Figure 1: Annual Distribution of Nosocomial and Community-acquired Influenza

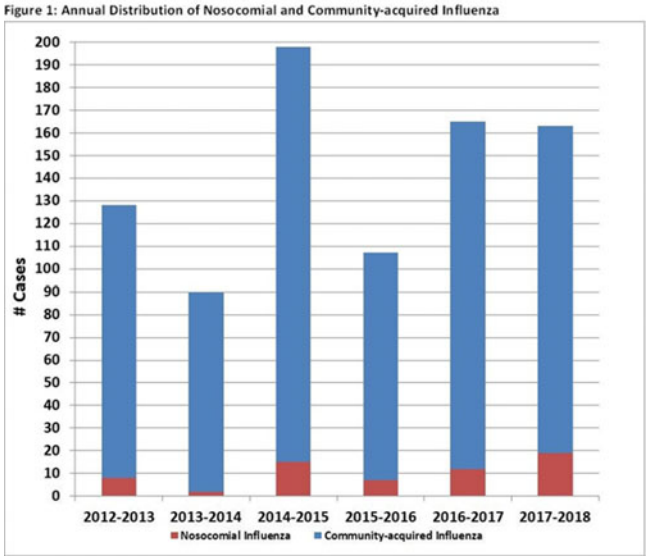

Fig. 1.

the study period, even after introduction of PCR tests in the 2014–2015 season. The mean age of the nosocomial influenza group was greater compared to the CA-I and no influenza groups. More than half of nosocomial influenza cases were unvaccinated at the time of admission, demonstrating the importance of improving vaccine uptake among vulnerable populations.

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Presentation Type:
Top Rated Posters

Incidence Trends of Central-Line–Associated Bloodstream Infections in Neonatal Intensive Care Units, NHSN, 2009–2018

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Background: Central-line–associated bloodstream infections (CLABSIs) are a major source of healthcare-associated infections (HAIs) in neonatal intensive care unit (NICU) patients, and they are associated with increased morbidity, mortality, and costs. CLABSI surveillance has been a critical component for hospitals participating in the Center for Disease Control and Prevention's National Healthcare Safety Network (NHSN) for many years. CLABSI reporting grew substantially as a result of state reporting mandates first introduced in 2005 and federal reporting requirements for all intensive care units that began in 2011. However, no recent assessment of NHSN CLABSI incidence rate changes have been performed. The objective of this analysis was to estimate the overall trends in annual CLABSI incidence rates in NICUs from 2009 to 2018. **Methods:** We analyzed NHSN CLABSI data reported from NICUs during 2009–2018. CLABSIs further classified as mucosal barrier injury were included in this analysis. To evaluate the trends of CLABSI incidence (per 1,000 central-line days), and to account for the potential impact of definition changes introduced in 2015, we conducted an interrupted time-series analysis using mixed-effects negative binomial regression modeling. Birth weight category, patient care location type and hospital-level characteristics such as hospital type, medical affiliation, teaching status, bed size, and average length of inpatient stay) were assessed as potential covariates in regression analysis. Random intercept and slope models were evaluated with covariance tests and used to account for differential baseline incidence and trends among reporting NICUs. **Results:** The number of NICUs reporting to NHSN increased significantly following the federal mandate and has remained slightly >1,000 NICUs since 2013. The crude incidence of CLABSI dropped from 2.24 in 2009 to 0.98 infections per 1,000 central-line days in 2018, except for an increase in 2015 (Table 1). The CLABSI incidence, adjusted for birth weight category, decreased by an average of 11.6% per year from 2009 to 2018 except for a 35.8% increase in 2015 (Table 2). **Conclusion:** These findings suggest that hospitals have made significant strides in reducing the occurrence of CLABSIs in NICUs over the last 10 years. The increase in 2015 could be explained in part by the implementation and application of new definitional changes. Continued practices and policies that target, assess and prevent CLABSI in this setting may have been effective and remain vital to sustaining this decline nationally in subsequent years.

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Table 1: Crude CLABSI incidence rates/1,000 central line days from NICUs, 2009-2018

Year	*No. of hospitals*	*No. of events*	*No. of central line days*	*CLABSI RATE*
2009	354	1,485	664,048	2.236
2010	530	1,380	844,652	1.634
2011	964	2,189	1,462,819	1.496
2012	999	1,860	1,423,481	1.307
2013	1,018	1,638	1,412,865	1.159
2014	1,013	1,537	1,427,678	1.077
2015	1,044	1,936	1,436,849	1.347
2016	1,051	1,600	1,415,628	1.130
2017	1,060	1,490	1,390,368	1.072
2018	1,063	1,292	1,314,420	0.983

Fig. 1.

Table 2: Summary of model coefficients, incidence rate ratios and annual percentage change for CLABSIs in NICUs, 2009-2018.

Effect of generalized linear mixed model[a]	Estimate	Standard Error	p-value	Incidence rate ratio (95% CI)	Percent change per year[b] (95%CI)
Time Trend	-0.1161	0.007567	<.0001	0.890 (0.877,0.904)	-11.61 (-12.28, -09.63)
Immediate effect of interruption at 2015	0.3575	0.03445	<.0001	1.430 (1.34,1.53)	35.75 (33.69, 53.02)

[a]Negative binomial model adjusted for birth weight category only. Other potential covariates were not significant and dropped from the final model. [b]Percent change = (incidence rate ratio-1) x 100

Fig. 2.

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National Reporting Trend for HO-MRSA Bacteremia LabID Events, 2010–2018

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Background: The Centers for Disease Control and Prevention's National Healthcare Safety Network (NHSN) has included surveillance of laboratory-identified (LabID) methicillin-resistant *Staphylococcus aureus* (MRSA) bacteremia events since 2009. In 2013, the Centers for Medicare & Medicaid Services (CMS) began requiring acute-care hospitals (ACHs) that participate in the CMS Inpatient Quality Reporting program to report MRSA LabID events to the NHSN and, in 2015, ACHs were required to report MRSA LabID events from emergency departments (EDs) and/or 24-hour observation locations. Prior studies observed a decline in hospital-onset MRSA (HO-MRSA) rates in national studies over shorter periods or other surveillance systems. In this analysis, we review the national reporting trend for HO-MRSA bacteremia LabID events, 2010–2018. **Method:** This analysis was limited to MRSA bacteremia LabID event data reported by ACHs that follow NHSN surveillance protocols. The data were restricted to events reported for overall inpatient facility-wide and, if applicable, EDs and 24-hour observation locations. MRSA events were classified as HO (collected >3 days after admission) or inpatient or outpatient community onset (CO, collected ≤3 days after admission). An interrupted time series random-effects generalized linear model was used to examine the relationship between HO-MRSA incidence rates (per 1,000 patient days) and time (year) while controlling for potential risk factors as fixed effects. The following potential risk factors were evaluated: facility's annual survey data (facility type, medical affiliation, length of facility stay, number of beds, and number of intensive care unit beds) and quarterly summary data (inpatient and outpatient CO prevalence rates). **Result:** The number of reporting ACHs increased during this period, from 473 in 2010 to 3,651 in 2018. The crude HO-MRSA incidence rates (per 1,000 patient days) have declined over time, from a high of 0.067 in 2011 to 0.052 in 2018 (Table 1). Compared to 2014, the adjusted annual incidence rate increased in 2015 by 16.38%, (95% confidence interval [CI], 10.26%–22.84%; $P < .0001$). After controlling for all significant risk factors, the estimated annual HO-MRSA incidence rates declined by 5.98% (95% CI, 5.17%–6.78%; $P < .0001$) (Table 2). **Conclusions:** HO-MRSA bacteremia incidence rates have decreased over the past 9 years, despite a slight increase in 2015. This national trend analysis reviewed a longer period while analyzing potential risk factors. The decline in HO-MRSA incidence rates has been gradual; however, given the current trend, it is not likely to meet the Healthy People 2020 objectives. This analysis suggests the need for hospitals to continue and/or enhance HO-MRSA infection prevention efforts to reduce rates further.

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Table 1. Hospital-onset (HO) MRSA bacteremia LabID events in Acute Care Hospitals, NHSN, 2010 – 2018

Year	No. of hospitals	No. of HO events	No. of patient days	HO Rate / 1,000 patient days
2010	473	1,019	16,945,243	0.060
2011	675	2,011	29,801,411	0.067
2012	1,051	2,612	42,857,046	0.061
2013	3,518	9,360	156,567,134	0.060
2014	3,592	9,160	159,993,159	0.057
2015	3,540	8,694	151,902,151	0.057
2016	3,564	8,421	153,342,316	0.055
2017	3,636	8,025	154,626,791	0.052
2018	3,651	8,136	156,224,325	0.052

HO: Hospital-onset

Fig. 1.

Table 2. Parameter estimates from interrupted time series generalized linear random effect model for Hospital-onset MRSA bacteremia LabID event trends, NHSN, 2010 – 2018

Variables*	Estimate	Standard error	p-value	Rate ratio	Annual percent change of rate ratio, % (95% CI)
Individual year	-0.0617	0.00438	<.0001	0.9401	-5.98 (-6.78, -5.17)
2015 – 2018 vs. 2010 – 2014	0.1517	0.02756	<.0001	1.1638	16.38 (10.26, 22.84)

CI: Confidence Interval

*The model adjusted for the following variables: annual survey variables included facility type, medical affiliation, length of facility stay, number of facility beds, and number of intensive care unit beds; quarterly summary variables included inpatient and outpatient community-onset prevalence rates; and an indicator variable for 2015 to account for the major change in MRSA reporting requirements.

Fig. 2.

Presentation Type:
Top Rated Posters

Infection Prevention Time Required for Construction and Design at a Large Tertiary-Care Hospital, 2019

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Background: Including infection preventionists (IPs) in hospital design, construction, and renovation projects is important. According to the Joint Commission, "Infection control oversights during building design or renovations commonly result in regulatory problems, millions lost and even patient deaths." We evaluated the number of active major construction projects at our 800-bed hospital with 6.0 IP FTEs and the IP time required for oversight. **Methods:** We reviewed construction records from October 2018 through October 2019. We classified projects as active if any construction occurred during the study period. We describe the types of projects: inpatient, outpatient, non–patient care, and the potential impact to patient health through infection control risk assessments (ICRA). ICRAs were classified as class I (non–patient-care area and minimal construction activity), class II (patients are not likely to be in the area and work is small scale), class III (patient care area and work requires demolition that generates dust), and class IV (any area requiring environmental precautions). We calculated the time spent visiting construction sites and in design meetings. **Results:** During October 2018–October 2019, there were 51 active construction projects with an average of 15 active sites per week. These sites included a wide range of projects from a new bone marrow transplant unit, labor and delivery expansion and renovation, space conversion to an inpatient unit to a project for multiple air handler replacements. All 51 projects were classified as class III or class IV. We visited, on average, 4 construction sites each week for 30 minutes per site, leaving 11 sites unobserved due to time constraints. We spent an average of 120