	3 (2.0)	148
Adult ward	2,490 (98.1)	47 (1.9)	2,537
Inpatient Rehabilitation Facilities [¶]			
Adult rehabilitation units - Freestanding	345 (99.4)	2 (0.6)	347
Adult rehabilitation units - Within hospital	560 (98.4)	9 (1.6)	569
Pediatric rehabilitation units - Within hospital	2 (100.0)		2
TOTAL	36,344 (98.6)	505 (1.4)	36,849

UTI, urinary tract infection; SUTI, symptomatic UTI; ABUTI, asymptomatic bacteremic UTI.⁶

*Includes only in-hospital rehabilitation wards that are not defined as inpatient rehabilitation facilities (IRF) per the CMS Inpatient Rehabilitation Facility Quality Reporting Program.

[†]Includes chronic care locations within the general acute care hospital setting.

[‡]Combines all critical care unit types within critical access hospitals.

[§]Combines all units not identified as critical care (eg, inpatient wards, step-down units) within critical access hospitals.

^{||}Includes free-standing long-term acute care hospitals and long-term acute care locations within the general acute care hospital setting.

[¶]Includes free-standing inpatient rehabilitation facilities and inpatient rehabilitation facilities within the acute care hospital setting, as defined by the CMS Inpatient Rehabilitation Facility Quality Reporting Program.

Table 14
Distribution of specific sites of ventilator-associated pneumonia by location, 2012

Type of location	PNU1 n (%)	PNU2 n (%)	PNU3 n (%)	Total			
Acute Care Hospitals							
Critical Care Units							
Burn	25	29.1%	61	70.9%	86		
Medical							
Major teaching	127	62.0%	74	36.1%	4	2.0%	205
Medical							
All other	119	62.3%	65	34.0%	7	3.7%	191
Medical cardiac	88	65.2%	46	34.1%	1	0.7%	135
Medical/surgical							
Major teaching	208	55.9%	160	43.0%	4	1.1%	372
Medical/surgical							
All other 15 beds	267	63.7%	138	32.9%	14	3.3%	419
Medical/surgical							
All other >15 beds	454	68.2%	201	30.2%	11	1.7%	666
Neurologic	24	38.7%	37	59.7%	1	1.6%	62
Neurosurgical	114	54.3%	95	45.2%	1	0.5%	210
Pediatric cardiothoracic	6	66.7%	2	22.2%	1	11.1%	9
Pediatric medical	1	50.0%	1	50.0%			2
Pediatric medical/surgical	80	70.8%	28	24.8%	5	4.4%	113
Pediatric surgical	1	100.0%					1
Respiratory	4	100.0%					4
Surgical							
Major teaching	157	56.1%	122	43.6%	1	0.4%	280

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Table 14
continued

Type of location	PNU1 n (%)		PNU2 n (%)		PNU3 n (%)		Total
Surgical							
All other	89	46.4%	98	51.0%	5	2.6%	192
Surgical cardiothoracic	194	60.8%	119	37.3%	6	1.9%	319
Trauma	232	45.7%	275	54.1%	1	0.2%	508
Specialty Care Areas/Oncology							
Hematopoietic stem cell transplant							0
Step-Down Units							
Adult step-down (post-critical care)	26	83.9%	5	16.1%			31
Pediatric step-down (post-critical care)	1	100.0%					1
Step-down NICU (level II)							0
Inpatient Wards							
Medical	2	66.7%	1	33.3%			3
Medical/surgical	4	18.2%	17	77.3%	1	4.5%	22
Pediatric medical							0
Pediatric medical/surgical							0
Pulmonary	6	85.7%	1	14.3%			7
Surgical							0
Telemetry	1	100.0%					1
Critical Access Hospitals							
Critical care units*	3	100.0%					3
Non-critical care units†	2	50.0%	1	25.0%	1	25.0%	4
Long-Term Acute Care Hospitals‡							
Adult critical care	7	87.5%	1	12.5%			8
Adult ward	78	75.7%	24	23.3%	1	1.0%	103
Total	2,320	58.6%	1,572	39.7%	65	1.6%	3,957

PNU1, clinically defined pneumonia; PNU2, pneumonia with specific laboratory findings; PNU3, pneumonia in immunocompromised patients.⁷

*Combines all critical care unit types within critical access hospitals.

†Combines all units not identified as critical care (eg, inpatient wards, step-down units) within critical access hospitals.

‡Includes free-standing long-term acute care hospitals and long-term acute care locations within the general acute care hospital setting.

Table 15

Distribution of specific sites and criteria for central line-associated laboratory-confirmed BSI among Level III NICUs by birthweight, 2012

Birth-weight category	LCBI				Total
	Criterion 1 n (%)		Criterion 2/3 n (%)		
750 grams	316	75.2%	104	24.8%	420
751-1,000 grams	176	68.8%	80	31.3%	256
1,001-1,500 grams	135	69.2%	60	30.8%	195
1,501-2,500 grams	76	73.1%	28	26.9%	104
>2,500 grams	101	74.3%	35	25.7%	136
Total	804	72.4%	307	27.6%	1,111

BSI, bloodstream infection; LCBI, laboratory-confirmed BSI.⁵

Table 16

Distribution of specific sites and criteria for central line-associated laboratory-confirmed BSI among Level II/III NICUs by birthweight, 2012

Birth-weight category	LCBI				Total
	Criterion 1 n (%)		Criterion 2/3 n (%)		
750 grams	211	70.3%	89	29.7%	300
751-1,000 grams	127	64.5%	70	35.5%	197
1,001-1,500 grams	73	63.5%	42	36.5%	115
1,501-2,500 grams	49	73.1%	18	26.9%	67
>2,500 grams	43	63.2%	25	36.8%	68
Total	503	67.3%	244	32.7%	747

BSI, bloodstream infection; LCBI, laboratory-confirmed BSI.⁵

(PNU1) which relies on the somewhat subjective interpretations of clinical findings.

As diverse types of facilities continue to participate in NHSN, either voluntarily or by mandate, the need for careful scrutiny

Table 17

Distribution of specific sites of ventilator-associated pneumonia among Level III NICUs by birthweight, 2012

Birth-weight category	PNU1 n (%)		PNU2 n (%)		PNU3 n (%)		Total
750 grams	60	61.9%	34	35.1%	3	3.1%	97
751-1,000 grams	30	63.8%	17	36.2%			47
1,001-1,500 grams	10	71.4%	4	28.6%			14
1,501-2,500 grams	1	25.0%	3	75.0%			4
>2,500 grams	7	70.0%	3	30.0%			10
Total	108	62.8%	61	35.5%	3	1.7%	172

PNU1, clinically defined pneumonia; PNU2, pneumonia with specific laboratory findings; PNU3, pneumonia in immunocompromised patients.⁷

Table 18

Distribution of specific sites of ventilator-associated pneumonia among Level II/III NICUs by birthweight, 2012

Birth-weight category	PNU1 n (%)		PNU2 n (%)		PNU3 n (%)		Total
750 grams	54	71.1%	20	26.3%	2	2.6%	76
751-1,000 grams	29	87.9%	3	9.1%	1	3.0%	33
1,001-1,500 grams	5	62.5%	2	25.0%	1	12.5%	8
1,501-2,500 grams	2	40.0%	2	40.0%	1	20.0%	5
> 2,500 grams	4	80.0%	1	20.0%			5
Total	94	74.0%	28	22.0%	5	3.9%	127

PNU1, clinically defined pneumonia; PNU2, pneumonia with specific laboratory findings; PNU3, pneumonia in immunocompromised patients.⁷

of the data increases. NHSN will continue to assess how changing facility composition and changes in the proportion of data contributed by facility types impact the rates and their distributions so that the best possible risk-adjusted comparative data may be provided in future reports.

To improve the reliability of data reported to NHSN, several protocol changes were introduced in January 2013. The majority of these changes were with respect to timing and implementation of two-day rules to clarify infections that are health care-associated, association of device use to HAI, and attribution of HAI to an inpatient location after transfer or to a hospital after discharge. In addition, NHSN added criteria for mucosal barrier injury laboratory-confirmed bloodstream infections, which have not been removed or accounted for separately in this report. Finally, the VAP definition no longer applies to adult patients (ie, ≥ 18 years of age) and this definition has been replaced by ventilator-associated events (VAEs).¹¹ We will carefully assess the potential impact of these changes on HAI incidence as these data are reported.

For those who do not report to NHSN but would like to use these data for comparison, the information must first be collected from your hospital in accordance with the methods described for NHSN.^{5–7} Refer to [Appendices A and B](#) for further instructions. [Appendix A](#) discusses the calculation of infection rates and DU ratios for the DA Module. [Appendix B](#) gives a step-by-step method for interpretation of percentiles of infection rates or DU ratios. Although a high rate or ratio (>90 th percentile) does not necessarily define a problem, it does suggest an area for further investigation. Similarly, a low rate or ratio (<10 th percentile) may be the result of inadequate infection detection.

Facilities should use the data in this report and their own data to guide local prevention strategies and other quality improvement efforts to reduce the occurrence of infections as much as possible. The data presented in this report can be used to prioritize prevention efforts in those patient care areas that are shown to have the highest incidence of DA infections and/or high device utilization. Facilities may also wish to set targets based on the percentile distributions provided in this report in an effort to strive for lower rates and greater prevention success.

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NHSN Education and Data Quality Assurance Team
 NHSN Development Team
 NHSN Protocol and Public Reporting Team
 NHSN Statistics Team
 NHSN User Support Team

The findings and conclusions of the report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

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APPENDIX A. HOW TO CALCULATE A DEVICE-ASSOCIATED INFECTION RATE AND DEVICE UTILIZATION RATIO WITH DEVICE-ASSOCIATED MODULE DATA

Calculation of device-associated infection rate

Step 1: Decide upon the time period for your analysis. It may be a month, a quarter, 6 months, a year, or some other period.

Step 2: Select the patient population for analysis, eg, the type of location or a birthweight category in a NICU.

Step 3: Select the infections to be included in the numerator. They must be site-specific and must have occurred in the selected patient population. Their date of onset must be during the selected time period.

Step 4: Determine the number of device-days which is used as the denominator of the rate. Device-days are the total number of days of exposure to the device (central line, ventilator, or urinary catheter) by all of the patients in the selected population during the selected time period.

Example: Five patients on the first day of the month had one or more central lines in place; five on day 2; two on day 3; five on day 4; three on day 5; four on day 6; and four on day 7. Adding the number of patients with central lines on days 1 through 7, we would have $5+5+2+5+3+4+4=28$ central line-days for the first week. If we continued for the entire month, the number of central line-days for the month is simply the sum of the daily counts.

Step 5: Calculate the device-associated infection rate (per 1,000 device-days) using the following formula:

$$\text{Device-associated Infection Rate} = \frac{\text{Number of device-associated infections for an infection site}}{\text{Number of device-days}} \times 1,000$$

$$\text{Example : Central line-associated BSI rate per 1,000 central line-days} = \frac{\text{Number of central line-associated BSI}}{\text{Number of central line-days}} \times 1,000$$

Calculation of device utilization (DU) ratio

Steps 1, 2, 4: Same as device-associated infection rates plus determine the number of patient-days which is used as the denominator of the DU ratio. Patient-days are the total number of days that patients are in the location during the selected time period.

Example: Ten patients were in the unit on the first day of the month; 12 on day 2; 11 on day 3; 13 on day 4; 10 on day 5; 6 on day 6; and 10 on day 7; and so on. If we counted the patients in the unit from days 1 through 7, we would add $10 + 12 + 11 + 13 + 10 + 6 + 10$ for a total of 72 patient-days for the first week of the month. If we continued for the entire month, the number of patient-days for the month is simply the sum of the daily counts.

Step 5: Calculate the DU ratio with the following formula:

$$\text{DU Ratio} = \frac{\text{Number of device-days}}{\text{Number of patient-days}}$$

With the number of device-days and patient-days from the examples above, $\text{DU} = 28/72 = 0.39$ or 39% of patient-days were also central line-days for the first week of the month.

Step 6: Examine the size of the denominator for your hospital's rate or ratio. Rates or ratios may not be good estimates of the "true" rate or ratio for your hospital if the denominator is small, ie, <50 device-days or patient-days.

Step 7: Compare your hospital's location-specific rates or ratios with those found in the tables of this report. Refer to [Appendix B](#) for interpretation of the percentiles of the rates/ratios.

APPENDIX B. INTERPRETATION OF PERCENTILES OF INFECTION RATES OR DEVICE UTILIZATION RATIOS

Step 1: Evaluate the rate (ratio) you have calculated for your hospital and confirm that the variables in the rate (both numerator and denominator) are identical to the rates (ratios) in the table.

Step 2: Examine the percentiles in each of the tables and look for the 50th percentile (or median). At the 50th percentile, 50% of the hospitals have lower rates (ratios) than the median and 50% have higher rates (ratios).

Step 3: Determine if your hospital's rate (ratio) is above or below this median.

Determining whether your hospital's rate or ratio is a HIGH outlier

Step 4: If it is above the median, determine whether the rate (ratio) is above the 75th percentile. At the 75th percentile, 75% of the hospitals had lower rates (ratios) and 25% of the hospital had higher rates (ratios).

Step 5: If the rate (ratio) is above the 75th percentile, determine whether it is above the 90th percentile. If it is, then the rate (ratio) is an outlier which may indicate a problem.

Determining whether your hospital's rate or ratio is a LOW outlier

Step 6: If it is below the median, determine whether the rate (ratio) is below the 25th percentile. At the 25th percentile, 25% of the hospitals had lower rates (ratios) and 75% of the hospitals had higher rates (ratios).

Step 7: If the rate (ratio) is below the 25th percentile, determine whether it is below the 10th percentile. If the rate is, then it is a low outlier which may be due to underreporting of infections. If the ratio is below the 10th percentile, it is a low outlier and may be due to infrequent and/or short duration of device use.

Note: Device-associated infection rates and device utilization ratios should be examined together so that preventive measures may be appropriately targeted. For example, you find that the ventilator-associated pneumonia rate for a certain type of ICU is consistently above the 90th percentile and the ventilator utilization ratio is routinely between the 75th and 90th percentile. Since the ventilator is a significant risk factor for pneumonia, you may want to limit the duration of ventilation whenever possible (ie, decrease unnecessary use) while at the same time optimize infection prevention strategies in patients for which ventilator use is required.